# CONSTRUCTION PHASE PLAN

## (notifiable projects)

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|---|---|
| **Project Name:** | Plot R – Rochdale – Sustainable Materials Manufacturing Centre (SMMC) |
| **Project Number:** | G11TBC |
| **Project Manager:** | Steven Schofield |



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# CONSTRUCTION PHASE PLAN

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# CONSTRUCTION PHASE PLAN

Glencar

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## Introduction

### Introduction to this Construction Phase Plan (CPP)

The purpose of this Construction Phase Plan (CPP) is to enable Glencar Group when acting as a Principal Contractor as specified in the Construction (Design & Management) Regulations 2015, to develop and add its own management organisation and arrangements to the Pre Construction Information (PCI) provided by the Client and Principal Designer in order to identify and control foreseeable hazards present in the Construction Phase.

### Implementation, communication and monitoring of the CPP

In order to ensure the safe undertaking of the project, everybody involved in the Construction Phase has a responsibility to ensure that the controls and arrangements within this CPP are adhered to.

In order to ensure that the information contained within the CPP is received and understood by all parties involved in the Construction Phase, the CPP will be made readily available to all contractors involved in the project and will be located within the site office as well as being held remotely on a cloud storage facility.

The CPP is an organic document which will be subject to regular reviews by the Project Management Team throughout the Construction Phase to ensure that the information and controls contained within it are appropriate for the works being undertaken.

### Health & Safety goals for this project:

- Complete the project with zero RIDDOR reportable incidents involving contractors
- Complete the project with zero RIDDOR reportable incidents involving members of the public/client staff
- Ensure compliance with Health & Safety legislation, company Health & Safety policies and client Health & Safety policies
- Maintain a professional and tidy work environment
- Create a positive Health & Safety culture
- Strive to improve Health & Safety standards
- Be proactive in the identification and control of Health & Safety hazards on site

# CONSTRUCTION PHASE PLAN

**Project Overview / Project information**

**Project Name**

Plot R2, Sustainable Materials Manufacturing Centre (SMMC), Rochdale

**Project Address**

Sustainable Materials and Manufacturing Centre (SMMC), Kingsway Business Park, Michael Faraday Avenue, Rochdale, OL16 4GY

**Description of works**

The proposed construction site is a 2.528-acre plot off Michael Faraday Avenue within the Kingsway Business Park site. The scope of works comprises the erection of a research and development facility namely the Sustainable Materials and Manufacturing Centre (SMMC). The building will comprise of a large workshop, flexible space for light workshop or office type uses, social café space and lecture theatre to the ground floor.

The upper level provides cellular offices, meeting rooms and breakout spaces.

| | |
|---|---|
| Total Gross Internal Area: | 42,572 ft² / 3955 m². |
| Ground Floor: | 24822 ft² / 2306 m². |
| First Floor: | 17135 ft² / 1592 m². |
| Second Floor | 615 ft² / 57 m². |

**Surrounding area**

Kingsway Business Park is a partially completed 170-hectare development between Rochdale and Junction 21 and 22 of the M62. The site is located within Kingsway Business Park, approximately 2.4km from Rochdale. The site is between the town of Rochdale and the M62 motorway on an undeveloped plot of the existing Kingsway Park Business Park.

**Structure details**

The building consists of a structural steel frame, with reinforced concrete slabs cast in-situ. On upper floors these are on structural metal decking. The unit roof is a flat roof on composite concrete deck with warm roof single-ply finish. Externally the unit consists of Corten rainscreen cladding supported on light-gauge steel infill wall construction. This light-gauge steel sits on brick & block plinth to the full unit perimeter. Other external finishes include curtain walling glazing, manifestation & Brise Soleil.

**Previous land usage**

The site is predominantly covered by mature vegetation, with boggy areas located in topographic low points. Michael Faraday Ave is the primary access route to site that links through from the wider Kingsway business park. To the north of the site is a Metrolink stop and Turbary Walk.
Previously the land was used as public farmland. Clearance of this land is required to facilitate the schemes construction. Clearance of the site will be undertaken outside of the breeding bird season, which runs from 1st March to 31st August inclusive.

**Planning restrictions**

There exists an easement to the North boundary which prevents any works beyond the site boundary. There is also a footpath running to the tram stop from Michael Faraday Ave. The working strategy for the footpath is to install the permanent footpath in its new position prior to closing the existing route.

**Location of existing records**

The Principal Designer has advised in the Pre-Construction Information Pack (PCI Pack) that the site is undeveloped and therefore no existing health and safety file.
Reports such as the Geotechnical assessment report, sub scan topographic survey etc will be available on viewpoint cloud system.

**Key dates**

Start & completion dates

- Start date: 6th October 2025
- Completion date: 23rd September 2026

**Site hours**

Site working hours are as follows:

- Monday to Friday: 08.00 to 18.00
- **Saturday working hours 08.00 to 13.00 only by prior request.**

**Out of Hours Working**

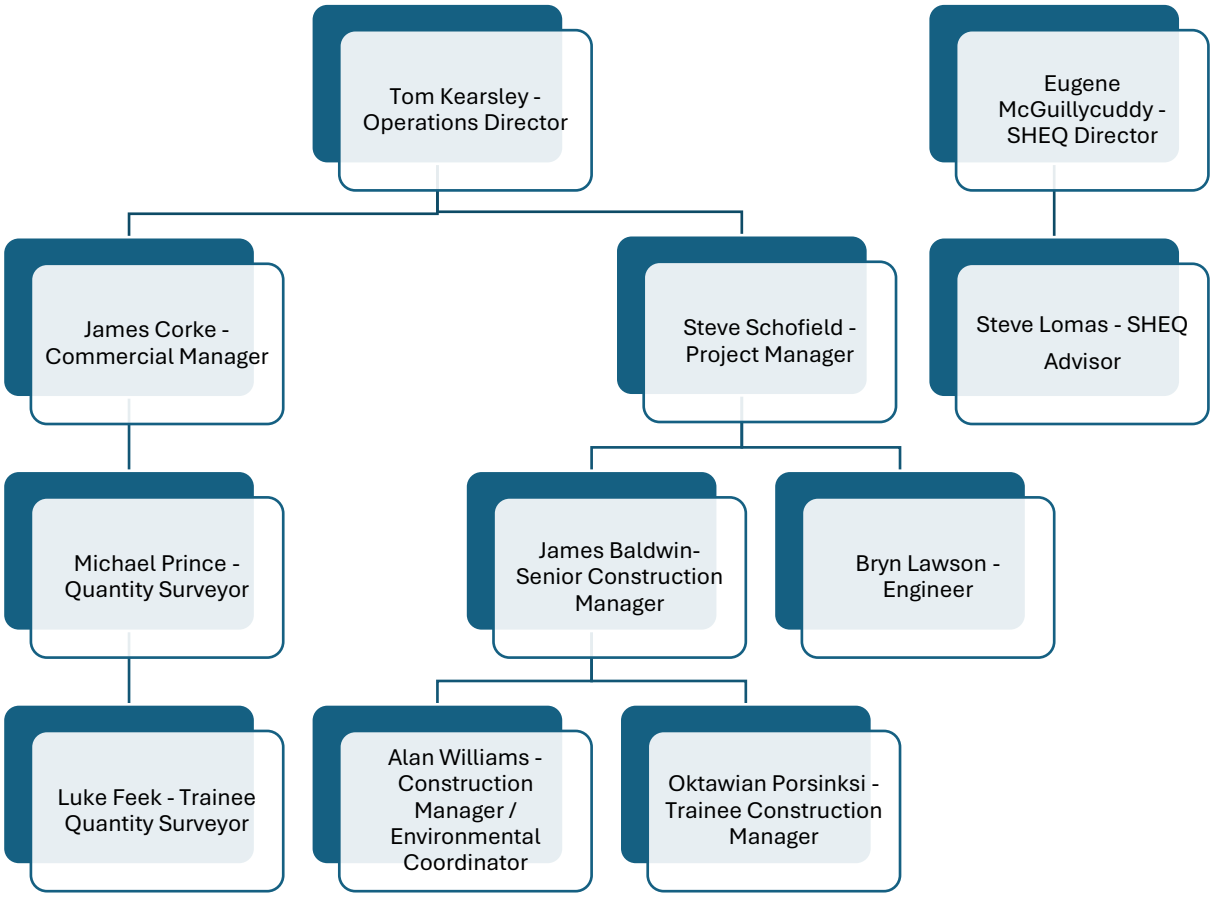
No out of hours working is permitted without prior authorisation from the Project Management Team. Any person or company found working outside of normal site working hours without written permission will be removed from the project.

Contacts, Roles & Responsibilities

**Management structure**

The following management structure has been applied to this project:

# CONSTRUCTION PHASE PLAN



**Roles & Responsibilities**

In accordance with the Company Health & Safety Policy, the following responsibilities have been assigned to each of the roles within the Project Management Team:

Director with Health & Safety Responsibilities

The Director with Health & Safety responsibilities will ensure that:

- They understand the Company's Health & Safety Policy and appreciates his role in the health and safety of all.
- The board accepts formally and publicly its collective role in providing health and safety leadership within the Company.
- The board understands that all decisions that may impact on health and safety need to reflect its health and safety intentions.
- The board recognises its role in engaging the active participation of workers in improving health and safety.
- The Director takes full responsibility for ensuring that the board is kept informed of relevant health and safety risk management issues within the Company.
- The Board is advised on resources needed at project level to provide and maintain the effectiveness of the Health and Safety Policy and the Safety Management Systems.
- Health and Safety is an agenda item at all Board meetings.
- Procedures are put in place to ensure that the Policy is effectively administered and monitored.
- That all accidents and incidents are correctly reported and recorded and that action is taken to prevent a recurrence of the accident or incident.
- That disciplinary action is taken against employees who do not comply with safe working methods.
- Liaison with external health and safety and health organisations is on-going.
- Pertinent information is distributed throughout the Company.
- Procedures are put in place to ensure that work is carried out as planned and the relevant legislation is complied with.
- The Director chairs the regular meetings of the Company Safety Committee.
- The Director takes part in Safety Tours with the Safety, Health and Environmental Manager.
- A good personal example is set, by using the appropriate Personal protective Equipment (PPE) and exhibiting appropriate behaviour.
- Any unsafe or potentially unsafe activities witnessed during visits to company locations are stopped.

- Disciplinary / corrective procedures are implemented, in consultation with the Project Managers and Human Resources, if any employee or contractor is careless with regard to their own or others Health and Safety.

Project Managers / Site Managers will ensure that:

- The Construction Phase Plan (CPP) is fully developed and approved prior to commencement of construction work.
- Sites are so organised that work is carried out to the required standard with the minimum risk of injury and / or ill health.
- Liaise with other duty holders, i.e. Client, PD, Designers and Contractors
- Ensure appropriate welfare facilities are in place prior to work commencing.
- They understand the requirements of the applicable legislation and the Company's Health & Safety Policy.
- The legal requirements are observed on site and that all registers, records and reports are in order, these documents include however are not limited to Site Team Inspection, Fire Equipment and hoarding which are held on Inndex.
- All employees are given precise instructions on their responsibilities for the correct working methods.
- All employees / visitors are made aware of the emergency procedures and welfare facilities.
- Provisions are made for the delivery and stacking of materials to avoid unnecessary handling.
- The electricity supply is installed and maintained so as not to present a risk of injury.
- The work environment / site is kept tidy.
- Tenders are adequate to allow for meeting the requirements of statutory provisions and the Company Policy.
- Only competent contractors are employed to carry out works on our behalf.
- All plant is operated by trained and experienced personnel.
- All levels of employees receive adequate and appropriate training in their tasks.
- Ensure that contractors coordinate and communicate their activities to avoid any potential unsafe interfaces.
- Machinery and plant, including hand tolls, are maintained in good condition.
- All hazardous materials are correctly marked, stored, handled and used.
- The adequate first aid equipment is available on site and that employees know where it is kept.
- Employees are not required or permitted to take known, unnecessary risks.
- They set a good personal example.
- Disciplinary action is taken against employees who contravene the requirements of the legislation or the Company's Health and Safety Policy.

- Work is carried out in accordance with the relevant method statement and risk assessment.
- Any unsafe or potentially unsafe activities witnessed during visits to company locations are stopped.
- They accompany Directors and Senior Managers on safety tours.

Safety, Health & Environmental Manager

The Group Safety, Health & Environmental Manager will ensure that:

- He understands the Company's Health and Safety Policy and appreciates the allocated responsibilities.
- The Health and Safety Policy and relevant documentation is reviewed and updated as required.
- The Company's policy for the prevention of injury, ill health and damage is sustained.
- All levels of management and employees are made aware of requirements placed upon them by this policy.
- The policy is effectively administered, monitored and that necessary alterations are made to the policy to reflect changes in legislation or company development.
- All accidents and incidents are correctly reported and recorded and that action is taken to prevent a recurrence of the accident or incident.
- Liaison with external safety, health & environmental organisations is instigated.
- Pertinent information is distributed throughout the company.
- Written procedures are provided to establish safe systems of work within the intranet system.
- He sets a good personal example by using the appropriate Personal Protective Equipment (PPE) whilst on site.
- Statistical information is maintained and reported to the Directors as required.
- Any unsafe or potentially unsafe activities witnessed during visits to company locations are stopped.
- He accompanies Directors on safety tours.

Safety, Health & Environmental Advisors

The Safety, Health & Environmental Advisors shall:

- Carry out site inspections, as requested or on an adhoc basis.
- Provide written reports for the site management teams and divisional team leaders / directors subsequent to the inspections.
- Provide an advisory service relating to all aspects of health and safety at work.
- By arrangement, provide an accident investigation service and liaise with the enforcing authority.
- If requested, assess method statements prepared by the site / project management teams.
- Attend meetings regarding health and safety as time allows.

- Provide Health and Safety training to both management and staff providing he / she is competent to do so.
- Stop any unsafe or potentially unsafe activities witnessed during visits to company locations.
- Investigate accidents and incidents and when necessary prepare reports on same.
- Accompany Directors on safety tours.

Contractors and Subcontractors

All contractors and subcontractors shall:

- Adhere to the site rules at all times.
- Co-operate with other duty holders.
- Consult with their employees
- Ensure all operatives are suitably competent for the work they are carrying out / equipment they are using.
- Ensure that sufficient supervision is provided to supervise their works.
- Only use plant and equipment which has been inspected / maintained in accordance with site rules, legislation, guidance and / or manufacturer's guidance.
- Only use plant and equipment in the manner in which it was designed to be used.
- Ensure that all works are planned and including a suitable and sufficient assessment of risk.
- Ensure that all works are carried out in accordance with the approved rams for the task and not allow works to be undertaken which are not covered under the approved rams for the task.
- Attend site meetings, training and toolbox talks as required.
- Provide, and ensure the use of, Personal protective Equipment (PPE) in accordance with Site Rules, Client requirements and approved rams for the task.

**Project Team Contacts**

| Position : | Contact / Company Name: | Telephone / Email: | Plan read and understood? (Sign): |
|---|---|---|---|
| Operations Director | Tom Kearsley | Tel: 07939 986811<br>Email: Tom.Kearsley@glencar.com | |
| Commercial Director | James Corke | Tel: 07391 067298<br>Email: James.Corke@glencar.com | |
| Project Manager | Steven Schofield | Tel: 07725485192<br>Email: steve.schofield@glencar.com | |
| Construction Manager | James Baldwin | Tel: 07584 182046<br>Email: James.Baldwin@glencar.com | |
| Construction Manager | Alan Williams | Tel: 07718245810<br>Email: Alan.Williams@glencar.com | |
| SH&E Manager | Ian Watkiss | Tel: 07584388581<br>Email: Ian.Watkiss@glencar.com | |
| SH&E Advisor | Steve Lomas | Tel: 07721 735563<br>Email: Steve.Lomas@glencar.com | |
| Temporary Works Coordinator | James Baldwin | Tel: 07702983177<br>Email: James.Baldwin@glencar.com | |

**Client and Third Party Contacts**

| Position: | Contact / Company Name: | Telephone / Email: | Address: |
|---|---|---|---|
| Client | Dave Ellis<br>Wilson Bowden | Tel: 01530 276 276<br>Email:<br>dave.ellis@wilsonbowden.co.uk | Wilson Bowden Developments Ltd<br>Forest Business Park<br>Leicestershire<br>LE67 1UN |
| Design Consultant | Ben Gavaghan<br>DLA | Tel: 01138873135<br>Email: ben.gavaghan@dla-architecture.co.uk | DLA Architecture<br>55 St Pauls<br>Leeds<br>LS1 2TE |
| Project Safety Advisor | Jason Evans<br>Mascot Management | Tel: 0114 275 3275<br>Email:<br>Jevans@mascotmanagement.co.uk | Wards Court, 203 Ecclesall Road, Sheffield S11 8HW2 |
| Architect | Daniel Pound<br>DLA | Tel: 01138873135<br>Email:Daniel.Pound@dla-architecture.co.uk | DLA Architecture<br>55 St Pauls<br>Leeds<br>LS1 2TE |
| Structural Engineer | Peter Davies<br>BWB Consulting | Tel: 01159241100<br>Email:<br>peter.davies@bwbconsulting.com | BWB Consulting Ltd<br>Whitehall Waterfront<br>Riverside Way<br>Leeds |
| M&E Consultants | Gavin Whittaker<br>BWB Consulting | Tel: 0113 233 8026<br>Email:<br>Gavin.whittaker@bwbconsulting.com | BWB Consulting Ltd<br>Whitehall Waterfront<br>Riverside Way<br>Leeds |
| Police | Rochdale police station | Tel:<br>0161 856 8530<br>Or 999 | The Holme<br>The Esplanade<br>Rochdale<br>Ol16 1AG |
| Hospital (with A&E) | Rochdale Royal Infirmary | Tel: 999 or 0161 624 0420 | Whitehall Street<br>Rochdale<br>OL12 0NB |
| Fire & Rescue | Rochdale Fire Station<br>Maclure Road<br>Rochdale | Tel: 01706900126 | Rochdale Fire Station<br>Maclure Road<br>Rochdale<br>OL11 1DN |

| Position: | Contact / Company Name: | Telephone / Email: | Address: |
|---|---|---|---|
| Local HSE Office | HSE Bootle | Tel: 03000031747 | Redgrave Court<br>Merton Rd<br>Bootle<br>L20 7HS |
| Employers Agent | Chris Rawlinson | Tel:07467781946<br>Email: christopherr@kampcl.com | Part First Floor<br>Kenworthy's Buildings<br>83 Bridge Street<br>Manchester<br>M3 2RF |

**Utility Contacts**

| Service : | Contact / Company Name: | Telephone / Email: | Address: |
|---|---|---|---|
| Gas | Danny Dunstan – GS Energy | Tel: 07557795261<br>Email<br>danny@gsenergyconnections.co.uk | |
| Electric | Mark Shaw - Electricity Northwest | Tel: 07717 734 030<br>Email: Mark.Shaw@enwl.co.uk | |
| Electric (Generator/ temps) | Wysepower | Tel: 07813218824<br>Email: | |
| Water | Michelle Bower - UU | Tel: / 07768 175 271<br>Email: michele.bower@uuplc.co.uk | |
| Telecoms | Brian Ross / BT | Tel: 07802792452<br>Email: brian.ross@openreach.co.uk | |
| Rail | | Tel:<br>Email: | N/A |
| Cable | | Tel:<br>Email: | N/A |
| Metrolink | Gregg Mitchell | Tel: (0)7971 387 107<br>Email: gmitchell@Metrolink.co.uk | Keolisamey Metrolink<br>Metrolink House<br>Queens Road<br>Manchester<br>M8 0RY |

## 5.0 Management of Work

### 5.1 Site rules

All persons working on site will be briefed on the site rules found in Appendix A of this Plan during their site induction. These rules are to be adhered to at all times whilst on site. Anybody found to be in breach of these rules will be subject to the site disciplinary procedure.

### 5.2 Disciplinary procedure

Anybody found to be in breach of any of the Site rules, Client rules, Health & Safety (or other) legislation or working in a way which is unsafe or likely to reflect poorly on the site will be subject to the Site Disciplinary Procedure. This will be implemented as follows:

Verbal warning: For a first or minor offence / infringement the person concerned will be given a verbal warning by a member of the Project Management Team.

Written warning: For a second minor offence / infringement or for a more serious offence / infringement a written warning (yellow card) will be given. This will be logged on Glencar's Inndex system and a notification email sent to the person's employer. The yellow card will only apply to the site on which it was issued and will last for 3 months or until the end of the project (whichever comes sooner).

Removal from site: For a third minor offence / infringement or a serious offence / infringement which presented a serious risk of death or serious injury, the person(s) concerned will be issued a red card and removed from site. This will be logged on Glencar's Inndex system and a notification email sent to the person's employer. The red card will last for 3 months and applies to all Glencar Group projects. However, this may be subject to extension depending on the nature of the situation.

### 5.3 Training & competency

#### 5.3.1 Inductions

All persons attending site are to complete the Glencar Site Induction and sign acceptance to site specific instructions prior to being allowed to access the site. Inductions are carried out on Inndex prior to arrival on site. Once the Inndex induction has been carried out an informal briefing will be held to discuss key site rules and current logistic considerations. This will be between 8:00 & 9:00am.

Our induction contains a specific slide applicable to site supervisors detailing the additional responsibilities they hold over and above the general operatives. A separate version of this slide is displayed on the site notice board signed by supervisors at the induction to act as a permanent reminder of the commitment by all parties to their duties on site.

All persons on site will be expected to attend on-site training / toolbox talk sessions/dabs meetings and/or Foreman's meetings when requested to do so by the Project Management Team.

### 5.3.2 Competency

All persons attending site must hold a genuine, in-date and job specific CSCS (or CSCS affiliated) card. In addition, where required they must also hold a recognised competency for the works they are carrying out / equipment they are using, including but not limited to, the following schemes:

- Asbestos awareness *(anybody working in areas known, or suspected, to contain acms)*
- Non-licenced asbestos training *(anybody carrying out planned non-licenced works with acms)*
- Licenced asbestos training *(anybody carrying out planned licenced works with acms)*
- CPCS *(Anybody operating plant)*
- CISRS *(Anybody installing, adjusting or inspecting scaffold)*
- PASMA *(Anybody erecting, adjusting or inspecting scaffold towers)*
- IPAF-PAL *(Anybody operating powered access equipment)*
- FASET *(Anybody installing, adjusting or inspecting safety nets)*
- UKPIA-SPA *(Anybody carrying out work on PFS forecourts)*

## 5.4 Regular liaison with all parties

### 5.4.1 Liaison between parties on site

Daily Activity Briefing Meetings (DABS) are held at 08.30 with all site supervisors discussing the day's work plan, short-term planning and site logistics allowing co-ordination of the works in close detail. The meeting is intended to act as an open forum for all parties to discuss their short-term plans and co-ordinate to provide safe access and working space for all parties and to allow any immediate-term issues to be addressed. The DABS meeting is intended to ensure that where contractor's works cannot be separated in time they are separated in space and appropriately segregated.

Weekly Co-Ordination Meetings (typically PM Weds/Thurs) are held with both site supervisors and contract's managers allowing long-term planning of the works, design and interface consideration and advance health and safety planning. The weekly meeting is intended to ensure that the contractors works are planned such that they are separated in time in advance of the works commencement, mitigating the burden of planning and reaction on the shorter-term DABS meetings. Tool-Box-Talks will be issued via Inndex to supervisors at regular intervals reinforcing their commitment to the scheme as supervisors, such commitment being provided at initial induction.

### 5.4.2 Exchange of Health & Safety Information Between Contractors

Contractors are to ensure open communication with the Principal Contractor as well as all other contractors on site at all times to ensure that any Health and Safety related issues can be quickly and efficiently communicated to all partied concerned.

### 5.4.3 Liaison with External Parties

To ensure that all works are planned and executed in a safe and efficient manner, external parties (such as rail, utility providers, local authorities, etc) will be consulted where works are likely to affect their interest.

### 5.4.4 Open-Door Policy

We operate an Open-Door Policy with regards to Health and Safety. All persons working on, or visiting the site are encouraged to report any unsafe acts / conditions to the Project Management Team. Any such reports will be dealt with in the strictest confidence by the Project Management Team.

## 5.5 Design information / changes

Any identified changes to the design will, in the first instance, be brought to the attention of the Principal Designer and the Client's representative by the fastest means possible.

## 5.6 Welfare facilities

Welfare facilities have been provided for the use of all persons on site. These facilities are to be kept clean and tidy and are to be treated with respect by all persons using them. Anybody found deliberately damaging or defiling these facilities will be subject to the Site Disciplinary Procedure. The welfare facilities provided include:

### 5.6.1 Canteen

Canteen facilities are to be kept in a clean and tidy state by all persons on site. Canteen facilities will be equipped with an adequate number of tables and adequate seating with backs for the number of persons at work likely to use them at any one time; include suitable arrangements to ensure that meals can be prepared and eaten; include the means for boiling water; and will be maintained at an appropriate temperature. Drinking water will be provided via water coolers. Signage will display if tap water is not suitable for consumption (TBC).

### 5.6.2 Toilets

Toilet facilities have been provided for use by site operatives, management & visitors. Separate toilets for men and women will be provided in readily accessible (GF) positions. These will be kept clean and in an orderly condition.

### 5.6.3 Washing

Suitable and sufficient washing facilities, including showers will be provided with a supply of clean hot and cold water. One number shower facility for men & women will be provided for use one at a time and will be able to be secured from the inside.

### 5.6.4 Smoking

Smoking areas have been provided for use by site operatives, management & visitors. These areas are to be treated with respect and kept in a clean and tidy state by all persons on site with all waste placed into the appropriate waste receptacle.

## 5.7 RAMS (Risk Assessments & Method Statements)

### 5.7.1 Submittal of RAMS

All contractors are required to submit their site-specific Risk Assessment(s) & Method Statement(s) at least two weeks before works commence to allow time for them to be vetted and approved by the Project Management Team. Failure to provide Management Team with RAMS within these timescales may result in you being refused permission to start work.

RAMS are to be submitted following the heading format of GSF 31. Where this is not possible (for a stand-alone lift plan for example) the contractor is to identify this at the pre-start meeting and format agreement to be reached with the site management team prior to RAMS submission.

All rams will be uploaded to and briefed to operatives on Inndex at site induction. It is the responsibility of the subcontractor to hold a hard copy from which supervisors should brief all operatives. This should be held on site for access when required.

### 5.7.2 Vetting of RAMS

The Project Management Team will undertake detailed vetting and approval of all contractor's RAMS prior to works commencing using GSF 31 with any comments fed back to the contractor for action prior to works commencement. Any amendment to address comments by the site team will be reviewed for suitability prior to works commencement using the same form and the form revised accordingly.

### 5.7.3 Reading / signing of RAMS

All operatives are required to read their RAMS during their inductions and to sign the briefing on Inndex to confirm that they have understood their RAMS and agree to work in accordance with them. Operatives are not permitted to commence work until they have signed this document with any questions or concerns satisfactorily addressed by either the GCL team or the subcontractor (whichever is appropriate).

### 5.7.4 On-going monitoring / updating of RAMS

Works are only to be undertaken in accordance with the approved method of work detailed within the approved RAMS for the task. If works need to be undertaken which are not covered by the approved RAMS then these must be altered by the contractor and re-submitted for vetting / approval prior to works continuing.

## 5.8 Selection & vetting of contractors

### 5.8.1 Company contractors

All Company contractors working on site are to be thoroughly vetted and approved prior to being allowed to start work as part of the Company's Supply Chain Management process. No contractors are permitted to work on site without first being formally approved and loaded onto the Company Supply Chain database.

### 5.8.2 Direct / nominated contractors

All direct and nominated contractors are to be thoroughly vetted and approved by the Client prior to being engaged.

## 5.9 Monitoring & Supervision of Works

In order to ensure a safe working environment for all persons on site, the Project Management Team will be implementing a multi-tiered inspection program which will include the following:

### 5.9.1 Daily inspections

Daily HS&E inspections will be undertaken by the Site Manager and photos taken periodically. Items raised will be forwarded to the sub-contractors responsible for close-out with close-out monitored on the following days inspection. These items will be raised on Inndex as 'Hazard Avoidances', good practices will also be raised.

### 5.9.2 Statutory Weekly Inspections

Statutory weekly inspections are carried out by the supervisors for each sub-contractor. Inspections are to be provided on arrival on site (prior to commencement of works) and then at no greater than 7-days from that date with inspections completed by a competent person in every case. It is the inspector's responsibility to ensure the inspection is completed accurately; it is the site supervisor's responsibility to ensure the inspections are completed, correct and provided to GCL on the agreed date; it is the GCL teams' responsibility to ensure the inspections are checked for completeness and challenged where errors are identified.

Hoarding checks will be undertaken weekly and records held on Inndex.

Teams are to display clearly on site a matrix of weekly inspections identifying which inspections are required from which sub-contractors. The matrix is to identify the day of the week that the site team collate their statutory

inspections; to allow compliance contractors will be required to complete at least one inspection at less than a 7-day interval but this will ease tracking by the site team so provides a mutual benefit.

### 5.9.3 Senior Management Inspections

Projects will be subject to regular visits from Senior Management including, but not limited to, Directors and the HS&E Advisor.

### 5.9.4 Contractor Supervision

Supervisors are to be provided at the ratio identified in GSF 52. In the event works are extended, increased etc. The ratio of supervisors will be reviewed and additional supervision provided as required.

### 5.9.5 Monthly Monitoring

Monthly accident/incident records will be collated on GSF 74 and returned to the SH&E department for trend analysis and business-wide statistics.

## 5.10 Wildlife Protection Measures

The site is fully enclosed with a mixture of timber and Heras style fencing which will act as a physical barrier for the prevention of access to various wildlife that inhabit the wider Kingsway area. The timing of the major site clearance works is such that this avoids both bird nesting seasons and other migration seasons (March – July).

Excavations can be of danger to wildlife should they manage to gain access to site. Excavation inspections are carried out daily and trench excavations must be left with at least a 45’ batter to one side as a means of escape.

Given the presence of badgers nearby Glencar will take a precautionary approach regarding the protection of potential badger habitats. A pre-works check for setts will be carried out prior to commencement of construction activities. The nearest badger setts as outlined on the Brookes ecological report is on the other side of MFA in the are of Stanney brook.

# 6.0 Management of Significant Safety Hazards

## 6.1 Traffic Management

### 6.1.1 Site boundary

The site boundary is marked on the Traffic Management Plan which can be found in Appendix A of this Construction Phase Plan. All works are to take place within this site boundary unless otherwise directed.

### 6.1.2 Pedestrian access / egress

The location of pedestrian access points are marked on the Traffic Management Plan which can be found in Appendix A of this Construction Phase Plan. Pedestrians are to ensure that these designated access / egress points are used at all times.

### 6.1.3 Vehicular access / egress

The location of vehicle access points are marked on the Traffic Management Plan which can be found in Appendix A of this Construction Phase Plan. Site vehicles, plant & deliveries are to ensure that these designated access / egress points are used at all times.

### 6.1.4 Parking

The location of site parking is marked on the Traffic Management Plan which can be found in Appendix A of this Construction Phase Plan. All persons are to ensure that vehicles are parked in the designated bays and that access / egress routes are not blocked. In the early stages of the construction process Glencar shall hoard off an area directly to the West of the Plot R Boundary. This area will be used temporarily to complete 278 works and progress with the bulk earthworks. This area shall be decanted as soon as practicable to form onsite parking.

Under no circumstances will parking on MFA be permitted. Glencar' gate staff will notify management of any vehicles that fail to adhere to this policy and vehicles will be moved.

### 6.1.5 Pedestrian routes

Where present, pedestrian routes are to be followed around site. These can be easily identified by the presence of pedestrian barriers/crossing hoops and or a mix of water-filled plastic barriers (Red & whites).

### 6.1.6 Unloading & storage areas

The locations of the unloading and storage areas are clearly marked on the Traffic Management Plan which can be found in Appendix A of this Construction Phase Plan.

All contractors and deliveries are to ensure that they unload in this area only and that the area is kept clear of materials, equipment, etc. Contractors will be required to be responsible for their own deliveries either by the use of Moffett or on site forks (subcontractor supplied). At relevant times mobile cranes (or HIAB) may be used

for offload of various materials, for example steel members of pre-cast lift/stair units. At no time will any crane be permitted to oversail the adjacent tramway.

All deliveries are to be moved to the designated storage area(s) as soon as possible. Contractors are responsible for keeping their own storage areas / containers tidy and free of unnecessary mess.

### 6.1.7 Moving plant / vehicles

All vehicles and plant on site are to adhere to the site speed limit which is clearly marked on the Traffic Management Plan (GSF 66) which will be available ahead of start on site.

Reversing is to be avoided where possible. If vehicles / plant does need to reverse, then this is to be carried out with a banksman present.

If vehicles / plant needs to move through public areas, then they must be escorted by a banksman until they are back within the site.

### 6.1.8 Restrictions on delivery times

Deliveries are only permitted within the following timescales:

- 08:00 to 16:00
- 09:00 to 12:00 on Saturdays with prior agreement.

The Project Management Team must be notified of all deliveries at least 36 hours prior to them arriving to ensure that there is sufficient space to receive it. The Project Management Team will endeavour to make every effort to receive any non-notified deliveries but reserves the right to turn them away.

Inndex vehicle booking system will be used in the busier periods of construction to reduce the risk of vehicles waiting on MFA. Vehicles arriving to site outside of the agreed/approved time slot will be asked to leave if they cannot be accommodated on site. This will be managed by Glencar gateman.

### 6.1.9 Storage of Plant/Machinery

Generally, the site will endeavour to keep plant and machinery away from any sensitive such as watercourses. All plant on site will be subject to daily inspection when in use which will be recorded on Inndex. Any leaks should therefore be identified in a timely manner. Should any leaks be identified then plant nappies will be deployed. Fuelling will take place in agreed locations from 110% capacity bunded tanks. In these locations spill kits will be positioned for use in emergency. Periodically drills will be carried out in response to a spillage.

### 6.1.10 Wheel washing and road cleanliness

Road sweepers will be used on site for the project, for earthworks movement / remediation. It is not anticipated large volumes of earth works being removed off site at present before the site is remediated and capped. Thus, at the early stages of the project a wheel wash is not anticipated. Jet wash facilities may also be installed for use by the Glencar gatemen should this be deemed necessary. Both the wheel wash and jet washing facilities would be situated at the main access egress point as noted in the traffic management plan.

All roads will be roads kept clean clear at access and egress from the site. Glencar management will monitor this daily along with the Glencar gateman.

### 6.1.11 External lighting

It is not anticipated any further external lighting shall be deemed necessary as the external hoarding as a general rule is situated on the back of the existing footpath line. To the perimeter of the site the existing footpath will be kept in place, and this has adequate street lighting. Should there be an issue with the tram stop footpath lighting, Glencar will provide bulkhead lights along this route.

It is noted compound lights will be erected for winter working. These will be situated as to not allow light spillage to adjacent properties causing a nuisance. I.e., in the opposite direction of neighbour's land / properties.

All internal lighting to buildings will be directed where far as practicable facing away from neighbouring properties. These will be switched off after working hours.

## 6.2 Site security

6.2.1 General precautions

The following security measures are to be followed by all persons on site:

- All doors and gates are to be closed / locked immediately after us
- Barriers, fences and other similar items are not to be moved, removed
- Keys are to be removed from all plant / vehicles when not in use
- Hazardous substances (including flammable liquids / gases) are to be securely stored
- All tools and equipment are to be stored securely

### 6.2.2 Signing in & out

All persons attending site (including visitors) are to ensure that they sign in and out every time they come to site. Signing in will be via the Inndex app (or via turnstile access depending on site period). Anybody found not to be signing in and / or out will be subject to the Site Disciplinary Procedure.

### 6.2.3 Restrictions on access

The following areas are restricted are out of bounds to all persons unless by written authorisation from the Project Management Team

- No Access will be given to the protected space between the site boundary and the metrolink area on the northern boundary.

## 6.3 Working on / near existing services

Services known to be present in and around the site include water, gas, electric, telecoms, sewerage, drainage, data.

Work on, or near to these live services is to be sufficiently planned and risk assessed by a competent person prior to commencing. This may include obtaining further information from third parties such as Client engineers or utility companies.

RAMS for the work are to be provided to the Project Management Team for vetting / approval prior to works commencing. It must be ensured that all control measures detailed within the approved RAMS for the task are strictly adhered to for the duration of the works being undertaken.

As a general principle the guidance of HSG47 must be implemented.

## 6.4 Working on / near fragile materials

Any works on, or involving, fragile materials including, but not limited to, fragile roofs, skylights, floors and structures is to be sufficiently planned, and risk assessed by a competent person prior to commencing. This may include consultation with structural engineers.

RAMS for the work are to be provided to the Project Management Team for vetting / approval prior to works commencing. It must be ensured that all control measures detailed within the approved RAMS for the task are strictly adhered to for the duration of the works being undertaken.

## 6.5 Working near to client staff / public

All works must be suitably segregated from the public / Client staff to prevent unauthorised access to live work areas. All works must be planned and risk assessed by a competent person prior to commencing and suitable means of segregation specified. These may include one or more of the following (this list is not exhaustive):

- Mesh fencing
- Barriers
- Barrier tape

- Cones
- Full hoarding
- Locked / closed doors with signage

RAMS for the work are to be provided to the Project Management Team for vetting / approval prior to works commencing. It must be ensured that items used for segregation are used in such a way that they do not pose a trip hazard for persons on the public side.

### 6.6 Permit procedure

Work permits must be obtained from a member of the Project Management Team for the following activities:

- Hot work
- Working from stepladders or hopups
- Temporary works (hoarding, scaffolds, etc)
- Excavation (Break Ground)
- Confined spaces
- Lifting (Hiab/Crane/Machine Lift)
- Roof Access

Whilst works are underway it must be ensured that the control measures detailed on the permit are adhered to at all times. Anybody found to be working outside of the control specified on the permit will be subject to the Site Disciplinary Procedure.

### 6.7 Temporary works

Temporary works includes, but is not limited to:

- Hoarding
- Scaffolding
- Propping, needling and falsework
- Formwork
- Excavation supports

All designed temporary (i.e Temporary Works which are not assembled in accordance with manufacturer's instructions or recognised standard) must be designed by a competent person prior to construction. Copies of any designs are to be presented to the Project Management Team for vetting / approval prior to works being undertaken.

All temporary works are to be constructed / installed to the exact specification of the manufacturer's instructions / recognised standard / approved design. Installation is to be carried out by competent persons only, holding where applicable, a recognised level of training.

Handover certificates and copies of manufacturer's instructions / recognised standard / approved design are to be provided to the Project Management Team for all Temporary Works undertaken on site.

Temporary Works are to be inspected by a competent person at intervals not exceeding 7 days or following adjustment, damage or other incident which may affect the stability of the temporary works (including weather, subsidence, etc). Temporary works are not to be altered without written permission from the Project Management Team.

### 6.8 Fire & emergency

#### 6.8.1 First aid

The following members of the Project Management Team are nominated as First Aiders on site:

- Steve Schofield
- James Baldwin
- Alan Williams

First aid facilities consisting of first aid kit(s), eye wash stations and one number defibrillator will be available on site. Exact locations of first aid equipment is marked on the Emergency Plan Drawing which will be displayed on the SH&E Notice Board(s), on every fire point and at various other locations around site.

All accidents and injuries are to be reported to a first aider by the fastest means necessary. In the event of hospital treatment being required, the address of the nearest A&E Department can be found in Section 4.4 of this Construction Phase Plan. In addition, maps showing the route from site to the nearest A&E Department can be found on the SH&E Notice Board.

All persons on site are to familiarise themselves with the locations of the above prior to commencing works.

#### 6.8.2 Fire & emergency

The following members of the Project Management Team are nominated as Emergency Marshalls on site:

- Steve Schofield
- James Baldwin
- Alan Williams

A specific Emergency Plan & Risk Assessment has been prepared detailing the roles and responsibilities as well as detailed arrangements for the management of fire (and other emergency) hazards during the construction phase.

Fire fighting and alarm equipment consisting of trolleys fitted with water, foam & CO2 extinguishers and Wi-Fi linked alarms will be positioned around site. Exact locations of the fire fighting and alarm equipment is marked on the Emergency Plan Drawing which will be displayed on the SH&E Notice Board(s), on every fire point and at various other locations around site.

6.8.3 Incident reporting

All incidents on site including (but not limited to) accidents, near misses, dangerous occurrences & unsafe acts are to be reported to a member of the Project Management Team by the fastest possible means.

Any non-emergency incidents, concerns or suggestions can be reported to the Project Management Team anonymously using the Near Miss Reporting Point which is situated in the site office.

Where an incident is classified as being reportable under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR) such as a dangerous occurrence, major injury & over 7 day injury (this list is not exhaustive), it is the responsibility of the contractor to ensure that the HSE are notified within the correct timescales as detailed within the RIDDOR acop.

## 6.9 Working at height

In accordance with the working at height regulations, all working at height must be sufficiently planned and risk assessed by a competent person prior to being undertaken. When deciding on the most practicable way to undertake the work, the hierarchy of control must be applied with fall prevention (e.g. Guard rails) superseding fall arrest (e.g. Fall arrest harness).

Access towers are to be erected strictly in accordance with PASMA guidelines and inspected for compliance with manufacturer's literature – such literature must be kept on site for the duration of the tower's time on site. Access towers are to be provided with a tower tag and entered into the scaffold register at erection with subsequent inspections recorded in accordance with 5.9.2 above.

Glencar Construction does not currently enforce a 'use or strike' policy in respect of mobile towers. We do however require the above measures to be adhered to absolutely – in the event that a contractor fails to satisfy these measures the supervisor will be subject to the disciplinary procedure noted in 5.2 above.

Stepladders and hopups are only to be used as a last resort when there is no other reasonably practicable option (i.e. In situations where there are space constraints or where the work is light and / or short duration). Stepladders

and hoppus (600x600) are only to be used following the issue of a permit (GSF 24) by a member of the site management team.

### 6.10 Lifting operations

All lifting operations must be sufficiently planned and risk assessed by a competent Appointed person prior to being undertaken. Copies of all lifting plans are to be presented to the Project Management Team for vetting / approving prior to works being undertaken.

All lifting equipment is to be in good working order and maintained in accordance with the Lifting Operations & Lifting Equipment Regulations 1998 (LOLER 98). Copies of thorough examination certificates are to be presented to the Project Management Team prior to work commencing.

All lifting operations are to be supervised and undertaken by qualified competent persons only.

#### 6.10.1 Special Considerations pertinent to Tramway

Under no circumstances shall any lifting or crane operation over sail the adjacent tramway. This will be ensured through the careful implementation of lift planning with defined crane positions (ensuring the jib faces southwards) combined with appropriate slew restrictors and/or boom restrictors if necessary. Any lifting plan will be required to provide an accompanying method statement with details of how oversail of the tramway will be prevented and monitored. If a crane is required to be positioned within its collapse radius of Metrolink then the crane must only be utilised to 80% of its load capacity.

This will be submitted to TfGM for authorisation prior to works commencing. Regular liaison with between Glencar and TfGM shall be had as the scheme commences to ensure information is provided with appropriate times for approval etc.

Generally approval will be sought should any works fall within that as defined in Working safely near Metrolink Guidance.

### 6.11 Safe use of plant & equipment

The Project Management Team must be given details of all plant & equipment in order that it can be logged on the relevant inspection register. All plant & equipment used on site is to be maintained in accordance with the manufacturer's instructions, legislation and / or HSE guidance which will include:

- Visual pre-use inspection for all work equipment
- PAT test for all portable electronic equipment (3 months for tools, 12 months for battery chargers)
- Weekly recorded inspections for all plant, lifting equipment, access equipment & working platforms
- 12 monthly inspections for all plant & lifting equipment (6 monthly if lifting people)

Plant & equipment is only to be operated by competent persons holding, where necessary, a recognised level of training for the plant / equipment and is only to be operated in the manner for which it was designed.

### 6.12 Excavation works

All excavation works must be sufficiently planned and risk assessed by a competent person prior to being undertaken which must include means to prevent collapse of the excavation (trench support, battering / stepping back, etc). RAMS are to be presented to the Project Management Team for vetting / approval prior to works being undertaken.

No excavation works are to be undertaken without a permit being obtained from a member of the Project Management Team. Whilst works are underway it must be ensured that the control measures detailed on the permit are adhered to at all times. Anybody found to be working outside of the control specified on the permit will be subject to the Site Disciplinary Procedure.

Excavations which operatives are going to be working in are to be inspected by a competent person at the beginning of every shift and the Excavation Pre-Entry Inspection Register signed. Furthermore, all excavations must be inspected by a competent person following periods of adverse weather and movement as well as during the repositioning, movement and adjustment of any / all trench boxes any / equipment used to shore up excavations.

### 6.13 Hot works

Hot works will be avoided where possible with alternatives such as push fit fittings and hand sawing being used where possible.

Where hot works must be undertaken, a permit must be obtained from a member of the Project Management Team. Whilst works are underway it must be ensured that the control measures detailed on the permit are adhered to at all times, including the presence of a second operative to act as Fire Watch for the duration of the works plus one hour after the works have ceased. Anybody found to be working outside of the control specified on the permit will be subject to the Site Disciplinary Procedure.

All equipment used for hot working is to be maintained in accordance with the manufacturer's instructions, legislation and / or HSE guidance.

Substances such as fuel and compressed gases are not to be stored on site without written permission from the Project Management Team.

### 6.14 Personal Protective Equipment

As an absolute minimum, all persons wishing to enter live work areas of site must be wearing the following PPE:

- Head Protection
- High visibility vest / jacket
- Foot protection
- Gloves

The above standard applies to all contractors, subcontractors and visitors and is in addition to any task-specific PPE identified within their Risk Assessment(s) & Method Statements. Any person not adhering to the site PPE rules will be removed from the work area and disciplined in line with the Site Disciplinary Procedure.

Contractors are responsible for supplying their employees with appropriate PPE and ensuring that it is used correctly including, where applicable, the provision of formal training for their operatives (including, but not limited to face fitting of RPE).

Contractors are responsible for ensuring that their PPE is stored properly and that it is kept in a clean, safe and serviceable condition at all times. All contractors are required to provide company branded PPE.

## 7.0 Management of Significant Health Hazards

### 7.1 Asbestos

The Phase 2 Geotechnical report KYR-BWB-ZZ-XX-RP-YE-0002_Ph2-P05 Phase 2

Geo-Environmental Assessment produced by BWB identifies that Asbestos fibres were recorded in two locations of made ground (TP01 and TP03 during the 2023 investigation) and are considered isolated areas of contamination. Further surveys may be undertaken in order to inform the correct method of remediation. The requirements of CAR 2012 will be complied with in relation to remediating these areas. Information on asbestos and its associated health effects will be made available in the welfare area. Anybody working in, or controlling works in, areas which are known, or suspected to contain asbestos must hold up-to-date Asbestos Awareness Training. Anybody carrying out planned work on asbestos containing materials must hold relevant in-date licenced/non-licenced asbestos training.

### 7.2 Noise

Construction activities will comply with the Control of Noise at Work Regulations 2005. All contractors carrying out work on site are responsible for identifying in their RAMS any sources of noise created by their work and for putting in place suitable & sufficient control measures to protect their own operatives as well as other persons who may be affected by the noise (other trades, members of the public, Client staff, etc). Where necessary the Subcontractor shall provide suitable hearing protection to workers as recommended in the HSE's guidance on controlling noise at work.

It is required that all delivery vehicles and plant on site be fitted with white noise reversing/operating beepers. Costs for retrospective install if required are the responsibility of the subcontractor.

When deciding on suitable and sufficient control measures, priority must be given to group control measures such as eliminating or reducing noise at source (for example by using electric / hand operated equipment rather than fuel driven) rather than individual measures such as issuing PPE.

Information on exposure to noise will be made available in the welfare areas.

Construction methodologies should be made as efficient as possible to minimise noise impacts to local residential areas and places of work. Additionally, ‘temporary’ screening, where it is likely to provide effective mitigation, may be deployed.

### 7.3 Vibration (HAV & WBV)

All contractors carrying out work on site must adhere to the Control of Vibration at Work Regulations 2005 and are responsible for identifying in their RAMS any sources of Whole Body Vibration (WBV) or Hand Arm Vibration

(HAV) created by their work and for putting in place suitable & sufficient control measures to protect their operatives from exposure.

When deciding on suitable and sufficient control measures, priority must be given to group control measures such as eliminating or reducing at source exposure (for example by using hand operated equipment rather than power operated) rather than individual measures such as issuing PPE. Where exposure to vibration cannot be fully avoided the Subcontractor carry out works in accordance with approved Code of Practice L140.

Information on HAVs and WBV will be made available in the welfare areas.

**7.4 Dust & silicates**

All construction activities will be carried out following the Control of Substances Hazardous to Health (COSHH) Regulations 2002. Contractors carrying out work on site are responsible for identifying in their RAMS any sources of dust created by their work and for putting in place suitable & sufficient control measures to protect their operatives as well as other persons who may be affected such as other trades, members of the public, Client staff, etc.

When deciding on suitable and sufficient control measures, priority must be given to group control measures such as eliminating or reducing the production of dust (for example by using hand operated equipment rather than power or using water suppression) rather than individual measures such as issuing PPE.

During periods of potentially excessive dust creation; for example during bulk earthworks, additional monitoring may be utilised as well as industry leading control measures to protect the workforce as well as other stakeholders that may be affected by the works. Given the expectation that these works will be carried out in the winter months it is not expected that dust suppression will be required; however, in all instances the works will be assessed and controlled following a general hierarchy of control so as to not expose workforce or adjacent parties including pedestrians.

On site dust suppression can take many forms, from on-tool extraction, dampening down etc, however in addition to this proper surface management including stabilised haul routes will be used to try and mitigate dust generation from traffic movements. A general strategy of sealing high-traffic routes will also be considered.

On completion of the scheme the site will be thoroughly cleaned both internally and externally therefore ensuring no dust will be on site at decant.

Information on silicosis will be made available in the welfare areas.

### 7.5 Psittacosis

Pigeon droppings have been identified in various areas around site. All contractors carrying out work in these areas must ensure that the presence of pigeon droppings and possible exposure to the Chlamydia psittaci bacteria is covered in their RAMS.

When deciding on suitable and sufficient control measures, priority must be given to group control measures such as eliminating or potential disturbance of the pigeon droppings (for example by using water suppression) rather than individual measures such as issuing PPE.

Information on psittacosis will be made available in the welfare areas.

### 7.6 Leptospirosis (Weil's disease)

Rats have been identified in various areas around site. All contractors carrying out work in these areas must ensure that the presence rats and possible exposure to the Leptospira bacterium is covered in their RAMS.

Operatives are to ensure that they exercise good hygiene practices including not eating on site, washing hands before eating, drinking or smoking and ensuring that all waste is placed in the appropriate waste receptacle.

Information on leptospirosis will be made available in the welfare areas.

### 7.7 Contaminated land / areas

The Phase 2 Geotechnical report KBP-BWB-ZJ-XX-RP-YE-0002_Ph2-P2 1 produced by BWB identifies that no contamination observations were noted during the groundwater sampling visit in 2022, or subsequent gas and groundwater monitoring during the period between 2022 and 2023. No visual or olfactory observations of contamination was noted during these ground investigations. However, if contamination is suspected then works will cease and the Project Management Team will be notified immediately.

### 7.8 Hazardous substances

#### 7.8.1 Existing

If other hazardous substances are encountered during the project then works will cease and the Project Management Team are to be notified immediately.

#### 7.8.2 During construction

The Project Management Team is to be notified of any hazardous substances bring used or stored on site during the project so that they can be entered onto the Site COSHH Register held on Inndex.

COSHH Assessments for hazardous substances are to be carried out by all contractors, copies of which are to be provided to the Project Management Team and approved along with the RAMS for the task before works are to commence.

All hazardous substances are to be used and stored in accordance with the COSHH Assessments and manufacturer's MSDS. Hazardous substances (including flammable liquids and gases) are only to be stored on site with written permission from the Project Management Team. The Project Management Team reserves the right to remove and dispose of any hazardous substances stored on site without permission.

#### 7.8.3 Polychlorinated Biphenyls (pcbs)

Polychlorinated Biphenyls (PCB) - may be present in some electrical equipment such as transformers, switchgear and capacitors manufactured prior to 1987. Such equipment may be labelled as containing PCB; however, older equipment may have no identification label.

Any PCB identified will be disposed of by a specialist waste contracting firm which is licensed by the Waste Regulation Authority in accordance with:

- The Health and Safety at Work etc Act 1974
- The Control of Substances Hazardous to Health Regulations 2002
- The Environmental Protection Act 1990

### 7.9 Waste

An important part of the site management process involves site cleansing, rubbish removal and recycling. We will produce a detailed Site Waste Management Plan which will include details of how we intend to reduce, re-use, recycle and manage site waste. This will be produced and implemented to comply with environmental legislation.

The adopted plan will involve the following provisions:

### 7.9.1 Buying and Storing Materials

- Order the amount of materials you need as accurately as possible.
- Arrange for 'just in time' deliveries to reduce storage and material losses.
- Consider the source of materials.
- Consider the packaging used for materials delivered to the site -can this be reduced or recycled.
- Ensure that deliveries are rejected if damaged or incomplete.
- Make sure storage areas are safe, secure and weatherproof (where required)
- Store liquids away from drains and in bunded areas to prevent pollution.

### 7.9.2 Site Activities

- Ensure options for the use of reclaimed and recycled construction materials, that meet the materials specification, are considered.
- Recycle suitable spoil, demolition materials, pruning's, and surplus construction material arising from the works on site to avoid the need to transport materials.
- Keep the site tidy to reduce material losses and waste.

### 7.9.3 Training and Awareness

- Promote good practice awareness as part of health and safety induction / training for workers onsite.

### 7.9.4 Waste Segregation

- Segregate different types of waste as they are generated using different skips where possible (given the space available).
- The responsibility of updating the SWMP belongs to the Glencar Project manager. An untidy site is NOT TOLERATED by Glencar Construction Ltd.

All persons are to ensure that their waste is placed into the appropriate waste receptacle on site. Any person found placing waste into the wrong receptacle, littering or in any way creating unnecessary waste on site may be subject to the Site Disciplinary Procedure.

Waste is only to be removed from site by licensed waste carriers who have been approved by the Project Management Team. Anybody found removing waste from site by any means other than an approved licensed waste carrier will be subject to the Site Disciplinary Procedure and where necessary, legal actions.

### 7.9 Emissions

Fuel powered machinery and equipment is only to be used where a manually operated or electronically powered alternative is not available or practicable.

Where fuel powered machinery is to be used, it is to be kept in good working order and used correctly by trained operatives to ensure that it operates efficiently. All machinery and equipment is to be switched off when not in use to prevent unnecessary emissions.

When working indoors, the emissions and gases given off by the use of fuel powered plant and machinery will need to be risk assessed and suitable and sufficient control measures (gas monitoring, catalytic converters) utilised as required by this risk assessment to protect those working in the area.

### 7.10 Skin cancer

A minimum of hats, T-shirts and full-length trousers are to be worn at all times on site. Vests, shorts and bare torsos are not permitted in any areas of the site.

Contractors are to ensure that exposure to the sun and its associated effects (skin cancer, sunburn m sunstroke, etc) are, where necessary, identified and risk assessed as part of the RAMS for their work and that suitable and sufficient control measures are put in place (avoiding work in the midday sun, taking regular breaks, etc).

Information on skin cancer and the effects of working in hot weather will be made available in the welfare areas.

## 8.0 Health & Safety File

### 8.1 Provision of information by contractors

All contractors involved in the project are to ensure that information for the Health & Safety File is provided to the Project Management Team as early as possible in electronic format. All information for the Health & Safety File must be provided to the Project Management Team no later than 21 days prior to practical completion. The information required will include the following (this list is not exhaustive):

- Operation and Maintenance (O&M) information
- As fitted drawings / diagrams
- Service drawings
- Details of any hazardous substances used
- Commissioning certificates
- Details of any residual risk

Any company or person not providing their Health & Safety File information within the timescales detailed above will be subject to the Site Disciplinary Procedure.

### 8.2 Provision of information to Principal designer

All information collated for inclusion in the Health & Safety File will be provided to the project Health and Safety Advisor by the Project Management Team in electronic format no later than 30 days from practical completion.

Appendices

- 9.1 Appendix 1 – F10, H&S Policy, Waste Management Policy
- 9.2 Appendix 2 – PD Sign Off
- 9.3 Appendix 3 - Logistics Plan
- 9.4 Appendix 4 - Fire Plans
- 9.5 Appendix 5 - Site Rules
- 9.6 Appendix 6 - Project Induction
- 9.7 Appendix 7 – Organogram
- 9.8 Appendix 8 - Project Programme
- 9.9 Appendix 9 - Emergency Contacts, Emergency Plan & Pollution Prevention Plan
- 9.10 Appendix 10 - Hospital Maps
- 9.11 Appendix 11 - Signed Roles and Responsibilities
- 9.12 Appendix 12 - Traffic Management Plan
- 9.13 Appendix 13 - Preconstruction Information and Ground Investigation Report
- 9.14 Appendix 14 - Design Risk Register
- 9.15 Appendix 15 - Project Specific Risk Assessment
- 9.16 Appendix 16 - Contract Directory

# F10

**The Project Safety Advisor will raise the F10 prior to start on site and once the Construction Programme has been accepted by the client.**

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Glencar

# Health & Safety Manual

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| Issue No: | 10 | Issue Date: | 06/06/2025 |
| Authorised by | Eddie McGillycuddy<br>CEO | Signed: | |

# Health and Safety Policy Amendment Record

| Issue No. | Date | Brief Description of Amendment |
|---|---|---|
| 1 | 12/12/16 | INITIAL RELEASE |
| 2 | 01/06/17 | Amendments following CHAS assessment procedures section updated. WAH, ASBESTOS, organisation chart |
| 3 | 18/06/18 | Annual review & addition of Scaffolding procedures, address change, Removal of source references. |
| 4 | 26/09/19 | Annual review |
| 5 | 29/09/20 | Annual review<br>Covid Controls p7 & p15<br>Riddor Reporting of Covid p28 |
| 6 | 23/09/21 | Annual Review<br>Organisation chart<br>Responsibilities<br>Reference to Glencar H&S Management System<br>Homeworking<br>UKCA CE marking<br>Training<br>Temporary workers<br>New and expectant mothers |
| 7 | 26/10/2022 | Annual review, org chart updated |
| 8 | 26/04/2023 | Annual Review<br>Anti-Entrapment device<br>Respiratory Protective Equipment(RPE)<br>Drugs and Alcohol testing |
| 9 | 26/04/2024 | Annual review, no changes. |
| 10 | 06/06/2025 | Mental Health and Wellbeing |

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## INTRODUCTORY NOTE

The Company safety documentation is divided into;

1. The “Policy", this contains the general Company policy, it addresses a variety of health and safety issues applicable to our operations. It details the organisation, arrangements and responsibilities.
2. Company “Procedures” which including assessment and documentation procedures for putting the goals of the "Policy" into practice
3. Company forms and method statements which will be used in accordance with the procedures and which will become company Records upon completion.

## COMPLIANCE REVIEW

The Health and Safety Policy shall be formally reviewed annually or more frequently by H&S Team for as long as this Company retains their services. This review shall cover all sections of the Policy and shall ensure that:

The responsibilities reflect the current staffing of the Company;

The arrangements remain unchanged;

The safe working procedures are still applicable.

Additionally, the Policy shall be reviewed as necessary to reflect any changes in legislation, appointments or working methods and materials used.

## SAFETY PROGRAMME

An annual review of the Company's Safety Programme will be undertaken to ensure that the Company follows the Policy. This review shall check that:

- All the responsibilities allocated in the Policy are understood and are being performed;
- The procedures set up in the Policy are being complied with and remain effective;
- Records, as required in the Policy, are being adequately compiled and retained;
- All the necessary reports are being prepared and forwarded to the relevant persons within the Company and the relevant Enforcing Authorities.
- Management and Employee attitudes to health and safety.
- The effectiveness of the training carried out and the requirements for further training;

The Policy will be reviewed regarding its effectiveness in relation to reducing accidents, incidents, dangerous occurrences and ill health in the workplace.

The results of the review shall be compiled into a report for the Managing Director and shall include recommendations of the action to be taken to rectify any non-compliance.

## HEALTH AND SAFETY POLICY STATEMENT

In accordance with its duty under Section 2(3) of the Health and Safety at Work etc. Act, 1974, and in fulfilling its obligations to both employees and the public who may be affected by its activities, the Managing Director of, Glencar Construction Ltd. endorses the following statement of policy in respect of health and safety.

It is our aim to achieve a working environment which is free of work related accidents and ill-health and to this end we will pursue continuing improvements from year to year.

We undertake to discharge our statutory duties by:

- Identifying hazards in the workplace, assessing the risks related to them and implementing appropriate preventative and protective measures;
- Providing and maintaining safe plant and work equipment;
- Establishing and enforcing safe methods of work;
- Recruiting and appointing personnel who have the skills, abilities and competence commensurate with their role and level of responsibility;
- Ensuring that tasks given to employees are within their skills, knowledge and ability to perform;
- Ensuring that technical competence is maintained through the provision of refresher training as appropriate;
- Promoting awareness of health and safety and of good practice through the effective communication or relevant information;
- Furnishing sufficient funds needed to meet these objectives.
- All employees on their part are encouraged to contribute actively towards achieving a work environment, which is free of accidents and ill health.
- Our health and safety policy will be reviewed annually to monitor its effectiveness and to ensure that it reflects changing needs and circumstances.

This policy is to be read in conjunction with the responsibilities, procedures and applicable safe systems of work that together form the Glencar Construction Ltd. health and safety documentation.

We will take the advice from The Department of Health & Social Care (DHSC) and Public Health England (PHE) during any nationwide health affecting situations (e.g. Covid-19) and will refer to https://www.hse.gov.uk/news/

Signed  Date 06/06/2025

CEO

## ENVIRONMENTAL POLICY

Glencar Construction recognises the importance of environmental protection and will comply with all environmental legislation, regulations and approved codes of practice relating to the activities of the company. Glencar Construction will co-operate and maintain good relations with all regulatory authorities.

The company's policy is to continually improve our environmental performance. An Environmental Management System based on the requirements of ISO 14001:2015 has been developed to determine how we manage the environmental aspects of our work.

Reviewing these records periodically will allow us to measure the impact of our activities and focus resources to achieve continual improvement in our environmental performance and prevention of pollution. Glencar Construction aims to reduce its environmental impact by;

- Provide a well-structured and organised approach to its operations.
- Using recycled materials and sustainable renewable sources where possible.
- Working with suppliers who take steps to minimise their environmental impact.
- Working with local suppliers to reduce carbon emissions from deliveries where possible.
- Reduce the amount of waste produced.
- Clearly determine the requirements of environmental management and assign responsibility to personnel.
- Involve employees in our environmental management plan and providing necessary training to enable them to discharge their responsibilities.
- Carry out our work in an environmentally sensitive manner.

All endeavours will be taken to ensure that our operations and activities are controlled to avoid any detrimental impact to the environment throughout all stages but in the event of a non-conformity being discovered this shall be investigated promptly and communicated back to senior management, such incidents will be recorded.

Documented procedures are implemented to ensure appropriate corrective actions are taken when required and the staff regularly consider actions required to prevent potential non-conformities.

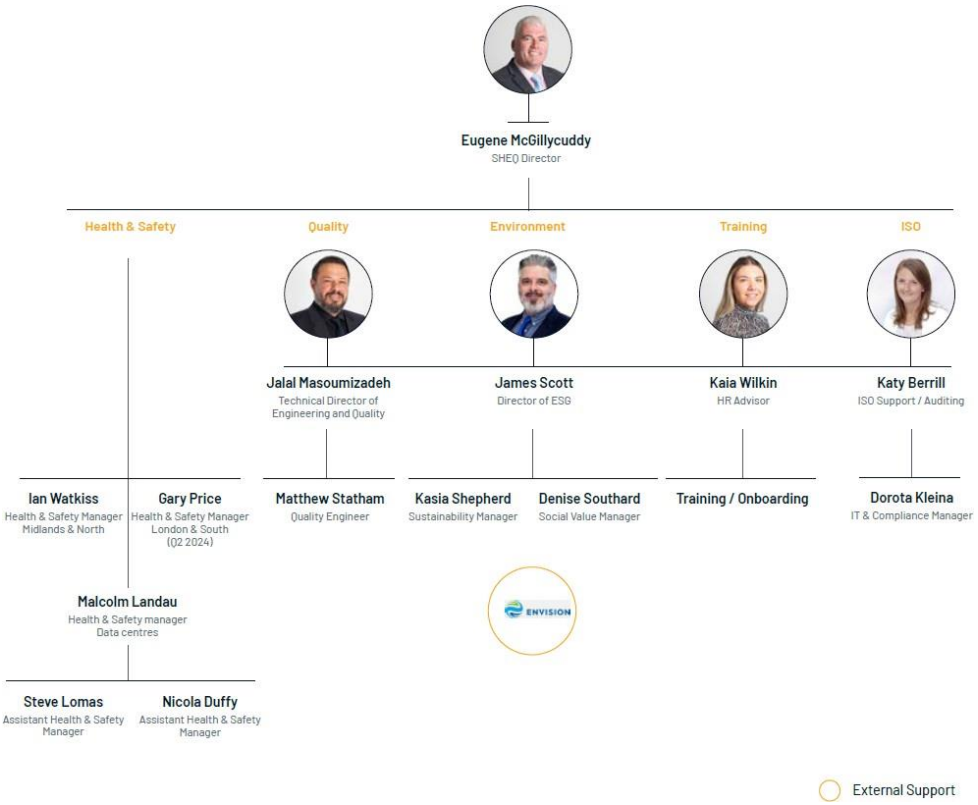
Internal Audit & Management Review: Audits are regularly carried out by trained staff to a predetermined schedule to ensure system and process compliance and continual improvement. Management Reviews are carried out at least annually and minutes circulated to participants and interested parties.

This Environmental Policy endorsed by Glencar Construction senior management outlines our commitment to our environmental responsibilities and will be available to the public and communicated to all Managers, Employees, Sub-Contractors and Suppliers. The Managing Director assumes overall responsibility for the formulating and implementing of this Environmental Policy.

Signed  Date 06/06/2025

CEO

## MANAGEMENT STRUCTURE FOR ENVIRONMENTAL HEALTH AND SAFETY




## HEALTH AND SAFETY RESPONSIBILITIES

These responsibilities are to be read in conjunction with, and to be considered part of, the Health and Safety Policy of Glencar Construction Ltd.

MANAGING DIRECTOR

The Managing Director with assistance from the Head of H&S is responsible for:

- The Company's policy for the prevention of injury, ill health and damage is initiated;
- All levels of management and employees understand the requirements placed upon them by this Policy;
- The policy is effectively administered, monitored and that necessary alterations are made to the policy to reflect changes in legislation or company development;
- All levels of employees receive adequate and appropriate training in their tasks;
- The relevant legislation is complied with in all the Company's areas of operation;
- Sound working practices are observed;
- Allowances are made in tendering, planning and production processes for the provision of adequate welfare facilities and the necessary equipment to avoid injury, ill health and damage;
- Health and safety activities are coordinated between all contractors working on the same site;
- All accidents and incidents are correctly reported and recorded and that action is taken to prevent a re-occurrence of the accident or incident;

- Disciplinary action is taken against all employees who do not comply with the requirements as detailed in the policy documents;
- Liaison with external safety and health organisations is instigated;
- Pertinent information is distributed throughout the company;
- Adequate funds are made available to meet the requirements of the policy;
- The appropriate insurance cover is provided and maintained;
- Provision is made at all meetings for discussing health and safety;
- Any hazardous substances are stored and handled in accordance with established rules and procedures;
- He sets a good personal example by using the appropriate personal protective equipment;
- A statement on health and safety is included in the company's annual report.
- Ensure department managers are equipped in the knowledge on how to risk assess and keep their teams safe

**EMPLOYEES (INCLUDING SUB-CONTRACTORS)**

For health and safety standards to be maintained and improved all employees will be responsible for the supervision of health and safety.

Employees and Sub-Contractors must:

- Use the correct tools and equipment for the task;
- All operatives must have training, skills, knowledge and experience to be deemed competent to carry out the task.
- Use the protective equipment provided;
- Only use tools which are in good condition;
- Report all defects in tools, plant, equipment and materials, or any obvious safety or health hazards;
- Do not endanger themselves or other persons through their actions or failures to act;
- Avoid improvisation;
- Warn new employees of known hazards;
- Refrain from horseplay;
- Not abuse the welfare facilities;
- Co-operate with the Company on all aspects of health, safety and welfare;
- Not operate any equipment or machinery unless they have been fully trained and instructed in its operation;
- Inform management of any change to their state of health, either temporary or permanent, which might affect their working ability or their suitability to carry out any task or tasks;
- Maintain good housekeeping principles;
- Ensure they are familiar with the emergency procedures designated emergency exits and assembly points relative to their work area.

- Scaffolding used by sub-contractor's employees (even when scaffold erected for other contractors) must be inspected by their employer or a competent person appointed by their employer to ensure that it is erected and maintained in accordance with the regulations and codes of practice.
- Sub-contractor's employees are not permitted to alter any scaffold provided for their use, or use or interfere with any plant or equipment on the site unless authorised.

## DRIVERS OF COMPANY SUPPLIED VEHICLES

The Drivers' Health and Safety responsibilities are to ensure that:

- Daily checks are carried out on their vehicles to ensure that they are safe and roadworthy;
- They always comply with the road traffic regulations;
- Maintenance is carried out as required by the manufacturers' instructions;
- All defects are reported on vehicles and any ancillary equipment and any additional maintenance is carried out as and when required;
- They do not drive any vehicle or machinery unless they have been fully trained and instructed in its operation;
- They comply with the requirements of the Company's Safety Policy;
- Information is given to management of any medical or legal impediment to their driving license or any pending prosecutions;
- Management is informed of any change to their state of health, either temporary or permanent, which might affect their working ability or their suitability to carry out any task or tasks.

## SUB-CONTRACTORS

Sub-contractors are to comply with all the requirements of this Safety Policy and are to provide copies of their Safety Policies and any other documentation appertaining to health and safety that may be requested by the Company or their Safety Advisers. Failure to do so will render the sub-contractor liable to suspension from the site and any financial penalties will be charged to that sub-contractor.

Labour only sub-contractors shall, for the purposes of health and safety only, be considered as employees of the companies. All work must be carried out in accordance with the relevant statutory provisions and taking into account the safety of others on the site and the general public.

Scaffolding used by sub-contractor's employees (even when scaffold erected for other contractors) must be inspected by their employer or a competent person appointed by their employer to ensure that it is erected and maintained in accordance with the regulations and codes of practice. Sub-contractor's employees are not permitted to alter any scaffold provided for their use, or use or interfere with any plant or equipment on the site unless authorised.

All plant or equipment brought on to site by sub-contractors must be safe and in good working condition, fitted with any necessary guards and safety devices and with any necessary certificates available for checking. Information and assessment on noise levels of plant, equipment or operations to be carried out by the sub-contractor must be provided to our contracts manager before work commences.

No power tools or electrical equipment of greater voltage than 110 volts may be brought on to site. All transformers, generators, extension leads, plugs and sockets must be to latest British Standards for industrial use, and in good condition.

Any injury sustained or damage caused by sub-contractors employees must be reported immediately to this company's site representative.

Sub-contractor's employees must comply with any safety instructions given by the company's site representative.

Any materials or substance brought on site which has health, fire or explosion risks must be used and stored in accordance with Regulations and current recommendations and that information must be provided to any other person who may be affected on site. Assessment of risk associated with any substance or process hazardous to health which will be used on the site must be provided to our Contract Manager before work commences.

Sub-contractors are particularly asked to note that workplaces must be kept tidy and all debris, waste materials, etc. cleared as work proceeds.

A detailed method statement will be required from sub-contractors carrying out high risk activities, e.g. asbestos removal, steel erection, demolition, roofing, entry into confined spaces, etc. The method statement must be agreed with our contracts management before work begins and copies made available on site so that compliance with the agreed method statement can be maintained.

Sub-contractors whose works package includes a design function will present those designs to the principal contractor for onward transmission to the Principal Designer in sufficient time to allow those designs to be considered by the design team prior to work commencing. Any such design work shall be included in the health and safety file.

The sub-contractors senior site representative shall attend safety meetings as they are called by the Principal Contractor or Principal Designer. These meetings shall be the primary point for the transfer of information

**OFFICE STAFF**

The Office Staffs' Health and Safety responsibilities are to ensure that they:

- Use the correct equipment for the task;
- Only use equipment which is in good condition;
- Report all defects in equipment and materials, or any obvious safety or health hazards;
- Do not endanger themselves or other persons through their actions or failures to act;
- Avoid improvisation;
- Warn new employees of known hazards;
- Refrain from horseplay;
- Do not abuse the welfare facilities;
- Co-operate with the Company on all aspects of health, safety and welfare;
- Do not operate any equipment unless they have been fully trained and instructed in its operation;
- Comply with the requirements of the Company's Safety Policy;
- Inform management of any change to their state of health, either temporary or permanent, which might affect their working ability or their suitability to carry out any task or tasks.

## HEALTH AND SAFETY ARRANGEMENTS

This section contains the management policy for approaching specific health and safety topics. Each policy is expanded into a management system.

## RISK ASSESSMENT

The purpose of risk assessment is to identify the risks to health and safety to Company employees, as well as others affected by this Company's activities, in order that measures can be taken to either remove such risk to health and safety from the workplace or reduce those risks to as low a level as practicable.

To comply with legislation this Company will require that written risk assessments be compiled by designated Company personnel on activities that could be deemed to, or do, present a health and safety risk to either our own employees or others affected by our activities. These assessments will be held in a central file and measures will be taken by this Company to ensure that the assessment findings and precautionary measures to be taken are communicated to persons at risk to which the assessment refers. All risk assessments compiled will be subject to review if the designated person suspects that the assessment is no longer valid, or if there has been a significant change in the matters to which the assessment relates.

Company procedures for carrying out risk assessments can be found in Glencar H&S Management system.

## ACCIDENT/INCIDENT REPORTING AND INVESTIGATION

An accident can be defined as an unplanned, unwanted, unscheduled event or occurrence which may result in injury to a person or damage to property or both and includes acts of non-consensual physical violence done to a person at work.

It is the policy of this Company that all accidents, whether they result in injury or not, MUST be reported to the supervisor or other premises management as soon as possible for recording in the accident book and investigation purposes and, where necessary, for notifying the appropriate authority as required by the RIDDOR Regulations.

The Regulations stipulate the circumstances under which the enforcing authority must be notified.

- Death at work.
- Major injury at work.
- A person not at work is injured and taken to hospital for treatment.
- Dangerous occurrence.

Where an employee of the Company is unable to return to normal duties because of an injury sustained during work for a period of more than seven consecutive days the responsible person will, as soon as practicable, but within 15 days, send a report to the enforcing authorities. Injuries that cause an employee to be away from work for over 7 days must be recorded in the company accident book.

Where an employee suffers from an occupational disease it must be reported forthwith to the enforcing authority on the form F2508A. The disease must only be reported if the responsible person has received a written statement of diagnosis of the employee by a medical practitioner.

All incidents can be reported online, and e-mail reporting is also possible by visiting www.hse.gov.uk/riddor.

A telephone service is available for reporting fatal and major injuries only, call the Incident Contact Centre on 0845 300 9923 (opening hours Monday to Friday 8.30 am to 5 pm). Out of hours fatal and major injuries must be reported to the duty officer on 0151 922 9235.

Records of accidents and injuries will be kept for 3 years from the date it was made. Extracts of the records will be sent to the enforcing authority when requested.

**RIDDOR reporting of COVID-19**

You must only make a report under RIDDOR (The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013) when:

an unintended incident at work has led to someone's possible or actual exposure to coronavirus. This must be reported as a dangerous occurrence.

Or

a worker has been diagnosed as having COVID 19 and there is reasonable evidence that it was caused by exposure at work. This must be reported as a case of disease.

https://www.hse.gov.uk/news/riddor-reporting-coronavirus.htm

## HEALTH, SAFETY AND WELFARE ON COMPANY PREMISES

It is the policy of this Company that close attention is paid to the provision of suitable and sufficient facilities and measures to ensure compliance with requirements on health, safety and welfare of its employees at work.

Where such a duty extends to outside contractors, visitors or others attending our premises, then procedures will be implemented to ensure their health, safety and welfare whilst on our premises. The Company's risk assessment procedure will be used to identify risks to health and safety on the Company's premises. We will comply with the Workplace health, safety and welfare. Workplace (Health, Safety and Welfare) Regulations 1992

The company does not employ sole homeworkers however where necessary and line with government guidance we may need to set up working from home situations for example in times of a pandemic and will do all possible to ensure the set-up is in line with good ergonomic practice.

## HEALTH, SAFETY AND WELFARE ON CONSTRUCTION SITES

This Company is committed to providing a safe working environment for its employees required to work on construction sites. The standard that is used to achieve this goal, as well as monitoring of compliance, is the Construction (Design and Managements) Regulations, 2015, these being regarded as the minimum requirements for this Company's operations. Where a site activity (e.g. erection of scaffolding) is not part of our Company operation then this Company will make all reasonable enquiries to ascertain compliance by other parties responsible for provision of such aspects of the works. Our Safety Management system contains all aspects of health and safety on site (i.e. CDM Roles and Responsibilities, Site Documents, Site Monitoring and Auditing Procedures, Temporary Structures, Emergency Procedures, Transport, etc).

## COMPANY STAFF VISITING HAZARDOUS AREAS/SITES

"Hazardous Areas" in the context of this section relates to areas within the Company premises, or on external work sites (e.g. construction sites) where Company employees are required to work/visit on Company business.

It is the policy of this Company that when Company employees are required to work in/visit external work sites or parts of the Company's premises that are deemed to be hazardous, then certain procedures will be put into place before entry or any works are undertaken. These procedures will either be in the form of a specific risk assessment or safe system of work and might incorporate a permit to work system.

## CONSULTATION WITH EMPLOYEES

The Health and Safety (Consultation with Employees) Regulations, 1996, require the employer to consult with employees in good time on matters of health and safety in the workplace. It is the policy of this Company that all personnel will be regularly informed in good time regarding the introduction of any substantial measures which can affect health and safety at the workplace.

The company will communicate with its employees and subcontractors:

- Orally – in the form of directions and statements from Managers
- In writing – in the form of safety memos/emails and policy statement
- By setting positive example

Consultation is facilitated through:

- The encouragement of informal 2-way communications between all employees /subcontractors and directors
- Regular group meetings.

Employees are expected to co-operate with directors and to accept their duties under this policy.

## COMMUNICATIONS ON SITE

Every effort will be made by both management and employees of this Company to keep other contractors, clients and other interested parties informed of health and safety issues pertinent to this Company's operations on site. The precise nature of the form of communication to be used will be dependent on the requirements of the site and/or the client (e.g. memos, formal safety meetings, verbal, compilation of documentation, etc.). The mode of communication will be agreed upon before work starts and that both site management and operatives are aware of this requirement.

Communications between management and employees of this Company will be such that legislated requirements are adhered to and that employees are aware of matters having an impact on their health and safety during works.

Trade contractors/sub-contractors carrying out work for our Company are expected to have a communications procedure in place, which is suitable and sufficient for the individual work circumstances. Proof of such communication procedures is part of our vetting procedure prior to works being awarded.

## CONFINED SPACES

A confined space is defined in the Confined Spaces Regulations, 1997, as being a place of an enclosed nature where there arises a reasonably foreseeable specified risk. As entry, working and exiting from confined spaces are within our Company remit it will be ensured that such work is done in a safe manner as prescribed by legislation. This will include the provision of suitable and effective emergency arrangements, risk assessment prior to any working in a confined space and a Company safe system of work for entry, exit and working in confined spaces. Our Company employees will not be required to work in confined spaces if it is reasonably practicable to carry out the work in another way. Detailed Company procedures for entry, exiting and working in confined spaces can be found our Safety Management system.

## EMERGENCY PROCEDURES

To ensure the safety of employees, and any other person, it is the policy of this Company that documented procedures are put in place regarding situations presenting serious and imminent danger. The individual emergency procedures will be displayed at our place of work to set out clear guidance on when employees and others at work should stop work and how they should move to a place of safety. In some cases, this will require full evacuation of the workplace. In other cases, it might mean some or all, of the workforce moving to a safer part of the workplace.

Enough competent persons within the workplace will be nominated to implement those procedures, which relate to evacuation of any part of the workplace.

Sites will have specific Emergency Procedures that will be detailed in the Site Construction Phase Plan.

## FIRE PREVENTION

We recognise the need for effective and suitable fire prevention measures to combat risks to the health and safety of our employees and others affected by our activities.

To this end, we are committed to the principle of fire risk assessment (the effective ongoing evaluation of our premises and other workplaces where our employees may be required to work to determine fire risks and control measures required to eliminate or reduce the risk of fire to as low a level as possible).

Where necessary the assistance of suitable persons and/or companies will be enlisted. This Company is also committed to the provision of adequate and suitable firefighting equipment, training in the use of such equipment to identified members of staff, and any other such measures as required by the stipulations contained in relevant legislation. We have work instructions and forms to refer to and to document our Fire Risk Assessments.

## FIRST AID

It is the policy of this Company to provide, or arrange to be provided, equipment and facilities which are adequate and appropriate for rendering of First Aid to employees both at our offices and on site. Additionally, enough trained and suitable persons will be appointed to render First Aid to employees, considering the specific risks that an employee may encounter during his daily tasks. The risk assessment process will be used to determine specific risks as necessary.

Employees will be informed of the arrangements concerning First Aid, including the location of the equipment, facilities and personnel. The location of First Aid boxes/equipment and the names of First Aiders will be indicated by signage. Wherever reasonably practicable, COSHH data sheets and assessments will be available for use by First Aiders.

Employees are instructed to record all accidents, including injuries requiring First Aid only, in the accident book provided for this purpose and to comply with the RIDDIR regulations. First Aiders/appointed persons are made responsible for the safekeeping and maintenance of First Aid boxes/equipment and their contents, and to report deficiencies to Company management for action.

## EMPLOYMENT OF YOUNG PERSONS

This Company employs young persons (defined in the Regulations as someone under the age of 18 years of age) during Company business (including for training purposes). As required by legislation, risk assessments will be carried out on any risks to young persons before they start work, or existing assessments will be reviewed where young persons are already in employment. The young persons' risk assessments carried out by this Company will follow the same procedure as that for other risk assessments as described in the procedures section of this safety policy, but will specifically take the following into account:

- The young person's inexperience, lack of perception of danger and immaturity.
- Their workplace and workstation.
- Any exposures to physical, chemical and/or biological agents.
- Any work equipment used.
- The work activities and processes to be undertaken.
- Any training provided, and any risks from specified agents and processes (listed in the original Directive).

The restrictions on work to be done by a young person, as required by legislation, will be complied with by this Company

## HAZARDOUS SUBSTANCES (COSHH)

Hazardous Substances encompass all those substances - liquid, solid, gaseous or biological, that may pose a hazard to health.

It is the policy of this Company that all substances used by our employees or affecting our employees, will be regularly assessed regarding the health risks imposed on the employee and others. If possible, hazardous substances will be substituted by a less harmful substance. The company will also take due regard to the storage and transport of hazardous substances if applicable.

Assessments made under the Regulations for controlling hazardous substances will be recorded and retained for future reference by employees and First Aiders. Contractors are required to complete COSHH assessment for the products they are using.

The company director and office manager will make sure that adequate information and training is given to those affected by the assessments.

All employees must work strictly in line within the information provided under the COSHH regulations. If any person is unsure about any symbol or sign, they must ask how to handle it.

## WORK EQUIPMENT (PUWER)

It is the policy of this Company that all work equipment used in the course of Company activities, whether provided by the Company, on lease or loan to or from another Company, or belonging to individuals, must be safe for use, suitable for the task and properly maintained in accordance with the manufacturers/suppliers' instructions and at intervals set by this Company.

Work Equipment means any machinery, appliance, apparatus or tool and any assembly of components which, to achieve a common end, are arranged and controlled so that they function as a whole.

All personnel who use work equipment, and those who supervise them, will have available to them adequate health and safety information and, where appropriate written instructions in the safe use of that equipment.

All personnel who use work equipment, and those who supervise them, will receive adequate training for purposes of health and safety, including training in the methods which may be adopted when using the work equipment, any risk which may be generated by that use and the precautions to be taken.

Where there is, a specific risk associated with the use, repair, modification, maintenance, or servicing of any equipment, only those personnel specifically trained and authorised will be permitted to carry out such operations.

It is the responsibility of all employees to ensure that any tools or equipment are in good a safe condition and that they are properly and safely stored when not in use.

Machinery which is in any way dangerous, will be fitted with the appropriate guarding and other safety devices required reducing that danger to the lowest practicable level, and only those personnel specifically

The company director / site manager or office manager will be responsible for identifying plant / equipment needing maintenance and for ensuring suitable and sufficient maintenance procedures are carried out. Maintenance records will be contained centrally on the maintenance file held in the office.

The equipment provided will be suitable for the task affording the necessary protection, equipment will conform to UKCA / CE

All Elevated Mobile Work Platforms to be fitted with Anti-Entrapment Device.

## HIRE & SUPPLY(Including Sub-Contractors)

Hire

Where equipment is hired in there is a duty under The Provision and Use of Work Equipment Regulations 1998 to ensure that:

- The equipment hired is suitable for the task and conditions that it is to perform;
- It has been properly maintained and inspected before work commences, with proof in the form of an inspection certificate or similar form;
- It is supplied with all relevant information (maintenance schedule, etc.) and operating instructions;
- Any necessary instruction and training is given to site operatives;
- A qualified or competent person is available to use the equipment;
- A competent person carries out any maintenance/inspection that is required, at the correct intervals.

Supply

Where equipment is supplied, there is a duty under The Provision and Use of Work Equipment Regulations 1998 to:

- Ensure that it is supplied in good working order accompanied by a current inspection/test certificate;
- Ensure that it is supplied with all relevant information and instruction;
- Provide any training as required by the hirer;
- Provide maintenance/inspection schedules as required;

## INFORMATION, INSTRUCTION, SUPERVISION & TRAINING

In order that personnel can work safely and efficiently it is important that each person receives training appropriate to the job they are required to do. Whilst appropriate qualifications are required by the Company before employment, it is not accepted that training will cease for that employee. It is the policy of this Company that all employees continue training during their employment.

All employees will receive appropriate induction training that will include the standard introduction programme, making them aware of their statutory duties, the emergency procedures and an explanation of the Company Safety Policy. An awareness of safety issues at all levels is an important feature in the promotion of this Safety Policy. Accordingly, in all forms of training, the safety requirements related directly or indirectly to the task or work area will be an integral part of occupational training and appropriate training will be given to anyone who undertakes a new task.

All training will be mandatory and records kept of courses and qualifications. The company manages its own Training Matrix to ensure all employees training is in date and valid

The current Health and Safety law poster is displayed at the company registered office. Health and safety advice is available from SHEQ Department. Additional training will be made available for persons under the age of 18.

## SUB-CONTRACTORS

Safety information, which forms an integral part of the Company's Health and Safety Policy, is applicable to all Trade Contractors and persons under their control and forms part of the Terms of Contract. Trade Contractors are required to ensure that:

- They, and all persons under their control, familiarise themselves with the site and any hazards to be found on the site;
- Their activities are conducted in accordance with the safe practices as detailed in this Policy, taking precautions to protect all employees and others who may be affected by their actions or failures to act;
- They comply with all the relevant legislation applicable to the workplace;
- They provide the correct protective equipment and clothing to their employees at the contractor's expense;
- Employees remain within the designated areas of their work;
- They only employ persons who are sufficiently trained and experienced in the performance of their duties. If persons under training are employed, the contractor is to ensure that they are adequately supervised.

It is the policy of this Company that in situations where outside contractors (e.g. utility company personnel, cleaners, maintenance personnel) enter our premises to perform tasks in areas where there may be a risk to their health and/or safety, measures will be taken to reduce that risk to the lowest level practicable under the circumstances. These measures may include any or all the following:

- Induction training (to include the hazards and/or risks posed by this Company's operations);

- Supervision by a competent representative of this Company who is aware of the hazards presented in works to be performed;
- Ensuring that personal protective equipment has been provided and is being worn, as required;
- Verifying that the outside contractor is competent and trained to carry out the proposed tasks;
- Ensuring that outside contractors' employers have received appropriate safety information relative to their proposed tasks, issued by this Company, and that outside contractor employees have been informed of such information prior to their works commencing.
- The measures to be taken will be dependent upon the hazard presented and the control measures as recommended by the risk assessment procedures. Likewise, this Company requires that any proposed works by outside contractors' employers which includes elements of risk or hazard to this Company's employees, is communicated by that employer to this Company's authorised representative in the form of a risk assessment or similar, prior to works commencing on the premises.

## TEMPORARY WORKERS

Temporary workers will only be selected from reputable sources and due diligence will be taken during the selection process

This Company recognises that it has duties to ensure the health and safety of employees who are temporary workers, or employees obtained from an employment business. These duties include the following:

To provide comprehensible information on: any special occupational qualifications or skills required to carry out work safely (e.g. working at height); and legally required health surveillance.

Nothing in the above information relieves the contractor of their duties and obligations under Statute or Common Law. Failure to comply with our Company's Health and Safety Policy or any legal requirements will lead, at our Company's discretion, to suspension of the contractor's work, at no cost to the employer, or to termination of the contract.

## SAFETY AUDITS/SAFETY MONITORING

Progressive improvement in Health and Safety can only be achieved through the constant development of policy, approaches to implementation and techniques of risk control. It is the policy of this Company that a systematic audit of all safety arrangements will be carried out on a regular basis.

Safe working conditions are monitored by:

- Regular monthly inspections
- General spot checks
- Accident investigation and analysis

Records of Safety Inspections and Audits will be kept in order that Management can monitor the performance of the Company and improve the overall safety culture within the workforce.

The Director / Site Manager/ Office manager will make sure defects/issues noticed have been rectified appropriately.

## OCCUPATIONAL HEALTH PROGRAMMES AND HEALTH SURVEILLANCE

At the present time, this Company rarely uses or comes into contact with any substances in concentrations, or in circumstances which would warrant an occupational health programme or health surveillance to be carried out on any of its employees.

If a need for health surveillance is identified because of our assessment procedures and/or available information about any of the sites where our employees would carry out those tasks, then such health surveillance and monitoring would be initiated by the management of this Company.

Our assessment procedures are reviewed on a regular basis to consider the introduction of new technologies, new information about products used by this Company (and their effects on health) and legislative requirements. Additionally, we employ the services of an external independent health and safety consultancy to advise on such issues.

## PERSONAL PROTECTIVE EQUIPMENT (PPE)

Personal Protective Equipment means all equipment, including accessories, additions and clothing used as weather protection, which is intended to be worn or held by a person at work to protect that person against one or more risks to health or safety.

It is the policy of this Company that suitable and sufficient personal protective equipment (PPE) is provided at no cost to our employees where risk assessment has shown a significant risk to their health or safety while at work.

It is also a legal requirement that the employee uses the protective equipment provided by the Employer.

PPE will only be utilised when engineering controls and safe systems of work are not sufficient or practicable in reducing the risk to an acceptable level.

This Company also recognises that they are legally required to provide training to their employees in the proper fitting and use of PPE, and the provision of accommodation for the PPE it provides to its employees when it is not in use.

When Respiratory Protective Equipment(RPE) is required to conduct specific tasks, it is a legal requirement to be Face Fit Tested for anyone who wears a tight or close fitting mask for work must produce a valid Face Fit Test Certificate.

## PROTECTION OF THE PUBLIC

The protection of the public is to be as important a function as the protection of any other person involved in the execution of the task. The possibility of injury or ill health occurring to a member of the public because of the Company's activities is to be identified in the risk assessment procedure and the control measures required preventing such injury or ill health implemented as part of the risk assessment procedure.

## DISPLAY SCREEN EQUIPMENT (DSE)

The company will ensure advice and direction is provided for staff on the use of DSE equipment to minimise health problems.

The company will determine those persons classed as DSE users and then perform a suitable and sufficient analysis of each workstation to assess risks they may be being expose to. Such assessments will be carried out:

- Annually
- If a reason exists to suspect the assessment is no longer valid or if a significant change has occurred to the workstation or user

Upon request the company will reimburse the eyesight test for the DSE user. Should the employee be prescribed corrective spectacles specifically for DSE work the company will reimburse a proportion of the cost upon production of a valid receipt and evidence that the spectacles are specifically for DSE use.

## WORKING ON OR ALONGSIDE ROADS

The operations of this Company include the need for employees to work on or alongside public roads. Such operations are recognised as being hazardous to Company employees, pedestrians and road users alike. This Company's management undertake to minimise the hazards presented by assessing the hazards and likely risk and implementing control measures to reduce the risk as far as reasonably practicable. Control measures will be based on the findings of risk assessments (together with any other assessments required by legislation) and the requirements of specific legislation dealing with work on or alongside roads. Additionally, it is the policy of this Company to devise and implement safe systems of work that address the risks posed by working on or alongside public roads.

## WORK RELATED ROAD SAFETY/DRIVING

The company is committed to ensuring the safety of those people employed for work related driving as we recognise that health and safety applies to on the road work activities as it does to all work activities.

The Directors will ensure that any vehicles provided for work-related driving activities are suitable and sufficient for their intended use

Any such vehicles will be regularly maintained in line with the manufacturer's guidelines with the relevant schedules and record keeping being the responsibility of the Directors.

It will be the responsibility of the Director/Office manager to ensure that person employed for work related driving hold a licence valid for the type of vehicle they will be required to drive and that this licence is checked at 12 monthly intervals therein. The Director is responsible for ensuring that all work-related road traffic accidents are investigated appropriately and that any actions are undertaken.

All persons involved in work related driving are reminded of the need for compliance with Road Traffic Law to ensure the safety of themselves and other road users. Additionally, any fines or prosecutions resulting from a breach of Road Traffic Law must be reported to the office.

## DRIVERS OF COMPANY SUPPLIED VEHICLES

The Drivers' Health and Safety responsibilities are to ensure that:

- Checks are carried out on their vehicles to ensure that they are safe and roadworthy;
- They always comply with the road traffic regulations;
- Maintenance is carried out as required by the manufacturers' instructions;
- All defects are reported on vehicles and any ancillary equipment and any additional maintenance is carried out as and when required;
- They do not drive any vehicle or machinery unless they have been fully trained and instructed in its operation;
- They comply with the requirements of the Company's Safety Policy;
- Information is given to management of any medical or legal impediment to their driving license or any pending prosecutions;
- Management is informed of any change to their state of health, either temporary or permanent, which might affect their working ability or their suitability to carry out any task or tasks.

## MANUAL HANDLING OPERATIONS

Manual Handling means any transporting or supporting of a load including lifting, putting down, pushing, pulling, carrying or moving by hand or by bodily force.

In accordance with the Regulations for Manual Handling, this Company will endeavour to avoid the need for employees to undertake manual handling operations that involve a risk of injury. If this is not reasonably practicable then the Company will make a suitable and sufficient assessment of the task and reduce the risk to the lowest level that is reasonably practicable. This will include, where possible, the provision of information and general indications on the weight of each load and the heaviest side of any load whose centre of gravity is not positioned centrally.

Assessment will be recorded and reviewed if no longer valid, or there is significant change in the matter to which it relates.

The requirement that the employee has a duty to make full and proper use of any system of work provided by this Company (as the employer) to alleviate or reduce the risk of manual handling operations, will be communicated to the Company's employees.

## LIFTING OPERATIONS

It is the policy of this company that all Lifting Operations carried out by or on behalf of this company by others will be always safe. This policy also extends to any Lifting Equipment used by the company, or others on its behalf and includes equipment that may be wholly owned or hired in by the company or others working on its behalf.

Lifting equipment means any chain, sling, shackle, crane or hoist or any other piece of equipment designed to raise or lower a load. Also included is equipment that is designed to raise or lower persons such as lifts, mobile elevated work platforms and ropes used for climbing work.

All those persons who use lifting equipment whilst carrying out work for this company and those who supervise them will always have adequate health and safety information available to them.

A competent person will plan all lifting operations and only those persons who are specifically trained and authorised will be allowed to operate the equipment.

It is the policy of this company that all equipment used for the purposes of lifting will be supported by the correct and up to date documentation.

## WORKS FALLING UNDER THE CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS 2015

This Company can assume roles and responsibilities under the above regulations, dependent upon the duty holder role decided upon at the pre-tender stage of the works. It is our aim to comply with the Regulations in so far as they relate to our work activities and our relations with other duty holders during the works, and to ensure that all duties and responsibilities assigned to us under the relevant statutory provisions are fulfilled in as competent a manner as possible. The detail of the requirements of various roles under CDM are described in the HSE Guidance document L153 and it is the intention of this Company to adhere to its responsibilities in performing whatever role it assumes during a project which falls within the scope of the CDM Regulations.

In addition, Glencar will comply with government guidance on working safely during Covid19 in construction work

https://www.gov.uk/guidance/working-safely-during-coronavirus-covid-19/construction-and-other-outdoor-work

## DRUG AND ALCOHOL POLICY

To assist in the safe performance of our duties, this company operates a strict policy of NO ALCOHOL and NO DRUGS in the workplace.

No alcohol or drugs will be tolerated on site. Anyone who presents themselves for work under, or apparently under the influence of drugs or alcohol will be refused entry to the workplace.

Random Drugs and Alcohol tests will be carried out by the company at any time.

For their own safety, that of their workmates and members of the public any member of staff believing that another is under the influence of drugs or alcohol should report this to their direct manager immediately.

Drugs supplied by a medical practitioner or chemist may still affect safety performance and the employee's direct manager must be informed of that circumstance.

## ASBESTOS

It is the policy of this Company that all employees will be protected from exposure to asbestos, where that exposure would be in breach of the Asbestos Regulations. Any material suspected of containing asbestos shall be quarantined (with measures being taken to ensure that there is no further contamination) until the material has been analysed to establish its nature.

If material is confirmed as being asbestos, then measures will be taken to ensure that the asbestos is dealt with in accordance with the relevant legislation. The company will comply with legislation regarding notification of work, medical surveillance and record keeping.

The company will comply with Asbestos legislation and refer to HSE ACOP guidance.

## WORKING WITH ELECTRICITY

It is the policy of this Company that no person in its employ can work on or near any live conductor, except where the live conductor is insulated to prevent danger, or there is an absolute need for the equipment to be live for work to be carried out. The following factors will be considered when determining whether work with live conductors is justified:

When it would not be practicable to carry out work with the conductors' dead (e.g. testing purposes);

- If making the system dead will create hazards for other users of the system, or for continuously operating plant, etc;
- The need to comply with other statutory requirements;
- The level of risk involved in working on the live equipment and the effectiveness of the precautions available set against the economic need to perform that work.

This Company recognises that statutory legislation only permits persons at work to be near live conductors if it is not feasible to do the work at a safe distance from the live conductors. Additionally, persons whose presence near the live conductors is not necessary must not be so near the conductors that they are at risk of injury.

Portable electrical equipment will be tagged, tested and maintained on a regular basis in accordance with recommended frequencies.

## NOISE AT WORK

Excessive noise in the workplace presents a risk to all personnel and may lead to irreparable hearing damage. Regulations regarding noise at work require that employers make provisions to protect their employees from levels of noise that could pose a risk to their hearing.

It is the policy of this Company to comply with The Control of Noise at Work Regulations 2005, in so far as they affect our own employees and those persons not in the employ of the Company. A noise survey will be carried out by a competent person to ascertain the actual levels, where any doubt exists as to whether any machinery or plant owned or used by Company employees exceeds exposure limit

It is the policy of the Company to keep all noise to a minimum level consistent with good commercial practice. Where noise levels reach 80 decibels the Company will assess the risk to workers' health and provide them with information and training.

The Company will provide hearing protection, free of charge and will clearly mark hearing protection zones for noise levels of 85 decibels (daily or weekly average exposure). Identified areas will be marked as Ear Protection Zones in accordance with BS 5378, and the wearing of hearing protection shall be made mandatory. The Company acknowledge that there is a legal exposure limit value of 87 decibels, taking account of any reduction in exposure provided by hearing protection, above which workers must not be exposed.

Employees have a duty under these Regulations to wear protection provided. Records will be kept of all surveys and subsequent action taken.

## WASTE DISPOSAL

It is the policy of this company that where waste is generated during company activities then that waste shall be disposed of in a controlled, safe and proper manner. Where such waste removal requires the application of special control measures to reduce hazards such as contamination, dust or risk of environmental pollution then laid down company procedures will be followed to render such waste removal inoffensive and free of risk so far as reasonably practicable. Waste systems will comply with Environmental legislation and best practice.

## CONTROL OF LEAD AT WORK

It is the policy of this Company to comply with The Control of Lead at Work Regulations 2002, in so far as they affect our own employees and those persons not in the employ of the Company.

As an employer, the company shall not carry out work which is liable to expose any employees to lead unless there has been a suitable and sufficient assessment of the risk created by that work to the health of those employees and of the steps that need to be taken to meet the requirements of the regulation.

The risk assessment shall include consideration of the following: -

- The hazardous properties of the lead.
- Information on health effects provided by the supplier, including information contained in relevant safety date sheets.
- The level, type and duration of the exposure.
- The circumstances of the work, including the amount of lead involved.
- Activities, such as maintenance, were there is the potential for high level of exposure.
- Any relevant occupational exposure limit, action level and suspension level.
- The effect of preventative and control measures which have been or will be taken in accordance with the requirements of regulation 6 –prevention or control of exposure to lead.
- The results of relevant medical surveillance.
- The results of monitoring of exposure in accordance with regulation 9 – air monitoring.
- In circumstances where the work will involve exposure to lead and another substance hazardous to health, the risk presented by exposure to those substances in combination.
- Whether the exposure of any employee to lead is liable to be significant.
- Such additional information as the employer may need to complete the risk assessment.

The risk assessment shall be reviewed regularly if: -

- There is a reason to suspect that the risk is no longer valid.
- There has been a significant change in the work to which the risk assessment relates.
- The results of any monitoring completed in accordance with regulation 9 – air monitoring – show it be necessary.
- The blood-level concentration of any employee under medical; surveillance in accordance with regulation 10 – medical surveillance – equals or exceeds the action level.

The purpose of the risk assessment is to allow employees to make a valid decision about whether the work concerned is likely to result in the exposure of any employees to lead being ‘significant’. The company does not carry out Lead installation or refurbishment works, but may during works discover lead or lead products such as Lead paint. Operatives will be made aware of such risks

## WORK AT HEIGHT

The company will ensure that:

- all work at height is properly planned and organised;
- those involved in work at height are competent;
- the risks from work at height are assessed and appropriate work equipment is selected and used;
- the risks from fragile surfaces are properly controlled; and
- equipment for work at height is properly inspected and maintained

Detailed information can be found in the Safety Management System.

## GAS SAFETY

Under the Gas Safety (installation and use) Regulations 1998 we have a duty to ensure that any installations within the premises are installed and maintained by a competent person. The annual checks will include the effectiveness of any flue, the supply of air for combustion, the operational pressure and the safe function of appliances. The person responsible for ensuring a Gas Safety Engineer inspects the gas installations at the office is the Directors

## THE HEALTH ACT 2006

Chapter 28 of the Health Act is to make provision for the prohibition of smoking in certain premises, places and vehicles and therefore “Smoking” is not allowed in any of our workplaces or entrances where smoke can enter the building. This also applies where cigarette smoke can enter the building through a window. It is also our policy to ensure that this legislation is fully applied and also includes our vehicles and therefore “Smoking” is not allowed. In the event of a person smoking in the workplace areas, disciplinary action will be taken.

## STRESS

The Company recognises that work related stress can cause ill health and will put controls in place to help prevent stress. However, we cannot be held responsible for stress caused by outside sources such as financial or domestic problems. Because stress does not affect all people in the same way and that one person may find a job stressful when another does not, it is difficult to assess the risk to all employees. Therefore, employees must ensure that they report any undue stress that they may feel from different work activities. Stressful situations can be reported in confidence to the Directors

## LONE WORKING

The Company has a duty to ensure the safety of lone workers as far as reasonably practicable. As far as the Health and Safety at Work, etc. Act 1974 is concerned, the responsibility of the employer to ensure the safety of lone workers does not differ much from that of the responsibility to ensure the safety of employees working in a group or under close supervision.

Employees must co-operate with management to enable them to comply with their health and safety duties in respect of lone working. Section 7 of HASWA requires employees to take reasonable care for the health and safety of themselves and of other persons who may be affected by their acts or omissions at work.

We will manage the risks associated with lone working by the following means;

- Risk assessments will be carried out for all lone working activities. This will enable us to establish the degree of risk and to put in place the control measures required to reduce the risk to an acceptable level. Risk assessment will take into consideration the person, the equipment/ materials being used and the environment where lone working is carried out. The assessment will also consider the emergency arrangements including rescue and first aid.
- We will ensure that the required communication equipment and procedures are implemented to enable employees to be communicated with at suitable intervals (the degree of risk determines what constitutes a suitable interval). The means of communication will be determined via the risk assessment process, but the telephone is an obvious means, with mobile telephones or two-way radios for workers who may be working at remote out-stations.
- Only trained, competent and authorised persons will be permitted to work alone. Training, information and instruction will be provided following the satisfactory completion of a suitable and sufficient risk assessment.
- Whether or not a person will be permitted to work alone in or out of normal hours, will depend on the degree of risk posed by the work, the working environment and on the individual.

## NEW & EXPECTANT MOTHERS POLICY

Management of Health and Safety at Work Regulations, Workplace (Health, Safety and Welfare) Regulations (the workplace Regulations) and Equality Act) place a requirement on employers to provide suitable rest facilities for workers who are pregnant or breastfeeding. The facilities should be suitably located (e.g. near to toilets) and where necessary should provide appropriate facilities for the new or expectant mother to lie down.

New and expectant mothers are not required to inform the company that they are pregnant, have given birth in the last 6 months or are breastfeeding it is important for expectant mothers and the unborn child's health and safety protection and for maternity leave purposes that written notification is provided to our HR department as soon as possible. The risk levels within the business differ therefore control measures need to be put in place. We will involve new and expectant mothers during the risk assessment process to ensure that it is relevant and feasible. Site based staff that plan to continue breastfeeding must discuss this with the Company H&S Director

It is important that we are notified of any changes/ health advice given throughout the pregnancy to enable us to support and provide necessary provisions and adjustments where reasonably practicable.

The working risk assessment will be reviewed every three (3) months from the date of notification unless otherwise required until the date of maternity leave starts or when the child arrives if this is different.

## Mental Health and Wellbeing

*(Aligned with ISO 45001:2018 Clauses 4.2, 6.1.2, 7.4, 8.1, and 10)*

At Glencar Construction, we are committed to managing health and safety risks holistically — encompassing both **physical** and **psychosocial hazards** in line with ISO 45001:2018. We recognise that mental health is a critical component of occupational health and safety, and we aim to create an environment where wellbeing is actively supported, and mental ill-health is not stigmatised.

**Our approach includes:**

- **Hazard Identification & Risk Assessment (Clause 6.1.2):**
  We assess psychosocial risks such as work-related stress, isolation, excessive working hours, and poor communication practices during risk assessments and project planning. These are addressed within our wider OH&S risk management processes.
- **Worker Participation and Engagement (Clause 5.4 / 7.4):**
  We involve our workforce in identifying wellbeing concerns through **toolbox talks**, **wellbeing check-ins**, and **worker surveys**, encouraging open dialogue at all levels of the organisation.
- **Support Systems and Interventions (Clause 8.1):**
  We provide access to **trained Mental Health First Aiders**, Employee Assistance Programs (EAPs), and signpost relevant support organisations. Our site induction process includes wellbeing awareness, and we monitor working conditions — including shift patterns and welfare provisions — for signs of undue pressure.
- **Continual Improvement (Clause 10):**
  Wellbeing data (e.g. absenteeism, feedback, occupational health referrals) is reviewed as part of our internal audits and management reviews. Action plans are developed to improve workplace mental health support over time.
- Promoting **work-life balance**, fair working hours, and clear communication of expectations

By integrating these measures into our OH&S Management System, we aim to **continually improve** our performance in supporting mental health and creating a resilient, healthy workforce.

Glencar

# GLENCAR WASTE MANAGEMENT POLICY

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|---|---|---|---|
| Issue reference: | GH DCI-0001 | Doc No: | GSPol 02 |
| Issue No: | 04 | Issue Date: | 04.04.24 |
| Authorised by | Eddie McGillycuddy CEO | Signed: |  |

## Waste Storage

Glencar Construction commits to take active steps to ensure that our responsibilities under the Environmental Permitting Regulations 2010 and the Waste (England and Wales) Regulations 2011 are properly discharged, particularly in the accurate completion, and secure retention, of waste transfer notes.

Waste shall be stored appropriately depending on type and classification, i.e. Controlled waste, Hazardous waste and General wastes. In any event, waste storage shall be kept to a minimum and in suitable containers or locations for disposal.

Whenever possible segregation of waste into different mainstream material types (wood, metals, etc.) shall be implemented to allow for recycling.

Where Hazardous waste is identified, it shall only be segregated and stored following approved methods from the Environment Agency.

GCL will maintain a Waste Management Plan (WMP) this can be found in the master filing system located in the site office.

The WMP will be kept for two years after the completion of the project and archived accordingly.

## Waste Disposal

Duty of care shall be applied to all waste, and it shall be ensured that all waste disposals are carried out by registered contractors and records of disposal controlled by waste transfer notes. Waste disposal containers/vehicles shall be covered during transport to prevent contents escaping.

Hazardous waste shall be controlled and disposed of following the Environment Agency approved procedures, and by implementing their consignment note system.

Hazardous Waste producer licence is to be applied prior to the commencement of the project.

# PD Sign Off

**The Project Director shall sign off on this CPP prior to Construction commencement.**

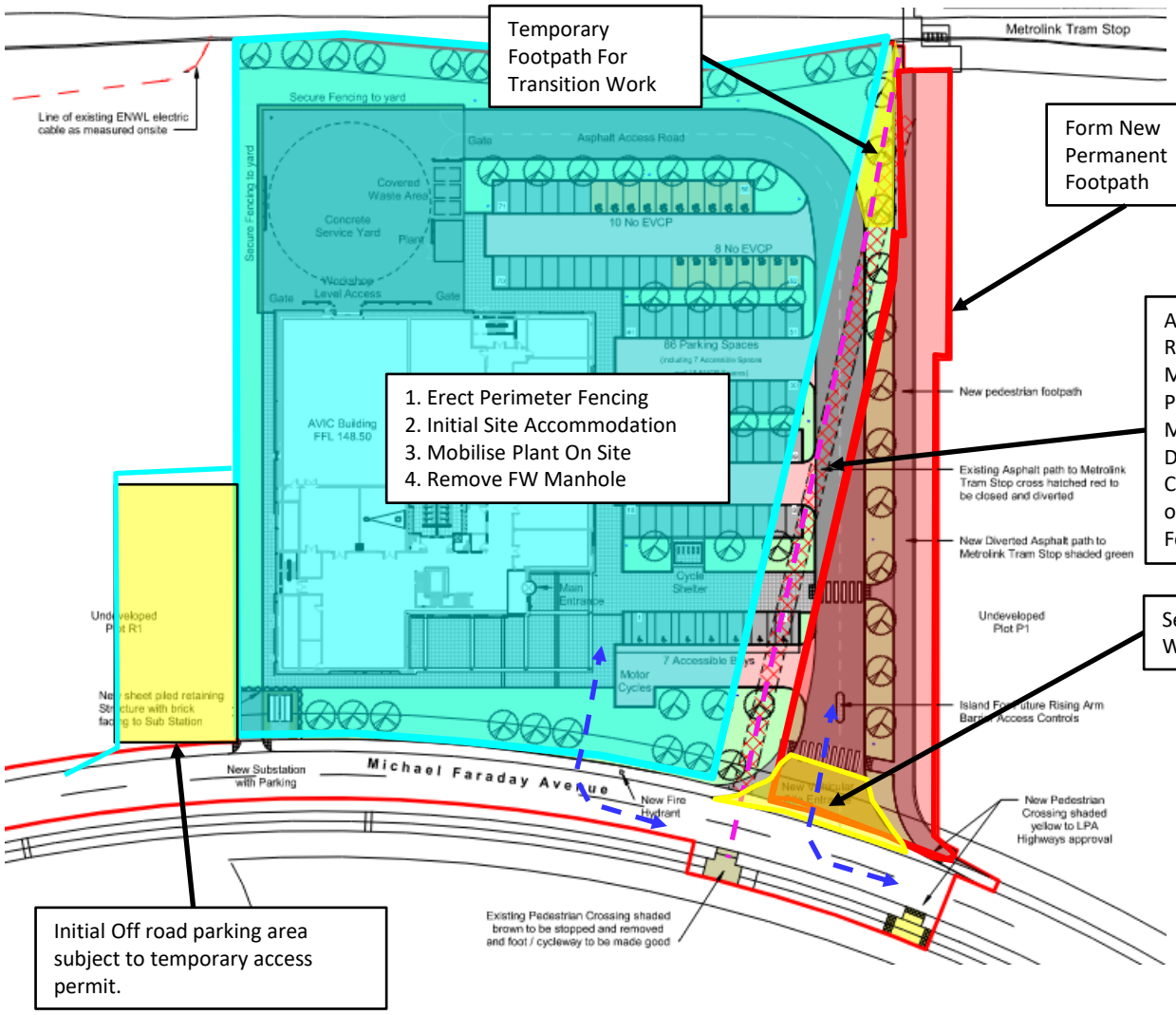
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# Plot R2 Rochdale – Site Logistics Plan

## Week -2 to 0




- Turnstile
- Gatehouse
- Site Offices, Stores & Welfare Facilities
- Site Car Parking
- Managed Pedestrian Routes
- Construction vehicles
- Hoarding Line Once Footpath Formed
- Site Boundary(approx.) Mesh & Block Heras Fencing
- First aid and Muster point

**Project Title:**
Plot R2

**Drawing Title:**
Site Logistics

**Client:**
Wilson Bowden

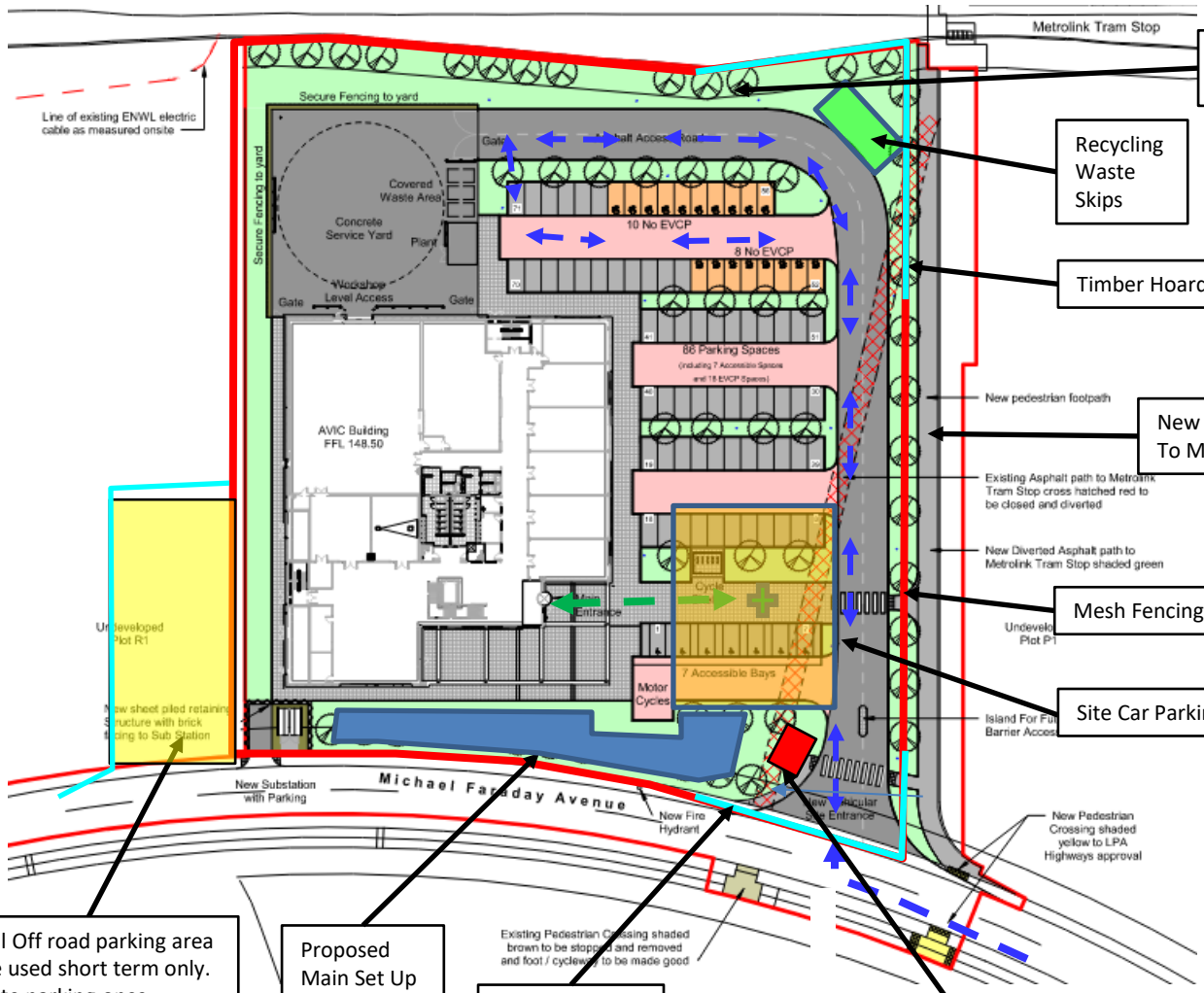
**Scale:**
NTS

**Date:**
1.8.25

**Drg No:**
GCL/T0720/TB/PH01

Glencar

# Plot R2 Kingsway Business Park, Rochdale – Logistics Plan




- Turnstile
- Gatehouse
- Site Offices, Stores & Welfare Facilities
- Site Car Parking
- Managed Pedestrian Routes
- Construction vehicles
- Hoarding Line Once Footpath Formed
- Site Boundary(approx.) Mesh & Block Heras Fencing
- First aid and Muster point

**Project Title:**
Plot R2

**Drawing Title:**
Site Logistics

**Client:**
Wilson Bowden

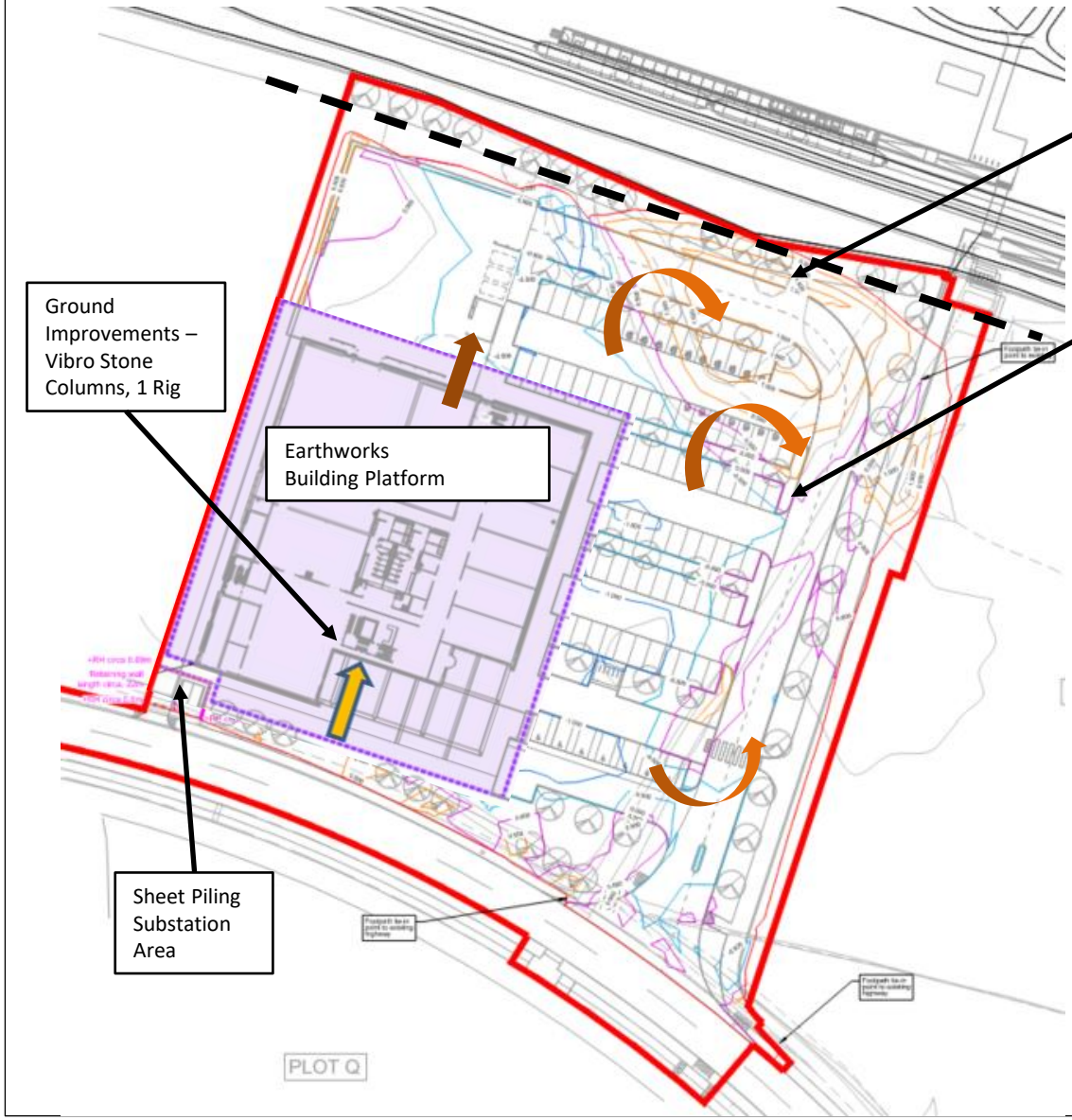
**Scale:**
NTS

**Date:**
1.8.25

**Drg No:**
GCL/T0720/TB/SL01

Glencar

# Plot R2 Rochdale – Earthworks / Vibro Stone Columns / Sheet Piling




- Turnstile
- Gatehouse
- Site Offices, Stores & Welfare Facilities
- Site Car Parking
- Managed Pedestrian Routes
- Construction vehicles
- Hoarding Line Once Footpath Formed
- Site Boundary(approx.) Mesh & Block Heras Fencing
- First aid and Muster point

**Project Title:**
Plot R2

**Drawing Title:**
Site Logistics

**Client:**
Wilson Bowden

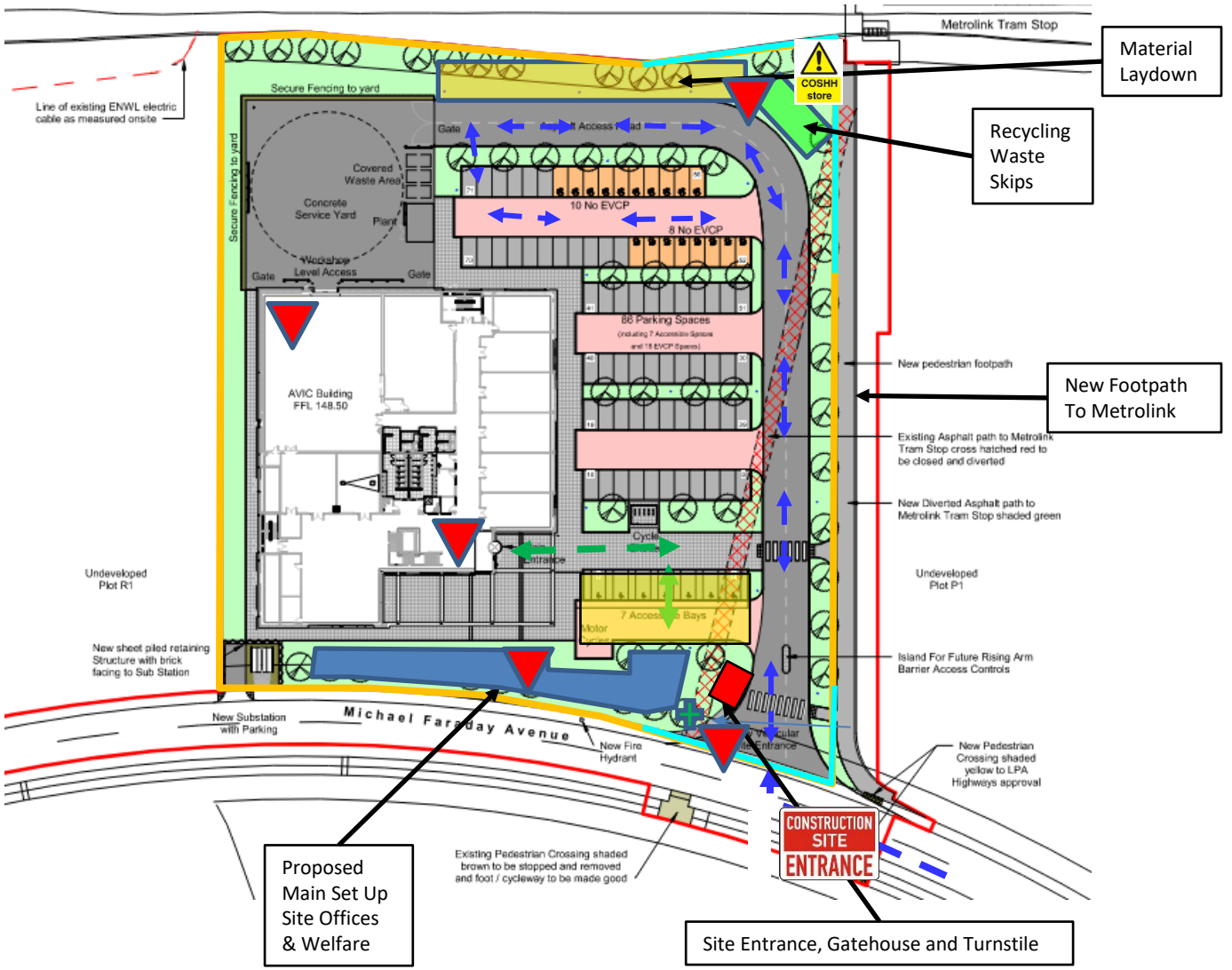
**Scale:**
NTS

**Date:**
1.8.25

**Drg No:**
GCL/T0720/TB/PH02

Glencar

# Plot R2 Kingsway Business Park, Rochdale – Fire Plan




Gatehouse

Site Offices, Stores & Welfare Facilities

Site Car Parking

COSHH Store

Managed Pedestrian Routes

Construction vehicles Emergency Access

Site Boundary(approx.)
Mesh & Block Heras Fencing

Fire Points

First aid and Muster point

**Project Title:**
Plot R2

**Drawing Title:**
Fire Plan

**Client:**
Wilson Bowden

**Scale:**
NTS

**Date:**
07. Jul 2025

**Drg No:**
GCL/T0720/SS/FP1

Glencar

# SITE SAFETY RULES

General Rules

- Signing in/out: Everybody entering or leaving site must sign in/out. This includes when leaving site temporarily during the day (e.g. for lunch).
- Inductions: All operatives are required to attend a site specific induction prior to commencing any work which will be carried out by the GLENCAR Site Management Team.
- Training: All operatives attending site should be competent and fully trained. Evidence of this will be required at the site specific induction. Some examples of this are CSCS/CPCS cards (or equivalent), PASMA cards, IPAF cards, CISRS cards, FASET, JIB etc.
- PPE: Whilst on site, hard hats, boots, gloves and clean high visibility vests must be worn at all times. Other task-specific PPE specified by risk assessments and method statements must be used as indicated. It is the responsibility of the contractors to ensure all of their staff and subcontractors have correct, fit for purpose PPE with them at all times.
- Dress code: All contractors must wear long trousers and short/long sleeved tops as a minimum or as risk assessed. Sleeveless tops including vests, shorts of any type and bare torsos are not permitted on site at any time.
- Work Equipment: All work equipment is to either be labelled or a copy of it's maintenance schedule produced to confirm it's fit for purpose and recorded on the PUWER Register held by the GLENCAR Site Management Team.
- Risk Assessments & Method Statements: The GLENCAR Site Management Team will approve all risk assessments (RAMS) prior to work commencing. Operatives are not to commence any works until they have read, understood and signed their RAMS.
- Mobile Phones: Using mobile phones on site is prohibited except in designated areas.
- Radios etc: No Radios/CD Players are allowed anywhere on site.
- Welfare Facilities: Operatives are expected to treat all welfare facilities with respect. Anybody found deliberately damaging welfare facilities will be removed from site and subsequently be liable to being charged for making good
- Storage: Storage of materials, tools and other work equipment is only permitted in designated areas.
- Use of work equipment: No one is permitted to operate, adjust, interfere with or otherwise interact with any piece of machinery/equipment without the relevant qualifications and/or permission.
- Working at Height: Every employer shall ensure that work at height is:
  - Properly planned
  - Appropriately supervised
  - Carried out in a manner which is so far as is reasonably practicable safe
  - Collective protection measures should take priority over individual protection
  - Step ladders are only to be used for work of short duration, where there is no other safer alternative and a permit issued by the GLENCAR Site Management Team.

# SITE SAFETY RULES

- Work Permits: Work permits must be obtained from the GLENCAR Site Manager before commencing any of the following tasks:
  - Hot work
  - Working on live services
  - Working in confined spaces
  - Excavations
  - Working from stepladders/hop-ups

- Emergency Procedures: All operatives must familiarise themselves with the site fire plan and any emergency procedures. Fire points are not to be moved or interfered with except in an emergency.

- Accident/Near Miss/Dangerous Occurrence Reporting: All accidents, near misses & dangerous occurrences, no matter how minor, must be reported to the GLENCAR Site Manager immediately who will then inform the Health & Safety department.

- Drugs & Alcohol: In accordance with GLENCAR Substance Misuse Policy. Anybody found to be under the influence of illegal drugs and/or alcohol will be immediately removed from site. In addition, any operative taking prescribed medication must notify the site management team. They must not operate machinery or plant if their medication prohibits it. GLENCAR reserves the right to random substance testing within ALL work areas (Site and Office)
- Behaviour: Operatives will conduct themselves in a respectful, professional manner towards the Client's staff, visitors, members of the public and any occupants of surrounding premises.

- Discipline: Operatives will be verbally warned for minor disciplinary incidents on the first occasion. For a major disciplinary incident or secondary occurrence of a minor incident then a formal procedure will be carried out with the possibility of the operative being removed from site.

Glencar

# site **safety, health & environmental** induction

indukcji zdrowia i bezpieczeństwa

site Sicherheit,Gesundheit & Umwel Induktion

iechyd a diogelwch sefydlu

здоровье и безопасность индукция





Podczas pracy w tym miejscu, to oczekuje, aby działać zgodnie z firmowym rachunku metody, bezpieczeństwa strony, zasad zdrowia i środowiska, a klient własnego bezpieczeństwa, zdrowia i Environmenta standardów.

Weźmiemy podejście zerowej tolerancji dla osoby lub firmy, uznane za naruszenie tych zasad.

Jeżeli złamiesz zasady, zostanie usunięte z serwisu.



Wrth weithio ar y safle hwn, disgwylir i chi weithio yn unol â Datganiad eich cwmni Dull, Diogelwch Safle, Iechyd ac Amgylcheddol reolau a safonau Diogelwch, Iechyd a environmenta y Cleient ei hun.

Byddwn yn mabwysiadu ymagwedd dim goddefgarwch i berson neu gwmni dod o hyd i fod yn torri'r rheolau hyn.

Os ydych yn torri'r rheolau, BYDD dynnu eich enw oddi ar y safle.



Während der Arbeit an diesem Ort, werden Sie erwartet, dass in Übereinstimmung mit Ihrer Firma Method Statement, der Sicherheit, Gesundheit und Umweltschutz Regeln und der Client die eigene Sicherheit, Gesundheit & Environmenta Standards arbeiten.

Wir werden eine Null-Toleranz-Ansatz auf die Person oder Firma zu gründen, um Verstöße gegen diese Regeln werden zu nehmen.

Wenn Sie die Regeln zu brechen, werden Sie von der Baustelle entfernt werden.



Во время работы на этом сайте, вы должны работать в соответствии с методом Вашей компании Заявлении сайта Безопасность, здоровье и правил охраны окружающей среды и собственного труда, здоровья и окр Клиента стандартам.

Мы будем принимать политику абсолютной нетерпимости к лицу или компании оказываются нарушения этих правил.

Если вы нарушите правила, вы будете удалены с сайта.

Glencar CONSTRUCTION



# ZERO TOLERANCE

## in operation on this site

Whilst working on this site, you are expected to work in accordance with your company's Method Statements, the Site SH&E Rules and the Client's own SH&E standards.

We will take a **ZERO TOLERANCE** approach to any person or company found to be breaching these rules.

If you break the rules, you **WILL** be removed from site.



Dostęp do i z miejsca. Zapoznaj Plan Zarządzania Ruchem na tablicy ogłoszeństronę po więcej szczegółów.

Kierownictwo budowy musi być powiadomiony o wszystkich dostaw przed ichprzybyciem do zapewnienia, że nie jest wystarczająco miejsca, aby je przyjąć.Serwis zastrzega sobie prawo do odwrócenia się nieautoryzowanym dostaw.

Istotne jest, aby zalogować się i przy każdym dojść, lub urlopu na stronie. Obejmujepozostawiając na lunch lub inne krótki okres w ciągu dnia.



Mynediad i ac o safle. Gweler Cynllun Rheoli Traffig ar y rhybudd safle bwrdd am fwy o fanylion.

Mae'n rhaid i'r tîm rheoli safle gael eu hysbysu o'r holl enedigaethau cyn iddyntgyrraedd er mwyn sicrhau bod digon o le i'w derbyn. Mae'r safle yn cadw'r hawl iwrthod unrhyw dosbarthu heb awdurdod.

Mae'n hanfodol eich bod yn llofnodi i mewn ac allan bob tro y byddwch yn cyrraedd,neu adael, y safle. Mae hyn yn cynnwys gadael i ginio neu gyfnod arall byr yn ystod ydydd.



Der Zugang zu und von der Baustelle. Bitte beachten Sie Traffic Management-Planauf der Baustelle Aushang für weitere Details.

Die Bauleitung muss alle Lieferungen benachrichtigt vor ihnen ankommen, um sicherzustellen, dass es genügend Platz, um sie zu akzeptieren. Die Site behält sich das Recht vor, abwenden unbefugte Lieferungen.

Es ist wichtig, dass Sie in & sign out jedes Mal erreichen Sie, oder lassen Sie dieWebsite. Dazu gehören der Abreise nach dem Mittagessen oder andere kurze Zeitwährend des Tages.



Доступ к информации и с сайта. Пожалуйста, смотрите движения План по доске объявлений сайта для более подробной информации.

Команда управления сайтом должна быть уведомлена о всех поставок до ихприбытия в гарантировать, что есть достаточно места, чтобы принять их.Сайтоставляет за собой право отказывать какой-либо несанкционированныхпоставок.

Очень важно, чтобы при входе в и каждый раз, когда вы приедете в, или оставить, сайт. Это включает в себя оставляя на обед или другой короткийпериод, в течение дня.



**Access to and from site:**

Pedestrian access to site is via the following

The site entrance off Michale Faraday Avenue

Vehicular access to site is via the following

The site entrance off Michale Faraday Avenue

Vehicle parking is located

on site follow the directional signage

Please see Traffic Management Plan on the site SH&E notice board for more details.

**Site deliveries**

The site management team must be notified of all deliveries prior to them arriving to ensure that there is adequate space to accept them.

Deliveries are to be reported to the Site Manager prior to unloading commencing





Istotne jest, aby zalogować się i za każdym razem przyjeździe, lub zostawić, witryna. Obejmuje pozostawiając na lunch lub innego krótkim czasie w ciągu dnia. Jeśli nie podpisać i obecnie strony, nie może być wypłacona!

Aby pomóc nam zmniejszyć emisję dwutlenku węgla, należy zarejestrować swój przebieg, gdy zalogowany



Mae'n hanfodol eich bod yn llofnodi'r i mewn ac allan bob tro y byddwch yn cyrraedd, neu adael y safle. Mae hyn yn cynnwys gadael am ginio neu gyfnod byr eraill yn ystod y dydd. Os nad ydych yn arwyddo i mewn ac allan o'r safle, efallai na fyddwch yn cael ei dalu!

Mae'r Er mwyn ein helpu i leihau ein hôl troed carbon, rhaid i chi fewngofnodi eich milltiroedd pan fyddwch yn llofnodi i mewn



Es ist wichtig, dass Sie in & Logout jedes Mal kommen Sie an, oder lassen Sie die Website. Dies beinhaltet verlassen zum Mittag-oder anderen kurzen Zeitraum während des Tages. Wenn Sie nicht unterschreiben in die und aus der Website, können Sie nicht bezahlen!

Die Um uns zu helfen, unseren Kohlenstoff-Fußabdruck zu reduzieren, müssen Sie sich Ihre Autos, wenn Sie sich anmelden



Очень важно, что вы входите в И каждый раз, когда вы приедете в, или оставить, на сайте. Это включает в себя оставляя на обед или другой короткий период в течение дня. Если вы не входить и выходить сайта, вы не можете быть оплачен!

Порядок, в, чтобы помочь нам уменьшить нашу углеродного следа, необходимо войти ваш пробег, когда вы войдите на сайт

## Signing in & out

The signing in book/point can be found at security and will be used to monitor who is on site at any given time.

It is vital that you sign in & out every time you arrive at, or leave, the site. This includes leaving for lunch or other short period during the day.

If you don't sign in and out of site, you may not be paid!




## Mileage

The In order to help us reduce our carbon footprint, you must log your mileage when you sign in as follows

For example, if you are staying 10 miles from site and you are only working on this site then please log your overall "round trip" mileage (10 miles to site + 10 miles back = 20 miles)

However, if you are heading onto another site after this one then please only log the distance you travelled to get to this site (10 miles)

daily signing in/out register

| Project Name: | | Project No: | |
|---|---|---|---|

| Date | Name (Print) | Signature | Company | Time In | Time Out | Travel details* | |
|---|---|---|---|---|---|---|---|
| | | | | | | Miles (Enter P if passenger) | Transport used (See key) |
| 07.06.13 | John Smith | John Smith | John Smith Construction | 07.00 | 17.00 | 20 | 5 |
| | | | | | | | |
| | | | | | | | |

**"Round trip" mileage logged as 20 miles (10 miles to site + 10 miles back)**

daily signing in/out register

| Project Name: | | Project No: | |
|---|---|---|---|

| Date | Name (Print) | Signature | Company | Time In | Time Out | Travel details* | |
|---|---|---|---|---|---|---|---|
| | | | | | | Miles (Enter P if passenger) | Transport used (See key) |
| 07.06.13 | John Smith | John Smith | John Smith Construction | 07.00 | 17.00 | 10 | 5 |
| | | | | | | | |
| | | | | | | | |

**Single journey mileage logged as 10 miles as travelling to another site afterwards.**



Następujące Sprzęt ochrony osobistej należy nosić na miejscu przez cały czas.

Zasady te mają zastosowanie do wszystkich ludzi bez względu na charakter pracy sąprzedsiębiorstwa obecne na miejscu przez cały czas.

Obowiązkiem wykonawców w celu zapewnienia ich ochrony osobistej. Zastrzegamy sobie prawo do odmowy wjazdu do każdej osoby przybywających na miejscu bez poprawnego PPE oraz, w stosownych przypadkach, do walki za wykonawcówkolejnych opóźnień programu.



Mae'n rhaid i'r Offer Amddiffynnol Personol canlynol yn cael eu gwisgo ar y safle bob amser.

Mae'r rheolau hyn yn berthnasol i BAWB bobl sy'n bresennol ar y safle ar adegauBOB waeth beth yw natur y gwaith y maent yn ei chyflawni.

Cyfrifoldeb o gontractwyr i ddarparu eu PPE hunain. Rydym yn cadw'r hawl i wrthod mynediad i unrhyw berson sy'n cyrraedd ar y safle heb PPE gywir yr a, lle y bo'n briodol, i wrth-dâl gontractwyr am unrhyw oedi raglen ddilynol.



Die folgenden persönlichen Schutzausrüstungen müssen vor Ort zu jeder Zeitgetragen werden.

Diese Regeln gelten für alle Anwesenden vor Ort bei ALL-mal unabhängig von der Art der Arbeit, die sie unternehmen.

Es ist die Verantwortung der Unternehmer, ihre eigenen PSA bieten. Wir behalten uns das Recht auf Einreise für jede Person ankommen vor Ort, ohne die richtige PSA und gegebenenfalls zu begegnen-charge Auftragnehmer für ein nachfolgendes Programm Verzögerungen zu verweigern.



Следующие Средства индивидуальной защиты должны носить на сайте в любое время.

Эти правила относятся ко всем присутствующим на сайте в любое время, независимо от характера работы, которые они проводят.

Это ответственность подрядчиков, чтобы обеспечить свою собственную СИЗ.Мы оставляем за собой право отказать во въезде любому лицу, прибывающих на сайте, без правильного средств индивидуальной защиты и, при необходимости, к борьбе с зарядом подрядчиков для любой последующейзадержки программы.

## Personal Protective Equipment (PPE)

In addition to any task specific PPE identified in your company's risk assessments and method statements, the wearing of the following forms of PPE is mandatory **AT ALL TIMES**:

- [x]  Head protection
- [x]  Foot protection
- [x]  High visibility vests
- [x]  Gloves
- [ ]  Eye protection
- [ ]  Hearing protection
- [ ]  Respiratory protection
- [ ]  Others (Specify)

These rules apply to ALL people present on site at ALL times regardless of the nature of the work they are undertaking.

It is the responsibility of contractors to provide their own PPE. Glencar reserve the right to refuse entry to any person arriving on site without the correct PPE and, where appropriate, to counter-charge contractors for any subsequent program delays.

**Anybody persistently failing to wear the correct PPE will be removed from this site.**



Wykonawcy nie mogą rozpocząć pracy na miejscu aż do ich firmy, oceny ryzyka ioświadczeń metodą otrzymano i które zostały zatwierdzone przez Zespół Zarządzania strony.

Pod koniec tej indukcji zostaniesz poproszony o podpisanie arkusza podpisdołączony do oceny ryzyka i zatwierdzone sprawozdania metody. W ten sposóbpotwierdzasz, że masz je przeczytać i zgodzić się na pracę zgodnie z nimi.

Zezwolenie należy uzyskać od kierownika budowy do następujących utworów:



Nid yw contractwyr chaniateir i ddechrau gweithio ar y safle nes asesiadau risg eucwmni a datganiadau dull wedi cael eu derbyn a'u cymeradwyo gan y Tîm Rheoli Safle.

Ar ddiwedd y cyfnod sefydlu, bydd gofyn i chi lofnodi taflen llofnod ynghlwm wrth eichasesiadau risg a gymeradwywyd a datganiadau dull. Wrth wneud hyn rydych yncadarnhau eich bod wedi eu darllen ac yn cytuno i weithio yn unol â hwy.

Rhaid i trwydded oddi wrth y rheolwr y safle ar gyfer y gwaith canlynol:



Vertragspartner sind nicht gestattet, Arbeiten auf der Baustelle beginnen, wenn ihreFirma Risikobewertungen und Methode Aussagen eingegangen sind und von derBauleitung genehmigt.

Am Ende dieser Induktion werden Sie aufgefordert, eine Signatur Blatt an Ihrenzugelassenen Risikobewertungen und Methode Aussagen zu unterzeichnen. Dabeibestätigen Sie, dass Sie sie bereits gelesen und bin damit einverstanden inÜbereinstimmung mit ihnen zu arbeiten.

Eine Genehmigung muss von der Bauleiter für den folgenden Werken bezogen werden:



Подрядчики не имеют права приступить к работе на месте, пока рисковать своей компании оценок и метод заявления были получены и утвержденыГруппы управления сайтом.

В конце этой индукции вам будет предложено подписать подписной листподключенный к утвержденной оценки рисков и методы отчетности. При этомВы подтверждаете, что вы читали их и согласиться на работу в соответствии с ними.

Разрешение должно быть получено от сайта менеджер следующие работы:

## RAMS (Risk Assessments & Method Statements)

Contractors are not permitted to start work on site until their company's RAMS have been received and approved by the Site Management Team. At the end of this induction you will be asked to sign a signature sheet attached to your approved RAMS. In doing so you are confirming that you have read them and agree to work in accordance with them.

## Work permits

A permit to work must be obtained from the Site Manager before undertaking any of the following work activities:



- [x] Hot work
- [x] Work in confined spaces
- [x] Excavations
- [x] Using steps, ladders or hop-ups
- [x] Temporary works
- [ ] Others (specify)

All work MUST be carried out following the system detailed within your company's RAMS. If the work being undertaken falls outside of the scope of your RAMS then work is to stop until the RAMS have been amended and re-approved by the Site Management Team



Wszystkie spółdzielnie pracy na naszej stronie musi posiadać albo karta CSCS lubkartę z stowarzyszonego programu (na przykład JIB, CPCS, CISRS).

Przeprowadza wyrywkowe kontrole są prowadzone w trakcie realizacji projektu na kartach kompetencji. Każdy znaleziony wykonywania pracy nie są przeszkoleni wmogą zostać poproszeni o opuszczenie strony.



Rhaid i'r holl weithwyr sy'n gweithio ar ein safle ddal naill ai gerdyn CSCS neu gerdyno gynllun gysylltiedig (er enghraifft JIB, CPCS, CISRS).

Gwiriadau ar hap ar hap yn cael eu cynnal drwy gydol y prosiect ar gardiaucymhwysedd. Gall unrhyw un gael gwneud gwaith nad ydynt yn cael eu hyfforddi i wneud y gofynnir i chi adael y safle.



Alle Agenten arbeiten auf unserer Website müssen im Besitz entweder ein CSCS-Karte oder eine Karte von einem verbundenen System (zum Beispiel JIB, CPCS,CISRS).

Zufällige Stichproben werden während des gesamten Projekts auf Kompetenz-Karten durchgeführt. Jeder fand der Durchführung von Arbeiten sie nicht trainiert sind,tun können aufgefordert werden, vor Ort zu verlassen.



Все оперативники работают над наш сайт должен иметь либо карты CSCS иликарту из аффилированных схемы (например, стрелы, CPCS, CISRS).

Случайные выборочные проверки проводятся на протяжении всего проекта покомпетенции карт. Любой найден проведения работ они не обучены делатьмогут попросить покинуть сайт.

## Competency:

ALL operatives working on our site must hold either a **CSCS card** or a **card from an affiliated scheme** (JIB, CPCS, CISRS etc).

In addition, below are some of the most common competency cards required on this site (please note, this list is note exhaustive, please contact the Site Manager if your task is not covered):

- **CPCS or NPORS** - Plant operating
- **PASMA** - Constructing/inspecting scaffold towers
- **IPAF** – Using MEWPs
- **CISRS** – Scaffolders
- **CCDO** – Demolition operatives
- **UKPIA SPA** – Working on PFS forecourts




Example of a card from a CSCS affiliated scheme displaying the CSCS hologram

Random spot checks are carried throughout the project on competency cards. Anybody found carrying out work they are not trained to do may be asked to leave site.



Plan awaryjny witryny można znaleźć na tablicy ogłoszeń i stronie powyżej każdy punkt ognia na miejscu. Poświęć trochę czasu na zapoznanie się z planem ognia iwszystkie drogi ucieczki z miejsca pracy.

Gaśnice wraz z ręcznego uruchomienia sygnalizatorów znajdują się w całej witrynie.Proszę Bądź świadomy lokalizacji tych punktów przed rozpoczęciem pracy.

Drzwi przeciwpożarowe pomóc spowolnić rozprzestrzenianie się ognia i musi byćzamknięte przez cały czas.

Wyjścia ewakuacyjne są używane do wyjścia z budynku w czasie zagrożenia i musi być utrzymana w czystości i w każdym czasie



Gall y safle cynllun argyfwng ar gael ar y rhybudd safle bwrdd ac uwch bob llecyn cyfarpar tân ar y safle. Cymerwch amser i ymgyfarwyddo â'r cynllun tān a'r holllwybrau dianc o'ch ardaloedd gwaith.

Diffoddwyr tân, ynghyd â larymau electronig activated â llaw yn cael eu lleoli ar drawsy safle. Dylech wneud eich hun yn ymwybodol o leoliad pwyntiau hyn cyn dechrau gweithio.

Drysau tân helpu i arafu lledaeniad y tân a rhaid eu cadw ar gau bob amser.

Allanfeydd tân yn cael eu defnyddio i fynd allan o'r adeilad mewn argyfwng a rhaid eucadw'n glir ac ar bob adeg



Die Website Notfallplan kann auf der Website Aushang und über jedem Brennpunktvor Ort gefunden werden. Bitte nehmen Sie sich Zeit, um sich mit dem Feuer zu planen und alle Fluchtwege aus Ihren Arbeitsbereichen vertraut zu machen.

Feuerlöscher mit manuell aktiviert elektronische Alarme werden auf der gesamten Website entfernt. Bitte machen Sie sich bewusst, die Position dieser Punkte vor Beginn der Arbeiten.

Brandschutztüren helfen verlangsamen die Ausbreitung von Feuer und mussgeschlossen gehalten zu allen Zeiten.

Notausgänge verwendet werden, um aus dem Gebäude in einem Notfall und müssen ständig freigehalten werden und jederzeit



План на объекте в аварийных можно найти на доске объявлений сайта и выше всякого воспламенения на месте. Пожалуйста, найдите время, чтобы ознакомиться с планом огонь, и все пути эвакуации из вашей области деятельности.

Огнетушители вместе с вручную активировать электронные тревогирасположены по всему сайту. Пожалуйста, сделайте себе знать расположениеэтих точек перед началом работы.

Противопожарные двери помогают замедлить распространение огня и долженбыть закрыт в любое время.

Пожарные выходы используются, чтобы выйти из здания в чрезвычайной ситуации и должны быть свободными и во все времена

## Emergency procedures

The site emergency plan can be found on the site SH&E notice board and above every fire point on site. Please take time to familiarise yourself with the fire plan and all escape routes from your work areas. The assembly point is located at the site entrance.

## Fire fighting equipment

Fire points are located around the site and consist of a minimum of a foam/dry powder and water extinguisher along with a manually activated electronic alarm. Please make yourself aware of the location of these points before starting work.







## Fire doors & Fire exits

Fire doors are designed to help slow down the spread of fire and must therefore be kept shut at all times.




Fire exits are used to get out of the building in an emergency and must be kept clear and at all times (clear of tools, machinery, materials etc…)

**All emergency exits need to remain clear of obstructions.**
**All fire points must remain in their designated location**

Zaplecza socjalnego strony w tym miejscu stołówka, toalety, umywalnie i suszenia obiektów są dostępne. Proszę potraktować te urządzenia z szacunkiem.



Następujące obszary strony są poza granicami wykonawcom ... ... ... ... ... ... ... ..
Każdy wykonawca w tych strefach bez zezwolenia zostaną poproszeni o opuszczeniestrony. Pamiętaj także, by zwracać uwagę na oznakowanie wyświetlone ostrzeżenie

Telefony komórkowe i palenie tytoniu jest dozwolone tylko w wyznaczonych miejscach.

Cyfleusterau lles Safle gan gynnwys, ffreutur safle toiledau, cyfleusterau ymolchi a chyfleusterau sychu ar gael. Dylech drin y cyfleusterau hyn gyda pharch.



Mae'r meysydd canlynol o safle yn waharddedig i gontractwyr ... ... ... ... ... ... ... ..
Bydd unrhyw gontractwr a geir yn yr ardaloedd hyn heb ganiatâd y gofynnir i chi adaely safle. Sicrhewch eich bod yn talu sylw i'r arwyddion rhybuddio eu harddangos

Mae ffonau symudol ac ysmygu yn cael eu caniatáu yn unig mewn ardaloedd dynodedig.

Seite Sozialeinrichtungen einschließlich Site Kantine, Toiletten, Waschgelegenheitenund Trockner stehen zur Verfügung. Bitte behandeln Sie diese Einrichtungen mit Respekt.



Folgende Bereiche der Website sind außerhalb des gültigen Bereichs an Auftragnehmer ... ... ... ... ... ... ... ..
Jeder Unternehmer in diesen Bereichen ohne Erlaubnis gefunden werden gebeten,vor Ort zu verlassen. Bitte beachten Sie unbedingt die Warnung Signage angezeigt

Mobiltelefone und das Rauchen nur in ausgewiesenen Bereichen gestattet.

Сайт бытового обслуживания, включая сайт столовая, туалеты, душевые исушильных установок доступны. Пожалуйста, обращайтесь этих объектов с уважением.



Следующих областях на сайте, являются вне закона, чтобы подрядчики ... ... ... ... ... ... ... ..
Любой подрядчик, найденные в этих областях без разрешения будет предложено покинуть сайт. Убедитесь, что Вы обратите внимание напредупреждение вывесок отображаться

Мобильные телефоны и курение разрешается только в специально отведенных местах.

## Welfare facilities

Site welfare facilities including (state as applicable) site canteen, toilets, washing facilities and drying facilities can be found at the site welfare area.
Please treat these facilities with respect.





## Unauthorised areas

Non deemed at present.
Any contractor found in these areas without permission will be asked to leave site. Please ensure you pay attention to the warning signage displayed

## Mobile phones

The use of mobile telephones whilst on site is prohibited. Mobile telephones are only to be used in designated mobile phone areas where the adjacent sign is displayed.







## Smoking

Smoking is prohibited in all areas of site. In order to maintain a professional image, smoking is also prohibited in all public areas (eg carpark) during site operational hours (including lunch breaks). Smoking is only permitted in designated smoking areas where the adjacent sign is displayed.

**Any person ignoring these rules will be removed from site and where appropriate, charged for any repair/cleanup.**



Mianowany pierwszym ratowników na miejscu mogą być łatwo zidentyfikowane przez pierwszy symbol pomocy na kask. Wszystkie wypadki i sytuacje niebezpieczne,muszą być zgłaszane natychmiast Site Manager

Jeśli pacjent przyjmuje jakiekolwiek leki, lub cierpisz na schorzenia, które mogłyby wpłynąć na zdolność do wykonywania pracy w sposób bezpieczny, należy poinformować Site Manager
Wszystkie informacje będą traktowane jako ściśle poufne.

Zgodnie z naszą polityką nadużywania substancji, leków i testów losowych alkoholumoże być przeprowadzone w dowolnym momencie. Każdy odmowy testu lub znaleźćsię pod wpływem alkoholu i / lub leków zostanie usunięty z serwisu.



Gall y cymorth a benodwyd cyntaf ar y safle gael ei hadnabod yn hawdd gan y symbolcymorth cyntaf ar eu hardhat. Rhaid i bob damwain a fu bron yn cael ei adrodd i'r Rheolwr Safle ar unwaith

Os ydych yn cymryd unrhyw feddyginiaeth a ragnodwyd neu yn dioddef o gyflwr meddygol a allai effeithio ar eich gallu i gyflawni eich swydd yn ddiogel mae'n RHAID i chi roi gwybod i'r Rheolwr Safle
Bydd yr holl wybodaeth a ddarperir yn cael ei drin yn gwbl gyfrinachol.

Gall Yn unol â'n Polisi Camddefnyddio Sylweddau, cyffuriau a phrofion ar hap alcohol yn cael ei wneud ar unrhyw adeg. Unrhyw un sy'n gwrthod y prawf neu dod o hyd i fodo dan ddylanwad alcohol a / neu a fydd cyffuriau eu tynnu oddi ar y safle.



Die bestellten Ersthelfer vor Ort kann leicht durch die Erste-Hilfe-Symbol auf ihremHelm identifiziert werden. Alle Unfälle & Beinaheunfällen muss der Bauleiter sofort gemeldet werden

Wenn Sie irgendwelche verschriebenen Medikamente sind oder an einer Krankheit, die Ihre Fähigkeit zur Durchführung Ihrer Arbeit beeinträchtigen könnten, leiden sicherSie müssen den Site Manager
Alle Angaben werden streng vertraulich behandelt werden.

In Übereinstimmung mit unserer Substanzmissbrauch Policy, zufällige Drogen und Alkohol-Tests können jederzeit durchgeführt werden. Wer verweigert den Testgefunden oder unter dem Einfluss von Alkohol und / oder Drogen wird von der Baustelle entfernt werden kann.



Назначен первой помощи на месте можно легко определить по первым символом помощи на их Hardhat. Все несчастные случаи и близких к ним должно быть сообщено: Управление сайтом сразу

Если вы принимаете какие-либо предписанных лекарств или страдают отзаболевания, которые могут повлиять на вашу способность выполнять работубезопасно Вы ДОЛЖНЫ сообщить: Управление сайтом
Вся информация будет рассматриваться в строжайшем секрете.

В соответствии с нашими злоупотребление психоактивными веществамиполитики, случайные наркотики и алкоголь, тесты могут быть проведены в любое время. Любой отказ теста или оказались под воздействием алкоголя и / или наркотиков, будут удалены с сайта.




## First aid & Accident reporting

The appointed first aiders on site are Ben Lees and Steve Schofield and can be easily identified by the first aid symbol on their hardhat. The first aid point on site is located in the site office.

All accidents & near misses must be reported to the Site Manager immediately

## Prescribed medicines & pre-existing medical conditions



For the safety of yourself and those around you, if you are taking any prescribed medication or are suffering from a medical condition which could affect your ability to carry out your job safely you MUST inform the Site Manager

All information provided will be treated in the strictest confidence.



## Illegal drugs & alcohol

In accordance with Glencar's Substance Misuse Policy, random drugs and alcohol tests may be carried out at any time. Anybody refusing the test or found to be under the influence of alcohol and/or drugs will be removed from site.

**The use of drugs and/or alcohol on site is extremely dangerous, not only to yourself but those around you. Anybody suspected or proven to be under the influence of drugs and/or alcohol will be removed from site immediately**



Azbest jest wiadomo, że jest obecny w następujących obszarach:
Kopię rejestru azbest znajduje się w ... ... ... ... Wszyscy wykonawcy są dozapoznawania się z nim przed rozpoczęciem prac.

W przypadku wykrycia niczego, co uważasz za azbest, należy natychmiast przerwać pracę i zgłosić to na Site Manager.

Następujące zagrożenie zdrowotne zostały określone na tej stronie ... ... ... ... ... ... ... ... .... Informacje o nich można uzyskać od kierownika budowy. Firmy RAMS musi miećśrodki kontroli w celu ochrony przed tymi zagrożeniami. Upewnij się, że te środki kontroli są zawsze przestrzegane



Mae asbestos yn gwybod i fod yn bresennol yn y meysydd canlynol:
Gellir gweld copi o'r gofrestr asbestos ar gael yn ... ... ... ... Pob contractwr yn cael eugwneud eu hunain yn gyfarwydd ag ef cyn i'r gwaith ddechrau.

Os byddwch yn darganfod unrhyw beth yr ydych yn credu i fod yn asbestos, rhaid i chiroi'r gorau i weithio UNWAITH a rhoi gwybod i'r Rheolwr Safle.

Mae'r peryglon iechyd galwedigaethol a ganlyn wedi eu nodi ar y safle hwn ... ... ... ..... ... ... ... .... Gellir cael gwybodaeth am y rhain ar gael oddi wrth y rheolwr y safle.Rhaid hyrddod eich cwmni wedi mesurau rheoli ar waith i amddiffyn rhag peryglon hyn. Gwnewch yn siŵr bod y mesurau rheoli yn cael eu dilyn BOB AMSER



Asbest ist wissen, dass sie in den folgenden Bereichen präsentieren:
Eine Kopie des Asbest-Register finden Sie in ... ... ... ... Alle Vertragspartner sind, umsich mit ihm vertraut vor Beginn der Arbeiten.

Sollten Sie alles, was Sie glauben, dass Asbest zu entdecken, müssen Sie sofort mit der Arbeit aufhören und ein Bericht an den Site Manager.

Die folgenden arbeitsbedingte Gesundheitsgefahren haben auf dieser Websiteidentifiziert worden ... ... ... ... ... ... ... ... .... Informationen über diese kann von der Website Manager bezogen werden. Ihre Firma RAMS müssen Kontrollmaßnahmen, um Sie vor diesen Gefahren zu schützen. Bitte stellen Sie sicher, dass dieseMaßnahmen zu allen Zeiten folgen



Асбест знать, чтобы быть в следующих областях:
Копия асбеста регистрации можно найти в ... ... ... ... Все подрядчики, чтобы сделать себя знакомы с ним до начала работы.

Если вы обнаружите все, что вы считаете асбеста, вы должны немедленно прекратить работу и сообщить об этом: Управление сайтом.

Следующие профессиональными рисками для здоровья были выявлены на этом сайте ... ... ... ... ... ... ... ... .... Информацию о них можно получить на сайтеменеджер. РАМН Ваша компания должна иметь контрольные меры, чтобы защитить вас от этих опасностей. Пожалуйста, убедитесь, что эти меры контроля следует ВСЕГДА

## Asbestos

No Asbestos has been identified on site through the Soil investigations.

Should you discover anything which you believe to be asbestos, you must stop work **IMMEDIATELY** and report it to the Site Manager.




## Occupational Health

The following occupational health hazards have been identified on this site, as seen below. Information on these can be obtained from the site manager. Your company's RAMS must have control measures in place to protect you from these hazards. Please ensure that these control measures are followed AT ALL TIMES

- [x] Silicosis
- [ ] Psittacosis
- [ ] Hepatitis
- [x] Leptospirosis
- [ ] Anthrax
- [x] Skin cancer
- [ ] Tetanus
- [ ] Other (specify)




Many more people die each year from work related health issues than from accidents. Remember to protect yourself.



Sprzęt roboczy musi być regularnie kontrolowane i utrzymywane w bezpiecznym stanie. Wszystkie platformy robocze (w tym drabiny) muszą być wyposażone wznaczniki kontroli i zarejestrowania kierownika budowy.
Wszystkie rośliny i urządzenia podnoszące muszą być wyposażone w znak Roślin irejestrowane z kierownikiem budowy.

Wszystkie 110v elektryczne narzędzia muszą być PAT testowane co 3 miesiące.
Wszystkie urządzenia 240V (np. ładowarki) muct być PAT testowane na 12 miesięcy



Rhaid i'r holl offer gwaith eu harchwilio'n rheolaidd a'u cynnal a'u cadw mewn cyflwr diogel. Mae'n rhaid i'r holl lwyfannau gweithio (gan gynnwys ysgolion bach) yn cael eugosod tagiau arolygu ac yn cofnodi gyda'r rheolwr y safle.
Rhaid i bob cyfarpar ac offer codi yn gosod tag Planhigion ac yn cofnodi gyda'rrheolwr y safle.

Rhaid i'r holl offer trydanol yn 110v PAT profi bob 3 mis.

Pob (er enghraifft gwefru batri) offer 240v muct cael ei PAT profi bob 12 mis



Alle Arbeitsmittel müssen regelmäßig inspiziert und gewartet werden, in einem sicheren Zustand. Alle Arbeitsbühnen (einschließlich Stufenleitern) muss mit der Inspektion tags ausgestattet werden und protokolliert mit dem Bauleiter.
Alle Pflanzen-und Hebevorrichtungen mit einer Pflanze tag eingebaut werden undprotokolliert mit dem Bauleiter.

Alle 110v elektrischer Werkzeuge müssen PAT getestet alle 3 Monate.
Alle 240 Geräte (z. B. Akku-Ladegeräte) muct werden PAT getestet nach 12 Monaten



Все рабочее оборудование должно регулярно проверяться и поддерживаться в безопасном состоянии. Все рабочие платформы (в том числе лестницы приставные) должны быть оснащены инспекции теги и регистрируется садминистратором сайта.
Все растительные и грузоподъемное оборудование должны быть оснащенызавод теги и регистрируется с администратором сайта.

Все 110v электроинструмент должен быть PAT испытания каждые 3 месяца.
Все оборудование 240 (например, зарядные устройства) muct быть PATиспытания каждые 12 месяцев

# Weekly equipment inspections

In order to ensure that all work equipment on site is in a safe condition, contractor work equipment is to be inspected to at least the following standards/timescales



## Working platforms (inc steps, ladders, hopups, podiums, scaffold towers)

- Logged on working platform weekly inspection register & fitted with an inspection tag
- Tag and register signed off before first use and then weekly thereafter following inspection
- Visual inspection by user before every use



## Plant & lifting equipment (inc MEWPs, plant, heavy machinery etc)

- Logged on plant & lifting equipment weekly inspection register & fitted with a Plant ID Tag (obtain from Site Manager)
- 6/12 month thorough examination certificates to be submitted to Site Manager and copy held with register
- Equipment to be inspected before first use and then weekly thereafter
- Visual inspection before every use

The Site Manager must be made aware of the presence of any of the above equipment at the end of this induction, and of any further equipment arriving during the course of the project, so that it can be logged & tagged prior to use

# PAT testing of work equipment



## 110v work equipment

- PAT tested every 3 months and display a PAT test sticker
- Must be in good working order and free from damage
- Visual inspection by user before every use.

## 240v battery chargers, laptops etc

- Must be PAT tested every 12 months and display a PAT test sticker
- Must be in good working order and free from damage
- Visual inspection by user before every use.

**Any contractor found using equipment which has not been logged and/or tagged will be asked to leave site.**



Pracodawca musi zapewnić, że masz dostęp do ochrony słuchu, jeśli poziom hałasuprzekracza 80 dB. Jeśli poziom hałasu przekracza 85 dB należy go używać. Jeśli niemasz dostępu do ochrony słuchu, należy przerwać pracę i kontakt z Site Manager.

Regularny kontakt z wibrujących narzędzi i maszyn może prowadzić do powstaniaproblemów zdrowotnych okresie. Pracodawca jest zobowiązany do stworzeniaśrodków kontroli miejsce na zmniejszenie stopnia narażenia na wibracje



Rhaid i'ch cyflogwr sicrhau eich bod yn cael mynediad i amddiffyn y clyw os bydd lefelau sŵn yn fwy na 80dB. Os bydd lefelau sŵn yn fwy na 85dB rhaid i chi ei ddefnyddio. Os nad oes gennych fynediad i ddiogelu clyw, os gwelwch yn dda rhoi'r gorau i weithio a chysylltu â'r Rheolwr Safle.

Gall amlygiad rheolaidd i dirgrynol offer a pheiriannau arwain at broblemau iechyd tymor hir. Eich cyflogwr ei angen i sefydlu mesurau rheoli ar waith er mwyn lleihaueich swm o fod yn agored i ddirgryniad



Ihr Arbeitgeber muss sicherstellen, dass Sie Zugriff auf Gehörschutz, wennGeräuschpegel 80 dB nicht überschreiten. Wenn Geräuschpegel 85 dBüberschreiten, müssen Sie sie verwenden. Wenn Sie keinen Zugang zumGehörschutz, bitte hör auf Arbeit und an den Site Manager.

Der tägliche Umgang mit vibrierenden Werkzeugen und Maschinen können zulangfristigen gesundheitlichen Problemen führen. Ihr Arbeitgeber ist dazu verpflichtet sein, Maßnahmen setzen, um Ihre Höhe der Exposition gegenüber Vibrationen zu reduzieren



Ваш работодатель должен гарантировать, что вы имеете доступ к средства защиты органов слуха, если уровень шума превышает 80 дБ. Если уровень шума превышает 85 дБ вы должны его использовать. Если у вас нет доступадля защиты органов слуха, пожалуйста, прекратите работу и обратитесь: Управление сайтом.

Регулярное воздействие вибрационных инструментов и оборудования может привести к длительным проблемам со здоровьем срок. Ваш работодатель обязан поставить в место меры контроля, чтобы снизить количествовоздействия вибрации

## Noise

In accordance with the Control of Noise at Work Regulations 2005, your employer must ensure that you have access to hearing protection if noise levels exceed 80dB. If noise levels exceed 85dB it is mandatory that you use hearing protection. If you suspect that you may be being exposed to high levels of noise but do not have immediate access to suitable PPE, please stop work and contact the Site Manager.



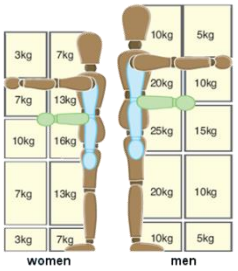


## Vibration

Regular exposure to vibrating tools and machinery can lead to long term health problems such Hand Arm Vibration Syndrome, Whole Body Vibration Syndrome and Carpal Tunnel Syndrome to name but a few. In accordance with the Control of Vibration at Work Regulations 2005, your employer is required to put in place control measures to reduce your amount of exposure to vibration

## Manual Handling

All manual handling tasks carried out on site must be covered by a Risk Assessment. This must be submitted to, and approved by, the Site Manager before any manual handling activities are allowed to commence. In accordance with the Manual Handling Operations Regulations 1992, your employer is required to put in place control measures to control the amount and type of manual handling you carry out.




The controls detailed within your RAMS are there to protect you. Please ensure that these control measures are adhered to at all times



Ta strona jest zarejestrowana w Considerate Program konstruktorów. Upewnij się, żekluczowe kryteria programu są przestrzegane przez cały czas:

Bądź rozważny w obszarze pracujemy, należy pamiętać o środowisku, być czyste,być dobrym sąsiadem, z szacunkiem dla publiczności i siebie nawzajem, być bezpieczne, odpowiedzialne i odpowiedzialność.



Mae'r safle wedi ei gofrestru â'r Cynllun Adeiladwyr Ystyriol. Gwnewch yn siŵr bod y meini prawf craidd y cynllun yn cael eu dilyn bob amser:

Byddwch yn ystyriol â'r ardal rydym yn gweithio mewn, fod yn ymwybodol o'r amgylchedd, fod yn lân, fod yn gymydog da, yn barchus i'r cyhoedd a eachother, fod yn ddiogel, yn gyfrifol ac yn atebol.



Diese Website wird mit dem Considerate Konstrukteurs Scheme registriert. Bitte stellen Sie sicher, dass die Kernkriterien des Systems zu jeder Zeit eingehalten werden:

Seien Sie rücksichtsvoll, um den Bereich wir tätig sind, bewusst sein, der Umwelt,sauber, ein guter Nachbar sein, respektvoll an die Öffentlichkeit und einander, sicher zu sein, verantwortlich und rechenschaftspflichtig sein.



Этот сайт зарегистрирован в продуманная схема конструкторов. Пожалуйста, убедитесь, что основные критерии схеме следуют во все времена:

Будьте внимательны к области мы работаем в, быть в курсе окружающей среды, быть чистыми, быть хорошим соседом, с уважением относиться кобщественной и друг друга, быть в безопасности, нести ответственность и бытьподотчетными.

# site safety, health & environmental induction

Glencar CONSTRUCTION

## Considerate Constructors Scheme
## Code of Considerate Practice

Considerate constructors seek to improve the image of the construction industry by striving to promote and achieve best practice under the Code.

### Enhancing the **Appearance**

**Constructors should ensure sites appear professional and well managed.**

- Ensuring that the external appearance of sites enhances the image of the industry.
- Being organised, clean and tidy.
- Enhancing the appearance of facilities, stored materials, vehicles and plant.
- Raising the image of the workforce by their appearance.

### Securing everyone's **Safety**

**Constructors should attain the highest levels of safety performance.**

- Having systems that care for the safety of the public, visitors and the workforce.
- Minimising security risks to neighbours.
- Having initiatives for continuous safety improvement.
- Embedding attitudes and behaviours that enhance safety performance.

### Respecting the **Community**

**Constructors should give utmost consideration to their impact on neighbours and the public.**

- Informing, respecting and showing courtesy to those affected by the work.
- Minimising the impact of deliveries, parking and work on the public highway.
- Contributing to and supporting the local community and economy.
- Working to create a positive and enduring impression, and promoting the Code.

### Caring for the **Workforce**

**Constructors should provide a supportive and caring working environment.**

- Providing a workplace where everyone is respected, treated fairly, encouraged and supported.
- Identifying personal development needs and promoting training.
- Caring for the health and wellbeing of the workforce.
- Providing and maintaining high standards of welfare.

### Protecting the **Environment**

**Constructors should protect and enhance the environment.**

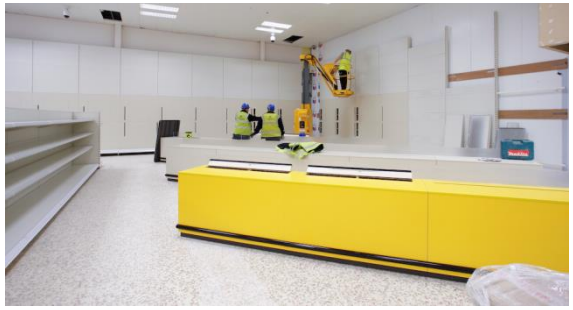
- Identifying, managing and promoting environmental issues.
- Seeking sustainable solutions, and minimising waste, the carbon footprint and resources.
- Minimising the impact of vibration, and air, light and noise pollution.
- Protecting the ecology, the landscape, wildlife, vegetation and water courses.

The Code of Considerate Practice outlines the Scheme's expectations of all registered sites and companies, describing those areas that are considered fundamental by the Scheme in helping improve the image of construction.

For more information, call 0800 783 1423 or visit www.ccscheme.org.uk

Improving the image of construction















Wszystkie odpady na miejscu muszą być usunięte we właściwym pomija /pojemników. Wszystkie pomija / Pojemniki są wyraźnie zaznaczone jakiego typuodpady mogą zostać umieszczone w nich. Upewnij się, że odpady są unieszkodliwiane w odpowiednich przejść tylko.

Porządek strona jest nie tylko znacznie przyjemniejszy miejsce do pracy, jest równieżznacznie bezpieczniejsze miejsce, nie tylko dla ludzi tam pracujących, ale także dlaszerszego środowiska. Pomaga także przedstawić o wiele bardziej profesjonalny wizerunek dla wszystkich nas. Upewnij się, że miejsca pracy są czyste i schludne.



Rhaid i bob gwastraff ar y safle gael ei waredu yn y sgipiau cywir / biniau. Mae'r hollsgipiau / biniau yn cael eu marcio'n glir gyda hyn y gall y math o wastraff gael ei rhoi iddynt. Sicrhewch fod gwastraff yn cael ei waredu yn y sgip cywir yn unig.

Mae safle daclus nid yn unig yn lle llawer brafiach i weithio, mae hefyd yn lle llawer mwy diogel, nid yn unig ar gyfer y bobl sy'n gweithio yno, ond hefyd ar gyfer yr amgylchedd ehangach. Mae hefyd yn helpu bortreadu delwedd llawer mwy proffesiynol i bawb ohonom. Gwnewch yn siŵr bod eich ardal waith yn cael eu cadw'n lân ac yn daclus bob amser.



Alle Abfälle vor Ort müssen in der richtigen überspringt / Bins entsorgt werden. Alleüberspringt / Bins sind eindeutig mit, welche Art von Abfall kann in ihnen platziert werden markiert. Bitte stellen Sie sicher, dass die Abfälle in der richtigen entsorgtüberspringen nur.

Eine saubere Seite ist nicht nur eine viel schönere Ort zum Arbeiten, sondern auchviel sicherer, nicht nur für die dort arbeitenden Menschen, sondern auch für dieUmwelt im weiteren Sinne. Es hilft auch, darzustellen, ein viel professionelleres Image für uns alle.
Bitte stellen Sie sicher, dass Sie Ihren Arbeitsplatz sauber gehalten werden und ordentlich zu allen Zeiten.



Все отходы на месте должны быть утилизированы в правильном пропускает /бункеров. Все пропускает / бункеров четко обозначены с тем, что тип отходовмогут быть помещены в них. Пожалуйста, убедитесь, что отходы удаляются в правильном пропустить только.

Аккуратный сайт не только гораздо приятнее, место для работы, но и гораздо более безопасным местом не только для людей, работающих там, но и дляболее широкой среде. Это также помогает изображать гораздо болеепрофессиональный имидж для всех нас. Пожалуйста, убедитесь, что ваше рабочее место содержатся в чистоте и порядке в любое время.

## Waste

Waste is defined as “Any substance or object, which the holder discards, intends to discard or is required to discard”.

## Disposal of waste

All waste on site must be disposed of in the correct skips/bins which are located at the waste disposal area. All skips/bins are clearly marked with what type of waste can be placed in them. Please ensure that waste is disposed of in the correct skip only.






## Housekeeping

A tidy site is not only a much nicer place to work, it is also a much safer place, not only for the people working there but also for the wider environment. It also helps portray a much more professional image for all us.

Please ensure that your work area are kept clean and tidy at all times.

Any contractor found disposing of waste in the wrong skip will be disciplined accordingly and may in some cases be liable for the cost of segregating the waste off site.



Nadmierne i / lub nieprawidłowe korzystanie z oświetlenia podczas prac budowlanych mogą zakłócić mieszkańcy, a nawet mieć wpływ na szkodę lokalnej przyrody. Na tej stronie, następujące ograniczenia oświetlenia są na miejscu i muszą być przestrzegane przez cały czas ... ... ... ...

Obowiązują następujące ograniczenia hałasu zostały wprowadzone na tej stronieprzez władze lokalne ... ... .... .... Te muszą być przestrzegane PRZEZ CAŁY CZAS

Pył z cięcia takich materiałów jak beton, drewno i MDF jest szkodliwe nie tylko dla zdrowia osób wykonujących pracę, ale także dla innych w zakresie i dla środowiska.Podczas przeprowadzania outork który tworzy kurz, odpylania (torby, odkurzacze) lubtłumienia pyłu (wody) muszą być wykorzystywane w uzupełnieniu do ŚOI chroniąceśrodowisko naturalne.



Gall defnydd gormodol a / neu amhriodol o oleuadau yn ystod gwaith adeiladugynhyrfu trigolion lleol a hyd yn oed yn cael effaith andwyol ar fywyd gwyllt lleol. Ar y wefan hon, mae'r cyfyngiadau goleuadau canlynol ar waith a rhaid eu dilyn bob amser... ... ... ...

Mae'r cyfyngiadau sŵn canlynol wedi cael eu rhoi ar waith ar y safle hwn gan yrawdurdod lleol yn ... ... ... ... ... . .... Mae'n rhaid i'r rhain fod yn cadw at BOB AMSER

Llwch o dorri o ddeunyddiau megis pren concrid a MDF yn niweidiol nid yn unig iiechyd y rhai sy'n gwneud y gwaith, ond hefyd i bobl eraill yn yr ardal a'r amgylcheddo'i amgylch. Rhaid Wrth gynnal outork sy'n creu llwch, dal llwch (bagiau, sugnwyr) neuatal llwch (dŵr) yn cael ei ddefnyddio yn ychwanegol at PPE i warchod yr amgylchedd ehangach.



Übermäßige und / oder unsachgemäße Verwendung der Beleuchtung während der Bauarbeiten kann stören die Anwohner und haben sogar einen Nachteil Effekt auf die lokale Tierwelt. Auf dieser Seite werden die folgenden Beleuchtung Einschränkungenin Kraft und muss zu jeder Zeit eingehalten werden .....

Die folgenden Lärm Beschränkungen eingeführt worden auf dieser Website stellenvon der örtlichen Behörde ..... Diese müssen zu jeder Zeiteingehalten werden

Staub aus dem Schneiden von Werkstoffen wie Beton, Holz und MDF ist nicht nur die Gesundheit der Durchführung der Arbeiten, sondern auch andere in der Gegend unddie Umgebung zu beschädigen. Bei der Durchführung outork denen Staub, Staubeinzufangen (Beutel, saugt) oder Staubbindung (Wasser) erstellt,

muss zusätzlich zum PSA der weiteren Umgebung zu schützen genutzt werden.



Чрезмерное и / или ненадлежащего использования освещения при проведении строительных работ может нарушить местные жители и даже ущерб влияние наместных диких животных. На этом сайте, следующие ограничения освещениянаходятся на месте и должны строго соблюдаться во все времена ... ... ... ...

Следующие ограничения шума были введены в действие на этом сайте вместные органы власти ... ... ..... .... Они должны быть привязаны кВСЕГДА

Пыль от резки таких материалов, как бетон, дерево и МДФ наносит ущерб не только здоровью тех, кто проводит работы, но и для других в области иокружающей среды. При проведении outork которая создает пыль, пыльзахвата (сумки, пылесосы) или подавления пыли (воды) должны быть

использованы в дополнение к СИЗ для защиты более широкого окружения.

## Light pollution



Excessive and/or inappropriate use of lighting during construction works can upset local residents and even have a detriment effect on local wildlife. On this site, the following lighting restrictions are in place and must be adhered to at all times……



## Noise pollution

Noise is not just a health & safety issue for workers, but also an environmental one. Just like with lighting, excessive noise can upset local residents and have a detriment effect on local wildlife.

The following noise restrictions have been put in place on this site by the local authority working 0730 – 1730. These must be adhered to AT ALL TIMES.

## Dust

Dust from the cutting of such materials as concrete, wood and MDF is damaging not only to the health of those carrying out the work, but also to others in the area and the surrounding environment. When carrying out work which creates dust, dust capture (bags, vacuums) or dust suppression (water) must be utilised in addition to PPE to protect the wider environment.



Glencar recognise that construction work, if not properly planned, can have a negative impact on the local population, wildlife and environment as a whole.

Our site managers will therefore ensure that anybody found deliberately ignoring the controls put in place to deal with these environmental issues, will be asked to leave site.



Prawo chroni niektórych gatunków roślin i zwierząt. W niektórych przypadkach może to być wykroczenie prawne, które mogą zakłócać lub nawet dotknąć tych gatunków.Następujące gatunki są znane / podejrzanych do obecności na tej stronie ..... ... ... ... .. Jeśli natkniesz się na żadnej z tych gatunków, należy przerwać pracę i zgłosić się do kierownika budowy NATYCHMIAST.
Niektóre ekosystemy lub archeologicznej featuresrequire szczególną uwagę i może mieć ochrony prawnej. Następujące obszary na stronie są chronione ..... ..
i nie może być zakłócony lub ingerować w jakikolwiek sposób.

Następujące obszary, na miejscu są zanieczyszczone i nie mogą być wprowadzaneza wyjątkiem pisemnej zgody od kierownika budowy ... ..... ... Obszary temogą być łatwo zidentyfikowane przez obecność objawów.



Mae'r gyfraith yn diogelu rhai rhywogaethau o blanhigion ac anifeiliaid. Mewn rhai achosion gall fod yn drosedd cyfreithiol i aflonyddu ar neu hyd yn oed yn cyffwrdd y rhywogaethau hyn. Mae'r rhywogaethau canlynol yn hysbys / amheuir i fod yn bresennol ar y safle hwn ... ... ... ... ... ... ... ... .. Os byddwch yn dod ar draws unrhyw un o'r rhywogaethau hyn, os gwelwch yn dda rhoi'r gorau i weithio ac yn adrodd i'r rheolwr safle SYTH.

Gall ecosystemau penodol neu nodweddion archeolegol angen ystyriaeth arbennig a gall fod diogelwch cyfreithiol. Mae'r meysydd canlynol ar y safle yn cael eu diogelu ..... ... ... ... .. Rhaid peidio a bod yn aflonyddu nac ymyrryd ag ef mewn unrhyw ffordd.

Mae'r meysydd canlynol ar y safle yn cael eu heintio a mae'n rhaid i ni yn cael ei gofnodi ac eithrio gyda chaniatâd ysgrifenedig a fynegwyd gan y rheolwr safle ... ... ... ... ... ... ... Gall yr ardaloedd eu hadnabod yn hawdd gan bresenoldeb arwyddion fel yr enghraifft cyfagos:



Das Gesetz schützt bestimmte Arten von Pflanzen und Tieren. In einigen Fällen kann es eine Rechtsverletzung zu stören oder sogar berühren diese Arten werden. Die folgenden Arten sind bekannt / vermutet anwesend zu sein auf dieser Website ... ... ..... ... ... ... ... .. Wenn Sie über jede dieser Arten kommen, bitte hör auf Arbeit und erstattet dem Bauleiter sofort.
Bestimmte Ökosysteme oder archäologischem featuresrequire besonderer Berücksichtigung und können rechtlich geschützt sein. Die folgenden Bereiche auf der Baustelle geschützt sind ... ... ... ... ... ..
und darf nicht gestört oder behindert auf irgendeine Weise.

Die folgenden Bereichen vor Ort sind verunreinigt und müssen nicht eingegeben werden, außer mit ausdrücklicher schriftlicher Genehmigung der Bauleiter ... ... ... ... Diese Bereiche können durch das Vorhandensein von Anzeichen erkannt werden.



Закон защищает некоторые виды растений и животных. В некоторых случаях это может быть правонарушением нарушить или даже прикасаться к этимвидам.Следующие виды известных и / или подозреваются в настоящее времяна этом сайте ... ... ... ... ... ... ... ... .. Если вы столкнетесь с какой-либо из этих видов, пожалуйста, прекратите работу и сообщить администратору сайтаНЕМЕДЛЕННО.

Некоторые экосистемы или археологических функций может потребоватьсяособое внимание и, возможно, правовой защиты.Следующих областях на сайте, защищены ... ... ... ... ... .. и не должны быть нарушены или ущемляют их в любом случае.

Следующих областях на сайте, являются загрязненными, и не должны быть введены, кроме как с письменного разрешения администрации сайтаменеджера ... ... ... ... ... ... ... Эти области могут быть легко идентифицированыналичие вывески, такие как соседние например:

## Ecology

The law protects certain species of plant and animal, such as: Badgers, Great Crested Newts, Bats, Otters, Fen Orchid, Japanese Knotweed, and Giant Hogweed, etc. In some cases it can be an legal offence to disturb or even touch these species. Foxes and are suspected to be present on this site fox.  Although  the ecologist has deemed this site safe ,If you come across any of these species, please stop work and report to the site manager IMMEDIATELY.





## Conservation, archaeology & heritage

Certain activities may impact on sensitive ecosystems or archaeological features, which require particular consideration and may have regulatory protection, such as: Sites of Specific Scientific Interest (SSSI's), National Parks, Tree Protection Orders (TPO's), National Trust Sites, Hedgerows, etc.

## Contaminated Land

The following areas on site are contaminated and for the protection of yourself and/or the environmental must not be entered except with expressed written permission from the site manager.  Non at present. These areas can be easily identified by the presence of signage such as the adjacent example:




Any contractor found to be deliberately or recklessly disturbing or interfering with any of the above will be removed from site immediately and, where necessary, reported to the relevant authorities.



Prosimy o rozmowę z kierownikiem budowy w dowolnym momencie w celu omówienia lub zgłaszać zdrowia, bezpieczeństwa lub środowiska problemów, jakie mogą napotkać.
Wszystkie rozmowy będą traktowane jako ściśle poufne. Należy jednak woliszpozostać anonimowy, Passport SH & E, które właśnie zostały wydane zawiera niektóre wyrwy stron, na których można wyróżnić żadnych obaw może być i pozostawić w witrynie Office dla Site Manager.

Regularne rozmowy narzędzi i SH & E spotkania odbędzie się również na miejscu, aby ludzie mogli podnieść i omówić wszelkie problemy mogą mieć.



Mae croeso i chi siarad â'r Rheolwr Safle ar unrhyw adeg i drafod neu roi gwybod am unrhyw faterion Iechyd, Diogelwch neu Amgylcheddol efallai y byddwch yn dod ar eu traws.
Bydd yr holl drafodaethau thrin yn gwbl gyfrinachol. Fodd bynnag, os byddai'n well gennych aros yn ddienw, y Pasbort SH Damweiniau ac Achosion Brys yr ydych newydd eu cyhoeddi yn cynnwys rhai tudalennau rhwygo-allan ar y gallwch dynnu sylw at unrhyw bryderon sydd gennych a gadael yn y swyddfa safle ar gyfer y Rheolwr Safle.

Bydd sgyrsiau blwch offer rheolaidd ac SH & E cyfarfodydd hefyd yn cael ei gynnal ar y safle i alluogi pobl i godi a thrafod unrhyw faterion sydd ganddynt.



Bitte zögern Sie nicht auf die Site Manager an jedem beliebigen Punkt zu diskutieren, zu sprechen oder melden Sie Gesundheit, Sicherheit oderUmweltaspekte, die auftreten können.
Alle Gespräche werden mit streng vertraulich behandelt. Allerdings sollten Sie lieber anonym bleiben möchten, enthält die SH & E Passport Sie nur ausgestellt wurdeneinige Reiß-Seiten, auf denen Sie irgendwelche Bedenken haben und im BaubüroUrlaubs kann für die Site Manager hervorheben können.

Regelmäßige Toolbox Talks und SH & E Treffen werden auch vor Ort stattfinden, damit die Menschen zu heben und zu diskutieren, Probleme sie haben.



Пожалуйста, не стесняйтесь говорить: Управление сайтом в любой моментобсудить или сообщать о любых здоровью, безопасности или экологические вопросы вы можете столкнуться.
Все обсуждения будут рассмотрены в строжайшем секрете. Однако, если вы предпочитаете остаться неизвестным, SH & E Паспорт вы только что были выданы содержит некоторые слезоточивый из страниц, на которых вы можетевыделить какие-либо проблемы, которые Вы, возможно, и оставьте на сайтеофиса: Управление сайтом.

Регулярные переговоры панели инструментов и SH & E встречи будут также проводиться на месте, чтобы дать людям возможность поднять и обсудитьлюбые вопросы, они могут иметь.

# Communication & Consultation

## Open Door Policy

In order to achieve and maintain the highest standards of Health, Safety & Environmental consideration on our sites, Glencar operate an open door policy with regards to communication with ALL operatives on site.

Please feel free to speak to the Site Manager at any point to discuss or report any Health, Safety or Environmental issues you may encounter.

All discussions will dealt with in the **Strictest Confidence**. However, should you prefer to remain anonymous, the SH&E Passport you have just been issued contains some tear-out pages on which you can highlight any concerns you may have and leave in the site office for the Site Manager.



## Toolbox talks/daily meetings/weekly meetings

Regular toolbox talks and SH&E meetings will also be held on site to enable people to raise and discuss any issues they may have.

Although we aim to achieve the highest standards of Health, Safety & Welfare on our sites, we cannot be everywhere.
Please **help us to help you** by reporting any issues you may encounter to the Site Manager as soon as you can.



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## Supervisors

As supervisors you have a key role in ensuring that this project is undertaken safely. Whilst working on this project, ALL contractor supervisors are expected to;

- Set a positive example for their own operatives as well as others on site.
- Ensure that they, and their operatives, are working in accordance with your company's RAMS, the Site HS&E Rules, the Construction Phase Plan and the Client's Rules.
- Ensure that all of their company's work equipment is correctly maintained/inspected and that it is in safe working order whilst on site.
- Attend site meetings and discussions as and when required.
- Stop and challenge *any* person on site found to be in breach of the Site HS&E Rules or the Client's Rules.
- Work with the Site Management Team and help ensure that this project is carried out safely and professionally.



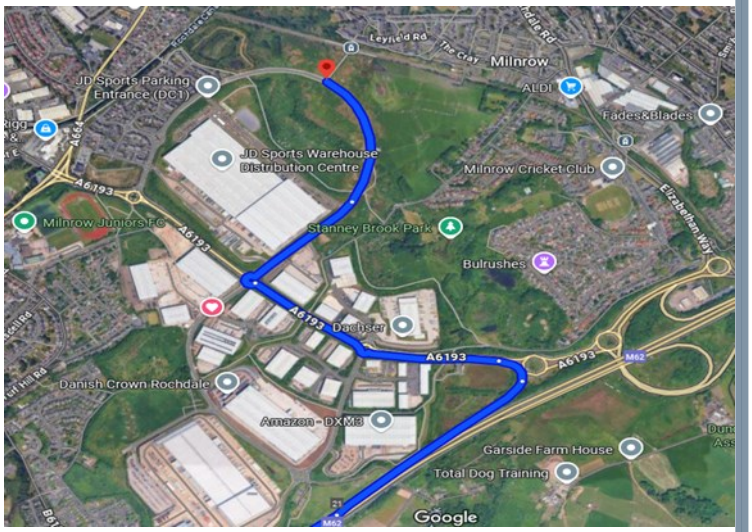
# Delivery Drivers Induction

## Site Information

Plot R2 - (SMMC)
Off Michael Faraday Avenue
Kingsway Business Park
Rochdale
OL16 4FX

Site Opening Hours
Monday - Friday 08:00 to 18:00
Saturday 08:00 13:00

## Access and Egress Routes




## DO

DO comply with road traffic legislation

DO use vehicle warning systems

DO Use only approved vehicle routes

DO follow instructions give by authorised persons (security, banksmen, traffic marshals, site management etc)

DO operate your flashing amber beacon

DO beware of height restrictions

DO beware of site operations

DO give right of way to pedestrians at all times

DO ensure appropriate vehicle safety equipment is fitted and operational

## DON'T

DON'T create excessive noise unnecessarily

DON'T use mobile phones

DON'T exceed the site speed limit

DON'T not reverse without a traffic marshal/banksmen in attendance

DON'T smoke, unless in a designated areas

DON'T drive or enter the site under the influence of drugs or alcohol

DON'T remove items from site without signed authority

DON'T block emergency escape routes

## Nearest Accident & Emergency

Rochdale Infirmary
Whitehall St
Rochdale
OL12 0NB
01706377777

## Emergency Contacts

Site Security: TBC
Site Manager James Baldwin
First Aid James Baldwin
Fire Warden George Taylor

## First Aid and Muster Points




First Aid is located at Site Office.

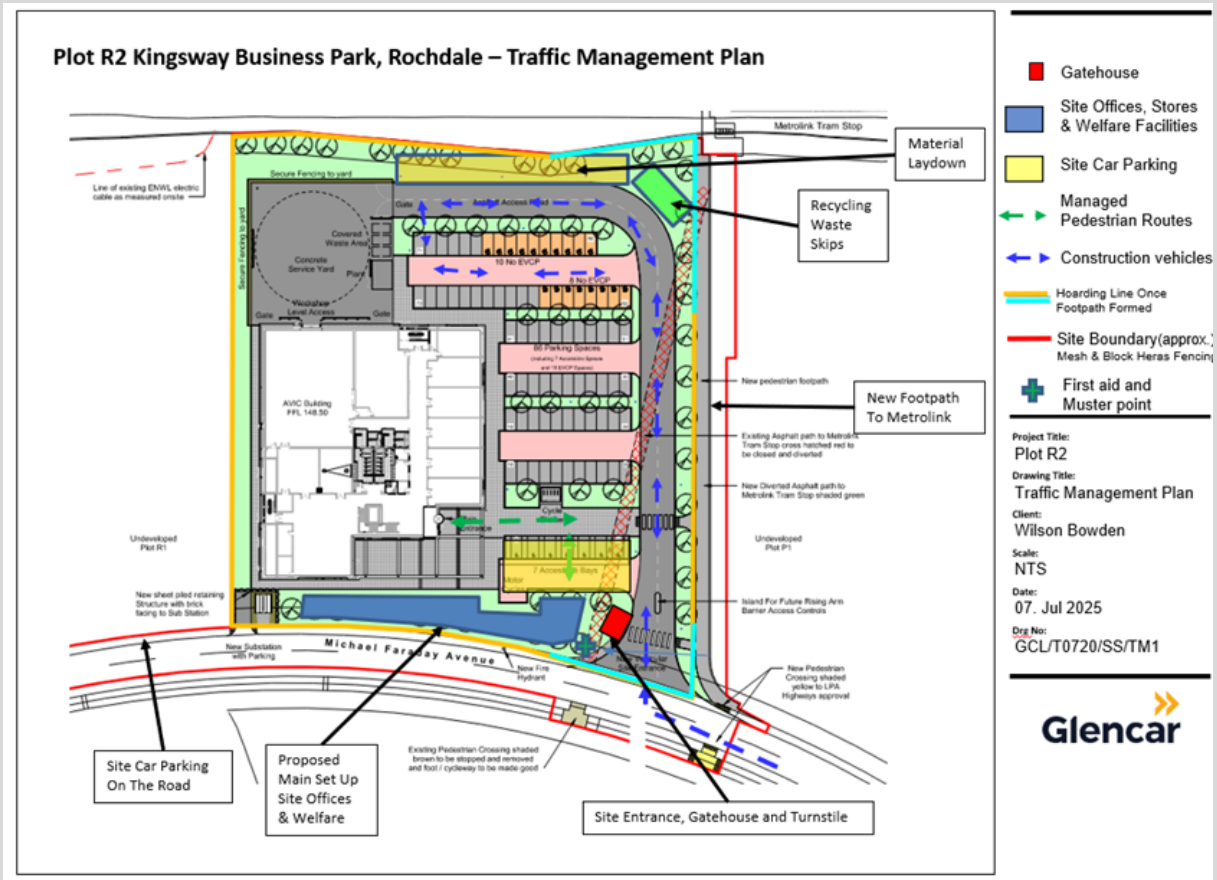


Emergency Muster Point is located at Site Compound.

## Welfare

WC's, Canteen, Drinking Water and Drying rooms are available at Site Compound,

## Site Map




## PPE

If you need to leave your cab you must wear full PPE at all times
Hard Hat
Orange HI-Vis
Safety Boots
Gloves



## Agreement

I agree to the site rules set out within this induction and will retain a copy

Drivers Name:
Organisation:
Date:
Signature:

Issued By :
Induction number:

# 2.0
# Proposed Team and CVs

The Glencar team pledge to create and develop strong relationships with the client team, designers and supply chain to promote trust, a collaborative team approach, open transparency and mutual respect.



**Tom Kearsley**
Operations Director

## Our Proposed Project Team

The proposed Plot R2, Kingsway project team will be led by our Project Manager, Steve Schofield, who has extensive experience in delivering high-quality builds and will be responsible for the project's success.

The Construction Team has been carefully selected based on their location, relevant experience, and recent collaborations, as demonstrated in their CVs.

The Construction Team will be supported centrally by the Commercial, Planning, and Health and Safety departments, based at the regional office in Manchester.

These teams will provide assistance as needed to ensure the successful, safe, and on-time delivery of a high-quality facility within budget.



**Peter Goodman**
Managing Director (Midlands and North)



**Chris Looney**
Construction Director

CLIENT TEAM

**Wilson Bowden Developments Ltd**
Developer / Client

**Rochdale Borough Council**
Client

**KAM Project Consultants Limited**
EA/QS

**DLA Architecture**
Architect/Principal Designer

**Mascot Management Limited**
Project Safety Advisor

**Jensen Hughes**
Fire Engineer

**BWB Consulting Limited**
Civil & Structural Engineer/M&E



**Ben Buchanan**
Commercial Director



**James Scott**
Director of ESG



**Eugene McGillycuddy**
SHEQ Director



**Tom Kearsley**
Operations Director



**Jalal Masoumizadeh**
Technical Director of Engineering and Quality



**Daniel Townsend**
Building Services Director



**Aidan Bannon**
Estimating Director



**Barry Wilkes**
Preconstruction and Planning Director



**James Corke**
Managing QS



**Grigory Grebennikov**
Carbon Manager



**Ian Watkiss**
Health and Safety Manager



**Matt Percival**
Operations Manager



**Matt Statham**
Quality Engineer



**Declan Donohue**
Building Services Manager



**Patrick Murphy**
Senior Estimator



**James Barber**
Design Lead



**Tony Bowler**
Senior Planner



**Andy Walton**
Senior QS



**Kasia Shepherd**
Sustainability Manager



**Steve Schofield**
Project Manager



**Laura Kuzavaite**
Assistant Design Manager



**Jessica Kendall**
Assistant QS



**Denise Southard**
Social Value Manager



**James Baldwin**
Senior Construction Manager



**Ben Lees**
Senior Construction Manager



**Hayley Bagley**
Senior Document Controller



**Bryn Lawson**
Engineer

Site Team

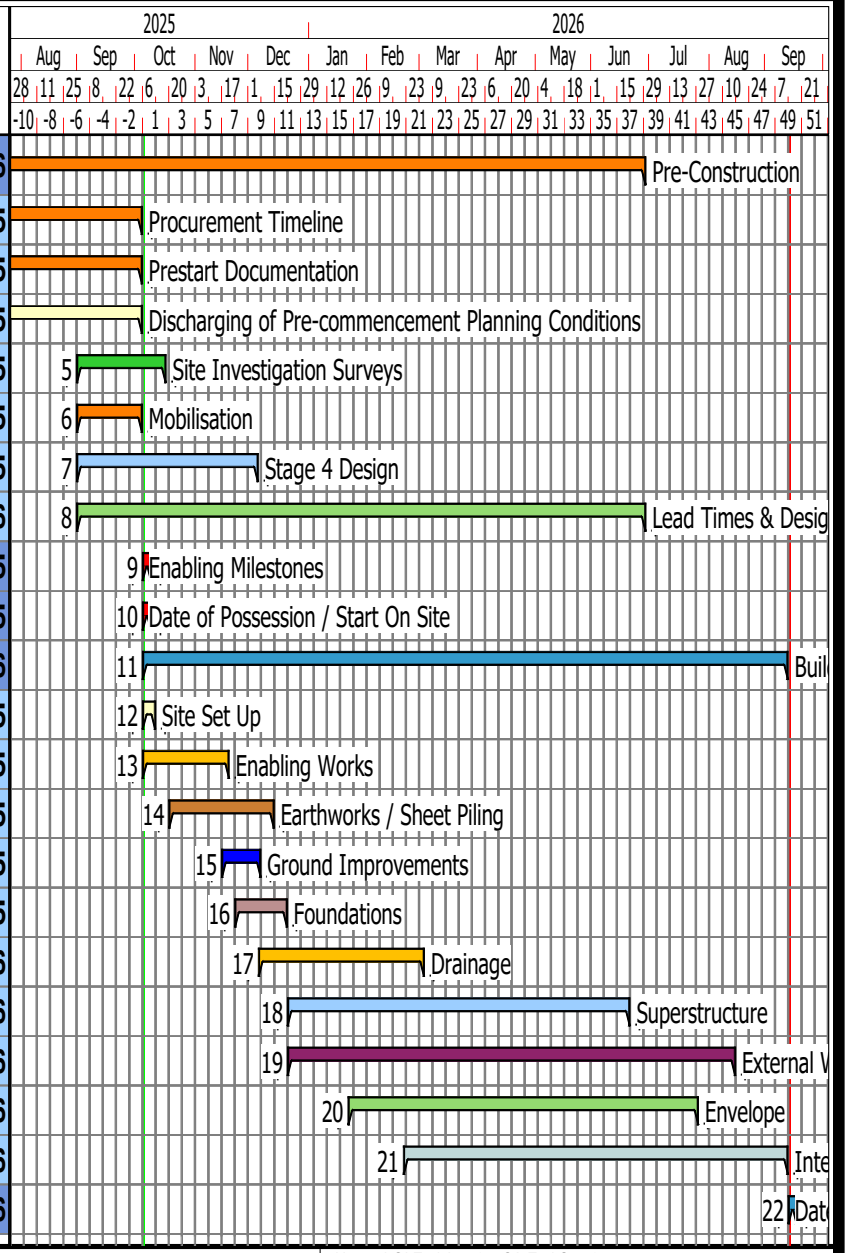
# SMMC Plot R2

06/08/2025

Programme

Glencar

| Line | Unique task ID | Name | Start | Calendar Weeks | Finish |
|---|---|---|---|---|---|
| 1 | R2A.10 | Pre-Construction | 21/03/2025 | 66ew | 29/06/2026 |
| 2 | R2A.20 | Procurement Timeline | 21/03/2025 | 28ew | 06/10/2025 |
| 3 | R2A.230 | Prestart Documentation | 23/06/2025 | 15ew | 06/10/2025 |
| 4 | R2A.480 | Discharging of Pre-commencement Planning Conditions | 14/07/2025 | 12ew | 06/10/2025 |
| 5 | R2A.100 | Site Investigation Surveys | 01/09/2025 | 7ew | 17/10/2025 |
| 6 | R2A.1890 | Mobilisation | 01/09/2025 | 5ew | 03/10/2025 |
| 7 | R2A.440 | Stage 4 Design | 01/09/2025 | 13ew | 04/12/2025 |
| 8 | R2A.550 | Lead Times & Design Reviews | 01/09/2025 | 43ew | 29/06/2026 |
| 9 | R2A.1930 | Enabling Milestones | 06/10/2025 | | 06/10/2025 |
| 10 | R2A.1961 | Date of Possession / Start On Site | 06/10/2025 | | 06/10/2025 |
| 11 | R2A.1980 | Build | 06/10/2025 | 49ew | 14/09/2026 |
| 12 | R2A.1990 | Site Set Up | 06/10/2025 | 1ew | 13/10/2025 |
| 13 | R2A.2050 | Enabling Works | 06/10/2025 | 6ew | 19/11/2025 |
| 14 | R2A.2100 | Earthworks / Sheet Piling | 20/10/2025 | 8ew | 12/12/2025 |
| 15 | R2A.2170 | Ground Improvements | 17/11/2025 | 3ew | 05/12/2025 |
| 16 | R2A.2250 | Foundations | 24/11/2025 | 4ew | 19/12/2025 |
| 17 | R2A.2190 | Drainage | 05/12/2025 | 13ew | 03/03/2026 |
| 18 | R2A.2280 | Superstructure | 22/12/2025 | 26ew | 19/06/2026 |
| 19 | R2A.2580 | External Works | 22/12/2025 | 34ew | 17/08/2026 |
| 20 | R2A.2970 | Envelope | 22/01/2026 | 27ew | 28/07/2026 |
| 21 | R2A.3720 | Internal Fit Out Works | 20/02/2026 | 29ew | 14/09/2026 |
| 22 | R2A.4860 | Date For Completion | 14/09/2026 | | 14/09/2026 |




Drawn by: Tony Bowler | Dwg No. T0720/TB/TP01 | Revision No. 5 Aug 25_internal draft | Notes: LOI End Aug 25, CA End Sep 25

# EMERGENCY PLAN & RISK ASSESSMENT

| | |
|---|---|
| Project Name: | Plot R, Kingsway Business Park, Rochdale |
| Project Number: | G1245 |
| Project Manager: | Steven Schofield |

Prepared by
**Glencar Group**
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# Emergency Plan & Risk Assessment

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# Emergency Plan & Risk Assessment

## 1.0 Introduction

In order to ensure the safety of it's employees, subcontractors, visitors and any other persons affected by our work as well as to comply with relevant legislative requirements, it is the policy of this company to put in place documented procedures regarding fire and emergency situations.

In order to satisfy these requirements, an Emergency Plan and Risk Assessment will be produced for every company workplace, whether fixed or temporary and will be regularly reviewed at intervals not exceeding every 12 months or following an incident, occurrence or change in situation which may warrant an earlier review of the document.

The nominated Emergency Marshall for each workplace will ensure that operatives with designated responsibilities, as detailed within this plan, will be thoroughly briefed on the details of their responsibilities, both general and emergency. The Emergency Marshall will also ensure that the details of the Emergency Plan and Risk Assessment are communicated to all persons in the workplace including company staff, subcontractors and visitors.

The Emergency Plan & Risk Assessment is split into three distinct sections as detailed below:

This plan will be updated as the buildings are erected on the site.

Part 1 Fire & Emergency Plan:

The Fire & Emergency Plan details general information on the premises and the emergency equipment/procedures in place. It also covers the specific roles and responsibilities of staff members and the actions which are required in the event of a fire or similar emergency situation.

Part 2 Fire & Emergency Risk Assessment:

This enables the company to carry out a suitable and sufficient assessment of the level of risk present in the workplace and to introduce control measures to help reduce the level of risk to people and property.

Part 3 Fire & Emergency Drawings:

Floor plans are contained as part of the plan and are displayed around the workplace to ensure that everybody is aware of the locations of key items such as fire exits, fire fighting equipment and assembly points.

# Emergency Plan & Risk Assessment

## 2.0 General Information

### 2.1 Workplace Details

| | | | | | |
|---|---|---|---|---|---|
| Project name: | Plot R, Kingsway Business Park, Rochdale Ol16 4FX | | | Project No: | G11xx |
| Responsible person: | Steven Schofield | | | | |
| Address: | Sustainable Materials and Manufacturing Centre (SMMC)<br>Kingsway Business Park<br>Michael Faraday Avenue<br>Rochdale<br>OL16 4GY | | | | |
| Assessor: | Steven Schofield | | | | |
| Revision number: | 0 | Date prepared: | 15.07.25 | Review date: | 11.11.25 |

### 2.2 Emergency Services Contact Details

| | | | |
|---|---|---|---|
| Hospital: | Rochdale Infirmary<br>Whitehall St<br>Rochdale<br>OL11 0NB | Fire service: | Rochdale fire Station<br>Maclure Road<br>Rochdale<br>011 1DN<br>01706900126<br>Or 999 |
| Police: | Rochdale Police Station<br>The Holme<br>The Esplanade<br>Rochdale<br>OL16 1AG<br>01618568530<br>Or 999 | Other: | |

**3. Staff Roles**

Roles and responsibilities (Section 1.4) read and understood.

3.1 Emergency Marshall

| Print Name: | Signature | Date |
|---|---|---|
| Steven Schofield | | |

3.2 Emergency Marshall

| Print Name: | Signature | Date |
|---|---|---|
| Alan Williams | | |

3.3 Emergency Marshall

| Print Name: | Signature | Date |
|---|---|---|
| James Baldwin | | |

## 4. Staff Responsibilities

4.1 Emergency Marshall

| General Responsibilities | Emergency Responsibilities |
|---|---|
| Familiarise themselves with, and brief others on, the emergency procedures contained within this plan<br><br>Provide continuous monitoring of the workplace and ensure that any hazards are controlled.<br><br>Ensure that all persons entering the workplace are given an induction including the emergency arrangements for the workplace<br><br>Ensure that evacuation drills are undertaken every 6 months to simulate a fire emergency<br><br>Ensure that all weekly emergency checks & inspections are carried out and logged using Fire & Emergency Test & Inspection Register | Fire/explosion (both unintentional and arson):<br>Raise the alarm by the fastest means possible<br>Contact the Fire Service by dialling 999<br>Collect signing in register, emergency plan & COSHH records and report to the assembly point to carry out a roll call<br>Take command until the Fire Service arrive and prevent re-entry into the building.<br>Liaise with the Fire Service when they arrive, supply them with the emergency plan and COSHH assessments/data sheets and inform them of result of roll call.<br>Prevent re-entry into the building until the Fire Service advise that it is safe to do so<br><br>Bomb threat:<br>Assume ALL threats to be genuine<br>Contact the emergency services immediately by dialling 999 and inform them that a bomb threat has been received<br>Follow all instructions given by emergency services<br><br>Floods predicted:<br>Cancel all unnecessary works<br>Where possible, remove all tools, equipment, materials, chemicals and waste from the workplace or move to higher ground.<br>Use sandbags or other type of barrier to protect remaining tools, equipment, materials, chemicals and/or waste<br>After incident, arrange for inspections of all scaffolds, hoardings, plant and other structures/equipment which may have been damaged.<br><br>Extreme winds/weather predicted:<br>Cancel all unnecessary works and all external working at height<br>Where possible, remove/bring inside materials and equipment<br>Secure all remaining materials and equipment<br>Check all hoardings, scaffolds and other similar structures<br>After incident, arrange for inspections of all scaffolds, hoardings and other structures/equipment which may have been damaged. |

| General Responsibilities | Emergency Responsibilities |
|---|---|
| | Civil unrest (riot, protest) predicted:<br>Contact local Police Station for detailed advice/information<br>Cancel all non-essential works<br>Secure workplace as far as reasonably practicable to prevent unauthorised access<br>Remove all unnecessary tools, equipment, materials and waste from the workplace.<br>Secure/lock away any tools, equipment, materials and/or waste which cannot be removed.<br><br>Civil unrest (riot, protest) in immediate vicinity:<br>Contact the police by calling 999<br>Cancel all works immediately and give order to evacuate site by safest means possible (standard Emergency Assembly Point may not be reachable so alternative point may have to be utilised)<br>Collect signing in register and report to the assembly point to carry out roll call<br>If required, liaise with the Police and inform them of result of roll call and nature of incident.<br><br>Environmental emergency (various):<br>Please refer to Project Environmental Plan for further instructions on workplace specific arrangements for dealing with environmental emergencies. |

4.2 Deputy Emergency Marshall(s)

| General Responsibilities | Emergency Responsibilities |
|---|---|
| • Assist the Emergency Marshall in his duties as required<br><br>• Familiarise themselves with the emergency procedures contained within this plan<br><br>• Provide continuous monitoring of the workplace and ensure that any hazards are controlled. | • Instruct staff to leave the building immediately by the nearest emergency fire exit when the fire alarm sounds<br>• Supervise the evacuation process and check that all staff have vacated the area<br>• Assist the Emergency Marshall in preventing re-entry to the building by staff and the public until it is safe to do so |

4.3 First Aider(s)

| General Responsibilities | Emergency Responsibilities |
|---|---|
| • Ensure that all workplace first aid kit(s) are fully stocked at all times<br>• Ensure that all workplace first aid kit(s) are situated in their correct positions at all times.<br>• Ensure that first aid signage is displayed as appropriate. | • Administer first aid to the injured person in accordance with the training that they have received.<br>• Where necessary to call an ambulance or arrange for transporting to the nearest hospital. |

## 5. Emergency Warning Systems

The following types of emergency warning systems are present in workplace:

5.1 Fire Warning System

Manual alarm activation points consisting of a Bull wireless call point system.

Automatic fire detection points consisting of smoke detectors located in the site cabins.

In order to terminate the fire alarm (in the case of a false alarm) one must contact the fire marshal who will in turn go to the fire panel and isolate should it be determined it is a false alarm.

All staff and visitors are to be made aware that the fire alarms are tested every week on a Friday of each week. The fire alarm test will consist of ringing alarm and will last for approx. 10 seconds

## 6. Emergency Equipment

The following types of emergency warning systems are present in workplace:

### 6.1 Fire Fighting Equipment

The following fire fighting equipment has been provided for use in the event of a small fire occurring in the workplace. Details of the locations of fire fighting equipment is detailed on the relevant floor plan. Nobody should attempt to fight a fire using the fire fighting equipment provided unless the fire is small enough to be safely extinguished and they have received the appropriate training.

| Type of Equipment | Site Ref No | Location | Test Date Expiry: |
|---|---|---|---|
| CO2 and Foam extinguisher | FP 1 | Site entrance | TBC |
| CO2 and Foam extinguisher | FP2 | Site compound | TBC |
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6.2 Spill kits

Spill kits can are located at the refuelling point by the compound. Spill kits are only to be used by trained, competent persons. For full details of specific arrangements for dealing with fuel, chemical and other spillages, please refer to Project Environmental Plan

6.3 First aid kits

First aid kits/points are located at Security and the site office. The location of these first aid kits can be easily identified by the presence of the sign in fig. 1 below

## 7. Emergency Evacuation

### 7.1 Emergency Exits

Emergency exits are located at the site compound and the security entrance exit. Full details of the locations of these exits are detailed on the emergency plan drawings which are displayed around the workplace. All exits will be clearly marked with running man signage detailed in fig. 2 below and will be kept clear of any obstructions at all times.

### 7.2 Emergency Assembly Points

The emergency assembled point is located at the entrance egress to the site off Michael Faraday Avenue, and can be easily identified by the presence of the sign in fig. 3 below. All operatives and visitors are to be made aware of the location of the assembly point and are to make their way here as soon as possible in the event of an emergency so that a roll call can be taken.




*Fig 1: First Aid Point*




*Fig 2: Fire Exit*




*Fig 3: Assembly Point*




*Fig 4: Signing in Point*

### 7.2 Signing In and Out

The signing in point is located at the site entrance off Michael Faraday Avenue and consists of a security guard who will note the number of operatives on site. The point can be easily located by the presence the sign in fig. 4 below. All staff as well as contractors and visitors are to sign in and out of the workplace every time they enter/leave.

## 8. Fire and Emergency Risk Assessment

### 8.1 General Information

| The Premises | | |
|---|---|---|
| 1 | Number of floors: | 0 |
| 2 | Approximate floor area: | 11 acres |
| 3 | Brief details of construction: | The site is presently a green field site. |
| 4 | Use of premises: | Green Field Site |

| Details of Occupants | | |
|---|---|---|
| 1 | Approximate maximum number: | 30 |
| 2 | Approximate number of employees at any one time: | 20 |
| 3 | Maximum number of members of public at any one time: | 2 |

| Details of Special Risk Occupants | | |
|---|---|---|
| 1 | Sleeping occupants: | None |
| 2 | Disabled occupants: | None |
| 3 | Occupants in remote areas and lone workers: | None |
| 4 | Young persons: | None |
| 5 | Others: | None |

| Previous Loss Experience (e.g. due to fire, explosion, flooding etc) | |
|---|---|
| 1 | None |

| Other Relevant Information | |
|---|---|
| 1 | Adjacent TfGM Tramway. |

| Relevant Fire and Emergency Legislation and Guidance | |
|---|---|
| 1 | The following fire safety legislation and guidance applies to these premises: |
| | FPA Joint code of practice for fire prevention on construction sites 8th edition 2012<br>Construction (Design and Management) Regulations 2015<br>Regulatory Reform (Fire Safety) Order 2005 |
| 2 | The above legislation is enforced by: |
| | >Rochdale Fire Service< http://www.direct.gov.uk/en/Diol1/DoItOnline/DG_10027464<br>>HSE Bootle< (http://www.hse.gov.uk/contact/maps/index.htm) |
| 3 | Other legislation that makes significant requirements for emergency arrangement in these premises (other than the Building Regulations 2000): |
| | None |
| 4 | The legislation detailed above is enforced by: |
| | NA |
| 5 | Additional comments: |
| | None |

8.2 Details of Fire Hazards and Their Control / Elimination

| No. | Potential Hazard | Y | N | Controls Measures |
|---|---|---|---|---|
| 1 | Fixed installation(s) | \ | | Periodically inspected and tested |
| 2 | Portable electrical equipment | \ | | Portable appliance testing carried out |
| 3 | Electrical leads | \ | | Fully unwound to prevent overheating. |
| 4 | Is smoking permitted in or around premises? | \ | | Designated smoking area(s) with metal cigarette receptacles. |
| 5 | Are portable electric heaters used in the premises? | | \ | PAT tested yearly. Not blocked with combustible materials. Switched off manually or via timers at the end of each working day. |
| 6 | Are portable gas powered heaters used in the premises? | | \ | Not blocked with combustible materials. Switched off manually or via timers at the end of each working day. |
| 7 | Are fixed heating installations used in the premises? | \ | | Not blocked with combustible materials. Switched off manually or via timers at the end of each working day. |
| 8 | Are electronic cooking appliances such as kettles and microwaves present? | \ | | PAT tested yearly |
| 9 | Are fridges and/or freezers present? | \ | | PAT tested yearly |
| 10 | Are gas cooking appliance such as cookers or hobs present? | | \ | Combustible materials stored away from naked flames |
| 11 | Is equipment used for frying or deep-fat frying present? | | \ | PAT tested yearly. Fire blankets present |
| 12 | In the event of a power failure, will there be enough ambient/natural light to enable safe evacuation of the premises? | \ | | Emergency lighting used for areas where ambient light is insufficient |
| 13 | Is temporary 110v lighting used? | \ | | Periodically tested by a competent person |
| 14 | Will combustible waste be produced? | \ | | Cleared regularly. Not stored near to sources of ignition. Access and egress routes to be kept clear |
| 15 | Are any flammable liquids, materials or substances stored? (eg diesel & petrol) | \ | | Stored in a secure areas in suitably sized bunds. Appropriate warning signage displayed |
| 16 | Are any explosive liquids, materials or substances stored? | | \ | Stored in a secure areas in suitably sized bunds. Appropriate warning signage displayed |
| 17 | Are any compressed gas cylinders/canisters stored? (eg LPG & acetylene) | \ | | Stored in a secure cages. Appropriate warning signage displayed. |
| 18 | Are compressed oxygen cylinders stored? | \ | | Stored in a secure cages away from any other form of flammable gases and/or liquids. Appropriate warning signage displayed. |
| 19 | Is temporary site accommodation in use? | \ | | Constructed from fire resistant materials. Situated as far away as practicable from Gaps between and underneath units blocked / checked regularly. |
| 20 | Is hot work being undertaken? | \ | | Controlled via permit procedure. Fire watches undertaken. Combustibles removed and extinguishers present |

| Additional Notes: |
| --- |
| |

8.3 Fire Protection Measures

| No. | Potential Hazard | Y | N | Controls Measures |
|---|---|---|---|---|
| 1 | Are fire exits required? | \ | | Escape routes to be kept clear and to be planned in accordance Exits marked on drawing and with clear signage. Details of exits briefed during inductions. |
| 2 | Emergency assembly point required? | \ | | Assembly point marked on drawing and with clear signage. Details of assembly point briefed during inductions. |
| 3 | Is there a potential for fire spread within the building? | \ | | Fire doors to be kept closed. Combustible materials not allowed to build up. All coverings to be fire retardant. |
| 4 | Is there a potential for fire spread outside of the building? | \ | | Combustible materials not allowed to build up and stored away from buildings. All coverings to be fire retardant. |
| 5 | Manual alarm system required? | \ | | Ensure that alarms can be heard by all persons. Linked systems used where necessary. Tested weekly. |
| 6 | Automatic alarm system required? | \ | | Ensure that alarms can be heard by all persons. Linked systems used where necessary. Tested weekly. |
| 7 | Fire extinguishers required? | \ | | Extinguishers provided to be of correct type for fire hazard. Inspected on daily basis to identify damage. Tested yearly (where required). Unobstructed. |
| 8 | Hose reels required? | | \ | Inspected on daily basis to identify damage. Tested yearly (where required). Unobstructed. |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |

| Additional Notes: |
|---|
| |

8.4 Management of Fire Safety

| No. | Potential Hazard | Y | N | Controls Measures |
|---|---|---|---|---|
| 1 | Need to summon fire and rescue service | \ | | Responsibility for summoning and liaising with fire and rescue service clearly documented within Plan. |
| 2 | Potential confusion during evacuation (emergency marshals) | \ | | Responsibility for managing evacuation and carrying roll call clearly documented within Plan. |
| 3 | Potential confusion during evacuation (occupants) | \ | | All staff to sign in. Assembly point to be clearly signed and location briefed during induction. Drills undertaken every 6 months. |
| 3 | Potential for confusion over roles and responsibilities | \ | | All persons named with responsibilities to read and sign Plan to confirm their understanding |
| 4 | Evacuation of disabled persons | \ | | Evacuation chairs to be provided where necessary. |
| 5 | Use of fire extinguishers | \ | | Training to be provided. Extinguishers to be kept clean and labels legible. Only to be used for small, easily manageable fires. |
| 6 | Failure of fire fighting equipment | \ | | Equipment inspected daily signs of damage or vandalism. Equipment to be positioned away from potential sources of damage where possible |
| 7 | Failure of alarm system | \ | | Alarms tested weekly to ensure they function. |
| 8 | Failure of emergency lighting system | \ | | Emergency lighting tested weekly and serviced periodically |
| 9 | Failure of sprinkler system | \ | | Sprinkler system serviced periodically |
| 10 | Failure of other emergency systems | | | |
| 11 | Blocking of escape routes | \ | | Escape routes to be kept clear at all times. Checked daily. |
| 12 | Blocking of emergency exits | \ | | Emergency exists to be kept clear at all times. Checked daily. |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |
| 17 | | | | |

| Additional Notes: |
|---|
| |

8.5 Other Potential Hazards and Controls

| No. | Potential Hazard | Y | N | Controls measures |
|---|---|---|---|---|
| 1 | Does the area have a history of adverse/extreme weather? | | \ | |
| 2 | Does the area have a history of flooding? | \ | | De watering operation to be implemented. |
| 3 | Does the area have a history of civil unrest? | | \ | |
| 4 | Is the workplace in a location which may be likely to be the target of protests (eg within a testing centre)? | | \ | |
| 5 | Is the nature of the workplace itself likely to spark any civil unrest? (For example, has there been protest against construction of the workplace?) | | \ | |
| 6 | Does the area have a history of receving bomb threats? | | \ | |
| 7 | Do the premises have a history of arson? | | \ | |
| 8 | Interference or damage to TfGM asset, | \ | | Physical hoarding in place in excess of 8M away.<br>Detailed lift plans for relevant woks to be produced inline with TfGM guidance and submitted for authorisation.<br>Works to follow generally TfGM |

| Additional Notes: |
|---|
| In the event of an emergency relating TfGM asset contact shall be made via the emergency help point at the tram stop, by telephoning 01612035619 and/or emergency services. |

8.6 Overall Premises Risk Rating

(**H**=High, **M**=Medium, **L**=Low, NA=Not Applicable)

| | Fire | Arson | Bomb Threat | Flood | Extreme Weather | Civil Unrest | Other (Specify) |
|---|---|---|---|---|---|---|---|
| Before control measures | | | | | | | |
| After control measures | **L** | **L** | **L** | **L** | **L** | **L** | **L** |

# Emergency Contact List

## Emergency marshal



**James Baldwin**
07584 182046

## Deputy Emergency marshal



**Steve Schofield**
07725485192



**Alan Williams**
07718245810

## First Aiders



**Steve Schofield**
07725485192



**James Baldwin**
07584 182046



**Alan Williams**
07718245810

## Other Emergency Contacts

| | | |
|---|---|---|
| **Hospital** | 01616240420 | Whitehall, Street, Rochdale OL12 0NB |
| **Police Station** | 0161 856 8530 | The Holme, The Esplanade, Rochdale, OL16 1AG |
| **Fire & Rescue** | 0161 909 8626 | Halifax Road, Rochdale, OL12 8BD |
| **Environment Agency** | 03078506506 | Lateral House, 8 City Walk, Holbeck, Leeds LS11 9AT |
| **Local Authority** | 01706 647474 | 1 Riverside, Smith St, Rochdale, OL16 1XU |
| **Local HSE office** | 0300 003 1747 | Regrave Court, Merton Road, Bootle L20 7SH |

PROJECT ENVIRONMENTAL PLAN

| | |
|---|---|
| Project Name: | Plot R Rochdale |
| Project Number: | G1245 |
| Project Manager: | Steven Schofield |

Prepared by
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# PROJECT ENVIRONMENTAL PLAN

1. Document Control

1.1 Document Status

| Rev Date | Status | Prepared By | Checked By | Approved By |
|---|---|---|---|---|
| 0 | For approval | SS | TK | TK |
| | | | | |
| | | | | |
| | | | | |

Project Revision Record

| Rev | Date | Page Numbers Altered | Revision Summary |
|---|---|---|---|
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# PROJECT ENVIRONMENTAL PLAN

2. Introduction

The purpose of this Project Environmental Plan (PEP), is to enable Glencar Construction to develop principal approaches regarding Environmental Legislation when carrying out operations, incorporating control procedures, processes and reporting in accordance with the Glencar Management System (LMS).

Glencar has a sustainable vision for all its construction sites based on three balanced and interlocking elements strong and diverse environmental understanding, fundamental improvements in environmental management and use of resources, and an understanding of its social responsibility. The Glencar Project Environmental Plan (PEP) sets out the objective to achieve environmental and social development simultaneously with a view to continuously improve the service and commitment it shows.

The Project Environmental Plan (PEP) document has been produced in outline format to accompany the planning application and highlights the areas which would be covered by a completed PEP which would be compiled prior to any works commencing on the site. This document also refers to associated documentation which on a live project would include the following supporting documentation:

- Pollution Prevention Plan
- Traffic Management Plan
- Construction Phase Plan
- Site Waste Management Plan
- Environmental Policy
- Environmental Aspects / Impacts Register

3. Environmental Management/Policy

The Glencar Management System (LMS) conforms to BS EN ISO14001. Details of the management system are clearly defined within the Management Overview Document. The Environmental Management System (EMS) is regularly monitored and audited by appropriate personnel, throughout the duration of the works. It is the responsibility of the Project Manager to ensure development, approval and effective implementation of the Environmental Management System. This should be undertaken with the support of the Environmental Manager and the SH&E Department. It must also be made clear to all site personnel that each individual has a responsibility to ensure no environmental incidents occur.

Further to this, an Environmental Policy has been produced, in accordance with duties under The Control of Pollution Act and the Environmental Protection Act, whilst fulfilling obligations to both employees and the public who may be affected by the company activities.

4. Environmental Aspects and Impacts Register

An Aspects and Impacts Register has been completed for this project which identifies the environmental aspects possible and the impacts that could occur as a result (Document Reference Number:  a copy of this document is located within Annex A of this document).

# PROJECT ENVIRONMENTAL PLAN

5. Project Details

The proposed construction site is a 2.528-acre plot off Michael Faraday Avenue within the Kingsway Business Park site. The scope of works comprises the erection of a research & development facility namely the Sustainable Materials and Manufacturing Centre (SMMC). The building will comprise of a large workshop, flexible space for light workshop or office type uses, social café space and lecture theatre to the ground floor.
The upper level provides cellular offices, meeting rooms and breakout spaces.

Total Gross Internal Area: 42,572 ft² / 3955 m².
Ground Floor 24822 ft² / 2306 m².
First Floor 17135 ft² / 1592 m².
Second Floor 615 ft² / 57 m².

5.1 Site Location and Description

Surrounding area

Kingsway Business Park is a partially completed 170-hectare development between Rochdale and Junction 21 and 22 of the M62. The site is located within Kingsway Business Park, approximately 2.4km from Rochdale. The site is between the town of Rochdale and the M62 motorway on an undeveloped plot of the existing Kingsway Park Business Park.

The Site is located on the northern edge of Kingsway Business Park. To the north a tram stop and line, sit between the Site and suburban housing. To the east, west and south similar additional undeveloped and unmanaged plots associated with the business park are found. Further south Stanney Brook Corridor a locally designated 'Site of Biological Interest' separates the Site from large commercially developed plots of the business park. the wider local area the Site is flanked by suburban residential and commercial development associated with Rochdale and Milnrow.

Structure details

The building consists of a structural steel frame, with reinforced concrete slabs cast in-situ. On upper floors these are on structural metal decking. The unit roof is a flat roof on composite concrete deck with warm roof single-ply finish.
Externally the unit consists of Corten rainscreen cladding supported on light-gauge steel infill wall construction. This light-gauge steel sits on brick & block plinth to the full unit perimeter.
Other external finishes include curtain walling glazing, manifestation & Brise Soleil.

Glencar operatives will work within the confines of the site boundaries. All site areas/boundaries shall have the appropriate safety barriers, fencing, hazard warning signs and segregation for vehicles and pedestrians. All mechanical vehicle movement outside the confines of the site boundaries shall be with the aid of a trained banks man.

This project is not required to achieve BREEAM.

5.2 Start / Completion Dates

| | | | | |
|---|---|---|---|---|
| Start Date: | 10.11.25 | Finish Date: | 28/10/26 | |
| Site Hours: | Monday -Friday | Saturday | Sunday | Out of Hours |
| | 07.00 – 07.00 | 0800 - 1300 | | |

# PROJECT ENVIRONMENTAL PLAN

| | |
|---|---|
| Contract Period (Wks) | 51 Weeks |

5.3 Project Management Team

The Project Management Team for this project is identified as follows:

| Role | Name | Contact Tel No | Location |
|---|---|---|---|
| Project Manager | Steven Schofield | 07725485192 | Site |
| Site Manager | James Baldwin | 07584182046 | Site |
| Site Foreman | TBA | TBA | TBA |
| HSE Advisor | Steve Lomas | 07721735563 | Roaming |
| Environmental Manager | Kasia Shepard | 07818 499701 | Roaming |

# PROJECT ENVIRONMENTAL PLAN

6.0 Site History

The past use(s) and ownership of this site were farmland according to the PCI.

6.1 Ground Conditions

Ground conditions are as stated in the BWB GI report and remediation strategy. The summary of which is “Ground conditions comprised Topsoil and Made Ground (from 0.2m to 2.3m thickness) directly underlain by Hummocky Glacial Deposits. A layer of relict topsoil between 2.3m and 2.5m was encountered below Made Ground in BH02 (2023). Hummocky Glacial Deposits typically comprised a layer of soft to firm clay (base depths of 0.8m to 3.0m) over medium dense to dense sands and sandy clays to a maximum proven depth of 15.45m. Bedrock was not encountered during either investigation. “

6.1.1 Existing Structure Details

None present.

6.1.2 Contaminated Land

The Phase 2 Geotechnical report KYR-BWB-ZZ-XX-RP-YE-0002_Ph2-P05 Phase 2 Geo-Environmental Assessment produced by BWB identifies that Asbestos fibres were recorded in two locations of made ground (TP01 and TP03 during the 2023 investigation) and are considered isolated areas of contamination. Further surveys may be undertaken to inform the correct method of remediation. The requirements of CAR 2012 will be complied with in relation to remediating these areas.

However, if contamination is suspected during the construction phase, then works will cease and the Client will be advised by the Site Management Team, who will investigate such incidents, or removal of any suspected materials. Operatives are not to remove or handle any suspected materials.

Environmental Considerations

6.2 Nuisance

For the purposes of this document, nuisance is broken down into four sections:

- Dust
- Noise
- Vibration
- Lighting

The following sections detail activities and control methods to be implemented on the project.
Sensitive receptors likely to be affected by the construction nuisance include.

Residential properties to the North of the site and along with the TRAM stop.
Industrial buildings to the South of the site.

6.2.1 Dust

Mechanical disturbance of granular material exposed to air creates atmospheric dust, this type of dust generation is termed as 'fugitive' as it is not discharged into the atmosphere in a confined stream. The potential sources of these fugitive dust emissions relevant to the project are outlined below:

- Site clearance
- On site earth moving operations, site levelling, cut and fill, etc.
- Vehicle movements over haul roads
- Vehicle movements on site during dry periods
- Wind blowing across the site during dry periods.
- Stockpiling of excavated materials
- Cutting and grinding
- Accidental spillage and loss of load from vehicles carrying loose material.
- Deep excavations
- The generation of this fugitive dust required consideration of additional factors such as: <Delete as necessary>
- Prevailing wind (speed, direction)
- Prevailing climate, including rainfall
- Location of sensitive receptors (including residential and commercial properties, habitats and watercourses)

Prevailing winds are specifically important when considering fugitive dust. The speed of winds can determine the dispersion of dust; high winds can increase the initial generation of dust, in addition to carrying the dust over greater distances.

Appropriate preventative measures to control dust emissions can significantly reduce the potential for dust generation.

Operations likely to cause air pollution will be subject to the preparation of a method statement that will define the preventative measures that will be put into place, such as damping down, containment and/or suppression, etc.

6.2.2 Noise

Noise has the potential to cause disturbance due to sensitive receptors within close proximity to site. The site is directly adjacent to a Metrolink tram stop / line and houses to the north of this area.

Noise monitoring will be undertaken whenever necessary and the findings recorded using the Noise Monitoring Register, to ensure that noise levels at site boundaries and the boundaries of neighbouring premises do not exceed those laid down in the planning documents. Operations that may cause nuisance noise will be planned in advance and plant selection will form an important part of the planning process.

In addition, our team will embrace best practice with regards to noise minimisation, which will include:

- All construction plant and equipment will comply with EU noise emission limits.
- Plant will be serviced regularly to minimise adverse noise impacts.
- All vehicles and mechanical plant used for the purpose of the works will be fitted with effective exhaust silencers and maintained in good efficient working order.
- Selection of inherently quiet plant where appropriate. All major compressors will be 'sound reduced' models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic percussive tools will be fitted with mufflers or silencers of the type recommended by the manufacturers.
- Machines in intermittent use will be shut down in the intervening periods between work or throttled down to a minimum.

- Plant and equipment such as flatbed lorries, skips and chutes will be lined with noise attenuating materials. Materials will be handled with care and be placed, not dropped. Materials will be delivered during normal working hours.
- Plant reversing near dwellings have banksmen in place of 'beepers', and or White noise bleepers.
- All ancillary plant such as generators, compressors and pumps will be positioned so as to cause minimum noise disturbance, i.e. furthest from receptors or behind close boarded noise barriers, if necessary, acoustic enclosures and/or shielding will be provided.
- Where practical, noise barriers, close into construction works, when working in the vicinity of properties on, will be provided. This will provide additional mitigation for the short-term significant construction noise effects at these properties.

Noise monitoring will be undertaken whenever necessary and the findings recorded using the Noise Monitoring Register, to ensure that noise levels at site boundaries and the boundaries of neighbouring premises do not exceed those laid down in the planning documents. Operations that may cause nuisance noise will be planned in advance and plant selection will form an important part of the planning process.

6.2.3 Vibration

It is anticipated that the works should not pose an environmental risk; this should be fully investigated by the Project/Site Manager and Environmental Manager.

Best practice should be utilised at all times, and ongoing monitoring undertaken. Where it is deemed that vibration may pose an environmental risk, this should be fully investigated by the Project/Site Manager and Environmental Manager.

6.2.4 Light Disturbance

Consideration will be given to the location and angle of lighting to ensure minimum potential for disturbance to local residents/Members of the Public. Where lighting is not required during night hours, it will be switched off. Additionally, lighting arrangements will also take into consideration the potential disturbance of wildlife and ecology. The impact of lighting on ecology has been assessed in the ecology assessment. The lighting design will minimise the impacts of light a spillage on adjacent retained habitats through the attachment of directional hoods to lights and the use of pressure sodium lamps. Non-essential lighting will be fitted with automatic cut-off switches.

6.3 Heritage and Archaeology

It is not anticipated that there are any archaeological sensitive areas within the site boundaries. However, the following outlines the procedures which will be followed in the event of such as find or discovery:

- Immediately stop works in the area of the find.
- Protect the find and the surrounding area, by fencing/blocking off and immediately contact the Site Manager
- Contact the archaeologist and obtain advice on how to proceed.
- All significant findings must be reported.

6.4 Waste Management System

In line with the Site Waste Management Plans Regulations 2008, a Site Waste Management Plan (SWMP) has been completed and is updated throughout the duration of the project, whilst being accessible upon request within the site office. Glencar site personnel will be trained in the use of the SWMP.

6.4.1 Environmental Permitting

If there are any processes which require environmental permitting, it must be ensured that the relevant subcontractor has followed the correct procedures via the Environment Agency to confirm that environmental permits are in place prior to the commencement of works.

An example of works that may require an environmental permit are as follows:

- Water discharge - including contaminated water from accidental spills or effluent treatment processes.
- Water abstraction
- Water impoundment

6.4.2 Segregation of Waste

To ensure maximum potential for reducing waste to landfill, and encouraging reuse and recycling, waste will be segregated where possible. Separate skips and / or wheelie bins will be made available for all types of waste. Each skip will be clearly labelled, and site personnel will be informed of procedures within the induction. Regular monitoring will be undertaken to ensure correct procedures are followed at all times. The skips will be emptied at regular intervals to prevent overfilling. Toolbox Talks will be undertaken with all site personnel to ensure full understanding of waste procedures.

6.4.3 Disposal of Non-Hazardous Waste

All non-hazardous waste will be removed from site within strict adherence to all waste legislation requirements, including the Duty of Care Regulations. Prior to any agreed use of waste carrier or waste disposal sites, the appropriate licences will be thoroughly checked by using the Environment Agency Public Register website (http://epr.environment-agency.gov.uk/ePRInternet/SearchRegisters.aspx)to ensure that particular waste streams can be accepted and carrier licences are valid. This can only be undertaken by authorised personnel and copies of all necessary licences must be retained on site at all times and reviewed for expiry.

No waste will leave site without appropriate Waste Transfer Notes. It is essential that all Waste Transfer Notes are inspected for detail and must contain the correct description of waste as well as the correct European Waste Code (EWC) in line with the List of Waste Codes Regulations. Only authorised and fully trained personnel may sign Waste Transfer Notes. Regular audits will be undertaken to ensure correct procedures are being followed.

6.4.4 Disposal of Hazardous Waste

No hazardous waste must leave site without the correctly completed Waste Consignment Note. The Consignment Notes must contain all necessary information, including waste description and hazardous waste registration number. Any waste carriers removing hazardous waste must have appropriate licences and disposal sites must be verified to be able to accept waste being sent. These checks and signing of consignment notes can be only undertaken by authorised personnel. All hazardous waste must be stored on site in appropriate, covered or locked skips. No mixing of hazardous and non-hazardous waste is authorised.

6.4.5 Waste Reporting and Records

All Waste Transfer/Consignment Notes will be held on site throughout the duration of the project and retained on file as legally required (i.e. Waste Transfer Note: 2 years and Waste Consignment Note: 3 years). If a waste carrier fails to provide a waste transfer/consignment note, Glencar templates will be printed from the Glencar Management System and completed prior to waste removal (NB: Waste Transfer Note: and Waste Consignment Note).

Each waste transfer will be fully documented, and the Site Waste Management Plan updated accordingly. Each month, a comprehensive waste report will be compiled by the Waste Management Contractor, detailing the exact movements of the previous months waste, including destination (i.e. Landfill / Recycled / reused, etc) and treatment.

6.5 Water

There are no known water courses located within proximity to the site. There is a ditch but this is not believed to be connected to a water course e.g Stanney Brook according to the ecological survey produced by Brook 6649 - 01

There are various proposed works which need to be carried out within and adjacent to the watercourses namely the discharge of possible ground water.

Spill kits will be made available, and site operatives trained in their use, to deal with any spillages. All spill kits will be fully stocked at all times.

Due care and attention must be made with regards to potential surface run-off affecting the water course, and stockpiling of any materials should ideally not be located within the vicinity of the watercourses. Where stockpiles have to be located in the vicinity of a watercourse a 7m buffer strip should be in place to reduce pollution risks.

The positioning of fuel storage tanks and other potentially polluting materials and maintenance/refuelling facilities should be on bunded areas of hard standing with dedicated drainage systems. Stored materials on site will be checked regularly for containment integrity (both primary and secondary), quantity stored and security of storage.

Construction of concrete structures during the construction phase would be monitored to prevent associated contaminated materials entering any watercourses. Pre-cast work or permanent formwork will reduce the amount of in-situ concreting required adjacent and above the watercourses. Washing out of concrete wagons or other equipment used in concrete operations will be undertaken in designated contained washout areas. These will be located away from all watercourses and drains and will be impermeable to prevent infiltration to ground.

Permission for any dewatering activities will need to be sought from the Environment Agency under the terms of the Water Act 2003, well in advance of construction commencing.

It is Glencar policy that all works will not directly or indirectly affect the natural water resources by any of its operations/activities. Surveys are carried out prior to the start of works to establish the existing water quality and water levels around the site. Disturbing underground pipes is avoided wherever possible, particularly those containing gas (yellow) or foul water (brown/black) or diesel. Regular inspections are carried out with regard to the discharges, drainage systems, collection ditches, lagoons, interceptors and watercourses to ensure that they are all in good order. It is ensured that run-off is directed away from sensitive areas. Services are protected to reduce the risk of damage by heavy plant or digging which could otherwise lead to pollution incidents.

6.6 Transportation and Traffic Management

A Traffic Management Plan will be implemented on the site; details will in due course be found in the Construction Phase Plan (CPP) and displayed on the site safety notice board. The plan will outline timings of deliveries and routes to

be taken by hauliers to ensure minimal disruption to local residents and businesses. This will include potential risk for noise disturbance as well as minimising additional traffic during peak periods.

6.7 Ecological Management

It is the responsibility of the Glencar Project Team to determine if the Client or other relevant persons have identified and designated ecological sites or protected species within this project/site. Prior to the start of works/activities on site, the sensitive areas are identified, fenced off and all staff made aware. Appropriate transport routes are designated with these sensitive areas in mind to ensure they are not disturbed. The project programme is to consider the breeding/nesting periods of wildlife. A Reptile Relocation Program (please refer to Section 6.7.2) is carried out if found that any reptiles are situated in any of the areas where works / activities are due to commence. The reptiles are placed in a new habitat according to their requirements.

Checks are made to confirm if there are any Tree Preservation Orders (TPO's) as per the Brooks ecological Tree survey AR 5290 01, with regard to any trees within the site area(s) which will mean that they are protected and cannot be removed or damaged. Transport routes should avoid areas containing protected trees and find an alternative safe route. Temporary fencing is used to mark out the protected area around the tree(s). Roots are not cut or damaged as per the Brooks ecological Tree survey AR 5290 01 Dated June 2022.

The Control of Pollution Act and the Environmental Protection Act impose a duty on everyone to prevent pollution to the environment. In order to fulfill its obligation, it is Glencar policy that all work activities will be assessed with regard to the level of risk to the environment.

Good practice should be undertaken during the construction phase in order to avoid or reduce ecological impacts, including:

- Dust minimisation methods (e.g. wetting of dust-producing plant and machinery, covering of all vehicles carrying spoil) to avoid impacts on retained vegetation.
- Night working should be avoided wherever possible, and all construction lighting should be directed away from retained areas of habitat. Security lighting and non-essential lighting should be fitted with automatic cutoff switches.
- Where works within and in close proximity to water courses are to be conducted, namely the removal of the culverts and construction of the bridge pollution prevention controls should be utilised to reduce the risk of sediment pollution resettling further downstream and potentially smothering benthic habitats.
- All clearance works, tree felling, and scrub removal should be undertaken outside the bird nesting season (i.e. should be undertaken during the period September – February), although if works cannot be avoided during the nesting season (March – August) then an ecologist should supervise any works.

6.7.1 Bats

An ecology survey has been undertaken.

The Brooks report ER -6649 -01 has stated that the site is considered to be of negligence conservation value for roosting bats, and the site is not important to local bat populations.

6.7.2 Reptiles

The Brooks report ER -6649 -01 suggests the presence of reptiles was not found on site.

In the unlikely event of the discovery of any reptiles during the construction works, immediate surrounding works will cease. The Site Manager will contact the Project Manager, who will in turn contact the SH&E Department. No works

may commence within the area until the SH&E Department has been contacted and advice/guidance provided and / or authorisation to continue works has been granted. Species identification training and posters will be available on site to assist all site personnel with identification.

6.7.3 Flora
No INNS were found during the survey in the Brooks report ER -6649-01

Site preparation works include levelling of earth mounds and clearance of areas of scrub.

6.7.4 Unexpected Discovery of Flora and Fauna

Where any unexpected species is located by any personnel on site, all works within that area must cease immediately. Site management must be immediately informed along with the SH&E Department. No further work may take place within that area until confirmation has been given by the SH&E Department and site management.

6.8 Land Management

A Site Investigation Survey has been conducted by BWB consultants KBP-BWB-ZJ-XX-RP-YE-0002_Ph2-P2 1under instruction form the client H&S and Principal designer teams and indicates that the land carries no significant contamination risk. Copies of these reports including trail pit locations and other associated surveys can be found in the preconstruction information pack.

As above previous ground investigations at the site have not encountered significant concentrations of contaminated soils and in addition, it is expected that the majority of excavated material should be suitable for re-use across the site. The proposed development will comprise a large proportion of hard standing, i.e. tarmac and concrete cover. There will, therefore, be a reduced pathway between any contamination and site receptors.

However, if contamination is suspected then works will cease and the Client will be advised by the Site Management Team, who will investigate such incidents.

During the site induction all personnel will be made aware of their responsibility to be vigilant regards potential soil contamination. Key personnel are ground workers, machine operators and their banksmen. They will report any suspicions of contaminated soil to site management who will then instigate the following actions:

If contamination is encountered during site works, it should be reported to the Local Authority and may require remediation.

Remediation options for contaminated soil typically include removal to a suitable landfill site, remediation on-site or the placement of a ‘clean cover system’ in areas of soft landscaping, imported soils for the clean cover system, or other fill materials required for the new development, must be free of contamination. All imported topsoil must comply with the Environment Agency’s Soil Guideline Values (SGV’s), for residential gardens and with BS3882:2007, specification for Topsoil. In addition, the source and supplier of any imported materials must be provided to the Local Authority together with appropriate analysis certification.

Any excavated soils removed from site for disposal to a landfill should undergo Waste Acceptance Criteria (WAC) testing in order to correctly classify the material in terms of waste disposal. The results of the WAC testing should be supplied to the chosen waste acceptor at an early stage of the development in order to locate a suitable landfill site.

The risk from contaminated dusts is considered to be low, due to the lack of contamination identified within site soils and can be controlled with good working practices such as dust control measures during construction works.

### 6.9 Resource Use

Glencar will ensure where practicable, the use of recycled or sustainable materials will be utilised. In line with company procedures, all wood should be obtained from a certified sustainable source, such as FSC and the Sustainable Timber Register fully completed with copies of the Chain of Custody Certificate(s) obtained.

A dedicated area will be maintained for storage of all materials and due care and appropriate handling will be undertaken at all times to reduce any risk of damages and wastage. Packaging of items should not be removed until required, to ensure maximum potential for returning of unused goods.

As much office waste as possible will be sent for recycling and strategies put in place to ensure minimal wastage, for example avoiding unnecessary printing, etc.
Where possible, use of local suppliers will be considered to reduce transportation costs and maintain a low carbon footprint. The project carbon footprint of transportation to and from site is captured using the Daily Signing In/Out Register which requests transport type (including fuel type), distance travelled, etc.

Waste disposal options are discussed with the designated waste management contractor to ensure minimal transportation requirements where possible.

#### 6.9.1 Energy Consumption / Monitoring

Switch it off schemes and other energy saving campaigns will be implemented on site to encourage all personnel to consider their carbon footprint both at work and home. Use of car sharing and public transport will be encouraged. Posters will be clearly displayed within the site office to ensure all personnel are aware. This will also be covered within the site induction and regular toolbox talks held relating to the subject.

#### 6.9.2 Water Usage

Within site accommodation, taps will be switched off when not in use or push taps will be implemented to ensure that water is not left running whilst also making staff aware of water saving techniques. Every effort to ensure reduction in water use should be implemented where available as well as consideration given to rainwater harvesting on site where possible.

### 6.10 Visual Amenity

Glencar will ensure that the site boundaries are kept clean and tidy at all times. Any hoardings and/or fencing will be well maintained and kept free of graffiti and non-site-specific posters. Damaged or unsightly fencing must be repaired or replaced as soon as possible. Local roads will be kept free of excessive dirt and mud, road sweepers and possible wheel wash facilities are to be used to prevent build up. It is the responsibility of the site management to ensure the cleanliness of the site is maintained and allocated personnel will be identified to carry out regular checks.

### 6.11 Considerate Constructors

This site is registered with the Considerate Constructors Scheme (CCS). The site will target to maintain a score of no less than 38 (as a minimum) on each site monitors visit. The site will clearly display the associated posters and banners allowing local residents to see clearly all contact numbers.

Glencar will ensure all works carried out are undertaken in a manner which not only ensures best practice but ensures minimal disruption and cause for complaint by the public.

6.11.1 Community Liaison

Glencar will actively seek to ensure community liaison is maintained throughout the duration of the works. Site specific activities will be planned where possible which ensure interactivity with local communities, schools, colleges and charities. Events are to offer opportunities to local residents to meet and discuss the project with site management.

Engagement with the local community will include.

- Continued engagement via letter drops and project update newsletters.
- Engagement with local high school (Kingsway Park Highschool) to educate students on the project and our aims and values while also promoting the construction industry as a career and giving them chance to witness a live project first hand.
- Community improvement operations such as litter picking and continued opportunity to recycle site materials from site in the community.
- Ongoing record and monitoring of community engagement via Compliment / Complaint Register.
- Utilise local social enterprise to opportunities to local community.

7.0 Local Environmental Improvement and Promotion Opportunities

Glencar is committed to exploring opportunities for the improvement of the local environment during the construction phase of the project. Please see below intended local environmental improvement opportunities Glencar intends to implement.

- Up to date tracker plus (Glencar's online environmental management system) to demonstrate current progress against defined targets on sustainability and carbon reduction.
- Introduce an additional community board with focus on environmental performance of the project including biodiversity initiatives – E.g. Litter pick to Stiups lane / Residential Areas.
- Planned installation of rainwater harvesting from site welfare cabins for use on boot wash and other grey water suitable systems.
- The Appointment of an Environmental champion.
- Utilise local environmental social enterprises for products and services.
- Introduce community timber recycling service for site waste.
- Reintroduce wildlife to the area via bug hotels and bird boxes around site during the construction phase. Adding to the plans already in place for the reintroduction of wild seeded, new trees and plants as part of the final scheme.
- Formulation of a green travel plan for educating the workforce on the benefits of utilising public transport and more environmentally friendly methods of travel (cycling, e-scooters, trams and car sharing etc).
- Installation of cycle stands to site.
- Distribute latest newsletter to residents with an environmental focus on the following points;
    - Retention of local resident's trees on Clients Land.
    - On site parking for contractors and visitors
- Offsite fabrication of building elements (precast stairs, lift shafts and foundation rebar etc.)
- Use of BIM for the reduction of overordering and unnecessary waste.
- Reduced energy usage to site cabins: Energy-efficient systems, LEDs, PIR Sensors, Push taps, doors closers.
- Responsible material sourcing (FSC Certification etc)

- Plug-and-play wiring utilised on site offices (reusable).
- Segregation / waste-management partnerships.
- Dedicated recycling / waste management storage.
- Introduction of PV panels to the building roofs as part of the Design and Build Process.
- Introduction of electric car charging for site operatives (free of charge)
- Revision and update Project Environmental plan to include measures discussed above.

8.0 Pollution Prevention

A Pollution Prevention Plan will be clearly displayed within the site office and all site personnel made fully aware of all sensitive receptors and control measures implemented to be adhered.

8.1 Pollution Prevention Planning and Emergency Response

In the event of an Environmental Incident, procedures must be followed to ensure risks of further spillages/migration of pollutants are minimised. The Glencar Site Management Team will be on standby in the event of a major incident. The Emergency Response is located within the Environmental Policy. Environmental emergencies may include fire and/or explosion, environmental release or serious weather conditions.

Emergency Contact Details will be clearly displayed on the site notice board and information clearly explained to all site personnel during the site induction.

The Pollution Prevention Plan will contain a clear detailed plan of the site, which indicates the location of sensitive receptors such as watercourse, drainage and bore holes. An appropriate number of spill kits will be located within these areas and clearly marked on the plan. It is the responsibility of the site management to ensure all spill kits are fully stocked at all times.

All environmental emergencies must be reported immediately to the Site Manager for preventative and protective measures to be implemented to control/eliminate the emergency and a possible future re-occurrence.

For further information on pollution prevention, please refer to the 'Working at Construction and Demolition sites: PPG6, Pollution Prevention Guidelines' set by the Environmental Agency by clicking on the link below:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/290139/pmho0412bwfe-e-e.pdf

9.0 Project Management

The following section will outline documentation and consents required for the project:

9.1 Licences/Consents/Exemptions

Site management will regularly liaise with the Environment Agency and other regulatory bodies with regard to all consents, exemptions and licences. Any applications will be made with consideration of appropriate timescales. A consents schedule will be completed and held on site files detailing information from date of application. Where specific limitations are set through any licence, consent or exemption, this is to be clearly identified and regularly reviewed to ensure compliance.

Land Drainage Consent will be required from the Environment Agency under the Land Drainage Act of 1991.

Permission for any dewatering activities will need to be sought from the Environment Agency under the terms of the Water Act 2003.

9.2 Site Environmental Documentation

All environmental documentation must be kept on site at all times and be available for inspection by internal and external auditors, as well as the Client. The folder structures will conform to the Glencar Site File Generators on the Internal system. Where any documentation is amended, previous versions will be superseded, and documents transmitted in line with procedures. Site personnel will be made aware immediately, if any significant changes in works procedures are implemented.
Initial startup documentation will include the following:

- Site Setup Checklist - Appendix A
- Environmental Aspects/Impacts Register – Appendix B
- Project Environmental Plan (PEP)
- Site Waste Management Plan (SWMP)
- Pollution Prevention Plan (PPP) – Appendix C

On-going weekly environmental inspections will take place on site by authorised personnel using the Daily/Shift SH&E Inspection Checklist. The findings of these inspections and any associated actions will be appropriately documented in agreed format. Copies will be held on site at all times.

9.3 Reporting

Monthly reporting of waste figures on to the Site Waste Management Plan (SWMP) and environmental incidents will be undertaken by the site.

9.4 Auditing and Monitoring

A regular audit schedule will be implemented throughout the duration of the project and will include both internal and external audits. It is the responsibility of the site management to ensure all documentation and evidence required for audit purposes is kept up to date and freely available for inspection at all times. The site environmental management system will be audited to the standards set out by ISO14001. Additional legal compliance audits will also be undertaken. Any system failures will be documented and appropriate corrective actions issued and implemented.
Daily and Weekly site inspections will be carried out to ensure environmental risks are being managed appropriately. These inspections will be carried out by suitably qualified personnel and the appropriate SH&E inspection forms will be completed and signed off by the site/project management. All documents will be filed and retained on site for auditing purposes. Any failure to undertake such monitoring will be deemed as a non-conformance with procedure and appropriate corrective action will be implemented.

9.5 Training

All Glencar site personnel with environmental responsibilities will be suitable trained and qualified. Where it is indicated that additional specific training requirements are needed, it is the responsibility of the site management to ensure these needs are met at the earliest possible opportunity.

The site induction includes a general overview of environmental issues relating to the site, as well as an overview of how these issues will be managed. It is expected that all appropriate site personnel will undertake in-house Environmental Awareness Training.

Environmental Toolbox Talks covering topics relating to site activities must be given to all site personnel and subcontractors at least fortnightly.

Environmental Alerts must be clearly displayed in all welfare/site areas. Any actions relating to these must be implemented immediately, and all site personnel made fully aware of any changes.

# PROJECT ENVIRONMENTAL PLAN

10.0 Appendix A

| | SITE SETUP CHECKLIST | | | | |
|---|---|---|---|---|---|
| **FREQUENCY** | **NAME OF PROJECT** | | | | **DATE** |
| **MONTHLY** | | | | | |
| **AREAS / ACTIVITY** | **REQUIREMENT** | **COMPLIANCE** | | | **REMARKS** |
| | | **Yes** | **No** | **Improvement** | |
| Site Boundaries | 1) Site fully closed & fenced.<br>2) Hoarding secured /signs.<br>3) Gates provided / secured.<br>4) Signage of prohibition / caution.<br>5) Traffic system/ signs.<br>6) Security. | | | | |
| Emergency Procedure | 1) Evacuation plan.<br>2) Emergency team.<br>3) Induction planned.<br>4) Map for exit routes. | | | | |
| Amenities | 1) Drinking water<br>2) Toilets<br>3) Mess area<br>4) Washing area<br>5) Rest area | | | | |
| Site Communication System | 1) Call no.<br>2) Communication source | | | | |
| Temporary Water & Electricity on Site | 1) Sewer<br>2) Temporary water<br>3) Electrical supplies<br>4) Gensets | | | | |
| Material Storage Facilities | 1) Stores<br>2) Lay down area<br>3) Signs<br>4) COSHH stores | | | | |
| Bus & Car Parking Area | 1) Location on site<br>2) Drop off point<br>3) Signage | | | | |
| Assembly Point | 1) Area (location)<br>2) Map/ drawing<br>3) Signage of exit<br>4) Signage of assembly point | | | | |
| **Checked By;**<br><br>**Name: ..... Designation: ..... Signature: .....** | | | | | |

# PROJECT ENVIRONMENTAL PLAN

## 11.0 Appendix B

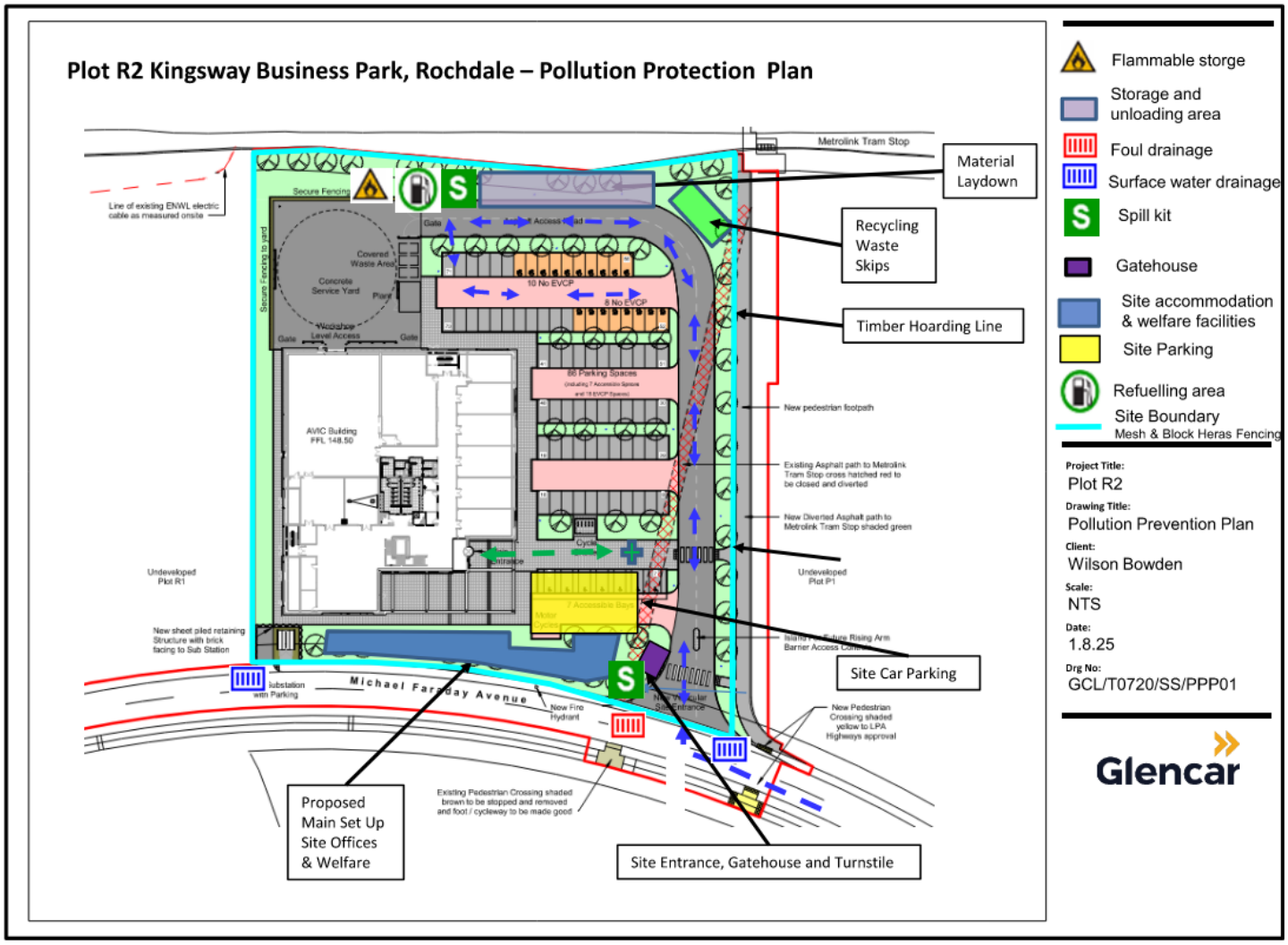
### Environmental Risk Assessment /Impact Register

| Aspect | Impact | Prior to Controls | | | Company Controls / Comment | After Controls | | |
|---|---|---|---|---|---|---|---|---|
| | | Probability (P) | Severity (S) | Risk Rating (PxS) | | Probability (P) | Severity (S) | Risk Rating (PxS) |
| **On Site Works** | | | | | | | | |
| General Waste | Increase in landfill sites due to increase in waste. This therefore leads to the takeover of land and reduced available living or farming availability. Inappropriate disposal may lead to legislative non-compliance | 4 | 2 | 8 | Waste controls are dependant on site requirements and space (i.e. not enough space on all sites to segregate waste). Company holds a current waste carriers license for the transportation of own waste | 2 | 2 | 4 |
| Hazardous Waste | Ground & water contamination as a result of incorrect hazardous waste disposal. Inappropriate disposal may lead to legislative non-compliance | 4 | 3 | 12 | Waste controls are dependant on site requirements. Company holds a current waste carriers license for the transportation of own waste. Hazardous waste is stored safely and securely prior to collection (i.e fluorescent tubes are handled carefully to ensure that they don't break and are placed into a coffin prior to collection by an approved, specialised contractor for removal from site and disposal) | 2 | 2 | 4 |
| Light Pollution (24hr operation) | Light impact to local residents and local wildlife | 4 | 2 | 8 | Restricted working hours (i.e. during the day) as determined by the client | 2 | 1 | 2 |
| Noise Pollution (24hr operation) | Noise impact to local residents and local wildlife | 4 | 2 | 8 | Due to the environment in which the organisation operates, noise control is typically limited to Personal Protective Equipment (PPE), control of operation hours (i.e during daylight hours), acoustic barriers if required, and the most up-to-date tooling is used and regularly inspected / maintained on site to ensure they are operating safely and efficiently | 2 | 1 | 2 |
| Vehicle Storage & Use | Ground / water / air pollution as a result of spillages and releases from poorly maintained vehicles. Inappropriately parked vehicles may lead to restricted access for emergency services or evacuation. Increased mileage and driving resulting in increased fuel consumption and reduced air quailty | 4 | 4 | 16 | Designated areas to park vehicles identified by the client. Reguarly inspect and maintain vehicle(s) to prevent leakages. Reduce air emissions, wherever possible by encouraging telephone conference calls for meetings as opposed to travelling. Longcross offer a 'Cycle To Work Scheme' to all staff to encourage the reduction of carbon emissions (air pollution) | 2 | 2 | 4 |
| Plant & Material Storage | Ground / water / air pollution as a result of spillages and releases from inappropriately stored or poorly maintained plant. Also resulting in possible access restrictions for emergency services / evacuation. Poorly stored plant / materials can increase fire risk | 4 | 3 | 12 | All plant and equipment regularly inspected and maintained to reduce spillages and leaks. Designated parking areas / storage areas for plant & material storage as identified at start of project | 2 | 3 | 6 |
| Purchasing Materials | Increase in air emissions as a result of sourcing materials from suppliers based a significant distance from the project and by placing numerous small orders instead of one big order. Increased waste stream (excess materials) as a result of over ordered. | 5 | 3 | 15 | Materials purchased from local suppliers and consolidated into 1 big order, wherever possible to reduce the carbon emissions used during deliveries. Any materials no longer required for the project to be stored in the office storage yard (if possible) and used on future projects | 1 | 2 | 2 |
| Disturbance to Flora & Fauna | Disturbance of flora & fauna during project activities. Potential spillages of chemicals / fuel from tools / plant used. Potential interaction with non-indiginous species (such as Japenese Knotweed) | 3 | 3 | 9 | Identified primarily by client and survey carried out if an issue arises during project. Competent contractors used if removal required | 1 | 1 | 1 |
| Disturbance to Wildlife | Disturbance to wildlife during project activities due to poorly controlled works resulting in direct influence on protected species (such as badgers & bats). | 3 | 3 | 9 | Identified primarily by client and survey carried out if an issue arises during project. Competent contractors used if removal required | 2 | 2 | 4 |
| Contamination of Land | Contamination caused from leaks and spillages that are allowed / left to soak into the ground | 4 | 4 | 16 | Survey carried out to identify areas of concern, competent contractors used if removal is required | 2 | 2 | 4 |
| Archaeological Disturbance | Disturbance / damage of items of historical interest caused by noise & air pollution and collision | 3 | 4 | 12 | Areas of archaeological / historical interest are identified prior to commencement of works. Areas are surrounded with barriers and in certain cases protected with plastic sheeting whilst works are carried out to the surroudning areas. Regular monitoring of air quality and noise are carried out to ensure that contaminants and vibration do not cause damage to the archaeology | 1 | 1 | 1 |
| Air Emissions from Plant Use | Degradation of local air quality from use of diesel plant | 4 | 3 | 12 | All plant and equipment is maintained or hired with appropriate certification, Local Exhaust Ventilation (LEV) used as required | 2 | 2 | 4 |
| **Site Office** | | | | | | | | |
| Electricity use | Increased air pollution from production (Co2). *(NB: Adds to the long term effect of climate change)* | 4 | 3 | 12 | Use of modern energy efficient equipment, switch off lights or have lights on motion sensors, switch off computers when not in use | 1 | 2 | 2 |
| Gas use | Increased air pollution (CO2) from the use of a gas boiler to heat water in the welfare area. *(NB: Adds to the long term effect of climate change by using a non-sustainable resource)* | 4 | 2 | 8 | Gas boiler removed from site welfare and replaced with electrical heating methods | 1 | 1 | 1 |
| Paper use | Increased use of paper has direct effect on waste amounts and high energy consumption from printing. *(NB: Use of non-sustainable resources and deforestation leads to global climate change)* | 4 | 2 | 8 | Paper use encouraged to be kept at a minimum due to the type of business, paper use is unavoidable because of project plans, safety files, etc | 2 | 2 | 4 |
| Purchasing of equipment / vehicles | Increased energy consumption and / air pollution, etc due to the incorrect selection of type / size / age and performance of vehicle / equipment *(i.e. an old style computer could use more energy as less energy efficient than newer models / an older vehicle would release more carbon emissions than new vehicles)* | 4 | 2 | 8 | Lease / purchase a hybrid and / or low emission vehicle. Ensure that regular inspection & maintenance of the vehicle is carried out. Purchase new, more energy efficient equipment and switch off when not in use to assist in the reduction of energy consumption | 2 | 2 | 4 |
| General Waste | Increase in landfill sites due to increase in waste. This therefore leads to the takeover of land and reduced available living or farming availability. Inappropriate disposal may lead to legislative non-compliance | 4 | 2 | 8 | General waste is limited to cardboard, wood, paper, etc which is segregated for recycling and therefore not sent to landfill | 2 | 1 | 2 |
| Hazardous Waste | Ground & water contamination as a result of incorrect hazardous waste disposal. Inappropriate disposal may lead to legislative non-compliance | 4 | 3 | 12 | Hazardous waste is limited to Waste Electrical and Electronic Equipment (WEEE) and fluorescent tubes. Specialised licenced contractors used for the removal and disposal. PH Neutraliser utilised for disposal of surface water to Stormwater drains. | 2 | 2 | 4 |
| Air Conditioning | Increased use of air conditioning system resulting in an increased electricity consumption. Incorrect / inappropriate work carried out may cause leaks and unintended release of refridgerent to the air, therefore reducing the air quality | 4 | 3 | 12 | No Air conditioning facilities installed on site | N/A | N/A | #VALUE! |
| Water Use | Reduction of water resource through increased usage | 4 | 2 | 8 | Water use is minimal (limited to welfare requirements) | 2 | 2 | 4 |
| Light Pollution | Light impact to local residents and local wildlife | 4 | 2 | 8 | Minimal impact due to business activities being carried out during daylight hours and not situated in a resedential area | 1 | 2 | 2 |
| Noise Pollution | Noise impact to local residents and local wildlife | 4 | 2 | 8 | Minimal impact due to business activities being carried out during daylight hours and not situated in a residential area | 1 | 2 | 2 |
| Landscaping | Disturbance of wildlife / flora / fauna due to landscaping activities. Potential spillages of chemicals / fuel from tools used. Potential interaction with non-indiginous species (such as Japenese Knotweed) | 3 | 3 | 9 | Works carried out by a competent sub-contractor that has assessed the risks and produced Risk Assessment and Method Statements prior to work commencing. Liquid Petroleum Gas (LPG) tools used for the works to ensure fewer emissions released to the atmosphere. Where chemical usage is required, the Eco-friendly type are used | 2 | 1 | 2 |
| Car Parking | Ground & water pollution caused by spillages and releases from poorly maintained vehicles. Restricted access for emergency services by parking in unauthorised areas | 4 | 3 | 12 | All vehicles are subject to regular inspection & maintenance. Designated parking areas are identified for considerate and safe parking | 2 | 3 | 6 |

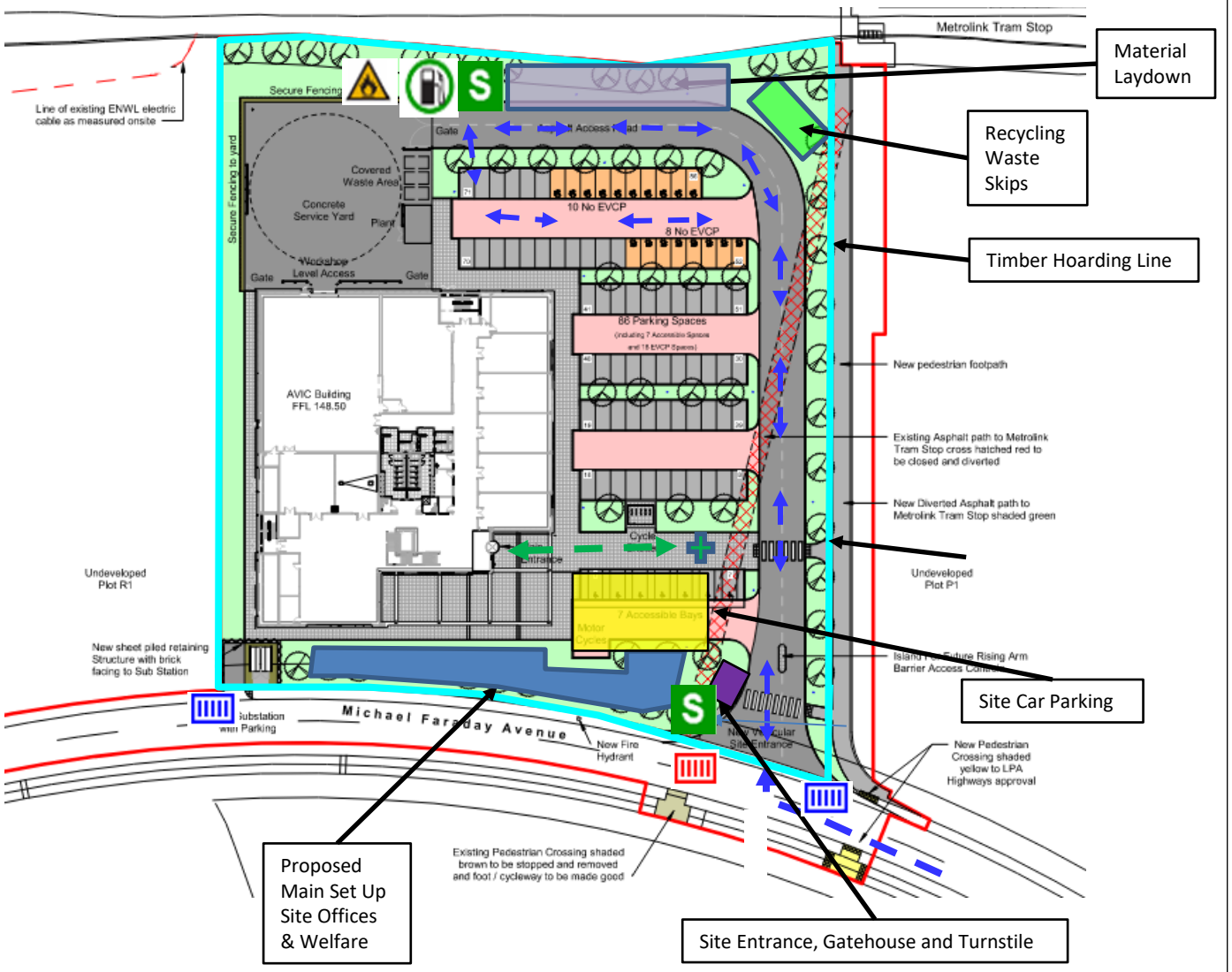
# PROJECT ENVIRONMENTAL PLAN

11.0 Appendix C

Pollution Prevention Plan (PPP)



# Plot R2 Kingsway Business Park, Rochdale – Pollution Protection Plan




- Flammable storge
- Storage and unloading area
- Foul drainage
- Surface water drainage
- Spill kit
- Gatehouse
- Site accommodation & welfare facilities
- Site Parking
- Refuelling area
- Site Boundary
  Mesh & Block Heras Fencing

**Project Title:**
Plot R2

**Drawing Title:**
Pollution Prevention Plan

**Client:**
Wilson Bowden

**Scale:**
NTS

**Date:**
1.8.25

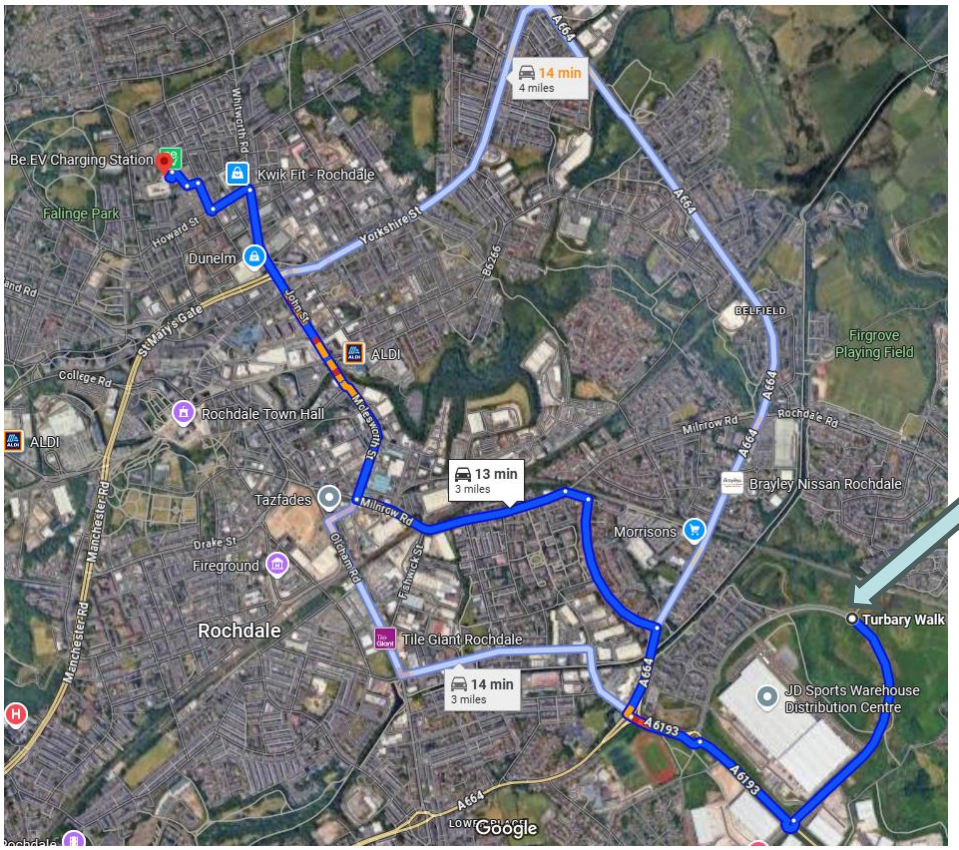
**Drg No:**
GCL/T0720/SS/PPP01

Glencar

# HOSPITAL LOCATION MAP

Distance:4.0 Miles

Estimated travel time: By Car 14 Mins




You are here

## HOSPITAL ADDRESS

Rochdale Infirmary

Whitehall Street

Rochdale

OL12 0NB

## SITE ADDRESS

Plot R2 - Sustainable Materials
Manufacturing Centre (SMMC)
Off Michael Faraday Avenue
Kingsway Business Park
Rochdale
OL16 4FX

## Directions

| | | |
|---|---|---|
| via A671<br>Fastest route now due to traffic conditions<br>Details | 13 min<br>3.0 miles |
| via Michael Faraday Ave and A671 | 14 min<br>3.0 miles |
| via Rochdale Bypass/A664<br>Some traffic, as usual | 14 min<br>4.0 miles |

# Signed Roles & Responsibilities

**See Project Team Contacts sections for signatures. These will be completed prior to commencement on site.**

*Glencar, 5th Floor, 1 St. James Square,*
*Manchester, M2 6DN*

*t. 0161 697 5776*
*e. enquiries@glencar.com*
**www.glencar.com**

Glencar Construction Limited is registered in England and Wales. Company registration no. 09640283
Registered Office; Glencar House, 32-34 Upper Marlborough Road, St Albans, AL1 3UU

# PROJECT TM PLAN

| | |
|---|---|
| Project Name: | Plot R, Kingsway Business Park Rochdale. OL16 FX |
| Project Number: | G1245 |
| Date of Publication: | 15.07.25 |

| Document Review and Issue |
|---|

| | Project Manager | Site Manager Site Manager |
|---|---|---|
| Name: | Steven Schofield | James Baldwin |
| Date: | | |
| Signature: | | |

This TM Plan will be reviewed at least monthly to maintain its relevance to the construction works.

| DATE | REVISION / SECTION | SIGNATURE |
|---|---|---|
| Rev 0 | Initial draft | |
| | | |
| | | |
| | | |
| | | |
| | | |

# PROJECT TM PLAN

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# PROJECT TM PLAN

## 1.0 INTRODUCTION

This Traffic Management Plan (TMP) provides the traffic management procedures to be followed by Sub-Contractors associated with this project. Traffic control devices or signs will be established on-site by Glencar prior to commencing work on the site, road or adjoining streets. This TMP will only be reviewed should there be any changes to the control measures affecting risk.

*1.1*

The following guidance from the HSE has been included to help with setting up traffic management on the construction site:

HSE Quick Guide to transport safety.pdf

### *1.2 Traffic Management Objectives and Strategies*

The objectives of the TMP are to:

- provide for a safe environment for all road users
- provide protection to workers, visitors, agents of the Subcontractor and the general public from traffic hazards that may arise as a result of the construction activity
- minimise the disruption, congestion and delays to all road users
- ensure road network performance is maintained at an acceptable level throughout the term of the work
- ensure access to adjacent commercial premises is maintained at all times.

To achieve the above objectives, the Traffic Management Plan will:

- ensure whenever possible, that a sufficient number of traffic lanes to accommodate vehicle traffic volumes are provided
- ensure that delays and traffic congestion are kept to a minimum and within acceptable levels
- ensure that appropriate/sufficient warning and information signs are installed and that adequate guidance is provided to delineate the travel paths through the work site
- ensure that the work area is free of hazards and that all road users are adequately protected from excavations and obstructions
- ensure that all needs of road users, motorists, pedestrians, cyclists, public transport passengers and people with disabilities are accommodated at and through the work site
- provide for work activities to be undertaken sequentially to reduce the adverse impacts of the work
- provide for safety procedures to enable work personnel to enter and leave the work area in a safe manner.

### *1.2 Legislative and Other Provisions*

This Traffic Management Plan has been developed and shall be implemented with due consideration and in accordance with the latest versions of the following legislative, environment and industry standards:

- Health and Safety at Work Act.
- Construction Design and Management Regulations.
- Traffic Signs Regulations and General Directions.
- New Roads and Street Works Act.
- Road Traffic Act.
- Chapter 8 – Traffic Signs Manual.
- The Highway Code (HMSO publication, ISBN 0-11-550962-3).
- HSG136 – Workplace Transport Safety: An employer's guide.
- HSG144 – The Safe Use of Vehicles on a Construction Site.
- HSG151 – Protecting the Public.
- INDG199 – Workplace Transport Safety: An overview.

Glencar shall ensure that the requirements of these documents and other relevant information will be monitored and the Traffic Management Plan adjusted to meet changing requirements where necessary.

## 2.0 PROJECT DESCRIPTION INCLUDING ANY SPECIAL REQUIREMENTS

The proposed construction site is a 2.528-acre plot off Michael Faraday Avenue within the Kingsway Business Park site. The scope of works comprises the erection of a research & development facility namely the Sustainable Materials and Manufacturing Centre (SMMC). The building will comprise of a large workshop, flexible space for light workshop or office type uses, social café space and lecture theatre to the ground floor. The upper level provides cellular offices, meeting rooms and breakout spaces.

Total Gross Internal Area: 42,572 $ft^2$ / 3955 $m^2$.

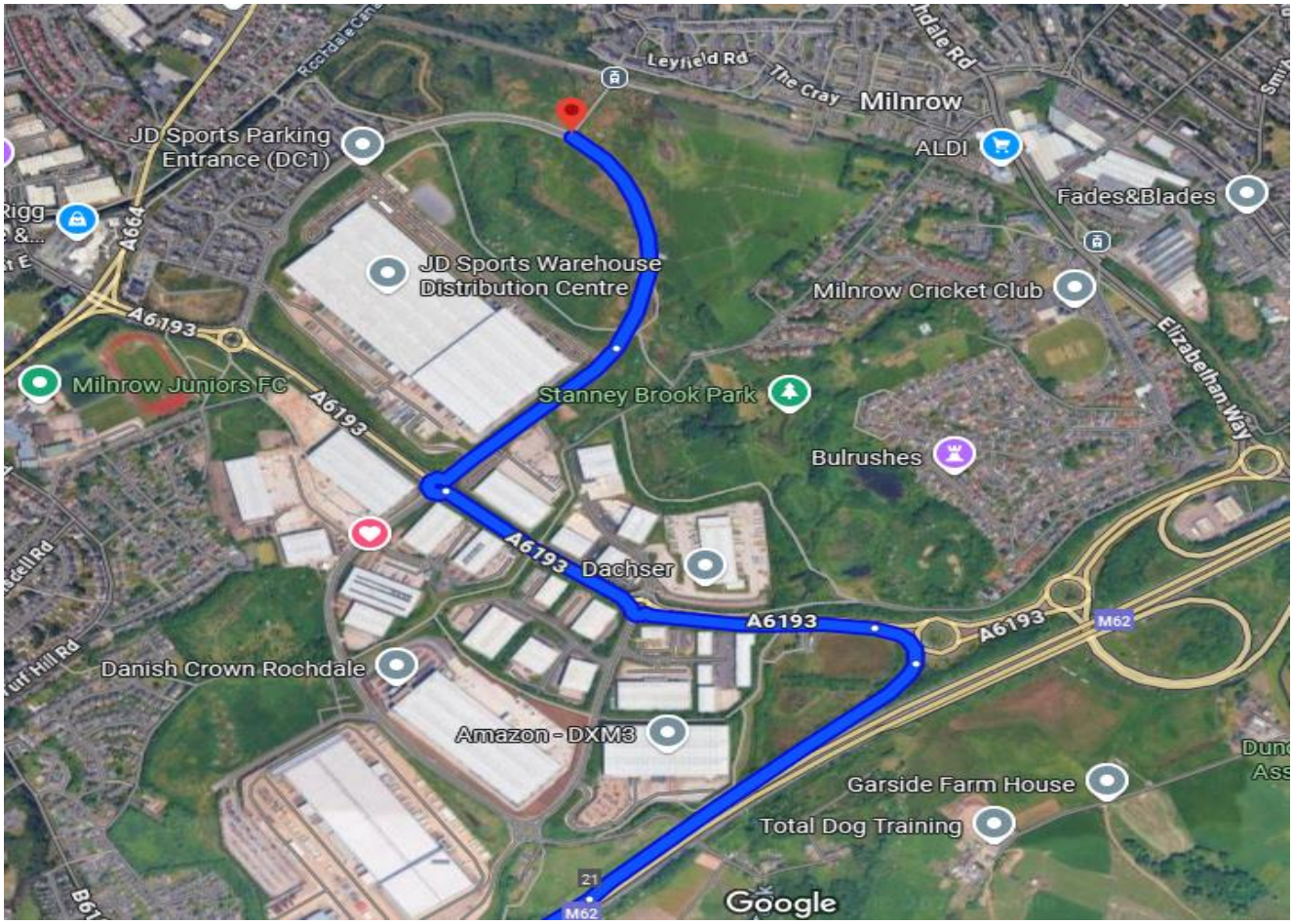
Ground Floor 24822 $ft^2$ / 2306 $m^2$.

First Floor 17135 $ft^2$ / 1592 $m^2$.

Second Floor 615 $ft^2$ / 57 $m^2$.

### *2.1 Project Location*

The project is located at Michael Faraday Avenue and James Kearne Avenue OL16 4FX




2.2 Site Constraints/Impacts

1) There are a number of residents to the North of the site who will be informed of the development by letter drop. There is also a tram line and trams stop to the North of the development. This has an existing footpath off Michael Faraday Avenue which will need to be relocated as this at present cuts through the site.
2) The are 1 new entrance to the new south entrance of the development. These constraints will considered further into the development, including lamp post removal and services lowering.

*2.3 Responsibilities*

Project Manager

Health and Safety responsibilities are to ensure that:

- they appoint a competent Construction Manager responsible for the works and that they have an approved TMP before work commences
- all traffic control measures for this TMP are placed and maintained in accordance with this plan and the relevant Acts, Regulation, Codes, Standards and Guidelines
- suitable communication and consultation with the affected stakeholders is maintained at all times
- inspections of the Traffic Controls are undertaken in accordance with the TMP, and results recorded. Any variations shall be detailed together with reasons
- they arrange and/or undertake any necessary audits and incident investigations.

Construction Manager

The Construction Manager is responsible for overseeing the day-to-day activities, and is therefore responsible for the practical application of the TMP. Their Health and Safety responsibilities are to ensure that:

- the TMP is implemented for the prevention of property damage and injury to employees, Sub-Contractors, road users and all members of the public
- workers are instructed on the relevant safety standards, including the correct wearing of high visibility safety vests, safety boots and other equipment as required
- traffic control measures are implemented and maintained in accordance with the TMP
- they undertake and submit the required inspection and evaluation reports to management
- they render assistance to road users and stakeholders when incidents arising out of the works affect the network performance or the safety of road users and workers
- they take appropriate action to correct unsafe conditions, including any necessary modifications to the TMP
- they are to ensure that a competent Construction Site Traffic Co-ordinator is appointed to manage the workforce.

Construction Site Traffic Co-ordinator

Their Health and Safety responsibilities are to ensure that:

- any traffic management devices are set out are in accordance with the TMP
- traffic is co-ordinated between Subcontractors and those affected by the works on a daily basis
- all site personnel are fully aware of their responsibilities, and traffic-controllers are appropriately trained and accredited
- sufficient controllers are available to ensure appropriate breaks are taken and that all personnel engaged in the field activities will follow the correct work practices
- the works is carried out in accordance with the TMP, reporting back to the Construction Manager any delays, issues or injuries etc.

### Transport Banksmen

Their Health and Safety responsibilities are to ensure that:

- they control road users to avoid conflict with plant, workers, traffic and pedestrians, and to stop and direct traffic in emergency situations
- they operate in accordance with their training.
- they hold a current Transport Banksmen certificate.
- they take appropriate breaks.

### Workers and Sub-Contractors

Their Health and Safety responsibilities are to ensure that:

- they wear the correct high visibility vests, in addition to other protective equipment required (e.g. footwear, gloves, helmet, sun protection, eye protection etc), at all times whilst on the worksite
- they comply with the requirements of the TMP and ensure no activity is undertaken that will endanger the safety of other workers or the general public
- they enter and leave the site by approved routes and in accordance with safe work practices.

### Appointments

The following appointments have been made to this project:

| Position | Name | Email | Phone No. |
|---|---|---|---|
| Project Manager | Steven Schofield | Steve.schofield @glencar.com | 07725485192 |
| Construction Manager | James Baldwin | James.baldwin @glencar.com | 07584182046 |
| Construction Site Traffic Co-ordinator | James Baldwin | James.baldwin @glencar.com | 07584182046 |
| Transport Banksman / Gateman | TBA | | |

## 3.0 WORKS ON ROAD

### *3.1 Project Scope*

At present there is a scope for 278 works. This will be managed further into the project

## 4.0 PLANNING AND CONTROLS

### *4.1 Emergency Procedures for Traffic Incident*

In the event of an incident involving traffic or road users, all work shall cease and traffic shall be stopped as necessary to avoid further deterioration of the situation. First Aid shall be administered as necessary, and medical assistance shall be called for if required.

#### Life Threatening Injuries

An ambulance shall be called on telephone number 999, also contacting Glencar Group Construction Manager and Project Manager immediately.

#### Traffic Incidents

The Police shall also be called on 999/111, also contacting Glencar Construction Manager and Project Manager for traffic incidents where life threatening injuries are apparent. Any traffic crash resulting in non-life threatening injury shall immediately be reported to the Local Police Station at The Holme, The Esplanade Rochdale Ol16 1AG 0161 856 and Glencar Construction Manager and Project Manager.

Broken down vehicles and vehicles involved in minor non-injury crashes shall be temporarily moved to the verge as soon as possible after details of the crash locations have been gathered and noted. Where necessary to maintain traffic flow, vehicles shall be temporarily moved into the closed section of the work area behind the cones, providing there is no risk to vehicles and their occupants or workers. Assistance shall be rendered to ensure the impact of the incident on the roadwork is minimised. Details of all incidents shall be reported to the Construction Manager and Project Manager immediately.

### *4.2 Damage to Services*

In the event that gas services are damaged, all work shall cease immediately, machinery and vehicles stopped and the area cleared of personnel as soon as possible. Traffic Controllers (and other personnel if necessary) shall

be deployed immediately to ensure no traffic or other road users approach the area. The Police Service and relevant supply authority shall be called immediately. Damage to any other services shall be treated in a similar manner except machinery may remain operational and access may be maintained where it is safe to do so. All site personnel shall be briefed on evacuation and control procedures.

### *4.3 Control and Direction of Pedestrians*

The worksite and its immediate surroundings shall be secured by the installation of heras fencing.

The existing footpath through site will be closed once the new footpath has been completed fully.

Within the site a combination of aluminium pedestrian barriers and heras fencing will be utilised depending on application.

### *4.4 Night Work Provisions*

No night works are being undertaken at this present time. The existing street lighting provides adequate illumination for traffic moving past the work site after working hours. Glencar will also provide hoarding lights to give adequate lighting for pedestrians should this be required.

### *4.5 Public Notification*

All adjacent properties will be advised in writing of the road and construction works.

### *4.6 Site Deliveries*

All deliveries to and collection from site are to be booked in with the Glencar Site Management. The details of the planned delivery/collection times will be entered into a Delivery Register held on Inndex. Any vehicle that comes outside of their allotted time will be turned away unless there is room on the site to safely accommodate the vehicle. Any vehicle that has not been booked in may risk being refused entry onto site if there is not enough room to safely accommodate. Transport banksmen will be available to supervise all vehicle movements. Storage/collection areas will be set up on site for the delivery and collection of all materials to and from site.

### *4.7 Segregation of the Works*

All routes will be clearly segregated to keep pedestrians and transport routes apart. Heras fencing or aluminium pedestrian barriers will be used to separate vehicle and pedestrian routes. Where there is a risk of a vehicle strike

then mass barriers will be used to offer greater protection to the workforce. All routes will be clearly marked using appropriate warning signs.

### *4.8 Risk Identification and Assessment*

Risk analysis of the proposed works has identified a number of risk events/items that will be managed by effective traffic management planning and the implementation of this TMP. All identified risks have been treated by development of this TMP. Unforeseen risks arising during the works will be treated in accordance with standard work practices and procedures where appropriate.

| Risk | Existing Risks | | | Control Measures | Residual Risk | | |
|---|---|---|---|---|---|---|---|
| | L | S | Rating | | L | S | Rating |
| Workers being hit by vehicles during setting up and dismantling of traffic management | 2 | 3 | 6 | Shadow vehicles with flashing lights used to protect vehicles. | 1 | 3 | 3 |
| Vehicles crashing into or through the worksite injuring workers. | 3 | 3 | 9 | Provide traffic management as per this TMP. Traffic arrangements to be evaluated for effectiveness following initial opening to traffic. | 2 | 2 | 4 |
| Pedestrians getting too close to the work area and being injured by machinery or tripping. | 2 | 2 | 4 | Re-direction of pedestrians. Provide pedestrian containment fencing around work area. Provide pedestrian routes. | 1 | 2 | 2 |
| Rear end and sideswipe crashes due to merging traffic | 2 | 2 | 4 | Advance warning signs, lane status signs and delineated tapers as well as flashing arrow signs | 1 | 2 | 2 |
| Construction traffic entering or leaving the work site may stop unexpectedly or behave | 3 | 3 | 9 | Construction vehicles fitted with warning devices. Operators instructed on safe procedures and "Spotters" will assist drivers in entering or leaving work site. | 2 | 2 | 4 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| in an unexpected manner | | | | | | | |
| Pedestrians misreading the signs, crossing street being injured. | 3 | 3 | 9 | Direct pedestrians to cross at designated safe crossing points outside work site. | 2 | 2 | 4 |
| Vehicles losing control and entering excavation. | 2 | 3 | 6 | Establish safety space and impose temporary speed zones. | 2 | 2 | 4 |

Risk Identification and Response Table

### *4.9 Site Vehicular Traffic*

#### Parking Facilities

All parking will be on site at all times, in a safe segregated area. See Logistics plan provided. The general premise is that an area to the West of site (Plot R1) will be used to provide temporary parking whilst 278 works and earthworks are ongoing. This area will be vacated and returned as close to previous condition as practicable. The temporary parking will likely be sheeted and stoned as a hard standing. A temporary access permit will be obtained. Under no circumstances must any site operative or visitor park on any roads, paths or pavements. Any person found to be deviating from these rules will be asked to leave site.

#### Heavy and Oversized Vehicles and Loads

All oversized loads and transport has to be booked in directly with Rochdale borough council movement Dept. Each subcontractor is liable for their own transport movement orders, these need to be notified to the Glencar team for acceptance also.

#### Public Transport

Public transport that can be used to get to site. The nearest bus stop is Stop ID MANAAJ on Michael Faraday Avenue.

#### Special Events and Other Works

No special events have been identified yet that may impact the project. However, alterations may be made to this plan should an event occur.

### *4.10 Non-Motorised Road Users*

#### Cyclists and Pedestrians

Cycling is encouraged by Glencar Group and local cycle routes to site may be found at TfGM website.

#### People with Disabilities and Other Vulnerable Road Users

There is no specific facility or service nearby that would increase normal use of the road facilities by people with disabilities and other vulnerable road users.

#### School Crossings

There is school to the Northwest of the site, however school crossing are not in the vicinity of the site at this point.

### *4.11 Site Environment*

#### Access to Adjoining Properties

The project is not envisaged to affect vehicle access to adjoining properties.

Weather:

All precautions are in places and at present no specific requirements are envisaged.

Road Geometry / Terrain

There are no specific geometry or terrain issues, all vehicles will proceed from the road to site. The road is flat with ample sight distances on the approaches to the worksite. There are no grades to affect deceleration or acceleration of vehicles and current geometry meets safe stopping sight distances for the existing 30mph zone.

Existing Signage:

No existing signage is anticipated to be affected during the construction of the works.

There is no hinderance to existing signage or road users along the site boundary. There are no structures affecting sight lines or access. The surrounding environment is built-up. There are no significant dust-producing elements. The works being undertaken are "Off-road" works and will not generate excessive dust.

The work is being carried out during normal weekday daytime hours. There are no nearby facilities, which require specific noise limiting measures. There are no specific noise restrictions by the Local Authorities.

Other:

5.0 IMPLEMENTATION

*1.3 5.1 Hazard Identification, Risk Assessment and Control*

In establishing adequate controls for the hazards identified in Section 4.8, Glencar have used a structured approach via the use of the hierarchy of control as outlined below:

1. Elimination
2. Substitution
3. Engineering
4. Administration
5. Personal Protection Equipment

Work will not commence until all appropriate signs, devices and barricades are in place and in accordance with the requirements of the Traffic Management Plan. All necessary signs and traffic control devices will be installed at the work site to direct and regulate traffic movements around the work activity and ensure that adverse impacts associated with the works are kept to a minimum.

Glencar Traffic Management practices require that the Construction Manager will evaluate all traffic arrangements before they are open to traffic and immediately following the opening to traffic.

Adjustments are to be made as required and recorded in the daily diary, including reasons for the changes. The Construction Manager is also required to evaluate the traffic arrangements where site conditions change. New hazards that arise throughout the work will be subject to risk assessment and incorporated onto the Risk Register.

### *5.2 Traffic Control Diagrams*

The Traffic Control Diagrams are attached to this document and will be amended according to the works being carried out. The TMP will be updated then posted for all on site to see. Any changes to the TMP will be passed to all Sub-Contractors during the planned meetings as per the Construction Phase Plan.

### *5.3 Traffic Control Devices*

Traffic control devices shall be erected in accordance with guidance docs. Before work commences, signs and devices at the approaches to the work area shall be erected in accordance with this TMP in the following sequence:

- Advance warning signs. (Erect approach and departure signs on approaches to the work site)
- All intermediate advance and positional signs and devices required in advance of the taper or start of the work area
- All delineating devices required to form the taper including the illuminated flashing arrow sign at the end of the taper where required. (Install delineation devices and lane closures)
- Delineation past the work area
- All other required warning and regulatory signs.

The signs and traffic control devices are to be removed in the reverse order of installation. A vehicle displaying a vehicle mounted warning device shall be used in advance of the signs and traffic control devices to protect workers removing the signs or traffic control devices.

Work will not commence or continue until all signs, devices and barricades are in place and operational in accordance with the requirements of the TMP. The number, type and location of signs, devices and barricades shall be to a standard not less than Chapter 8. Devices no longer required shall be promptly and completely removed from road user's lines of sight.

### *5.4 Signs*

All signs shall be in accordance with Department of Transport specifications. The Symbolic Worker sign shall also be fluorescent. Prior to the installation all signs shall be checked for damage and cleanliness and repaired, replaced or cleaned as necessary. Signs and devices shall be erected in accordance with the locations and spacing's shown on the drawings such that they:

- are properly displayed and securely mounted
- are within the driver's line of sight
- cannot be obscured from view
- do not obscure other devices from the driver's line of sight
- do not become a possible hazard to workers or vehicles
- do not deflect traffic into an undesirable path.

All existing 30mph speed limit signs on the carriageway within the work site shall be retained as "speed re-establishment" signs. There are no other traffic or advertising signs in the vicinity which could cause distractions or confusion, or which restrict sight lines.

The following signage will be deployed entering the site and within the grounds generally arranged as shown below:

(i) 5 mph speed limit
(ii) No reversing without Signaller
(iii) Caution moving traffic
(iv) No unauthorised plant past this point
(v) Restricted area signs
(vi) Keep clear
(vii) No parking

Additional signage will be positioned to provide directions; the outline above is intended to indicate the positioning of safety signage to ensure clear lines of sight for arriving and departing vehicles is considered in signage procurement and placement.

### *5.5 Pavement Marking*

The off-road works will not have any impact on the existing pavement markings. 278 works will be advised during the project.

### *5.6 Delineation*

Traffic cones or bollards will be erected in accordance with the drawings as temporary lane separators between through traffic lanes as shown in the traffic management plan. Cones and bollards shall be fitted with suitable

white retro-reflective tape. All cones or bollards will be inspected daily and where displaced or missing made good immediately.

All Traffic Line Cones will be 75cm one piece ballast filled cone conforming to B873, fitted with sealed retro-reflective D2 sleeve. Cellular construction of D2 sleeve for greater tear resistance.

The base of the cones and bollards shall be designed to be stable under reasonably expected wind conditions and air turbulence from passing traffic. The Construction Site Traffic Controller will inspect cones at intervals necessary to ensure any miss-alignment or displacement is identified and corrected prior to this causing disruption to traffic.

### *5.7 Site Access*

Drivers accessing the construction site by Michael faraday Avenue encouraged to use the Westen access route so as to avid traffic from the housing estate adjoining MFA. They should decelerate slowly and signal their intention by indicator to leave the traffic stream, the vehicle's rotating yellow lamps should be activated once a speed of 20 mph has been reached at 50 metres from the point of entry. A security guard / gateman will open the gate and remove traffic cones to allow work vehicles to enter the work site. All drivers will be issued with a traffic management drawing showing the site setup and all delivery locations. A Transport Banksman from the drivers company will be on hand to ensure that the site rules are adhered to during delivery.

Drivers leaving the work site shall, leave via the same entrance gate, and have the vehicle's rotating yellow lamps activated and only enter the traffic stream when advised by the transport banksmen when it is safe to do so. The rotating yellow lamps should be turned off once a speed of 30 mph is reached.

### *5.8* RULES for Drivers.

DO comply with road traffic legislation

DO use vehicle warning systems

DO Use only approved vehicle routes

DO follow instructions give by authorised persons (security, banksmen, traffic marshals, site management etc)

DO operate your flashing amber beacon

DO beware of height restrictions

DO beware of site operations

DO give right of way to pedestrians at all times

DO ensure appropriate vehicle safety equipment is fitted and operational.

DON'T create excessive noise unnecessarily

DON'T use mobile phones

DON'T exceed the site speed limit

DON'T not reverse without a traffic marshal/banksmen in attendance

DON'T smoke, unless in a designated areas

DON'T drive or enter the site under the influence of drugs or alcohol

DON'T remove items from site without signed authority

DON'T block emergency escape routes

### 5.9 Unloading & storage areas

The locations of the unloading and storage areas are clearly marked on the Traffic Management Plan which can be found in Appendix A of the Construction Phase Plan.

All contractors and deliveries are to ensure that they unload in this area only and that the area is kept clear of materials, equipment, etc.

All deliveries are to be moved to the designated storage area(s) as soon as possible. Contractors are responsible for keeping their own storage areas / containers tidy and free of unnecessary mess.

### 5.10 Moving plant / vehicles

All vehicles and plant on site are to adhere to the site speed limit which is clearly marked on the Traffic Management Plan (GSF 66) which can be found in file 1.1.6.

Reversing is to be avoided where possible. If vehicles / plant do need to reverse then this is to be carried out with a banksman present.

If vehicles / plant need to move through public areas then they must be escorted by a banksman until they are back within the site.

### *5.11 Communicating TMP Requirements*

The requirements of the TMP will be communicated to all personnel entering the site through the site induction program, planned meetings and toolbox talks.

## 6.0 MONITORING AND MEASUREMENT

### *6.1 Site Inspections & Record Keeping*

The Project Manager will ensure that the Traffic Management Plan is implemented and evaluated for effectiveness. The manager shall inspect and monitor traffic movements around the site in conjunction with the personnel who have erected the control measures. The outcomes of the inspection will be recorded for the information of the Project Manager.

Inspections shall be undertaken as required and at a minimum on the following occasions:

- Before the start of work activities on site
- Closing down at the end of the shift period
- During the hours of work
- After hours.

A daily record of the inspections will be kept indicating:

- When traffic controls where erected;
- When changes to controls occurred and why the changes were undertaken;
- Any significant incidents or observations associated with the traffic controls and their impacts on road users or adjacent properties.

Where significant changes to the work or traffic environment or adverse impacts are observed, the controls should be reviewed as a matter of urgency. Daily Inspection Sheets shall be completed by the person undertaking the inspections and reviewed by the manager. All variations to the TMP, non-conformances, incidents and accidents shall be recorded. Copies of the completed report shall be forwarded to the Construction Manager.

### *6.2 Public Feedback*

Glencar will use the Considerate Constructors Scheme Complaints form to record comments and complaints received from the public, regarding the works. The Construction Manager is responsible for monitoring the register on a daily basis.

# Project Directory

**WBD, AVIC**

Updated: **06/09/2024**

| NAME | ROLE | JOB TITLE | ORGANISATION | ADDRESS | LANDLINE NUMBER | MOBILE NUMBER | EMAIL ADDRESS |
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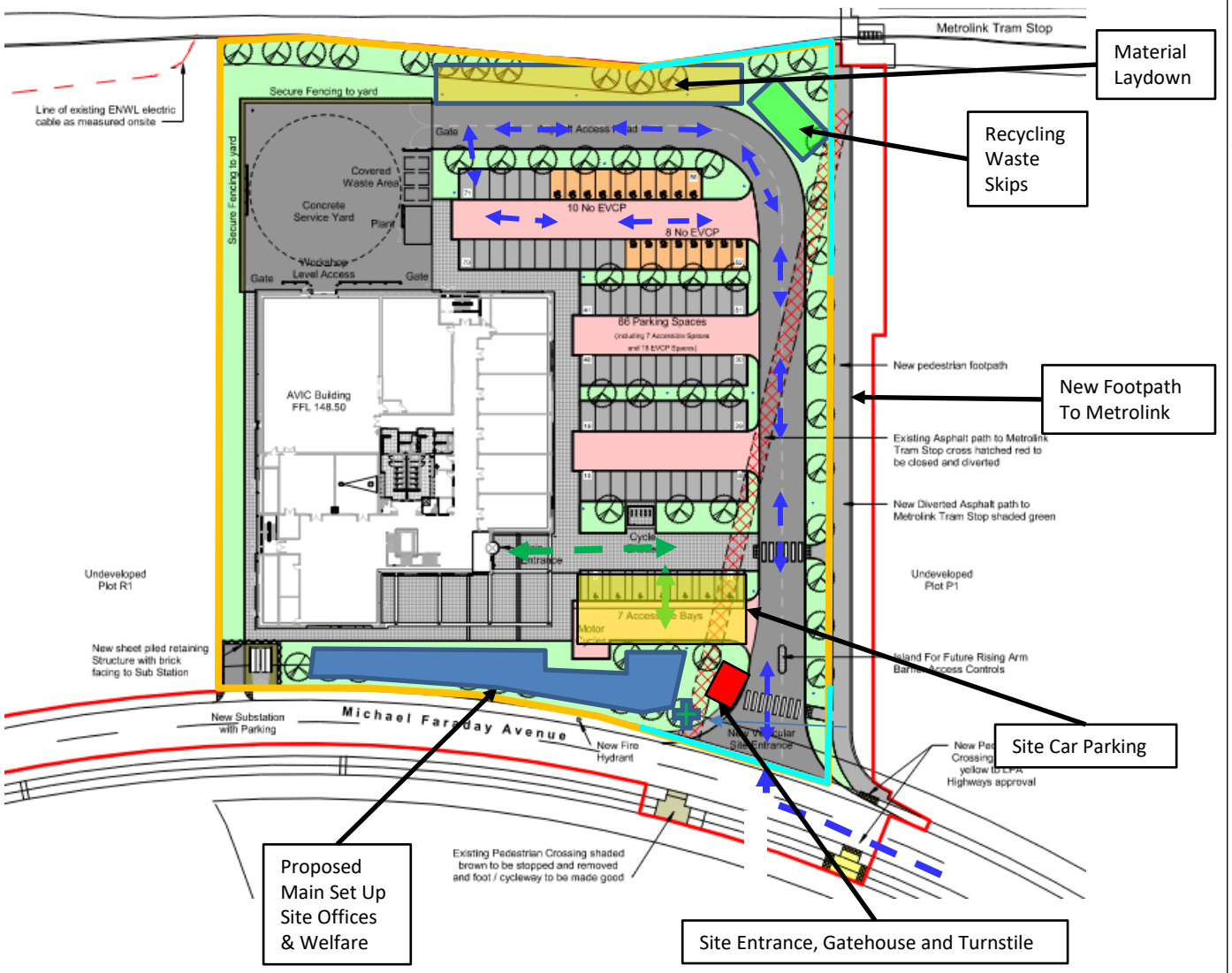
# Project Directory

**RBC, AVIC**

Updated: **02/09/2024**

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# Plot R2 Kingsway Business Park, Rochdale – Traffic Management Plan




- Gatehouse
- Site Offices, Stores & Welfare Facilities
- Site Car Parking
- Managed Pedestrian Routes
- Construction vehicles
- Hoarding Line Once Footpath Formed
- Site Boundary(approx.) Mesh & Block Heras Fencing
- First aid and Muster point

**Project Title:**
Plot R2

**Drawing Title:**
Traffic Management Plan

**Client:**
Wilson Bowden

**Scale:**
NTS

**Date:**
07. Jul 2025

**Drg No:**
GCL/T0720/SS/TM1

Glencar

Wilson Bowden Developments

Mascot Management

# Pre-construction Information

for

Wilson Bowden Developments Ltd &
Rochdale Borough Council
Plot R2 Sustainable Materials Manufacturing Centre (SMMC)
Rochdale

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| Rev: | Prepared by: | Authorised for Issue by: | Date: |
|---|---|---|---|
| 3 | Jason Evans | Paul Skelland | 10 January 2025 |

# 1 Description of the Project

## 1.1 Introduction

Kingsway Business Park is a partially completed 170-hectare development between Rochdale and Junction 21 and 22 of the M62. The site is located within Kingsway Business Park, approximately 2.4km from Rochdale. The site is between the town of Rochdale and the M62 motorway on an undeveloped plot of the existing Kingsway Park Business Park.

The site is predominantly covered by mature vegetation, with boggy areas located in topographic low points. Wallis Avenue, Lower Lane (Stanney Brook), and Sir Isaac Newton Way form the western, eastern, and southern boundary roads. To the north of the site is a Metrolink stop and Turbary Walk.

The proposed construction site is a 2.528-acre plot off Michael Faraday Avenue within the Kingsway Business Park site. The scope of works comprises the erection of a research & development facility namely the Sustainable Materials and Manufacturing Centre (SMMC). The building will comprise of a large workshop, flexible space for light workshop or office type uses, social café space and lecture theatre to the ground floor. The upper level provides cellular offices, meeting rooms and breakout spaces.

Total Gross Internal Area: 42,572 ft² / 3955 m².
Ground Floor 24822 ft² / 2306 m².
First Floor 17135 ft² / 1592 m².
Second Floor 615 ft² / 57 m².

61 No. Standard car parking spaces will be provided.
7 No. Disabled car parking spaces will be provided.
18 Spaces to have Electric Vehicle Charging Points.
Total of 86 No. parking spaces.

## 1.2 Project Location

The project address is:

Plot R2 - Sustainable Materials Manufacturing Centre (SMMC)
Off Michael Faraday Avenue
Kingsway Business Park
Rochdale
OL16 4FX

## 1.3 Programme Details

Based on the Plot R WBD Development Tender Programme. The planned date for the start of the construction works is 09 September 2025 and the estimated construction period is 60 weeks.

The client has allowed the principal contractor a minimum of 35 weeks to plan and prepare for the construction works.

The principal contractor shall provide a sufficiently developed construction phase health and safety plan for review by the project safety advisor at least 4 weeks before the commencement of the work on site.

## 1.4 Project Notification

An F10 Notification will be submitted to the HSE on behalf of the developer and will be updated by the project safety advisor when the Principal Contractor is appointed, the construction period has been finalised; or as and when any of the relevant key information changes during the project.

## 1.5 Details of Client, Principal Designers, and Designers as defined under CDM Regs 2015.

| | | |
|---|---|---|
| Developer/Employer | **Wilson Bowden Developments Ltd**.<br>Cartwright Way<br>Forest Business Park<br>Bardon Hill<br>Leicestershire LE67 1UB | Tel 01530 276276<br>Email:<br>dave.ellis@wilsonbowden.co.uk |
| End Client | **Rochdale Metropolitan Borough Council.**<br>Number One Riverside<br>Smith Street<br>Rochdale OL16 1XU | Tel 01706 647474<br>Email:<br>Stephen pressman |
| Architect/Landscape Architect/Principal Designer | **DLA Architecture**<br>6 East Parade<br>Leeds LS1 2AD | Tel 0113 8873135<br>Email:<br>ben.gavaghan@dla-architecture.co.uk |
| Designers (Structural) | **BWB Consulting Ltd**<br>5th Floor<br>Waterfront House<br>Station Street<br>Nottingham NG2 3DQ | Tel: 07970 282 604<br>Email: Peter.Davies@bwbconsulting.com |

| | | |
|---|---|---|
| Building Services Engineer | **BWB Consulting Ltd**<br>Whitehall Waterfront<br>Riverside Way<br>Leeds<br>LS1 4EH | Tel: 0113 233 8001<br>Email: Peter.leonard@bwbconsulting.com |
| Designers<br>(Infrastructure) | **BWB Consulting Ltd**<br>11 Portland Street<br>Manchester<br>M1 3HU | Tel: 07918 277 599<br>Email:<br>Joseph.Hackwell@bwbconsulting.com |
| Designers<br>(Geotechnical) | **BWB Consulting Ltd**<br>11 Portland Street<br>Manchester<br>M1 3HU | Tel: 07425 817 470<br>Email: alex.booer@bwbconsulting.com |
| Designers<br>(Landscape) | **DLA Architecture**<br>55 St Pauls<br>Leeds LS1 2TE | Tel: 07764 241 433<br>Email: Chris.Hardy@dla-architecture.co.uk |
| Project Safety Advisor | **Mascot Management Ltd**<br>Wards Court<br>203 Ecclesall Road<br>Sheffield S11 8HW | Tel: 0114 275 3275<br>Email: jevans@mascotmanagement.co.uk |
| Principal Contractor | **TBC**<br>TBC | Tel: TBC<br>Email: TBC |

## 1.6 Workplace

The completed project will also be used as a workplace, so the finished design will need to take account of the relevant requirements of the Workplace (Health, Safety and Welfare) Regulations 1992. This will include provisions related to general workplace safety, sanitation facilities, lighting, ventilation, temperature control, and other aspects relevant to workers' welfare.

The Principal Contractor shall follow the guidance provided by the Health and Safety Executive (HSE) that is relevant to the construction industry, including documents such as "Managing Health and Safety in Construction" (HSG 150) and "Workplace Health, Safety and Welfare: A Short Guide for Managers" (HSG 71), and adhere to the relevant ACoPs, such as "Workplace Health, Safety and Welfare: Workplace (Health, Safety and Welfare) Regulations 1992 - Approved Code of Practice and Guidance" (ACoP L24).

## 1.7 Extent and location of existing records and plans

The principal contractor should also consult the full tender pack of information and read it in conjunction with the information contained within this PCI Pack. They shall take all industry standard precautions before and during work commencing.

The Principal Contractor will follow the guidance provided by the Health and Safety Executive (HSE) that relates to Electrical work, HSG85 (Third edition) Electricity at Work: Safe Working Practices, HSG150 - Health and Safety in Construction and The Electricity at Work Regulations 1989. This guidance provides essential information on managing risks.

A comprehensive list of drawings and reports are contained within the tender pack information as detailed below:

These documents are available and will require due consideration in planning construction activities. Contained within Appendix 2:

| | | |
|---|---|---|
| Appendix 2.0 | 2022-040_002_RevP01_SITE PLAN GA | Site Plan GA |
| Appendix 2.1 | 2022-040_001_RevP01_PLOT AREAS | Plot Areas |
| Appendix 2.2 | 2022-040_AVIC-DLA-XX-00-DR-A-90100_RevP02_TRANSFER PLAN 1 RED LINE PROPERTY PLAN | Transfer Plan 1 – Red Line Property Plan |
| Appendix 2.3 | 451845361_Electricity North West | Electricity North West |
| Appendix 2.4 | 2022-040_AVIC-DLA-XX-00-DR-A-90107_RevP02_EXISTING ENWL | Existing ENWL |
| Appendix 2.5 | 2022-040_AVIC-DLA-XX-00-DR-A-90104_RevP01_ENWL SUB STATION RED LINE PROPERTY PLAN | ENWL Substation – Red Line Property Plan |
| Appendix 2.6 | 2022-040_AVIC-DLA-XX-00-DR-A-90103_RevP02_TRANSFER PLAN 4 FW AND SW MEDIA SERVICES | Transfer Plan 4 – FW & SW Media Services |
| Appendix 2.7 | PRK-BWB-XX-XX-DR-ME-0300_Existing Utilities Services Layout, Proposed Site Plan-S2-P1 | Utilities Services Existing Utilities Services Layout, Proposed Site Plan |
| Appendix 2.8 | PRK-BWB-XX-XX-DR-ME-0301_Proposed Utilities Services Layout, Proposed Site Plan-S2-P1 | Utilities Services Proposed Utilities Services Layout, Proposed Site Plan |

The principal contractor should not assume that this information is definitive and shall take all industry standard precautions before and during excavation commencement.

### 1.8 Previous Use of the Site

The site is undeveloped and was previously used as public farmland. Clearance of the land is to take place. Please reference document ER-6649-01 PEA Statutory Metric which identifies a precautionary approach regarding the protection of potential badger habitats. Given the presence of badgers nearby, a pre-works check for setts is to be carried out by the Principal Contractor before construction activities can commence.

To prevent the proposed works from impacting nesting birds, any clearance of vegetation will need to be undertaken outside of the breeding bird season, which runs from 1st March to 31st August inclusive. Any clearance required during the breeding bird season should be preceded by a nesting bird survey to ensure that the law is not contravened through the destruction of nests and that any active nests are identified and adequately protected during the construction phase of the development.

This document can be found in Appendix 5 of this document.

### 1.9 Health and Safety File and Other Existing Records and Plans

As the site is undeveloped, there is no existing Health and Safety File.

In addition to the information contained within the appendices of this document, a Phase 2 Geo-Environmental Assessment has been prepared and has been issued elsewhere as part of the tender documents.

## 2 Client's Considerations and Management Requirements

### 2.1 Arrangements for Planning for and Managing the Construction Work, Including any Health and Safety Goals for the Project

The Client requires the following safety goals to be targeted for this project:

- The project is to be managed to achieve zero accidents. The project shall not receive any HSE Improvement or Enforcement Notices
- If this target is not achieved all accidents must be fully investigated and details reported as necessary and forwarded to the project safety advisor

Reports on activities and progress in achieving these goals will be included in the principal contractor's regular progress reports. The principal contractor will provide all the necessary information and resources to meet these requirements.

## 2.2 Arrangements for Communication and Liaison Between Client and Others

The construction phase health and safety plan must include arrangements for regular liaison between parties on site, consultation with the workforce, exchange of information between the Client, designers, project safety advisor and contractors.

**The principal contractor shall include information in the construction phase health and safety plan for**:

- Managing the project including the identity and responsibilities of his management team and managing contractors and suppliers to ensure that design changes are managed effectively
- Communicating with contractors on a frequent and regular basis, particularly in terms of maintaining safe access and egress, escape routes and interfaces.

## 2.3 Arrangements for Security of the Site

Maintaining a secure site out of working hours is of paramount importance. The Principal Contractor shall ensure that adequate security measures are implemented to prevent unauthorised access to the site and control access to materials and plant. The entrance to the construction area shall be identified and procedures shall be established for visitors to report their presence as soon as they arrive on site. The initial construction phase plan shall detail the following measures.

A comprehensive risk assessment will be conducted to identify potential security risks and vulnerabilities associated with the construction site. This assessment will guide the selection and implementation of appropriate security measures.

The Principal Contractor will establish a range of security measures based on the site-specific risks and requirements. These measures will be designed to deter unauthorised access, theft, vandalism, and other security breaches.

Adequate provisions will be made to secure valuable equipment, machinery, and materials through appropriate storage, locking mechanisms, and restricted access. **The initial construction phase plan shall detail these measures**. The entrance to the construction area shall be identified and procedures shall be established for visitors to report their presence as soon as they arrive on site.

## 2.4 Arrangements for Welfare Provisions

The Principal Contractor is responsible for providing appropriate welfare facilities in accordance with 13(4) c) of the CDM Regulations. These must meet the requirements set down in CDM 2015 and in particular Schedule 2.

The facilities must be in place before the initial commencement of works and be available until completion of all works and must be maintained in good working order and include adequate provision of all consumable items throughout the Works. The Construction Phase Health and Safety Plan shall detail these measures.

## 2.5 Hoarding Requirements Relating to the Health and Safety of the Public

The principal contractor shall be responsible for providing and maintaining the temporary fencing and/or hoarding to ensure the site is of no danger to the public and must also ensure that only authorised personnel gain access to the site. The location and design of the fencing shall be appropriate to the type of construction work being undertaken in terms of security and safety.

## 2.6 Site Transport/Vehicle Requirements Relating to the Health and Safety of the Operatives and the Public

The Principal Contractor is to confirm the position of any skips associated with the works and proposed storage areas.

Reversing of vehicles should be minimised wherever possible and a trained banksman must be used to supervise the movement of vehicles. Contractors must observe displayed speed limits.

Where there is a possibility of debris or spillage of spoil materials, any affected roads, walkways, or pathways are to be thoroughly cleaned during the works and made good after use and shall generally be left in an unimpaired condition at all times. Your attention is drawn to other commercial operations taking place within the locality which are live working areas. Due consideration is required to ensure that neighbouring business activities are not affected by the planned construction activities.

The initial construction phase plan shall include a Traffic Management Plan, Site Logistics Plan, and methods for dealing with and interacting with existing activities.

**The initial construction phase plan shall include a Traffic Management Plan, Site Logistics Plan, and methods for dealing with and interacting with existing tenant businesses working locally to the construction site location.**

## 2.7 Arrangements for Site Induction

The principal contractor will be required to plan for:

Assessing that all site personnel (including clients and visitors) have sufficient training for their needs and the provision of on-site training where required.

All operatives should have received specific training and be competent to work on or adjacent public highways.

Adequate health and safety information to be provided as part of a site safety induction.

The site induction should cover all the points outlined in this Preconstruction Information Pack and include the Principal Contractor's management control measures, which will also be detailed within their Construction Phase Health and Safety Plan. Any remaining risks that have been identified must be further mitigated.

## 2.8 Permit-to-Work Systems Relating to the Health and Safety of the Client's Employees or Customers

The Principal Contractor is required to operate Permit to Work systems for any works of a hazardous nature, e.g., hot work, electrical work, confined space working, working at height, excavations, crane, and lift plans, etc.

The permit to work system will be established in full compliance with the relevant UK legislation, including but not limited to the Health and Safety at Work Act 1974, The Management of Health and Safety at Work Regulations 1999; and The Construction (Design and Management) Regulations 2015 and associated regulations, such as the Control of Substances Hazardous to Health (COSHH) Regulations 2002; The Electricity at Work Regulations 1989; The Electricity Safety, Quality and Continuity Regulations 2002 (ESQCR); The Confined Spaces Regulations 1997; The Work at Height Regulations 2005; and The Lifting Operations and Lifting Equipment Regulations 1998 (LOLER).

**Hot Work permits.**

Must be aligned with industry-specific guidance and codes of practice that further detail the requirements for managing hot work activities:

HSG 168: "Safety in the Use of Abrasive Wheels"

HSG 47: "Avoiding Danger from Underground Services"

HSG 129: "Hot Work - Fire Precautions During Welding and Cutting"

HSG 51: "The Safe Use of Oxygen and Acetylene in Welding, Flame Cutting and Similar Processes"

**Live Electrical Working permits.**

Must be aligned with The ESQCR regulations specifically address the safety, quality, and continuity of electrical supply. They set out requirements for the safe working

practices, including live working, and provide guidance on the use of permits to work and other control measures to ensure electrical safety.

**Confined Spaces permits.**

Must be aligned with The Confined Spaces Regulations 1997 which specifically address the risks associated with working in confined spaces and provide a legal framework for managing those risks. They require employers to assess the risks associated with confined spaces, implement control measures, and develop safe systems of work, including the use of permits to work.

**Working at Height permits.**

Must be aligned with The Work at Height Regulations 2005. There are also industry-specific guidance and codes of practice, such as those published by the Health and Safety Executive (HSE), that provide detailed information on managing the risks of working at height and implementing the permit-to-work system effectively:

HSG 33: "Health and Safety in Roof Work"

HSG 150: "Working at Height"

BS 8437: "Code of Practice for the Selection, Use, and Maintenance of Personal Fall Protection Systems and Equipment for Use in the Workplace"

**Permit to Excavate/Break ground.**

Regulation 18 of The Construction (Design and Management) Regulations 2015 specifically addresses excavation work and requires adequate planning, risk assessments, and control measures, including the use of permits to work for specific excavation tasks.

**Permit for cranes and lift plans.**

The Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) specifically address the safe use of lifting equipment, including cranes, and lifting. They require employers to ensure that lifting operations are planned, supervised and carried out safely. Regulation 8 emphasises the need for adequate planning, including the use of a safe system of work such as a permit to work, for complex or high-risk lifting operations.

The Principal Contractor shall implement a permit work system for all of the activities identified above, they should also fully comply with the above guidance, approved codes of practice, and regulations. **This shall be included in the initial construction phase plan.**

## 2.9 Emergency Procedures and Means of Escape Relating to the Health and Safety of the Client's Employees or Customers

The Principal Contractor shall prepare a suitable Fire Plan and Emergency Plan. These shall detail the procedures to be taken in the event of serious and imminent danger and must be coordinated and aligned with the emergency procedures. The emergency procedures must be tested at regular intervals to ensure effectiveness; and communicated to all entering the construction site. These shall be included in the initial Construction Phase Health and Safety Plan.

## 2.10 No–Go Areas Relating to the Health and Safety of the Client's Employees or Customers

The Principal Contractor is to confine the activities to the designated site areas and access/egress arrangements only.

## 2.11 Confined Spaces as Designated by the Client

None have been identified as part of the works at the time of this information pack being produced. However, if any high-risk activities arise during the construction activities under the control of the Principal Contractor's design and build activities, the guidance provided by the Health and Safety Executive (HSE) that relates to the use of permit-to-work systems, such as the HSE's publication 'Safe Work in Confined Spaces' (ACoP L101), will be followed.

## 2.12 Smoking and Parking Areas Relating to the Health and Safety of the Client's Employees or Customers

The Principal Contractor shall make available an externally designated Smoking/Vaping/E-cigarette area within the welfare area, that is situated away from buildings and combustible materials. All other areas of the construction site will be smoking/vaping/e-cigarettes-free and must managed to be in compliance with the relevant UK legislation, the Health Act 2006, which prohibits smoking in enclosed and substantially enclosed workplaces.

### 2.13 Emergency Contact Details

| | |
|---|---|
| Hospital | Rochdale Infirmary<br>Whitehall Street,<br>Rochdale Tel: 01706 377777 |
| Fire Brigade | Rochdale Fire Station - Station No: E30<br>Maclure Road<br>Rochdale Tel: 01706 900126 |
| Police | The Holme,<br>The Esplanade,<br>Rochdale Tel: 0161 872 5050 |

# 3 Environmental Restrictions and Existing On-Site Risks

### 3.1 Boundaries and Access Including Temporary Access

Site access and boundaries can be found in Appendix 2 of this document. The principal contractor must ensure that parking or unloading and loading of vehicles does not restrict access or obstruct highways.

### 3.2 Adjacent Land Usage

To the South of the site, the neighbourhood is primarily developed for warehouse and distribution use. The adjacent land has a rural aspect with long views across the business park and extensive views of the hills to the north and east. The site is also highly visible from the Metrolink station and route adjacent to the business park. The site and adjacent land are comprised of long since disused pasture which through a lack of management has become tussocky, overgrown, and is slowly succeeding to rush and scrub cover.

### 3.3 Information about Existing Structures

Not applicable.

### 3.4 Information about Existing Services

Refer to Appendices 2.0, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, and 2.8

### 3.5 Arrangements for Working with Services

All parties on site must be informed of the location of existing services and details included in the construction phase health plan and site induction.

All work involving services and utilities will be conducted in strict accordance with the relevant UK legislation, including but not limited to the Health and Safety at Work Act 1974, Construction (Design and Management) Regulations 2015, and any specific regulations related to services and utilities.

The Principal Contractor shall follow the guidance provided by the Health and Safety Executive (HSE) that relates to working with services and utilities.

When live services are exposed during construction works, the services must be marked with suitable warning tape and all parties on site must be informed.

## 3.6 Existing Storage of Hazardous Materials

None have been reported to the project safety advisor.

Should the principal contractor discover any hazardous materials or substances during the construction works he must cease work immediately and the principal designer and project safety advisor should be advised as soon as possible.

## 3.7 Working with or Near Fragile Materials

No fragile materials have been designed in this project.

## 3.8 Maintenance of Plant and Equipment

The use and movement of mobile plant, site vehicles, and equipment during the works should be appropriately planned, managed, and subject to adequate supervision and maintenance provisions.

Health and Safety at Work Act: All maintenance activities related to plant and equipment will comply with the Health and Safety at Work Act 1974, which places a duty on employers to ensure the health, safety, and welfare of their employees and others affected by their work activities.

The Principal Contractor will follow the applicable ACoP, such as "Safe Use of Work Equipment" (ACoP L22), to guide the safe use and maintenance of plant and equipment on the construction site.

Maintenance procedures will conform to the relevant British Standards, such as BS 5304:2011 "Code of Practice for the Safe Use of Powered Access Equipment," to ensure the highest standards of safety and efficiency.

In addition to legal requirements, the Principal Contractor will implement industry best practices for the maintenance of plant and equipment. Maintenance procedures will

incorporate recognised guidelines and recommendations from reputable sources, promoting the safe and effective operation of machinery and equipment.

## 3.9 Traffic Routes and Segregation of Vehicles and Pedestrians

Vehicle access routes within the site must always be segregated from pedestrian routes. Safe working routes shall be defined before the commencement of any work.

Appropriate warning signage to the site entrance and access roads will be required for both site deliveries, neighboring properties, and public road users.

The principal contractor shall implement and control site speed limits and ensure all access and shared roads remain free of obstructions and site runoff debris.

The principal contractor shall provide, erect, and maintain for the duration of the contract traffic signs, pedestrian barriers, and warning signage to control vehicle and pedestrian traffic to, from, and within the site.

**The initial construction phase plan shall include a Traffic Management Plan.**

## 3.10 Scaffolding and Other Temporary Works

All temporary works will be designed, installed, and maintained in compliance with the applicable ACoP, such as the "Temporary Works - Code of Practice" (BS 5975). All design calculations, drawings, and specifications for temporary works will be prepared by competent professionals, ensuring structural stability and safety throughout the project. Regular inspections and monitoring of temporary works will be conducted to identify and address any potential hazards or deficiencies promptly.

Scaffolding erection, use, and dismantling will adhere to the relevant ACoP, such as the "Safe Use of Scaffolding" (BS EN 12811) and the "Code of Practice for the Use of Mobile Access Towers" (BS EN 1004). Competent and trained personnel will be responsible for the erection, alteration, and dismantling of scaffolding structures, and always follow safe practices. Regular inspections of scaffolding will be conducted to ensure stability, integrity, and compliance with safety regulations.

By following the guidelines outlined in "Safe Use of Scaffolding" (BS EN 12811) and the "Code of Practice for the Use of Mobile Access Towers" (BS EN 1004), the Principal Contractor can ensure the safe use and proper management of scaffolding and mobile access towers, promoting a secure working environment and preventing accidents and injuries.

## 3.11 Working at Height and Other Safety Risks

Work at Height Regulations 2005: All work at height activities will be conducted in accordance with the Work at Height Regulations 2005. This legislation provides guidance and requirements for managing risks associated with working at height.

The principal contractor will adhere to the relevant ACoP, such as "Working at Height: A Brief Guide" (ACoP Ladders and Stepladders), to ensure proper control measures are in place to mitigate risks associated with working at height.

Work at height activities will comply with the applicable British Standards, such as BS 8437:2012 "Code of Practice for the Selection, Use, and Maintenance of Personal Fall Protection Systems and Equipment for Use in the Workplace.

Best Practice Standards: In addition to regulatory requirements, the client team are committed to implementing recognised industry best practices for work at height.

The Principal Contractor team will stay updated on the latest developments and guidelines in work at height safety, incorporating any relevant best practices into the construction activities.

The Principal Contractor is to engage with reputable suppliers and contractors who follow industry best practices, ensuring that high-quality equipment and safe work methods are employed.

The Principal Contractor must provide details of, and adhere to, the safe system of working proposed to ensure the health and safety of employees and the public when carrying out work at height activities.

## 3.12 Asbestos Including Results of Survey

The Phase 2 Geotechnical report KYR-BWB-ZZ-XX-RP-YE-0002_Ph2-P05 Phase 2 Geo-Environmental Assessment produced by BWB identifies that Asbestos fibres were recorded in two locations of made ground (TP01 and TP03 during the 2023 investigation) and are considered isolated areas of contamination.  The requirements of CAR 2012 should be complied with in relation to remediating these areas.

## 3.13 Contaminated Land

The Phase 2 Geotechnical report KBP-BWB-ZJ-XX-RP-YE-0002_Ph2-P2 1 produced by BWB identifies that no contamination observations were noted during the groundwater sampling visit in 2022, or subsequent gas and groundwater monitoring during the period between 2022 and 2023. No visual or olfactory observations of contamination were noted during these ground investigations.

## 3.14 Manual handling

All manual handling tasks will be conducted in strict accordance with the Manual Handling Operations Regulations 1992. These regulations provide guidelines on minimising the risk of injury from manual handling activities.
The Principal Contractor will follow the guidance provided by the Health and Safety Executive (HSE), such as "Manual Handling at Work: A Brief Guide," to ensure safe manual handling practices are implemented throughout the construction site, along with the HSE's MAC Tool Guidance to assess and evaluate manual handling tasks on the construction site. The MAC tool provides a systematic approach to identifying and managing the risks associated with manual handling.
The Principal Contractor will adhere to the applicable ACoP, such as "Manual Handling: Solutions You Can Handle" (ACoP L23), which provides detailed guidance on assessing and controlling manual handling risks.
By strictly adhering to the relevant legislation, HSE's MAC tool guidance, ACoP, and best practice standards, the client's aim is to minimise the risk of injuries associated with manual handling tasks on the construction site. The Principal Contractor is to conduct regular reviews, assessments, and training programs to ensure ongoing compliance and continuous improvement in manual handling practices.

## 3.15 Hazardous materials

Should the principal contractor discover any hazardous materials during the project works, work in the area must cease immediately and the principal designer and project safety advisor are to be advised.

## 3.16 Noise, Dust and Vibration controls

The Principal Contractor must outline his proposals for noise, dust, and vibration control, as a hazard to the health of site personnel.

Noise: Construction activities will comply with the Control of Noise at Work Regulations 2005. The Principal Contractor will assess noise levels, implement noise control measures where necessary, and provide suitable hearing protection to workers as recommended in the HSE's guidance on controlling noise at work.

Dust: All construction activities will be carried out following the Control of Substances Hazardous to Health (COSHH) Regulations 2002. The Principal Contractor is to implement appropriate control measures, such as dust suppression systems, LEV containment measures, and personal protective equipment, as outlined in the HSE's guidance on controlling dust in the workplace.

Vibration: Construction activities involving hand-arm vibration, or whole-body vibration will adhere to the Control of Vibration at Work Regulations 2005. The Principal

Contractor will assess and control vibration levels, provide appropriate tools and equipment, and offer relevant training and awareness to workers based on the HSE's guidance on controlling vibration at work.

The Principal Contractor will follow the HSE's relevant guidance documents, such as "Control of Noise at Work" (HSG 138), "Control of Vibration at Work" (HSG 170), and other applicable guidance related to dust control and management.

All construction activities will be carried out in accordance with the relevant ACoPs, such as "Control of Substances Hazardous to Health" (ACoP L5), "The Control of Noise at Work" (ACoP L108), and "The Control of Vibration at Work" (ACoP L140).

### 3.17 Health Risks Arising from Client's Activities

There are no unusual risks associated with the client's activities.

# 4 Significant Design and Construction Hazards

### 4.1 Significant design assumptions and suggested work methods

The principle of 'designing out' risks and the designers have followed the HSE's RAG guidance, and as far as possible it has been applied to this project and there are no foreseeable risks that would not be encountered as part of normal construction activities. However, should the designers discover risk in their design that could not be eliminated this will be identified to the Principal Contractor.

### 4.2 Arrangements for co-ordination of ongoing design work and handling design changes

The principal contractor shall provide the project safety advisor and principal designer with assurances of competence and resources before any appointment of proposed designers to be employed by him or his contractors.

In the event of design changes being proposed which may result in significant changes to the risk of undertaking the work the principal contractor and principal designer shall: -

- Inform the project safety advisor immediately of the event,
- Submit details of health and safety issues and revised resources or proposals resulting from that event,
- Ensure that such details are submitted for consideration in good time before the relevant works are executed.

### 4.3 Information on significant risks identified during design

The designers have identified risks as part of the review process. The Designer Risk Assessments are contained within appendices. They identify the residual risks within the project. The Principal Contractor must fully understand these risks, produce a construction phase plan that further mitigates the risks that have been identified, and ahead of any construction activities taking place.

### 4.4 Materials Requiring Particular Precautions

There are no specified hazardous materials reported to the project safety advisor.

## 5 Health and Safety File

Separate Health and Safety Files and O&M manuals shall be produced for each building.

The completed and collated Health and Safety File shall be provided to the Project Safety Advisor. The File should be formatted in accordance with Appendix 6.

Throughout the execution of the works, the contractors and design team must make certain that adequate, accurate records, are being kept ensuring the ultimate completeness and accuracy of the Health and Safety File documents. The documents are to be progressively compiled as the work proceeds.

The principal contractor shall prepare and maintain a monthly programme for the collection of information in the Health and Safety File/Operation and Maintenance Manual. The Principal Contractor shall report on this at the monthly progress meetings. This report will detail the information required, what has been requested, received, and outstanding. At least 8 weeks before the completion of the works, the Principal Contractor will provide the package of information in the appropriate format necessary for the Project Safety Advisor to fulfill his statutory obligations.

The principal contractor shall ensure that appropriate instruction is provided for the relevant Client’s staff and users as necessary regarding all new systems installed.

Details of all technical support and emergency cover to be provided to the Client end users shall be identified in the plan.

# APPENDIX 1

F10 (to be forwarded upon PC appointment)

# APPENDIX 2

Site Plans

# APPENDIX 3

**BWB's Designer Risk Assessment**

# APPENDIX 4

DLA's Designer Risk Assessments

# APPENDIX 5

Preliminary Ecological Appraisal Report

# APPENDIX 6

Health and Safety File Format

A CAF GROUP COMPANY

## ENVIRONMENT

Wilson Bowden Developments Ltd
Plot P, Kingsway Business Park
Rochdale
Phase 1 Geo-Environmental Assessment

**ENVIRONMENT**

# Wilson Bowden Developments Ltd
# Plot P, Kingsway Business Park
# Rochdale
# Phase 1 Geo-Environmental Assessment

Birmingham
Livery Place, 35 Livery Street, Colmore Business District, Birmingham, B3 2PB
T: 0121 233 3322

**Leeds**
**Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH**
**T: 0113 233 8000**

London
11 Borough High Street, London, SE1 9SE
T: 0207 407 3879

Manchester
11, Portland Street, Manchester M1 3HU
T: 0161 233 4260

Market Harborough
Harborough Innovation Centre, Wellington Way, Airfield Business Park,
Leicester Road, Market Harborough, Leicestershire, LE16 7WB
T: 01858 455020

Nottingham
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# EXECUTIVE SUMMARY

| Executive Summary | |
|---|---|
| Site Address | The site is located on a collection of fields, immediately south of Kingsway Business Park tram station in Rochdale, OL16 4JN. |
| Proposed Development | The proposed development is anticipated to comprise a commercial and/or warehouse use with associated infrastructure. |
| Current Site Use | At the time of the walkover the site was disused and comprised overgrown grassland, with a path leading to the loop road in the south from the tram station to the north |
| Site History | Historically, the site largely comprised of numerous fence enclosed fields, with a persistent body of water to the immediate southeast. The site remained largely unchanged throughout its history. The only onsite activity present between 2012 and 2018, was related to the loop road construction to the south in which material was placed on site and a path being constructed north south through the area. From 1851, the site has been immediately bordered to the north by a rail line, expanded with sidings during 1891-1908 period but was since developed into a tram line, remaining largely unchanged.<br>Off-site, the area was largely agricultural fields bounded by residential developments of Rochdale and Milnrow. Industrial developments were primarily over 650m from site. |
| Ground Conditions | Information published by the BGS indicates that the site is directly underlain by Glaciofluvial (Sand and Gravel) in the western part of the site and Till deposits in the eastern part, these are underlain by Pennine Lower Coal Measures bedrock. The bedrock is inferred as faulted to the southwest and northeast of the site at 52m and 130m respectively (NW-SE trending). |
| Geotechnical Review | Based on the proposed commercial and/or warehouse use on the site, shallow strip foundations bearing onto the Glaciofluvial & Till superficial deposits are likely to be suitable at the site. However, for heavier loadings, ground improvement may be required.<br>The proposed development is expected to include changes to site levels and so shallow soil properties should be assessed. |
| Environmental Review | When considered in the context of the conceptual site model and the historical activities that have taken place (agricultural work and potential landfill), the proposed development is considered to pose a moderate/low risk to human health. It is considered that the main driver for the risk rating for human health is migration and accumulation of ground gases in association with the potential Made Ground and potential organic rich soils on the site.<br>The risk posed to controlled waters is predominantly considered to be low due to potential of contaminants from soil left on site as part of the loop road construction. |
| Recommendations | It is recommended that an intrusive ground investigation be completed to assess the ground conditions on site, the extent of any potential contamination, assess the ground gas regime at the site and to quantify the identified pollutant linkages and assess likely mitigation measures. |
| This summary should be read in conjunction with BWB's full report (ref. KYP-BWB-ZZ-XX-RP-YE-0001_Ph1) and reflects an assessment of the site based on information received by BWB at the time of production. | |

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# 1. INTRODUCTION

## Instruction

1.1 BWB Consulting (BWB) was instructed by Wilson Bowden Developments Ltd (the Client) to carry out a Phase 1 Geo-Environmental Assessment for the site at Plot P, Kingsway Business Park, Rochdale. Details of the project brief are included in BWB proposal reference 211215/P01/01/210939/KES/RTR, dated 15/12/2021.

1.2 The proposed development is anticipated to comprise commercial and/or warehouse use with associated infrastructure.

1.3 The proposed development site layout, 7675-FDG-XX-XX-M3-A-0001_RIWA8AJN, dated 31/05/2022, is provided as **Appendix 1**.

## Objectives

1.4 This report has been completed to present pertinent information into the environmental risks and liabilities associated with the site. It has been completed to fulfil the requirements of a preliminary risk assessment in accordance with BS 10175:2011+A2:2017 *'Investigation of potentially contaminated sites, code of practice'* and EA Guidance on Risk Management of Land Contamination https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm.

1.5 The report has also been prepared with reference to land contamination technical guidance available through https://www.gov.uk/government/collections/land-contamination-technical-guidance.

1.6 The objectives of this report are to:

- Assess historical activities at the site with respect to their potential impact on the site environment;
- Characterise the environmental setting of the site, identify migration pathways and vulnerable receptors for contamination originating at the site, focusing on potential soil and groundwater liabilities;
- Assess historical and current surrounding land use in relation to known or potential off-site contamination issues that may impact the site;
- Review existing site investigation and remediation information for the site, where available;
- Develop a preliminary Conceptual Site Model (CSM); and
- Assess potential environmental liabilities associated with the site.

## Scope of Work

1.7 The Scope of Work included:

- A site visit to inspect the current site and immediate surroundings, identify potential hazards associated with ground conditions or contamination and to determine potential constraints with regards to ground investigation (photographs presented as **Appendix 2**);
- A review of the following information:
    - Groundsure report, reference HMD-214-8800198 (**Appendix 3**);
    - Historical Ordnance Survey Mapping (**Appendix 4**);
    - Historical aerial photographs (Google Earth) and other imagery (Groundsure);
    - BGS online geological maps and exploratory hole records (www.bgs.ac.uk);
    - Coal Authority Interactive Map Viewer (http://mapapps2.bgs.ac.uk/coalauthority/home.html);
    - Coal Authority Consultants Coal Mining Report, reference HMD-214-8800197 (**Appendix 6**);
    - Regional unexploded bomb risk maps;.
- A summary of the key hazards or uncertainties that require additional investigation in order to further characterise the associated risks; and
- Production of a Geo-Environmental Assessment (this report), concluding in a qualitative assessment of the risks from contamination and ground-related constraints which may impact on the site.

# 2. THE SITE

## Site Location

2.1 The site is located at Plot P, Kingsway Business Park, in Rochdale, centred at National Grid reference 391907 412651, nearest postcode OL16 4JN. The approximate location of the site is shown below in **Figure 2:1.**

**Figure 2:1: Site Location Plan**




## Site Description

2.2 The site comprises of an irregularly shaped parcel of land to the east of Rochdale centre, covering approximately 2.6 hectares. The site is undulating, 149m above Ordnance Datum.

## Site Walkover

2.3 A site walkover of accessible areas was completed on 16/06/2022 by a representative of BWB. Photographs from the walkover are presented in **Appendix 2**

2.4 At the time of the walkover, the site comprised of slightly overgrown fields divided down the site by a footpath. Old stone walls that follow old field divisions are still present in a ruined state. The north of the site was bordered by a tram station and associated tram line and infrastructure, separated by a wooden post, wired with barbed wire topped fence. The east of the site comprises farmland with livestock and bodies of standing water (used for livestock drinking water). To the south and west borders are uninhabited, wild grass fields, except for the asphalt loop road that comprises the southern boundary of the site.

2.5 Site access on foot was possible utilising the loop road to the south of site and the footpath through the centre of the site. This route was used to bypass a ditch that borders most of the sites southern boundary. The eastern field containing livestock was not accessed during walkover. For ground investigation, the wire fence will need to be partially dismantled to allow access.

2.6 Approximately 80% of the site was covered in grass or overgrown vegetation, with a small amount of tree cover along the northern boundary. Approximately 10% of the site was comprised of a narrow footpath connecting the loop road to the south of the site and the northern tram station. Approximately 10% of the site comprised standing water, or dry/seasonal wet areas primarily in the eastern portion of the site.

2.7 The site topography was largely undulating across the entire site, with depressions and a mound noted in the western portion. The site gently slopes down towards the western and eastern boundaries of the site. The footpath through the site is lower than the surrounding topography to the east and west.

2.8 Trees on northern boundary were generally semi-mature. Vegetation across the site was largely overgrown but traversable, with seasonal wet areas identifiable by collections of bulrushes.

2.9 There are three bodies of standing water to the east of the site, two located within the site boundaries and one 15m east within the livestock fields. Previously wet ground identified by soft ground conditions and bulrushes located 25m west of the standing water.

2.10 The site had foul and surface water utilities marker posts immediately west of the footpath, running parallel between the loop road and tram station.

## Potential Constraints to Ground Investigation

2.11 Site access into the eastern field would require negotiation with landowner/tenant farmer for partial temporary dismantling of the barbed wire fence and moving of livestock to allow for access and safe work conditions.

2.12 The site is open and visited by members of the public utilising the tram station, as well as dog walkers or recreational users indicated by trodden footpath through vegetation in the west of site. Additional safety precautions will need to be considered for any further works on site.

### Site Surroundings

2.13 The surrounding land uses at the time of the walkover survey are summarised in **Table 2:1**.

**Table 2:1: Surrounding Land Use**

| Surrounding Land Use | |
|---|---|
| North | Tram line with residential properties beyond. |
| East | Fields used for livestock. |
| South | Loop road followed by empty fields similar to site. |
| West | Fields similar to site with large stand of mature trees. |

**2.14** An aerial photograph representative of the site and surroundings, dated 23/05/2019, is presented as **Figure 2:2**.

**Figure 2:2: Aerial Photograph**



# 3. ANTICIPATED GROUND CONDITIONS

3.1 The anticipated ground conditions for the site and controlled waters vulnerability is discussed within **Table 3:1**.

**Table 3:1: Summary of Anticipated Ground Conditions**

| Anticipated Ground Conditions | |
|---|---|
| Geology | Information published by the BGS indicates that the site is directly underlain by Glaciofluvial (Sand and Gravel) to the west and Till deposits to the east, these are underlain by Pennine Lower Coal Measures bedrock. The bedrock is inferred as faulted to the southwest and northeast of the site at 52m and 130m respectively (NW-SE trending).<br>The BGS Lexicon database describes the bedrock as interbedded mudstone, siltstone and sandstone containing thicker coal seams towards the upper boundary.<br>Topsoil is likely to be present across a majority of the site. There are areas of worked and Made Ground within 50m of the site, primarily around tram infrastructure and the loop road to the south. On site, located in the southeast, worked ground comprised of void rock. Information from aerial photographs suggest Made Ground is present on site, likely originating from the loop road construction. Made Ground also borders the body of standing water to the east of the site.<br>The closest BGS borehole to the site is SD91SW156, approximately 380 m west. The borehole recorded 1.4m of Made Ground, comprising of 200mm of topsoil over dark brown sandy topsoil with a small amount of gravel content. This is underlain by 4.6m of medium dense, brown silty fine to medium sand with loosening occurring at 5.2m to the borehole's termination at 6.0m bgl (below ground level). The Till deposits on site are not present at this borehole location, but the underlying glaciofluvial and Lower Coal Measures bedrock, which are present on site, are present in this record. |
| Hydrogeology | The Environment Agency (EA) classifies the Till as a Secondary Undifferentiated Aquifer, the Glaciofluvial deposits as a Secondary A Aquifer and the bedrock as a Secondary A Aquifer.<br>There are no active or historical abstractions within 1km of the site.<br>There has been one Category 3 (minor) pollution incident impacting on land located 460m north of the site relating to construction and demolition materials and waste.<br>The site is indicated to be within an EA groundwater Source Protection Zone 2, outer catchment. |
| Surface Waters | There are three bodies of standing water located within the site boundary wider than 5m with no clear drainage. At the time of the site walkover, the preceding weather was especially dry. Areas of the site displayed evidence of previous water logging/standing water.<br>The closest flowing surface water feature to the site is the Stanney Brook, approximately 150m to the South and West of the site. This flows to the nearby Rochdale Canal, approximately 380m to the northwest.<br>The closest active surface water abstraction is located 692m east of the site and is utilised for general cooling purposes.<br>There is one active licensed discharge located within 500m of the site. This is located approximately 176m northwest of the site, relating to pumping station sewage discharge with Stanney Brook as the receiving water.<br>There have been five Category 3 (minor) pollution incidents impacting on controlled waters within 500m of the site. Two located 181m northwest of the |

| Anticipated Ground Conditions | |
|---|---|
| | site related to crude sewage, two located 382m west of the site related to oils and fuel and one located 421m southeast relating to crude sewage<br>There is a high risk of surface water flooding on site, primarily related to the observed surface water on site, and within 50m. There is a maximum flood depth of 0.3m to 1m from surface water flooding on site for a 1 in 30-year event. There is a low to moderate risk of groundwater flooding on site.<br>The site is not located in an EA flood zone 2 or 3 designation. |
| Ground Gas & Radon | The site is located within an area with a less than 1% risk of radon present.<br>The Groundsure Report indicates a historical local authority landfill is present on site. Clarification with Rochdale Council confirmed that this is not present (**Appendix 5**).<br>Organic material built up within the surface water bodies present on site currently and historically may pose a potential source of hazardous ground gas. |
| Mining and Mineral Extraction | The site is located within a coal mining area as defined by the Coal Authority.<br>A Consultants Coal Mining Report is presented as **Appendix 6**. The report indicated the following information:<br>- Three Lower Mountain coal seams are reported as worked. Two are beneath the site and one is to the west, with the latest mining activity terminating in 1915 at depths between 97m to 107m.<br>- No shallow or opencast coal workings are recorded within 500m of the site.<br>- No outcrops have been recorded on site. There are faults near to the site, located 52m SW and 130m NE, placing the site in a slight graben structure.<br>- There are no mine entries within 100m of the site.<br>- There have been no reports of subsidence or related damage within 50m of the site.<br>- There has been no mine gas or mine water treatments within 500m of the site<br>Present on the site may be features related to the railway cutting along the northern boundary of the site that may have been backfilled since operation.<br>There have been no other mining or extractions within 1000m of the site. |
| Environmental Sensitivity | The Merseyside and Greater Manchester area of Green Belt is 726m NE of the site.<br>There nearby Rochdale Canal is a designated SSSI, located 314m northwest of the site. The Canal is also listed as special areas of conservation. The site is within two SSSI impact risk zones and developments requiring consultation include infrastructure, minerals oil and gas, residential, rural residential & non-residential, combustion, waste, composting, discharges, water supply in addition to air pollution.<br>Within 125m of the site, priority habitat for lowland fens is present, with the site being designated as Network Enhancement Zone 1 & 2. |

# 4. SITE HISTORY

4.1 Historical Ordnance Survey (OS) mapping for the site area has been reviewed. These maps and plans date from 1851 to 2022. The historical plans reviewed are provided in **Appendix 4**. The key points of the historical development of the site and surrounding area are summarised in **Table 4:1**. All distances quoted are approximate and potential SOURCES and receptors are highlighted through their formatting.

**Table 4:1: Key Points of Development History**

| Dates | On Site | Off-Site |
|---|---|---|
| 1851<br>Country Series<br>1:10,560 | Site comprised of open fields with no development present.<br>Bordered by rail workings to the immediate north of site.<br>A body of standing water was present at the tip of the southern extrusion. | The surrounding area was primarily **AGRICULTURAL** with sporadic ***residences***.<br>Milnrow village was 700m east of site<br>**SANDSTONE QUARRIES** were located approximately 550m north east and 730m east of site.<br>**BELFIELD COLLIERY** located 710m to the northeast of site. |
| 1891<br>County Series<br>1:2,500<br>1:10,560 | No significant changes on site. | Belfield Colliery activity ceased, marked as **OLD SHAFTS**.<br>Sandstone quarries activity ceased.<br>**GAS WORKS** 750m east of site |
| 1908-1910<br>County Series<br>1:10,560 and 1:2,500 | No significant changes on site. | **RAIL SIDINGS** constructed within 50m of site.<br>**TANK** present 450m southwest of the site.<br>**SEWAGE WORKS** with filler tanks developed on site of old Belfield Colliery. |
| 1928<br>County Series<br>1:10,560 | No significant changes on site. | **TANK** present 625m southeast of site.<br>***Residential development*** 625m west of site across the canal. |
| 1930<br>County Series<br>1:2,500 | Small terrain marking change in the west of site. | No significant changes off site. |
| 1938<br>County Series<br>1:10,560 | No significant changes on site. | ***Residential areas*** developed between 125 and 500m to the north of site.<br>Kingsway road developed 500m west of site. |
| 1954<br>Provisional<br>1:10,560 | No significant changes on site. | ***Residential area*** developed 750m west of the site. |

| Dates | On Site | Off-Site |
|---|---|---|
| 1955 – 56<br>National Grid<br>1:1,250<br>1:2,500 | No significant changes on site. | ***Residential area*** developed within 150m of site to the north between 1955 and 1956. |
| 1967<br>National Grid<br>1:1,250<br>Provisional<br>1:10,560 | No significant changes on site. | Drain emplaced in ***Stanney brook*** 250m west of site.<br>Large ***residential development*** occurred west of site across canal.<br>Tank 625m southeast ceased operation. |
| 1976<br>National Grid<br>1:1,250<br>and<br>1:10,000 | No significant changes on site. | Large ***residential development*** occurred in Milnrow, bringing residences to the other side of the rail track. |
| 1984-2003<br>National Grid<br>1:1,250<br>and<br>1:10,000 | Residential development occurred north of rail tracks, within 100m of site (1984). | No significant changes off site. |
| 2010<br>National Grid<br>1:10,000 | No significant changes on site. | Farms located within 500m to the southwest and southeast of site disused and removed, **MAIN ROAD** constructed between 500m and 750m south. |
| 2022<br>National Grid<br>1:10,000 | No significant changes on site. | ***Residential areas*** developed within 500m of site to the west, joined to **ROAD** developed to immediate southern site boundary.<br>Largescale **WAREHOUSE** development within 500m of site to the south. |

## Historical Aerial Photography and Imagery

4.2 Aerial photographs/imagery available through Google Earth and included within the Groundsure report are summarised in **Table 4:2**.

**Table 4:2: Summary of Aerial Photography**

| Date (Source) | Description |
|---|---|
| 2000 (Groundsure) | The site is shown as agricultural land with a railway line immediately to the north of the site running east-west. Bodies of water were present on the site to the east. |
| 2012 (Groundsure) | Larger scale works carried out along the southern boundary of the site, associated with the loop road, with works and material |

| Date (Source) | Description |
|---|---|
| | stockpiles spread out over the entirety of the site. Bodies of water expanded and conjoined in the east of the site. |
| 2018 (Groundsure) | Site returned to being largely grassland, road now constructed on southern boundary. Water bodies reduced in size. Path to tram station present through the site, running north to south. |
| 2019 (Groundsure) | No significant changes when compared to 2018 aerial photograph. |

## Planning History

4.3 The Rochdale Council Planning Portal was accessed on 13/06/2022 and indicated that no planning applications have been submitted for the site.

## Summary of Site History

4.4 The site largely comprised of numerous fenced enclosed fields, with a persistent body of water to the immediate southeast. The site remained largely unchanged throughout its history, with the only onsite activity being between 2012 and 2018, with southern road construction material being placed on site and a path constructed north to south through the area. From circa 1851, the site has been immediately bordered to the north by a rail line, expanded with sidings during 1891-1908 period but has since been developed into a tramline, remaining largely unchanged.

4.5 Off-site, the area was largely agricultural fields bounded by residential developments of Rochdale and Milnrow. Industrial developments, including Belfield Colliery, were primarily over 650m from the site. Residential developments from 1976 and recent development of Kingsway Business park to the south has brought residences to within 300m of the site.

# 5. REGULATORY SETTING

## Permits Consents and Authorisations

5.1 A full listing of permits, consents and authorisations including discharge consents, pollution incidences and other environmental information, is included in the Groundsure report, presented in **Appendix 3.**

5.2 No significant features have been identified which are considered likely to have had a detrimental impact on the site.

## Landfilling and Waste Management

5.3 A full listing of EA, BGS and Local Authority recorded landfills are provided in the Groundsure report presented in **Appendix 3.**

5.4 The following facilities have been identified which have the potential to have a detrimental impact on site.

5.5 Two historical landfill sites were identified within 500m of the site, as detailed in **Table 5:1**.

**Table 5:1: Historical Landfill Sites**

| Name | Distance from Site | Details |
|---|---|---|
| Little Lane | 425m southeast | No information provided. |
| Ex Universal Laundry | 471m east | Accepted inert waste in 1988. |

5.6 The historical local authority landfill identified on site in the Groundsure report has been discounted as a potential source of contamination. Clarification on the presence of this landfill was requested from Rochdale Council. Their records indicate no landfill is present on site. Council correspondence is presented in **Appendix 5**.

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# 6. GEOTECHNICAL APPRAISAL

6.1 The Groundsure report, site history, current site setting and geology setting have all been considered in order to provide an indication of the potential ground related constraints and opportunities in the context of the proposed development as set out in **Table 6:1**.

**Table 6:1: Ground Related Constraints & Opportunities**

| Potential Constraint / Opportunity | Explanation | Potential Mitigation Options |
|---|---|---|
| Topsoil / Made Ground | Topsoil is expected to be present across the majority of the site.<br>Made Ground is expected to be present across the site as a result of material placed during the loop road construction, along the footpath and in potentially infilled ground on-site. | Topsoil and Made Ground may be suitable for reuse on site, subject to confirmation of chemical status and engineering properties via ground investigation, and confirmation of potential restrictions on reuse associated with waste management licencing. |
| Preliminary Foundation Solution | Based on the proposed commercial and/or warehouse use on the site, shallow strip foundations bearing onto the Glaciofluvial & Till superficial deposits may be suitable at the site. For heavier loadings, ground improvement may be required. | Ground investigation should be undertaken to confirm ground conditions at the site and allow for in-situ and laboratory testing to inform foundation design. |
| Buried Obstructions | Given the historical uses of the site there is limited potential for buried obstructions such as former foundations. Foul and surface water services are indicated to be present in the west of the site. | Buried obstructions may require removal from site within areas of proposed development.<br>Services may need to be diverted away from proposed building footprints. |
| Trees | Juvenile and semi-mature trees were noted as scattered around the site. | Foundations in close proximity to new or existing trees may need to be locally deepened beyond the zone of influence of tree roots and/or heave precautions adopted. |
| Pyritic Geology | Ground conditions have limited potential to be pyritic based on the geology. | No further assessment is required. |
| Shrinking and Swelling Clays and Running Sands | The Groundsure report indicates a very low to negligible risk on site.<br>There is very low risk of running sands. | Ground conditions are predominantly low plasticity therefore no further assessment required.<br>Although the running sands risk is indicated to be very low, BWB have encountered running sands often across the wider Kingsway Business Park within the same geology so running sands are considered to be a likely issue that needs further consideration. |

| Potential Constraint / Opportunity | Explanation | Potential Mitigation Options |
|---|---|---|
| Coal Mining | Coal is not expected to be present at the surface or at shallow depth across the site. The Coal Authority Report indicates deeper mining at the site at depths of 97-107m. | No further assessment is required. |
| Mineral Extraction | No mineral extraction has been identified as taking place on the site | No further assessment is required. |
| Earthworks | The proposed development is expected to include a change to site levels. | Further assessment is required of materials on site and their potential for re-use/re-engineering. |
| Slope Stability | The Groundsure report indicates a very low risk on site. | It is indicated that slope instability problems are unlikely to be present on-site therefore no further assessment required. |
| Retaining Walls | No retaining walls were noted during the walkover. | No further assessment required. |
| Shallow Groundwater | Shallow groundwater and seasonal high groundwater table are common across the local area based on BWBs history of working on nearby sites. | The groundwater levels should be assessed through intrusive investigation and monitoring. The effects of the foundation solution, earthworks strategy, and construction methodologies will need to be considered. |
| Drainage and Soakaways | Soakaways may be a viable option in the west of the site, within Sand and Gravel deposits. Depending upon groundwater levels and drainage properties. | Should soakaways be considered as part of the drainage strategy, it is recommended that infiltration testing in accordance with current guidance is undertaken. |
| Roads and Pavements | California Bearing Ratio (CBR) values should be sought for road, car park and pavement design. | In-situ testing should be undertaken to infer CBR values. Furthermore, geotechnical testing should be undertaken to provide consistency of results. |
| Ground Dissolution Hazards | The Groundsure report indicates a negligible risk based on location. | Soluble rocks are indicated to potentially be present but are unlikely to cause problems except under exceptional conditions. No further action is required. |
| UXO | Review of the unexploded ordnance risk maps available online indicates the site to be in an area of low risk from UXO. | No further assessment required. |

# 7. PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

## Introduction

7.1 The risk posed by any contaminants in soil or groundwater will depend on the nature of the hazard, the probability of exposure, the pathway by which exposure occurs, and the likely effects on the receptors. A contaminant is defined as a substance that has the potential to cause harm, while a risk is considered to exist if such a substance is present in sufficient concentration to cause harm and a pathway exists for a receptor to be exposed to the substance.

7.2 Three impact potentials exist for any given site, all of which need to be considered in a risk assessment, which are:

- The site impacting upon itself;
- The site impacting on its surroundings; and
- The surroundings impacting on the site.

7.3 The following sections discuss all the identified potential on and off-site sources, pathways and receptors in the context of the proposed development and plausible pollutant linkages which may represent a risk to identified receptors such as human health and/or controlled waters from the data gained from the desk study.

7.4 The assessment is qualitative and aimed to determine all likely pollutant linkages, with consideration of significance and allowing for uncertainties.

7.5 **Sources (S):** These are potential or known sources of contamination that may relate to a former land use or present site feature or process (e.g. fuel storage tanks).

7.6 **Pathways (P):** A pathway is defined as a mechanism or route by which a contaminant comes into contact with, or otherwise affects a receptor. Pathways by which the identified receptors may be impacted upon in the context of the proposed development.

7.7 **Receptors (R):** Receptors are defined as people, living organisms, ecological systems, controlled waters, atmosphere, structures and utilities that could be adversely affected by contaminant(s).

## Conceptual Site Model

7.8 Consideration has been given to the likely sources, pathways and receptors which may be present, based on the information in the previous sections. These are presented in **Table 7:1** and **Table 7:2** and further information about the risk classification scheme is included within **Appendix 7**, with reference to CIRIA C552 '*Contaminated land risk assessment - a guide to good practice*'.

7.9 A tabulated version of the Preliminary CSM based on the desk study and site observations is presented in **Table 7:3.**

**Table 7:1: Potential Sources of Contamination**

| Location | Potential Source | Contaminants of Potential Concern (CoPC) |
|---|---|---|
| On-site | **MADE GROUND** associated with previous infrastructure developments such as **RAILWAY SIDINGS** and **ROAD DEVELOPMENT** | • Heavy metals<br>• Inorganics, such as cyanides, sulphates and nitrates<br>• Arsenic<br>• Methane, carbon dioxide |
| | Former/current **surface water/pond** features on site. | • Organic material<br>• Methane, carbon dioxide |
| | Contamination associated with **AGRICULTURAL** activities | • Semi-volatile organic compounds (SVOCs) including phenols and polycyclic aromatic hydrocarbons (PAHs)<br>• Inorganics, such as cyanides, sulphates and nitrates<br>• Methane, carbon dioxide |
| | Gas accumulation in **DEEP MINING WORKS** | • Methane, carbon dioxide |
| Off-site | Contamination associated with neighbouring activities including RAILWAY CUTTING and **QUARRIES** | • Heavy metals<br>• Semi-volatile organic compounds (SVOCs) including phenols and polycyclic aromatic hydrocarbons (PAHs)<br>• Petroleum hydrocarbons<br>• Inorganics, such as cyanides, sulphates and nitrates<br>• pH |

**Table 7:2: Relevant Potential Pathways and Receptors**

| Receptors | Pathways |
|---|---|
| **Human Health:**<br>• Future site users (commercial)<br>• Neighbouring public (residential/commercial)<br>• Intrusive maintenance workers | • Dermal contact with soil or dust<br>• Incidental ingestion of soil and/or dust<br>• Inhalation of dust and/or fibres<br>• Inhalation of vapours<br>• Migration and accumulation of ground gas in enclosed spaces leading to inhalation or explosion |
| **Controlled Waters:**<br>• Groundwater (aquifers)<br>• Surface water (Rochdale Canal, Stanney Brook) | • Leaching of soil contaminants<br>• Vertical and lateral migration<br>• Surface run-off |
| **Ecology:**<br>• Flora and Fauna | • Lateral migration<br>• Uptake and accumulation |
| **Property:**<br>• Underground utilities<br>• Building structures | • Direct Contact<br>• Accumulation and explosion of gas |

7.10 A number of potential sources of contamination, identified during the review, are not considered likely to impact on the site. These are detailed below, along with the appropriate justification for their exclusion from the preliminary CSM:

7.11 Due to the depth of recorded mining beneath the site, >90m, ground gas associated with coal mining is unlikely to have an influence on the site.

7.12 Potentially infilled sandstone quarries, with a distance from the site exceeding 500m, are unlikely to impact receptors on site.

7.13 Both Little Lane and the Ex Universal Laundry historical landfill sites have been discounted as a potential source of contamination. This is due to their distance from the site (>400m) and the superficial geology (Till), leaving it unlikely that a pathway would be viable to any receptors on site.

**Table 7:3: Preliminary Conceptual Site Model**

| Source | Pathway | Receptor | Con | Prob | Risk | Potential Mitigation/Investigation Requirements |
|---|---|---|---|---|---|---|
| On-site sources as detailed in **Table 7:1**. | Dermal contact with, and incidental ingestion of soil and/or dust.<br>Inhalation of dust and/or fibres. | Future site users (commercial) | Md | Ul | L | Limit potential for on-site contamination has been identified. As part of the proposed development, it is anticipated that hardstanding will be present across the majority of the site. This will limit the potential for direct contact with and minimise dust generation from potentially contaminated soils at the site post construction. In public open space, the provision of a clean soil cover layer would restrict direct exposure to potentially contaminated soils.<br>It is recommended that an intrusive ground investigation be completed in order to assess the extent of any potential contamination at the site. |
| | | Intrusive maintenance workers | Md | Lw | M/L | The exposure of intrusive maintenance workers can be mitigated by the adoption of suitable working methods, utilising appropriate personal protective equipment (PPE) and maintaining good hygiene. If significant asbestos is recorded, the requirements of the Control of Asbestos Regulations (CAR) 2012 should be complied with. |
| | Inhalation of vapours. | Future site users (commercial) | Md | Ul | L | If elevated concentrations of volatile contaminants are identified during ground investigation works, potential vapour sources such as Made Ground and contaminated soils/groundwater could potentially be mitigated through removal or treatment prior to construction or the installation of protection measures may be required during construction to mitigate the potential risk to future site users from vapours. |
| | | Neighbouring public | Md | Ul | L | |

| Source | Pathway | Receptor | Con | Prob | Risk | Potential Mitigation/Investigation Requirements |
|---|---|---|---|---|---|---|
| | | Intrusive maintenance workers | Md | Lw | M/L | If elevated concentrations of volatile contaminants are identified during ground investigation works and where entry into confined spaces/excavations is required by intrusive maintenance workers, it is recommended that a combination of the following may be required to mitigate the potential risk of exposure to vapours:<br>• appropriate PPE and/or Respiratory Protective Equipment (RPE);<br>• monitoring equipment (such as explosive level meters); and<br>• safe entry procedures. |
| | Migration and accumulation of ground gases in enclosed spaces leading to asphyxiation (carbon dioxide) or explosion (methane). | Future site users (commercial) | Md | Lw | M/L | Made Ground is expected across the site, with organic material related to surface water pond features likely to be present in the north west and east of the site.<br>The presence of the above indicates a potential risk from ground gases. Ground investigation should include the installation of ground gas monitoring wells in order to determine the risk posed from ground gases. |
| | Leaching and permeation through soil profile. | Groundwater: Underlying Secondary Superficial & Bedrock Aquifers | Md | Ul | L | Ground investigation should include the installation of groundwater monitoring wells to allow for sampling of groundwater for chemical analysis, in order to assess whether potentially unacceptable levels of contaminants of potential concern are present.<br>The recommendations of DEFRA and EA guidance document '*Pollution prevention for businesses*' should be considered during construction. |
| | Vertical and lateral migration of contaminants. | | Md | Ul | L | |
| | Surface run-off. | Stanney Brook<br>Rochdale Canal | Md | Ul | L | |
| | Direct contact. | Water utility pipes | Md | Lw | M/L | Organic compounds in the shallow soils could taint the water supply. A ground investigation and subsequent laboratory analysis should be undertaken to inform the design of new services. |

| Source | Pathway | Receptor | Con | Prob | Risk | Potential Mitigation/Investigation Requirements |
|---|---|---|---|---|---|---|
| | | Buried structures/ foundations. | Mi | Lw | L | Sulphates and low pH in the ground could accelerate the degradation of buried concrete structures (e.g. foundations). Ground investigation should include an assessment of the concrete design class. |
| Off-site sources as detailed in **Table 7:1**. | Dermal contact with, and incidental ingestion of soil and/or dust. | Future site users (commercial) | Md | Ul | L | As part of the proposed development, it is anticipated that hardstanding will be present across the majority of the site. This will limit the potential for direct contact with and minimise dust generation from potentially contaminated soils at the site post construction. In public open space, the provision of a clean capping layer would restrict direct access to potentially contaminated soils.<br>It is recommended that an intrusive ground investigation be completed in order to assess the extent of any potential contamination at the site. |
| | | Future site users (commercial) | Md | Ul | L | |
| | Leaching and permeation through soil profile. | Groundwater: Underlying Secondary Superficial & Bedrock Aquifers | Md | Ul | L | Ground investigation should include the installation of groundwater monitoring wells to allow for sampling of groundwater for chemical analysis, in order to assess whether potentially unacceptable levels of CoPC are present.<br>The recommendations of DEFRA and EA guidance document '*Pollution prevention for businesses*' should be considered during construction. |
| | Vertical and lateral migration of contaminants. | | Md | Ul | L | |
| VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low<br>KEY: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor, Hi = High, Li = Likely, Lw = Low Likelihood, Ul = Unlikely | | | | | | |

**Pollutant Linkage Assessment Summary**

When considered in the context of the conceptual site model and the historical activities that have taken place (agricultural work and potential landfill), the proposed development is considered to pose a **MODERATE/LOW** risk to human health. It is considered that the main driver for the risk rating for human health is Migration and accumulation of ground gases related to potential Made Ground and organic rich soils on the site.

The risk posed to controlled waters is predominantly considered to be **LOW** due to the limited contaminative sources identified on site.

It is recommended that a ground investigation be undertaken to quantify the identified pollutant linkages and assess likely mitigation measures.

# 8. ENVIRONMENTAL LIABILITY ASSESSMENT AND DEVELOPMENT IMPLICATIONS

## Statutory Liability

8.1 The contaminated land regime has implications for those who cause or knowingly permit land to be contaminated, or who own or occupy land that is contaminated. Contaminated land is defined in Section 78A(2) of Part IIA of the Environmental Protection Act 1990 as:

*"Any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that:*

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

*ii. Significant pollution of controlled waters is being caused or there is a significant possibility of such pollution being caused."*

8.2 Harm is defined in Section 78A(4) of the Environmental Protection Act 1990 as:

*"Harm to the health of living organisms or other interference with ecological systems of which they form part and, in the case of man, includes harm to his property."*

8.3 Once an area of land has been identified as contaminated land, appropriate persons will be identified as being responsible for the cost of cleaning up the land by the enforcing authority. The appropriate person will be liable for all or part of the remediation of the land. Two classes of appropriate person have been identified:

- Class A appropriate persons are those who cause or knowingly permit the pollutants to be in, on or under the land.
- Class B appropriate persons are the owners(s) or occupier(s) of the land.

8.4 Where no Class A appropriate persons can be identified, then Class B appropriate persons may become liable.

8.5 Based on the information available regarding the site, the potential for Statutory Authority action based on "pollution of controlled water" or "significant harm" as defined by Part IIA of the Environmental Protection Act 1990 is considered to be **LOW**.

## Third Party Liability

8.6 Based on the information contained in this report, it is the opinion of BWB that the potential for legal action by surrounding landowners, based on the potential for contamination to migrate off-site, is considered to be **LOW** when considering the former agricultural use of the surrounding land

### Public Relations

8.7 The likelihood of public relations being tarnished due to contamination issues at the site are considered to be **LOW**.

### Development Implications

8.8 Intrusive ground investigation should be undertaken to confirm the ground conditions at the site, primarily in regard to suitability of superficial deposits and the potential for running sands in the glaciofluvial deposits in the west of the site and the potential for differential settlement if the proposed development spans differing geology.

8.9 It is recommended that the requirement for earthworks and potential for re-use of or disposal of waste is established at an early stage in the project. The site is raised and undulating, primarily relating to the deposition of material associated with the construction of the loop road to the south of the site.

# 9. CONCLUSION AND RECOMMENDATIONS

## Conclusions

9.1 Historically, the site largely comprised of numerous fence enclosed fields, with a persistent body of water to the immediate southeast. The site remained largely unchanged throughout its history. The only onsite activity identified was between 2012 and 2018, with the southern loop road construction material being placed on site and a path constructed north south through the area. From 1851, the site has been immediately bordered to the north by a rail line, expanded with sidings during 1891-1908 period but has since been developed into a tramline, remaining largely unchanged.

9.2 Off-site, the area was largely agricultural fields bounded by residential developments of Rochdale and Milnrow. Industrial developments were primarily over 650m from site, with Belfield Colliery located 710m to the northeast of the site.

9.3 The site is situated on Glaciofluvial (Sand and Gravel) and Till superficial deposits. These deposits are underlain by the Pennine Lower Coal Measures bedrock. Both superficial and bedrock are classed as Secondary A Aquifers. Made Ground associated with the loop road construction and organic rich deposits associated with bodies of surface water are likely to be present on site.

9.4 The Coal Authority report places the site in a coal mining area, with mining operations being carried out at a depth of 97m to 107m that terminated in 1915.

9.5 Based on the predicted geology of the area, a shallow strip foundation may be viable dependent on the load of the development; ground investigation will be required to confirm ground conditions and check suitability of Sand and Gravel deposits.

9.6 The proposed development is considered to pose a moderate/low risk to human health with the main driver for the risk rating for human health is the migration and accumulation of ground gases related to Made Ground and the potential for organic rich soils on the site. The risk posed to controlled waters is predominantly considered to be low due to the lack of a significant contaminant source.

## Recommendations

9.7 A ground investigation should be undertaken at the site to:

- Confirm ground conditions presence at the site;
- Assess the ground gas regime;
- Allow for in-situ and laboratory testing to inform:
- foundation design; and
- an earthworks specification, if required.

9.8 Whilst the risk from contamination at the site has been assessed as low, it is considered best practice to allow for testing of soils as part of any ground investigation to confirm

the absence of any contamination, as well as to determine the suitability of soils for reuse as part of the proposed development.

# 10. REFERENCES

1. BS 10175:2011+A2:2017 Investigation of potentially contaminated sites. Code of practice. British Standards Institute, 2017.

2. CIRIA C552 *Contaminated land risk assessment. A guide to good practice*. Rudland, D J, Lancefield, R M, Mayell, P N, 2001.

3. Environmental Protection Act 1990: Part 2A, Contaminated Land Statutory Guidance. Department for Environment Food and Rural Affairs (DEFRA), 2012.

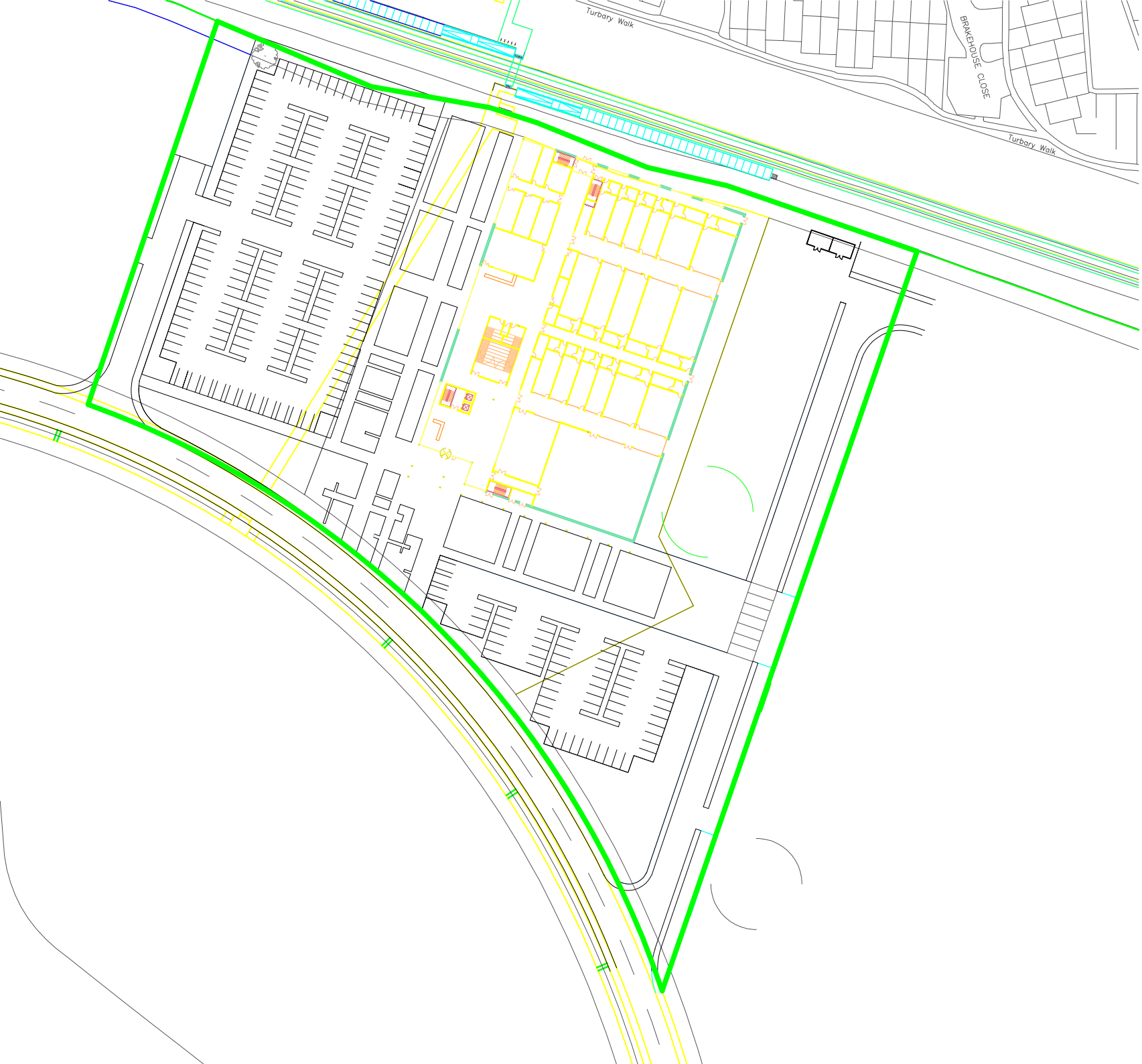
4. Land Contamination Risk Management. Environment Agency, 2020.

5. https://www.gov.uk/government/collections/land-contamination-technical-guidance.

6. The Control of Asbestos Regulations. Health and Safety Executive, 2012.

# *APPENDICES*

# Appendix 1: Proposed Site Layout


Turbary Walk
BRAKEHOUSE CLOSE
Turbary Walk

# Appendix 2: Site Photographs

**Project Number: 210939**
**Project Name: Plot P Kingsway Business Park**
**Site Photographs**



Photo 1—View of southern tarmac road taken from point of access, facing west



Photo 2—View of southern tarmac road taken from point of access, facing east

**Project Number: 210939**
**Project Name: Plot P Kingsway Business Park**
**Site Photographs**



Photo 3—Opposite footpath towards the south, open utilities excavation across the road



Photo 4—Facing north towards tram station, highlighting likely point of access into site

**Project Number: 210939**
**Project Name: Plot P Kingsway Business Park**
**Site Photographs**



Photo 5—Facing north just west of point of access, surface and foul water markers present in the vegetation



Photo 6—Facing north taken from tarmac road, looking along the western boundary of site

**Project Number: 210939**
**Project Name: Plot P Kingsway Business Park**
**Site Photographs**



Photo 7—Facing west along footpath, two areas of burnt ground and litter



Photo 8—Facing south from tram station along the footpath, small bicycle storage

**Project Number: 210939**
**Project Name: Plot P Kingsway Business Park**
**Site Photographs**



Photo 9—Broken glass alongside bicycle storage



Photo 10—Western section of site, old drystone wall that runs across the site from west to east.

**Project Number: 210939**
**Project Name: Plot P Kingsway Business Park**
**Site Photographs**



Photo 11—In western section of site a mound of earth approximately 2.5m high is present



Photo 12—North of the mound is a depression of approximately 2m at the northern boundary of the site

**Project Number: 210939**
**Project Name: Plot P Kingsway Business Park**
**Site Photographs**



Photo 13—East of the cycle storage, the northern boundary is marked by a barbed wire fence immediately before the tramline



Photo 14— Dry area that would normally be wet, containing bullrushes and soft ground located in eastern section of site

**Project Number: 210939**
**Project Name: Plot P Kingsway Business Park**
**Site Photographs**



Photo 15—Facing eastern boundary, two bodies of water and livestock separated from site by barbed wire fence



Photo 16— On northern pavement of tarmac road are utilities accessible for site work

**Project Number: 210939**
**Project Name: Plot P Kingsway Business Park**
**Site Photographs**



Photo 17—Facing north from tarmac road on eastern section of site, ditch creates a steep slope that creates a side profile of the natural material.

## Appendix 3: Groundsure Report

Groundsure
LOCATION INTELLIGENCE

# Enviro+Geo Insight

PLOT P, KINGSWAY BUSINESS PARK, MICHAEL FARADAY AVENUE, ROCHDALE, OL16 4FW

## Order Details

**Date:** 07/06/2022

**Your ref:** 210939_PO_1762

**Our Ref:** HMD-214-8800198

## Site Details

**Location:** 391907 412651

**Area:** 2.63 ha

**Authority:** Rochdale Metropolitan Borough Council





**Summary of findings** p. 2

**OS MasterMap site plan** p.12

**Aerial image** p. 8

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Contact us with any questions at:
info@groundsure.com
08444 159 000

# Summary of findings

| Page | Section | Past land use | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 13 | 1.1 | Historical industrial land uses | 3 | 2 | 7 | 22 | - |
| 15 | 1.2 | Historical tanks | 0 | 0 | 0 | 8 | - |
| 16 | 1.3 | Historical energy features | 0 | 0 | 3 | 9 | - |
| 16 | 1.4 | Historical petrol stations | 0 | 0 | 0 | 0 | - |
| 17 | 1.5 | Historical garages | 0 | 0 | 0 | 3 | - |
| 17 | 1.6 | Historical military land | 0 | 0 | 0 | 0 | - |
| Page | Section | Past land use - un-grouped | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 18 | 2.1 | Historical industrial land uses | 5 | 5 | 9 | 28 | - |
| 20 | 2.2 | Historical tanks | 0 | 0 | 0 | 20 | - |
| 21 | 2.3 | Historical energy features | 0 | 0 | 7 | 26 | - |
| 23 | 2.4 | Historical petrol stations | 0 | 0 | 0 | 0 | - |
| 23 | 2.5 | Historical garages | 0 | 0 | 0 | 4 | - |
| Page | Section | Waste and landfill | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 24 | 3.1 | Active or recent landfill | 0 | 0 | 0 | 0 | - |
| 24 | 3.2 | Historical landfill (BGS records) | 0 | 0 | 0 | 0 | - |
| 25 | 3.3 | Historical landfill (LA/mapping records) | 1 | 0 | 0 | 2 | - |
| 25 | 3.4 | Historical landfill (EA/NRW records) | 0 | 0 | 0 | 2 | - |
| 26 | 3.5 | Historical waste sites | 0 | 0 | 0 | 0 | - |
| 26 | 3.6 | Licensed waste sites | 0 | 0 | 0 | 0 | - |
| 26 | 3.7 | Waste exemptions | 0 | 0 | 0 | 0 | - |
| Page | Section | Current industrial land use | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 27 | 4.1 | Recent industrial land uses | 1 | 1 | 2 | - | - |
| 28 | 4.2 | Current or recent petrol stations | 0 | 0 | 0 | 2 | - |
| 28 | 4.3 | Electricity cables | 0 | 0 | 0 | 0 | - |
| 28 | 4.4 | Gas pipelines | 0 | 0 | 0 | 0 | - |
| 29 | 4.5 | Sites determined as Contaminated Land | 0 | 0 | 0 | 0 | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 29 | 4.6 | Control of Major Accident Hazards (COMAH) | 0 | 0 | 0 | 0 | - |
| 29 | 4.7 | Regulated explosive sites | 0 | 0 | 0 | 0 | - |
| 29 | 4.8 | Hazardous substance storage/usage | 0 | 0 | 0 | 0 | - |
| 29 | 4.9 | Historical licensed industrial activities (IPC) | 0 | 0 | 0 | 0 | - |
| 30 | 4.10 | Licensed industrial activities (Part A(1)) | 0 | 0 | 0 | 0 | - |
| 30 | 4.11 | Licensed pollutant release (Part A(2)/B) | 0 | 0 | 0 | 0 | - |
| 30 | 4.12 | Radioactive Substance Authorisations | 0 | 0 | 0 | 0 | - |
| **30** | **4.13** | **Licensed Discharges to controlled waters** | 0 | 0 | 2 | 1 | - |
| 31 | 4.14 | Pollutant release to surface waters (Red List) | 0 | 0 | 0 | 0 | - |
| 31 | 4.15 | Pollutant release to public sewer | 0 | 0 | 0 | 0 | - |
| 31 | 4.16 | List 1 Dangerous Substances | 0 | 0 | 0 | 0 | - |
| **32** | **4.17** | **List 2 Dangerous Substances** | 0 | 0 | 1 | 0 | - |
| **32** | **4.18** | **Pollution Incidents (EA/NRW)** | 0 | 0 | 2 | 4 | - |
| 33 | 4.19 | Pollution inventory substances | 0 | 0 | 0 | 0 | - |
| 33 | 4.20 | Pollution inventory waste transfers | 0 | 0 | 0 | 0 | - |
| 33 | 4.21 | Pollution inventory radioactive waste | 0 | 0 | 0 | 0 | - |

| Page | Section | Hydrogeology | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| **34** | **5.1** | **Superficial aquifer** | Identified (within 500m) | | | | |
| **36** | **5.2** | **Bedrock aquifer** | Identified (within 500m) | | | | |
| **37** | **5.3** | **Groundwater vulnerability** | Identified (within 50m) | | | | |
| 38 | 5.4 | Groundwater vulnerability- soluble rock risk | None (within 0m) | | | | |
| 38 | 5.5 | Groundwater vulnerability- local information | None (within 0m) | | | | |
| **39** | **5.6** | **Groundwater abstractions** | 0 | 0 | 0 | 0 | 13 |
| **43** | **5.7** | **Surface water abstractions** | 0 | 0 | 0 | 0 | 21 |
| **48** | **5.8** | **Potable abstractions** | 0 | 0 | 0 | 0 | 3 |
| **49** | **5.9** | **Source Protection Zones** | 1 | 0 | 0 | 0 | - |
| 50 | 5.10 | Source Protection Zones (confined aquifer) | 0 | 0 | 0 | 0 | - |

| Page | Section | Hydrology | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| **51** | **6.1** | **Water Network (OS MasterMap)** | 0 | 0 | 29 | - | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 54 | 6.2 | Surface water features | 1 | 0 | 16 | - | - |
| 54 | 6.3 | WFD Surface water body catchments | 1 | - | - | - | - |
| 55 | 6.4 | WFD Surface water bodies | 0 | 0 | 1 | - | - |
| 55 | 6.5 | WFD Groundwater bodies | 1 | - | - | - | - |

| Page | Section | River and coastal flooding | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 56 | 7.1 | Risk of flooding from rivers and the sea | None (within 50m) | | | | |
| 56 | 7.2 | Historical Flood Events | 0 | 0 | 0 | - | - |
| 56 | 7.3 | Flood Defences | 0 | 0 | 0 | - | - |
| 57 | 7.4 | Areas Benefiting from Flood Defences | 0 | 0 | 0 | - | - |
| 57 | 7.5 | Flood Storage Areas | 0 | 0 | 0 | - | - |
| 58 | 7.6 | Flood Zone 2 | None (within 50m) | | | | |
| 58 | 7.7 | Flood Zone 3 | None (within 50m) | | | | |

| Page | Section | Surface water flooding | |
|---|---|---|---|
| 59 | 8.1 | Surface water flooding | 1 in 30 year, Greater than 1.0m (within 50m) |

| Page | Section | Groundwater flooding | |
|---|---|---|---|
| 61 | 9.1 | Groundwater flooding | Moderate (within 50m) |

| Page | Section | Environmental designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 62 | 10.1 | Sites of Special Scientific Interest (SSSI) | 0 | 0 | 0 | 1 | 1 |
| 63 | 10.2 | Conserved wetland sites (Ramsar sites) | 0 | 0 | 0 | 0 | 0 |
| 63 | 10.3 | Special Areas of Conservation (SAC) | 0 | 0 | 0 | 1 | 1 |
| 64 | 10.4 | Special Protection Areas (SPA) | 0 | 0 | 0 | 0 | 0 |
| 64 | 10.5 | National Nature Reserves (NNR) | 0 | 0 | 0 | 0 | 0 |
| 64 | 10.6 | Local Nature Reserves (LNR) | 0 | 0 | 0 | 0 | 0 |
| 64 | 10.7 | Designated Ancient Woodland | 0 | 0 | 0 | 0 | 0 |
| 64 | 10.8 | Biosphere Reserves | 0 | 0 | 0 | 0 | 0 |
| 65 | 10.9 | Forest Parks | 0 | 0 | 0 | 0 | 0 |
| 65 | 10.10 | Marine Conservation Zones | 0 | 0 | 0 | 0 | 0 |
| 65 | 10.11 | Green Belt | 0 | 0 | 0 | 0 | 4 |
| 65 | 10.12 | Proposed Ramsar sites | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 66 | 10.13 | Possible Special Areas of Conservation (pSAC) | 0 | 0 | 0 | 0 | 0 |
| 66 | 10.14 | Potential Special Protection Areas (pSPA) | 0 | 0 | 0 | 0 | 0 |
| 66 | 10.15 | Nitrate Sensitive Areas | 0 | 0 | 0 | 0 | 0 |
| 66 | 10.16 | Nitrate Vulnerable Zones | 0 | 0 | 0 | 0 | 0 |
| **67** | **10.17** | **SSSI Impact Risk Zones** | 2 | - | - | - | - |
| **69** | **10.18** | **SSSI Units** | 0 | 0 | 0 | 1 | 1 |
| Page | Section | Visual and cultural designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 70 | 11.1 | World Heritage Sites | 0 | 0 | 0 | - | - |
| 70 | 11.2 | Area of Outstanding Natural Beauty | 0 | 0 | 0 | - | - |
| 70 | 11.3 | National Parks | 0 | 0 | 0 | - | - |
| 70 | 11.4 | Listed Buildings | 0 | 0 | 0 | - | - |
| 71 | 11.5 | Conservation Areas | 0 | 0 | 0 | - | - |
| 71 | 11.6 | Scheduled Ancient Monuments | 0 | 0 | 0 | - | - |
| 71 | 11.7 | Registered Parks and Gardens | 0 | 0 | 0 | - | - |
| Page | Section | Agricultural designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **72** | **12.1** | **Agricultural Land Classification** | Urban (within 250m) | | | | |
| 73 | 12.2 | Open Access Land | 0 | 0 | 0 | - | - |
| 73 | 12.3 | Tree Felling Licences | 0 | 0 | 0 | - | - |
| 73 | 12.4 | Environmental Stewardship Schemes | 0 | 0 | 0 | - | - |
| 73 | 12.5 | Countryside Stewardship Schemes | 0 | 0 | 0 | - | - |
| Page | Section | Habitat designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **74** | **13.1** | **Priority Habitat Inventory** | 0 | 0 | 4 | - | - |
| **75** | **13.2** | **Habitat Networks** | 2 | 0 | 2 | - | - |
| 75 | 13.3 | Open Mosaic Habitat | 0 | 0 | 0 | - | - |
| 75 | 13.4 | Limestone Pavement Orders | 0 | 0 | 0 | - | - |
| Page | Section | Geology 1:10,000 scale | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **76** | **14.1** | **10k Availability** | Identified (within 500m) | | | | |
| **77** | **14.2** | **Artificial and made ground (10k)** | 1 | 2 | 3 | 3 | - |
| **79** | **14.3** | **Superficial geology (10k)** | 3 | 0 | 6 | 2 | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 80 | 14.4 | Landslip (10k) | 0 | 0 | 0 | 0 | - |
| 81 | 14.5 | Bedrock geology (10k) | 1 | 0 | 2 | 0 | - |
| 82 | 14.6 | Bedrock faults and other linear features (10k) | 0 | 0 | 3 | 0 | - |
| Page | Section | Geology 1:50,000 scale | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 83 | 15.1 | 50k Availability | Identified (within 500m) | | | | |
| 84 | 15.2 | Artificial and made ground (50k) | 0 | 0 | 0 | 0 | - |
| 84 | 15.3 | Artificial ground permeability (50k) | 0 | 0 | - | - | - |
| 85 | 15.4 | Superficial geology (50k) | 3 | 0 | 5 | 5 | - |
| 86 | 15.5 | Superficial permeability (50k) | Identified (within 50m) | | | | |
| 86 | 15.6 | Landslip (50k) | 0 | 0 | 0 | 0 | - |
| 87 | 15.7 | Landslip permeability (50k) | None (within 50m) | | | | |
| 88 | 15.8 | Bedrock geology (50k) | 1 | 0 | 3 | 2 | - |
| 89 | 15.9 | Bedrock permeability (50k) | Identified (within 50m) | | | | |
| 89 | 15.10 | Bedrock faults and other linear features (50k) | 0 | 0 | 3 | 1 | - |
| Page | Section | Boreholes | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 90 | 16.1 | BGS Boreholes | 0 | 0 | 0 | - | - |
| Page | Section | Natural ground subsidence | | | | | |
| 91 | 17.1 | Shrink swell clays | Very low (within 50m) | | | | |
| 92 | 17.2 | Running sands | Very low (within 50m) | | | | |
| 93 | 17.3 | Compressible deposits | Negligible (within 50m) | | | | |
| 94 | 17.4 | Collapsible deposits | Very low (within 50m) | | | | |
| 95 | 17.5 | Landslides | Low (within 50m) | | | | |
| 97 | 17.6 | Ground dissolution of soluble rocks | Negligible (within 50m) | | | | |
| Page | Section | Mining, ground workings and natural cavities | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 98 | 18.1 | Natural cavities | 0 | 0 | 0 | 0 | - |
| 99 | 18.2 | BritPits | 0 | 0 | 0 | 0 | - |
| 99 | 18.3 | Surface ground workings | 1 | 4 | 8 | - | - |
| 100 | 18.4 | Underground workings | 0 | 0 | 0 | 0 | 25 |
| 101 | 18.5 | Historical Mineral Planning Areas | 0 | 0 | 0 | 0 | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 101 | 18.6 | Non-coal mining | 0 | 0 | 0 | 0 | 0 |
| 101 | 18.7 | Mining cavities | 0 | 0 | 0 | 0 | 0 |
| 101 | 18.8 | JPB mining areas | None (within 0m) | | | | |
| **102** | **18.9** | **Coal mining** | Identified (within 0m) | | | | |
| 102 | 18.10 | Brine areas | None (within 0m) | | | | |
| 102 | 18.11 | Gypsum areas | None (within 0m) | | | | |
| 102 | 18.12 | Tin mining | None (within 0m) | | | | |
| 102 | 18.13 | Clay mining | None (within 0m) | | | | |

| Page | Section | Radon | | | | | |
|---|---|---|---|---|---|---|---|
| **103** | **19.1** | **Radon** | Less than 1% (within 0m) | | | | |

| Page | Section | Soil chemistry | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| **104** | **20.1** | **BGS Estimated Background Soil Chemistry** | 5 | 8 | - | - | - |
| 105 | 20.2 | BGS Estimated Urban Soil Chemistry | 0 | 0 | - | - | - |
| 105 | 20.3 | BGS Measured Urban Soil Chemistry | 0 | 0 | - | - | - |

| Page | Section | Railway infrastructure and projects | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 106 | 21.1 | Underground railways (London) | 0 | 0 | 0 | - | - |
| 106 | 21.2 | Underground railways (Non-London) | 0 | 0 | 0 | - | - |
| 107 | 21.3 | Railway tunnels | 0 | 0 | 0 | - | - |
| **107** | **21.4** | **Historical railway and tunnel features** | 4 | 4 | 0 | - | - |
| 107 | 21.5 | Royal Mail tunnels | 0 | 0 | 0 | - | - |
| 108 | 21.6 | Historical railways | 0 | 0 | 0 | - | - |
| **108** | **21.7** | **Railways** | 0 | 7 | 1 | - | - |
| 108 | 21.8 | Crossrail 1 | 0 | 0 | 0 | 0 | - |
| 109 | 21.9 | Crossrail 2 | 0 | 0 | 0 | 0 | - |
| 109 | 21.10 | HS2 | 0 | 0 | 0 | 0 | - |

## Recent aerial photograph




Capture Date: 23/05/2019

Site Area: 2.63ha

## Recent site history - 2018 aerial photograph




Capture Date: 01/07/2018

Site Area: 2.63ha

# Recent site history - 2012 aerial photograph




Capture Date: 26/03/2012

Site Area: 2.63ha

# Recent site history - 2000 aerial photograph




Capture Date: 19/06/2000

Site Area: 2.63ha

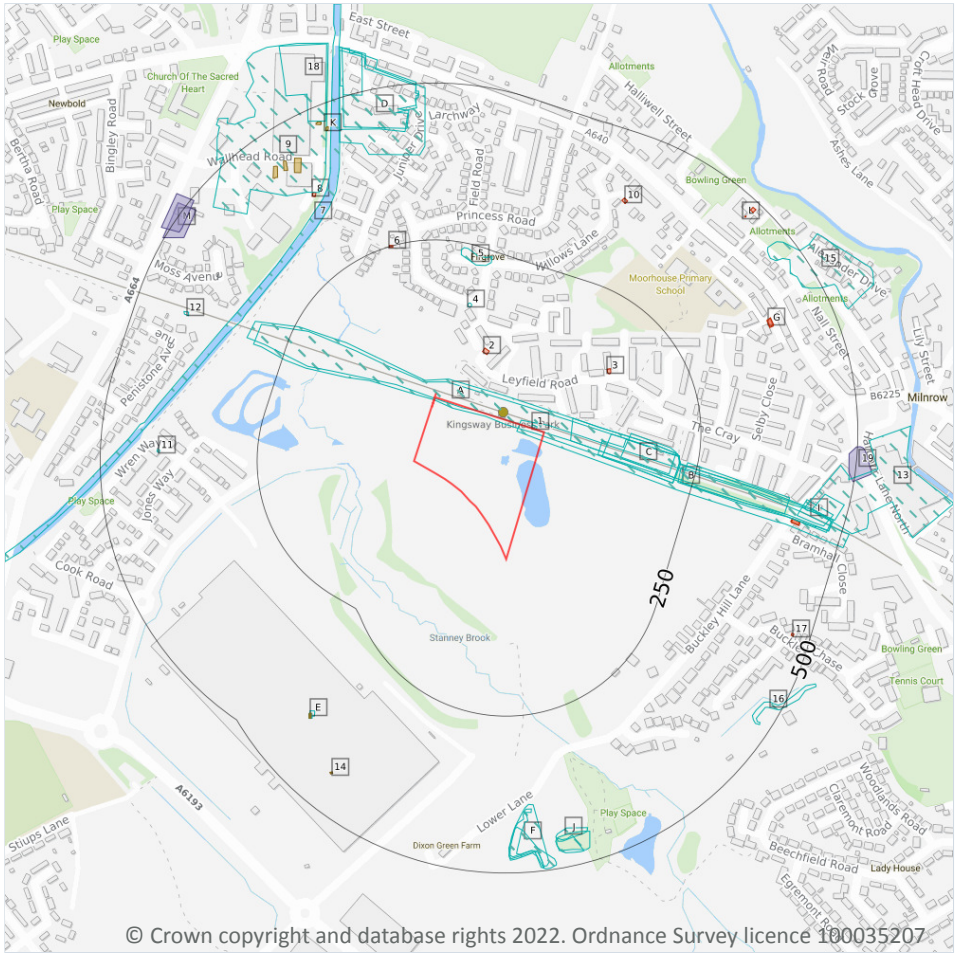
## OS MasterMap site plan




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Site Area: 2.63ha

# 1 Past land use




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## 1.1 Historical industrial land uses

| Records within 500m | 34 |
|---|---|

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| **A** | **On site** | **Railway Sidings** | **1954** | **724759** |

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| **A** | **On site** | **Railway Sidings** | **1908 - 1938** | **751687** |
| **B** | **On site** | **Cuttings** | **1851** | **786262** |
| 1 | 1m N | Railway Building | 1908 - 1938 | 783697 |
| B | 43m E | Cuttings | 1928 - 1938 | 765393 |
| B | 93m E | Cuttings | 1891 - 1908 | 779322 |
| C | 100m E | Cuttings | 1954 | 734088 |
| C | 129m E | Cuttings | 1976 | 739294 |
| 4 | 153m N | Pump | 1851 | 675559 |
| 5 | 220m N | Gravel Pit | 1928 | 652793 |
| B | 225m E | Cuttings | 1954 | 755622 |
| B | 231m E | Cuttings | 1967 - 1976 | 694503 |
| 7 | 317m NW | Disused Canal | 1976 | 754144 |
| 9 | 374m NW | Unspecified Works | 1976 | 678989 |
| D | 386m N | Unspecified Mill | 1967 - 1976 | 695566 |
| E | 389m SW | Unspecified Tank | 1976 | 734152 |
| F | 392m S | Unspecified Heap | 1928 - 1938 | 756700 |
| E | 395m SW | Unspecified Tank | 1908 | 751839 |
| F | 399m S | Unspecified Ground Workings | 1954 | 790979 |
| 11 | 406m W | Pump | 1851 | 675561 |
| 12 | 413m W | Railway Building | 1938 | 670151 |
| I | 424m E | Cuttings | 1976 | 773256 |
| D | 425m N | Unspecified Mill | 1954 | 699075 |
| F | 427m S | Unspecified Ground Workings | 1908 | 734223 |
| D | 430m N | Unspecified Mill | 1908 - 1938 | 733595 |
| 13 | 432m E | Unspecified Commercial/Industrial | 1954 | 712244 |
| J | 439m S | Unspecified Heap | 1908 - 1938 | 731546 |
| I | 444m E | Unspecified Works | 1908 | 678987 |
| J | 448m S | Unspecified Pit | 1967 | 690648 |

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| J | 451m S | Unspecified Heap | 1954 | 710976 |
| 15 | 455m NE | Sandstone Quarry | 1851 | 687572 |
| 16 | 465m SE | Unspecified Ground Workings | 1954 | 647991 |
| 18 | 473m N | Unspecified Mill | 1967 | 745503 |
| D | 495m N | Unspecified Mill | 1891 | 775083 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.2 Historical tanks

| **Records within 500m** | **8** |
|---|---|

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| E | 396m SW | Unspecified Tank | 1955 | 88604 |
| E | 398m SW | Unspecified Tank | 1910 | 92886 |
| H | 416m NW | Tanks | 1988 | 87640 |
| H | 430m NW | Tanks | 1988 | 87641 |
| H | 430m NW | Tanks | 1988 | 87639 |
| 14 | 438m SW | Tanks | 1955 | 98986 |
| K | 457m N | Tanks | 1988 - 1997 | 100658 |
| K | 470m NW | Unspecified Tank | 1988 - 1997 | 94216 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.3 Historical energy features

| Records within 500m | 12 |
|---|---|

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| 2 | 90m N | Electricity Substation | 1984 | 59344 |
| 3 | 139m NE | Electricity Substation | 1983 - 1996 | 52949 |
| 6 | 247m N | Electricity Substation | 1984 | 58271 |
| 8 | 372m NW | Electricity Substation | 1988 - 1997 | 54991 |
| 10 | 387m N | Electricity Substation | 1955 - 1989 | 54904 |
| G | 397m NE | Electricity Substation | 1996 | 48183 |
| G | 397m NE | Electricity Substation | 1975 - 1989 | 54152 |
| I | 417m E | Electricity Substation | 1983 | 54013 |
| I | 418m E | Electricity Substation | 1975 - 1996 | 53917 |
| L | 469m NE | Electricity Substation | 1973 | 45419 |
| 17 | 470m E | Electricity Substation | 1995 | 45544 |
| L | 483m NE | Electricity Substation | 1982 - 1989 | 52765 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.4 Historical petrol stations

| Records within 500m | 0 |
|---|---|

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.5 Historical garages

| Records within 500m | 3 |
|---|---|

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| M | 474m NW | Garage | 1979 - 1985 | 19493 |
| M | 485m NW | Garage | 1979 | 15479 |
| 19 | 487m E | Garage | 1968 | 14602 |

*This data is sourced from Ordnance Survey / Groundsure.*

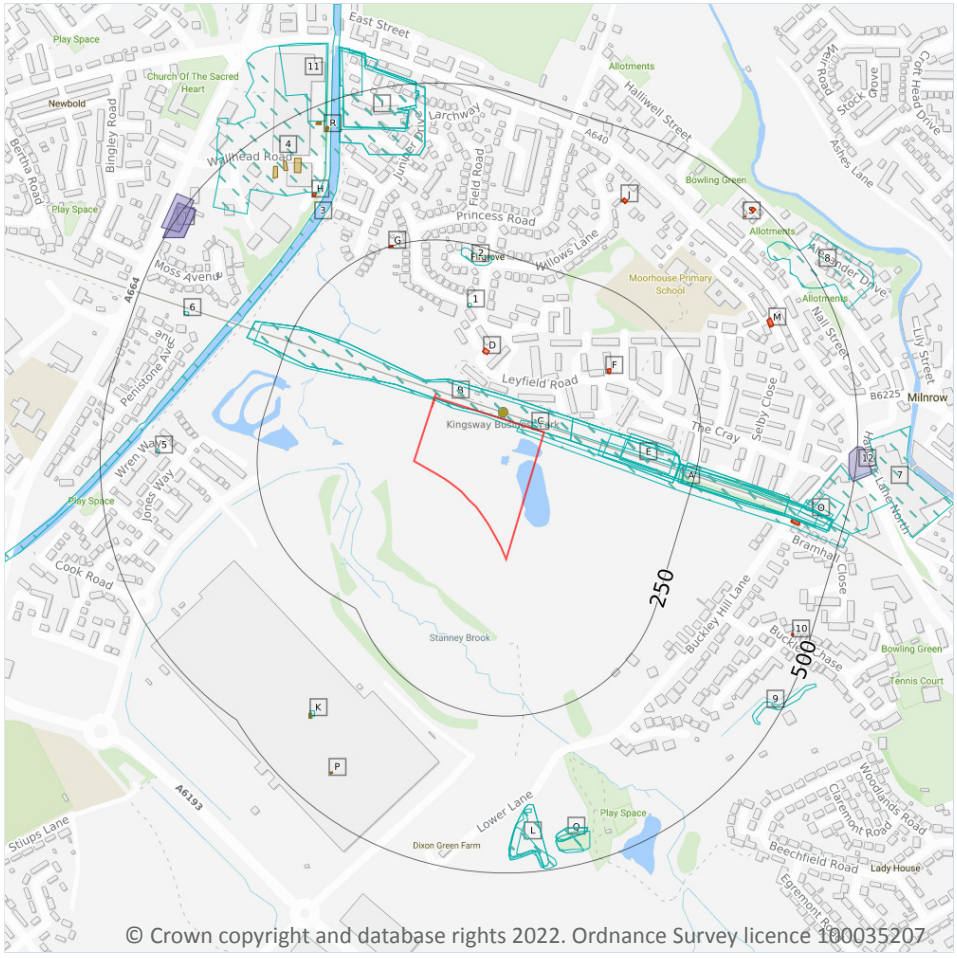
## 1.6 Historical military land

| Records within 500m | 0 |
|---|---|

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

*This data is sourced from Ordnance Survey / Groundsure / other sources.*

# 2 Past land use - un-grouped



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## 2.1 Historical industrial land uses

| Records within 500m | 47 |
|---|---|

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 18**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| **A** | **On site** | **Cuttings** | **1851** | **786262** |
| **B** | **On site** | **Railway Sidings** | **1954** | **724759** |
| **B** | **On site** | **Railway Sidings** | **1938** | **751687** |

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| **B** | **On site** | **Railway Sidings** | **1928** | **751687** |
| **B** | **On site** | **Railway Sidings** | **1908** | **751687** |
| C | 1m N | Railway Building | 1938 | 783697 |
| C | 1m N | Railway Building | 1928 | 783697 |
| C | 1m N | Railway Building | 1908 | 783697 |
| A | 43m E | Cuttings | 1938 | 765393 |
| A | 43m E | Cuttings | 1928 | 765393 |
| A | 93m E | Cuttings | 1891 | 779322 |
| E | 100m E | Cuttings | 1954 | 734088 |
| A | 127m E | Cuttings | 1908 | 779322 |
| E | 129m E | Cuttings | 1976 | 739294 |
| 1 | 153m N | Pump | 1851 | 675559 |
| 2 | 220m N | Gravel Pit | 1928 | 652793 |
| A | 225m E | Cuttings | 1954 | 755622 |
| A | 231m E | Cuttings | 1976 | 694503 |
| A | 231m E | Cuttings | 1967 | 694503 |
| 3 | 317m NW | Disused Canal | 1976 | 754144 |
| 4 | 374m NW | Unspecified Works | 1976 | 678989 |
| I | 386m N | Unspecified Mill | 1976 | 695566 |
| I | 386m N | Unspecified Mill | 1967 | 695566 |
| K | 389m SW | Unspecified Tank | 1976 | 734152 |
| L | 392m S | Unspecified Heap | 1938 | 756700 |
| L | 392m S | Unspecified Heap | 1928 | 756700 |
| K | 395m SW | Unspecified Tank | 1908 | 751839 |
| L | 399m S | Unspecified Ground Workings | 1954 | 790979 |
| 5 | 406m W | Pump | 1851 | 675561 |
| 6 | 413m W | Railway Building | 1938 | 670151 |
| O | 424m E | Cuttings | 1976 | 773256 |

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| I | 425m N | Unspecified Mill | 1954 | 699075 |
| L | 427m S | Unspecified Ground Workings | 1908 | 734223 |
| I | 430m N | Unspecified Mill | 1938 | 733595 |
| I | 430m N | Unspecified Mill | 1928 | 733595 |
| I | 430m N | Unspecified Mill | 1908 | 733595 |
| 7 | 432m E | Unspecified Commercial/Industrial | 1954 | 712244 |
| Q | 439m S | Unspecified Heap | 1938 | 731546 |
| Q | 439m S | Unspecified Heap | 1928 | 731546 |
| Q | 439m S | Unspecified Heap | 1908 | 731546 |
| O | 444m E | Unspecified Works | 1908 | 678987 |
| Q | 448m S | Unspecified Pit | 1967 | 690648 |
| Q | 451m S | Unspecified Heap | 1954 | 710976 |
| 8 | 455m NE | Sandstone Quarry | 1851 | 687572 |
| 9 | 465m SE | Unspecified Ground Workings | 1954 | 647991 |
| 11 | 473m N | Unspecified Mill | 1967 | 745503 |
| I | 495m N | Unspecified Mill | 1891 | 775083 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.2 Historical tanks

| **Records within 500m** | **20** |
|---|---|

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 18**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| K | 396m SW | Unspecified Tank | 1955 | 88604 |
| K | 396m SW | Unspecified Tank | 1955 | 88604 |
| K | 398m SW | Unspecified Tank | 1910 | 92886 |
| N | 416m NW | Tanks | 1988 | 87640 |

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| N | 430m NW | Tanks | 1988 | 87641 |
| N | 430m NW | Tanks | 1988 | 87639 |
| P | 438m SW | Tanks | 1955 | 98986 |
| P | 438m SW | Tanks | 1955 | 98986 |
| R | 457m N | Tanks | 1988 | 100658 |
| R | 458m N | Tanks | 1995 | 100658 |
| R | 458m N | Tanks | 1997 | 100658 |
| R | 458m N | Tanks | 1995 | 100658 |
| R | 458m N | Tanks | 1996 | 100658 |
| R | 458m N | Tanks | 1995 | 100658 |
| R | 470m NW | Unspecified Tank | 1988 | 94216 |
| R | 471m NW | Unspecified Tank | 1997 | 94216 |
| R | 471m NW | Unspecified Tank | 1995 | 94216 |
| R | 471m NW | Unspecified Tank | 1996 | 94216 |
| R | 471m NW | Unspecified Tank | 1995 | 94216 |
| R | 471m NW | Unspecified Tank | 1995 | 94216 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.3 Historical energy features

**Records within 500m** **33**

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 18**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| D | 90m N | Electricity Substation | 1984 | 59344 |
| D | 90m N | Electricity Substation | 1984 | 59344 |
| F | 139m NE | Electricity Substation | 1983 | 52949 |
| F | 139m NE | Electricity Substation | 1996 | 52949 |

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| F | 140m NE | Electricity Substation | 1989 | 52949 |
| G | 247m N | Electricity Substation | 1984 | 58271 |
| G | 247m N | Electricity Substation | 1984 | 58271 |
| H | 372m NW | Electricity Substation | 1988 | 54991 |
| H | 372m NW | Electricity Substation | 1997 | 54991 |
| H | 372m NW | Electricity Substation | 1995 | 54991 |
| H | 372m NW | Electricity Substation | 1996 | 54991 |
| H | 372m NW | Electricity Substation | 1995 | 54991 |
| H | 372m NW | Electricity Substation | 1995 | 54991 |
| J | 387m N | Electricity Substation | 1955 | 54904 |
| J | 387m N | Electricity Substation | 1989 | 54904 |
| J | 387m N | Electricity Substation | 1973 | 54904 |
| J | 387m N | Electricity Substation | 1982 | 54904 |
| J | 387m N | Electricity Substation | 1982 | 54904 |
| J | 387m N | Electricity Substation | 1987 | 54904 |
| J | 387m N | Electricity Substation | 1955 | 54904 |
| M | 397m NE | Electricity Substation | 1996 | 48183 |
| M | 397m NE | Electricity Substation | 1989 | 54152 |
| M | 397m NE | Electricity Substation | 1975 | 54152 |
| O | 417m E | Electricity Substation | 1983 | 54013 |
| O | 418m E | Electricity Substation | 1996 | 53917 |
| O | 419m E | Electricity Substation | 1989 | 53917 |
| O | 419m E | Electricity Substation | 1975 | 53917 |
| S | 469m NE | Electricity Substation | 1973 | 45419 |
| 10 | 470m E | Electricity Substation | 1995 | 45544 |
| S | 483m NE | Electricity Substation | 1982 | 52765 |
| S | 483m NE | Electricity Substation | 1982 | 52765 |
| S | 483m NE | Electricity Substation | 1987 | 52765 |

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| S | 483m NE | Electricity Substation | 1989 | 52765 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.4 Historical petrol stations

| Records within 500m | 0 |
|---|---|

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.5 Historical garages

| Records within 500m | 4 |
|---|---|

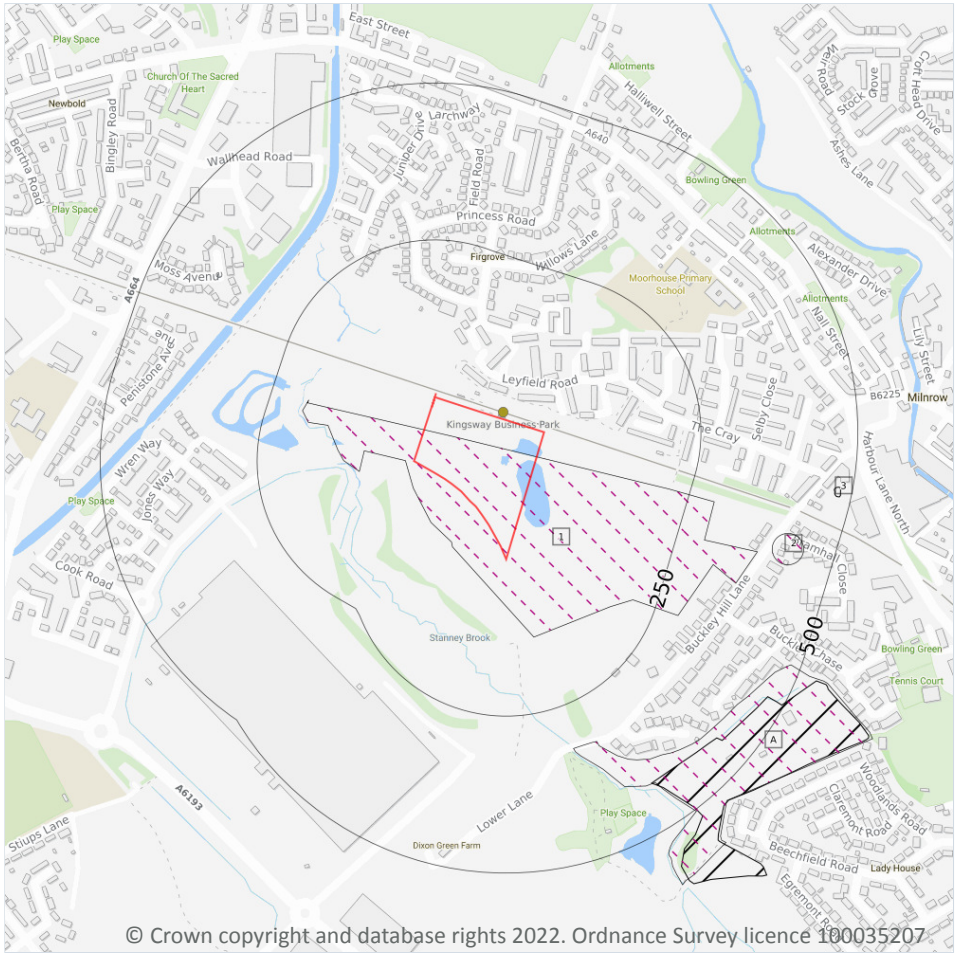
Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 18**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| T | 474m NW | Garage | 1979 | 19493 |
| T | 474m NW | Garage | 1985 | 19493 |
| T | 485m NW | Garage | 1979 | 15479 |
| 12 | 487m E | Garage | 1968 | 14602 |

*This data is sourced from Ordnance Survey / Groundsure.*

# 3 Waste and landfill




Site Outline

Search buffers in metres (m)

Historical landfill (EA/NRW)

Historical landfill (LA/OS)

## 3.1 Active or recent landfill

| Records within 500m | 0 |
|---|---|

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 3.2 Historical landfill (BGS records)

| Records within 500m | 0 |
|---|---|

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

*This data is sourced from the British Geological Survey.*

## 3.3 Historical landfill (LA/mapping records)

| Records within 500m | 3 |
|---|---|

Landfill sites identified from Local Authority records and high detail historical mapping.

Features are displayed on the Waste and landfill map on **page 24**

| ID | Location | Site address | Source | Data type |
|---|---|---|---|---|
| **1** | **On site** | **Buckley hill lane,Rochdale** | **Rochdale** | **Polygon** |
| A | 320m S | Little Lane, Off Harbour Lane, Milnrow | Rochdale Council | Polygon |
| 2 | 401m E | Ex Universal Laundry Lodge | Rochdale Council | Point |

*This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.*

## 3.4 Historical landfill (EA/NRW records)

| Records within 500m | 2 |
|---|---|

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

Features are displayed on the Waste and landfill map on **page 24**

| ID | Location | Details | | |
|---|---|---|---|---|
| A | 425m SE | Site Address: Little Lane, Off Harbour Lane, Milnrow, Greater Manchester<br>Licence Holder Address: - | Waste Licence: -<br>Site Reference: D073<br>Waste Type: -<br>Environmental Permitting Regulations (Waste) Reference: -<br>Licence Issue: -<br>Licence Surrender: - | Operator: -<br>Licence Holder: -<br>First Recorded -<br>Last Recorded: - |
| 3 | 471m E | Site Address: Ex Universal Laundry Lodge, Buckley Hill Lane, Milnrow, Rochdale<br>Licence Holder Address: Lane Bottom, Newhey, Rochdale | Waste Licence: Yes<br>Site Reference: RD/LIC/493/87<br>Waste Type: Inert<br>Environmental Permitting Regulations (Waste) Reference: -<br>Licence Issue: 01/07/1988<br>Licence Surrender: - | Operator: -<br>Licence Holder: Lane Bottom Industrial Equitables Pioneers<br>First Recorded 01/08/1988<br>Last Recorded: 31/12/1988 |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 3.5 Historical waste sites

| Records within 500m | 0 |
|---|---|

Waste site records derived from Local Authority planning records and high detail historical mapping.

*This data is sourced from Ordnance Survey/Groundsure and Local Authority records.*

## 3.6 Licensed waste sites

| Records within 500m | 0 |
|---|---|

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

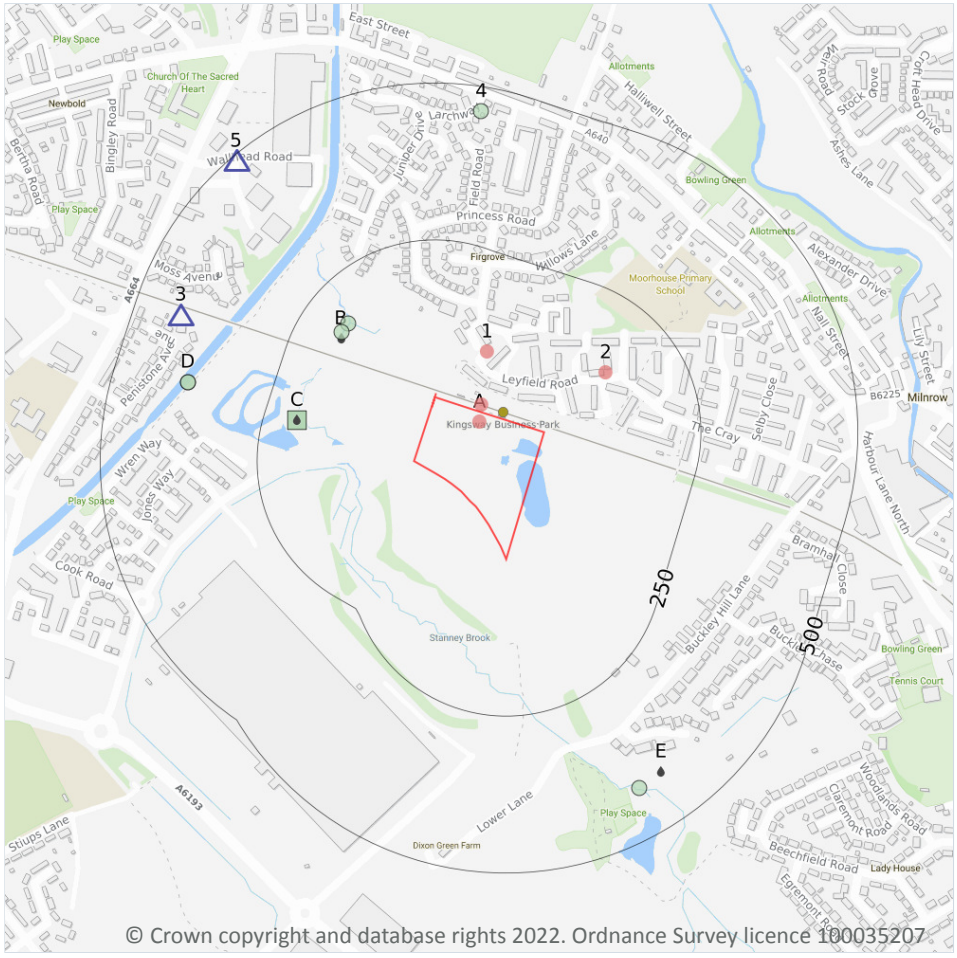
## 3.7 Waste exemptions

| Records within 500m | 0 |
|---|---|

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

# 4 Current industrial land use




Site Outline

Search buffers in metres (m)

Recent industrial land uses

Current or recent petrol stations

Licensed Discharges to controlled waters

List 2 Dangerous Substances

Pollution Incidents (EA/NRW)

## 4.1 Recent industrial land uses

| Records within 250m | 4 |
|---|---|

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 27**

| ID | Location | Company | Address | Activity | Category |
|---|---|---|---|---|---|
| **A** | **On site** | **Kingsway Business Park** | **Greater Manchester, OL16** | **Business Parks and Industrial Estates** | **Industrial Features** |

| ID | Location | Company | Address | Activity | Category |
|---|---|---|---|---|---|
| A | 12m N | Kingsway Business Park (Mancheste r Metrolink) | Greater Manchester, OL16 | Tram, Metro and Light Railway Stations and Stops | Public Transport, Stations and Infrastructure |
| 1 | 95m N | Electricity Sub Station | Greater Manchester, OL16 | Electrical Features | Infrastructure and Facilities |
| 2 | 137m NE | Electricity Sub Station | Greater Manchester, OL16 | Electrical Features | Infrastructure and Facilities |

*This data is sourced from Ordnance Survey.*

## 4.2 Current or recent petrol stations

| **Records within 500m** | **2** |
|---|---|

Open, closed, under development and obsolete petrol stations.

Features are displayed on the Current industrial land use map on **page 27**

| ID | Location | Company | Address | LPG | Status |
|---|---|---|---|---|---|
| 3 | 426m W | OBSOLETE | Kingsway, Rochdale, Greater Manchester, OL16 4AP | Not Applicable | Obsolete |
| 5 | 492m NW | OBSOLETE | 301, Kingsway, Rochdale, Greater Manchester, OL16 5BX | Not Applicable | Obsolete |

*This data is sourced from Experian.*

## 4.3 Electricity cables

| **Records within 500m** | **0** |
|---|---|

High voltage underground electricity transmission cables.

*This data is sourced from National Grid.*

## 4.4 Gas pipelines

| **Records within 500m** | **0** |
|---|---|

High pressure underground gas transmission pipelines.

*This data is sourced from National Grid.*

## 4.5 Sites determined as Contaminated Land

| Records within 500m | 0 |
|---|---|

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

*This data is sourced from Local Authority records.*

## 4.6 Control of Major Accident Hazards (COMAH)

| Records within 500m | 0 |
|---|---|

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

*This data is sourced from the Health and Safety Executive.*

## 4.7 Regulated explosive sites

| Records within 500m | 0 |
|---|---|

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

*This data is sourced from the Health and Safety Executive.*

## 4.8 Hazardous substance storage/usage

| Records within 500m | 0 |
|---|---|

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

*This data is sourced from Local Authority records.*

## 4.9 Historical licensed industrial activities (IPC)

| Records within 500m | 0 |
|---|---|

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.10 Licensed industrial activities (Part A(1))

| Records within 500m | 0 |
|---|---|

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.11 Licensed pollutant release (Part A(2)/B)

| Records within 500m | 0 |
|---|---|

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

*This data is sourced from Local Authority records.*

## 4.12 Radioactive Substance Authorisations

| Records within 500m | 0 |
|---|---|

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.13 Licensed Discharges to controlled waters

| Records within 500m | 3 |
|---|---|

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

Features are displayed on the Current industrial land use map on **page 27**

| ID | Location | Address | Details | |
|---|---|---|---|---|
| B | 176m NW | THE CRAY PS, MILNROW, ROCHDALE, GREATER MANCHESTER | Effluent Type: SEWAGE DISCHARGES - PUMPING STATION - WATER COMPANY<br>Permit Number: 016982941<br>Permit Version: 1<br>Receiving Water: STANNEY BROOK | Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY)<br>Issue date: -<br>Effective Date: 17/11/1995<br>Revocation Date: - |

| ID | Location | Address | Details | |
|---|---|---|---|---|
| C | 197m W | KINGSWAY BUSINESS PARK, OPPOSITE KINGSWAY HOTEL, KINGSWAY, ROCHDALE, OL16 5HS | Effluent Type: TRADE DISCHARGES - SITE DRAINAGE (CONTAM SURFACE WATER, NOT WASTE SIT<br>Permit Number: 016993832<br>Permit Version: 1<br>Receiving Water: STANNEY BROOK TRIB RIVER ROCH | Status: REVOKED - UNSPECIFIED<br>Issue date: 11/04/2006<br>Effective Date: 11/04/2006<br>Revocation Date: 28/04/2007 |
| E | 418m SE | WHITFIELD DR SPS, WHITFIELD DRIVE, MILNROW, ROCHDALE, GREATER MANCHESTER | Effluent Type: SEWAGE DISCHARGES - PUMPING STATION - WATER COMPANY<br>Permit Number: 016993214<br>Permit Version: 1<br>Receiving Water: STANNEY BROOK | Status: SURRENDERED UNDER EPR 2010<br>Issue date: -<br>Effective Date: 30/09/1997<br>Revocation Date: 07/06/2016 |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.14 Pollutant release to surface waters (Red List)

| **Records within 500m** | **0** |
|---|---|

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.15 Pollutant release to public sewer

| **Records within 500m** | **0** |
|---|---|

Discharges of Special Category Effluents to the public sewer.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.16 List 1 Dangerous Substances

| **Records within 500m** | **0** |
|---|---|

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.17 List 2 Dangerous Substances

| Records within 500m | 1 |
|---|---|

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

Features are displayed on the Current industrial land use map on **page 27**

| ID | Location | Name | Status | Receiving Water | Authorised Substances |
|---|---|---|---|---|---|
| C | 198m W | Kingsway Business Park | Active | River Roch | Iron, pH |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.18 Pollution Incidents (EA/NRW)

| Records within 500m | 6 |
|---|---|

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

Features are displayed on the Current industrial land use map on **page 27**

| ID | Location | Details | |
|---|---|---|---|
| B | 181m NW | Incident Date: 20/02/2003<br>Incident Identification: 138259<br>Pollutant: Sewage Materials<br>Pollutant Description: Crude Sewage | Water Impact: Category 3 (Minor)<br>Land Impact: Category 4 (No Impact)<br>Air Impact: Category 4 (No Impact) |
| B | 181m NW | Incident Date: 12/04/2003<br>Incident Identification: 150636<br>Pollutant: Sewage Materials<br>Pollutant Description: Crude Sewage | Water Impact: Category 3 (Minor)<br>Land Impact: Category 4 (No Impact)<br>Air Impact: Category 4 (No Impact) |
| D | 382m W | Incident Date: 04/07/2002<br>Incident Identification: 89401<br>Pollutant: Oils and Fuel<br>Pollutant Description: Mixed/Waste Oils | Water Impact: Category 3 (Minor)<br>Land Impact: Category 4 (No Impact)<br>Air Impact: Category 4 (No Impact) |
| D | 382m W | Incident Date: 04/07/2002<br>Incident Identification: 89401<br>Pollutant: Oils and Fuel<br>Pollutant Description: Mixed/Waste Oils | Water Impact: Category 3 (Minor)<br>Land Impact: Category 4 (No Impact)<br>Air Impact: Category 4 (No Impact) |
| E | 421m SE | Incident Date: 19/04/2002<br>Incident Identification: 73135<br>Pollutant: Sewage Materials<br>Pollutant Description: Crude Sewage | Water Impact: Category 3 (Minor)<br>Land Impact: Category 4 (No Impact)<br>Air Impact: Category 4 (No Impact) |

| ID | Location | Details | |
|---|---|---|---|
| 4 | 460m N | Incident Date: 01/04/2002<br>Incident Identification: 67928<br>Pollutant: Inert Materials and Wastes<br>Pollutant Description: Construction and Demolition Materials and Wastes | Water Impact: Category 4 (No Impact)<br>Land Impact: Category 3 (Minor)<br>Air Impact: Category 4 (No Impact) |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.19 Pollution inventory substances

| **Records within 500m** | **0** |
|---|---|

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

## 4.20 Pollution inventory waste transfers

| **Records within 500m** | **0** |
|---|---|

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

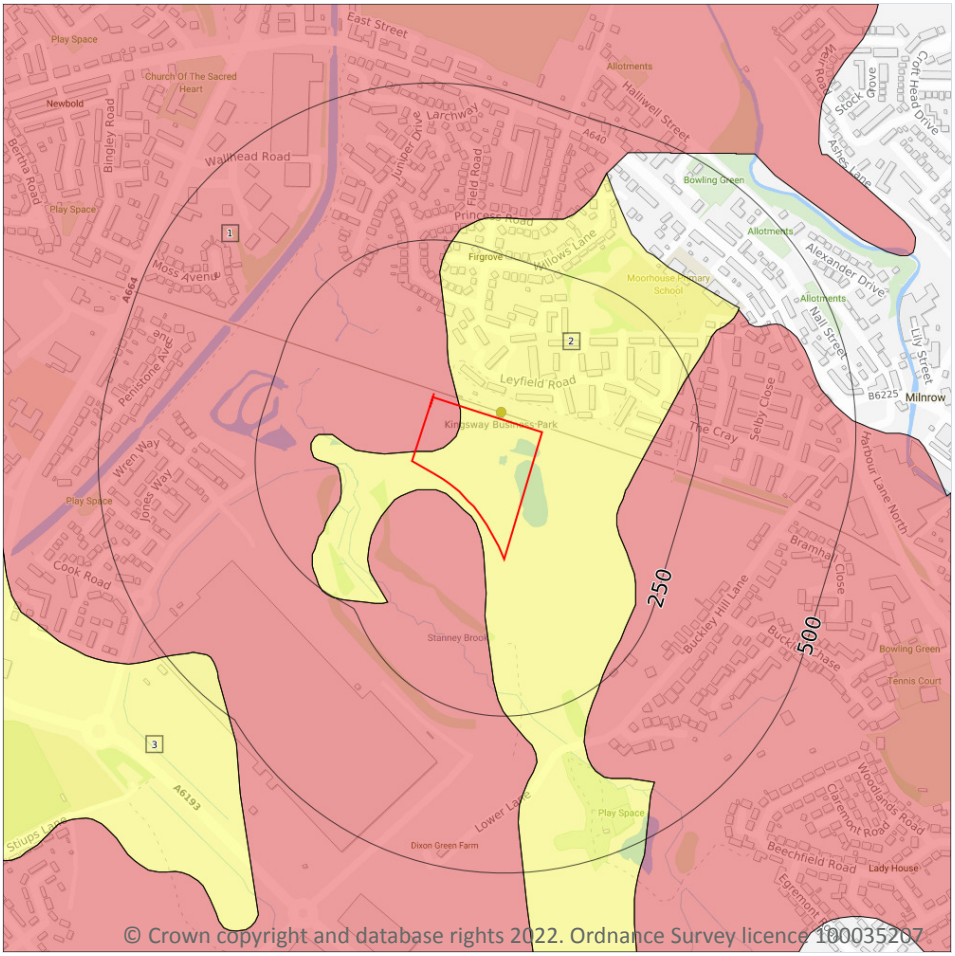
## 4.21 Pollution inventory radioactive waste

| **Records within 500m** | **0** |
|---|---|

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

# 5 Hydrogeology - Superficial aquifer




## 5.1 Superficial aquifer

| Records within 500m | 3 |
|---|---|

Aquifer status of groundwater held within superficial geology.

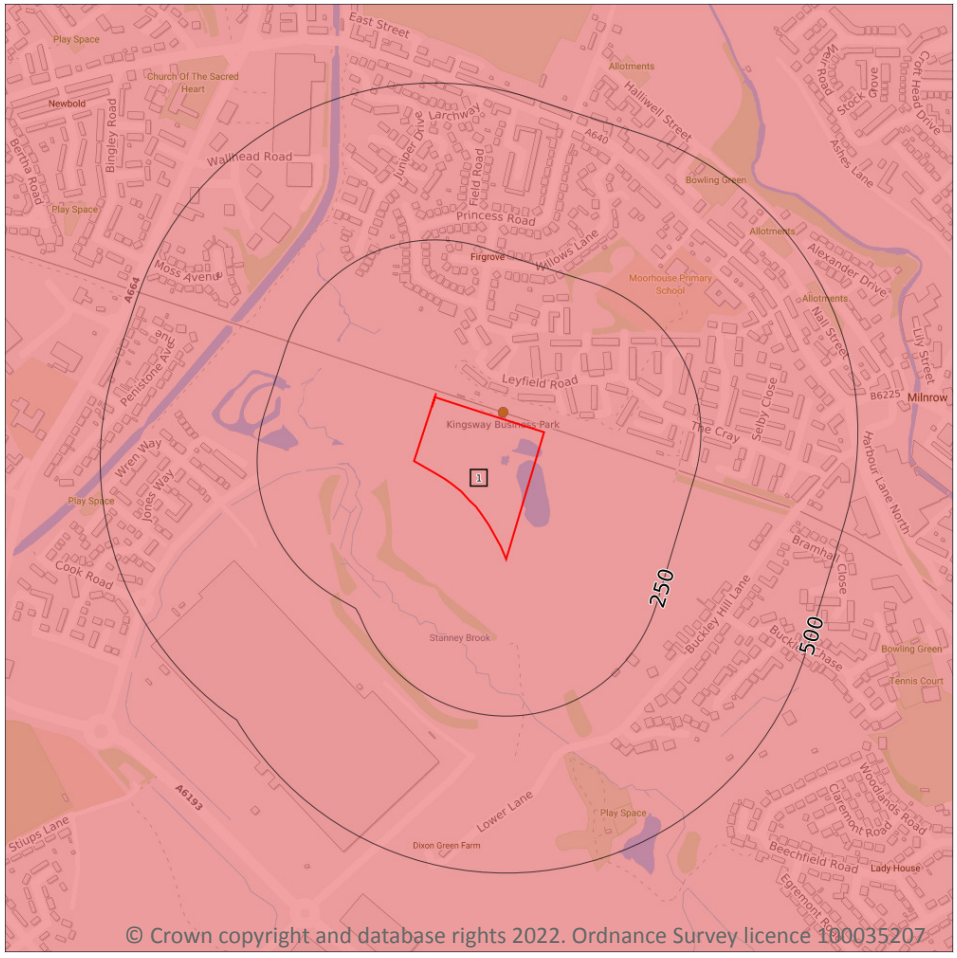
Features are displayed on the Hydrogeology map on **page 34**

| ID | Location | Designation | Description |
|---|---|---|---|
| 1 | On site | Secondary A | Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers |
| 2 | On site | Secondary Undifferentiated | Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type |

| ID | Location | Designation | Description |
|---|---|---|---|
| 3 | 448m SW | Secondary Undifferentiated | Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type |

*This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.*

# Bedrock aquifer




## 5.2 Bedrock aquifer

| Records within 500m | 1 |
|---|---|

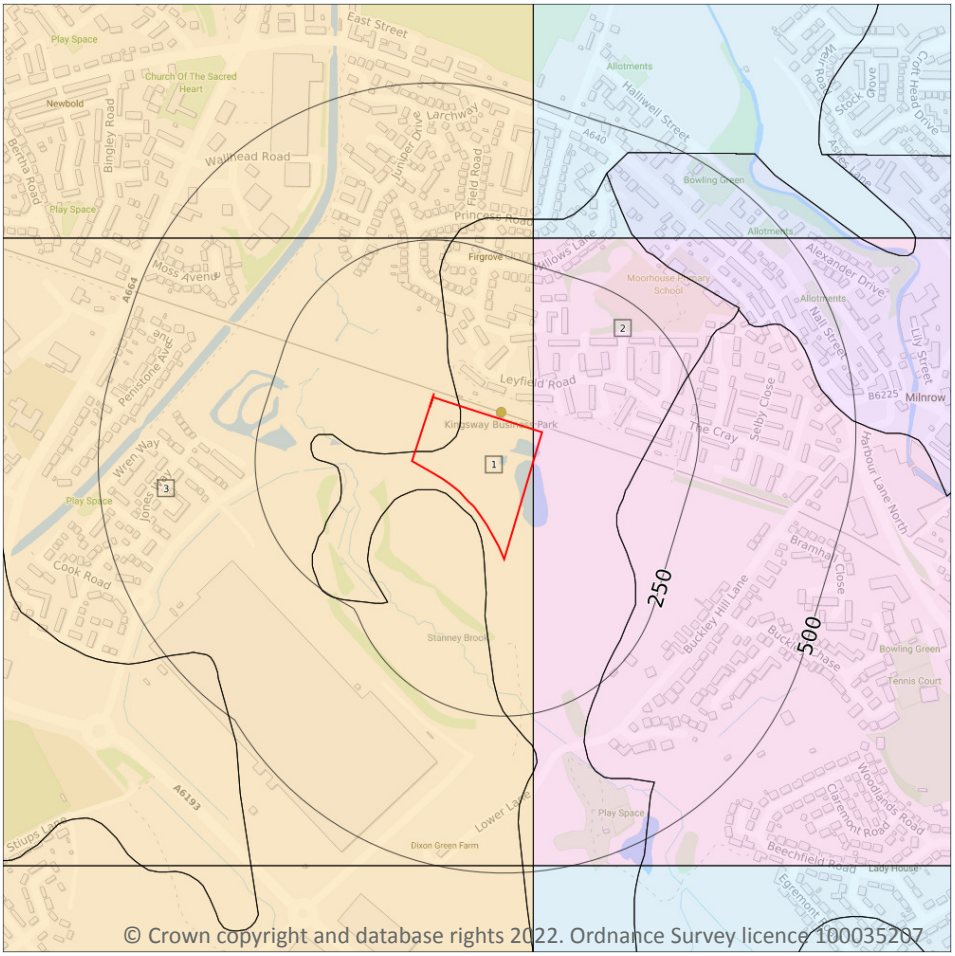
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 36**

| ID | Location | Designation | Description |
|---|---|---|---|
| 1 | On site | Secondary A | Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers |

*This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.*

# Groundwater vulnerability




Site Outline

Search buffers in metres (m)

Superficial vulnerability

- Principal superficial aquifer, high vulnerability
- Secondary superficial aquifer, high vulnerability
- Principal superficial aquifer, medium vulnerability
- Secondary superficial aquifer, medium vulnerability
- Principal superficial aquifer, low vulnerability
- Secondary superficial aquifer, low vulnerability

Bedrock vulnerability

- Principal bedrock aquifer, high vulnerability
- Secondary bedrock aquifer, high vulnerability
- Principal bedrock aquifer, medium vulnerability
- Secondary bedrock aquifer, medium vulnerability
- Principal bedrock aquifer, low vulnerability
- Secondary bedrock aquifer, low vulnerability

Other information

- Unproductive aquifer
- Soluble rock risk
- Local information

## 5.3 Groundwater vulnerability

| Records within 50m | 3 |
|---|---|

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on **page 37**

| ID | Location | Summary | Soil / surface | Superficial geology | Bedrock geology |
|---|---|---|---|---|---|
| 1 | On site | Summary Classification: Secondary superficial aquifer - High Vulnerability<br>Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer | Leaching class: High<br>Infiltration value: >70%<br>Dilution value: >550mm/year | Vulnerability: High<br>Aquifer type: Secondary<br>Thickness: >10m<br>Patchiness value: >90%<br>Recharge potential: High | Vulnerability: Low<br>Aquifer type: Secondary<br>Flow mechanism: Well connected fractures |
| 2 | On site | Summary Classification: Secondary superficial aquifer - Medium Vulnerability<br>Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer | Leaching class: High<br>Infiltration value: <40%<br>Dilution value: >550mm/year | Vulnerability: Medium<br>Aquifer type: Secondary<br>Thickness: >10m<br>Patchiness value: <90%<br>Recharge potential: High | Vulnerability: Medium<br>Aquifer type: Secondary<br>Flow mechanism: Well connected fractures |
| 3 | On site | Summary Classification: Secondary superficial aquifer - High Vulnerability<br>Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer | Leaching class: High<br>Infiltration value: >70%<br>Dilution value: >550mm/year | Vulnerability: High<br>Aquifer type: Secondary<br>Thickness: >10m<br>Patchiness value: >90%<br>Recharge potential: High | Vulnerability: Low<br>Aquifer type: Secondary<br>Flow mechanism: Well connected fractures |

*This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.*

## 5.4 Groundwater vulnerability- soluble rock risk

| Records on site | 0 |
|---|---|

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

*This data is sourced from the British Geological Survey and the Environment Agency.*

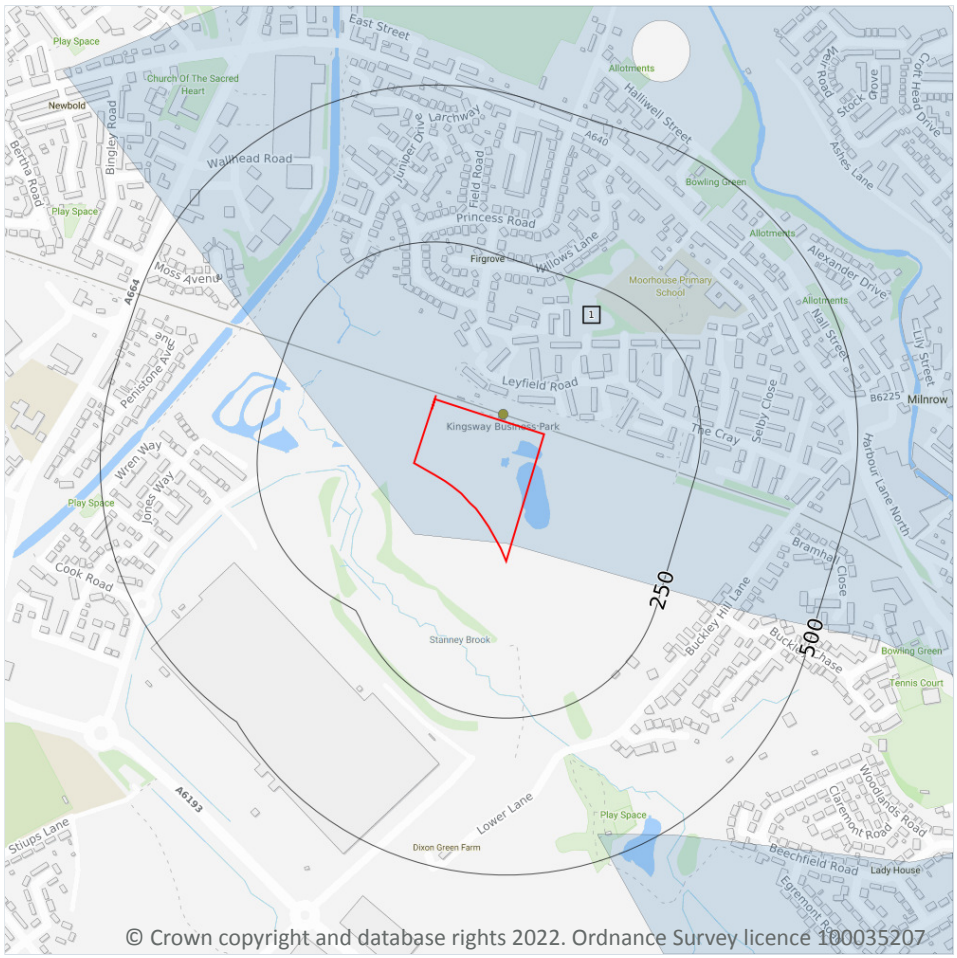
## 5.5 Groundwater vulnerability- local information

| Records on site | 0 |
|---|---|

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk.

*This data is sourced from the British Geological Survey and the Environment Agency.*

# Abstractions and Source Protection Zones




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Site Outline

Search buffers in metres (m)

- Source Protection Zone 1 — Inner catchment
- Source Protection Zone 2 — Outer catchment
- Source Protection Zone 3 — Total catchment
- Source Protection Zone 4 — Zone of Special Interest
- Source Protection Zone 1c — Inner catchment - confined aquifer
- Source Protection Zone 2c — Outer catchment - confined aquifer
- Source Protection Zone 3c — Total catchment - confined aquifer
- Drinking water abstraction licences
- Drinking water abstraction licences — Polygon features
- Drinking water abstraction licences — Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

## 5.6 Groundwater abstractions

| Records within 2000m | 13 |
|---|---|

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 39**

| ID | Location | Details | |
|---|---|---|---|
| - | 1046m SW | Status: Historical<br>Licence No: 2569002159<br>Details: General Farming & Domestic<br>Direct Source: Ground Water - North West Region<br>Point: "WELL AT FARM, LOWER LANE, MILNROW, ROCHDALE"<br>Data Type: Point<br>Name: HARTLE<br>Easting: 391400<br>Northing: 411600 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 01/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/02/1966<br>Version End Date: - |
| - | 1046m SW | Status: Historical<br>Licence No: 2569002159<br>Details: General Farming & Domestic<br>Direct Source: Ground Water - North West Region<br>Point: WELL AT FARM, LOWER LANE, MILNROW, ROCHDALE<br>Data Type: Point<br>Name: HARTLE<br>Easting: 391400<br>Northing: 411600 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 01/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/02/1966<br>Version End Date: - |
| - | 1046m SW | Status: Historical<br>Licence No: 2569002159<br>Details: General Farming & Domestic<br>Direct Source: Ground Water - North West Region<br>Point: WELL AT FARM LOWER LANE MILNROW ROCHDALE<br>Data Type: Point<br>Name: HARTLE<br>Easting: 391400<br>Northing: 411600 | Annual Volume ($m^3$): 5123.34<br>Max Daily Volume ($m^3$): 31.822<br>Original Application No: -<br>Original Start Date: 01/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/04/2007<br>Version End Date: - |
| - | 1132m SW | Status: Historical<br>Licence No: 2569002060<br>Details: General use relating to Secondary Category (Medium Loss)<br>Direct Source: Ground Water - North West Region<br>Point: "WELL AT CASTLE FARM, LOWER LANE, MILNROW"<br>Data Type: Point<br>Name: SANDERSON<br>Easting: 391400<br>Northing: 411500 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 11/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 11/02/1966<br>Version End Date: - |

| ID | Location | Details | |
|---|---|---|---|
| - | 1132m SW | Status: Historical<br>Licence No: 2569002060<br>Details: General use relating to Secondary Category (Medium Loss)<br>Direct Source: Ground Water - North West Region<br>Point: WELL AT CASTLE FARM, LOWER LANE, MILNROW<br>Data Type: Point<br>Name: SANDERSON<br>Easting: 391400<br>Northing: 411500 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 11/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 11/02/1966<br>Version End Date: - |
| - | 1221m E | Status: Historical<br>Licence No: 2569002206<br>Details: Potable Water Supply - Direct<br>Direct Source: Ground Water - North West Region<br>Point: "COLLIERY SHAFT @ PREMISES, BUTTERWORTH HALL, MILNROW"<br>Data Type: Point<br>Name: UNITED UTILITIES WATER PLC<br>Easting: 393200<br>Northing: 412400 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 01/04/1969<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 31/03/1994<br>Version End Date: - |
| - | 1221m E | Status: Active<br>Licence No: 2569002206<br>Details: Potable Water Supply - Direct<br>Direct Source: Ground Water - North West Region<br>Point: COLLIERY SHAFT @ PREMISES, BUTTERWORTH HALL, MILNROW<br>Data Type: Point<br>Name: United Utilities Water Ltd<br>Easting: 393200<br>Northing: 412400 | Annual Volume ($m^3$): 3,982,296<br>Max Daily Volume ($m^3$): 13,638<br>Original Application No: 1567<br>Original Start Date: 01/04/1969<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 31/03/1994<br>Version End Date: - |
| - | 1239m N | Status: Historical<br>Licence No: 2569002216<br>Details: General use relating to Secondary Category (Medium Loss)<br>Direct Source: Ground Water - North West Region<br>Point: "SPRING FED TANK AT PREMISES, MILNROW"<br>Data Type: Point<br>Name: HEGINBOTTOMS FARM LTD<br>Easting: 392300<br>Northing: 413900 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 25/11/1975<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 25/11/1975<br>Version End Date: - |

| ID | Location | Details | |
|---|---|---|---|
| - | 1239m N | Status: Historical<br>Licence No: 2569002216<br>Details: General use relating to Secondary Category (Medium Loss)<br>Direct Source: Ground Water - North West Region<br>Point: SPRING FED TANK AT PREMISES, MILNROW<br>Data Type: Point<br>Name: HEGINBOTTOMS FARM LTD<br>Easting: 392300<br>Northing: 413900 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 25/11/1975<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 25/11/1975<br>Version End Date: - |
| - | 1396m S | Status: Historical<br>Licence No: 2569002086<br>Details: General use relating to Secondary Category (Medium Loss)<br>Direct Source: Ground Water - North West Region<br>Point: "WELL AT BROADSHAW FARM, MILNROW, ROCHDALE"<br>Data Type: Point<br>Name: CROSTON<br>Easting: 391800<br>Northing: 411100 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 02/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 02/02/1966<br>Version End Date: - |
| - | 1396m S | Status: Historical<br>Licence No: 2569002086<br>Details: General use relating to Secondary Category (Medium Loss)<br>Direct Source: Ground Water - North West Region<br>Point: WELL AT BROADSHAW FARM, MILNROW, ROCHDALE<br>Data Type: Point<br>Name: CROSTON<br>Easting: 391800<br>Northing: 411100 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 02/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 02/02/1966<br>Version End Date: - |
| - | 1904m S | Status: Historical<br>Licence No: 2569002204<br>Details: General use relating to Secondary Category (Medium Loss)<br>Direct Source: Ground Water - North West Region<br>Point: "BOREHOLE AT PREMISES, OLD BARN FARM,BURNEDGE, ROCHDALE"<br>Data Type: Point<br>Name: CRYER<br>Easting: 392200<br>Northing: 410600 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 24/04/1969<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 24/04/1969<br>Version End Date: - |

| ID | Location | Details | |
|---|---|---|---|
| - | 1904m S | Status: Historical<br>Licence No: 2569002204<br>Details: General use relating to Secondary Category (Medium Loss)<br>Direct Source: Ground Water - North West Region<br>Point: BOREHOLE AT PREMISES, OLD BARN FARM,BURNEDGE, ROCHDALE<br>Data Type: Point<br>Name: CRYER<br>Easting: 392200<br>Northing: 410600 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 24/04/1969<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 24/04/1969<br>Version End Date: - |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 5.7 Surface water abstractions

| **Records within 2000m** | **21** |
|---|---|

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 39**

| ID | Location | Details | |
|---|---|---|---|
| - | 692m E | Status: Historical<br>Licence No: 2569002175<br>Details: General Cooling (Existing Licences Only) (Low Loss)<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: RESERVOIR FED BY SPRINGS AT PREMISESMILNROW<br>Data Type: Point<br>Name: HOLROYD MACHINES TOOLS & ROTORS<br>Easting: 392700<br>Northing: 412600 | Annual Volume ($m^3$): 16365.6<br>Max Daily Volume ($m^3$): 54.552<br>Original Application No: -<br>Original Start Date: 15/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/04/2007<br>Version End Date: - |
| - | 692m E | Status: Active<br>Licence No: 2569002175<br>Details: General Cooling (Existing Licences Only) (High Loss)<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: RESERVOIR FED BY SPRINGS AT PREMISESMILNROW<br>Data Type: Point<br>Name: Precision Components Limited<br>Easting: 392700<br>Northing: 412600 | Annual Volume ($m^3$): 16,365<br>Max Daily Volume ($m^3$): 54.55<br>Original Application No: -<br>Original Start Date: 15/02/1966<br>Expiry Date: -<br>Issue No: 101<br>Version Start Date: 30/11/2009<br>Version End Date: - |

| ID | Location | Details | |
|---|---|---|---|
| - | 1310m SE | Status: Historical<br>Licence No: 2569002064<br>Details: Boiler Feed<br>Direct Source: "Surface, Non-Tidal - North West Region"<br>Point: "R BEAL AT NEWHEY, MILNROW, ROCHDALE"<br>Data Type: Point<br>Name: THE SECRETARY<br>Easting: 393000<br>Northing: 411700 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 18/01/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 21/06/1993<br>Version End Date: - |
| - | 1310m SE | Status: Historical<br>Licence No: 2569002064<br>Details: General Cooling (Existing Licences Only) (Low Loss)<br>Direct Source: "Surface, Non-Tidal - North West Region"<br>Point: "R BEAL AT NEWHEY, MILNROW, ROCHDALE"<br>Data Type: Point<br>Name: THE SECRETARY<br>Easting: 393000<br>Northing: 411700 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 18/01/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 21/06/1993<br>Version End Date: - |
| - | 1310m SE | Status: Historical<br>Licence No: 2569002064<br>Details: Boiler Feed<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: R BEAL AT NEWHEY, MILNROW, ROCHDALE<br>Data Type: Point<br>Name: THE SECRETARY<br>Easting: 393000<br>Northing: 411700 | Annual Volume ($m^3$): 327312<br>Max Daily Volume ($m^3$): 2954.9<br>Original Application No: -<br>Original Start Date: 18/01/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 21/06/1993<br>Version End Date: - |
| - | 1310m SE | Status: Historical<br>Licence No: 2569002064<br>Details: General Cooling (Existing Licences Only) (Low Loss)<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: R BEAL AT NEWHEY, MILNROW, ROCHDALE<br>Data Type: Point<br>Name: ELLENROAD TRUST LTD<br>Easting: 393000<br>Northing: 411700 | Annual Volume ($m^3$): 327312<br>Max Daily Volume ($m^3$): 2954.9<br>Original Application No: -<br>Original Start Date: 18/01/1966<br>Expiry Date: -<br>Issue No: 101<br>Version Start Date: 11/09/2008<br>Version End Date: - |

| ID | Location | Details | |
|---|---|---|---|
| - | 1310m SE | Status: Active<br>Licence No: 2569002064<br>Details: Non-Evaporative Cooling<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: R BEAL AT NEWHEY, MILNROW, ROCHDALE<br>Data Type: Point<br>Name: ELLENROAD TRUST LTD<br>Easting: 393000<br>Northing: 411700 | Annual Volume ($m^3$): 3,520<br>Max Daily Volume ($m^3$): 350<br>Original Application No: NPS/WR/015275<br>Original Start Date: 18/01/1966<br>Expiry Date: -<br>Issue No: 103<br>Version Start Date: 30/01/2014<br>Version End Date: - |
| - | 1310m SE | Status: Active<br>Licence No: 2569002233<br>Details: General Cooling (Existing Licences Only) (Low Loss)<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: R BEAL AT MILNROW<br>Data Type: Point<br>Name: SUN CHEMICAL LTD<br>Easting: 393000<br>Northing: 411700 | Annual Volume ($m^3$): 66,370<br>Max Daily Volume ($m^3$): 181.80<br>Original Application No: 2725<br>Original Start Date: 13/08/1986<br>Expiry Date: -<br>Issue No: 102<br>Version Start Date: 01/01/2005<br>Version End Date: - |
| - | 1468m E | Status: Historical<br>Licence No: 2569002207<br>Details: Boiler Feed<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: RESERVOIR FED BY UNNAMED TRIB OF BUTTERWORTH HALL BRK AT<br>Data Type: Point<br>Name: SONOCO INDUSTRIAL PACKAGING<br>Easting: 393400<br>Northing: 412200 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 26/06/1970<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/02/1990<br>Version End Date: - |
| - | 1468m E | Status: Historical<br>Licence No: 2569002207<br>Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: RESERVOIR FED BY UNNAMED TRIB OF BUTTERWORTH HALL BRK AT<br>Data Type: Point<br>Name: SONOCO INDUSTRIAL PACKAGING<br>Easting: 393400<br>Northing: 412200 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 26/06/1970<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/02/1990<br>Version End Date: - |

| ID | Location | Details | |
|---|---|---|---|
| - | 1468m E | Status: Historical<br>Licence No: 2569002207<br>Details: General Cooling (Existing Licences Only) (Low Loss)<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: RESERVOIR FED BY UNNAMED TRIB OF BUTTERWORTH HALL BRK AT<br>Data Type: Point<br>Name: SONOCO INDUSTRIAL PACKAGING<br>Easting: 393400<br>Northing: 412200 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 26/06/1970<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/02/1990<br>Version End Date: - |
| - | 1480m NW | Status: Historical<br>Licence No: 2569002249<br>Details: Process water<br>Direct Source: "Surface, Non-Tidal - North West Region"<br>Point: "RIVER ROCH AT MELLOROID WORKS, BELFIELD ROAD"<br>Data Type: Point<br>Name: BRITISH MILLERAIN 1922 CO LTD<br>Easting: 390800<br>Northing: 413800 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 04/11/1991<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 04/11/1991<br>Version End Date: - |
| - | 1480m NW | Status: Historical<br>Licence No: 2569002249<br>Details: Process water<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: RIVER ROCH AT MELLOROID WORKS, BELFIELD ROAD<br>Data Type: Point<br>Name: BRITISH MILLERAIN 1922 CO LTD<br>Easting: 390800<br>Northing: 413800 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 04/11/1991<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 04/11/1991<br>Version End Date: - |
| - | 1480m NW | Status: Historical<br>Licence No: 2569002249<br>Details: Process Water<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: RIVER ROCH AT MELLOROID WORKS BELFIELD ROAD<br>Data Type: Point<br>Name: BRITISH MILLERAIN 1922 CO LTD<br>Easting: 390800<br>Northing: 413800 | Annual Volume ($m^3$): 213662<br>Max Daily Volume ($m^3$): 1136.49<br>Original Application No: -<br>Original Start Date: 04/11/1991<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 04/11/1991<br>Version End Date: - |

| ID | Location | Details | |
|---|---|---|---|
| - | 1545m W | Status: Historical<br>Licence No: 2569002076<br>Details: Boiler Feed<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: ROCHDALE CANAL AT ROCHDALE, LANCS<br>Data Type: Point<br>Name: J & J MAKIN CONVERTORS LTD<br>Easting: 390300<br>Northing: 412300 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 18/01/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/04/1993<br>Version End Date: - |
| - | 1815m SW | Status: Historical<br>Licence No: 2569002178<br>Details: Boiler Feed<br>Direct Source: "Surface, Non-Tidal - North West Region"<br>Point: "CATCHPIT FED BY SURFACE DRAINAGE AT PREMISES, ROCHDALE"<br>Data Type: Point<br>Name: DUNPHY COMBUSTION LTD.<br>Easting: 390200<br>Northing: 411800 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 18/02/1966<br>Expiry Date: -<br>Issue No: 101<br>Version Start Date: 12/02/1991<br>Version End Date: - |
| - | 1815m SW | Status: Active<br>Licence No: 2569002178<br>Details: Boiler Feed<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: CATCHPIT FED BY SURFACE DRAINAGE AT PREMISES, ROCHDALE<br>Data Type: Point<br>Name: DUNPHY COMBUSTION LTD<br>Easting: 390200<br>Northing: 411800 | Annual Volume ($m^3$): 2,318.46<br>Max Daily Volume ($m^3$): 34.09<br>Original Application No: CW 1093<br>Original Start Date: 18/02/1966<br>Expiry Date: -<br>Issue No: 101<br>Version Start Date: 12/02/1991<br>Version End Date: - |
| - | 1866m W | Status: Historical<br>Licence No: 2569002107<br>Details: Boiler Feed<br>Direct Source: "Surface, Non-Tidal - North West Region"<br>Point: "ROCHDALE CANAL AT QUEENSWAY,ROCHDALE"<br>Data Type: Point<br>Name: SEALOCRETE PLA LTD<br>Easting: 390070<br>Northing: 411960 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 02/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 20/12/1993<br>Version End Date: - |

| ID | Location | Details | |
|---|---|---|---|
| - | 1866m W | Status: Historical<br>Licence No: 2569002107<br>Details: General Cooling (Existing Licences Only) (Low Loss)<br>Direct Source: "Surface, Non-Tidal - North West Region"<br>Point: "ROCHDALE CANAL AT QUEENSWAY,ROCHDALE"<br>Data Type: Point<br>Name: SEALOCRETE PLA LTD<br>Easting: 390070<br>Northing: 411960 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 02/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 20/12/1993<br>Version End Date: - |
| - | 1866m W | Status: Historical<br>Licence No: 2569002107<br>Details: Boiler Feed<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: ROCHDALE CANAL AT QUEENSWAY,ROCHDALE<br>Data Type: Point<br>Name: SEALOCRETE PLA LTD<br>Easting: 390070<br>Northing: 411960 | Annual Volume ($m^3$): 10455.8<br>Max Daily Volume ($m^3$): 45.46<br>Original Application No: -<br>Original Start Date: 02/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/04/2008<br>Version End Date: - |
| - | 1866m W | Status: Historical<br>Licence No: 2569002107<br>Details: General Cooling (Existing Licences Only) (Low Loss)<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: ROCHDALE CANAL AT QUEENSWAY,ROCHDALE<br>Data Type: Point<br>Name: SEALOCRETE PLA LTD<br>Easting: 390070<br>Northing: 411960 | Annual Volume ($m^3$): 10455.8<br>Max Daily Volume ($m^3$): 45.46<br>Original Application No: -<br>Original Start Date: 02/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/04/2008<br>Version End Date: - |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 5.8 Potable abstractions

| **Records within 2000m** | **3** |
|---|---|

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 39**

| ID | Location | Details | |
|---|---|---|---|
| - | 1221m E | Status: Historical<br>Licence No: 2569002206<br>Details: Potable Water Supply - Direct<br>Direct Source: Ground Water - North West Region<br>Point: "COLLIERY SHAFT @ PREMISES, BUTTERWORTH HALL, MILNROW"<br>Data Type: Point<br>Name: UNITED UTILITIES WATER PLC<br>Easting: 393200<br>Northing: 412400 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 01/04/1969<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 31/03/1994<br>Version End Date: - |
| - | 1221m E | Status: Active<br>Licence No: 2569002206<br>Details: Potable Water Supply - Direct<br>Direct Source: Ground Water - North West Region<br>Point: COLLIERY SHAFT @ PREMISES, BUTTERWORTH HALL, MILNROW<br>Data Type: Point<br>Name: United Utilities Water Ltd<br>Easting: 393200<br>Northing: 412400 | Annual Volume ($m^3$): 3,982,296<br>Max Daily Volume ($m^3$): 13,638<br>Original Application No: 1567<br>Original Start Date: 01/04/1969<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 31/03/1994<br>Version End Date: - |
| - | 1468m E | Status: Historical<br>Licence No: 2569002207<br>Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: RESERVOIR FED BY UNNAMED TRIB OF BUTTERWORTH HALL BRK AT<br>Data Type: Point<br>Name: SONOCO INDUSTRIAL PACKAGING<br>Easting: 393400<br>Northing: 412200 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 26/06/1970<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/02/1990<br>Version End Date: - |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 5.9 Source Protection Zones

| **Records within 500m** | **1** |
|---|---|

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

Features are displayed on the Abstractions and Source Protection Zones map on **page 39**

| ID | Location | Type | Description |
|---|---|---|---|
| **1** | **On site** | **2** | **Outer catchment** |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

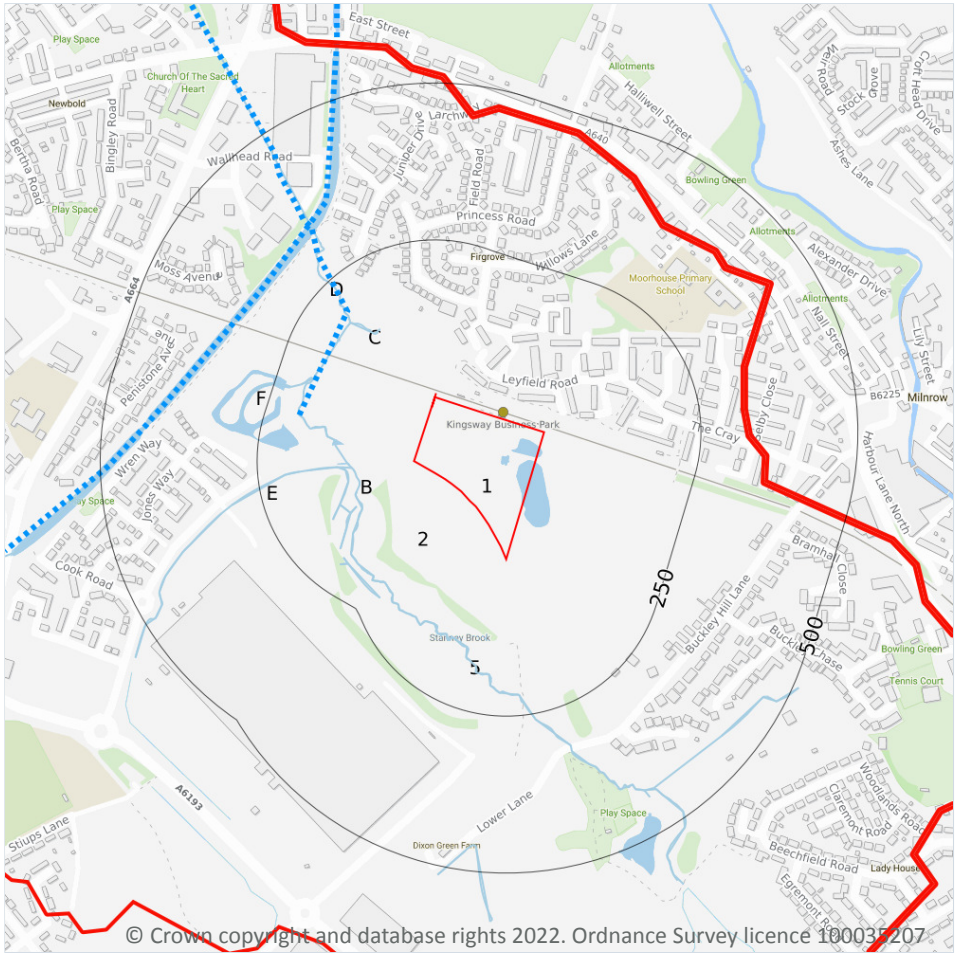
## 5.10 Source Protection Zones (confined aquifer)

| Records within 500m | 0 |
|---|---|

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

# 6 Hydrology




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Site Outline

Search buffers in metres (m)

Water Network (OS MasterMap)

Surface water features (wider than 5m)

Surface water features (narrower than 5m)

WFD River, canal and surface water transfer water bodies

WFD Lake water bodies

WFD Transitional and coastal water bodies

WFD Surface water body catchments boundaries

WFD Groundwater body boundaries

## 6.1 Water Network (OS MasterMap)

| Records within 250m | 29 |
|---|---|

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 51**

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| B | 93m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| B | 99m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| B | 99m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| 5 | 102m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| B | 106m W | Inland river not influenced by normal tidal action. | Underground | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| B | 107m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| B | 116m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| B | 116m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| B | 128m W | Lake, loch or reservoir. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| B | 130m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| B | 130m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| B | 131m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| B | 136m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| C | 137m NW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| C | 171m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| B | 172m W | Inland river not influenced by normal tidal action. | Underground | Watercourse contains water year round (in normal circumstances) | - |
| C | 176m NW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| C | 178m NW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| C | 178m NW | Inland river not influenced by normal tidal action. | Underground | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| C | 178m NW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| D | 179m NW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| E | 182m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| C | 186m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| B | 190m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| C | 192m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| B | 194m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| B | 194m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| C | 208m W | Inland river not influenced by normal tidal action. | Underground | Watercourse contains water year round (in normal circumstances) | - |
| F | 223m W | Lake, loch or reservoir. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |

*This data is sourced from the Ordnance Survey.*

## 6.2 Surface water features

| **Records within 250m** | **17** |
|---|---|

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 51**

*This data is sourced from the Ordnance Survey.*

## 6.3 WFD Surface water body catchments

| **Records on site** | **1** |
|---|---|

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on **page 51**

| ID | Location | Type | Water body catchment | Water body ID | Operational catchment | Management catchment |
|---|---|---|---|---|---|---|
| **2** | **On site** | **River** | **Roch (Source to Spodden)** | **GB112069064720** | **Roch Irk Medlock** | **Irwell** |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 6.4 WFD Surface water bodies

| Records identified | 1 |
|---|---|

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each water body listed.

Features are displayed on the Hydrology map on **page 51**

| ID | Location | Type | Name | Water body ID | Overall rating | Chemical rating | Ecological rating | Year |
|---|---|---|---|---|---|---|---|---|
| 6 | 184m NW | River | Roch (Source to Spodden) | GB112069064720 | Moderate | Fail | Moderate | 2019 |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 6.5 WFD Groundwater bodies

| Records on site | 1 |
|---|---|

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

Features are displayed on the Hydrology map on **page 51**

| ID | Location | Name | Water body ID | Overall rating | Chemical rating | Quantitative | Year |
|---|---|---|---|---|---|---|---|
| **1** | **On site** | **Northern Manchester Carboniferous Aquifers** | **GB41202G101800** | **Poor** | **Poor** | **Good** | **2019** |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

# 7 River and coastal flooding

## 7.1 Risk of flooding from rivers and the sea

| Records within 50m | 0 |
|---|---|

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 chance) or High (greater than or equal to 1 in 30 chance).

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 7.2 Historical Flood Events

| Records within 250m | 0 |
|---|---|

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 7.3 Flood Defences

| Records within 250m | 0 |
|---|---|

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 7.4 Areas Benefiting from Flood Defences

| Records within 250m | 0 |
|---|---|

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 7.5 Flood Storage Areas

| Records within 250m | 0 |
|---|---|

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

# River and coastal flooding - Flood Zones

## 7.6 Flood Zone 2

| Records within 50m | 0 |
|---|---|

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

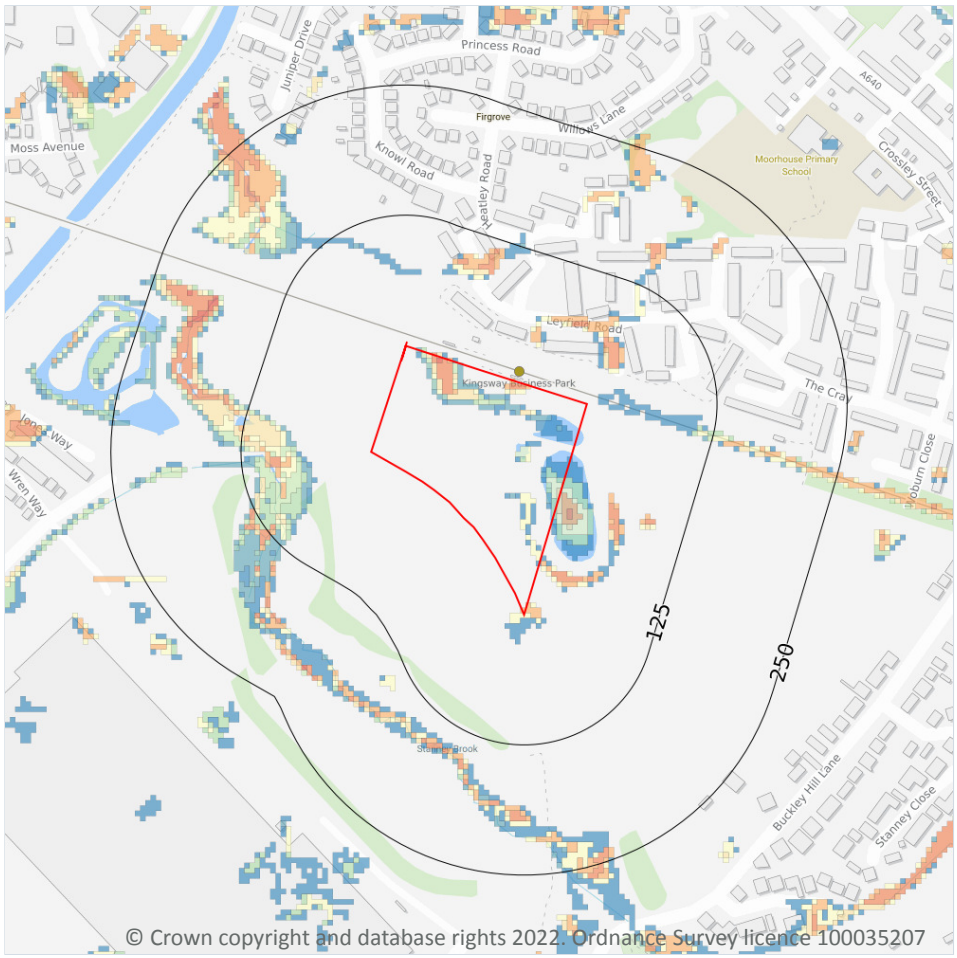
## 7.7 Flood Zone 3

| Records within 50m | 0 |
|---|---|

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

# 8 Surface water flooding




Site Outline
Search buffers in metres (m)

1 in 1000 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

## 8.1 Surface water flooding

| | |
|---|---|
| **Highest risk on site** | **1 in 30 year, Greater than 1.0m** |
| **Highest risk within 50m** | **1 in 30 year, Greater than 1.0m** |

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 59**

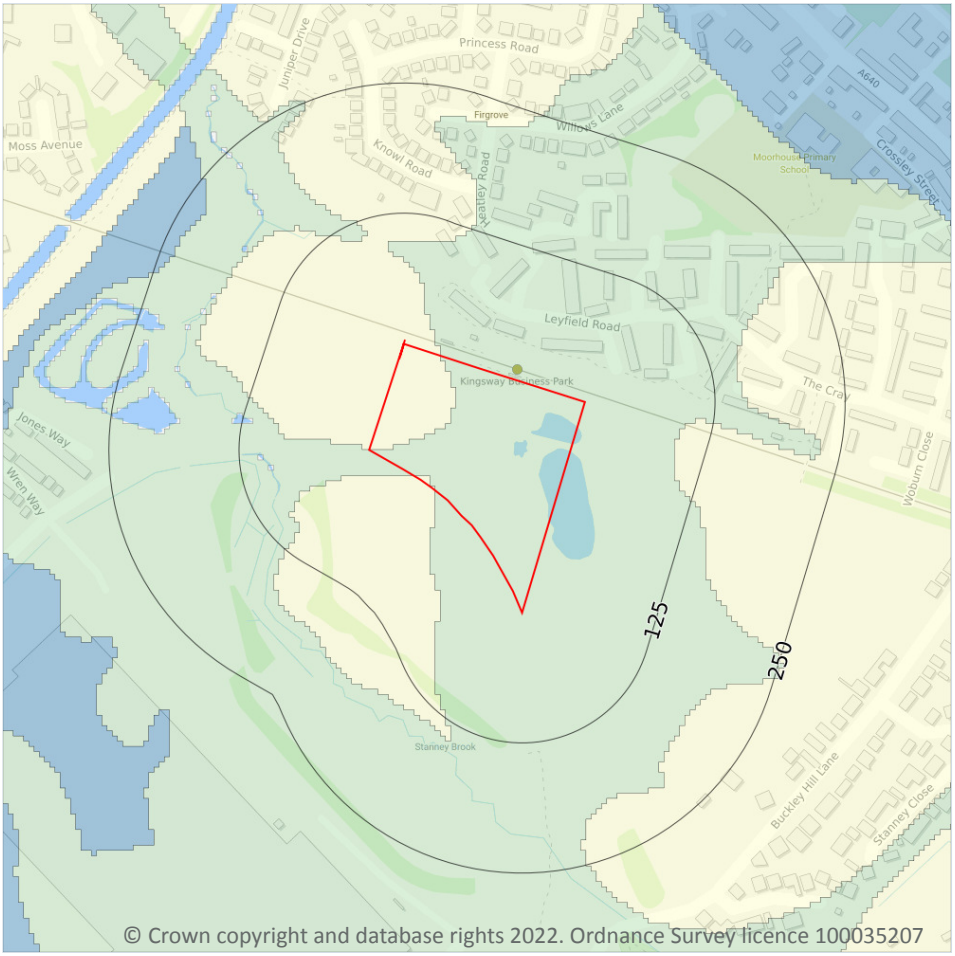
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

The table below shows the maximum flood depths for a range of return periods for the site.

| Return period | Maximum modelled depth |
|---|---|
| 1 in 1000 year | Greater than 1.0m |
| 1 in 250 year | Greater than 1.0m |
| 1 in 100 year | Greater than 1.0m |
| 1 in 30 year | Greater than 1.0m |

*This data is sourced from Ambiental Risk Analytics.*

# 9 Groundwater flooding




Site Outline

Search buffers in metres (m)

High

Moderate - High

Moderate

Low

Negligible

## 9.1 Groundwater flooding

| | |
|---|---|
| **Highest risk on site** | **Moderate** |
| **Highest risk within 50m** | **Moderate** |

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 61**

*This data is sourced from Ambiental Risk Analytics.*

# 10 Environmental designations




## 10.1 Sites of Special Scientific Interest (SSSI)

| Records within 2000m | 2 |
|---|---|

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

Features are displayed on the Environmental designations map on **page 62**

| ID | Location | Name | Data source |
|---|---|---|---|
| A | 314m NW | Rochdale Canal | Natural England |

| ID | Location | Name | Data source |
|---|---|---|---|
| B | 596m N | Rochdale Canal | Natural England |

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.2 Conserved wetland sites (Ramsar sites)

| **Records within 2000m** | **0** |
|---|---|

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.3 Special Areas of Conservation (SAC)

| **Records within 2000m** | **2** |
|---|---|

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

Features are displayed on the Environmental designations map on **page 62**

| ID | Location | Name | Features of interest | Habitat description | Data source |
|---|---|---|---|---|---|
| A | 314m NW | Rochdale Canal | Floating water-plantain. | Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Inland water bodies (Standing water, Running water) | Natural England |
| B | 596m N | Rochdale Canal | Floating water-plantain. | Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Inland water bodies (Standing water, Running water) | Natural England |

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.4 Special Protection Areas (SPA)

| Records within 2000m | 0 |
|---|---|

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.5 National Nature Reserves (NNR)

| Records within 2000m | 0 |
|---|---|

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.6 Local Nature Reserves (LNR)

| Records within 2000m | 0 |
|---|---|

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.7 Designated Ancient Woodland

| Records within 2000m | 0 |
|---|---|

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.8 Biosphere Reserves

| Records within 2000m | 0 |
|---|---|

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.9 Forest Parks

| Records within 2000m | 0 |
|---|---|

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

*This data is sourced from the Forestry Commission.*

## 10.10 Marine Conservation Zones

| Records within 2000m | 0 |
|---|---|

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.11 Green Belt

| Records within 2000m | 4 |
|---|---|

Areas designated to prevent urban sprawl by keeping land permanently open.

Features are displayed on the Environmental designations map on **page 62**

| ID | Location | Name | Local Authority name |
|---|---|---|---|
| 1 | 726m NE | Merseyside and Greater Manchester | Rochdale |
| 2 | 1120m SE | Merseyside and Greater Manchester | Rochdale |
| 3 | 1314m SE | Merseyside and Greater Manchester | Oldham |
| - | 1978m SE | Merseyside and Greater Manchester | Rochdale |

*This data is sourced from the Ministry of Housing, Communities and Local Government.*

## 10.12 Proposed Ramsar sites

| Records within 2000m | 0 |
|---|---|

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

*This data is sourced from Natural England.*

## 10.13 Possible Special Areas of Conservation (pSAC)

| Records within 2000m | 0 |
|---|---|

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

*This data is sourced from Natural England and Natural Resources Wales.*

## 10.14 Potential Special Protection Areas (pSPA)

| Records within 2000m | 0 |
|---|---|

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

*This data is sourced from Natural England.*

## 10.15 Nitrate Sensitive Areas

| Records within 2000m | 0 |
|---|---|

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

*This data is sourced from Natural England.*

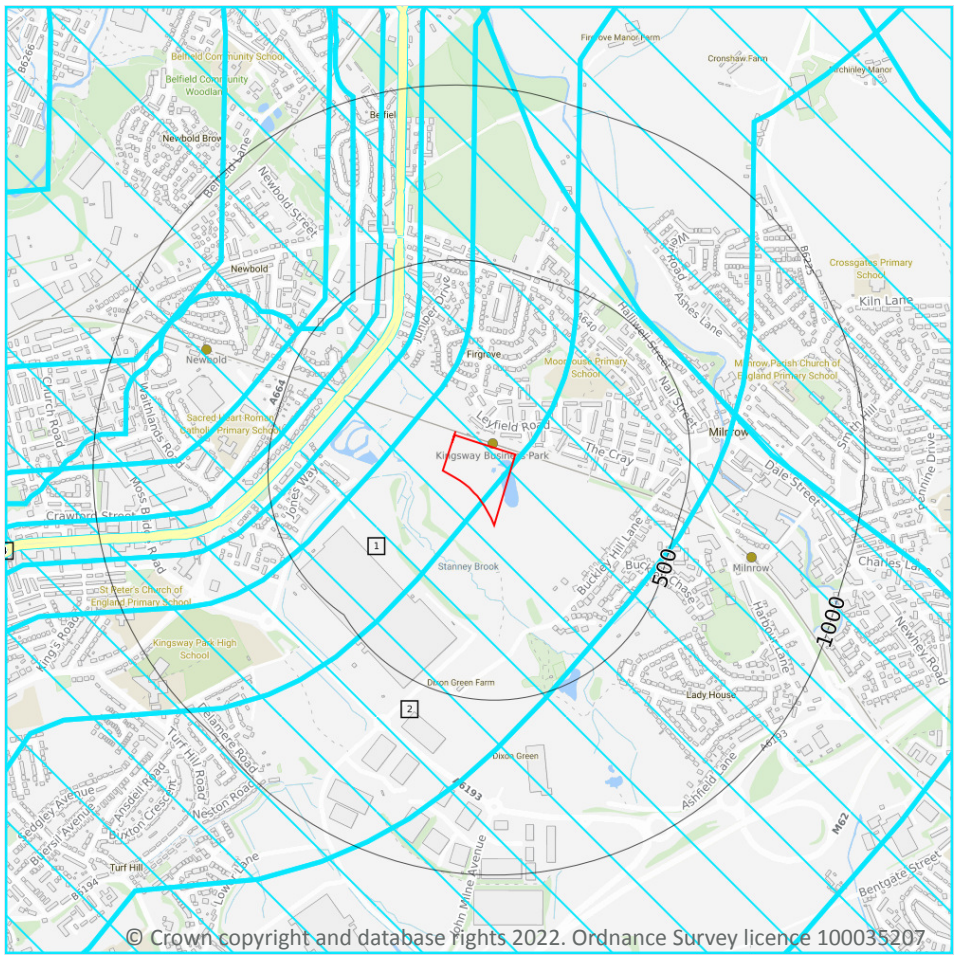
## 10.16 Nitrate Vulnerable Zones

| Records within 2000m | 0 |
|---|---|

Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

*This data is sourced from Natural England and Natural Resources Wales.*

# SSSI Impact Zones and Units




Site Outline

Search buffers in metres (m)

SSSI Impact Risk Zones

SSSI Units

- Not recorded
- Favourable
- Unfavourable - Recovering
- Unfavourable - No change
- Unfavourable - Declining
- Partially destroyed
- Destroyed

## 10.17 SSSI Impact Risk Zones

| Records on site | 2 |
|---|---|

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Features are displayed on the SSSI Impact Zones and Units map on **page 67**

| ID | Location | Type of developments requiring consultation |
|---|---|---|
| 1 | On site | **Infrastructure - Pipelines, pylons and overhead cables. any transport proposal including road, rail and by water (excluding routine maintenance). airports, helipads and other aviation proposals.<br>Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, review of minerals permissions (romp), extensions, variations to conditions etc. oil & gas exploration/extraction.<br>Rural non-residential - Large non residential developments outside existing settlements/urban areas where net additional gross internal floorspace is > 1,000m² or footprint exceeds 0.2ha.<br>Residential - Residential development of 100 units or more.<br>Rural residential - Any residential development of 50 or more houses outside existing settlements/urban areas.<br>Air pollution - Any development that could cause air pollution (incl: industrial/commercial processes, livestock & poultry units, slurry lagoons & digestate stores, manure stores).<br>Combustion - All general combustion processes. incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.<br>Waste - Mechanical and biological waste treatment, inert landfill, non-hazardous landfill, hazardous landfill, household civic amenity recycling facilities construction, demolition and excavation waste, other waste management.<br>Composting - Any composting proposal. incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management.<br>Discharges - Any discharge of water or liquid waste that is discharged to ground (ie to seep away) or to surface water, such as a beck or stream.<br>Water supply - Large infrastructure such as warehousing / industry where net additional gross internal floorspace is > 1,000m² or any development needing its own water supply .** |
| 2 | On site | **Infrastructure - Pipelines, pylons and overhead cables. any transport proposal including road, rail and by water (excluding routine maintenance). airports, helipads and other aviation proposals.<br>Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, review of minerals permissions (romp), extensions, variations to conditions etc. oil & gas exploration/extraction.<br>Rural non-residential - Large non residential developments outside existing settlements/urban areas where net additional gross internal floorspace is > 1,000m² or footprint exceeds 0.2ha.<br>Residential - Residential development of 100 units or more.<br>Rural residential - Any residential development of 50 or more houses outside existing settlements/urban areas.<br>Air pollution - Any industrial/agricultural development that could cause air pollution (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 200m², manure stores > 250t).<br>Combustion - General combustion processes >20mw energy input. incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.<br>Waste - Landfill. incl: inert landfill, non-hazardous landfill, hazardous landfill.<br>Composting - Any composting proposal with more than 500 tonnes maximum annual operational throughput. incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management.<br>Discharges - Any discharge of water or liquid waste of more than 2m³/day to ground (ie to seep away) or to surface water, such as a beck or stream.<br>Water supply - Large infrastructure such as warehousing / industry where net additional gross internal floorspace is > 1,000m² or any development needing its own water supply .** |

*This data is sourced from Natural England.*

## 10.18 SSSI Units

| Records within 2000m | 2 |
|---|---|

Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

Features are displayed on the SSSI Impact Zones and Units map on **page 67**

ID: 4
Location: 314m NW
SSSI name: Rochdale Canal
Unit name: Failsworth
Broad habitat: Standing Open Water And Canals
Condition: Unfavourable - Recovering
Reportable features:

| Feature name | Feature condition | Date of assessment |
|---|---|---|
| Population of Schedule 8 plant - Luronium natans, Floating Water-plantain | Unfavourable - Recovering | 25/11/2010 |

ID: 11
Location: 596m N
SSSI name: Rochdale Canal
Unit name: Failsworth
Broad habitat: Standing Open Water And Canals
Condition: Unfavourable - Recovering
Reportable features:

| Feature name | Feature condition | Date of assessment |
|---|---|---|
| Population of Schedule 8 plant - Luronium natans, Floating Water-plantain | Unfavourable - Recovering | 25/11/2010 |

*This data is sourced from Natural England and Natural Resources Wales.*

# 11 Visual and cultural designations

## 11.1 World Heritage Sites

| Records within 250m | 0 |
|---|---|

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 11.2 Area of Outstanding Natural Beauty

| Records within 250m | 0 |
|---|---|

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 11.3 National Parks

| Records within 250m | 0 |
|---|---|

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

*This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.*

## 11.4 Listed Buildings

| Records within 250m | 0 |
|---|---|

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 11.5 Conservation Areas

| Records within 250m | 0 |
|---|---|

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 11.6 Scheduled Ancient Monuments

| Records within 250m | 0 |
|---|---|

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

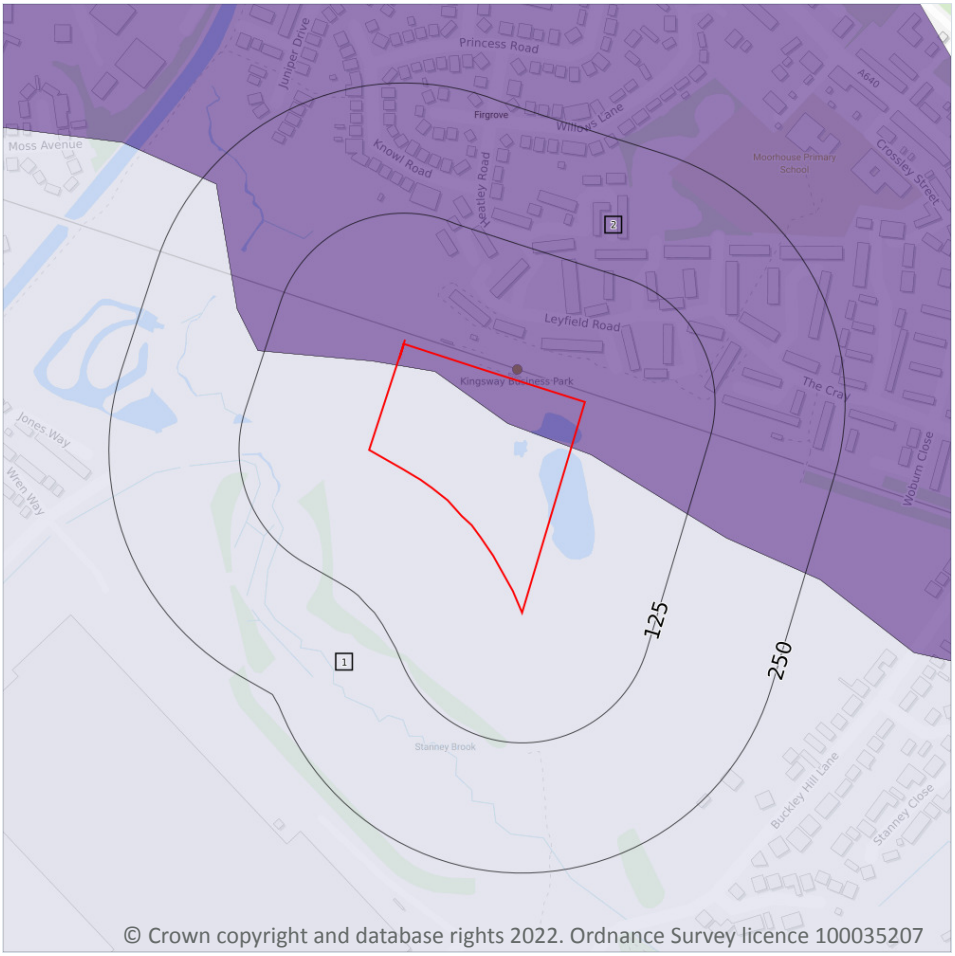
## 11.7 Registered Parks and Gardens

| Records within 250m | 0 |
|---|---|

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

# 12 Agricultural designations




Site Outline

Search buffers in metres (m)

- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Non-agricultural land
- Urban land
- Exclusion land
- Tree felling licences
- Open Access land

## 12.1 Agricultural Land Classification

| Records within 250m | 2 |
|---|---|

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 72**

| ID | Location | Classification | Description |
|---|---|---|---|
| 1 | On site | Grade 4 | **Poor quality agricultural land. Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.** |

| ID | Location | Classification | Description |
|---|---|---|---|
| **2** | **On site** | **Urban** | **-** |

*This data is sourced from Natural England.*

## 12.2 Open Access Land

| **Records within 250m** | **0** |
|---|---|

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

*This data is sourced from Natural England and Natural Resources Wales.*

## 12.3 Tree Felling Licences

| **Records within 250m** | **0** |
|---|---|

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

*This data is sourced from the Forestry Commission.*

## 12.4 Environmental Stewardship Schemes

| **Records within 250m** | **0** |
|---|---|

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

*This data is sourced from Natural England.*

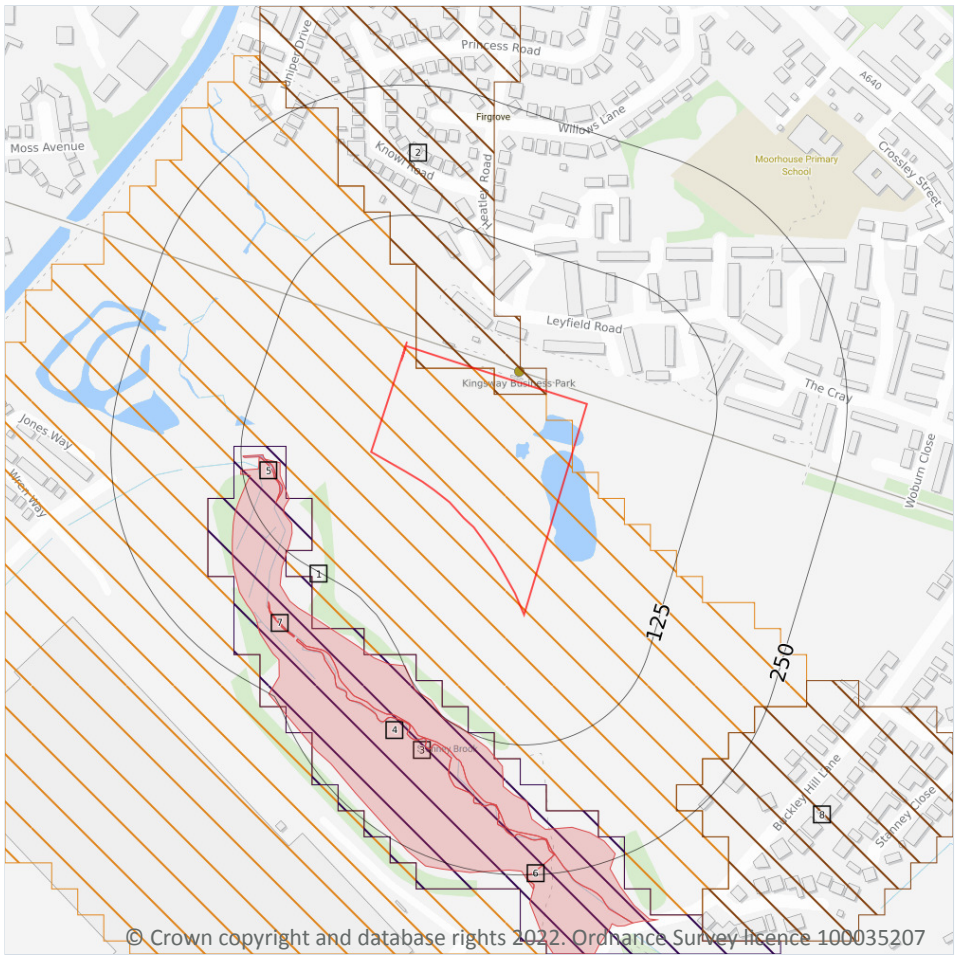
## 12.5 Countryside Stewardship Schemes

| **Records within 250m** | **0** |
|---|---|

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

*This data is sourced from Natural England.*

# 13 Habitat designations




Site Outline

Search buffers in metres (m)

Priority Habitat Inventory
Open Mosaic Habitat
Limestone Pavement Orders

Habitat Networks

Primary Habitat
Restorable Habitat
Associated Habitats
Habitat Restoration-Creation
Network Enhancement Zone 1
Network Enhancement Zone 2

## 13.1 Priority Habitat Inventory

| Records within 250m | 4 |
|---|---|

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

Features are displayed on the Habitat designations map on **page 74**

| ID | Location | Main Habitat | Other habitats |
|---|---|---|---|
| 4 | 88m W | Lowland fens | Main habitat: LFENS (INV > 50%) |
| 5 | 92m W | Lowland fens | Main habitat: LFENS (INV > 50%) |
| 6 | 148m SW | Lowland fens | Main habitat: LFENS (INV > 50%) |
| 7 | 175m SW | Lowland fens | Main habitat: LFENS (INV > 50%) |

*This data is sourced from Natural England.*

## 13.2 Habitat Networks

| Records within 250m | 4 |
|---|---|

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

Features are displayed on the Habitat designations map on **page 74**

| ID | Location | Type | Habitat |
|---|---|---|---|
| **1** | **On site** | **Network Enhancement Zone 1** | **Not specified** |
| **2** | **On site** | **Network Enhancement Zone 2** | **Not specified** |
| 3 | 72m SW | Primary Habitat | Lowland fens |
| 8 | 219m SE | Network Enhancement Zone 2 | Not specified |

*This data is sourced from Natural England.*

## 13.3 Open Mosaic Habitat

| Records within 250m | 0 |
|---|---|

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

*This data is sourced from Natural England.*

## 13.4 Limestone Pavement Orders

| Records within 250m | 0 |
|---|---|

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

*This data is sourced from Natural England.*

# 14 Geology 1:10,000 scale - Availability




## 14.1 10k Availability

| Records within 500m | 1 |
|---|---|

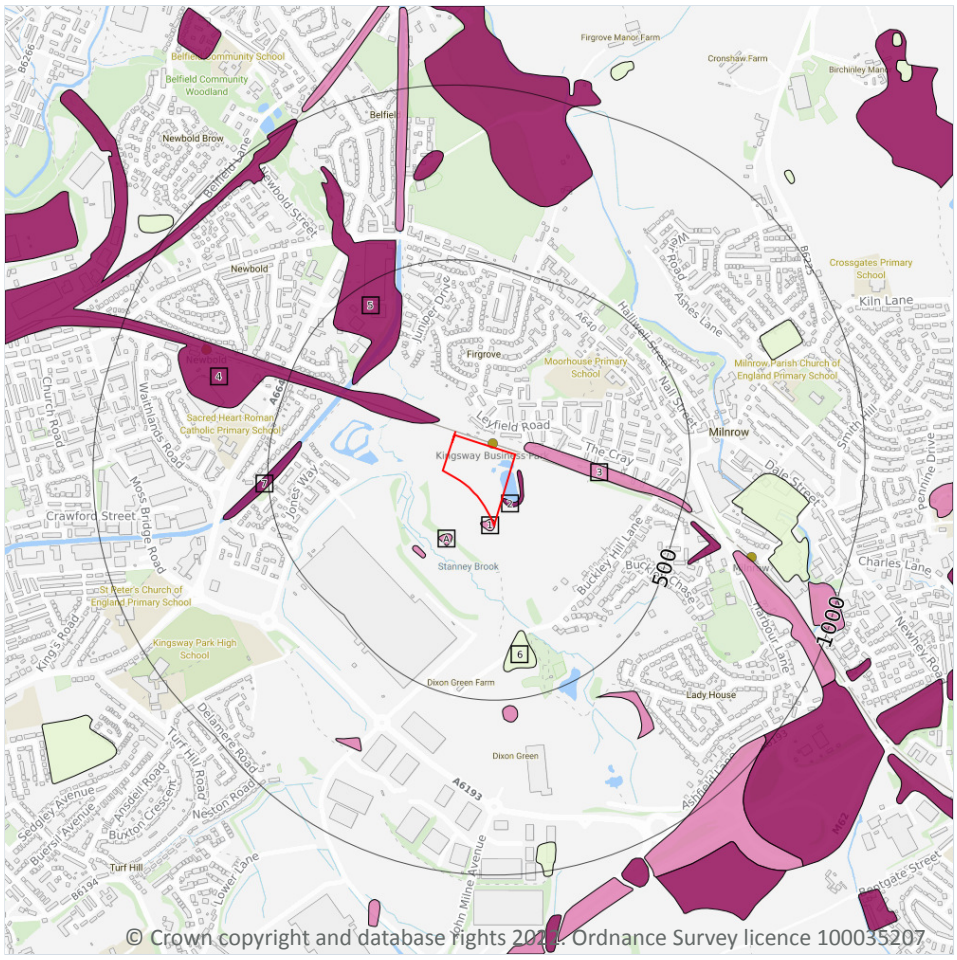
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 76**

| ID | Location | Artificial | Superficial | Bedrock | Mass movement | Sheet No. |
|---|---|---|---|---|---|---|
| **1** | **On site** | **Full** | **Full** | **Full** | **Full** | **SD91SW** |

*This data is sourced from the British Geological Survey.*

# Geology 1:10,000 scale - Artificial and made ground




## 14.2 Artificial and made ground (10k)

| Records within 500m | 9 |
|---|---|

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

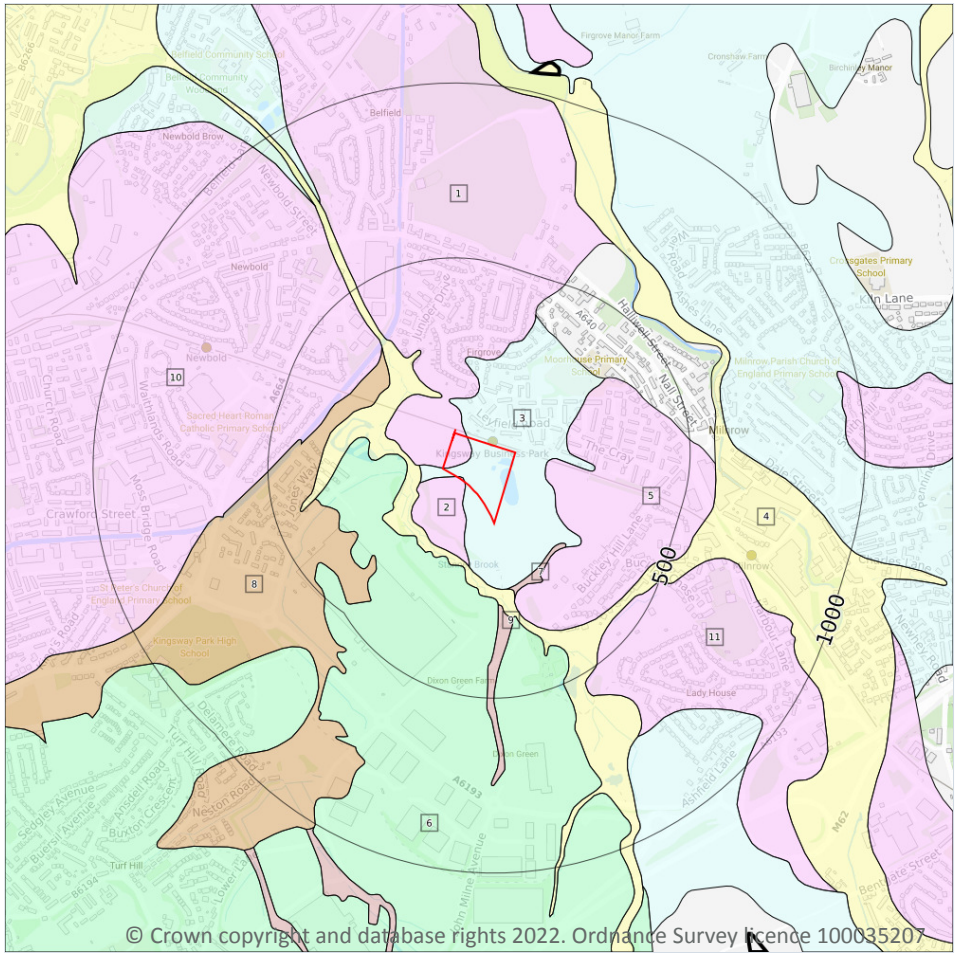
Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 77**

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| **1** | **On site** | **WGR-VOID** | **Worked Ground (Undivided)** | **Void** |
| 2 | 2m E | MGR-ARTDP | Made Ground (Undivided) | Artificial Deposit |
| 3 | 30m NE | WGR-VOID | Worked Ground (Undivided) | Void |
| 4 | 59m NW | MGR-ARTDP | Made Ground (Undivided) | Artificial Deposit |

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| A | 123m SW | WGR-VOID | Worked Ground (Undivided) | Void |
| A | 213m SW | WGR-VOID | Worked Ground (Undivided) | Void |
| 5 | 295m NW | MGR-ARTDP | Made Ground (Undivided) | Artificial Deposit |
| 6 | 311m S | WMGR-ARTDP | Infilled Ground | Artificial Deposit |
| 7 | 411m W | MGR-ARTDP | Made Ground (Undivided) | Artificial Deposit |

*This data is sourced from the British Geological Survey.*

# Geology 1:10,000 scale - Superficial




Site Outline

Search buffers in metres (m)

Landslip (10k)

Superficial geology (10k)
Please see table for more details.

## 14.3 Superficial geology (10k)

**Records within 500m** **11**

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 79**

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| **1** | **On site** | **GFDUD-XSV** | **Glaciofluvial Deposits, Devensian - Sand And Gravel** | **Sand And Gravel** |
| **2** | **On site** | **GFSDD-XSV** | **Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel** | **Sand And Gravel** |
| **3** | **On site** | **TILLD-DMTN** | **Till, Devensian - Diamicton** | **Diamicton** |

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| 4 | 63m W | ALV-XCZSV | Alluvium - Clay, Silt, Sand And Gravel | Clay, Silt, Sand And Gravel |
| 5 | 95m E | GFSDD-XSV | Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel | Sand And Gravel |
| 6 | 102m W | HMGDD-DMTN | Hummocky (moundy) Glacial Deposits, Devensian - Diamicton | Diamicton |
| 7 | 177m SE | HEAD-XCZSV | Head - Clay, Silt, Sand And Gravel | Clay, Silt, Sand And Gravel |
| 8 | 230m NW | PEAT-P | Peat - Peat | Peat |
| 9 | 233m S | HEAD-XCZSV | Head - Clay, Silt, Sand And Gravel | Clay, Silt, Sand And Gravel |
| 10 | 295m NW | GFDUD-XSV | Glaciofluvial Deposits, Devensian - Sand And Gravel | Sand And Gravel |
| 11 | 436m SE | GFSDD-XSV | Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel | Sand And Gravel |

*This data is sourced from the British Geological Survey.*

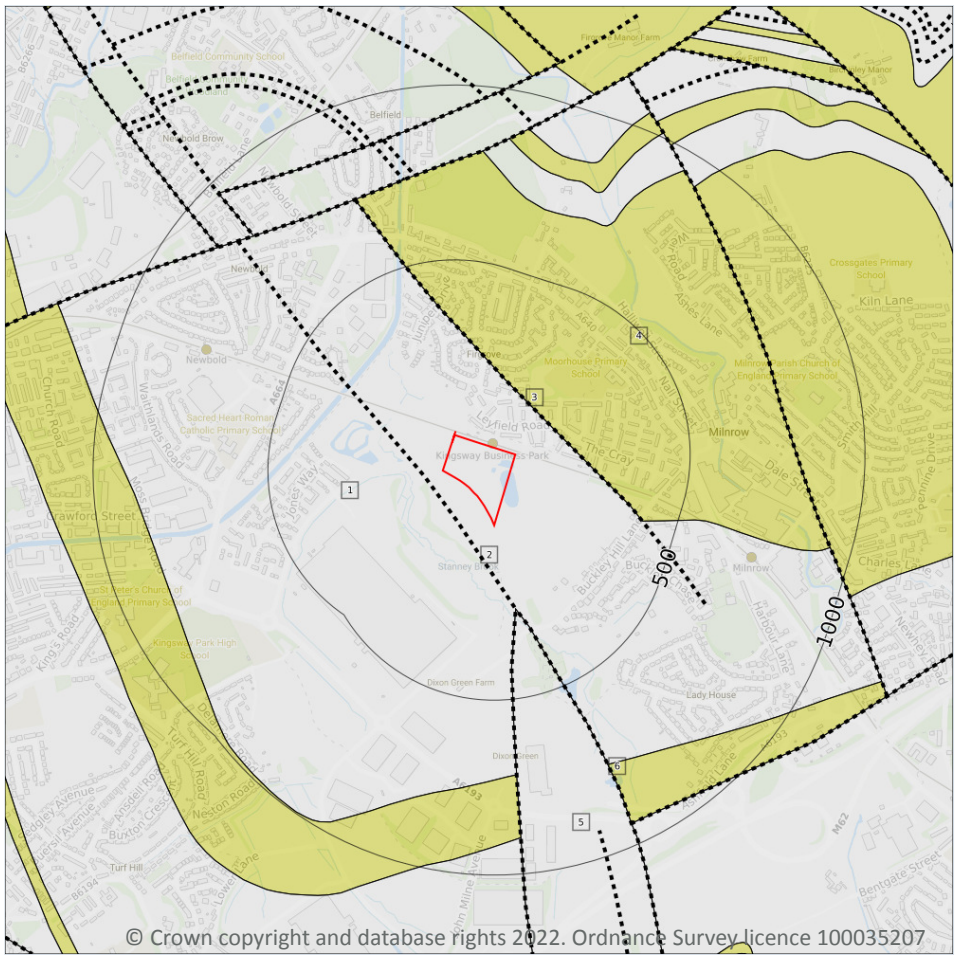
## 14.4 Landslip (10k)

| Records within 500m | 0 |
|---|---|

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

*This data is sourced from the British Geological Survey.*

# Geology 1:10,000 scale - Bedrock




Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (10k)

Bedrock geology (10k)
Please see table for more details.

## 14.5 Bedrock geology (10k)

| Records within 500m | 3 |
|---|---|

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 81**

| ID | Location | LEX Code | Description | Rock age |
|---|---|---|---|---|
| **1** | **On site** | **PLCM-MDSS** | **Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone** | **Langsettian Sub-age** |
| 4 | 130m NE | MLRS-SDST | Milnrow Sandstone - Sandstone | Langsettian Sub-age |
| 5 | 247m S | PLCM-MDSS | Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone | Langsettian Sub-age |

*This data is sourced from the British Geological Survey.*

## 14.6 Bedrock faults and other linear features (10k)

| **Records within 500m** | **3** |
|---|---|

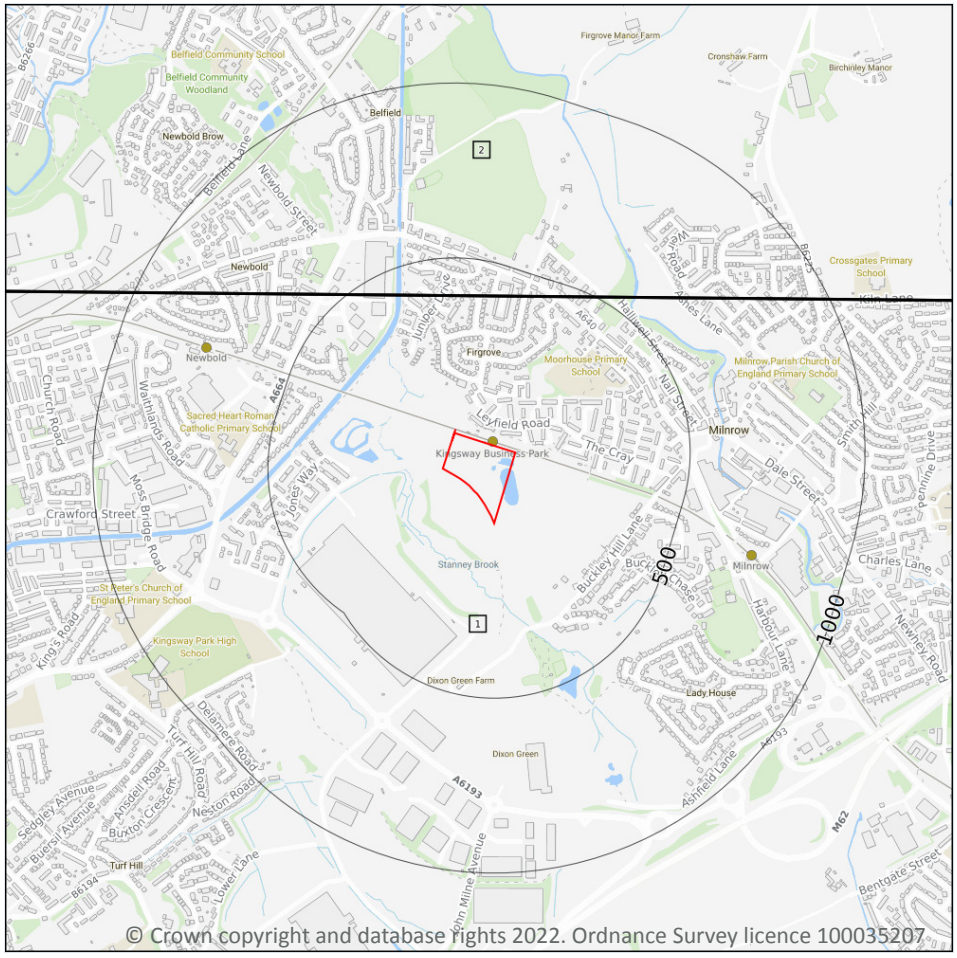
Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 81**

| ID | Location | Category | Description |
|---|---|---|---|
| 2 | 52m SW | FAULT | Normal fault, inferred; crossmarks on downthrow side |
| 3 | 130m NE | FAULT | Normal fault, inferred; crossmarks on downthrow side |
| 6 | 247m S | FAULT | Normal fault, inferred; crossmarks on downthrow side |

*This data is sourced from the British Geological Survey.*

# 15 Geology 1:50,000 scale - Availability




## 15.1 50k Availability

| Records within 500m | 2 |
|---|---|

An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 83**

| ID | Location | Artificial | Superficial | Bedrock | Mass movement | Sheet No. |
|---|---|---|---|---|---|---|
| **1** | **On site** | **No coverage** | **Full** | **Full** | **No coverage** | **EW085_manchester_v4** |
| 2 | 392m N | No coverage | Full | Full | Full | EW076_rochdale_v4 |

*This data is sourced from the British Geological Survey.*

# Geology 1:50,000 scale - Artificial and made ground

## 15.2 Artificial and made ground (50k)

| Records within 500m | 0 |
|---|---|

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

*This data is sourced from the British Geological Survey.*

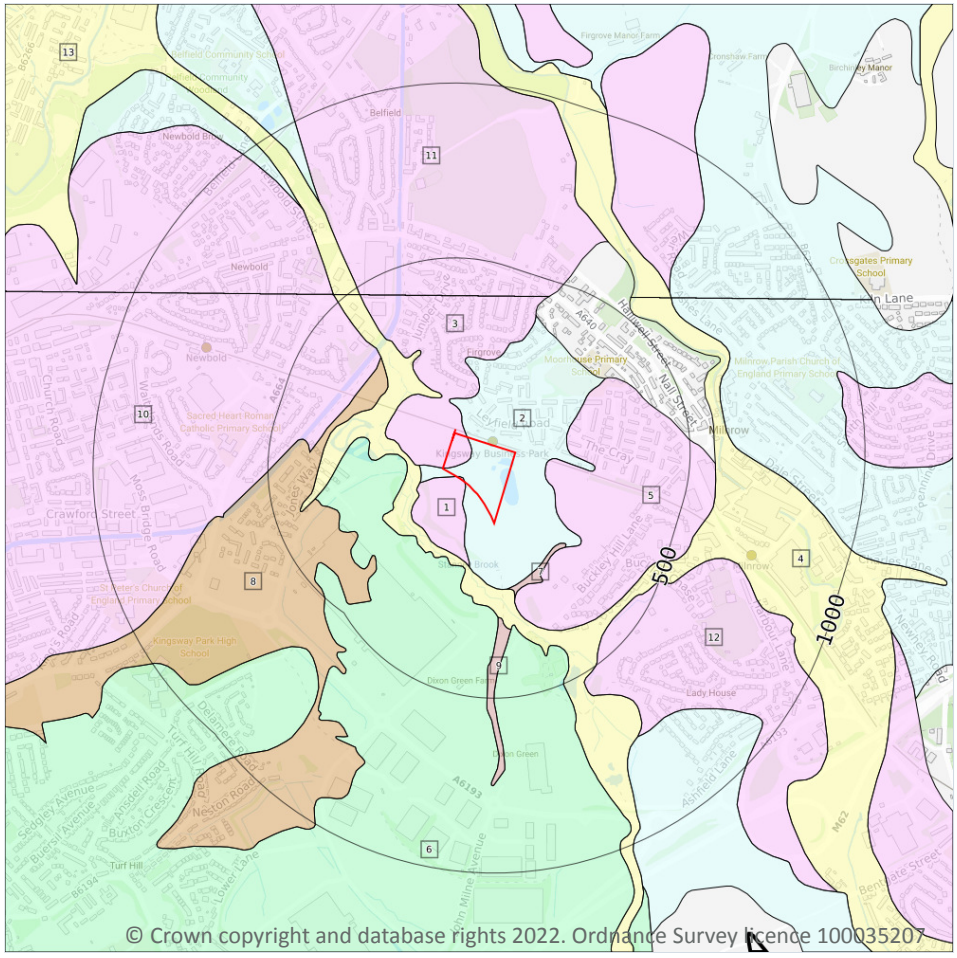
## 15.3 Artificial ground permeability (50k)

| Records within 50m | 0 |
|---|---|

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

*This data is sourced from the British Geological Survey.*

# Geology 1:50,000 scale - Superficial




Site Outline

Search buffers in metres (m)

Landslip (50k)

Superficial geology (50k)
Please see table for more details.

## 15.4 Superficial geology (50k)

**Records within 500m** **13**

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 85**

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| 1 | On site | GFSDD-XSV | GLACIOFLUVIAL SHEET DEPOSITS, DEVENSIAN | SAND AND GRAVEL |
| 2 | On site | TILLD-DMTN | TILL, DEVENSIAN | DIAMICTON |
| 3 | On site | GFDUD-XSV | GLACIOFLUVIAL DEPOSITS, DEVENSIAN | SAND AND GRAVEL |

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| 4 | 63m W | ALV-XCZSV | ALLUVIUM | CLAY, SILT, SAND AND GRAVEL |
| 5 | 95m E | GFSDD-XSV | GLACIOFLUVIAL SHEET DEPOSITS, DEVENSIAN | SAND AND GRAVEL |
| 6 | 102m W | HMGDD-DMTN | HUMMOCKY (MOUNDY) GLACIAL DEPOSITS, DEVENSIAN | DIAMICTON |
| 7 | 177m SE | HEAD-XCZSV | HEAD | CLAY, SILT, SAND AND GRAVEL |
| 8 | 229m NW | PEAT-P | PEAT | PEAT |
| 9 | 270m S | HEAD-XCZSV | HEAD | CLAY, SILT, SAND AND GRAVEL |
| 10 | 289m NW | GFDUD-XSV | GLACIOFLUVIAL DEPOSITS, DEVENSIAN | SAND AND GRAVEL |
| 11 | 392m N | GFDUD-XSV | GLACIOFLUVIAL DEPOSITS, DEVENSIAN | SAND AND GRAVEL |
| 12 | 436m SE | GFSDD-XSV | GLACIOFLUVIAL SHEET DEPOSITS, DEVENSIAN | SAND AND GRAVEL |
| 13 | 479m NW | ALV-XCZSV | ALLUVIUM | CLAY, SILT, SAND AND GRAVEL |

*This data is sourced from the British Geological Survey.*

## 15.5 Superficial permeability (50k)

**Records within 50m** **3**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

| Location | Flow type | Maximum permeability | Minimum permeability |
|---|---|---|---|
| **On site** | **Mixed** | **High** | **Low** |
| **On site** | **Intergranular** | **Very High** | **High** |
| **On site** | **Intergranular** | **Very High** | **High** |

*This data is sourced from the British Geological Survey.*

## 15.6 Landslip (50k)

**Records within 500m** **0**

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

*This data is sourced from the British Geological Survey.*

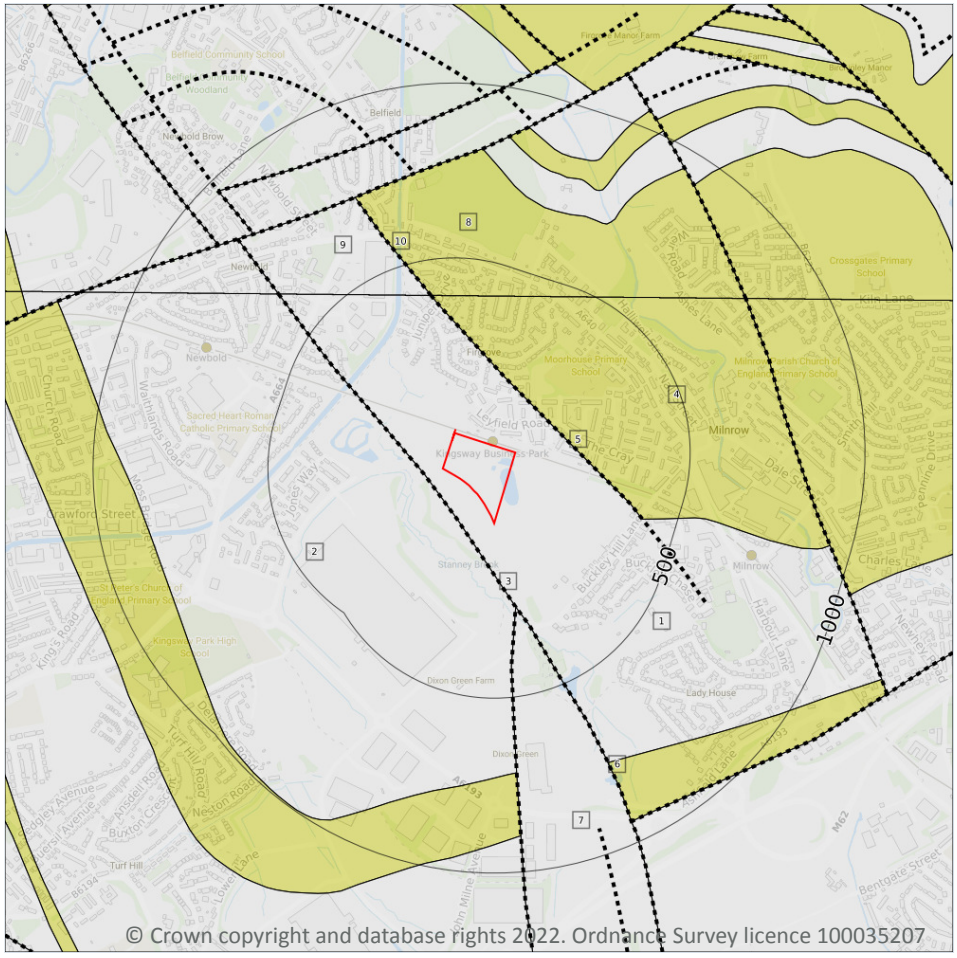
## 15.7 Landslip permeability (50k)

| Records within 50m | 0 |
|---|---|

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

*This data is sourced from the British Geological Survey.*

# Geology 1:50,000 scale - Bedrock




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Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

## 15.8 Bedrock geology (50k)

**Records within 500m** **6**

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 88**

| ID | Location | LEX Code | Description | Rock age |
|---|---|---|---|---|
| **1** | **On site** | **PLCM-MDSS** | **PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE** | **WESTPHALIAN** |
| 2 | 52m SW | PLCM-MDSS | PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE | WESTPHALIAN |
| 4 | 130m NE | MLRS-SDST | MILNROW SANDSTONE - SANDSTONE | WESTPHALIAN |

| ID | Location | LEX Code | Description | Rock age |
|---|---|---|---|---|
| 7 | 247m S | PLCM-MDSS | PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE | WESTPHALIAN |
| 8 | 392m N | MLRS-SDST | MILNROW SANDSTONE - SANDSTONE | WESTPHALIAN |
| 9 | 399m N | PLCM-MDSS | PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE | WESTPHALIAN |

*This data is sourced from the British Geological Survey.*

## 15.9 Bedrock permeability (50k)

**Records within 50m** **1**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

| Location | Flow type | Maximum permeability | Minimum permeability |
|---|---|---|---|
| **On site** | **Fracture** | **Moderate** | **Low** |

*This data is sourced from the British Geological Survey.*

## 15.10 Bedrock faults and other linear features (50k)

**Records within 500m** **4**

Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 88**

| ID | Location | Category | Description |
|---|---|---|---|
| 3 | 52m SW | FAULT | Fault, inferred |
| 5 | 130m NE | FAULT | Fault, inferred |
| 6 | 247m S | FAULT | Fault, inferred |
| 10 | 399m N | FAULT | Fault, inferred |

*This data is sourced from the British Geological Survey.*

# 16 Boreholes

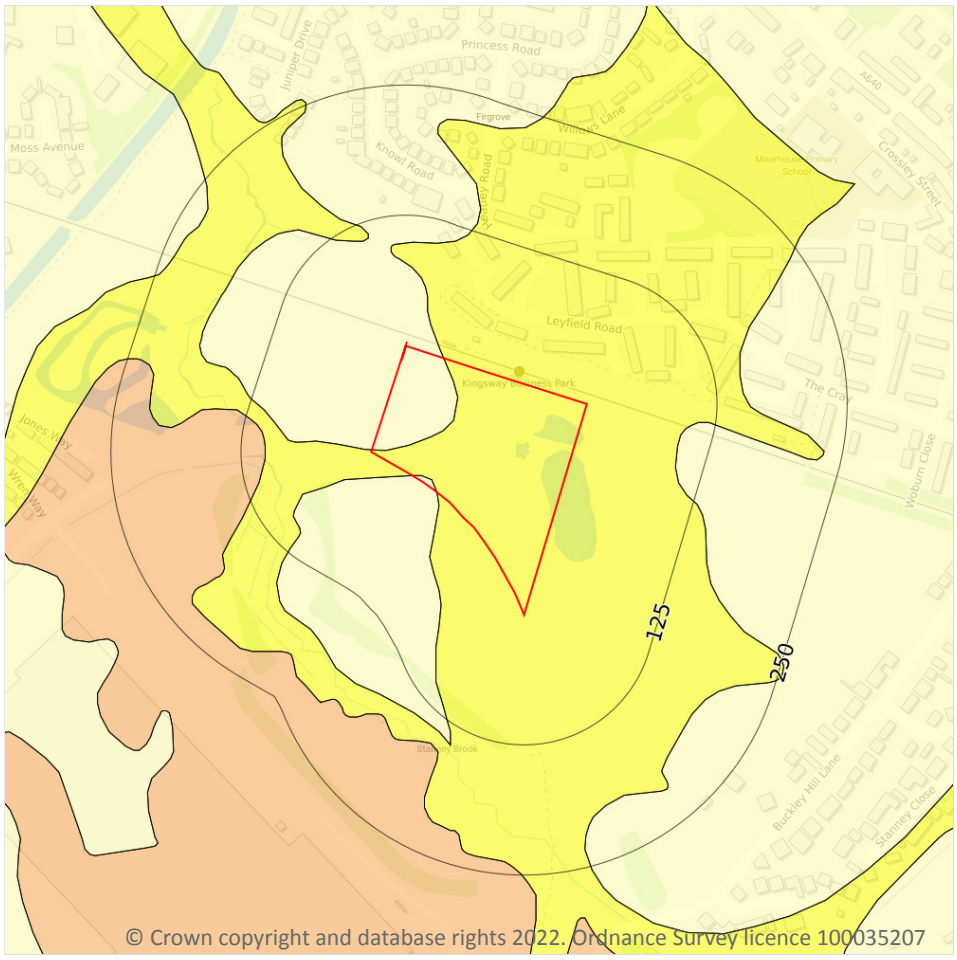
## 16.1 BGS Boreholes

| Records within 250m | 0 |
|---|---|

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

*This data is sourced from the British Geological Survey.*

# 17 Natural ground subsidence - Shrink swell clays




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.1 Shrink swell clays

| Records within 50m | 2 |
|---|---|

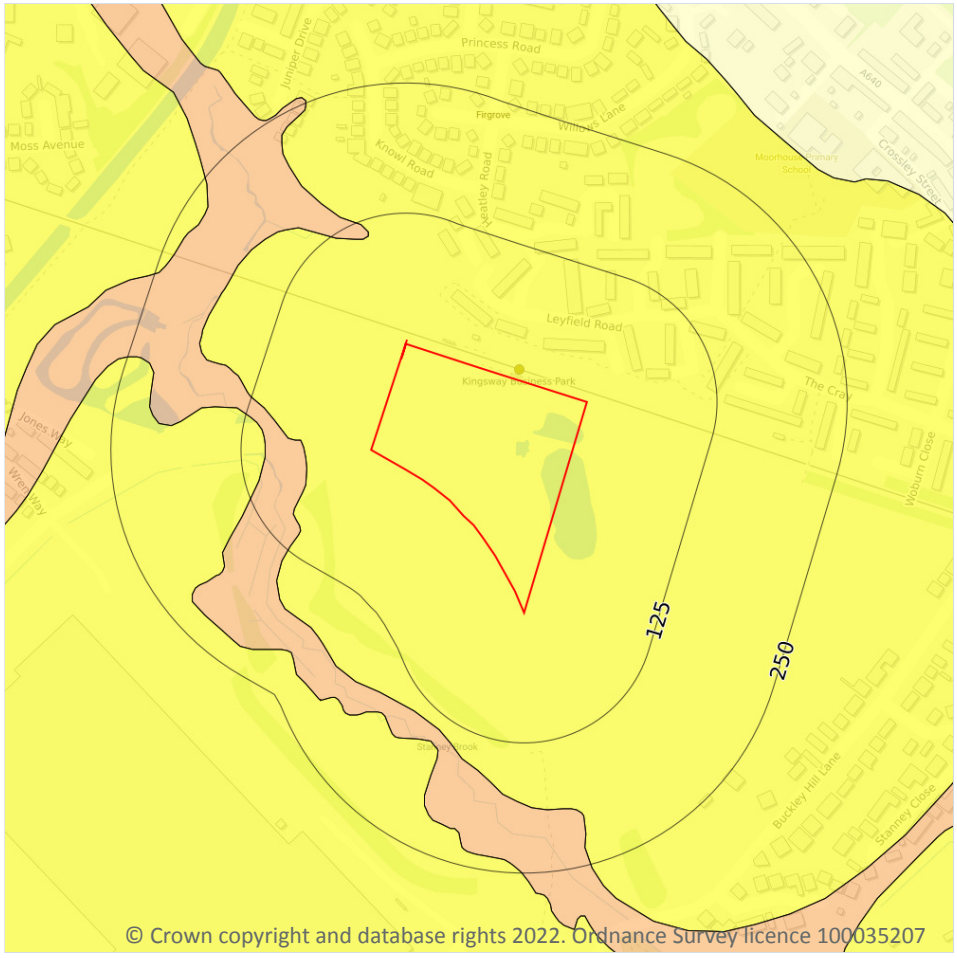
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 91**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Negligible** | **Ground conditions predominantly non-plastic.** |
| **On site** | **Very low** | **Ground conditions predominantly low plasticity.** |

*This data is sourced from the British Geological Survey.*

# Natural ground subsidence - Running sands




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.2 Running sands

| Records within 50m | 1 |
|---|---|

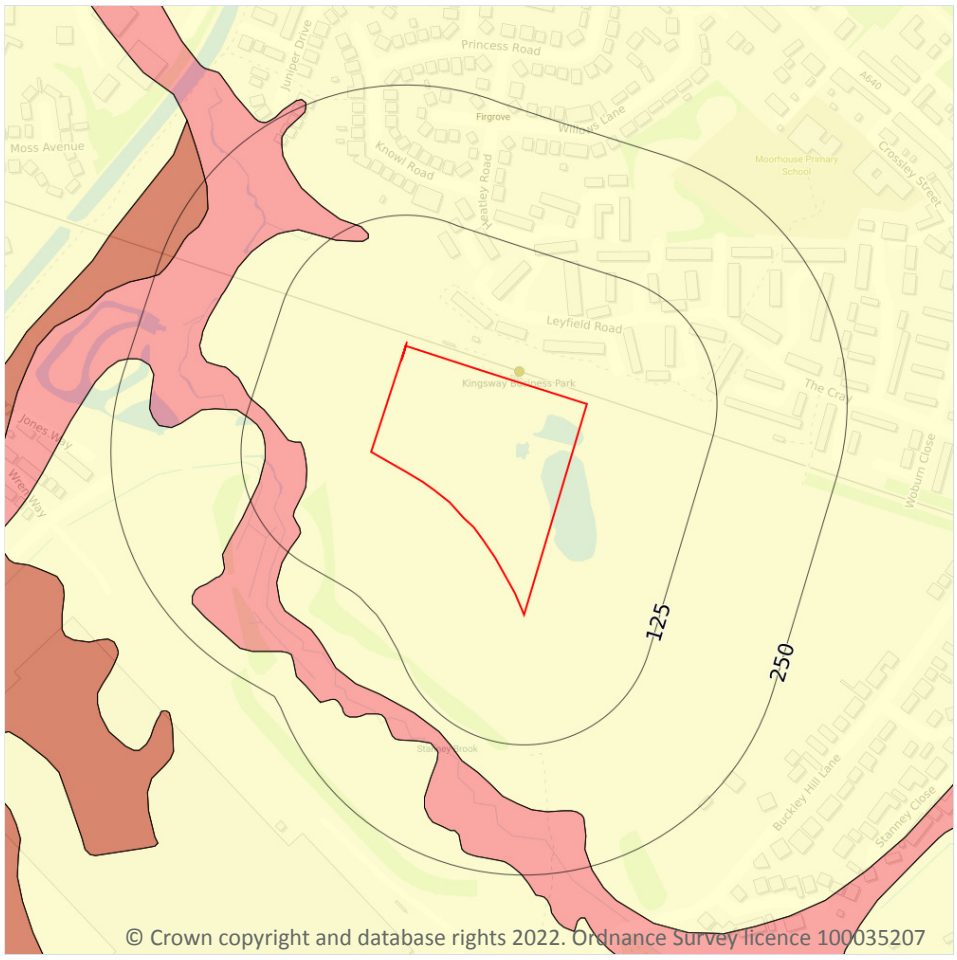
The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

Features are displayed on the Natural ground subsidence - Running sands map on **page 92**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Very low** | **Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.** |

*This data is sourced from the British Geological Survey.*

# Natural ground subsidence - Compressible deposits




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.3 Compressible deposits

| Records within 50m | 1 |
|---|---|

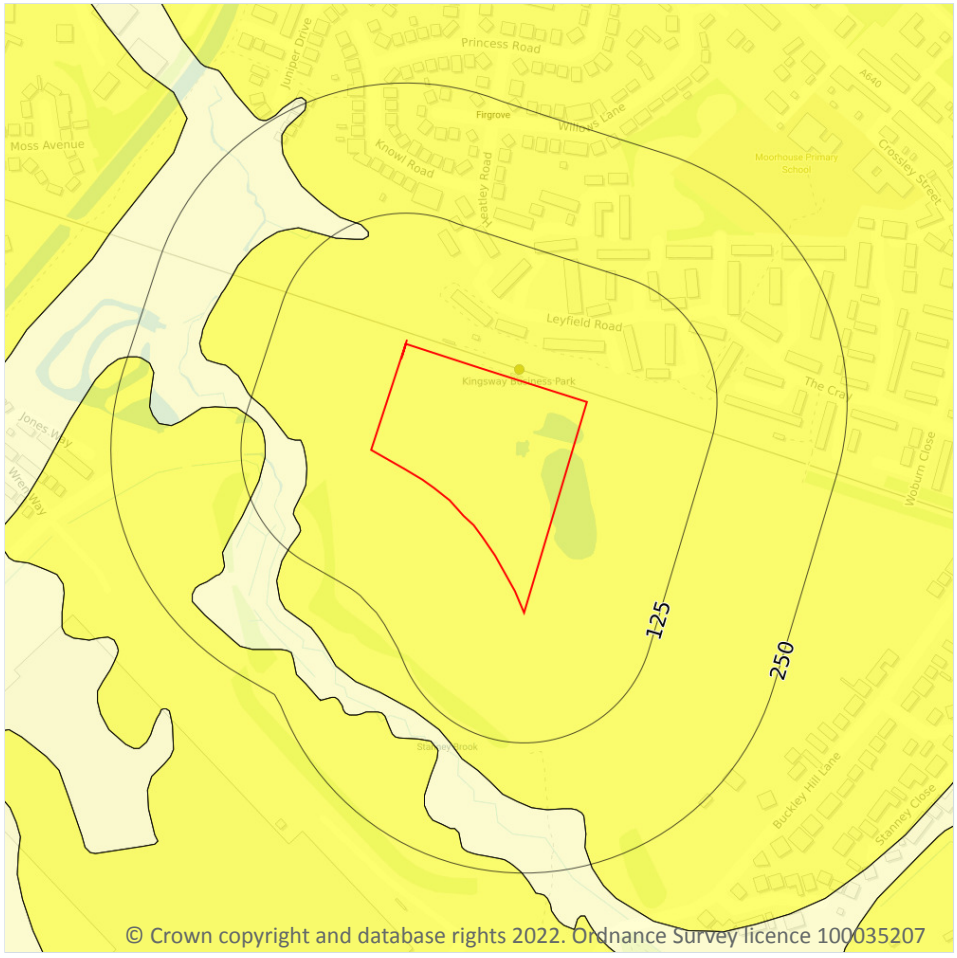
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 93**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Negligible** | **Compressible strata are not thought to occur.** |

*This data is sourced from the British Geological Survey.*

# Natural ground subsidence - Collapsible deposits




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.4 Collapsible deposits

| Records within 50m | 1 |
|---|---|

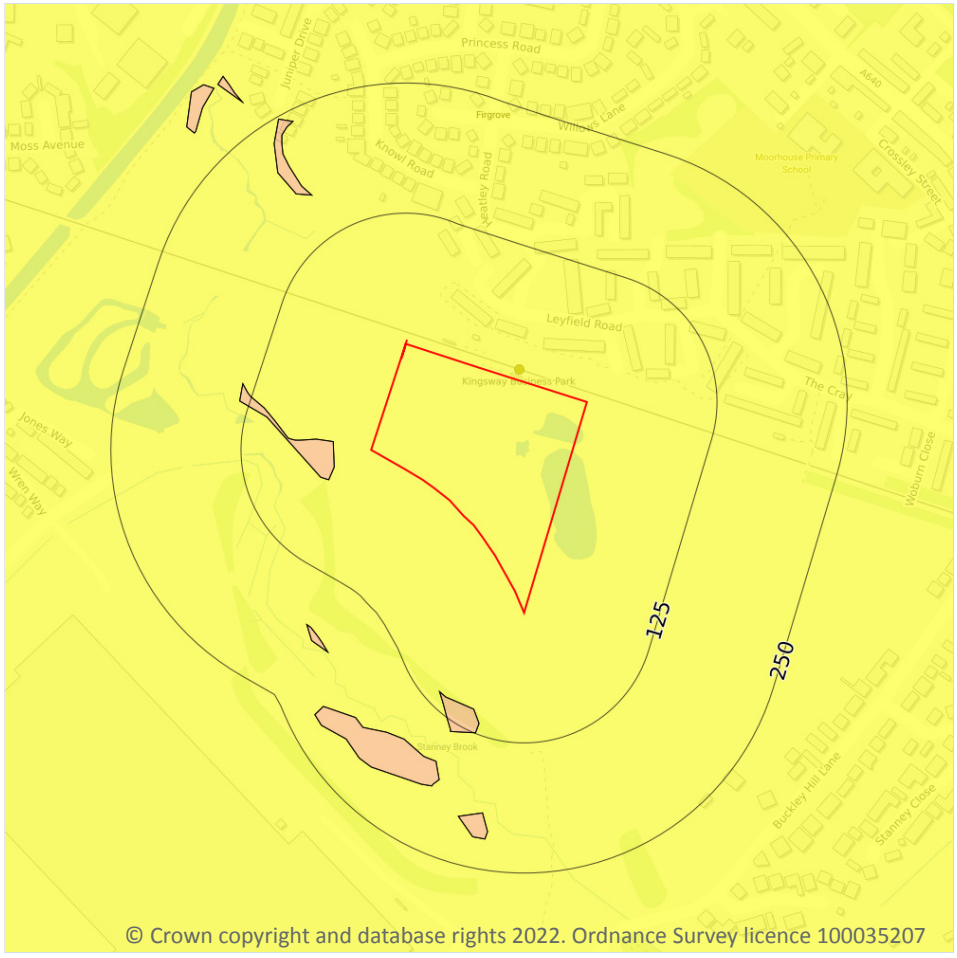
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 94**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Very low** | **Deposits with potential to collapse when loaded and saturated are unlikely to be present.** |

*This data is sourced from the British Geological Survey.*

# Natural ground subsidence - Landslides




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.5 Landslides

| Records within 50m | 2 |
|---|---|

The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

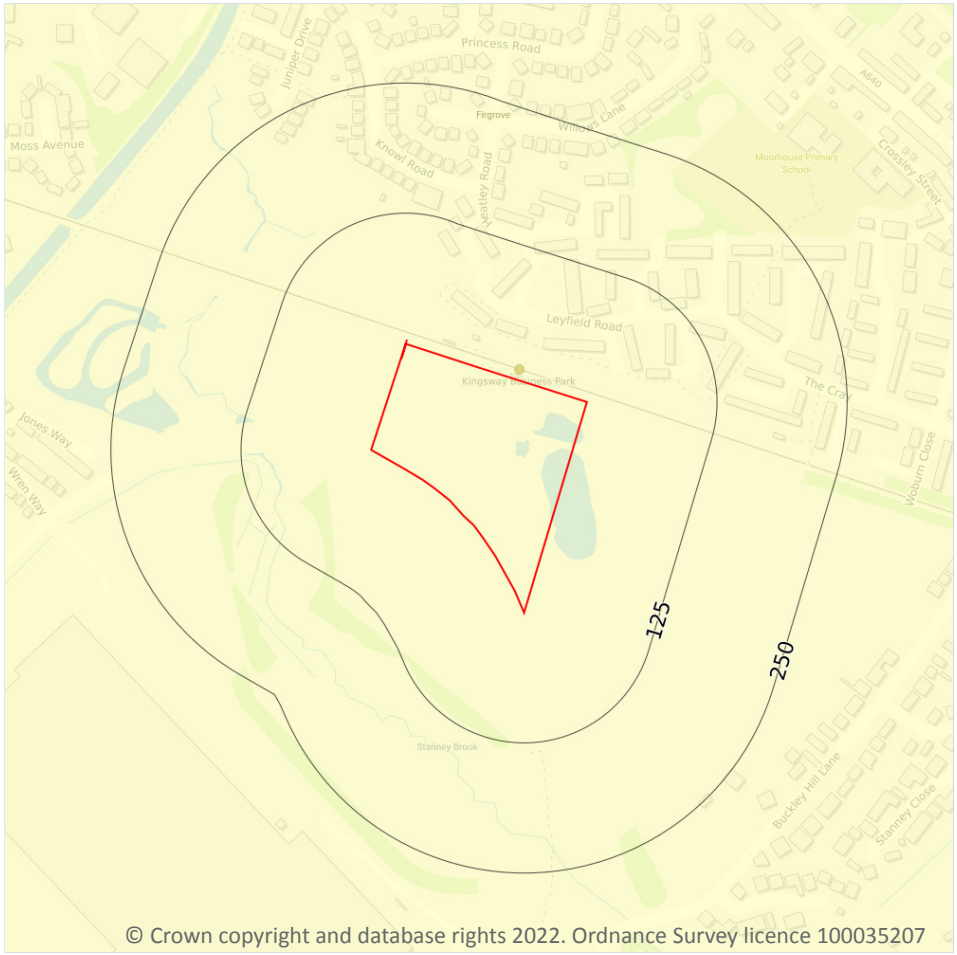
Features are displayed on the Natural ground subsidence - Landslides map on **page 95**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Very low** | **Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.** |

| Location | Hazard rating | Details |
|---|---|---|
| 36m W | Low | Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site. |

*This data is sourced from the British Geological Survey.*

# Natural ground subsidence - Ground dissolution of soluble rocks




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.6 Ground dissolution of soluble rocks

| Records within 50m | 1 |
|---|---|

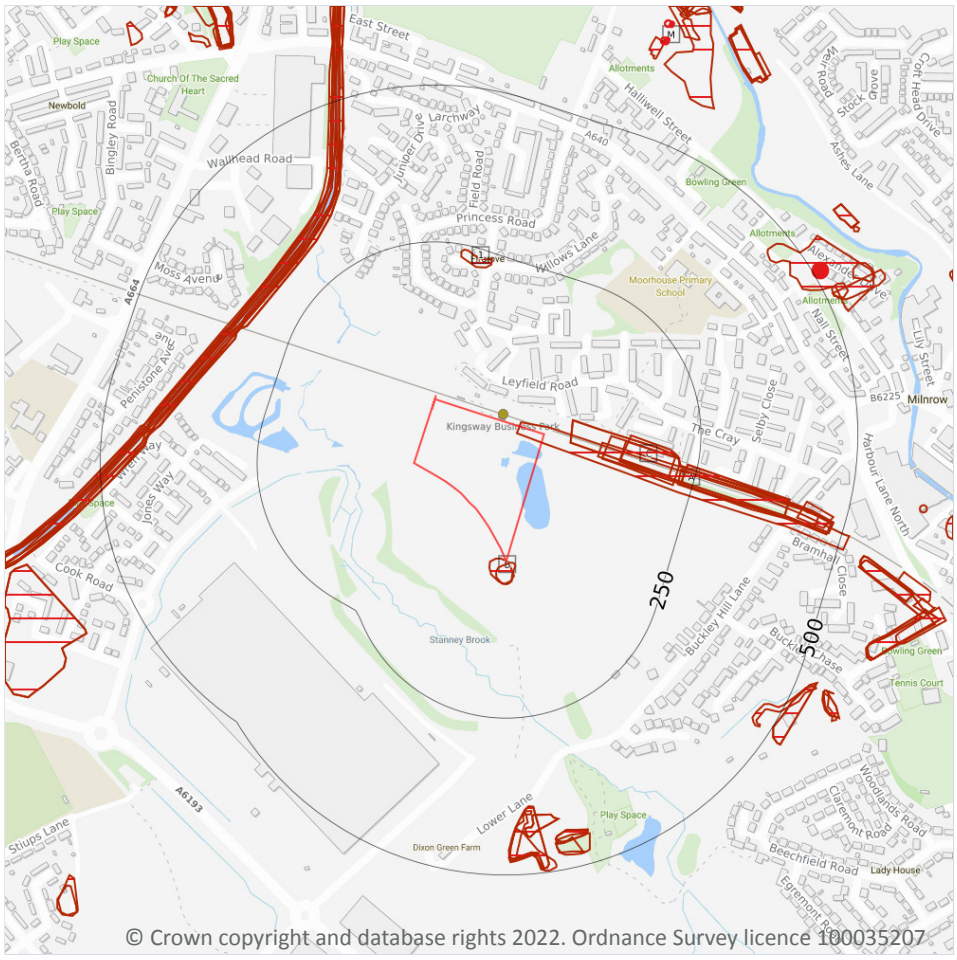
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 97**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Negligible** | **Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.** |

*This data is sourced from the British Geological Survey.*

# 18 Mining, ground workings and natural cavities




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Site Outline

Search buffers in metres (m)

- Natural cavities (Area)
- Natural cavities (Point)
- BritPits
- Surface ground workings
- Underground workings
- Historical Mineral Planning Areas
- Mining Cavities

Non Coal Mining

- Sporadic underground mining of restricted extent possible
- Localised small scale underground mining possible
- Small scale mining possible
- Underground mining known or likely within or in close proximity
- Underground mining known within or in very close proximity

## 18.1 Natural cavities

| Records within 500m | 0 |
|---|---|

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

*This data is sourced from Stantec UK Ltd.*

## 18.2 BritPits

| Records within 500m | 0 |
|---|---|

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

*This data is sourced from the British Geological Survey.*

## 18.3 Surface ground workings

| Records within 250m | 13 |
|---|---|

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining, ground workings and natural cavities map on **page 98**

| ID | Location | Land Use | Year of mapping | Mapping scale |
|---|---|---|---|---|
| **A** | **On site** | **Cuttings** | **1851** | **1:10560** |
| B | 0m SW | Pond | 1976 | 1:10000 |
| B | 4m S | Pond | 1851 | 1:10560 |
| A | 43m E | Cuttings | 1938 | 1:10560 |
| A | 43m E | Cuttings | 1928 | 1:10560 |
| A | 93m E | Cuttings | 1891 | 1:10560 |
| C | 100m E | Cuttings | 1954 | 1:10560 |
| A | 127m E | Cuttings | 1908 | 1:10560 |
| C | 129m E | Cuttings | 1976 | 1:10000 |
| 1 | 220m N | Gravel Pit | 1928 | 1:10560 |
| A | 225m E | Cuttings | 1954 | 1:10560 |
| A | 231m E | Cuttings | 1976 | 1:10000 |
| A | 231m E | Cuttings | 1967 | 1:10560 |

*This is data is sourced from Ordnance Survey/Groundsure.*

## 18.4 Underground workings

| Records within 1000m | 25 |
|---|---|

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

Features are displayed on the Mining, ground workings and natural cavities map on **page 98**

| ID | Location | Land Use | Year of mapping | Mapping scale |
|---|---|---|---|---|
| M | 650m N | Unspecified Disused Shafts | 1976 | 1:10000 |
| M | 650m N | Unspecified Disused Shafts | 1967 | 1:10560 |
| M | 651m N | Unspecified Old Shaft | 1954 | 1:10560 |
| M | 655m N | Old Coal Shafts | 1908 | 1:10560 |
| M | 655m N | Unspecified Old Shaft | 1938 | 1:10560 |
| M | 655m N | Unspecified Old Shaft | 1928 | 1:10560 |
| M | 655m N | Unspecified Old Shafts | 1891 | 1:10560 |
| M | 678m N | Unspecified Disused Shafts | 1976 | 1:10000 |
| M | 678m N | Unspecified Disused Shafts | 1967 | 1:10560 |
| M | 680m N | Unspecified Old Shaft | 1954 | 1:10560 |
| M | 682m N | Old Coal Shafts | 1908 | 1:10560 |
| M | 684m N | Unspecified Old Shaft | 1938 | 1:10560 |
| M | 684m N | Unspecified Old Shaft | 1928 | 1:10560 |
| M | 684m N | Unspecified Old Shafts | 1891 | 1:10560 |
| - | 971m NW | Unspecified Disused Shaft | 1967 | 1:10560 |
| - | 971m NW | Unspecified Disused Shafts | 1976 | 1:10000 |
| - | 972m NW | Unspecified Disused Shafts | 1976 | 1:10000 |
| - | 972m NW | Unspecified Disused Shaft | 1967 | 1:10560 |
| - | 989m NE | Unspecified Disused Shaft | 1976 | 1:10000 |
| - | 989m NE | Unspecified Disused Shaft | 1967 | 1:10560 |
| - | 992m NE | Unspecified Old Shaft | 1954 | 1:10560 |
| - | 994m NE | Disused Colliery | 1891 | 1:10560 |
| - | 996m NE | Old Coal Shaft | 1908 | 1:10560 |

| ID | Location | Land Use | Year of mapping | Mapping scale |
|---|---|---|---|---|
| - | 996m NE | Unspecified Old Shaft | 1938 | 1:10560 |
| - | 996m NE | Unspecified Old Shaft | 1928 | 1:10560 |

*This is data is sourced from Ordnance Survey/Groundsure.*

## 18.5 Historical Mineral Planning Areas

| **Records within 500m** | **0** |
|---|---|

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

*This data is sourced from the British Geological Survey.*

## 18.6 Non-coal mining

| **Records within 1000m** | **0** |
|---|---|

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

*This data is sourced from the British Geological Survey.*

## 18.7 Mining cavities

| **Records within 1000m** | **0** |
|---|---|

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

*This data is sourced from Stantec UK Ltd.*

## 18.8 JPB mining areas

| **Records on site** | **0** |
|---|---|

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

*This data is sourced from Johnson Poole and Bloomer.*

## 18.9 Coal mining

| Records on site | 1 |
|---|---|

Areas which could be affected by past, current or future coal mining.

| Location | Details |
|---|---|
| **On site** | **The site is located within a coal mining area as defined by the Coal Authority. A Consultants Coal Mining Report is recommended to further assess coal mining issues at the site. This can be ordered directly through Groundsure or your preferred search provider.** |

*This data is sourced from the Coal Authority.*

## 18.10 Brine areas

| Records on site | 0 |
|---|---|

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

*This data is sourced from the Cheshire Brine Subsidence Compensation Board.*

## 18.11 Gypsum areas

| Records on site | 0 |
|---|---|

Generalised areas that may be affected by gypsum extraction.

*This data is sourced from British Gypsum.*

## 18.12 Tin mining

| Records on site | 0 |
|---|---|

Generalised areas that may be affected by historical tin mining.

*This data is sourced from Groundsure.*

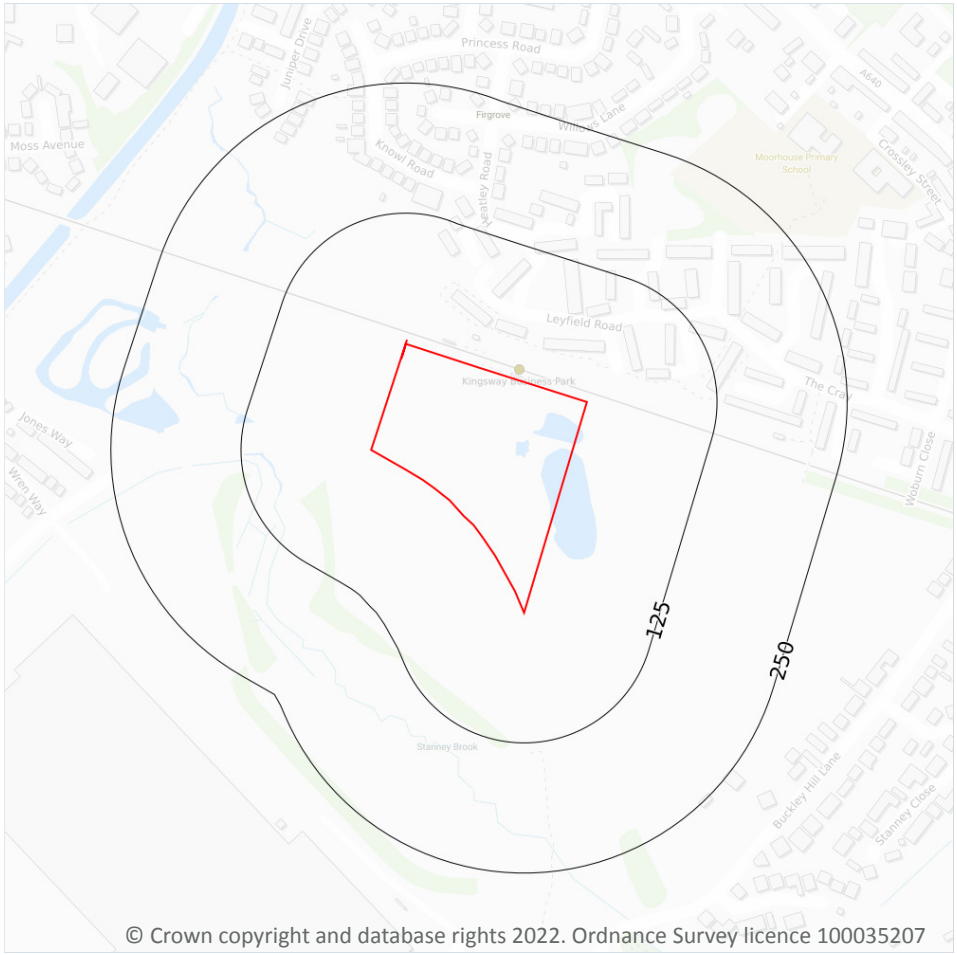
## 18.13 Clay mining

| Records on site | 0 |
|---|---|

Generalised areas that may be affected by kaolin and ball clay extraction.

*This data is sourced from the Kaolin and Ball Clay Association (UK).*

# 19 Radon




Site Outline

Search buffers in metres (m)

- Greater than 30%
- Between 10% and 30%
- Between 5% and 10%
- Between 3% and 5%
- Between 1% and 3%
- Less than 1%

## 19.1 Radon

| Records on site | 1 |
|---|---|

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on **page 103**

| Location | Estimated properties affected | Radon Protection Measures required |
|---|---|---|
| **On site** | **Less than 1%** | **None**** |

*This data is sourced from the British Geological Survey and Public Health England.*

# 20 Soil chemistry

## 20.1 BGS Estimated Background Soil Chemistry

| **Records within 50m** | **13** |
|---|---|

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 $km^2$. In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 $km^2$; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

| Location | Arsenic | Bioaccessible Arsenic | Lead | Bioaccessible Lead | Cadmium | Chromium | Nickel |
|---|---|---|---|---|---|---|---|
| **On site** | **15 - 25 mg/kg** | **No data** | **100 - 200 mg/kg** | **60 - 120 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |
| **On site** | **15 - 25 mg/kg** | **No data** | **100 - 200 mg/kg** | **60 - 120 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |
| **On site** | **15 - 25 mg/kg** | **No data** | **300 - 600 mg/kg** | **240 - 360 mg/kg** | **1.8 - 2.2 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |
| **On site** | **15 - 25 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |
| **On site** | **25 - 35 mg/kg** | **No data** | **100 - 200 mg/kg** | **60 - 120 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |
| 13m NW | 15 - 25 mg/kg | No data | 100 - 200 mg/kg | 60 - 120 mg/kg | 1.8 mg/kg | 90 - 120 mg/kg | 30 - 45 mg/kg |
| 13m SW | 25 - 35 mg/kg | No data | 100 - 200 mg/kg | 60 - 120 mg/kg | 1.8 mg/kg | 60 - 90 mg/kg | 15 - 30 mg/kg |
| 19m N | 15 - 25 mg/kg | No data | 100 - 200 mg/kg | 60 - 120 mg/kg | 1.8 mg/kg | 60 - 90 mg/kg | 30 - 45 mg/kg |
| 24m NE | 15 - 25 mg/kg | No data | 300 - 600 mg/kg | 240 - 360 mg/kg | 1.8 - 2.2 mg/kg | 60 - 90 mg/kg | 30 - 45 mg/kg |
| 24m NE | 15 - 25 mg/kg | No data | 100 - 200 mg/kg | 60 - 120 mg/kg | 1.8 mg/kg | 60 - 90 mg/kg | 30 - 45 mg/kg |
| 26m S | 25 - 35 mg/kg | No data | 100 mg/kg | 60 mg/kg | 1.8 mg/kg | 60 - 90 mg/kg | 15 - 30 mg/kg |
| 41m S | 15 - 25 mg/kg | No data | 100 mg/kg | 60 mg/kg | 1.8 mg/kg | 60 - 90 mg/kg | 15 - 30 mg/kg |

| Location | Arsenic | Bioaccessible Arsenic | Lead | Bioaccessible Lead | Cadmium | Chromium | Nickel |
|---|---|---|---|---|---|---|---|
| 41m SE | 15 - 25 mg/kg | No data | 100 mg/kg | 60 mg/kg | 1.8 mg/kg | 60 - 90 mg/kg | 15 - 30 mg/kg |

*This data is sourced from the British Geological Survey.*

## 20.2 BGS Estimated Urban Soil Chemistry

| Records within 50m | 0 |
|---|---|

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per $km^2$).

*This data is sourced from the British Geological Survey.*

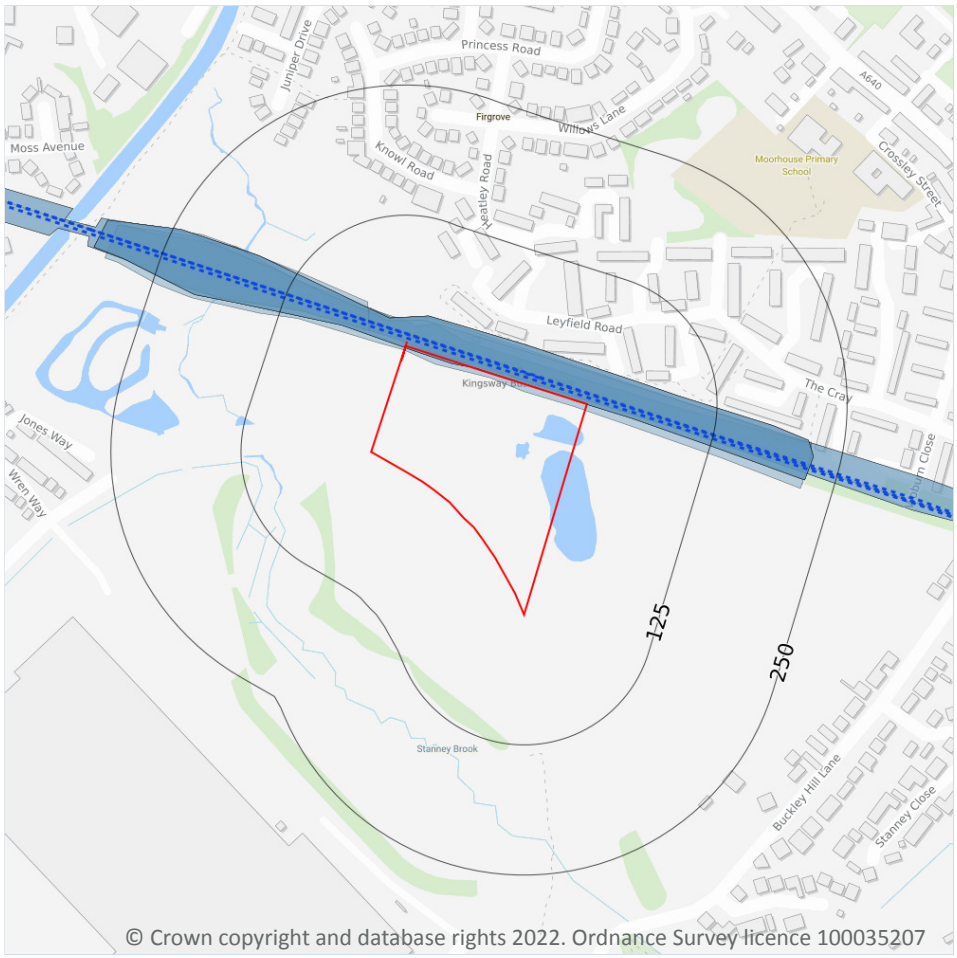
## 20.3 BGS Measured Urban Soil Chemistry

| Records within 50m | 0 |
|---|---|

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per $km^2$.

*This data is sourced from the British Geological Survey.*

# 21 Railway infrastructure and projects




Site Outline

Search buffers in metres (m)

- Crossrail 1 Stations
- Crossrail 1 Route
- Crossrail 1 Worksites
- Crossrail 2 Stations
- Crossrail 2 Route
- Crossrail 2 Worksites
- Crossrail 2 Safeguarding
- Crossrail 2 Headhouses
- Railway stations
- Active railways
- Active tunnels
- Abandoned railways
- Historic railways
- Historic tunnels
- Underground stations
- Underground Lines
- Royal Mail tunnels
- HS2 optimised route
- HS2 Stations
- HS2 Depots
- HS2 Surface Safeguarding
- HS2 Subsurface Safeguarding

## 21.1 Underground railways (London)

| Records within 250m | 0 |
|---|---|

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

*This data is sourced from publicly available information by Groundsure.*

## 21.2 Underground railways (Non-London)

| Records within 250m | 0 |
|---|---|

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

*This data is sourced from publicly available information by Groundsure.*

## 21.3 Railway tunnels

| Records within 250m | 0 |
|---|---|

Railway tunnels taken from contemporary Ordnance Survey mapping.

*This data is sourced from the Ordnance Survey.*

## 21.4 Historical railway and tunnel features

| Records within 250m | 8 |
|---|---|

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

Features are displayed on the Railway infrastructure and projects map on **page 106**

| Location | Land Use | Year of mapping | Mapping scale |
|---|---|---|---|
| **On site** | **Railway Sidings** | **1954** | **10560** |
| **On site** | **Railway Sidings** | **1938** | **10560** |
| **On site** | **Railway Sidings** | **1928** | **10560** |
| **On site** | **Railway Sidings** | **1908** | **10560** |
| 0m N | Railway | 1891 | - |
| 1m N | Railway | 1907 | - |
| 38m W | Railway | 1890 | - |
| 38m W | Railway | 1908 | - |

*This data is sourced from Ordnance Survey/Groundsure.*

## 21.5 Royal Mail tunnels

| Records within 250m | 0 |
|---|---|

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

*This data is sourced from Groundsure/the Postal Museum.*

## 21.6 Historical railways

| Records within 250m | 0 |
|---|---|

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

*This data is sourced from OpenStreetMap.*

## 21.7 Railways

| Records within 250m | 8 |
|---|---|

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

Features are displayed on the Railway infrastructure and projects map on **page 106**

| Location | Name | Type |
|---|---|---|
| 6m N | Metrolink | light_rail |
| 10m N | Not given | Multi Track |
| 10m N | Not given | Multi Track |
| 10m N | Not given | Multi Track |
| 10m N | Metrolink | light_rail |
| 10m N | Not given | Multi Track |
| 11m N | Not given | Multi Track |
| 223m E | Not given | Multi Track |

*This data is sourced from Ordnance Survey and OpenStreetMap.*

## 21.8 Crossrail 1

| Records within 500m | 0 |
|---|---|

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

*This data is sourced from publicly available information by Groundsure.*

## 21.9 Crossrail 2

| Records within 500m | 0 |
|---|---|

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

*This data is sourced from publicly available information by Groundsure.*

## 21.10 HS2

| Records within 500m | 0 |
|---|---|

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

*This data is sourced from HS2 ltd.*

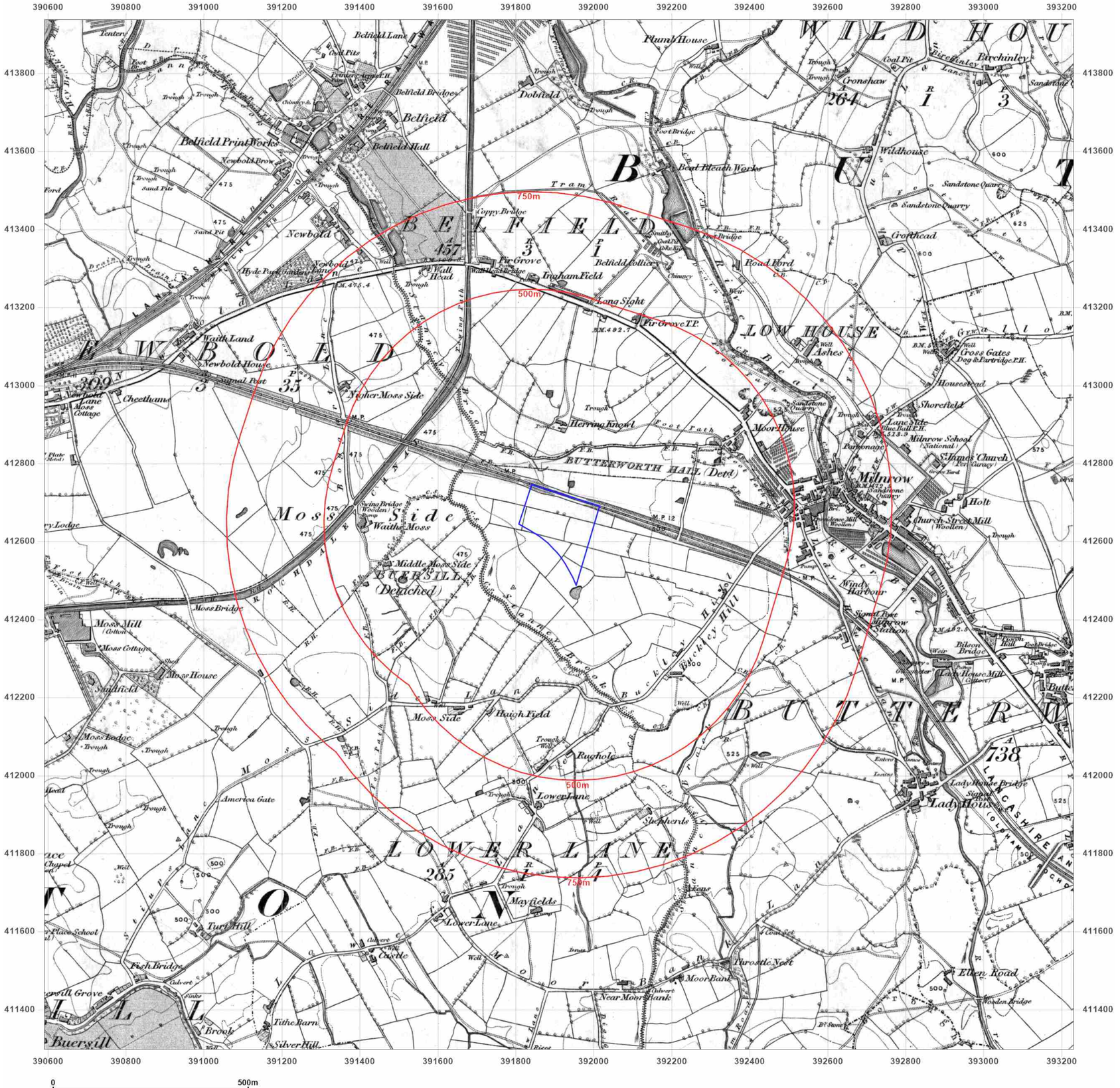
## Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see https://www.groundsure.com/sources-reference.

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# Appendix 4: Historical Mapping




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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** County Series
**Map date:** **1851**
**Scale:** 1:10,560
**Printed at:** 1:10,560

N
W E
S

Surveyed 1848
Revised N/A
Edition 1851
Copyright N/A
Levelled N/A

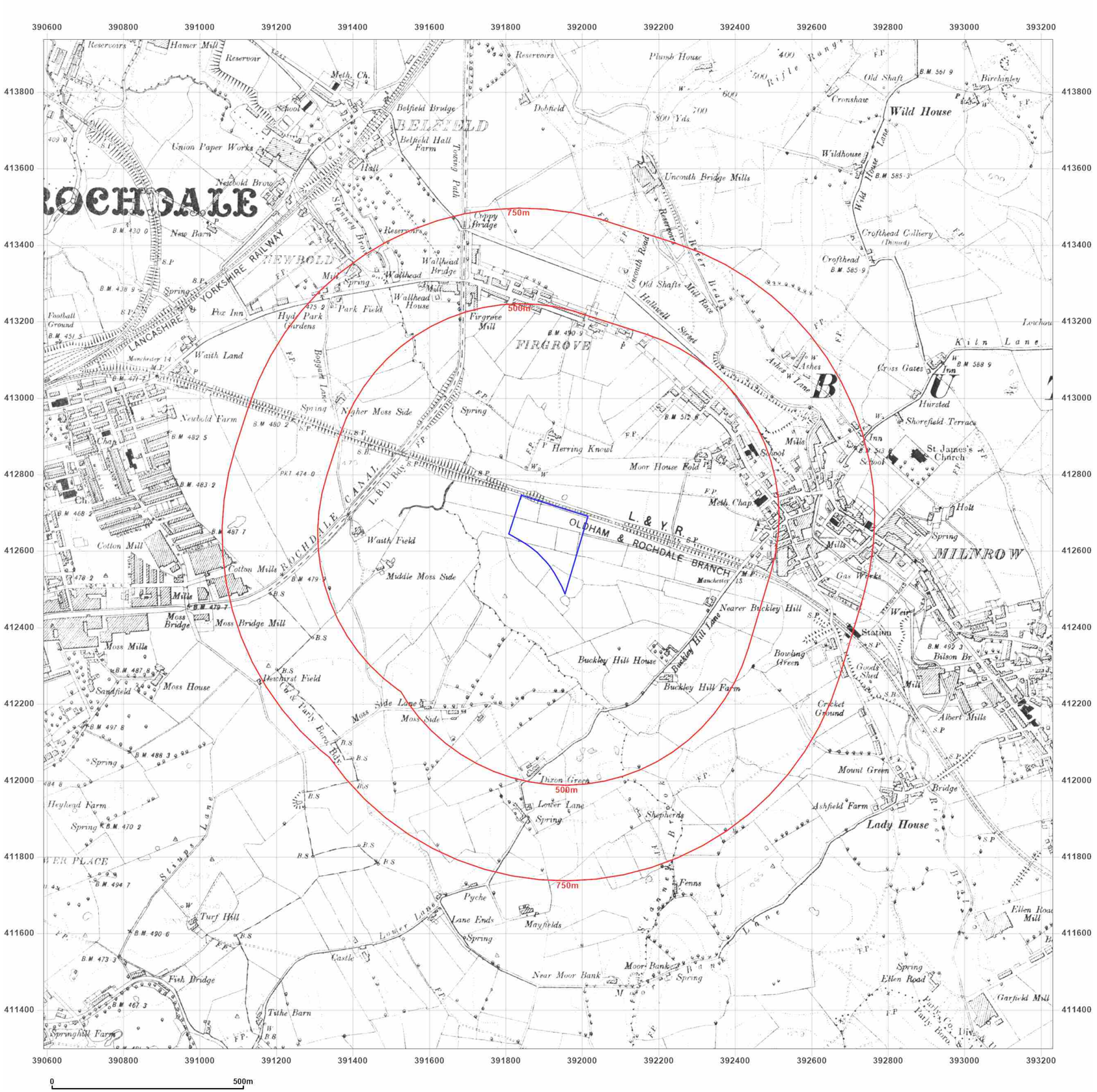
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** County Series

**Map date:** **1891**

**Scale:** 1:10,560

**Printed at:** 1:10,560

N
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Surveyed 1891
Revised 1891
Edition N/A
Copyright N/A
Levelled N/A

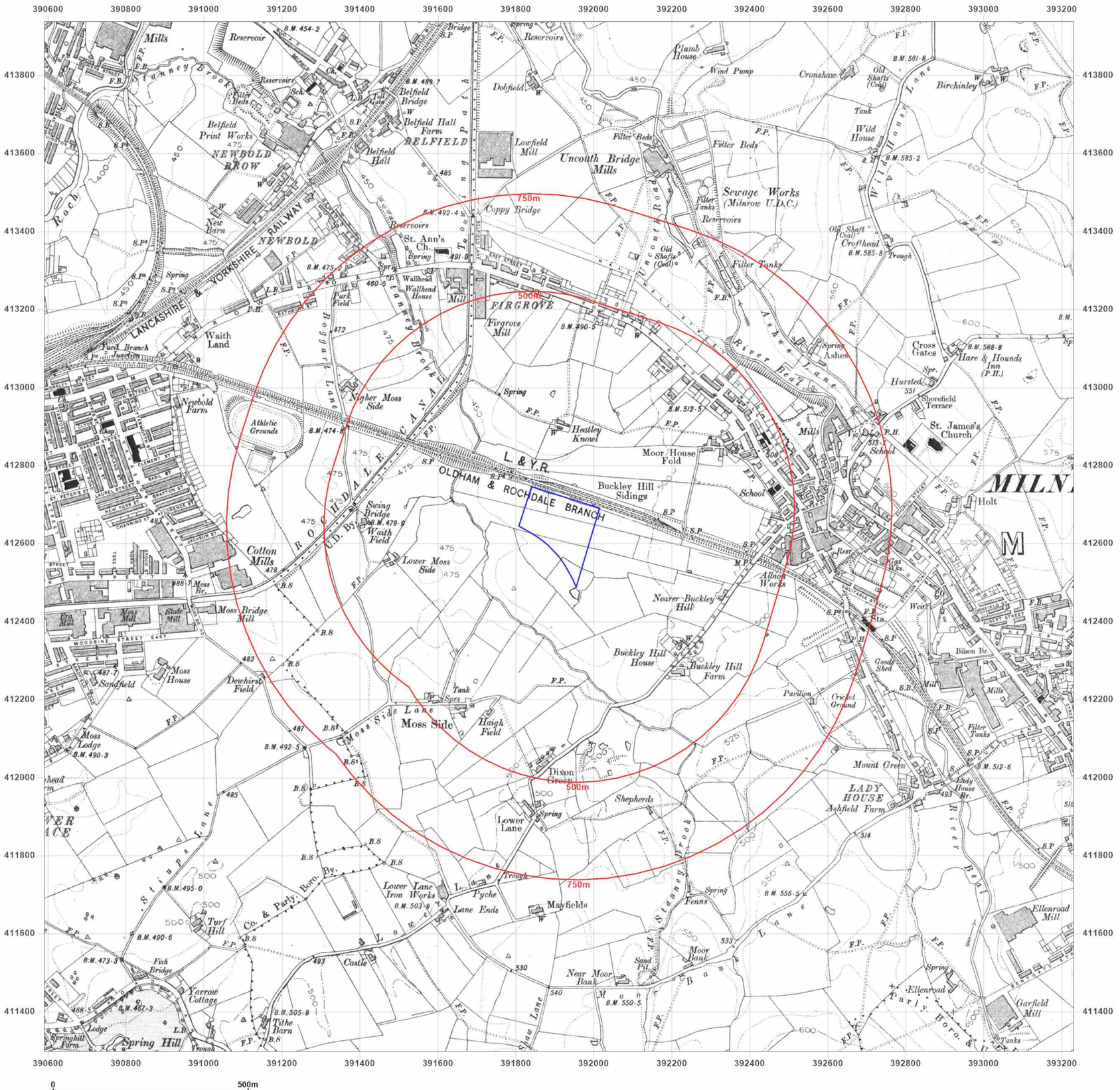
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** County Series

**Map date:** **1908**

**Scale:** 1:10,560

**Printed at:** 1:10,560

N
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Surveyed 1848
Revised 1908
Edition N/A
Copyright N/A
Levelled N/A

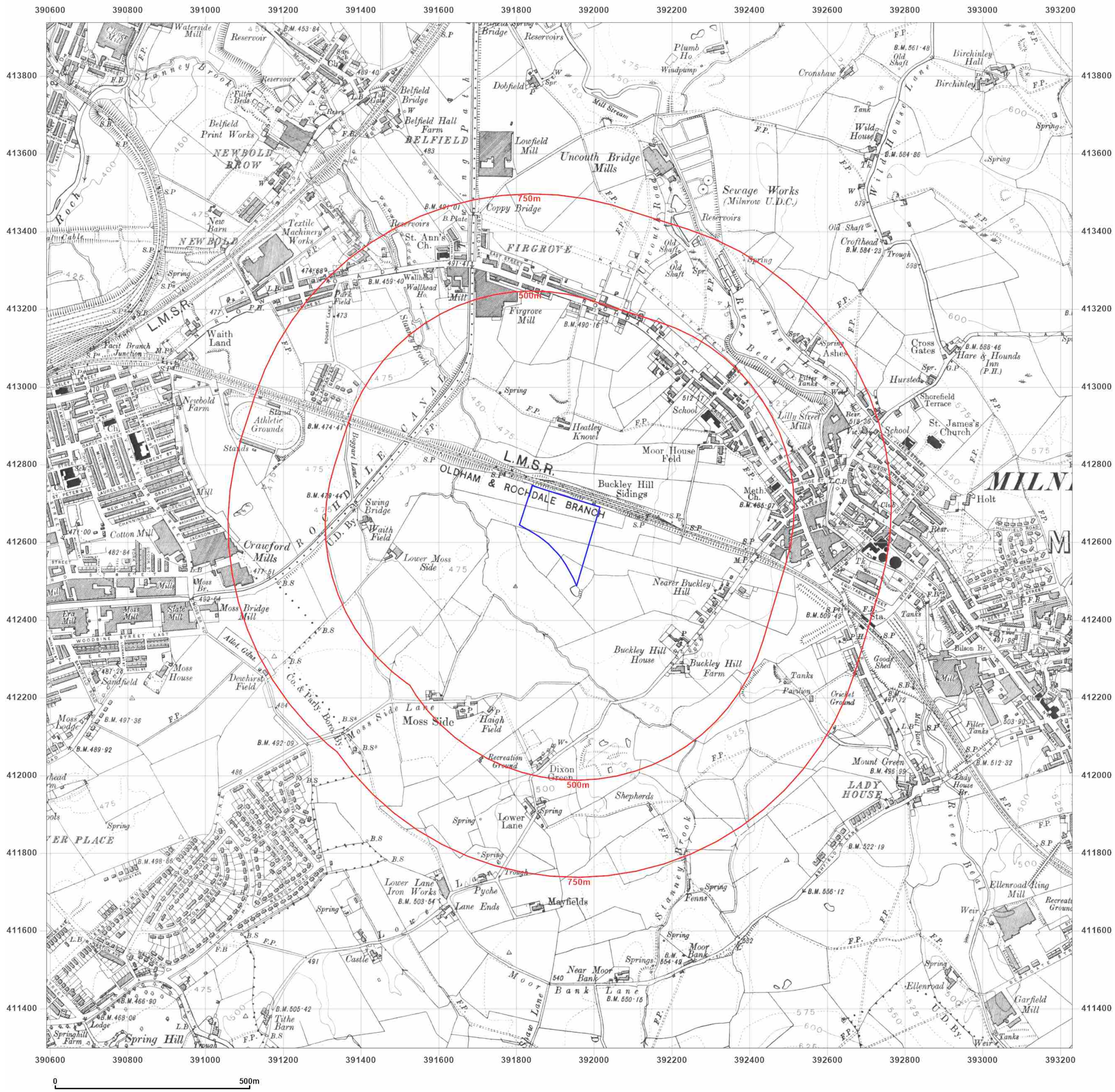
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** County Series

**Map date:** **1928**

**Scale:** 1:10,560

**Printed at:** 1:10,560

N
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Surveyed 1848
Revised 1928
Edition N/A
Copyright N/A
Levelled N/A

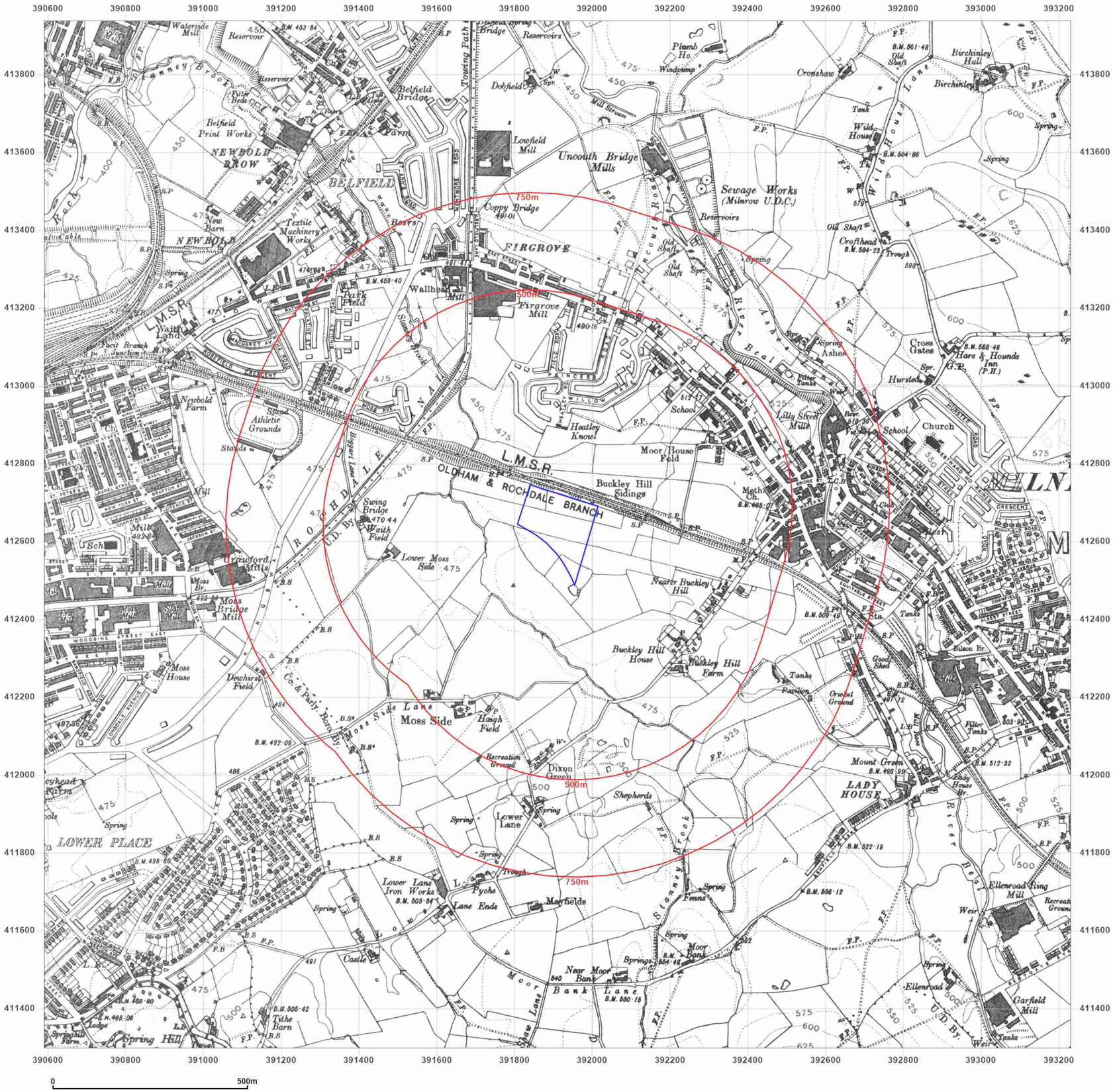
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** County Series

**Map date:** **1938**

**Scale:** 1:10,560

**Printed at:** 1:10,560

N
W E
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Surveyed 1848
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

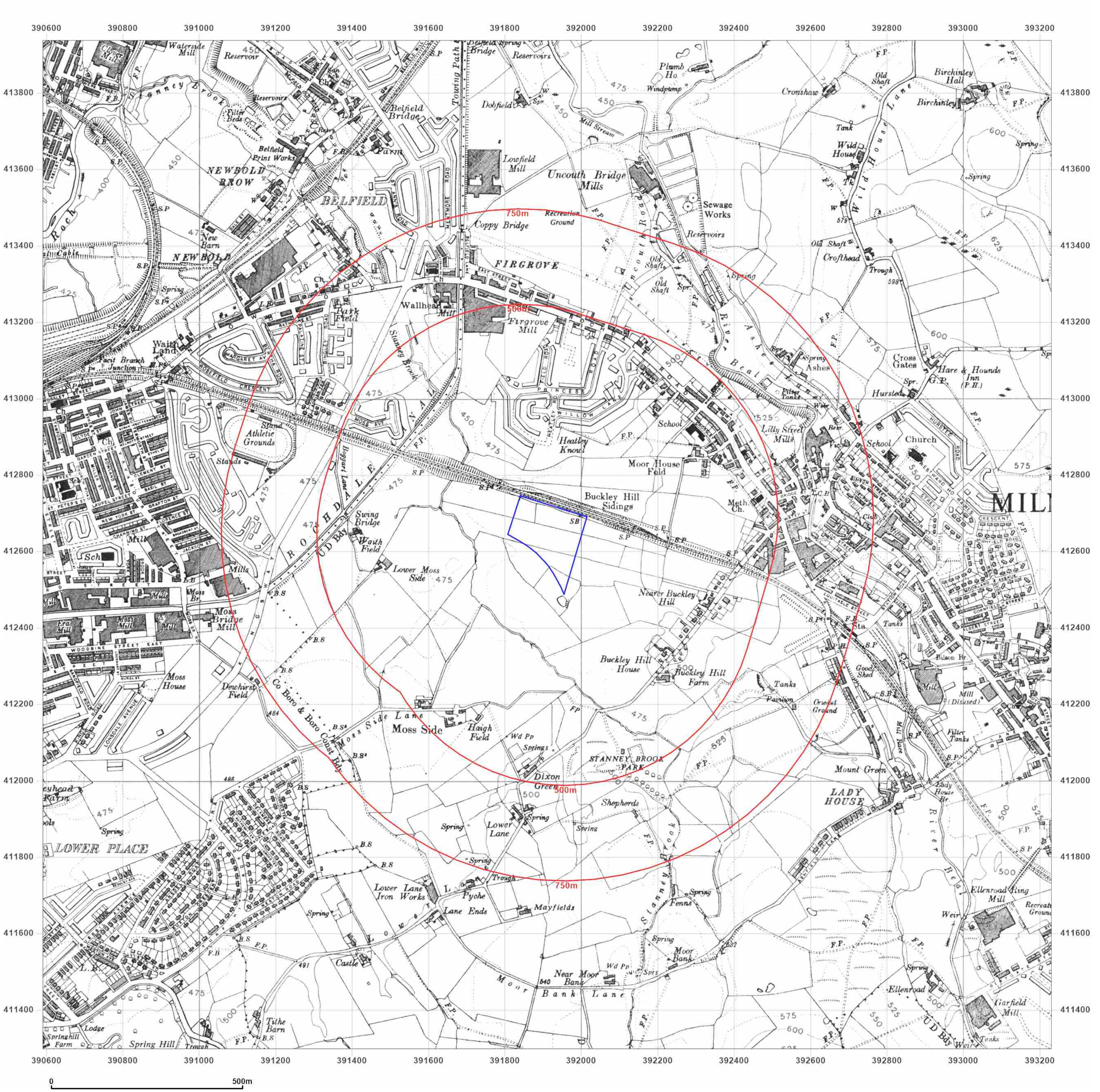
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** Provisional

**Map date:** **1954**

**Scale:** 1:10,560

**Printed at:** 1:10,560

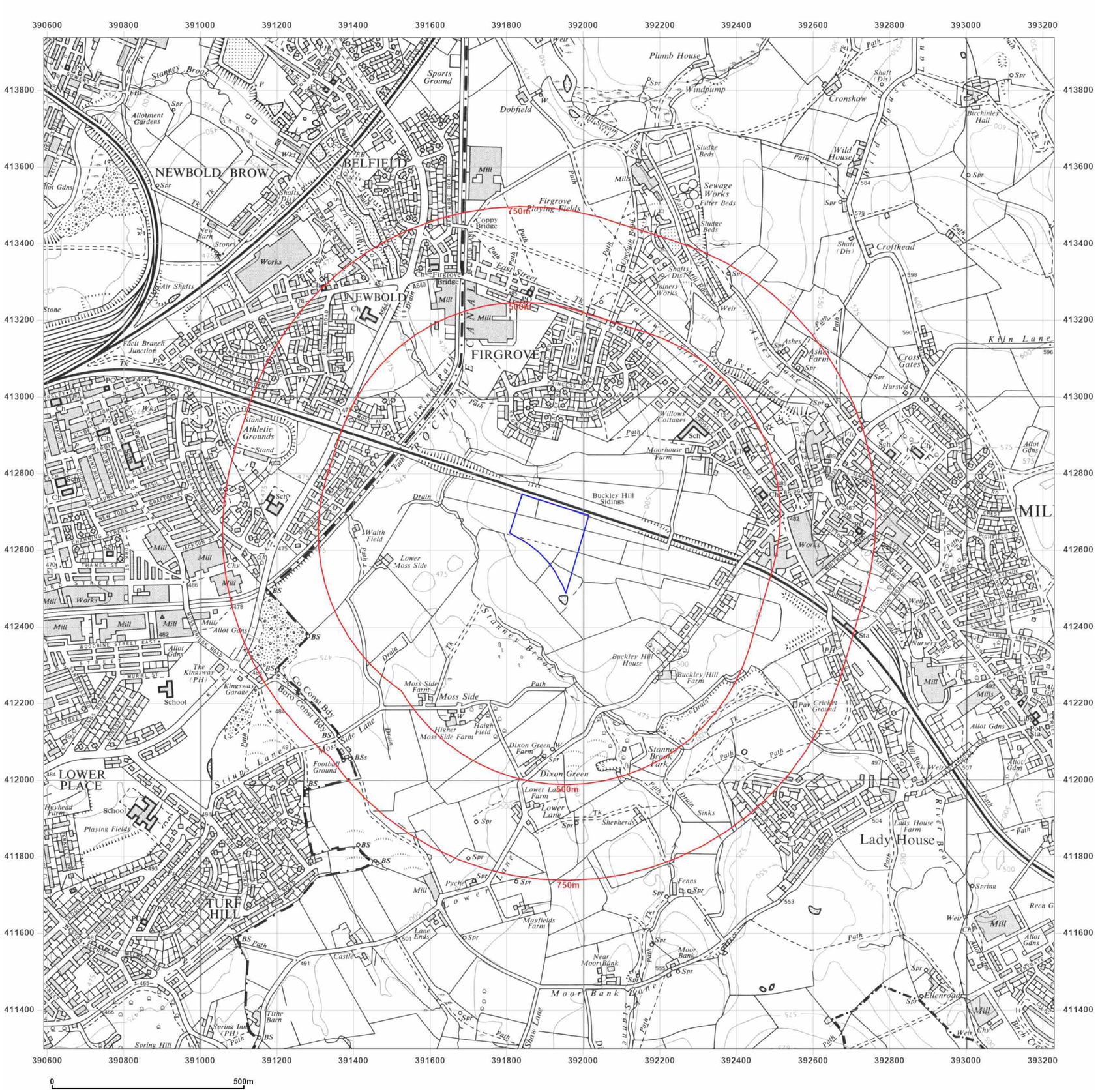
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** Provisional

**Map date:** **1967**

**Scale:** 1:10,560

**Printed at:** 1:10,560

N
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Surveyed 1967
Revised 1967
Edition N/A
Copyright N/A
Levelled N/A

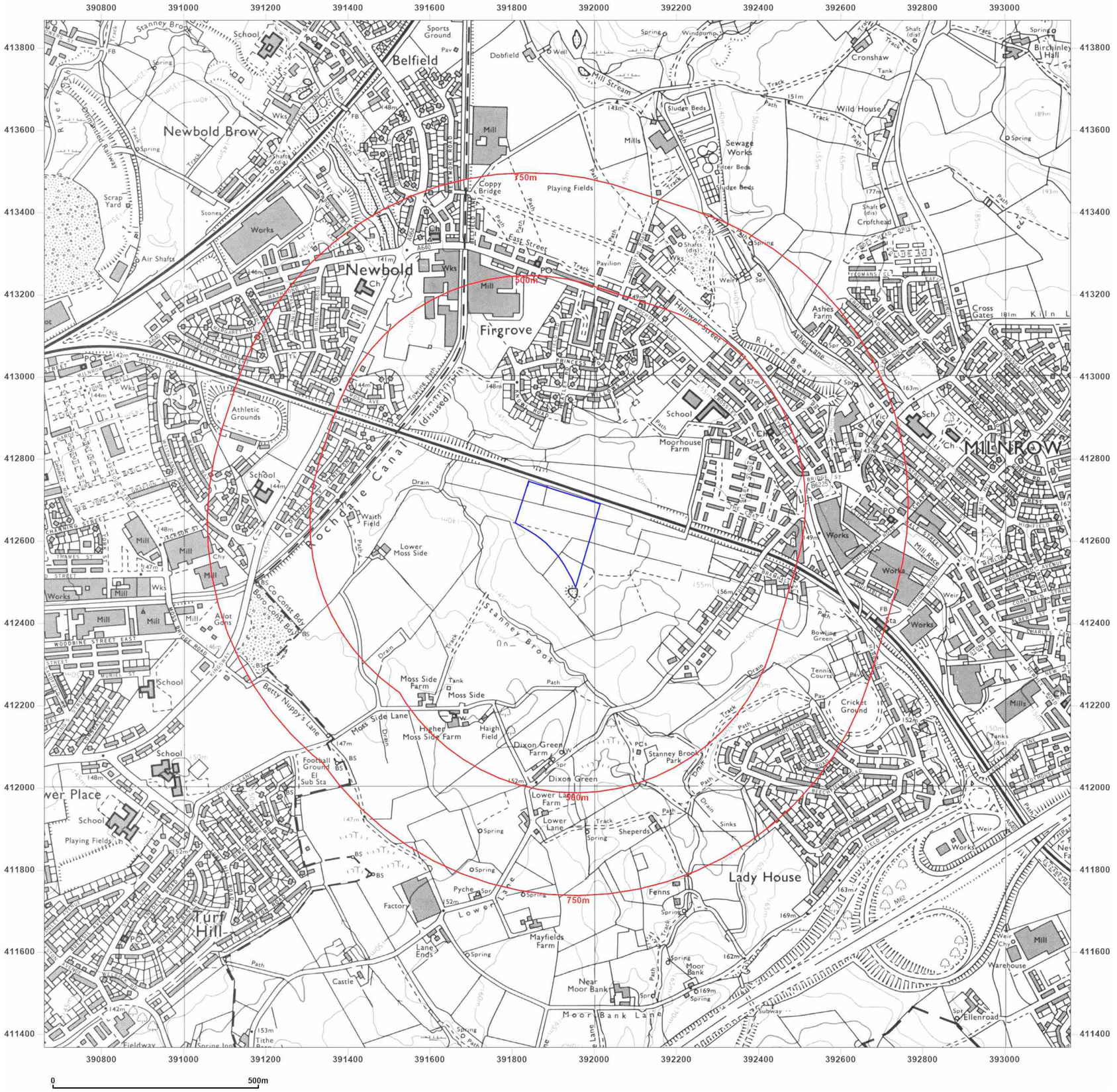
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid

**Map date:** **1976**

**Scale:** 1:10,000

**Printed at:** 1:10,000

N
W E
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Surveyed 1976
Revised 1976
Edition N/A
Copyright N/A
Levelled N/A

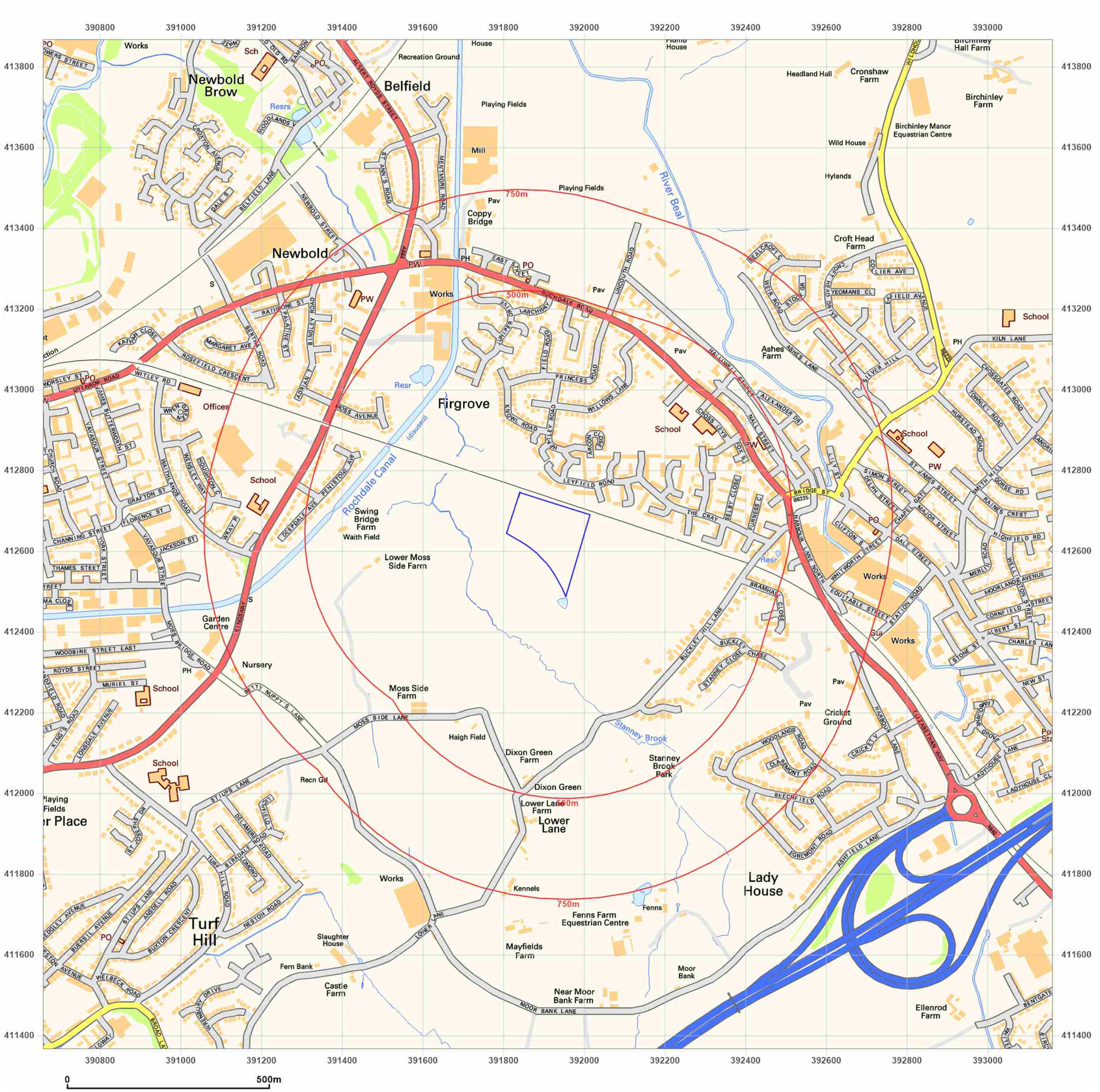
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid

**Map date:** **2001**

**Scale:** 1:10,000

**Printed at:** 1:10,000

N W E S

2001

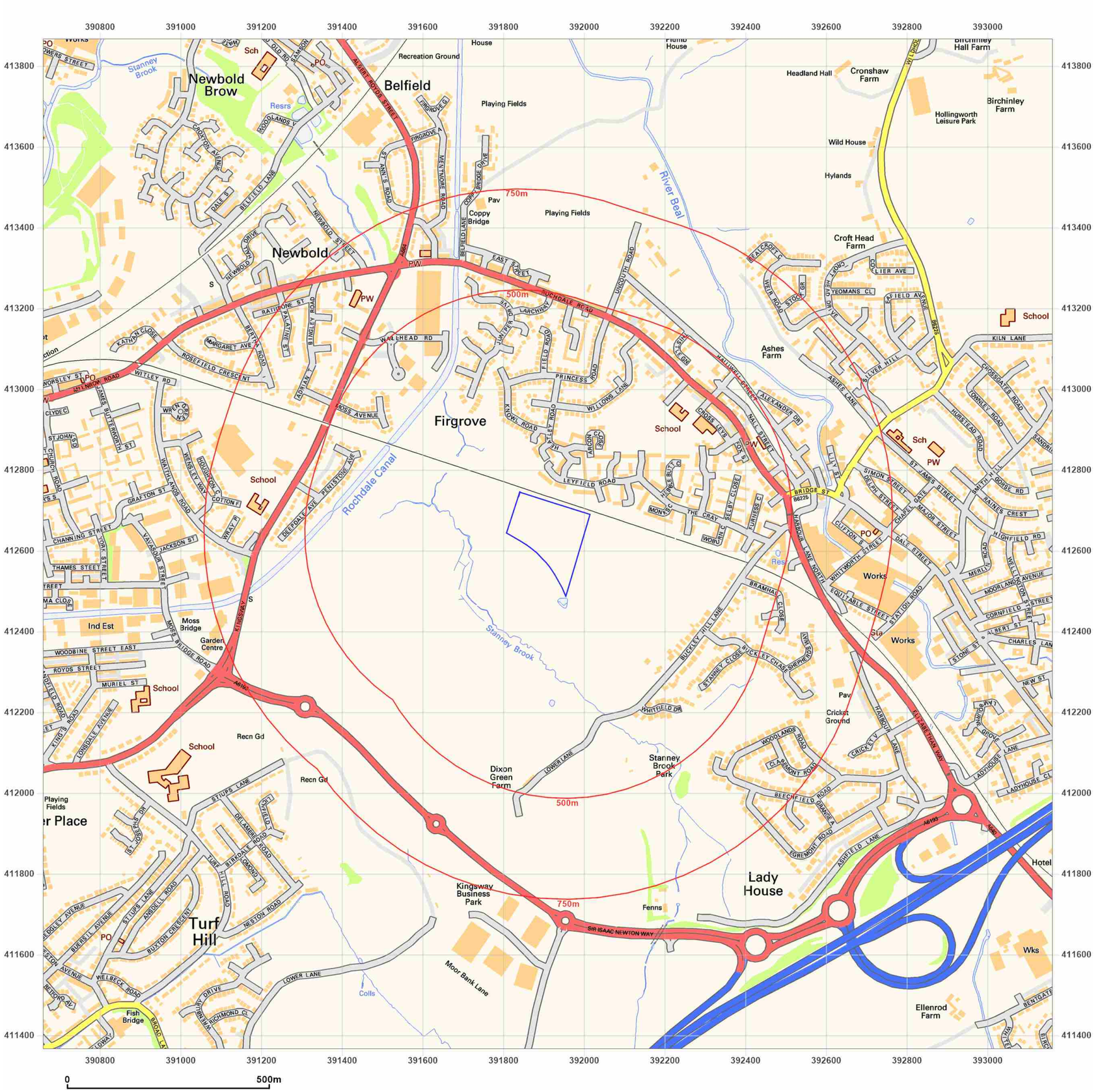
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid

**Map date:** **2010**

**Scale:** 1:10,000

**Printed at:** 1:10,000

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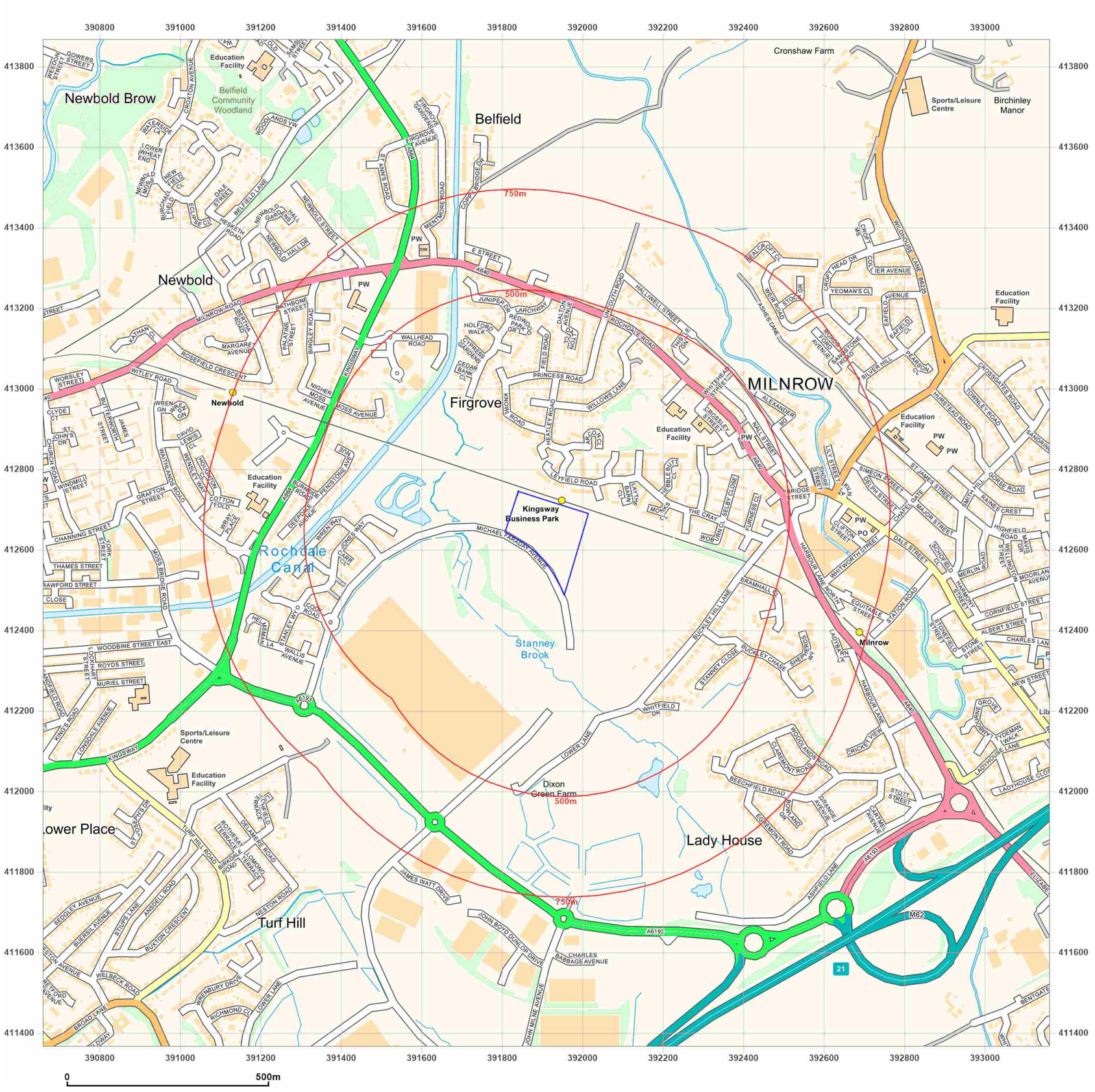
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**Site Details:**

PLOT P, KINGSWAY BUSINESS PARK, MICHAEL FARADAY AVENUE, ROCHDALE, OL16 4FW

**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid
**Map date:** **2022**
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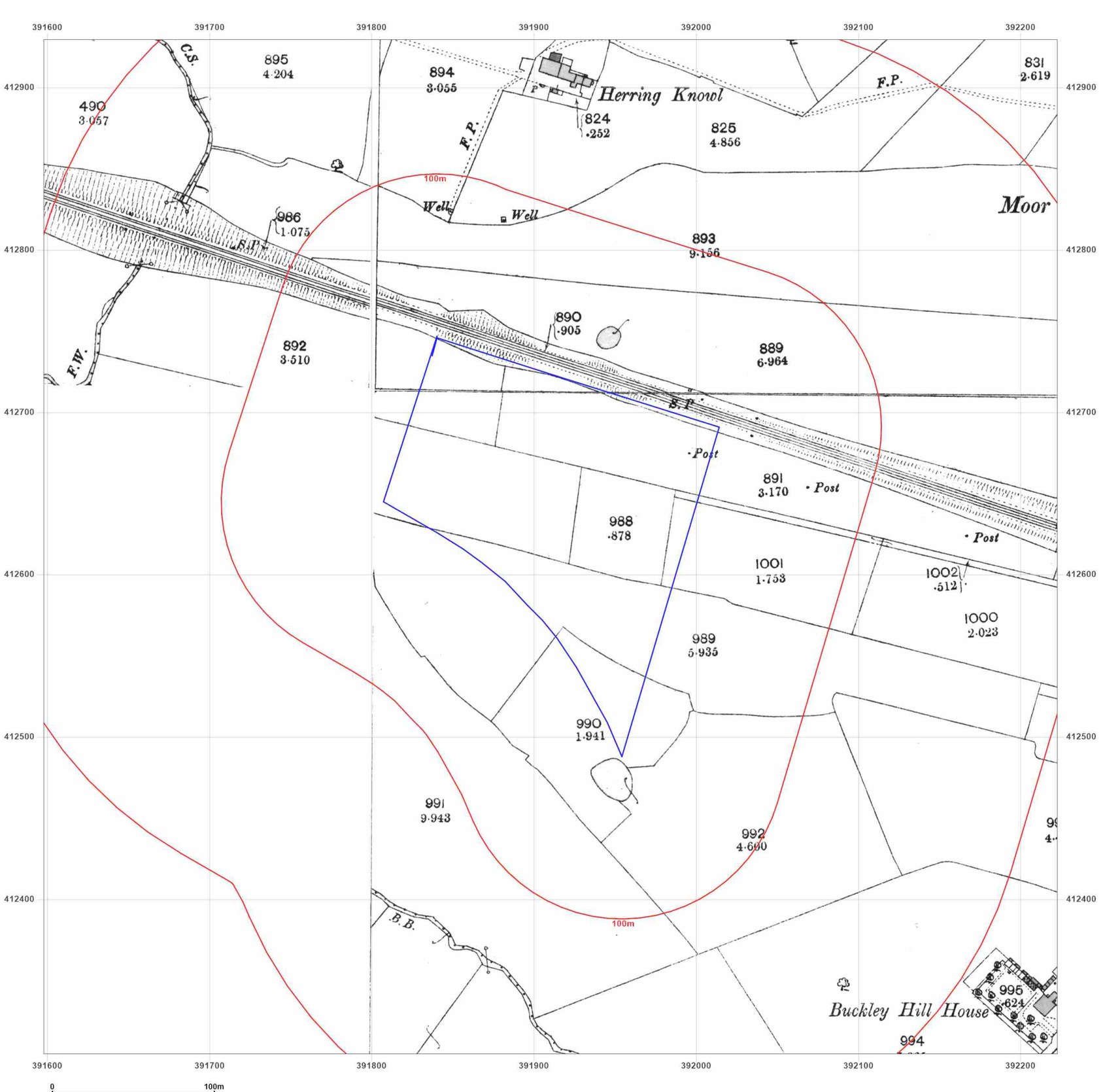
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**Site Details:**

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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** County Series

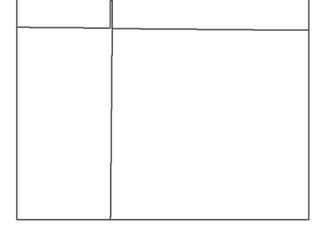
**Map date:** **1891**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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Surveyed 1891
Revised 1891
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1891
Revised 1891
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1891
Revised 1891
Edition N/A
Copyright N/A
Levelled N/A

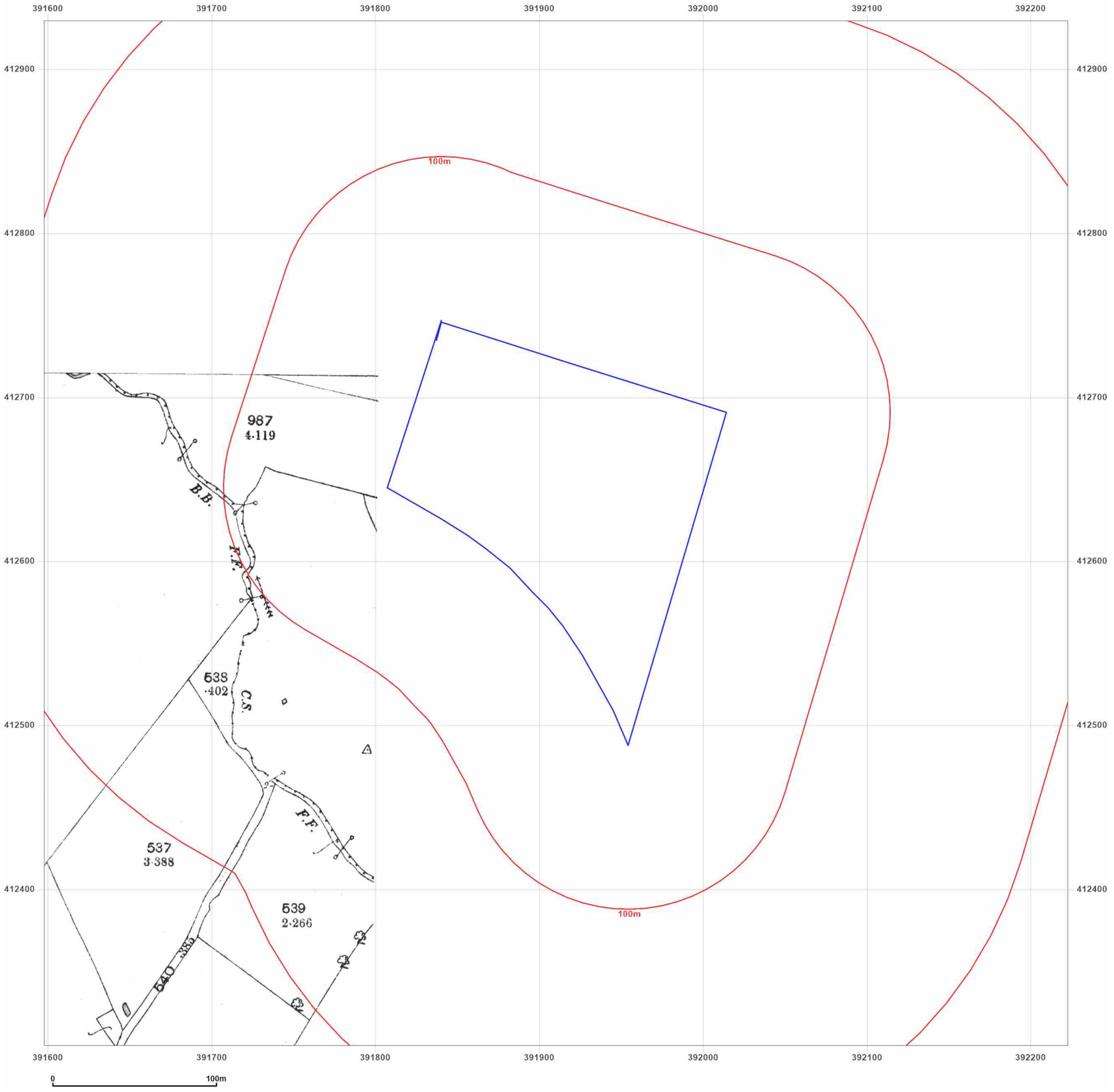
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**Site Details:**

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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** County Series

**Map date:** **1891**

**Scale:** 1:2,500

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Surveyed 1891
Revised 1891
Edition N/A
Copyright N/A
Levelled N/A

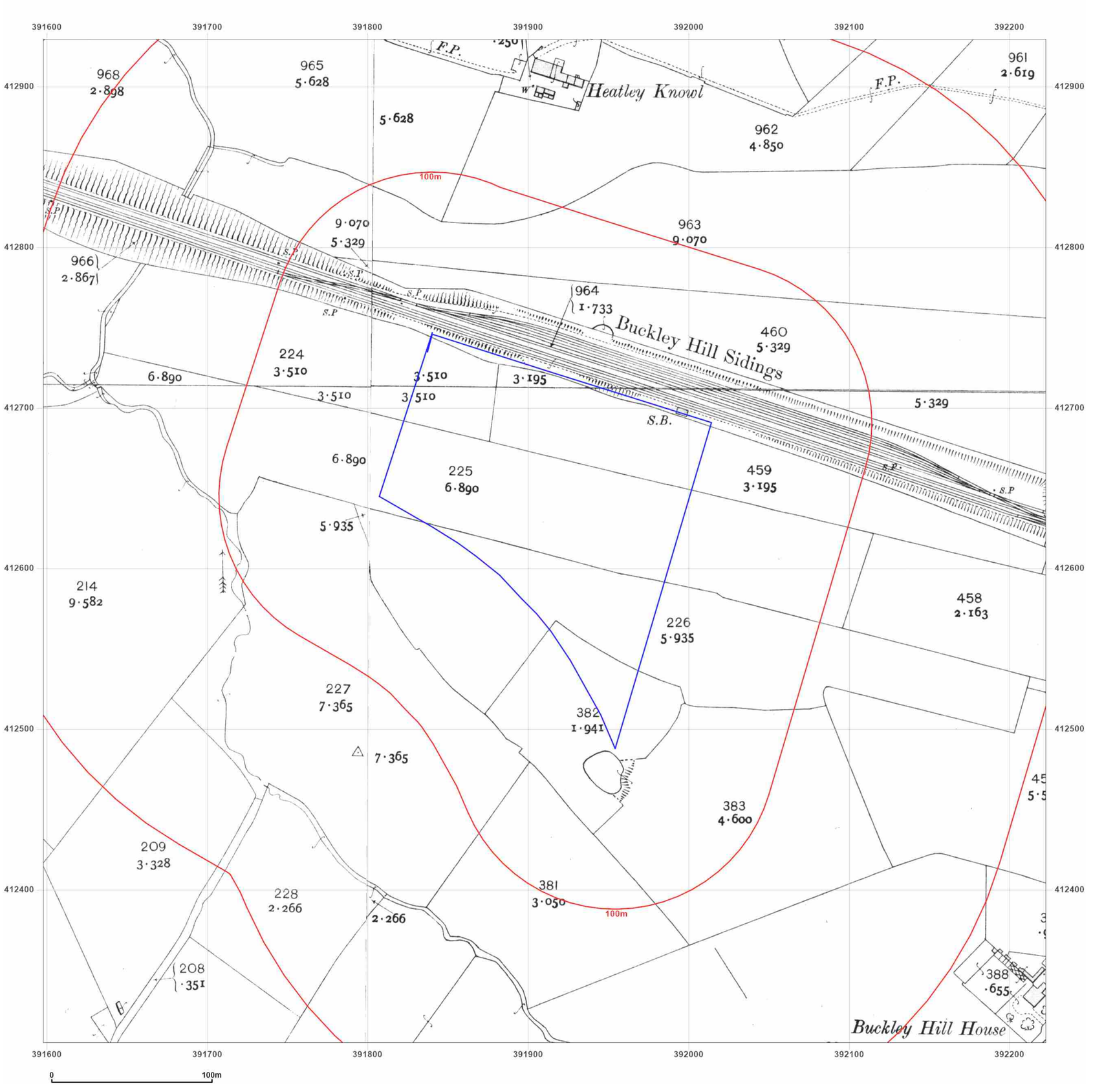
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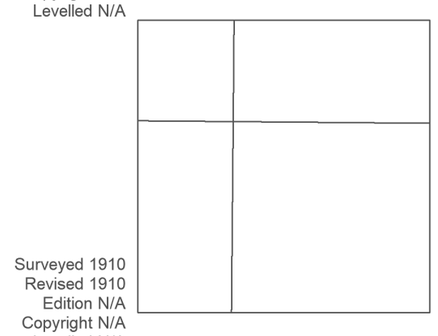
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**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** County Series
**Map date:** **1910**
**Scale:** 1:2,500
**Printed at:** 1:2,500

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Surveyed 1910
Revised 1910
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1910
Revised 1910
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1910
Revised 1910
Edition N/A
Copyright N/A
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Surveyed 1910
Revised 1910
Edition N/A
Copyright N/A
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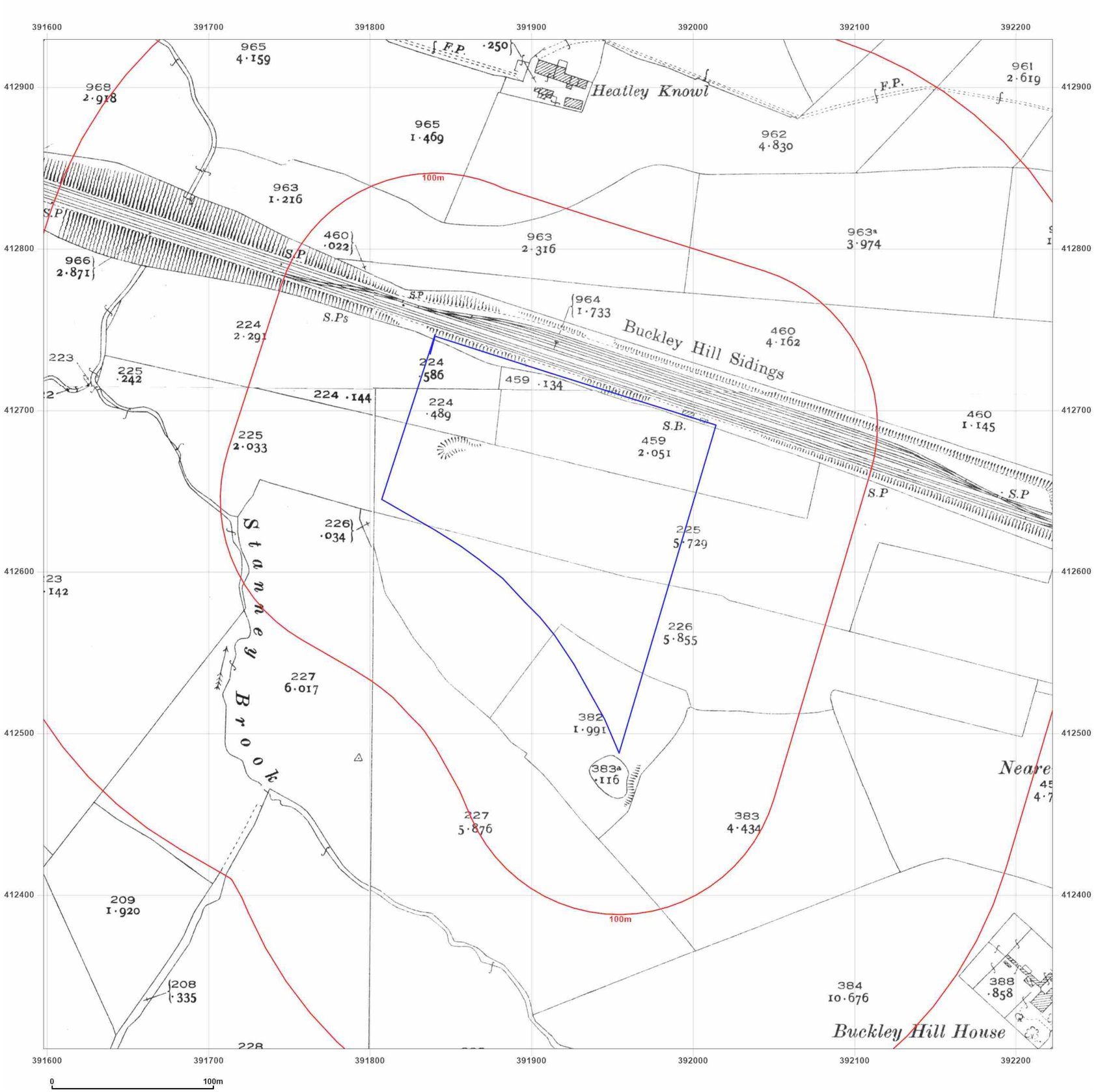
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** County Series

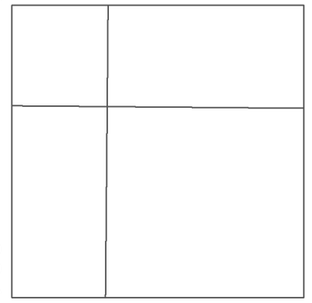
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**Scale:** 1:2,500

**Printed at:** 1:2,500

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Surveyed 1930
Revised 1930
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1930
Revised 1930
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1930
Revised 1930
Edition N/A
Copyright N/A
Levelled N/A

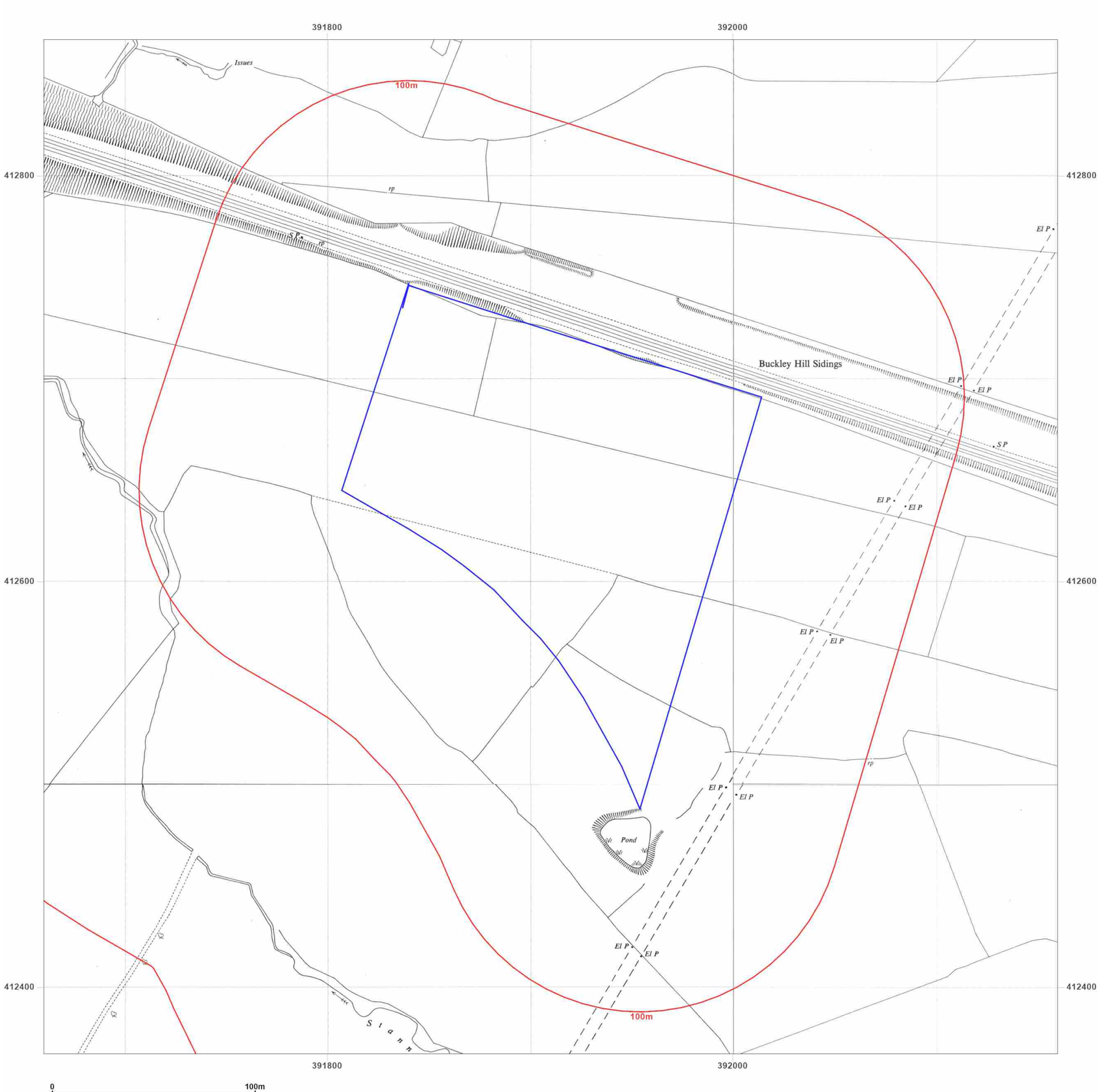
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**Site Details:**

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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid
**Map date:** **1955**
**Scale:** 1:1,250
**Printed at:** 1:2,000

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| ~~Surveyed 1955~~<br>Revised 1955<br>Edition N/A<br>Copyright N/A<br>Levelled 1928 | Surveyed 1955<br>Revised 1955<br>Edition N/A<br>Copyright N/A<br>Levelled 1928 |
| Surveyed 1955<br>Revised 1955<br>Edition N/A<br>Copyright N/A<br>Levelled 1928 | Surveyed 1955<br>Revised 1955<br>Edition N/A<br>Copyright N/A<br>Levelled 1928 |

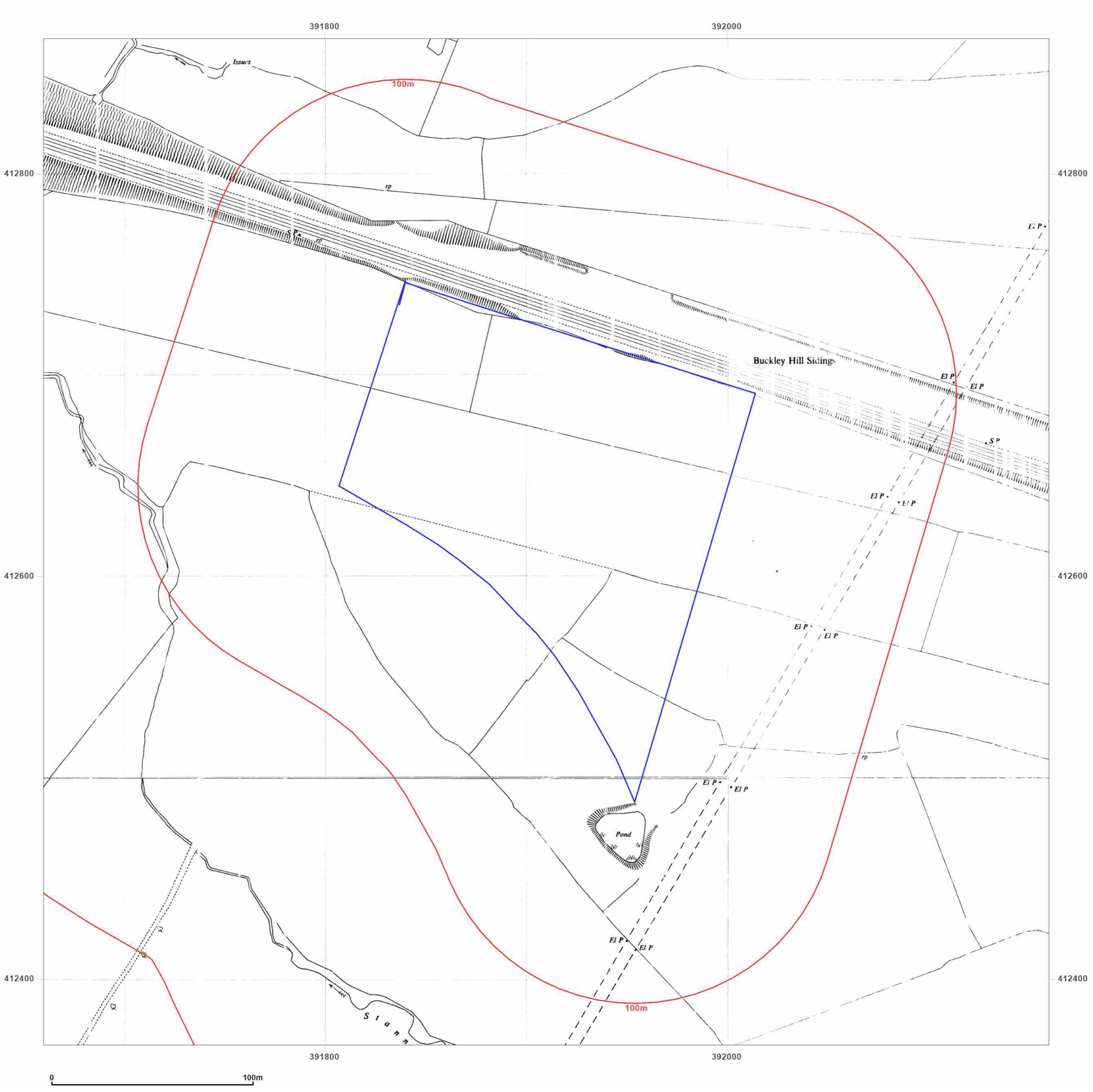
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**Site Details:**

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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid
**Map date:** **1956**
**Scale:** 1:1,250
**Printed at:** 1:2,000

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|---|---|
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| Surveyed 1955<br>Revised N/A<br>Edition N/A<br>Copyright 1956<br>Levelled 1928 | Surveyed 1955<br>Revised N/A<br>Edition N/A<br>Copyright 1956<br>Levelled 1928 |

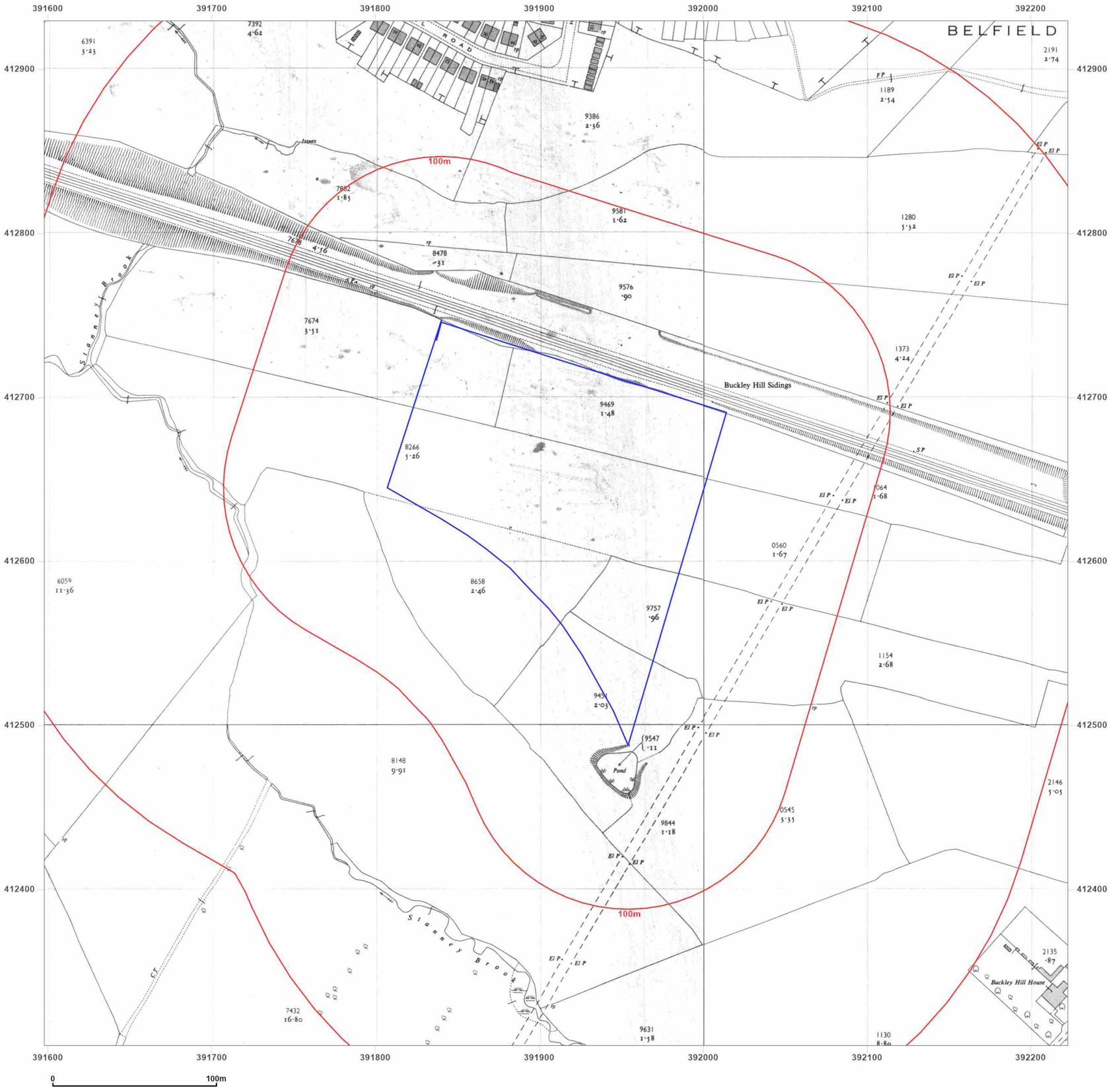
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid

**Map date:** **1956**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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| Surveyed 1955 | Surveyed 1955 |
|---|---|
| Revised 1955 | Revised 1955 |
| Edition 1956 | Edition 1956 |
| Copyright N/A | Copyright N/A |
| Levelled 1928 | Levelled 1928 |

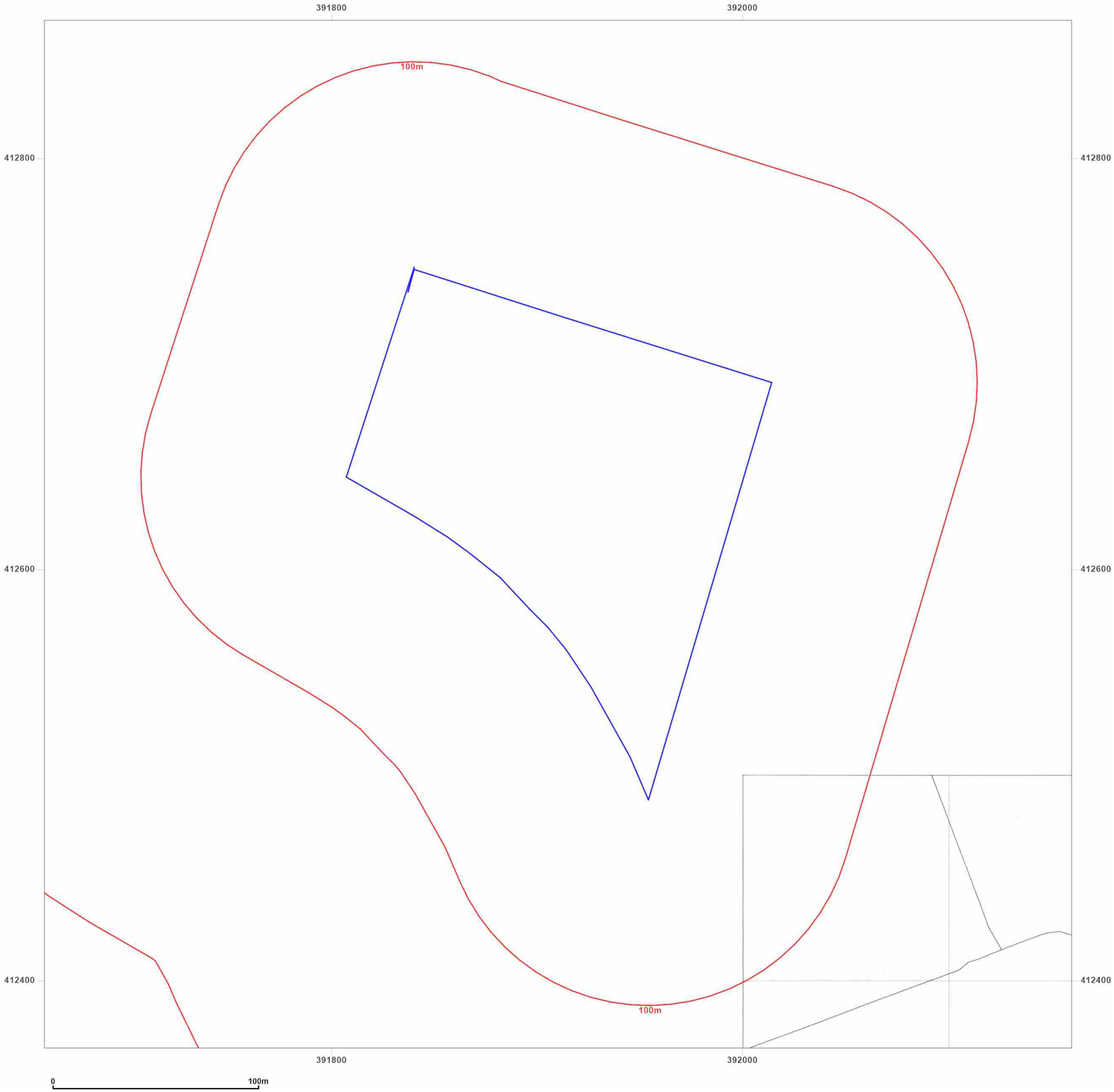
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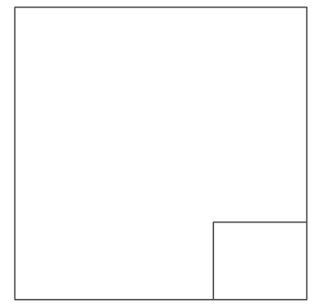
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid
**Map date:** **1967**
**Scale:** 1:1,250
**Printed at:** 1:2,000

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Surveyed 1966
Revised 1966
Edition N/A
Copyright 1967
Levelled 1956

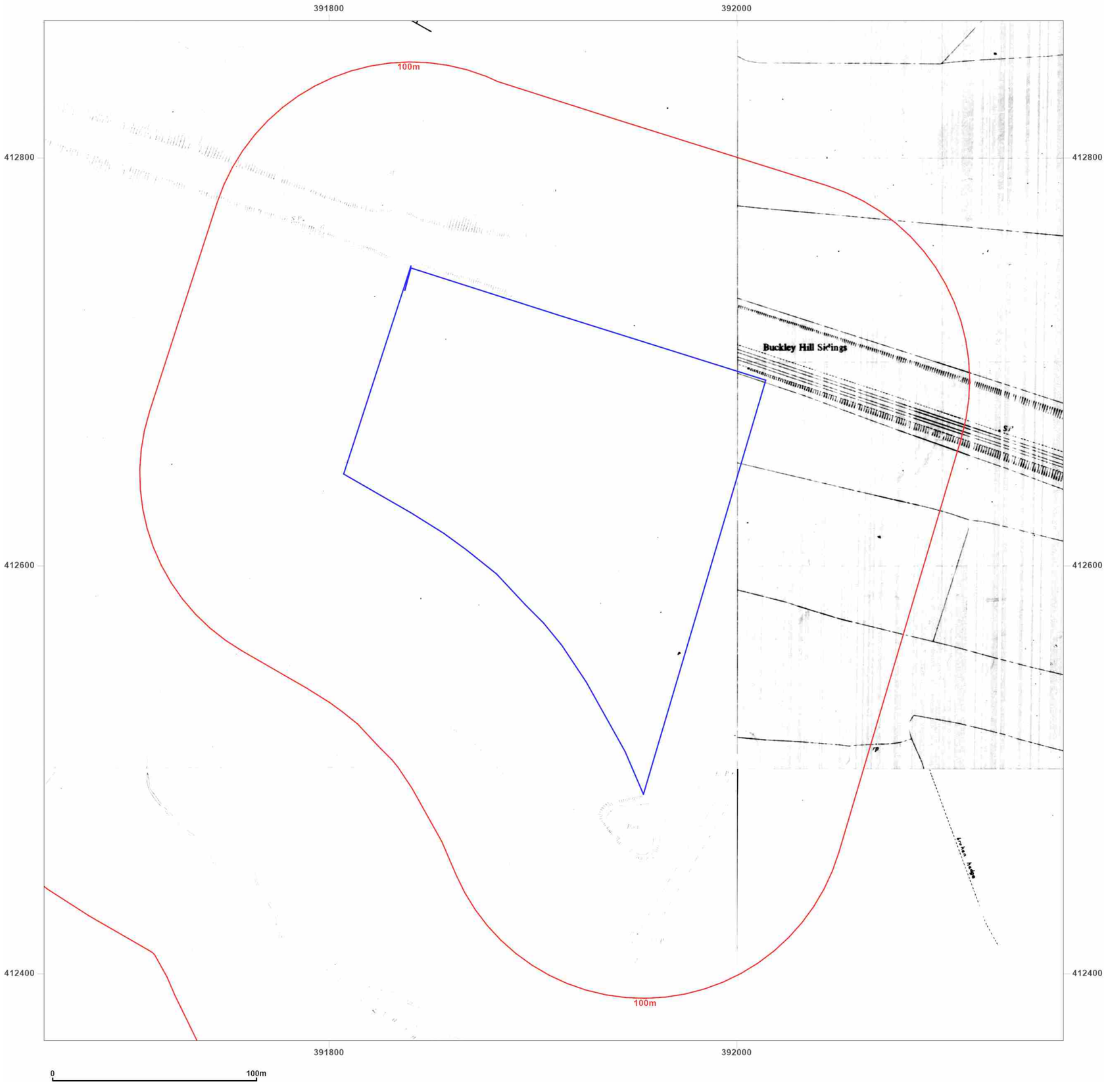
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**Site Details:**

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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid
**Map date:** **1973-1976**
**Scale:** 1:1,250
**Printed at:** 1:2,000

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| Surveyed N/A<br>Revised N/A<br>Edition N/A<br>Copyright 1975<br>Levelled N/A | Surveyed N/A<br>Revised N/A<br>Edition N/A<br>Copyright N/A<br>Levelled N/A |

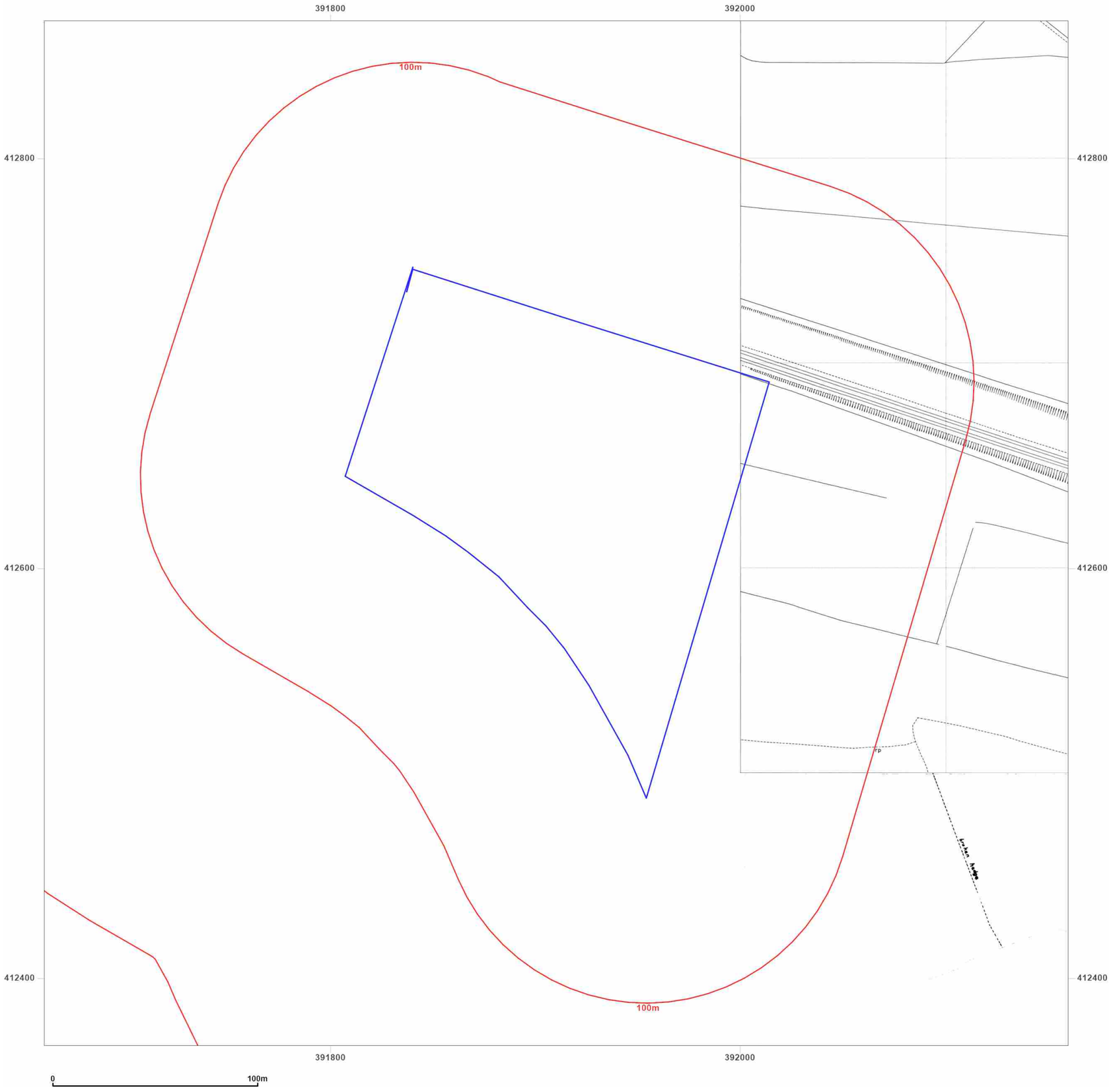
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid

**Map date:** **1975-1976**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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Surveyed 1955
Revised 1974
Edition N/A
Copyright 1975
Levelled 1962

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1975
Levelled N/A

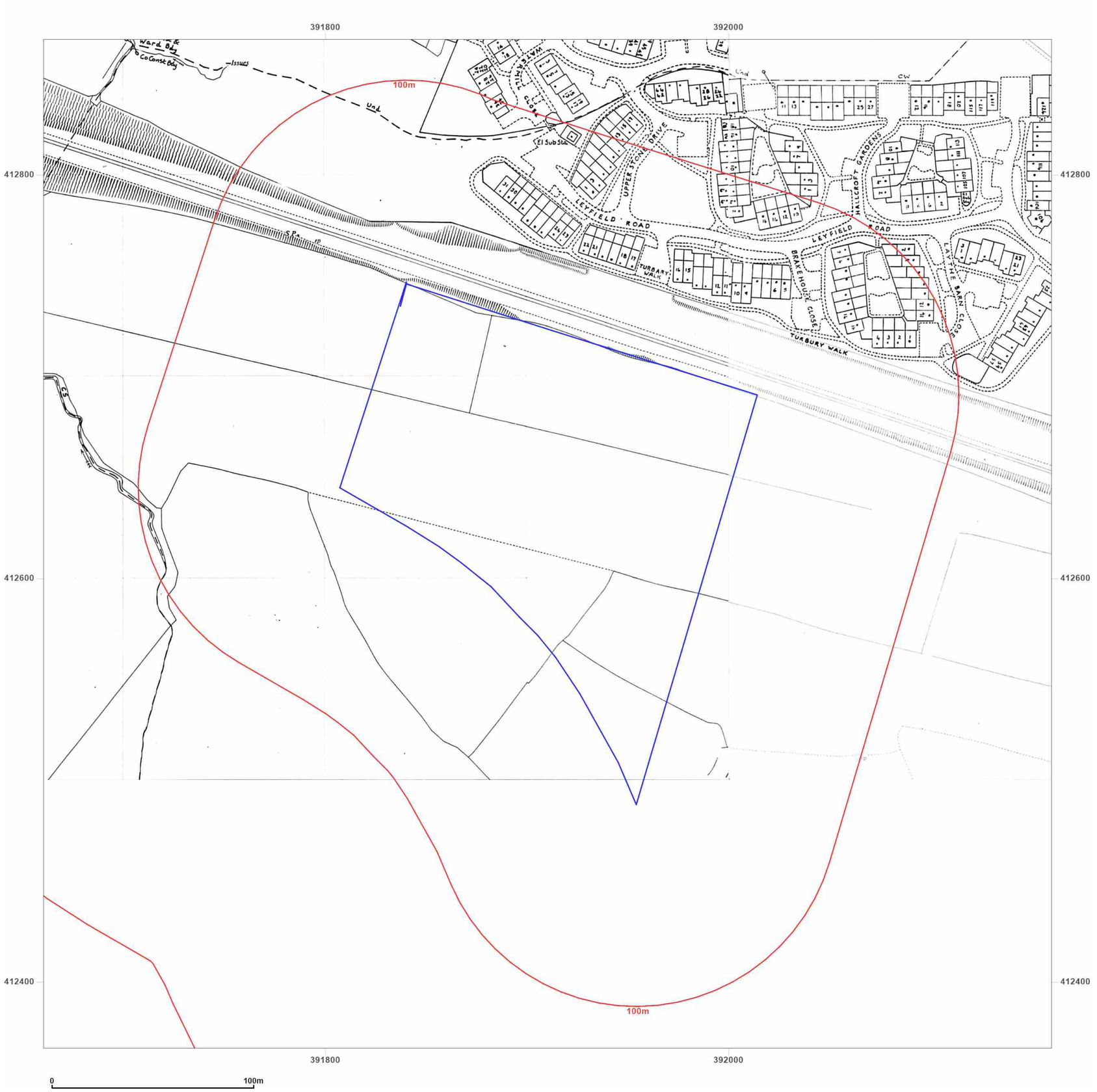
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**Site Details:**

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**Client Ref:** 210939_PO_1762
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**Grid Ref:** 391910, 412617

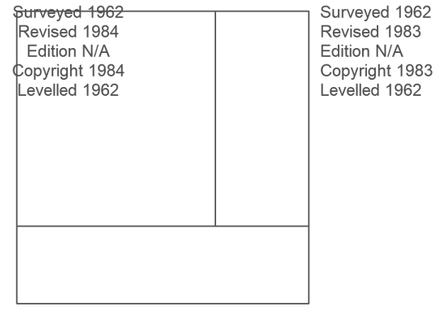
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**Map date:** **1983-1984**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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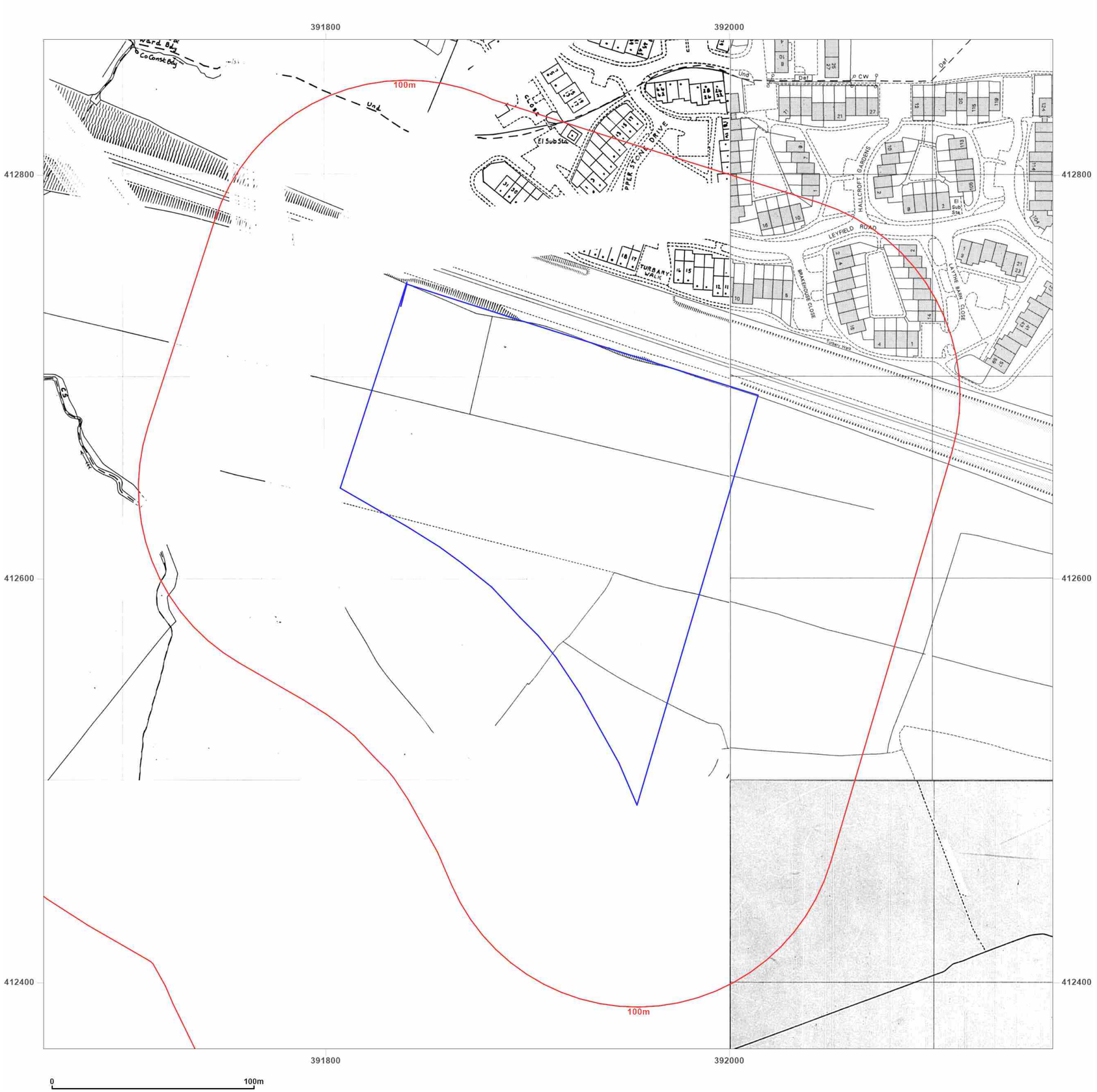

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**Site Details:**

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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid

**Map date:** **1984-1989**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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| | Surveyed 1956<br>Revised 1984<br>Edition N/A<br>Copyright 1984<br>Levelled 1956 |

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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid

**Map date:** **1992**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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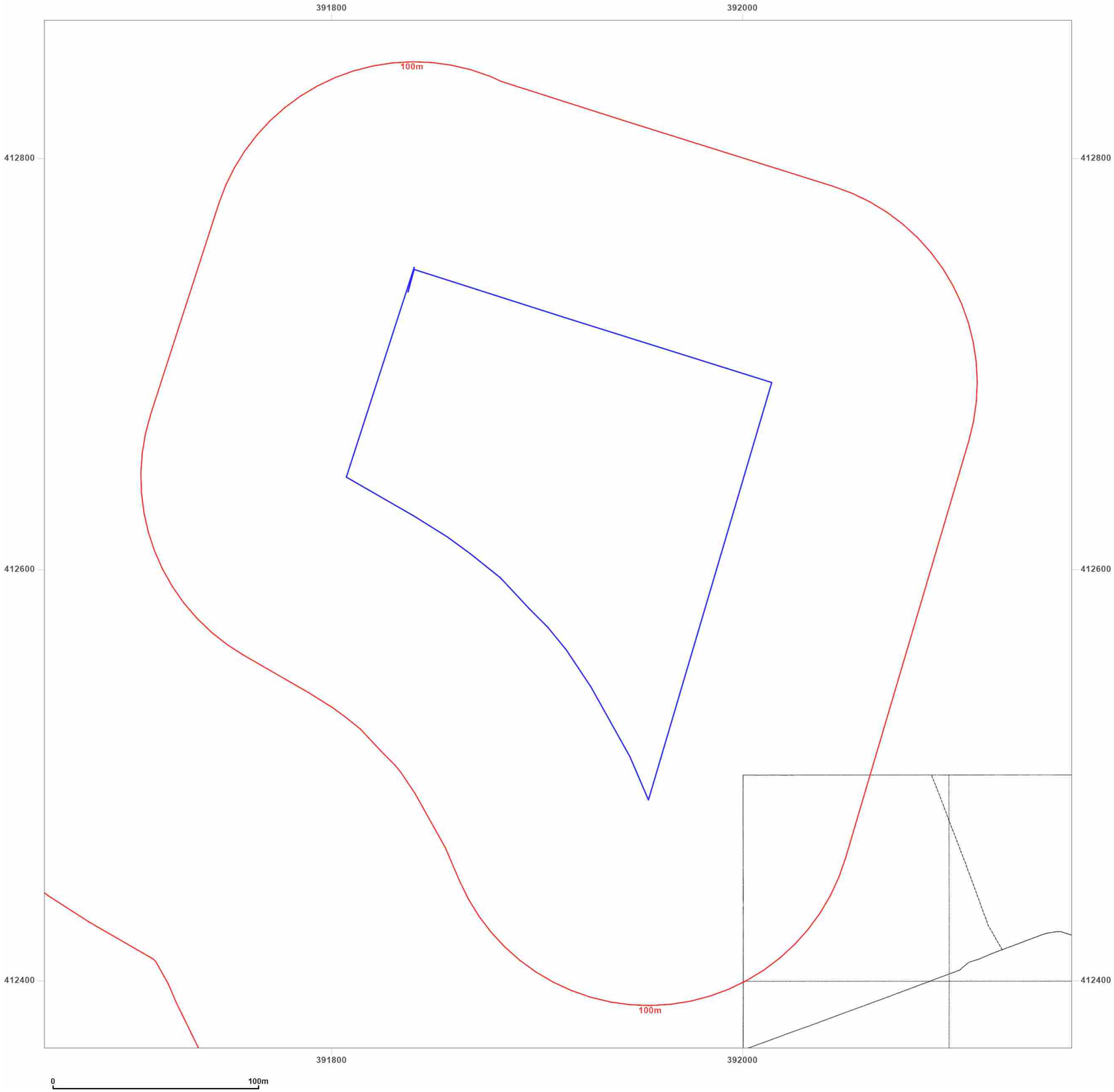
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**Site Details:**

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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

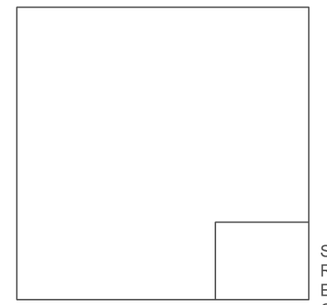
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**Map date:** **1994**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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Surveyed 1994
Revised 1994
Edition N/A
Copyright N/A
Levelled N/A

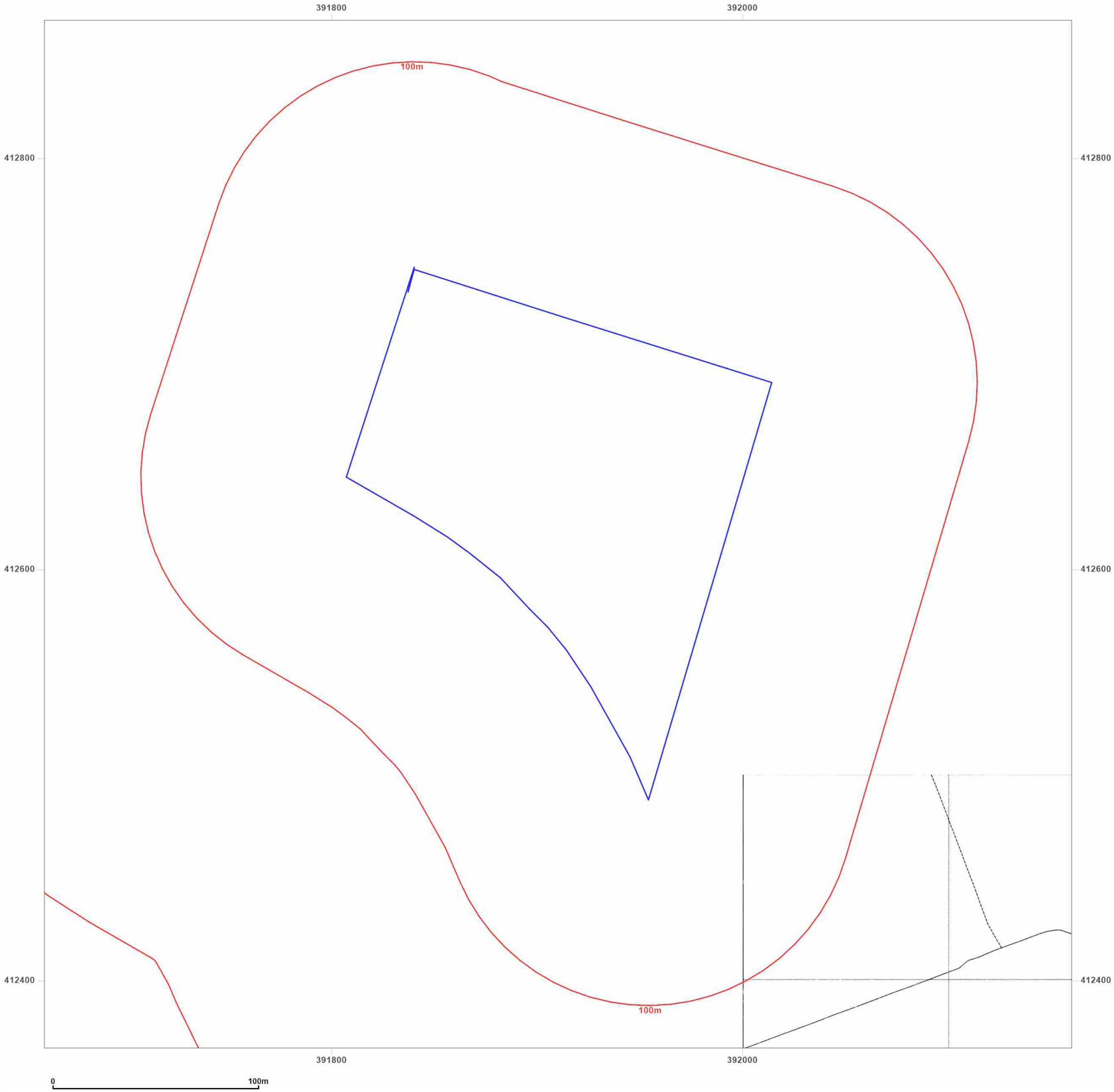
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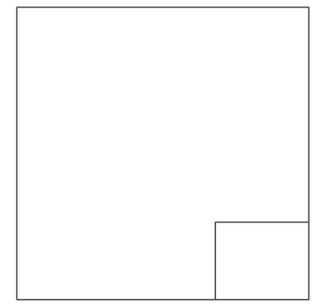
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PLOT P, KINGSWAY BUSINESS PARK, MICHAEL FARADAY AVENUE, ROCHDALE, OL16 4FW

**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid
**Map date:** **1994**
**Scale:** 1:1,250
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Surveyed 1994
Revised N/A
Edition N/A
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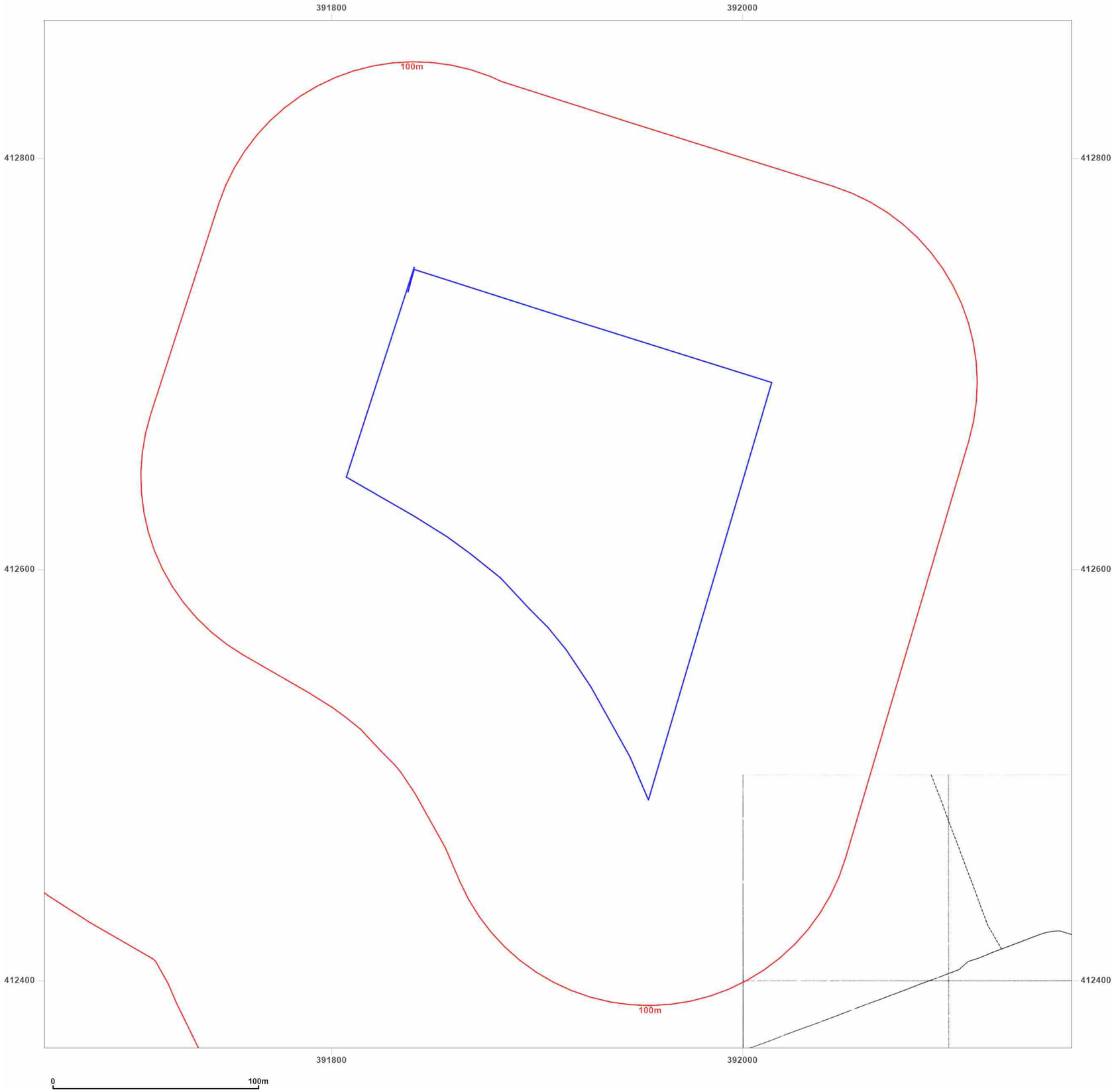
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**Site Details:**

PLOT P, KINGSWAY BUSINESS PARK, MICHAEL FARADAY AVENUE, ROCHDALE, OL16 4FW

**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

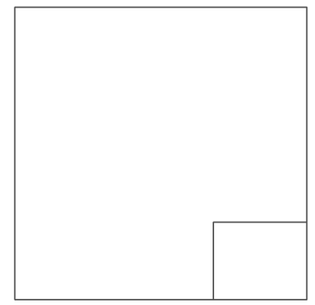
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**Map date:** **1995**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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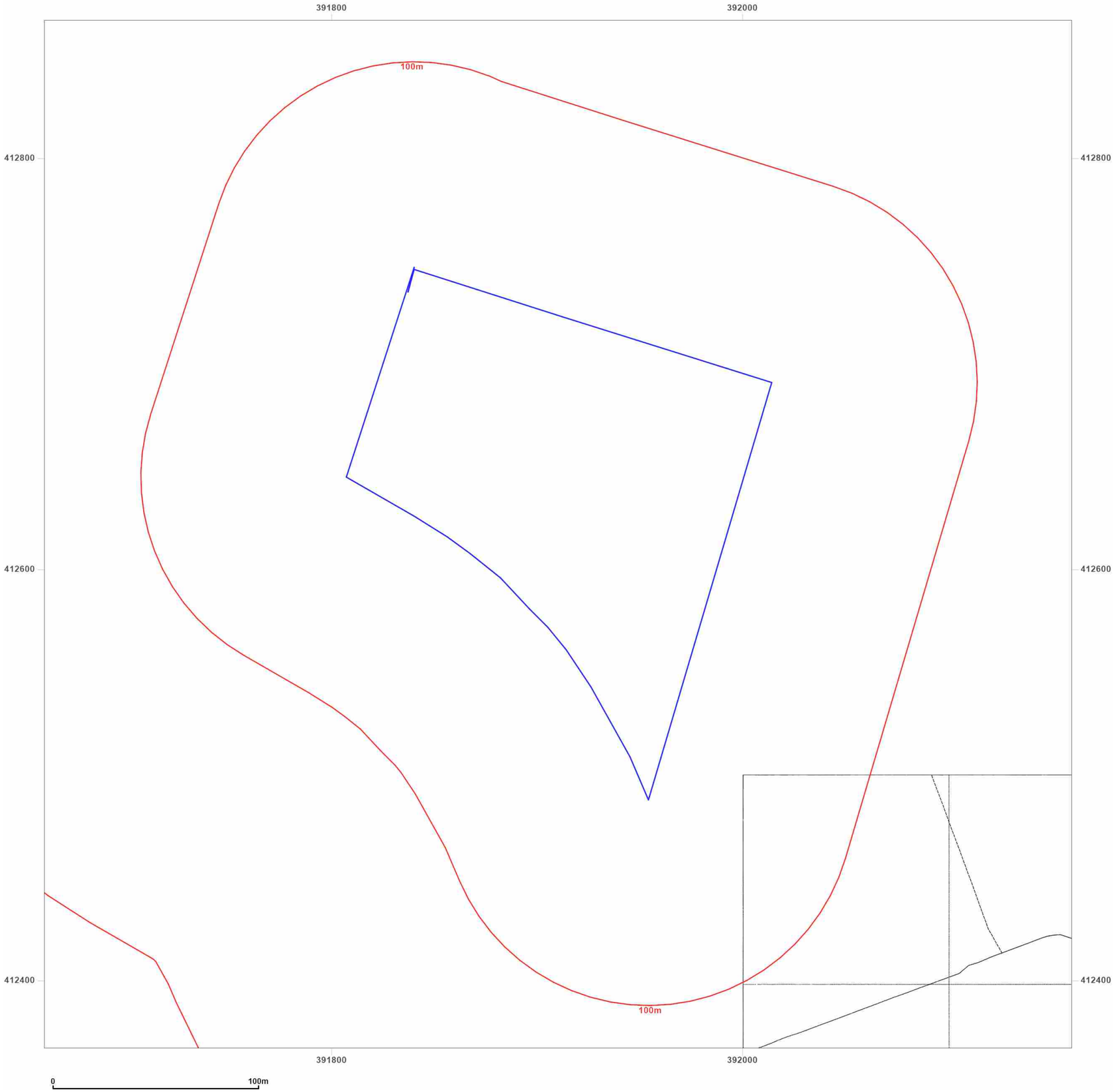
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PLOT P, KINGSWAY BUSINESS PARK, MICHAEL FARADAY AVENUE, ROCHDALE, OL16 4FW

**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

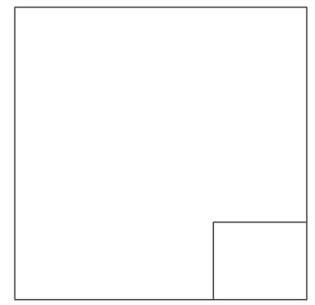
**Map Name:** National Grid

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**Scale:** 1:1,250

**Printed at:** 1:2,000

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Surveyed 1995
Revised 1995
Edition N/A
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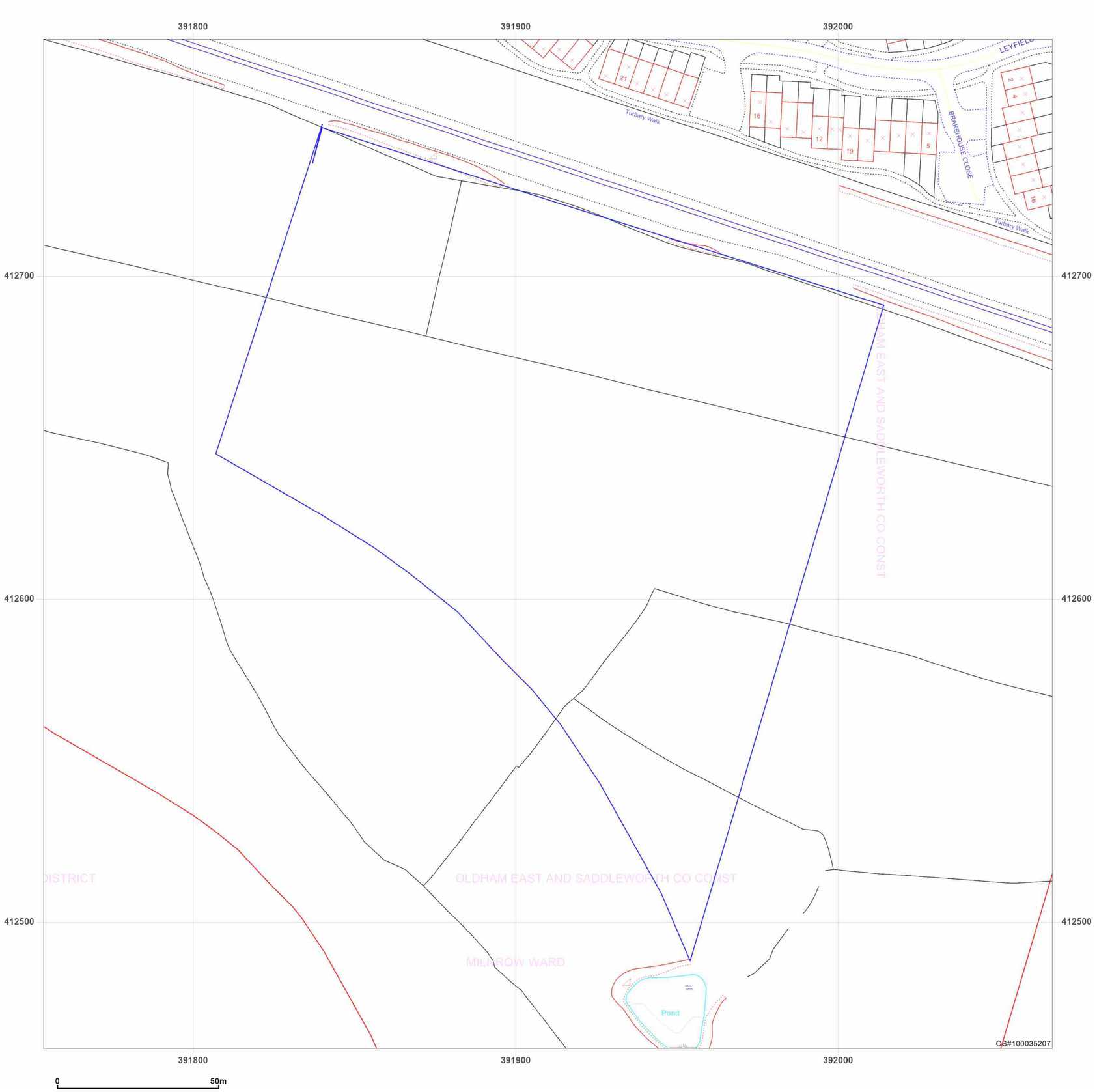
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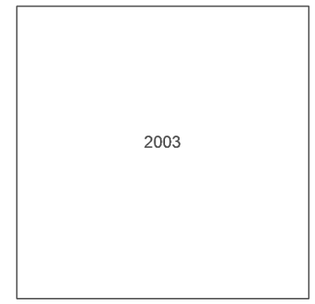
**Site Details:**

PLOT P, KINGSWAY BUSINESS PARK, MICHAEL FARADAY AVENUE, ROCHDALE, OL16 4FW

**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** LandLine
**Map date:** **2003**
**Scale:** 1:1,250
**Printed at:** 1:1,250

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# Appendix 5: Rochdale Council Correspondence

## Oliver Stewart

**From:** Michael Moore P <Michael.Moore@rochdale.gov.uk>
**Sent:** 21 June 2022 09:57
**To:** Oliver Stewart; Contaminated Land
**Subject:** RE: Possible Landfill - Kingsway Business Park

**This email originated from outside of our organisation. Please exercise caution with content, links and attachments.**

Good morning Oliver,

According to our records there is no landfill outlined in red below.

Regards

**Michael Moore P**
Environmental Health Senior Officer (Environment Prot)
Place

ROCHDALE BOROUGH COUNCIL

01706 924107
07976 059366
michael.moore@rochdale.gov.uk

Rochdale Borough Council
Floor 3, Number One Riverside
Smith Street, Rochdale, OL16 1XU

To access our services go to www.rochdale.gov.uk
For news, events and social media updates go to www.rochdale.gov.uk/newsandevents

Please consider the environment before printing this email.

**From:** Oliver Stewart <Oliver.Stewart@bwbconsulting.com>
**Sent:** 13 June 2022 12:28
**To:** Contaminated Land <Contaminated.Land@Rochdale.Gov.UK>
**Subject:** Possible Landfill - Kingsway Business Park

:CAUTION: This email originated from outside of the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

To Contaminated Land team,

I'm writing to enquire into an area of land situated just south of Kingsway Business Park tram station, postcode OL16 4JN.
There seems to be a discrepancy between data provided to us from a third party source and information gained through separate historical mapping and council records.
The third party data is showing a landfill recorded on site, sourcing local authority records, whereas the public council records and historical mapping are vacant of any development on this area of land entirely minus agriculture.
I have attached the relevant image provided, listing the dashed zone as Buckley Hill Lane.




Please let us know of any charges this may incur.

Thank you for any assistance,

**Oliver Stewart** BSc (Hons) MSc
Graduate Geoenvironmental Consultant | BWB Consulting Limited

Whitehall Waterfront, 2 Riverside Way, Leeds LS1 4EH
**M** 07469 295004 **T** 0113 233 8000 **W** www.bwbconsulting.com

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**Registered Office:** 5th Floor, Waterfront House, Station Street, Nottingham, NG2 3DQ
**Company No.** 5265863
**VAT Reg No.** 648 1142 45

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Rochdale Borough Council undertakes monitoring of both incoming and outgoing e-mails. You should therefore be aware that if you send an e-mail to a person within Rochdale Borough Council it may be subject to any monitoring deemed necessary by Rochdale Borough Council from time to time. Rochdale Borough Council cannot guarantee that this message or any attachment is virus free or has not been intercepted and amended.

As a public body, Rochdale Borough Council may be required to disclose this email (or any response to it) under the Freedom of Information Act 2000, unless the information in it is covered by one of the exemptions within the Act.

## Appendix 6: Coal Mining Report

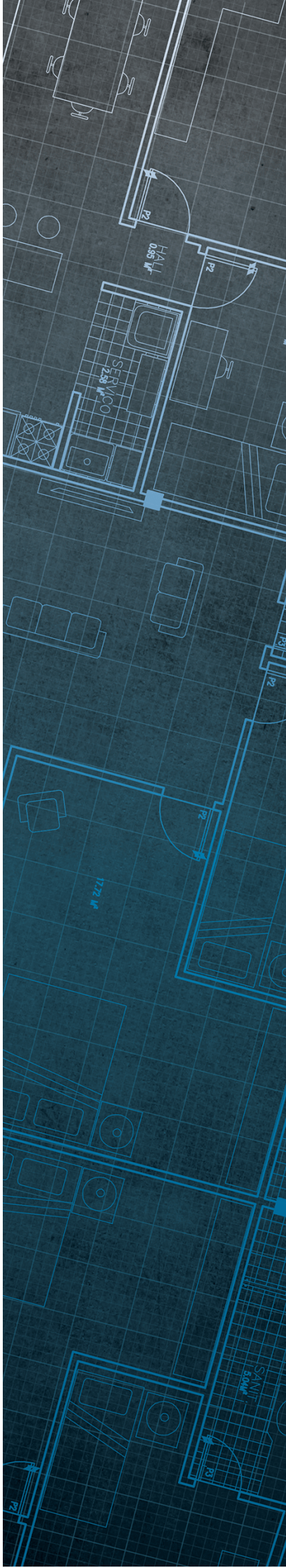
The Coal Authority

# Consultants

## Coal Mining Report

Plot P, Kingsway Business Park,
Michael Faraday Avenue, Rochdale,
Ol16 4fw
Greater Manchester

| | |
|---|---|
| Date of enquiry: | **7 June 2022** |
| Date enquiry received: | **7 June 2022** |
| Issue date: | **7 June 2022** |
| Our reference: | **51003165344001** |
| Your reference: | **HMD-214-8800197** |



# Consultants

# Coal Mining Report

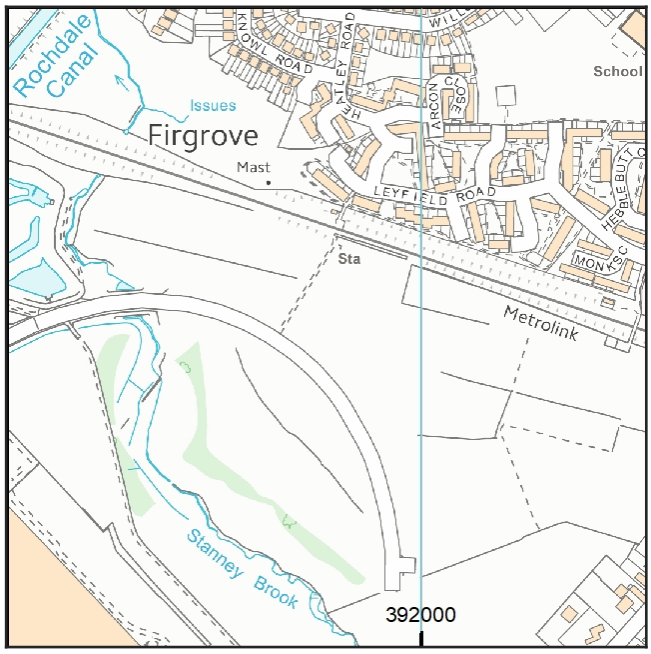
This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

**Client name**

GROUNDSURE LIMITED

**Enquiry address**

Plot P, Kingsway Business Park, Michael Faraday Avenue, Rochdale, Ol16 4fw
Greater Manchester




Approximate position of property

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**How to contact us**

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

www.groundstability.com

@coalauthority
/company/the-coal-authority
/thecoalauthority
/thecoalauthority

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# Section 1 – Mining activity and geology

## Past underground mining

| Colliery | Seam | Mineral | Coal Authority reference | Depth (m) | Direction to working | Dipping rate of seam worked (degrees) | Dipped direction of seam worked | Extraction thickness (cm) | Year last mined |
|---|---|---|---|---|---|---|---|---|---|
| unnamed | LOWER MOUNTAIN | Coal | 3XBO | 97 | West | 5.2 | South | 60 | 1907 |
| unnamed | LOWER MOUNTAIN | Coal | 3XB1 | 102 | Beneath Property | 5.2 | South | 60 | 1905 |
| unnamed | LOWER MOUNTAIN | Coal | A0DR | 107 | Beneath Property | | | 60 | 1915 |

## Probable unrecorded shallow workings

None.

## Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

## Mine entries

None recorded within 100 metres of the enquiry boundary.

## Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

| | | |
|---|---|---|
| NW1260 | 6600 | NW1261 |

**Please contact us on 0345 762 6848** to determine the exact abandoned mine plans you require based on your needs.

## Outcrops

No outcrops recorded.

## Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

## Opencast mines

None recorded within 500 metres of the enquiry boundary.

## Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

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# Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

### Site investigations
None recorded within 50 metres of the enquiry boundary.

### Remediated sites
None recorded within 50 metres of the enquiry boundary.

### Coal mining subsidence
The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal 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
None recorded within 500 metres of the enquiry boundary.

### Mine water treatment schemes
None recorded within 500 metres of the enquiry boundary.

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# Section 3 – Licensing and future mining activity

### Future underground mining
None recorded.

### Coal mining licensing
None recorded within 200 metres of the enquiry boundary.

### Court orders
None recorded.

### Section 46 notices
No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

### Withdrawal of support notices
The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

### Payments to owners of former copyhold land
The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

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# Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

### Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

**For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.**

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# Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk.**

### Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

### Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

### Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

### Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

### Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

### Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

### Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

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### Opencast mines
Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

### Coal Authority managed tips
Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

### Site investigations
Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

### Remediated sites
Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

### Coal mining subsidence
Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

### Mine gas
Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission.

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### Mine water treatment schemes
Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

### Future underground mining
Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

### Coal mining licensing
Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

### Court orders
Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

### Section 46 notices
Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

### Withdrawal of support notices
Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

### Payment to owners of former copyhold land
Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

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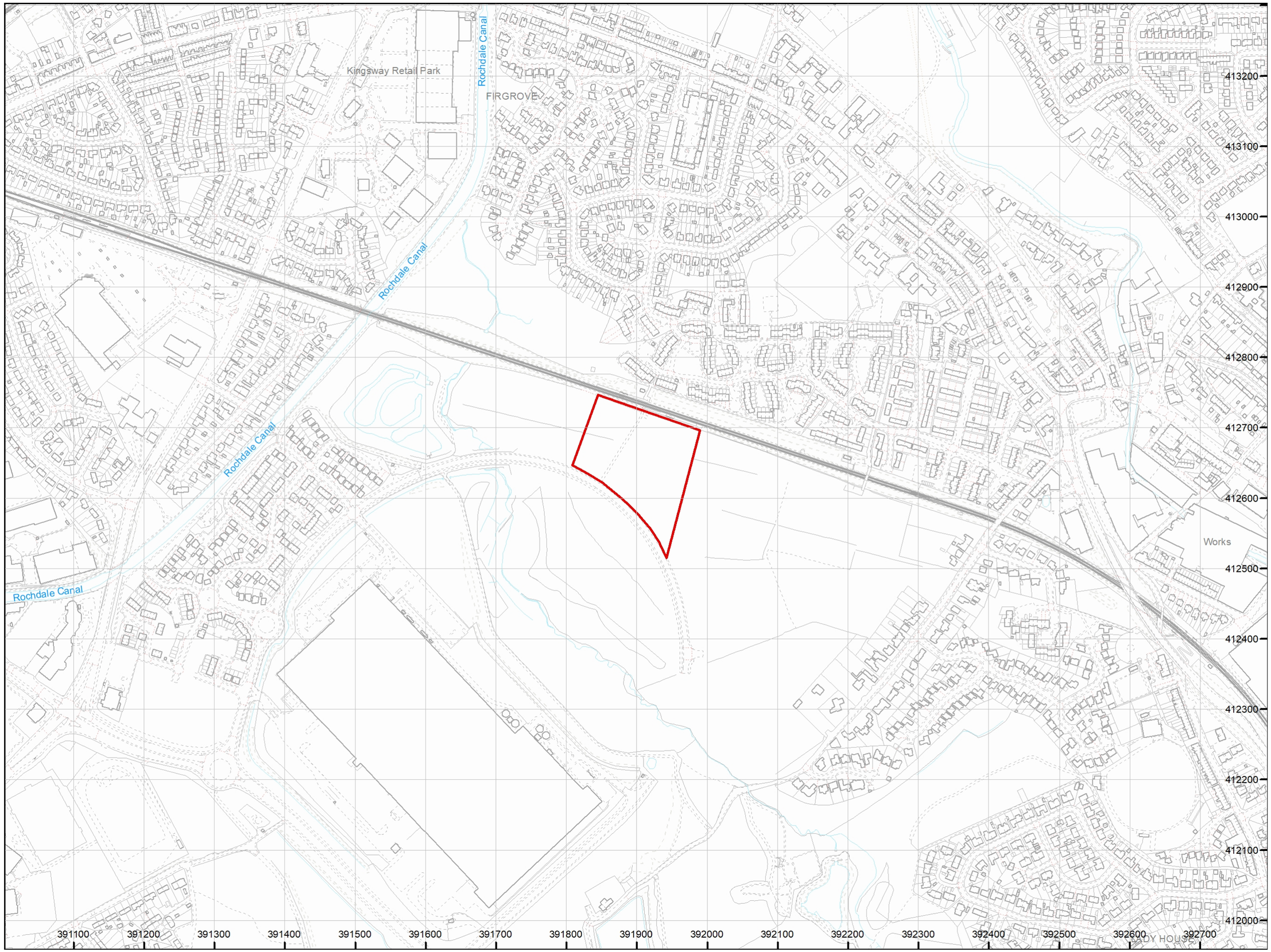
# Summary of findings

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Map data

The map highlights any specific surface or subsurface features within or near to the boundary of the site.

## Key

Approximate position of the enquiry boundary shown




**How to contact us**
0345 762 6848 (UK)
+44 (0)1623 637 000 (International)
www.groundstability.com

# Appendix 7: Classification of Risk

# BWB RISK ASSESSMENT CLASSIFICATION (REFERENCE CIRIA C552, *CONTAMINATED LAND RISK ASSESSMENT: A GUIDE TO GOOD PRACTICE*, 2001)

CIRIA C552, *Contaminated Land Risk Assessment A Guide to Good Practice*, 2001 sets out a methodology for estimating risk. The methodology for risk evaluation is a qualitative method for interpreting the output for the risk estimation stage of the assessment. It involves the classification of the:

- Magnitude of the potential consequence (severity) of risk occurring; and
- Magnitude of the probability (likelihood) of the risk occurring.

The classification of consequence and probability are replicated in **Table 1** and **Table 2**, respectively.

**Table 1: Classification of Consequence**

| Classification | Definition | Examples |
|---|---|---|
| **Severe (Sv)** | Short term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. Short term risk of pollution of sensitive water resource. Catastrophic damage to buildings/ property. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem. | High concentrations of cyanide on the surface of an informal recreation area.<br>Major spillage of contaminants from site into controlled water.<br>Explosion, causing building collapse (can also equate to a short-term human health risk if buildings are occupied). |
| **Medium (Md)** | Chronic damage to Human Health ("significant harm"). Pollution of sensitive water resources. A significant change in a particular ecosystem, or organism forming part of such ecosystem. | Concentrations of a contaminant from site exceeding the generic or site-specific assessment criteria.<br>Leaching of contaminants from a site to a major or minor aquifer.<br>Death of species within a designated nature reserve. |
| **Mild (Mi)** | Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services. Damage to sensitive buildings/structures/services or the environment. | Pollution of non-classified groundwater.<br>Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability). |
| **Minor (Mr)** | Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by measures such as protective clothing etc.). Easily repairable effects of damage to buildings, structures and services. | The presence of contaminants at such concentration that protective equipment is required during site works.<br>The loss of plants in a landscaping scheme.<br>Discolouration of concrete. |

The classification of consequence does not take into account the probability of the consequence being realised. Therefore, there may be more than one consequence for a particular pollutant linkage. Both a severe and medium classification can result in death.

Severe relates to short term (acute) risk while medium relates to long term (chronic) risk. Mild relates to significant harm but to less sensitive receptors. Minor classification relates to harm which is not significant but could have a financial cost.

**Table 2: Classification of Probability**

| Classification | Definition |
|---|---|
| **High likelihood (Hi)** | There is a pollutant linkage and an event that either appears very likely in the short term and almost inevitable in the long term, or there is evidence at the receptor of harm or pollution. |
| **Likely (Li)** | There is a pollutant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur.<br>Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term. |
| **Low likelihood (Lw)** | There is a pollutant linkage and circumstances are possible under which an event could occur.<br>However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term. |
| **Unlikely (Ul)** | There is a pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long term. |

The classification gives a guide as to the severity and consequence of identified risk when compared with other risk presented on the site. It should be noted that if a risk is identified it cannot be classified as "no risk" but as "very low risk". Differing stakeholders may have a different view on the acceptability of a risk.

Once the consequence and probability have been classified these can be compared using a matrix to identify an overall risk category, as shown in **Table 3**. These categories and the actions required are categorised in **Table 4**.

**Table 3: Risk Evaluation Matrix**

| | Consequence | Severe (Sv) | Medium (Md) | Mild (Mi) | Minor (Mr) |
|---|---|---|---|---|---|
| Probability | **High likelihood (Hi)** | Very High Risk (VH) | High Risk (H) | Moderate Risk (M) | Mod/Low Risk (M/L) |
| | **Likely (Li)** | High Risk (H) | Moderate Risk (M) | Mod/Low Risk (M/L) | Low Risk (L) |
| | **Low likelihood (Lw)** | Moderate Risk (M) | Mod/Low Risk (M/L) | Low Risk (L) | Very Low Risk (VL) |
| | **Unlikely (Ul)** | Mod/Low Risk (M/L) | Low Risk (L) | Very Low Risk (VL) | Very Low Risk (VL) |

**Table 4: Risk Categorisations**

| | |
|---|---|
| **Very High Risk (VH)** | There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening.<br>This risk, if realised, is likely to result in a substantial liability.<br>Urgent investigation (if not undertaken already) and remediation are likely to be required. |
| **High Risk (H)** | Harm is likely to arise to a designated receptor from an identified hazard.<br>Realisation of the risk is likely to present a substantial liability.<br>Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short-term and are likely over the longer-term. |
| **Moderate Risk (M)** | It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild.<br>Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer-term. |
| **Low Risk (L)** | It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild. |
| **Very Low Risk (VL)** | There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe. |

**Reference:**

CIRIA C552 *Contaminated land risk assessment. A guide to good practice*. Rudland, D J, Lancefield, R M, Mayell, P N, 2001.

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## ENVIRONMENT

Wilson Bowden Developments Ltd
Plot P, Kingsway Business Park
Rochdale
Phase 1 Geo-Environmental Assessment

**ENVIRONMENT**

# Wilson Bowden Developments Ltd
# Plot P, Kingsway Business Park
# Rochdale
# Phase 1 Geo-Environmental Assessment

Birmingham
Livery Place, 35 Livery Street, Colmore Business District, Birmingham, B3 2PB
T: 0121 233 3322

**Leeds**
**Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH**
**T: 0113 233 8000**

London
11 Borough High Street, London, SE1 9SE
T: 0207 407 3879

Manchester
11, Portland Street, Manchester M1 3HU
T: 0161 233 4260

Market Harborough
Harborough Innovation Centre, Wellington Way, Airfield Business Park,
Leicester Road, Market Harborough, Leicestershire, LE16 7WB
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Nottingham
Waterfront House, Station Street, Nottingham NG2 3DQ
T: 0115 924 1100

July 2022

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# EXECUTIVE SUMMARY

| Executive Summary | |
|---|---|
| Site Address | The site is located on a collection of fields, immediately south of Kingsway Business Park tram station in Rochdale, OL16 4JN. |
| Proposed Development | The proposed development is anticipated to comprise a commercial and/or warehouse use with associated infrastructure. |
| Current Site Use | At the time of the walkover the site was disused and comprised overgrown grassland, with a path leading to the loop road in the south from the tram station to the north |
| Site History | Historically, the site largely comprised of numerous fence enclosed fields, with a persistent body of water to the immediate southeast. The site remained largely unchanged throughout its history. The only onsite activity present between 2012 and 2018, was related to the loop road construction to the south in which material was placed on site and a path being constructed north south through the area. From 1851, the site has been immediately bordered to the north by a rail line, expanded with sidings during 1891-1908 period but was since developed into a tram line, remaining largely unchanged.<br>Off-site, the area was largely agricultural fields bounded by residential developments of Rochdale and Milnrow. Industrial developments were primarily over 650m from site. |
| Ground Conditions | Information published by the BGS indicates that the site is directly underlain by Glaciofluvial (Sand and Gravel) in the western part of the site and Till deposits in the eastern part, these are underlain by Pennine Lower Coal Measures bedrock. The bedrock is inferred as faulted to the southwest and northeast of the site at 52m and 130m respectively (NW-SE trending). |
| Geotechnical Review | Based on the proposed commercial and/or warehouse use on the site, shallow strip foundations bearing onto the Glaciofluvial & Till superficial deposits are likely to be suitable at the site. However, for heavier loadings, ground improvement may be required.<br>The proposed development is expected to include changes to site levels and so shallow soil properties should be assessed. |
| Environmental Review | When considered in the context of the conceptual site model and the historical activities that have taken place (agricultural work and potential landfill), the proposed development is considered to pose a moderate/low risk to human health. It is considered that the main driver for the risk rating for human health is migration and accumulation of ground gases in association with the potential Made Ground and potential organic rich soils on the site.<br>The risk posed to controlled waters is predominantly considered to be low due to potential of contaminants from soil left on site as part of the loop road construction. |
| Recommendations | It is recommended that an intrusive ground investigation be completed to assess the ground conditions on site, the extent of any potential contamination, assess the ground gas regime at the site and to quantify the identified pollutant linkages and assess likely mitigation measures. |
| This summary should be read in conjunction with BWB's full report (ref. KYP-BWB-ZZ-XX-RP-YE-0001_Ph1) and reflects an assessment of the site based on information received by BWB at the time of production. | |

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# 1. INTRODUCTION

## Instruction

1.1 BWB Consulting (BWB) was instructed by Wilson Bowden Developments Ltd (the Client) to carry out a Phase 1 Geo-Environmental Assessment for the site at Plot P, Kingsway Business Park, Rochdale. Details of the project brief are included in BWB proposal reference 211215/P01/01/210939/KES/RTR, dated 15/12/2021.

1.2 The proposed development is anticipated to comprise commercial and/or warehouse use with associated infrastructure.

1.3 The proposed development site layout, 7675-FDG-XX-XX-M3-A-0001_RIWA8AJN, dated 31/05/2022, is provided as **Appendix 1**.

## Objectives

1.4 This report has been completed to present pertinent information into the environmental risks and liabilities associated with the site. It has been completed to fulfil the requirements of a preliminary risk assessment in accordance with BS 10175:2011+A2:2017 *'Investigation of potentially contaminated sites, code of practice'* and EA Guidance on Risk Management of Land Contamination https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm.

1.5 The report has also been prepared with reference to land contamination technical guidance available through https://www.gov.uk/government/collections/land-contamination-technical-guidance.

1.6 The objectives of this report are to:

- Assess historical activities at the site with respect to their potential impact on the site environment;
- Characterise the environmental setting of the site, identify migration pathways and vulnerable receptors for contamination originating at the site, focusing on potential soil and groundwater liabilities;
- Assess historical and current surrounding land use in relation to known or potential off-site contamination issues that may impact the site;
- Review existing site investigation and remediation information for the site, where available;
- Develop a preliminary Conceptual Site Model (CSM); and
- Assess potential environmental liabilities associated with the site.

## Scope of Work

1.7 The Scope of Work included:

- A site visit to inspect the current site and immediate surroundings, identify potential hazards associated with ground conditions or contamination and to determine potential constraints with regards to ground investigation (photographs presented as **Appendix 2**);
- A review of the following information:
    - Groundsure report, reference HMD-214-8800198 (**Appendix 3**);
    - Historical Ordnance Survey Mapping (**Appendix 4**);
    - Historical aerial photographs (Google Earth) and other imagery (Groundsure);
    - BGS online geological maps and exploratory hole records (www.bgs.ac.uk);
    - Coal Authority Interactive Map Viewer (http://mapapps2.bgs.ac.uk/coalauthority/home.html);
    - Coal Authority Consultants Coal Mining Report, reference HMD-214-8800197 (**Appendix 6**);
    - Regional unexploded bomb risk maps;.
- A summary of the key hazards or uncertainties that require additional investigation in order to further characterise the associated risks; and
- Production of a Geo-Environmental Assessment (this report), concluding in a qualitative assessment of the risks from contamination and ground-related constraints which may impact on the site.

# 2. THE SITE

## Site Location

2.1 The site is located at Plot P, Kingsway Business Park, in Rochdale, centred at National Grid reference 391907 412651, nearest postcode OL16 4JN. The approximate location of the site is shown below in **Figure 2:1.**

**Figure 2:1: Site Location Plan**




## Site Description

2.2 The site comprises of an irregularly shaped parcel of land to the east of Rochdale centre, covering approximately 2.6 hectares. The site is undulating, 149m above Ordnance Datum.

## Site Walkover

2.3 A site walkover of accessible areas was completed on 16/06/2022 by a representative of BWB. Photographs from the walkover are presented in **Appendix 2**

2.4 At the time of the walkover, the site comprised of slightly overgrown fields divided down the site by a footpath. Old stone walls that follow old field divisions are still present in a ruined state. The north of the site was bordered by a tram station and associated tram line and infrastructure, separated by a wooden post, wired with barbed wire topped fence. The east of the site comprises farmland with livestock and bodies of standing water (used for livestock drinking water). To the south and west borders are uninhabited, wild grass fields, except for the asphalt loop road that comprises the southern boundary of the site.

2.5 Site access on foot was possible utilising the loop road to the south of site and the footpath through the centre of the site. This route was used to bypass a ditch that borders most of the sites southern boundary. The eastern field containing livestock was not accessed during walkover. For ground investigation, the wire fence will need to be partially dismantled to allow access.

2.6 Approximately 80% of the site was covered in grass or overgrown vegetation, with a small amount of tree cover along the northern boundary. Approximately 10% of the site was comprised of a narrow footpath connecting the loop road to the south of the site and the northern tram station. Approximately 10% of the site comprised standing water, or dry/seasonal wet areas primarily in the eastern portion of the site.

2.7 The site topography was largely undulating across the entire site, with depressions and a mound noted in the western portion. The site gently slopes down towards the western and eastern boundaries of the site. The footpath through the site is lower than the surrounding topography to the east and west.

2.8 Trees on northern boundary were generally semi-mature. Vegetation across the site was largely overgrown but traversable, with seasonal wet areas identifiable by collections of bulrushes.

2.9 There are three bodies of standing water to the east of the site, two located within the site boundaries and one 15m east within the livestock fields. Previously wet ground identified by soft ground conditions and bulrushes located 25m west of the standing water.

2.10 The site had foul and surface water utilities marker posts immediately west of the footpath, running parallel between the loop road and tram station.

## Potential Constraints to Ground Investigation

2.11 Site access into the eastern field would require negotiation with landowner/tenant farmer for partial temporary dismantling of the barbed wire fence and moving of livestock to allow for access and safe work conditions.

2.12 The site is open and visited by members of the public utilising the tram station, as well as dog walkers or recreational users indicated by trodden footpath through vegetation in the west of site. Additional safety precautions will need to be considered for any further works on site.

### Site Surroundings

2.13 The surrounding land uses at the time of the walkover survey are summarised in **Table 2:1**.

**Table 2:1: Surrounding Land Use**

| Surrounding Land Use | |
|---|---|
| North | Tram line with residential properties beyond. |
| East | Fields used for livestock. |
| South | Loop road followed by empty fields similar to site. |
| West | Fields similar to site with large stand of mature trees. |

**2.14** An aerial photograph representative of the site and surroundings, dated 23/05/2019, is presented as **Figure 2:2**.

**Figure 2:2: Aerial Photograph**



# 3. ANTICIPATED GROUND CONDITIONS

3.1 The anticipated ground conditions for the site and controlled waters vulnerability is discussed within **Table 3:1**.

**Table 3:1: Summary of Anticipated Ground Conditions**

| Anticipated Ground Conditions | |
|---|---|
| Geology | Information published by the BGS indicates that the site is directly underlain by Glaciofluvial (Sand and Gravel) to the west and Till deposits to the east, these are underlain by Pennine Lower Coal Measures bedrock. The bedrock is inferred as faulted to the southwest and northeast of the site at 52m and 130m respectively (NW-SE trending).<br>The BGS Lexicon database describes the bedrock as interbedded mudstone, siltstone and sandstone containing thicker coal seams towards the upper boundary.<br>Topsoil is likely to be present across a majority of the site. There are areas of worked and Made Ground within 50m of the site, primarily around tram infrastructure and the loop road to the south. On site, located in the southeast, worked ground comprised of void rock. Information from aerial photographs suggest Made Ground is present on site, likely originating from the loop road construction. Made Ground also borders the body of standing water to the east of the site.<br>The closest BGS borehole to the site is SD91SW156, approximately 380 m west. The borehole recorded 1.4m of Made Ground, comprising of 200mm of topsoil over dark brown sandy topsoil with a small amount of gravel content. This is underlain by 4.6m of medium dense, brown silty fine to medium sand with loosening occurring at 5.2m to the borehole's termination at 6.0m bgl (below ground level). The Till deposits on site are not present at this borehole location, but the underlying glaciofluvial and Lower Coal Measures bedrock, which are present on site, are present in this record. |
| Hydrogeology | The Environment Agency (EA) classifies the Till as a Secondary Undifferentiated Aquifer, the Glaciofluvial deposits as a Secondary A Aquifer and the bedrock as a Secondary A Aquifer.<br>There are no active or historical abstractions within 1km of the site.<br>There has been one Category 3 (minor) pollution incident impacting on land located 460m north of the site relating to construction and demolition materials and waste.<br>The site is indicated to be within an EA groundwater Source Protection Zone 2, outer catchment. |
| Surface Waters | There are three bodies of standing water located within the site boundary wider than 5m with no clear drainage. At the time of the site walkover, the preceding weather was especially dry. Areas of the site displayed evidence of previous water logging/standing water.<br>The closest flowing surface water feature to the site is the Stanney Brook, approximately 150m to the South and West of the site. This flows to the nearby Rochdale Canal, approximately 380m to the northwest.<br>The closest active surface water abstraction is located 692m east of the site and is utilised for general cooling purposes.<br>There is one active licensed discharge located within 500m of the site. This is located approximately 176m northwest of the site, relating to pumping station sewage discharge with Stanney Brook as the receiving water.<br>There have been five Category 3 (minor) pollution incidents impacting on controlled waters within 500m of the site. Two located 181m northwest of the |

| Anticipated Ground Conditions | |
|---|---|
| | site related to crude sewage, two located 382m west of the site related to oils and fuel and one located 421m southeast relating to crude sewage<br>There is a high risk of surface water flooding on site, primarily related to the observed surface water on site, and within 50m. There is a maximum flood depth of 0.3m to 1m from surface water flooding on site for a 1 in 30-year event. There is a low to moderate risk of groundwater flooding on site.<br>The site is not located in an EA flood zone 2 or 3 designation. |
| Ground Gas & Radon | The site is located within an area with a less than 1% risk of radon present.<br>The Groundsure Report indicates a historical local authority landfill is present on site. Clarification with Rochdale Council confirmed that this is not present (**Appendix 5**).<br>Organic material built up within the surface water bodies present on site currently and historically may pose a potential source of hazardous ground gas. |
| Mining and Mineral Extraction | The site is located within a coal mining area as defined by the Coal Authority.<br>A Consultants Coal Mining Report is presented as **Appendix 6**. The report indicated the following information:<br>- Three Lower Mountain coal seams are reported as worked. Two are beneath the site and one is to the west, with the latest mining activity terminating in 1915 at depths between 97m to 107m.<br>- No shallow or opencast coal workings are recorded within 500m of the site.<br>- No outcrops have been recorded on site. There are faults near to the site, located 52m SW and 130m NE, placing the site in a slight graben structure.<br>- There are no mine entries within 100m of the site.<br>- There have been no reports of subsidence or related damage within 50m of the site.<br>- There has been no mine gas or mine water treatments within 500m of the site<br>Present on the site may be features related to the railway cutting along the northern boundary of the site that may have been backfilled since operation.<br>There have been no other mining or extractions within 1000m of the site. |
| Environmental Sensitivity | The Merseyside and Greater Manchester area of Green Belt is 726m NE of the site.<br>There nearby Rochdale Canal is a designated SSSI, located 314m northwest of the site. The Canal is also listed as special areas of conservation. The site is within two SSSI impact risk zones and developments requiring consultation include infrastructure, minerals oil and gas, residential, rural residential & non-residential, combustion, waste, composting, discharges, water supply in addition to air pollution.<br>Within 125m of the site, priority habitat for lowland fens is present, with the site being designated as Network Enhancement Zone 1 & 2. |

# 4. SITE HISTORY

4.1 Historical Ordnance Survey (OS) mapping for the site area has been reviewed. These maps and plans date from 1851 to 2022. The historical plans reviewed are provided in **Appendix 4**. The key points of the historical development of the site and surrounding area are summarised in **Table 4:1**. All distances quoted are approximate and potential SOURCES and receptors are highlighted through their formatting.

**Table 4:1: Key Points of Development History**

| Dates | On Site | Off-Site |
|---|---|---|
| 1851<br>Country Series<br>1:10,560 | Site comprised of open fields with no development present.<br>Bordered by rail workings to the immediate north of site.<br>A body of standing water was present at the tip of the southern extrusion. | The surrounding area was primarily **AGRICULTURAL** with sporadic ***residences***.<br>Milnrow village was 700m east of site<br>**SANDSTONE QUARRIES** were located approximately 550m north east and 730m east of site.<br>**BELFIELD COLLIERY** located 710m to the northeast of site. |
| 1891<br>County Series<br>1:2,500<br>1:10,560 | No significant changes on site. | Belfield Colliery activity ceased, marked as **OLD SHAFTS**.<br>Sandstone quarries activity ceased.<br>**GAS WORKS** 750m east of site |
| 1908-1910<br>County Series<br>1:10,560 and 1:2,500 | No significant changes on site. | **RAIL SIDINGS** constructed within 50m of site.<br>**TANK** present 450m southwest of the site.<br>**SEWAGE WORKS** with filler tanks developed on site of old Belfield Colliery. |
| 1928<br>County Series<br>1:10,560 | No significant changes on site. | **TANK** present 625m southeast of site.<br>***Residential development*** 625m west of site across the canal. |
| 1930<br>County Series<br>1:2,500 | Small terrain marking change in the west of site. | No significant changes off site. |
| 1938<br>County Series<br>1:10,560 | No significant changes on site. | ***Residential areas*** developed between 125 and 500m to the north of site.<br>Kingsway road developed 500m west of site. |
| 1954<br>Provisional<br>1:10,560 | No significant changes on site. | ***Residential area*** developed 750m west of the site. |

| Dates | On Site | Off-Site |
|---|---|---|
| 1955 – 56<br>National Grid<br>1:1,250<br>1:2,500 | No significant changes on site. | ***Residential area*** developed within 150m of site to the north between 1955 and 1956. |
| 1967<br>National Grid<br>1:1,250<br>Provisional<br>1:10,560 | No significant changes on site. | Drain emplaced in ***Stanney brook*** 250m west of site.<br>Large ***residential development*** occurred west of site across canal.<br>Tank 625m southeast ceased operation. |
| 1976<br>National Grid<br>1:1,250<br>and<br>1:10,000 | No significant changes on site. | Large ***residential development*** occurred in Milnrow, bringing residences to the other side of the rail track. |
| 1984-2003<br>National Grid<br>1:1,250<br>and<br>1:10,000 | Residential development occurred north of rail tracks, within 100m of site (1984). | No significant changes off site. |
| 2010<br>National Grid<br>1:10,000 | No significant changes on site. | Farms located within 500m to the southwest and southeast of site disused and removed, **MAIN ROAD** constructed between 500m and 750m south. |
| 2022<br>National Grid<br>1:10,000 | No significant changes on site. | ***Residential areas*** developed within 500m of site to the west, joined to **ROAD** developed to immediate southern site boundary.<br>Largescale **WAREHOUSE** development within 500m of site to the south. |

## Historical Aerial Photography and Imagery

4.2 Aerial photographs/imagery available through Google Earth and included within the Groundsure report are summarised in **Table 4:2**.

**Table 4:2: Summary of Aerial Photography**

| Date (Source) | Description |
|---|---|
| 2000 (Groundsure) | The site is shown as agricultural land with a railway line immediately to the north of the site running east-west. Bodies of water were present on the site to the east. |
| 2012 (Groundsure) | Larger scale works carried out along the southern boundary of the site, associated with the loop road, with works and material |

| Date (Source) | Description |
|---|---|
| | stockpiles spread out over the entirety of the site. Bodies of water expanded and conjoined in the east of the site. |
| 2018 (Groundsure) | Site returned to being largely grassland, road now constructed on southern boundary. Water bodies reduced in size. Path to tram station present through the site, running north to south. |
| 2019 (Groundsure) | No significant changes when compared to 2018 aerial photograph. |

## Planning History

4.3 The Rochdale Council Planning Portal was accessed on 13/06/2022 and indicated that no planning applications have been submitted for the site.

## Summary of Site History

4.4 The site largely comprised of numerous fenced enclosed fields, with a persistent body of water to the immediate southeast. The site remained largely unchanged throughout its history, with the only onsite activity being between 2012 and 2018, with southern road construction material being placed on site and a path constructed north to south through the area. From circa 1851, the site has been immediately bordered to the north by a rail line, expanded with sidings during 1891-1908 period but has since been developed into a tramline, remaining largely unchanged.

4.5 Off-site, the area was largely agricultural fields bounded by residential developments of Rochdale and Milnrow. Industrial developments, including Belfield Colliery, were primarily over 650m from the site. Residential developments from 1976 and recent development of Kingsway Business park to the south has brought residences to within 300m of the site.

# 5. REGULATORY SETTING

## Permits Consents and Authorisations

5.1 A full listing of permits, consents and authorisations including discharge consents, pollution incidences and other environmental information, is included in the Groundsure report, presented in **Appendix 3.**

5.2 No significant features have been identified which are considered likely to have had a detrimental impact on the site.

## Landfilling and Waste Management

5.3 A full listing of EA, BGS and Local Authority recorded landfills are provided in the Groundsure report presented in **Appendix 3.**

5.4 The following facilities have been identified which have the potential to have a detrimental impact on site.

5.5 Two historical landfill sites were identified within 500m of the site, as detailed in **Table 5:1**.

**Table 5:1: Historical Landfill Sites**

| Name | Distance from Site | Details |
|---|---|---|
| Little Lane | 425m southeast | No information provided. |
| Ex Universal Laundry | 471m east | Accepted inert waste in 1988. |

5.6 The historical local authority landfill identified on site in the Groundsure report has been discounted as a potential source of contamination. Clarification on the presence of this landfill was requested from Rochdale Council. Their records indicate no landfill is present on site. Council correspondence is presented in **Appendix 5**.

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# 6. GEOTECHNICAL APPRAISAL

6.1 The Groundsure report, site history, current site setting and geology setting have all been considered in order to provide an indication of the potential ground related constraints and opportunities in the context of the proposed development as set out in **Table 6:1**.

**Table 6:1: Ground Related Constraints & Opportunities**

| Potential Constraint / Opportunity | Explanation | Potential Mitigation Options |
|---|---|---|
| Topsoil / Made Ground | Topsoil is expected to be present across the majority of the site.<br>Made Ground is expected to be present across the site as a result of material placed during the loop road construction, along the footpath and in potentially infilled ground on-site. | Topsoil and Made Ground may be suitable for reuse on site, subject to confirmation of chemical status and engineering properties via ground investigation, and confirmation of potential restrictions on reuse associated with waste management licencing. |
| Preliminary Foundation Solution | Based on the proposed commercial and/or warehouse use on the site, shallow strip foundations bearing onto the Glaciofluvial & Till superficial deposits may be suitable at the site. For heavier loadings, ground improvement may be required. | Ground investigation should be undertaken to confirm ground conditions at the site and allow for in-situ and laboratory testing to inform foundation design. |
| Buried Obstructions | Given the historical uses of the site there is limited potential for buried obstructions such as former foundations. Foul and surface water services are indicated to be present in the west of the site. | Buried obstructions may require removal from site within areas of proposed development.<br>Services may need to be diverted away from proposed building footprints. |
| Trees | Juvenile and semi-mature trees were noted as scattered around the site. | Foundations in close proximity to new or existing trees may need to be locally deepened beyond the zone of influence of tree roots and/or heave precautions adopted. |
| Pyritic Geology | Ground conditions have limited potential to be pyritic based on the geology. | No further assessment is required. |
| Shrinking and Swelling Clays and Running Sands | The Groundsure report indicates a very low to negligible risk on site.<br>There is very low risk of running sands. | Ground conditions are predominantly low plasticity therefore no further assessment required.<br>Although the running sands risk is indicated to be very low, BWB have encountered running sands often across the wider Kingsway Business Park within the same geology so running sands are considered to be a likely issue that needs further consideration. |

| Potential Constraint / Opportunity | Explanation | Potential Mitigation Options |
|---|---|---|
| Coal Mining | Coal is not expected to be present at the surface or at shallow depth across the site. The Coal Authority Report indicates deeper mining at the site at depths of 97-107m. | No further assessment is required. |
| Mineral Extraction | No mineral extraction has been identified as taking place on the site | No further assessment is required. |
| Earthworks | The proposed development is expected to include a change to site levels. | Further assessment is required of materials on site and their potential for re-use/re-engineering. |
| Slope Stability | The Groundsure report indicates a very low risk on site. | It is indicated that slope instability problems are unlikely to be present on-site therefore no further assessment required. |
| Retaining Walls | No retaining walls were noted during the walkover. | No further assessment required. |
| Shallow Groundwater | Shallow groundwater and seasonal high groundwater table are common across the local area based on BWBs history of working on nearby sites. | The groundwater levels should be assessed through intrusive investigation and monitoring. The effects of the foundation solution, earthworks strategy, and construction methodologies will need to be considered. |
| Drainage and Soakaways | Soakaways may be a viable option in the west of the site, within Sand and Gravel deposits. Depending upon groundwater levels and drainage properties. | Should soakaways be considered as part of the drainage strategy, it is recommended that infiltration testing in accordance with current guidance is undertaken. |
| Roads and Pavements | California Bearing Ratio (CBR) values should be sought for road, car park and pavement design. | In-situ testing should be undertaken to infer CBR values. Furthermore, geotechnical testing should be undertaken to provide consistency of results. |
| Ground Dissolution Hazards | The Groundsure report indicates a negligible risk based on location. | Soluble rocks are indicated to potentially be present but are unlikely to cause problems except under exceptional conditions. No further action is required. |
| UXO | Review of the unexploded ordnance risk maps available online indicates the site to be in an area of low risk from UXO. | No further assessment required. |

# 7. PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

## Introduction

7.1 The risk posed by any contaminants in soil or groundwater will depend on the nature of the hazard, the probability of exposure, the pathway by which exposure occurs, and the likely effects on the receptors. A contaminant is defined as a substance that has the potential to cause harm, while a risk is considered to exist if such a substance is present in sufficient concentration to cause harm and a pathway exists for a receptor to be exposed to the substance.

7.2 Three impact potentials exist for any given site, all of which need to be considered in a risk assessment, which are:

- The site impacting upon itself;
- The site impacting on its surroundings; and
- The surroundings impacting on the site.

7.3 The following sections discuss all the identified potential on and off-site sources, pathways and receptors in the context of the proposed development and plausible pollutant linkages which may represent a risk to identified receptors such as human health and/or controlled waters from the data gained from the desk study.

7.4 The assessment is qualitative and aimed to determine all likely pollutant linkages, with consideration of significance and allowing for uncertainties.

7.5 **Sources (S):** These are potential or known sources of contamination that may relate to a former land use or present site feature or process (e.g. fuel storage tanks).

7.6 **Pathways (P):** A pathway is defined as a mechanism or route by which a contaminant comes into contact with, or otherwise affects a receptor. Pathways by which the identified receptors may be impacted upon in the context of the proposed development.

7.7 **Receptors (R):** Receptors are defined as people, living organisms, ecological systems, controlled waters, atmosphere, structures and utilities that could be adversely affected by contaminant(s).

## Conceptual Site Model

7.8 Consideration has been given to the likely sources, pathways and receptors which may be present, based on the information in the previous sections. These are presented in **Table 7:1** and **Table 7:2** and further information about the risk classification scheme is included within **Appendix 7**, with reference to CIRIA C552 '*Contaminated land risk assessment - a guide to good practice*'.

7.9 A tabulated version of the Preliminary CSM based on the desk study and site observations is presented in **Table 7:3.**

**Table 7:1: Potential Sources of Contamination**

| Location | Potential Source | Contaminants of Potential Concern (CoPC) |
|---|---|---|
| On-site | **MADE GROUND** associated with previous infrastructure developments such as **RAILWAY SIDINGS** and **ROAD DEVELOPMENT** | • Heavy metals<br>• Inorganics, such as cyanides, sulphates and nitrates<br>• Arsenic<br>• Methane, carbon dioxide |
| | Former/current **surface water/pond** features on site. | • Organic material<br>• Methane, carbon dioxide |
| | Contamination associated with **AGRICULTURAL** activities | • Semi-volatile organic compounds (SVOCs) including phenols and polycyclic aromatic hydrocarbons (PAHs)<br>• Inorganics, such as cyanides, sulphates and nitrates<br>• Methane, carbon dioxide |
| | Gas accumulation in **DEEP MINING WORKS** | • Methane, carbon dioxide |
| Off-site | Contamination associated with neighbouring activities including RAILWAY CUTTING and **QUARRIES** | • Heavy metals<br>• Semi-volatile organic compounds (SVOCs) including phenols and polycyclic aromatic hydrocarbons (PAHs)<br>• Petroleum hydrocarbons<br>• Inorganics, such as cyanides, sulphates and nitrates<br>• pH |

**Table 7:2: Relevant Potential Pathways and Receptors**

| Receptors | Pathways |
|---|---|
| **Human Health:**<br>• Future site users (commercial)<br>• Neighbouring public (residential/commercial)<br>• Intrusive maintenance workers | • Dermal contact with soil or dust<br>• Incidental ingestion of soil and/or dust<br>• Inhalation of dust and/or fibres<br>• Inhalation of vapours<br>• Migration and accumulation of ground gas in enclosed spaces leading to inhalation or explosion |
| **Controlled Waters:**<br>• Groundwater (aquifers)<br>• Surface water (Rochdale Canal, Stanney Brook) | • Leaching of soil contaminants<br>• Vertical and lateral migration<br>• Surface run-off |
| **Ecology:**<br>• Flora and Fauna | • Lateral migration<br>• Uptake and accumulation |
| **Property:**<br>• Underground utilities<br>• Building structures | • Direct Contact<br>• Accumulation and explosion of gas |

7.10 A number of potential sources of contamination, identified during the review, are not considered likely to impact on the site. These are detailed below, along with the appropriate justification for their exclusion from the preliminary CSM:

7.11 Due to the depth of recorded mining beneath the site, >90m, ground gas associated with coal mining is unlikely to have an influence on the site.

7.12 Potentially infilled sandstone quarries, with a distance from the site exceeding 500m, are unlikely to impact receptors on site.

7.13 Both Little Lane and the Ex Universal Laundry historical landfill sites have been discounted as a potential source of contamination. This is due to their distance from the site (>400m) and the superficial geology (Till), leaving it unlikely that a pathway would be viable to any receptors on site.

**Table 7:3: Preliminary Conceptual Site Model**

| Source | Pathway | Receptor | Con | Prob | Risk | Potential Mitigation/Investigation Requirements |
|---|---|---|---|---|---|---|
| On-site sources as detailed in **Table 7:1**. | Dermal contact with, and incidental ingestion of soil and/or dust.<br>Inhalation of dust and/or fibres. | Future site users (commercial) | Md | Ul | L | Limit potential for on-site contamination has been identified. As part of the proposed development, it is anticipated that hardstanding will be present across the majority of the site. This will limit the potential for direct contact with and minimise dust generation from potentially contaminated soils at the site post construction. In public open space, the provision of a clean soil cover layer would restrict direct exposure to potentially contaminated soils.<br>It is recommended that an intrusive ground investigation be completed in order to assess the extent of any potential contamination at the site. |
| | | Intrusive maintenance workers | Md | Lw | M/L | The exposure of intrusive maintenance workers can be mitigated by the adoption of suitable working methods, utilising appropriate personal protective equipment (PPE) and maintaining good hygiene. If significant asbestos is recorded, the requirements of the Control of Asbestos Regulations (CAR) 2012 should be complied with. |
| | Inhalation of vapours. | Future site users (commercial) | Md | Ul | L | If elevated concentrations of volatile contaminants are identified during ground investigation works, potential vapour sources such as Made Ground and contaminated soils/groundwater could potentially be mitigated through removal or treatment prior to construction or the installation of protection measures may be required during construction to mitigate the potential risk to future site users from vapours. |
| | | Neighbouring public | Md | Ul | L | |

| Source | Pathway | Receptor | Con | Prob | Risk | Potential Mitigation/Investigation Requirements |
|---|---|---|---|---|---|---|
| | | Intrusive maintenance workers | Md | Lw | M/L | If elevated concentrations of volatile contaminants are identified during ground investigation works and where entry into confined spaces/excavations is required by intrusive maintenance workers, it is recommended that a combination of the following may be required to mitigate the potential risk of exposure to vapours:<br>• appropriate PPE and/or Respiratory Protective Equipment (RPE);<br>• monitoring equipment (such as explosive level meters); and<br>• safe entry procedures. |
| | Migration and accumulation of ground gases in enclosed spaces leading to asphyxiation (carbon dioxide) or explosion (methane). | Future site users (commercial) | Md | Lw | M/L | Made Ground is expected across the site, with organic material related to surface water pond features likely to be present in the north west and east of the site.<br>The presence of the above indicates a potential risk from ground gases. Ground investigation should include the installation of ground gas monitoring wells in order to determine the risk posed from ground gases. |
| | Leaching and permeation through soil profile. | Groundwater: Underlying Secondary Superficial & Bedrock Aquifers | Md | Ul | L | Ground investigation should include the installation of groundwater monitoring wells to allow for sampling of groundwater for chemical analysis, in order to assess whether potentially unacceptable levels of contaminants of potential concern are present.<br>The recommendations of DEFRA and EA guidance document '*Pollution prevention for businesses*' should be considered during construction. |
| | Vertical and lateral migration of contaminants. | | Md | Ul | L | |
| | Surface run-off. | Stanney Brook<br>Rochdale Canal | Md | Ul | L | |
| | Direct contact. | Water utility pipes | Md | Lw | M/L | Organic compounds in the shallow soils could taint the water supply. A ground investigation and subsequent laboratory analysis should be undertaken to inform the design of new services. |

| Source | Pathway | Receptor | Con | Prob | Risk | Potential Mitigation/Investigation Requirements |
|---|---|---|---|---|---|---|
| | | Buried structures/ foundations. | Mi | Lw | L | Sulphates and low pH in the ground could accelerate the degradation of buried concrete structures (e.g. foundations). Ground investigation should include an assessment of the concrete design class. |
| Off-site sources as detailed in **Table 7:1**. | Dermal contact with, and incidental ingestion of soil and/or dust. | Future site users (commercial) | Md | Ul | L | As part of the proposed development, it is anticipated that hardstanding will be present across the majority of the site. This will limit the potential for direct contact with and minimise dust generation from potentially contaminated soils at the site post construction. In public open space, the provision of a clean capping layer would restrict direct access to potentially contaminated soils.<br>It is recommended that an intrusive ground investigation be completed in order to assess the extent of any potential contamination at the site. |
| | | Future site users (commercial) | Md | Ul | L | |
| | Leaching and permeation through soil profile. | Groundwater: Underlying Secondary Superficial & Bedrock Aquifers | Md | Ul | L | Ground investigation should include the installation of groundwater monitoring wells to allow for sampling of groundwater for chemical analysis, in order to assess whether potentially unacceptable levels of CoPC are present.<br>The recommendations of DEFRA and EA guidance document '*Pollution prevention for businesses*' should be considered during construction. |
| | Vertical and lateral migration of contaminants. | | Md | Ul | L | |
| VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low<br>KEY: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor, Hi = High, Li = Likely, Lw = Low Likelihood, Ul = Unlikely | | | | | | |

**Pollutant Linkage Assessment Summary**

When considered in the context of the conceptual site model and the historical activities that have taken place (agricultural work and potential landfill), the proposed development is considered to pose a **MODERATE/LOW** risk to human health. It is considered that the main driver for the risk rating for human health is Migration and accumulation of ground gases related to potential Made Ground and organic rich soils on the site.

The risk posed to controlled waters is predominantly considered to be **LOW** due to the limited contaminative sources identified on site.

It is recommended that a ground investigation be undertaken to quantify the identified pollutant linkages and assess likely mitigation measures.

# 8. ENVIRONMENTAL LIABILITY ASSESSMENT AND DEVELOPMENT IMPLICATIONS

## Statutory Liability

8.1 The contaminated land regime has implications for those who cause or knowingly permit land to be contaminated, or who own or occupy land that is contaminated. Contaminated land is defined in Section 78A(2) of Part IIA of the Environmental Protection Act 1990 as:

*"Any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that:*

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

*ii. Significant pollution of controlled waters is being caused or there is a significant possibility of such pollution being caused."*

8.2 Harm is defined in Section 78A(4) of the Environmental Protection Act 1990 as:

*"Harm to the health of living organisms or other interference with ecological systems of which they form part and, in the case of man, includes harm to his property."*

8.3 Once an area of land has been identified as contaminated land, appropriate persons will be identified as being responsible for the cost of cleaning up the land by the enforcing authority. The appropriate person will be liable for all or part of the remediation of the land. Two classes of appropriate person have been identified:

- Class A appropriate persons are those who cause or knowingly permit the pollutants to be in, on or under the land.
- Class B appropriate persons are the owners(s) or occupier(s) of the land.

8.4 Where no Class A appropriate persons can be identified, then Class B appropriate persons may become liable.

8.5 Based on the information available regarding the site, the potential for Statutory Authority action based on "pollution of controlled water" or "significant harm" as defined by Part IIA of the Environmental Protection Act 1990 is considered to be **LOW**.

## Third Party Liability

8.6 Based on the information contained in this report, it is the opinion of BWB that the potential for legal action by surrounding landowners, based on the potential for contamination to migrate off-site, is considered to be **LOW** when considering the former agricultural use of the surrounding land

### Public Relations

8.7 The likelihood of public relations being tarnished due to contamination issues at the site are considered to be **LOW**.

### Development Implications

8.8 Intrusive ground investigation should be undertaken to confirm the ground conditions at the site, primarily in regard to suitability of superficial deposits and the potential for running sands in the glaciofluvial deposits in the west of the site and the potential for differential settlement if the proposed development spans differing geology.

8.9 It is recommended that the requirement for earthworks and potential for re-use of or disposal of waste is established at an early stage in the project. The site is raised and undulating, primarily relating to the deposition of material associated with the construction of the loop road to the south of the site.

# 9. CONCLUSION AND RECOMMENDATIONS

## Conclusions

9.1 Historically, the site largely comprised of numerous fence enclosed fields, with a persistent body of water to the immediate southeast. The site remained largely unchanged throughout its history. The only onsite activity identified was between 2012 and 2018, with the southern loop road construction material being placed on site and a path constructed north south through the area. From 1851, the site has been immediately bordered to the north by a rail line, expanded with sidings during 1891-1908 period but has since been developed into a tramline, remaining largely unchanged.

9.2 Off-site, the area was largely agricultural fields bounded by residential developments of Rochdale and Milnrow. Industrial developments were primarily over 650m from site, with Belfield Colliery located 710m to the northeast of the site.

9.3 The site is situated on Glaciofluvial (Sand and Gravel) and Till superficial deposits. These deposits are underlain by the Pennine Lower Coal Measures bedrock. Both superficial and bedrock are classed as Secondary A Aquifers. Made Ground associated with the loop road construction and organic rich deposits associated with bodies of surface water are likely to be present on site.

9.4 The Coal Authority report places the site in a coal mining area, with mining operations being carried out at a depth of 97m to 107m that terminated in 1915.

9.5 Based on the predicted geology of the area, a shallow strip foundation may be viable dependent on the load of the development; ground investigation will be required to confirm ground conditions and check suitability of Sand and Gravel deposits.

9.6 The proposed development is considered to pose a moderate/low risk to human health with the main driver for the risk rating for human health is the migration and accumulation of ground gases related to Made Ground and the potential for organic rich soils on the site. The risk posed to controlled waters is predominantly considered to be low due to the lack of a significant contaminant source.

## Recommendations

9.7 A ground investigation should be undertaken at the site to:

- Confirm ground conditions presence at the site;
- Assess the ground gas regime;
- Allow for in-situ and laboratory testing to inform:
- foundation design; and
- an earthworks specification, if required.

9.8 Whilst the risk from contamination at the site has been assessed as low, it is considered best practice to allow for testing of soils as part of any ground investigation to confirm

the absence of any contamination, as well as to determine the suitability of soils for reuse as part of the proposed development.

# 10. REFERENCES

1. BS 10175:2011+A2:2017 Investigation of potentially contaminated sites. Code of practice. British Standards Institute, 2017.

2. CIRIA C552 *Contaminated land risk assessment. A guide to good practice*. Rudland, D J, Lancefield, R M, Mayell, P N, 2001.

3. Environmental Protection Act 1990: Part 2A, Contaminated Land Statutory Guidance. Department for Environment Food and Rural Affairs (DEFRA), 2012.

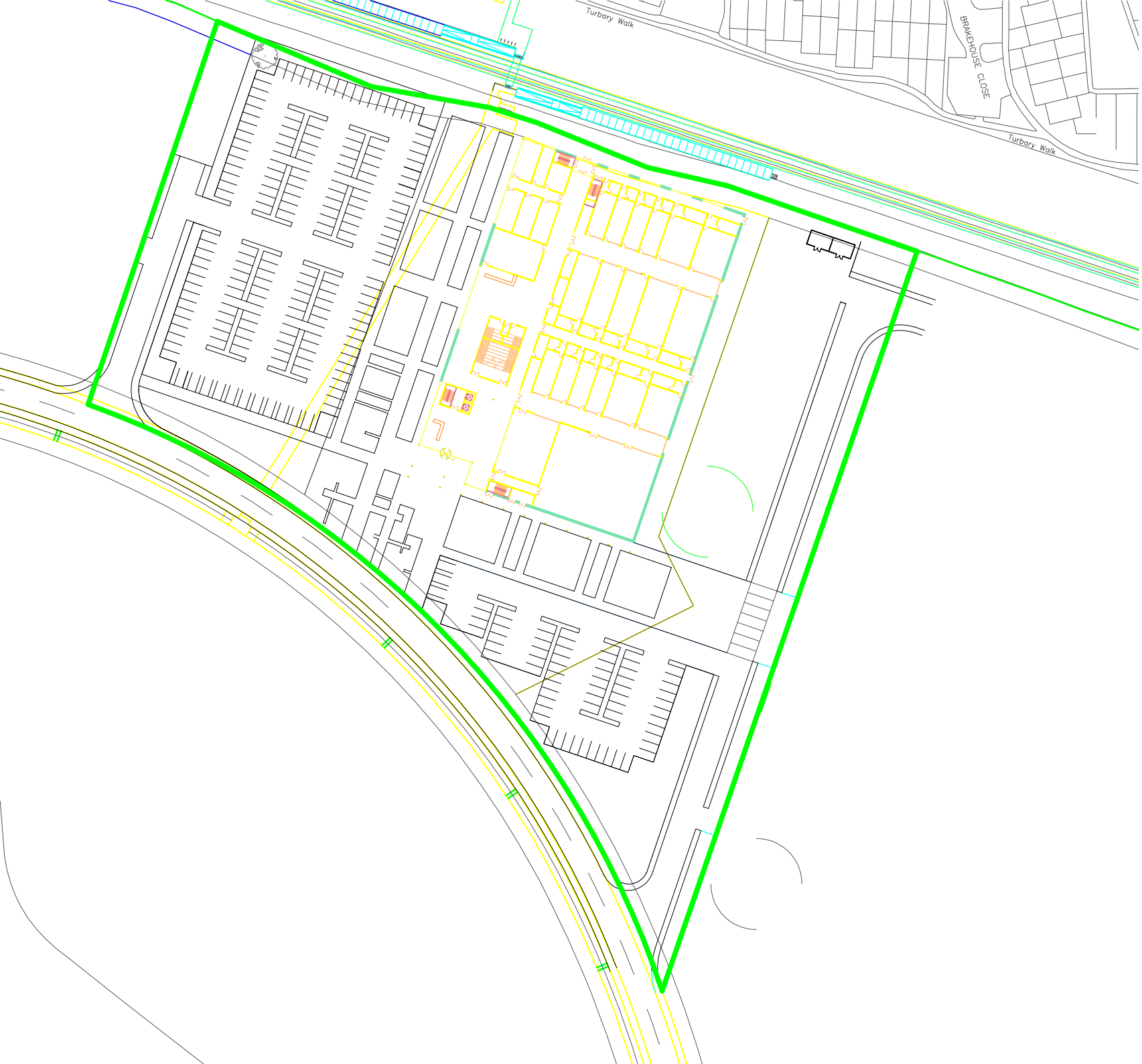
4. Land Contamination Risk Management. Environment Agency, 2020.

5. https://www.gov.uk/government/collections/land-contamination-technical-guidance.

6. The Control of Asbestos Regulations. Health and Safety Executive, 2012.

# *APPENDICES*

# Appendix 1: Proposed Site Layout


Turbary Walk
BRAKEHOUSE CLOSE
Turbary Walk

# Appendix 2: Site Photographs

**Project Number: 210939**
**Project Name: Plot P Kingsway Business Park**
**Site Photographs**



Photo 1—View of southern tarmac road taken from point of access, facing west



Photo 2—View of southern tarmac road taken from point of access, facing east

**Project Number: 210939**
**Project Name: Plot P Kingsway Business Park**
**Site Photographs**



Photo 3—Opposite footpath towards the south, open utilities excavation across the road



Photo 4—Facing north towards tram station, highlighting likely point of access into site

**Project Number: 210939**
**Project Name: Plot P Kingsway Business Park**
**Site Photographs**



Photo 5—Facing north just west of point of access, surface and foul water markers present in the vegetation



Photo 6—Facing north taken from tarmac road, looking along the western boundary of site

**Project Number: 210939**
**Project Name: Plot P Kingsway Business Park**
**Site Photographs**



Photo 7—Facing west along footpath, two areas of burnt ground and litter



Photo 8—Facing south from tram station along the footpath, small bicycle storage

**Project Number: 210939**
**Project Name: Plot P Kingsway Business Park**
**Site Photographs**



Photo 9—Broken glass alongside bicycle storage



Photo 10—Western section of site, old drystone wall that runs across the site from west to east.

**Project Number: 210939**
**Project Name: Plot P Kingsway Business Park**
**Site Photographs**



Photo 11—In western section of site a mound of earth approximately 2.5m high is present



Photo 12—North of the mound is a depression of approximately 2m at the northern boundary of the site

**Project Number: 210939**
**Project Name: Plot P Kingsway Business Park**
**Site Photographs**



Photo 13—East of the cycle storage, the northern boundary is marked by a barbed wire fence immediately before the tramline



Photo 14— Dry area that would normally be wet, containing bullrushes and soft ground located in eastern section of site

**Project Number: 210939**
**Project Name: Plot P Kingsway Business Park**
**Site Photographs**



Photo 15—Facing eastern boundary, two bodies of water and livestock separated from site by barbed wire fence



Photo 16— On northern pavement of tarmac road are utilities accessible for site work

**Project Number: 210939**
**Project Name: Plot P Kingsway Business Park**
**Site Photographs**



Photo 17—Facing north from tarmac road on eastern section of site, ditch creates a steep slope that creates a side profile of the natural material.

## Appendix 3: Groundsure Report

Groundsure
LOCATION INTELLIGENCE

# Enviro+Geo Insight

PLOT P, KINGSWAY BUSINESS PARK, MICHAEL FARADAY AVENUE, ROCHDALE, OL16 4FW

## Order Details

**Date:** 07/06/2022

**Your ref:** 210939_PO_1762

**Our Ref:** HMD-214-8800198

## Site Details

**Location:** 391907 412651

**Area:** 2.63 ha

**Authority:** Rochdale Metropolitan Borough Council





**Summary of findings** p. 2

**OS MasterMap site plan** p.12

**Aerial image** p. 8

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Contact us with any questions at:
info@groundsure.com
08444 159 000

# Summary of findings

| Page | Section | Past land use | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 13 | 1.1 | Historical industrial land uses | 3 | 2 | 7 | 22 | - |
| 15 | 1.2 | Historical tanks | 0 | 0 | 0 | 8 | - |
| 16 | 1.3 | Historical energy features | 0 | 0 | 3 | 9 | - |
| 16 | 1.4 | Historical petrol stations | 0 | 0 | 0 | 0 | - |
| 17 | 1.5 | Historical garages | 0 | 0 | 0 | 3 | - |
| 17 | 1.6 | Historical military land | 0 | 0 | 0 | 0 | - |
| Page | Section | Past land use - un-grouped | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 18 | 2.1 | Historical industrial land uses | 5 | 5 | 9 | 28 | - |
| 20 | 2.2 | Historical tanks | 0 | 0 | 0 | 20 | - |
| 21 | 2.3 | Historical energy features | 0 | 0 | 7 | 26 | - |
| 23 | 2.4 | Historical petrol stations | 0 | 0 | 0 | 0 | - |
| 23 | 2.5 | Historical garages | 0 | 0 | 0 | 4 | - |
| Page | Section | Waste and landfill | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 24 | 3.1 | Active or recent landfill | 0 | 0 | 0 | 0 | - |
| 24 | 3.2 | Historical landfill (BGS records) | 0 | 0 | 0 | 0 | - |
| 25 | 3.3 | Historical landfill (LA/mapping records) | 1 | 0 | 0 | 2 | - |
| 25 | 3.4 | Historical landfill (EA/NRW records) | 0 | 0 | 0 | 2 | - |
| 26 | 3.5 | Historical waste sites | 0 | 0 | 0 | 0 | - |
| 26 | 3.6 | Licensed waste sites | 0 | 0 | 0 | 0 | - |
| 26 | 3.7 | Waste exemptions | 0 | 0 | 0 | 0 | - |
| Page | Section | Current industrial land use | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 27 | 4.1 | Recent industrial land uses | 1 | 1 | 2 | - | - |
| 28 | 4.2 | Current or recent petrol stations | 0 | 0 | 0 | 2 | - |
| 28 | 4.3 | Electricity cables | 0 | 0 | 0 | 0 | - |
| 28 | 4.4 | Gas pipelines | 0 | 0 | 0 | 0 | - |
| 29 | 4.5 | Sites determined as Contaminated Land | 0 | 0 | 0 | 0 | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 29 | 4.6 | Control of Major Accident Hazards (COMAH) | 0 | 0 | 0 | 0 | - |
| 29 | 4.7 | Regulated explosive sites | 0 | 0 | 0 | 0 | - |
| 29 | 4.8 | Hazardous substance storage/usage | 0 | 0 | 0 | 0 | - |
| 29 | 4.9 | Historical licensed industrial activities (IPC) | 0 | 0 | 0 | 0 | - |
| 30 | 4.10 | Licensed industrial activities (Part A(1)) | 0 | 0 | 0 | 0 | - |
| 30 | 4.11 | Licensed pollutant release (Part A(2)/B) | 0 | 0 | 0 | 0 | - |
| 30 | 4.12 | Radioactive Substance Authorisations | 0 | 0 | 0 | 0 | - |
| **30** | **4.13** | **Licensed Discharges to controlled waters** | 0 | 0 | 2 | 1 | - |
| 31 | 4.14 | Pollutant release to surface waters (Red List) | 0 | 0 | 0 | 0 | - |
| 31 | 4.15 | Pollutant release to public sewer | 0 | 0 | 0 | 0 | - |
| 31 | 4.16 | List 1 Dangerous Substances | 0 | 0 | 0 | 0 | - |
| **32** | **4.17** | **List 2 Dangerous Substances** | 0 | 0 | 1 | 0 | - |
| **32** | **4.18** | **Pollution Incidents (EA/NRW)** | 0 | 0 | 2 | 4 | - |
| 33 | 4.19 | Pollution inventory substances | 0 | 0 | 0 | 0 | - |
| 33 | 4.20 | Pollution inventory waste transfers | 0 | 0 | 0 | 0 | - |
| 33 | 4.21 | Pollution inventory radioactive waste | 0 | 0 | 0 | 0 | - |

| Page | Section | Hydrogeology | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| **34** | **5.1** | **Superficial aquifer** | Identified (within 500m) | | | | |
| **36** | **5.2** | **Bedrock aquifer** | Identified (within 500m) | | | | |
| **37** | **5.3** | **Groundwater vulnerability** | Identified (within 50m) | | | | |
| 38 | 5.4 | Groundwater vulnerability- soluble rock risk | None (within 0m) | | | | |
| 38 | 5.5 | Groundwater vulnerability- local information | None (within 0m) | | | | |
| **39** | **5.6** | **Groundwater abstractions** | 0 | 0 | 0 | 0 | 13 |
| **43** | **5.7** | **Surface water abstractions** | 0 | 0 | 0 | 0 | 21 |
| **48** | **5.8** | **Potable abstractions** | 0 | 0 | 0 | 0 | 3 |
| **49** | **5.9** | **Source Protection Zones** | 1 | 0 | 0 | 0 | - |
| 50 | 5.10 | Source Protection Zones (confined aquifer) | 0 | 0 | 0 | 0 | - |

| Page | Section | Hydrology | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| **51** | **6.1** | **Water Network (OS MasterMap)** | 0 | 0 | 29 | - | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 54 | 6.2 | Surface water features | 1 | 0 | 16 | - | - |
| 54 | 6.3 | WFD Surface water body catchments | 1 | - | - | - | - |
| 55 | 6.4 | WFD Surface water bodies | 0 | 0 | 1 | - | - |
| 55 | 6.5 | WFD Groundwater bodies | 1 | - | - | - | - |

| Page | Section | River and coastal flooding | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 56 | 7.1 | Risk of flooding from rivers and the sea | None (within 50m) | | | | |
| 56 | 7.2 | Historical Flood Events | 0 | 0 | 0 | - | - |
| 56 | 7.3 | Flood Defences | 0 | 0 | 0 | - | - |
| 57 | 7.4 | Areas Benefiting from Flood Defences | 0 | 0 | 0 | - | - |
| 57 | 7.5 | Flood Storage Areas | 0 | 0 | 0 | - | - |
| 58 | 7.6 | Flood Zone 2 | None (within 50m) | | | | |
| 58 | 7.7 | Flood Zone 3 | None (within 50m) | | | | |

| Page | Section | Surface water flooding | |
|---|---|---|---|
| 59 | 8.1 | Surface water flooding | 1 in 30 year, Greater than 1.0m (within 50m) |

| Page | Section | Groundwater flooding | |
|---|---|---|---|
| 61 | 9.1 | Groundwater flooding | Moderate (within 50m) |

| Page | Section | Environmental designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 62 | 10.1 | Sites of Special Scientific Interest (SSSI) | 0 | 0 | 0 | 1 | 1 |
| 63 | 10.2 | Conserved wetland sites (Ramsar sites) | 0 | 0 | 0 | 0 | 0 |
| 63 | 10.3 | Special Areas of Conservation (SAC) | 0 | 0 | 0 | 1 | 1 |
| 64 | 10.4 | Special Protection Areas (SPA) | 0 | 0 | 0 | 0 | 0 |
| 64 | 10.5 | National Nature Reserves (NNR) | 0 | 0 | 0 | 0 | 0 |
| 64 | 10.6 | Local Nature Reserves (LNR) | 0 | 0 | 0 | 0 | 0 |
| 64 | 10.7 | Designated Ancient Woodland | 0 | 0 | 0 | 0 | 0 |
| 64 | 10.8 | Biosphere Reserves | 0 | 0 | 0 | 0 | 0 |
| 65 | 10.9 | Forest Parks | 0 | 0 | 0 | 0 | 0 |
| 65 | 10.10 | Marine Conservation Zones | 0 | 0 | 0 | 0 | 0 |
| 65 | 10.11 | Green Belt | 0 | 0 | 0 | 0 | 4 |
| 65 | 10.12 | Proposed Ramsar sites | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 66 | 10.13 | Possible Special Areas of Conservation (pSAC) | 0 | 0 | 0 | 0 | 0 |
| 66 | 10.14 | Potential Special Protection Areas (pSPA) | 0 | 0 | 0 | 0 | 0 |
| 66 | 10.15 | Nitrate Sensitive Areas | 0 | 0 | 0 | 0 | 0 |
| 66 | 10.16 | Nitrate Vulnerable Zones | 0 | 0 | 0 | 0 | 0 |
| **67** | **10.17** | **SSSI Impact Risk Zones** | 2 | - | - | - | - |
| **69** | **10.18** | **SSSI Units** | 0 | 0 | 0 | 1 | 1 |
| Page | Section | Visual and cultural designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 70 | 11.1 | World Heritage Sites | 0 | 0 | 0 | - | - |
| 70 | 11.2 | Area of Outstanding Natural Beauty | 0 | 0 | 0 | - | - |
| 70 | 11.3 | National Parks | 0 | 0 | 0 | - | - |
| 70 | 11.4 | Listed Buildings | 0 | 0 | 0 | - | - |
| 71 | 11.5 | Conservation Areas | 0 | 0 | 0 | - | - |
| 71 | 11.6 | Scheduled Ancient Monuments | 0 | 0 | 0 | - | - |
| 71 | 11.7 | Registered Parks and Gardens | 0 | 0 | 0 | - | - |
| Page | Section | Agricultural designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **72** | **12.1** | **Agricultural Land Classification** | Urban (within 250m) | | | | |
| 73 | 12.2 | Open Access Land | 0 | 0 | 0 | - | - |
| 73 | 12.3 | Tree Felling Licences | 0 | 0 | 0 | - | - |
| 73 | 12.4 | Environmental Stewardship Schemes | 0 | 0 | 0 | - | - |
| 73 | 12.5 | Countryside Stewardship Schemes | 0 | 0 | 0 | - | - |
| Page | Section | Habitat designations | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **74** | **13.1** | **Priority Habitat Inventory** | 0 | 0 | 4 | - | - |
| **75** | **13.2** | **Habitat Networks** | 2 | 0 | 2 | - | - |
| 75 | 13.3 | Open Mosaic Habitat | 0 | 0 | 0 | - | - |
| 75 | 13.4 | Limestone Pavement Orders | 0 | 0 | 0 | - | - |
| Page | Section | Geology 1:10,000 scale | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| **76** | **14.1** | **10k Availability** | Identified (within 500m) | | | | |
| **77** | **14.2** | **Artificial and made ground (10k)** | 1 | 2 | 3 | 3 | - |
| **79** | **14.3** | **Superficial geology (10k)** | 3 | 0 | 6 | 2 | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 80 | 14.4 | Landslip (10k) | 0 | 0 | 0 | 0 | - |
| 81 | 14.5 | Bedrock geology (10k) | 1 | 0 | 2 | 0 | - |
| 82 | 14.6 | Bedrock faults and other linear features (10k) | 0 | 0 | 3 | 0 | - |
| Page | Section | Geology 1:50,000 scale | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 83 | 15.1 | 50k Availability | Identified (within 500m) | | | | |
| 84 | 15.2 | Artificial and made ground (50k) | 0 | 0 | 0 | 0 | - |
| 84 | 15.3 | Artificial ground permeability (50k) | 0 | 0 | - | - | - |
| 85 | 15.4 | Superficial geology (50k) | 3 | 0 | 5 | 5 | - |
| 86 | 15.5 | Superficial permeability (50k) | Identified (within 50m) | | | | |
| 86 | 15.6 | Landslip (50k) | 0 | 0 | 0 | 0 | - |
| 87 | 15.7 | Landslip permeability (50k) | None (within 50m) | | | | |
| 88 | 15.8 | Bedrock geology (50k) | 1 | 0 | 3 | 2 | - |
| 89 | 15.9 | Bedrock permeability (50k) | Identified (within 50m) | | | | |
| 89 | 15.10 | Bedrock faults and other linear features (50k) | 0 | 0 | 3 | 1 | - |
| Page | Section | Boreholes | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 90 | 16.1 | BGS Boreholes | 0 | 0 | 0 | - | - |
| Page | Section | Natural ground subsidence | | | | | |
| 91 | 17.1 | Shrink swell clays | Very low (within 50m) | | | | |
| 92 | 17.2 | Running sands | Very low (within 50m) | | | | |
| 93 | 17.3 | Compressible deposits | Negligible (within 50m) | | | | |
| 94 | 17.4 | Collapsible deposits | Very low (within 50m) | | | | |
| 95 | 17.5 | Landslides | Low (within 50m) | | | | |
| 97 | 17.6 | Ground dissolution of soluble rocks | Negligible (within 50m) | | | | |
| Page | Section | Mining, ground workings and natural cavities | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
| 98 | 18.1 | Natural cavities | 0 | 0 | 0 | 0 | - |
| 99 | 18.2 | BritPits | 0 | 0 | 0 | 0 | - |
| 99 | 18.3 | Surface ground workings | 1 | 4 | 8 | - | - |
| 100 | 18.4 | Underground workings | 0 | 0 | 0 | 0 | 25 |
| 101 | 18.5 | Historical Mineral Planning Areas | 0 | 0 | 0 | 0 | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 101 | 18.6 | Non-coal mining | 0 | 0 | 0 | 0 | 0 |
| 101 | 18.7 | Mining cavities | 0 | 0 | 0 | 0 | 0 |
| 101 | 18.8 | JPB mining areas | None (within 0m) | | | | |
| **102** | **18.9** | **Coal mining** | Identified (within 0m) | | | | |
| 102 | 18.10 | Brine areas | None (within 0m) | | | | |
| 102 | 18.11 | Gypsum areas | None (within 0m) | | | | |
| 102 | 18.12 | Tin mining | None (within 0m) | | | | |
| 102 | 18.13 | Clay mining | None (within 0m) | | | | |

| Page | Section | Radon | | | | | |
|---|---|---|---|---|---|---|---|
| **103** | **19.1** | **Radon** | Less than 1% (within 0m) | | | | |

| Page | Section | Soil chemistry | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| **104** | **20.1** | **BGS Estimated Background Soil Chemistry** | 5 | 8 | - | - | - |
| 105 | 20.2 | BGS Estimated Urban Soil Chemistry | 0 | 0 | - | - | - |
| 105 | 20.3 | BGS Measured Urban Soil Chemistry | 0 | 0 | - | - | - |

| Page | Section | Railway infrastructure and projects | On site | 0-50m | 50-250m | 250-500m | 500-2000m |
|---|---|---|---|---|---|---|---|
| 106 | 21.1 | Underground railways (London) | 0 | 0 | 0 | - | - |
| 106 | 21.2 | Underground railways (Non-London) | 0 | 0 | 0 | - | - |
| 107 | 21.3 | Railway tunnels | 0 | 0 | 0 | - | - |
| **107** | **21.4** | **Historical railway and tunnel features** | 4 | 4 | 0 | - | - |
| 107 | 21.5 | Royal Mail tunnels | 0 | 0 | 0 | - | - |
| 108 | 21.6 | Historical railways | 0 | 0 | 0 | - | - |
| **108** | **21.7** | **Railways** | 0 | 7 | 1 | - | - |
| 108 | 21.8 | Crossrail 1 | 0 | 0 | 0 | 0 | - |
| 109 | 21.9 | Crossrail 2 | 0 | 0 | 0 | 0 | - |
| 109 | 21.10 | HS2 | 0 | 0 | 0 | 0 | - |

## Recent aerial photograph




Capture Date: 23/05/2019

Site Area: 2.63ha

## Recent site history - 2018 aerial photograph




Capture Date: 01/07/2018

Site Area: 2.63ha

# Recent site history - 2012 aerial photograph




Capture Date: 26/03/2012

Site Area: 2.63ha

# Recent site history - 2000 aerial photograph




Capture Date: 19/06/2000

Site Area: 2.63ha

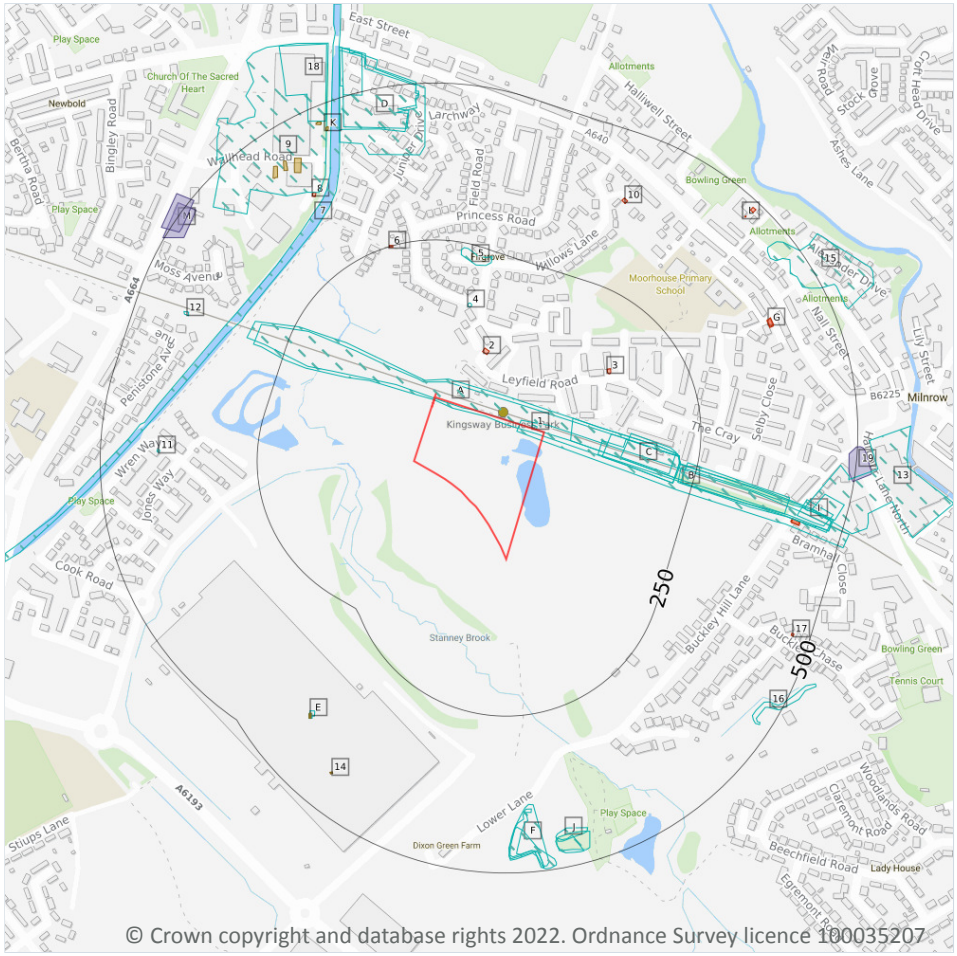
## OS MasterMap site plan




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Site Area: 2.63ha

# 1 Past land use




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## 1.1 Historical industrial land uses

| Records within 500m | 34 |
|---|---|

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| **A** | **On site** | **Railway Sidings** | **1954** | **724759** |

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| **A** | **On site** | **Railway Sidings** | **1908 - 1938** | **751687** |
| **B** | **On site** | **Cuttings** | **1851** | **786262** |
| 1 | 1m N | Railway Building | 1908 - 1938 | 783697 |
| B | 43m E | Cuttings | 1928 - 1938 | 765393 |
| B | 93m E | Cuttings | 1891 - 1908 | 779322 |
| C | 100m E | Cuttings | 1954 | 734088 |
| C | 129m E | Cuttings | 1976 | 739294 |
| 4 | 153m N | Pump | 1851 | 675559 |
| 5 | 220m N | Gravel Pit | 1928 | 652793 |
| B | 225m E | Cuttings | 1954 | 755622 |
| B | 231m E | Cuttings | 1967 - 1976 | 694503 |
| 7 | 317m NW | Disused Canal | 1976 | 754144 |
| 9 | 374m NW | Unspecified Works | 1976 | 678989 |
| D | 386m N | Unspecified Mill | 1967 - 1976 | 695566 |
| E | 389m SW | Unspecified Tank | 1976 | 734152 |
| F | 392m S | Unspecified Heap | 1928 - 1938 | 756700 |
| E | 395m SW | Unspecified Tank | 1908 | 751839 |
| F | 399m S | Unspecified Ground Workings | 1954 | 790979 |
| 11 | 406m W | Pump | 1851 | 675561 |
| 12 | 413m W | Railway Building | 1938 | 670151 |
| I | 424m E | Cuttings | 1976 | 773256 |
| D | 425m N | Unspecified Mill | 1954 | 699075 |
| F | 427m S | Unspecified Ground Workings | 1908 | 734223 |
| D | 430m N | Unspecified Mill | 1908 - 1938 | 733595 |
| 13 | 432m E | Unspecified Commercial/Industrial | 1954 | 712244 |
| J | 439m S | Unspecified Heap | 1908 - 1938 | 731546 |
| I | 444m E | Unspecified Works | 1908 | 678987 |
| J | 448m S | Unspecified Pit | 1967 | 690648 |

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| J | 451m S | Unspecified Heap | 1954 | 710976 |
| 15 | 455m NE | Sandstone Quarry | 1851 | 687572 |
| 16 | 465m SE | Unspecified Ground Workings | 1954 | 647991 |
| 18 | 473m N | Unspecified Mill | 1967 | 745503 |
| D | 495m N | Unspecified Mill | 1891 | 775083 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.2 Historical tanks

| **Records within 500m** | **8** |
|---|---|

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| E | 396m SW | Unspecified Tank | 1955 | 88604 |
| E | 398m SW | Unspecified Tank | 1910 | 92886 |
| H | 416m NW | Tanks | 1988 | 87640 |
| H | 430m NW | Tanks | 1988 | 87641 |
| H | 430m NW | Tanks | 1988 | 87639 |
| 14 | 438m SW | Tanks | 1955 | 98986 |
| K | 457m N | Tanks | 1988 - 1997 | 100658 |
| K | 470m NW | Unspecified Tank | 1988 - 1997 | 94216 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.3 Historical energy features

| Records within 500m | 12 |
|---|---|

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| 2 | 90m N | Electricity Substation | 1984 | 59344 |
| 3 | 139m NE | Electricity Substation | 1983 - 1996 | 52949 |
| 6 | 247m N | Electricity Substation | 1984 | 58271 |
| 8 | 372m NW | Electricity Substation | 1988 - 1997 | 54991 |
| 10 | 387m N | Electricity Substation | 1955 - 1989 | 54904 |
| G | 397m NE | Electricity Substation | 1996 | 48183 |
| G | 397m NE | Electricity Substation | 1975 - 1989 | 54152 |
| I | 417m E | Electricity Substation | 1983 | 54013 |
| I | 418m E | Electricity Substation | 1975 - 1996 | 53917 |
| L | 469m NE | Electricity Substation | 1973 | 45419 |
| 17 | 470m E | Electricity Substation | 1995 | 45544 |
| L | 483m NE | Electricity Substation | 1982 - 1989 | 52765 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.4 Historical petrol stations

| Records within 500m | 0 |
|---|---|

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.5 Historical garages

| Records within 500m | 3 |
|---|---|

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

| ID | Location | Land use | Dates present | Group ID |
|---|---|---|---|---|
| M | 474m NW | Garage | 1979 - 1985 | 19493 |
| M | 485m NW | Garage | 1979 | 15479 |
| 19 | 487m E | Garage | 1968 | 14602 |

*This data is sourced from Ordnance Survey / Groundsure.*

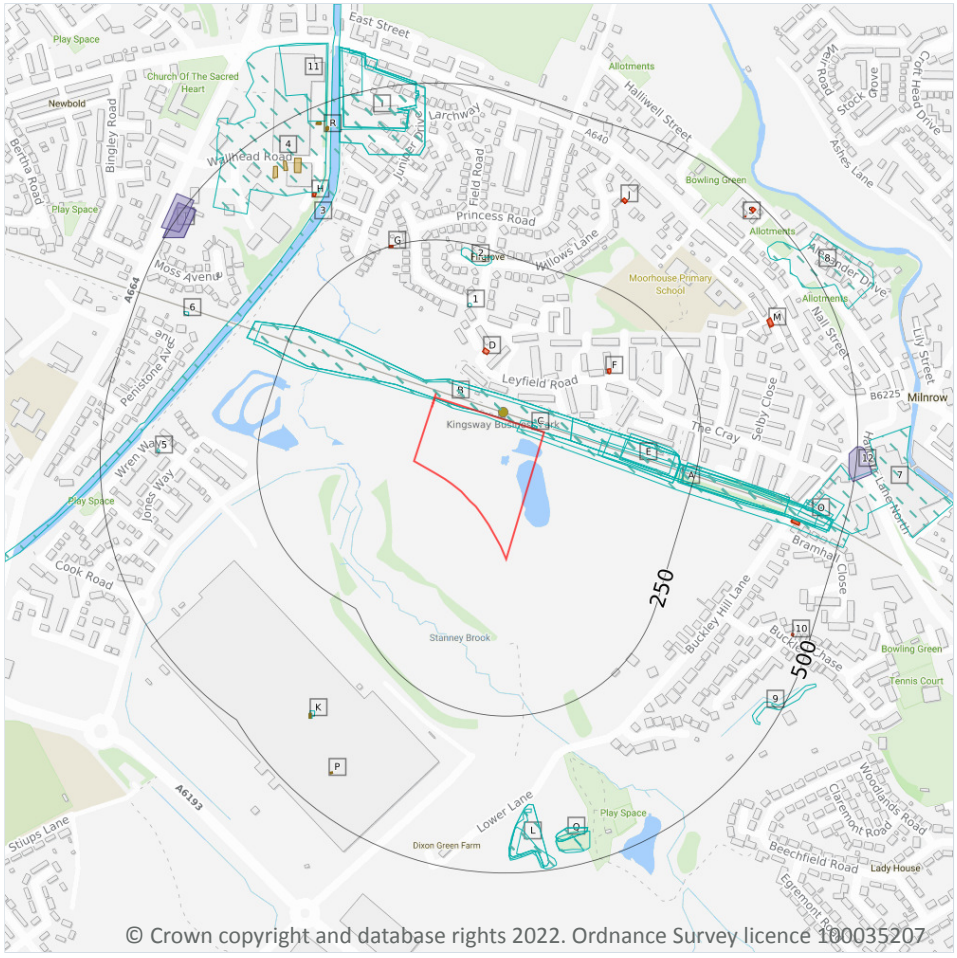
## 1.6 Historical military land

| Records within 500m | 0 |
|---|---|

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

*This data is sourced from Ordnance Survey / Groundsure / other sources.*

# 2 Past land use - un-grouped



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## 2.1 Historical industrial land uses

| Records within 500m | 47 |
|---|---|

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 18**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| **A** | **On site** | **Cuttings** | **1851** | **786262** |
| **B** | **On site** | **Railway Sidings** | **1954** | **724759** |
| **B** | **On site** | **Railway Sidings** | **1938** | **751687** |

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| **B** | **On site** | **Railway Sidings** | **1928** | **751687** |
| **B** | **On site** | **Railway Sidings** | **1908** | **751687** |
| C | 1m N | Railway Building | 1938 | 783697 |
| C | 1m N | Railway Building | 1928 | 783697 |
| C | 1m N | Railway Building | 1908 | 783697 |
| A | 43m E | Cuttings | 1938 | 765393 |
| A | 43m E | Cuttings | 1928 | 765393 |
| A | 93m E | Cuttings | 1891 | 779322 |
| E | 100m E | Cuttings | 1954 | 734088 |
| A | 127m E | Cuttings | 1908 | 779322 |
| E | 129m E | Cuttings | 1976 | 739294 |
| 1 | 153m N | Pump | 1851 | 675559 |
| 2 | 220m N | Gravel Pit | 1928 | 652793 |
| A | 225m E | Cuttings | 1954 | 755622 |
| A | 231m E | Cuttings | 1976 | 694503 |
| A | 231m E | Cuttings | 1967 | 694503 |
| 3 | 317m NW | Disused Canal | 1976 | 754144 |
| 4 | 374m NW | Unspecified Works | 1976 | 678989 |
| I | 386m N | Unspecified Mill | 1976 | 695566 |
| I | 386m N | Unspecified Mill | 1967 | 695566 |
| K | 389m SW | Unspecified Tank | 1976 | 734152 |
| L | 392m S | Unspecified Heap | 1938 | 756700 |
| L | 392m S | Unspecified Heap | 1928 | 756700 |
| K | 395m SW | Unspecified Tank | 1908 | 751839 |
| L | 399m S | Unspecified Ground Workings | 1954 | 790979 |
| 5 | 406m W | Pump | 1851 | 675561 |
| 6 | 413m W | Railway Building | 1938 | 670151 |
| O | 424m E | Cuttings | 1976 | 773256 |

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| I | 425m N | Unspecified Mill | 1954 | 699075 |
| L | 427m S | Unspecified Ground Workings | 1908 | 734223 |
| I | 430m N | Unspecified Mill | 1938 | 733595 |
| I | 430m N | Unspecified Mill | 1928 | 733595 |
| I | 430m N | Unspecified Mill | 1908 | 733595 |
| 7 | 432m E | Unspecified Commercial/Industrial | 1954 | 712244 |
| Q | 439m S | Unspecified Heap | 1938 | 731546 |
| Q | 439m S | Unspecified Heap | 1928 | 731546 |
| Q | 439m S | Unspecified Heap | 1908 | 731546 |
| O | 444m E | Unspecified Works | 1908 | 678987 |
| Q | 448m S | Unspecified Pit | 1967 | 690648 |
| Q | 451m S | Unspecified Heap | 1954 | 710976 |
| 8 | 455m NE | Sandstone Quarry | 1851 | 687572 |
| 9 | 465m SE | Unspecified Ground Workings | 1954 | 647991 |
| 11 | 473m N | Unspecified Mill | 1967 | 745503 |
| I | 495m N | Unspecified Mill | 1891 | 775083 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.2 Historical tanks

| **Records within 500m** | **20** |
|---|---|

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 18**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| K | 396m SW | Unspecified Tank | 1955 | 88604 |
| K | 396m SW | Unspecified Tank | 1955 | 88604 |
| K | 398m SW | Unspecified Tank | 1910 | 92886 |
| N | 416m NW | Tanks | 1988 | 87640 |

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| N | 430m NW | Tanks | 1988 | 87641 |
| N | 430m NW | Tanks | 1988 | 87639 |
| P | 438m SW | Tanks | 1955 | 98986 |
| P | 438m SW | Tanks | 1955 | 98986 |
| R | 457m N | Tanks | 1988 | 100658 |
| R | 458m N | Tanks | 1995 | 100658 |
| R | 458m N | Tanks | 1997 | 100658 |
| R | 458m N | Tanks | 1995 | 100658 |
| R | 458m N | Tanks | 1996 | 100658 |
| R | 458m N | Tanks | 1995 | 100658 |
| R | 470m NW | Unspecified Tank | 1988 | 94216 |
| R | 471m NW | Unspecified Tank | 1997 | 94216 |
| R | 471m NW | Unspecified Tank | 1995 | 94216 |
| R | 471m NW | Unspecified Tank | 1996 | 94216 |
| R | 471m NW | Unspecified Tank | 1995 | 94216 |
| R | 471m NW | Unspecified Tank | 1995 | 94216 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.3 Historical energy features

**Records within 500m** **33**

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 18**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| D | 90m N | Electricity Substation | 1984 | 59344 |
| D | 90m N | Electricity Substation | 1984 | 59344 |
| F | 139m NE | Electricity Substation | 1983 | 52949 |
| F | 139m NE | Electricity Substation | 1996 | 52949 |

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| F | 140m NE | Electricity Substation | 1989 | 52949 |
| G | 247m N | Electricity Substation | 1984 | 58271 |
| G | 247m N | Electricity Substation | 1984 | 58271 |
| H | 372m NW | Electricity Substation | 1988 | 54991 |
| H | 372m NW | Electricity Substation | 1997 | 54991 |
| H | 372m NW | Electricity Substation | 1995 | 54991 |
| H | 372m NW | Electricity Substation | 1996 | 54991 |
| H | 372m NW | Electricity Substation | 1995 | 54991 |
| H | 372m NW | Electricity Substation | 1995 | 54991 |
| J | 387m N | Electricity Substation | 1955 | 54904 |
| J | 387m N | Electricity Substation | 1989 | 54904 |
| J | 387m N | Electricity Substation | 1973 | 54904 |
| J | 387m N | Electricity Substation | 1982 | 54904 |
| J | 387m N | Electricity Substation | 1982 | 54904 |
| J | 387m N | Electricity Substation | 1987 | 54904 |
| J | 387m N | Electricity Substation | 1955 | 54904 |
| M | 397m NE | Electricity Substation | 1996 | 48183 |
| M | 397m NE | Electricity Substation | 1989 | 54152 |
| M | 397m NE | Electricity Substation | 1975 | 54152 |
| O | 417m E | Electricity Substation | 1983 | 54013 |
| O | 418m E | Electricity Substation | 1996 | 53917 |
| O | 419m E | Electricity Substation | 1989 | 53917 |
| O | 419m E | Electricity Substation | 1975 | 53917 |
| S | 469m NE | Electricity Substation | 1973 | 45419 |
| 10 | 470m E | Electricity Substation | 1995 | 45544 |
| S | 483m NE | Electricity Substation | 1982 | 52765 |
| S | 483m NE | Electricity Substation | 1982 | 52765 |
| S | 483m NE | Electricity Substation | 1987 | 52765 |

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| S | 483m NE | Electricity Substation | 1989 | 52765 |

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.4 Historical petrol stations

| Records within 500m | 0 |
|---|---|

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

*This data is sourced from Ordnance Survey / Groundsure.*

## 2.5 Historical garages

| Records within 500m | 4 |
|---|---|

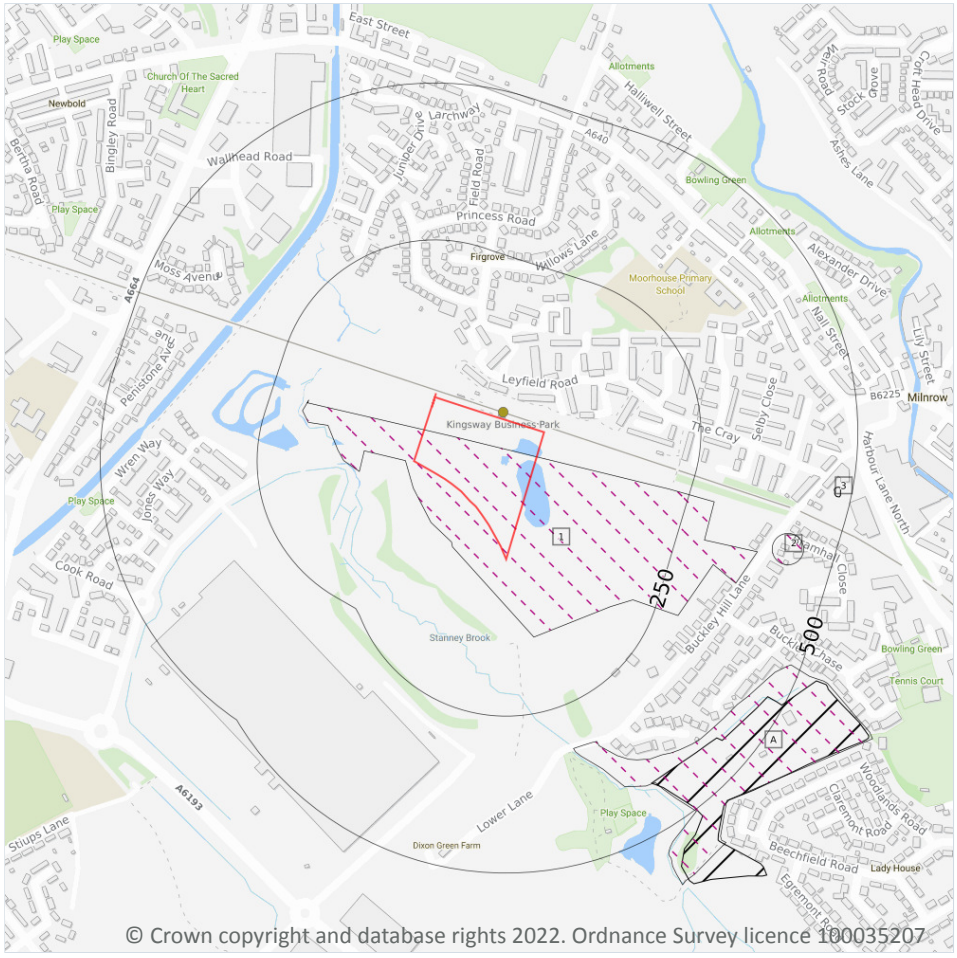
Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 18**

| ID | Location | Land Use | Date | Group ID |
|---|---|---|---|---|
| T | 474m NW | Garage | 1979 | 19493 |
| T | 474m NW | Garage | 1985 | 19493 |
| T | 485m NW | Garage | 1979 | 15479 |
| 12 | 487m E | Garage | 1968 | 14602 |

*This data is sourced from Ordnance Survey / Groundsure.*

# 3 Waste and landfill




Site Outline

Search buffers in metres (m)

Historical landfill (EA/NRW)

Historical landfill (LA/OS)

## 3.1 Active or recent landfill

| Records within 500m | 0 |
|---|---|

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 3.2 Historical landfill (BGS records)

| Records within 500m | 0 |
|---|---|

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

*This data is sourced from the British Geological Survey.*

## 3.3 Historical landfill (LA/mapping records)

| Records within 500m | 3 |
|---|---|

Landfill sites identified from Local Authority records and high detail historical mapping.

Features are displayed on the Waste and landfill map on **page 24**

| ID | Location | Site address | Source | Data type |
|---|---|---|---|---|
| **1** | **On site** | **Buckley hill lane,Rochdale** | **Rochdale** | **Polygon** |
| A | 320m S | Little Lane, Off Harbour Lane, Milnrow | Rochdale Council | Polygon |
| 2 | 401m E | Ex Universal Laundry Lodge | Rochdale Council | Point |

*This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.*

## 3.4 Historical landfill (EA/NRW records)

| Records within 500m | 2 |
|---|---|

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

Features are displayed on the Waste and landfill map on **page 24**

| ID | Location | Details | | |
|---|---|---|---|---|
| A | 425m SE | Site Address: Little Lane, Off Harbour Lane, Milnrow, Greater Manchester<br>Licence Holder Address: - | Waste Licence: -<br>Site Reference: D073<br>Waste Type: -<br>Environmental Permitting Regulations (Waste) Reference: -<br>Licence Issue: -<br>Licence Surrender: - | Operator: -<br>Licence Holder: -<br>First Recorded -<br>Last Recorded: - |
| 3 | 471m E | Site Address: Ex Universal Laundry Lodge, Buckley Hill Lane, Milnrow, Rochdale<br>Licence Holder Address: Lane Bottom, Newhey, Rochdale | Waste Licence: Yes<br>Site Reference: RD/LIC/493/87<br>Waste Type: Inert<br>Environmental Permitting Regulations (Waste) Reference: -<br>Licence Issue: 01/07/1988<br>Licence Surrender: - | Operator: -<br>Licence Holder: Lane Bottom Industrial Equitables Pioneers<br>First Recorded 01/08/1988<br>Last Recorded: 31/12/1988 |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 3.5 Historical waste sites

| Records within 500m | 0 |
|---|---|

Waste site records derived from Local Authority planning records and high detail historical mapping.

*This data is sourced from Ordnance Survey/Groundsure and Local Authority records.*

## 3.6 Licensed waste sites

| Records within 500m | 0 |
|---|---|

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

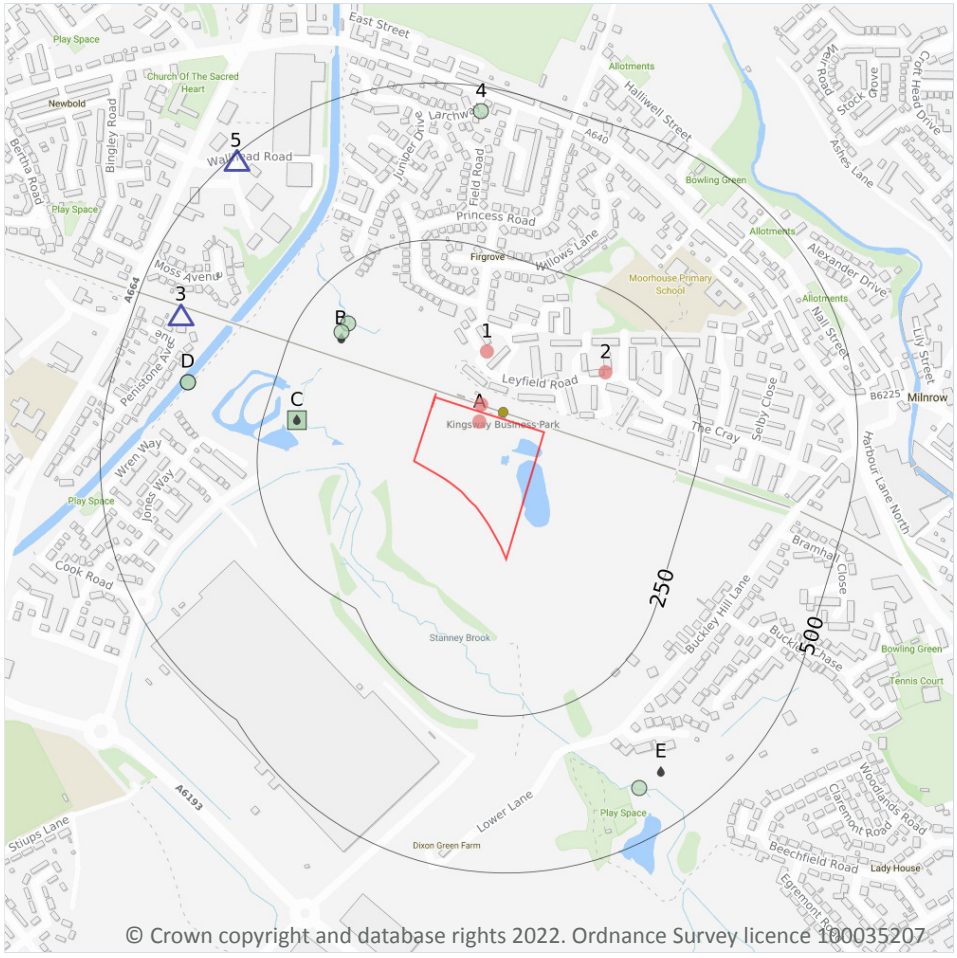
## 3.7 Waste exemptions

| Records within 500m | 0 |
|---|---|

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

# 4 Current industrial land use




Site Outline

Search buffers in metres (m)

Recent industrial land uses

Current or recent petrol stations

Licensed Discharges to controlled waters

List 2 Dangerous Substances

Pollution Incidents (EA/NRW)

## 4.1 Recent industrial land uses

| Records within 250m | 4 |
|---|---|

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 27**

| ID | Location | Company | Address | Activity | Category |
|---|---|---|---|---|---|
| **A** | **On site** | **Kingsway Business Park** | **Greater Manchester, OL16** | **Business Parks and Industrial Estates** | **Industrial Features** |

| ID | Location | Company | Address | Activity | Category |
|---|---|---|---|---|---|
| A | 12m N | Kingsway Business Park (Mancheste r Metrolink) | Greater Manchester, OL16 | Tram, Metro and Light Railway Stations and Stops | Public Transport, Stations and Infrastructure |
| 1 | 95m N | Electricity Sub Station | Greater Manchester, OL16 | Electrical Features | Infrastructure and Facilities |
| 2 | 137m NE | Electricity Sub Station | Greater Manchester, OL16 | Electrical Features | Infrastructure and Facilities |

*This data is sourced from Ordnance Survey.*

## 4.2 Current or recent petrol stations

| **Records within 500m** | **2** |
|---|---|

Open, closed, under development and obsolete petrol stations.

Features are displayed on the Current industrial land use map on **page 27**

| ID | Location | Company | Address | LPG | Status |
|---|---|---|---|---|---|
| 3 | 426m W | OBSOLETE | Kingsway, Rochdale, Greater Manchester, OL16 4AP | Not Applicable | Obsolete |
| 5 | 492m NW | OBSOLETE | 301, Kingsway, Rochdale, Greater Manchester, OL16 5BX | Not Applicable | Obsolete |

*This data is sourced from Experian.*

## 4.3 Electricity cables

| **Records within 500m** | **0** |
|---|---|

High voltage underground electricity transmission cables.

*This data is sourced from National Grid.*

## 4.4 Gas pipelines

| **Records within 500m** | **0** |
|---|---|

High pressure underground gas transmission pipelines.

*This data is sourced from National Grid.*

## 4.5 Sites determined as Contaminated Land

| Records within 500m | 0 |
|---|---|

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

*This data is sourced from Local Authority records.*

## 4.6 Control of Major Accident Hazards (COMAH)

| Records within 500m | 0 |
|---|---|

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

*This data is sourced from the Health and Safety Executive.*

## 4.7 Regulated explosive sites

| Records within 500m | 0 |
|---|---|

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

*This data is sourced from the Health and Safety Executive.*

## 4.8 Hazardous substance storage/usage

| Records within 500m | 0 |
|---|---|

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

*This data is sourced from Local Authority records.*

## 4.9 Historical licensed industrial activities (IPC)

| Records within 500m | 0 |
|---|---|

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.10 Licensed industrial activities (Part A(1))

| Records within 500m | 0 |
|---|---|

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.11 Licensed pollutant release (Part A(2)/B)

| Records within 500m | 0 |
|---|---|

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

*This data is sourced from Local Authority records.*

## 4.12 Radioactive Substance Authorisations

| Records within 500m | 0 |
|---|---|

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.13 Licensed Discharges to controlled waters

| Records within 500m | 3 |
|---|---|

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

Features are displayed on the Current industrial land use map on **page 27**

| ID | Location | Address | Details | |
|---|---|---|---|---|
| B | 176m NW | THE CRAY PS, MILNROW, ROCHDALE, GREATER MANCHESTER | Effluent Type: SEWAGE DISCHARGES - PUMPING STATION - WATER COMPANY<br>Permit Number: 016982941<br>Permit Version: 1<br>Receiving Water: STANNEY BROOK | Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY)<br>Issue date: -<br>Effective Date: 17/11/1995<br>Revocation Date: - |

| ID | Location | Address | Details | |
|---|---|---|---|---|
| C | 197m W | KINGSWAY BUSINESS PARK, OPPOSITE KINGSWAY HOTEL, KINGSWAY, ROCHDALE, OL16 5HS | Effluent Type: TRADE DISCHARGES - SITE DRAINAGE (CONTAM SURFACE WATER, NOT WASTE SIT<br>Permit Number: 016993832<br>Permit Version: 1<br>Receiving Water: STANNEY BROOK TRIB RIVER ROCH | Status: REVOKED - UNSPECIFIED<br>Issue date: 11/04/2006<br>Effective Date: 11/04/2006<br>Revocation Date: 28/04/2007 |
| E | 418m SE | WHITFIELD DR SPS, WHITFIELD DRIVE, MILNROW, ROCHDALE, GREATER MANCHESTER | Effluent Type: SEWAGE DISCHARGES - PUMPING STATION - WATER COMPANY<br>Permit Number: 016993214<br>Permit Version: 1<br>Receiving Water: STANNEY BROOK | Status: SURRENDERED UNDER EPR 2010<br>Issue date: -<br>Effective Date: 30/09/1997<br>Revocation Date: 07/06/2016 |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.14 Pollutant release to surface waters (Red List)

| **Records within 500m** | **0** |
|---|---|

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.15 Pollutant release to public sewer

| **Records within 500m** | **0** |
|---|---|

Discharges of Special Category Effluents to the public sewer.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.16 List 1 Dangerous Substances

| **Records within 500m** | **0** |
|---|---|

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.17 List 2 Dangerous Substances

| Records within 500m | 1 |
|---|---|

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

Features are displayed on the Current industrial land use map on **page 27**

| ID | Location | Name | Status | Receiving Water | Authorised Substances |
|---|---|---|---|---|---|
| C | 198m W | Kingsway Business Park | Active | River Roch | Iron, pH |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.18 Pollution Incidents (EA/NRW)

| Records within 500m | 6 |
|---|---|

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

Features are displayed on the Current industrial land use map on **page 27**

| ID | Location | Details | |
|---|---|---|---|
| B | 181m NW | Incident Date: 20/02/2003<br>Incident Identification: 138259<br>Pollutant: Sewage Materials<br>Pollutant Description: Crude Sewage | Water Impact: Category 3 (Minor)<br>Land Impact: Category 4 (No Impact)<br>Air Impact: Category 4 (No Impact) |
| B | 181m NW | Incident Date: 12/04/2003<br>Incident Identification: 150636<br>Pollutant: Sewage Materials<br>Pollutant Description: Crude Sewage | Water Impact: Category 3 (Minor)<br>Land Impact: Category 4 (No Impact)<br>Air Impact: Category 4 (No Impact) |
| D | 382m W | Incident Date: 04/07/2002<br>Incident Identification: 89401<br>Pollutant: Oils and Fuel<br>Pollutant Description: Mixed/Waste Oils | Water Impact: Category 3 (Minor)<br>Land Impact: Category 4 (No Impact)<br>Air Impact: Category 4 (No Impact) |
| D | 382m W | Incident Date: 04/07/2002<br>Incident Identification: 89401<br>Pollutant: Oils and Fuel<br>Pollutant Description: Mixed/Waste Oils | Water Impact: Category 3 (Minor)<br>Land Impact: Category 4 (No Impact)<br>Air Impact: Category 4 (No Impact) |
| E | 421m SE | Incident Date: 19/04/2002<br>Incident Identification: 73135<br>Pollutant: Sewage Materials<br>Pollutant Description: Crude Sewage | Water Impact: Category 3 (Minor)<br>Land Impact: Category 4 (No Impact)<br>Air Impact: Category 4 (No Impact) |

| ID | Location | Details | |
|---|---|---|---|
| 4 | 460m N | Incident Date: 01/04/2002<br>Incident Identification: 67928<br>Pollutant: Inert Materials and Wastes<br>Pollutant Description: Construction and Demolition Materials and Wastes | Water Impact: Category 4 (No Impact)<br>Land Impact: Category 3 (Minor)<br>Air Impact: Category 4 (No Impact) |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 4.19 Pollution inventory substances

| **Records within 500m** | **0** |
|---|---|

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

## 4.20 Pollution inventory waste transfers

| **Records within 500m** | **0** |
|---|---|

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

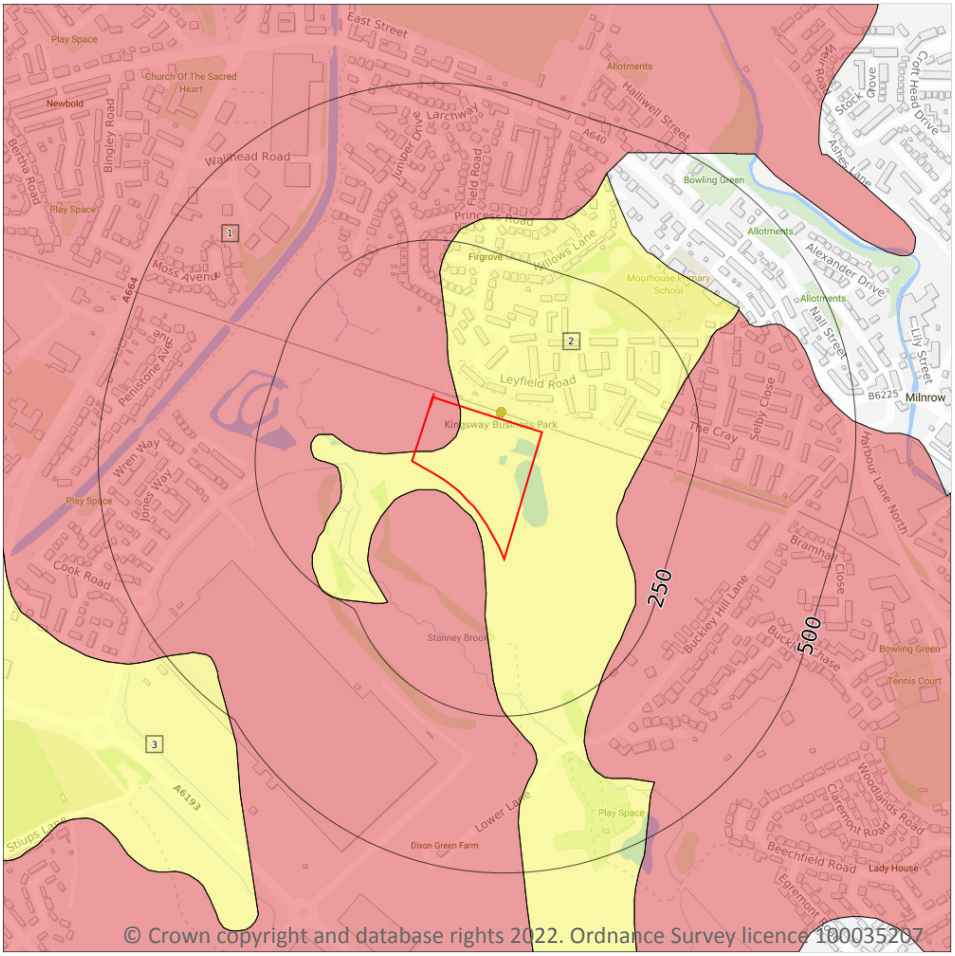
## 4.21 Pollution inventory radioactive waste

| **Records within 500m** | **0** |
|---|---|

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

*This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.*

# 5 Hydrogeology - Superficial aquifer




## 5.1 Superficial aquifer

| Records within 500m | 3 |
|---|---|

Aquifer status of groundwater held within superficial geology.

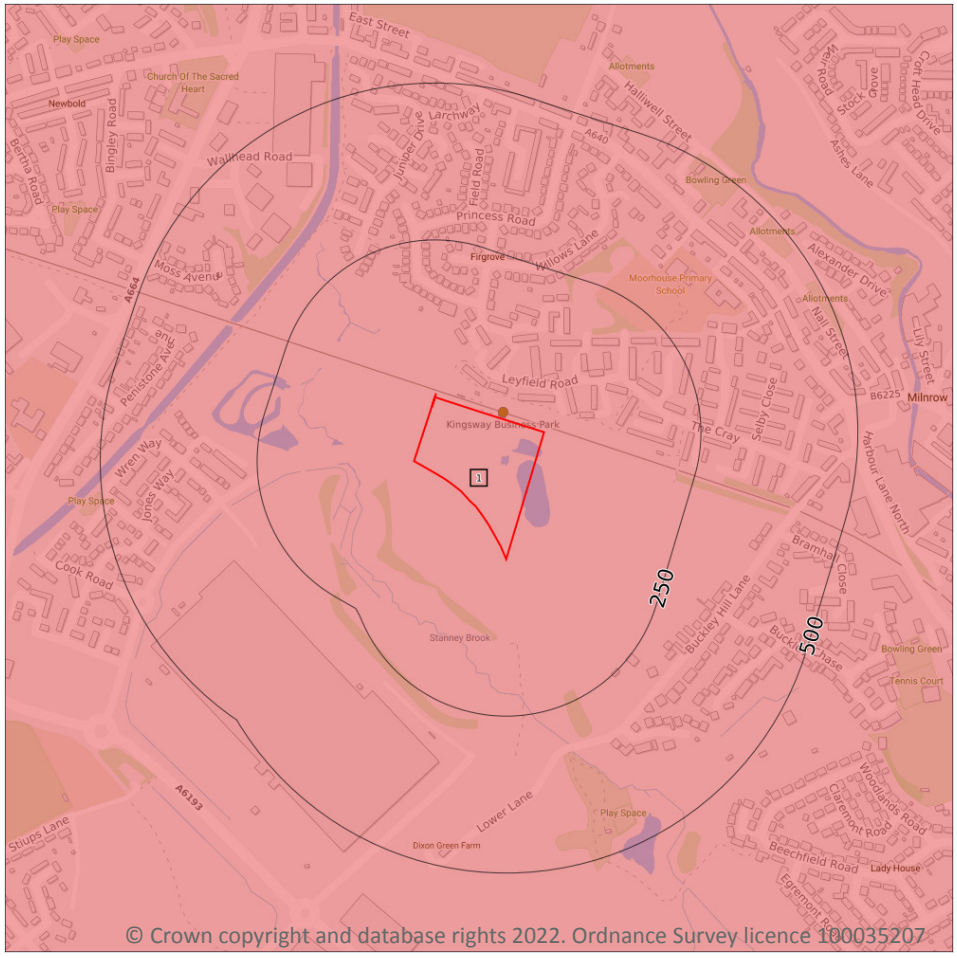
Features are displayed on the Hydrogeology map on **page 34**

| ID | Location | Designation | Description |
|---|---|---|---|
| 1 | On site | Secondary A | Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers |
| 2 | On site | Secondary Undifferentiated | Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type |

| ID | Location | Designation | Description |
|---|---|---|---|
| 3 | 448m SW | Secondary Undifferentiated | Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type |

*This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.*

# Bedrock aquifer




## 5.2 Bedrock aquifer

| Records within 500m | 1 |
|---|---|

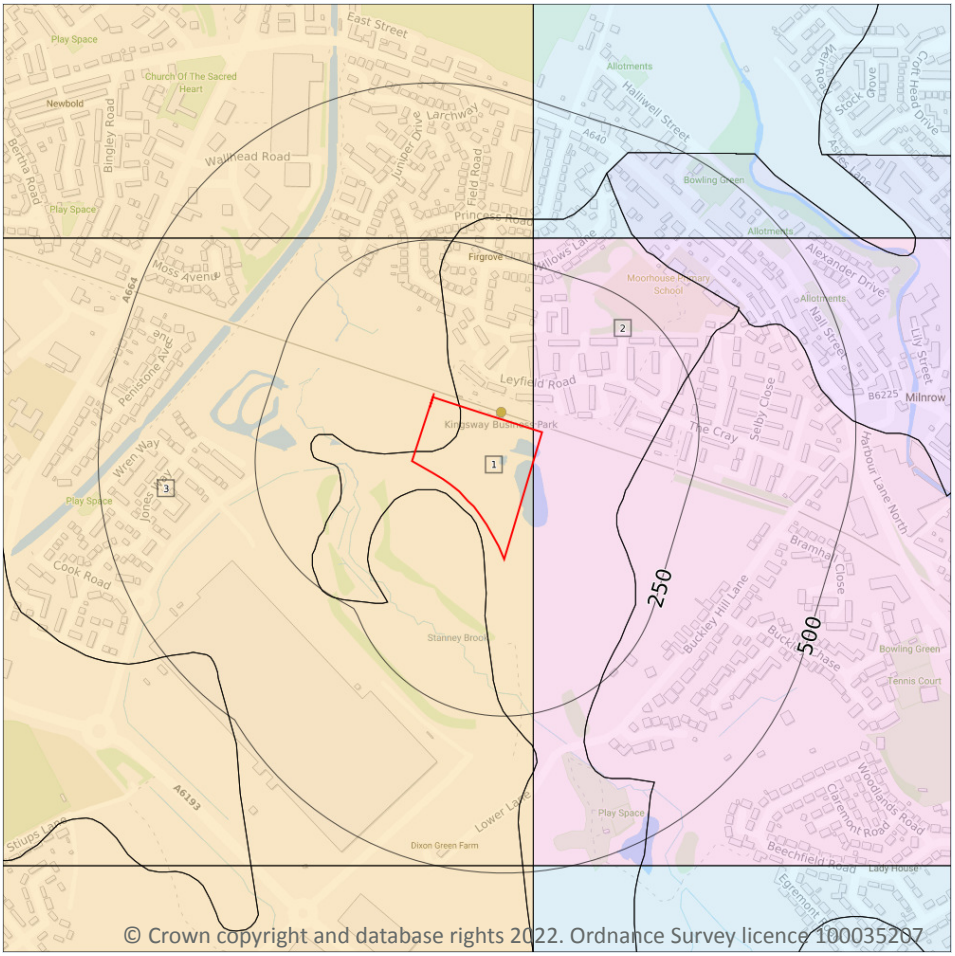
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 36**

| ID | Location | Designation | Description |
|---|---|---|---|
| 1 | On site | Secondary A | Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers |

*This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.*

# Groundwater vulnerability




Site Outline

Search buffers in metres (m)

Superficial vulnerability

- Principal superficial aquifer, high vulnerability
- Secondary superficial aquifer, high vulnerability
- Principal superficial aquifer, medium vulnerability
- Secondary superficial aquifer, medium vulnerability
- Principal superficial aquifer, low vulnerability
- Secondary superficial aquifer, low vulnerability

Bedrock vulnerability

- Principal bedrock aquifer, high vulnerability
- Secondary bedrock aquifer, high vulnerability
- Principal bedrock aquifer, medium vulnerability
- Secondary bedrock aquifer, medium vulnerability
- Principal bedrock aquifer, low vulnerability
- Secondary bedrock aquifer, low vulnerability

Other information

- Unproductive aquifer
- Soluble rock risk
- Local information

## 5.3 Groundwater vulnerability

| Records within 50m | 3 |
|---|---|

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on **page 37**

| ID | Location | Summary | Soil / surface | Superficial geology | Bedrock geology |
|---|---|---|---|---|---|
| 1 | On site | Summary Classification: Secondary superficial aquifer - High Vulnerability<br>Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer | Leaching class: High<br>Infiltration value: >70%<br>Dilution value: >550mm/year | Vulnerability: High<br>Aquifer type: Secondary<br>Thickness: >10m<br>Patchiness value: >90%<br>Recharge potential: High | Vulnerability: Low<br>Aquifer type: Secondary<br>Flow mechanism: Well connected fractures |
| 2 | On site | Summary Classification: Secondary superficial aquifer - Medium Vulnerability<br>Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer | Leaching class: High<br>Infiltration value: <40%<br>Dilution value: >550mm/year | Vulnerability: Medium<br>Aquifer type: Secondary<br>Thickness: >10m<br>Patchiness value: <90%<br>Recharge potential: High | Vulnerability: Medium<br>Aquifer type: Secondary<br>Flow mechanism: Well connected fractures |
| 3 | On site | Summary Classification: Secondary superficial aquifer - High Vulnerability<br>Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer | Leaching class: High<br>Infiltration value: >70%<br>Dilution value: >550mm/year | Vulnerability: High<br>Aquifer type: Secondary<br>Thickness: >10m<br>Patchiness value: >90%<br>Recharge potential: High | Vulnerability: Low<br>Aquifer type: Secondary<br>Flow mechanism: Well connected fractures |

*This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.*

## 5.4 Groundwater vulnerability- soluble rock risk

| Records on site | 0 |
|---|---|

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

*This data is sourced from the British Geological Survey and the Environment Agency.*

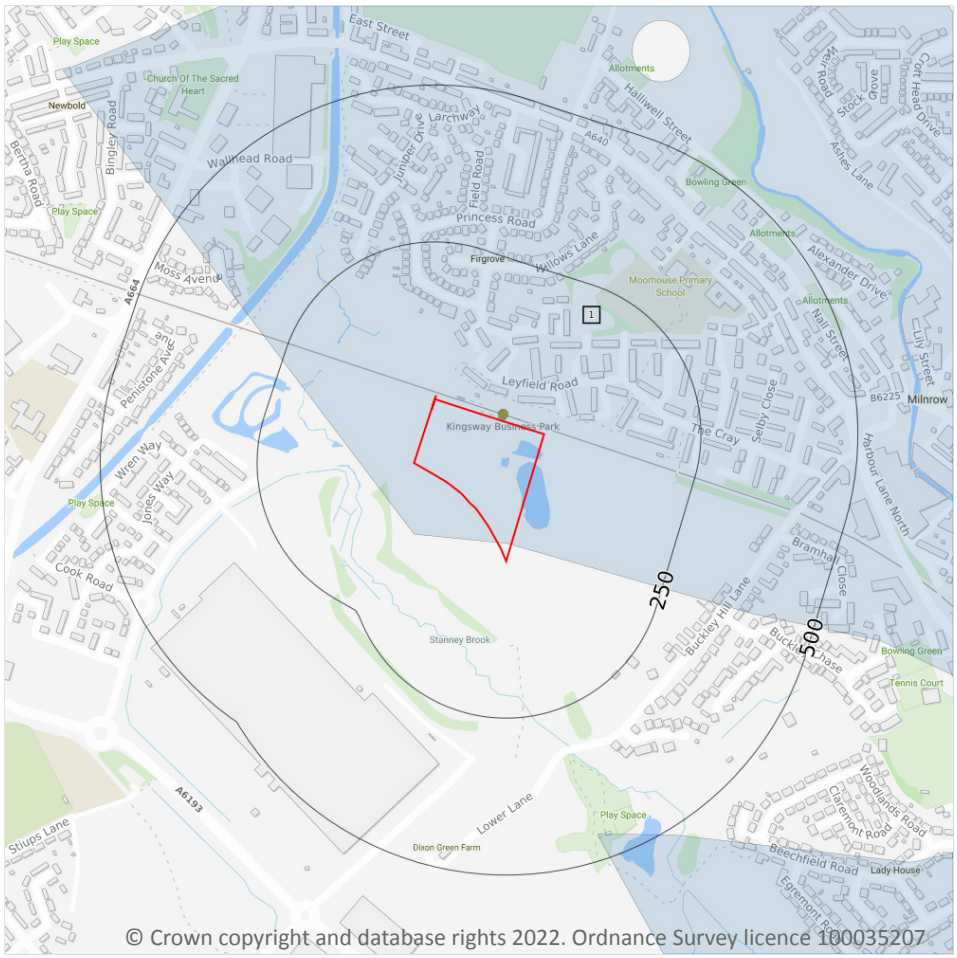
## 5.5 Groundwater vulnerability- local information

| Records on site | 0 |
|---|---|

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk.

*This data is sourced from the British Geological Survey and the Environment Agency.*

# Abstractions and Source Protection Zones




Site Outline

Search buffers in metres (m)

- Source Protection Zone 1 — Inner catchment
- Source Protection Zone 2 — Outer catchment
- Source Protection Zone 3 — Total catchment
- Source Protection Zone 4 — Zone of Special Interest
- Source Protection Zone 1c — Inner catchment - confined aquifer
- Source Protection Zone 2c — Outer catchment - confined aquifer
- Source Protection Zone 3c — Total catchment - confined aquifer
- Drinking water abstraction licences
- Drinking water abstraction licences — Polygon features
- Drinking water abstraction licences — Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

## 5.6 Groundwater abstractions

| Records within 2000m | 13 |
|---|---|

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 39**

| ID | Location | Details | |
|---|---|---|---|
| - | 1046m SW | Status: Historical<br>Licence No: 2569002159<br>Details: General Farming & Domestic<br>Direct Source: Ground Water - North West Region<br>Point: "WELL AT FARM, LOWER LANE, MILNROW, ROCHDALE"<br>Data Type: Point<br>Name: HARTLE<br>Easting: 391400<br>Northing: 411600 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 01/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/02/1966<br>Version End Date: - |
| - | 1046m SW | Status: Historical<br>Licence No: 2569002159<br>Details: General Farming & Domestic<br>Direct Source: Ground Water - North West Region<br>Point: WELL AT FARM, LOWER LANE, MILNROW, ROCHDALE<br>Data Type: Point<br>Name: HARTLE<br>Easting: 391400<br>Northing: 411600 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 01/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/02/1966<br>Version End Date: - |
| - | 1046m SW | Status: Historical<br>Licence No: 2569002159<br>Details: General Farming & Domestic<br>Direct Source: Ground Water - North West Region<br>Point: WELL AT FARM LOWER LANE MILNROW ROCHDALE<br>Data Type: Point<br>Name: HARTLE<br>Easting: 391400<br>Northing: 411600 | Annual Volume ($m^3$): 5123.34<br>Max Daily Volume ($m^3$): 31.822<br>Original Application No: -<br>Original Start Date: 01/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/04/2007<br>Version End Date: - |
| - | 1132m SW | Status: Historical<br>Licence No: 2569002060<br>Details: General use relating to Secondary Category (Medium Loss)<br>Direct Source: Ground Water - North West Region<br>Point: "WELL AT CASTLE FARM, LOWER LANE, MILNROW"<br>Data Type: Point<br>Name: SANDERSON<br>Easting: 391400<br>Northing: 411500 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 11/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 11/02/1966<br>Version End Date: - |

| ID | Location | Details | |
|---|---|---|---|
| - | 1132m SW | Status: Historical<br>Licence No: 2569002060<br>Details: General use relating to Secondary Category (Medium Loss)<br>Direct Source: Ground Water - North West Region<br>Point: WELL AT CASTLE FARM, LOWER LANE, MILNROW<br>Data Type: Point<br>Name: SANDERSON<br>Easting: 391400<br>Northing: 411500 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 11/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 11/02/1966<br>Version End Date: - |
| - | 1221m E | Status: Historical<br>Licence No: 2569002206<br>Details: Potable Water Supply - Direct<br>Direct Source: Ground Water - North West Region<br>Point: "COLLIERY SHAFT @ PREMISES, BUTTERWORTH HALL, MILNROW"<br>Data Type: Point<br>Name: UNITED UTILITIES WATER PLC<br>Easting: 393200<br>Northing: 412400 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 01/04/1969<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 31/03/1994<br>Version End Date: - |
| - | 1221m E | Status: Active<br>Licence No: 2569002206<br>Details: Potable Water Supply - Direct<br>Direct Source: Ground Water - North West Region<br>Point: COLLIERY SHAFT @ PREMISES, BUTTERWORTH HALL, MILNROW<br>Data Type: Point<br>Name: United Utilities Water Ltd<br>Easting: 393200<br>Northing: 412400 | Annual Volume ($m^3$): 3,982,296<br>Max Daily Volume ($m^3$): 13,638<br>Original Application No: 1567<br>Original Start Date: 01/04/1969<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 31/03/1994<br>Version End Date: - |
| - | 1239m N | Status: Historical<br>Licence No: 2569002216<br>Details: General use relating to Secondary Category (Medium Loss)<br>Direct Source: Ground Water - North West Region<br>Point: "SPRING FED TANK AT PREMISES, MILNROW"<br>Data Type: Point<br>Name: HEGINBOTTOMS FARM LTD<br>Easting: 392300<br>Northing: 413900 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 25/11/1975<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 25/11/1975<br>Version End Date: - |

| ID | Location | Details | |
|---|---|---|---|
| - | 1239m N | Status: Historical<br>Licence No: 2569002216<br>Details: General use relating to Secondary Category (Medium Loss)<br>Direct Source: Ground Water - North West Region<br>Point: SPRING FED TANK AT PREMISES, MILNROW<br>Data Type: Point<br>Name: HEGINBOTTOMS FARM LTD<br>Easting: 392300<br>Northing: 413900 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 25/11/1975<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 25/11/1975<br>Version End Date: - |
| - | 1396m S | Status: Historical<br>Licence No: 2569002086<br>Details: General use relating to Secondary Category (Medium Loss)<br>Direct Source: Ground Water - North West Region<br>Point: "WELL AT BROADSHAW FARM, MILNROW, ROCHDALE"<br>Data Type: Point<br>Name: CROSTON<br>Easting: 391800<br>Northing: 411100 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 02/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 02/02/1966<br>Version End Date: - |
| - | 1396m S | Status: Historical<br>Licence No: 2569002086<br>Details: General use relating to Secondary Category (Medium Loss)<br>Direct Source: Ground Water - North West Region<br>Point: WELL AT BROADSHAW FARM, MILNROW, ROCHDALE<br>Data Type: Point<br>Name: CROSTON<br>Easting: 391800<br>Northing: 411100 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 02/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 02/02/1966<br>Version End Date: - |
| - | 1904m S | Status: Historical<br>Licence No: 2569002204<br>Details: General use relating to Secondary Category (Medium Loss)<br>Direct Source: Ground Water - North West Region<br>Point: "BOREHOLE AT PREMISES, OLD BARN FARM,BURNEDGE, ROCHDALE"<br>Data Type: Point<br>Name: CRYER<br>Easting: 392200<br>Northing: 410600 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 24/04/1969<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 24/04/1969<br>Version End Date: - |

| ID | Location | Details | |
|---|---|---|---|
| - | 1904m S | Status: Historical<br>Licence No: 2569002204<br>Details: General use relating to Secondary Category (Medium Loss)<br>Direct Source: Ground Water - North West Region<br>Point: BOREHOLE AT PREMISES, OLD BARN FARM,BURNEDGE, ROCHDALE<br>Data Type: Point<br>Name: CRYER<br>Easting: 392200<br>Northing: 410600 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 24/04/1969<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 24/04/1969<br>Version End Date: - |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 5.7 Surface water abstractions

| **Records within 2000m** | **21** |
|---|---|

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 39**

| ID | Location | Details | |
|---|---|---|---|
| - | 692m E | Status: Historical<br>Licence No: 2569002175<br>Details: General Cooling (Existing Licences Only) (Low Loss)<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: RESERVOIR FED BY SPRINGS AT PREMISESMILNROW<br>Data Type: Point<br>Name: HOLROYD MACHINES TOOLS & ROTORS<br>Easting: 392700<br>Northing: 412600 | Annual Volume ($m^3$): 16365.6<br>Max Daily Volume ($m^3$): 54.552<br>Original Application No: -<br>Original Start Date: 15/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/04/2007<br>Version End Date: - |
| - | 692m E | Status: Active<br>Licence No: 2569002175<br>Details: General Cooling (Existing Licences Only) (High Loss)<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: RESERVOIR FED BY SPRINGS AT PREMISESMILNROW<br>Data Type: Point<br>Name: Precision Components Limited<br>Easting: 392700<br>Northing: 412600 | Annual Volume ($m^3$): 16,365<br>Max Daily Volume ($m^3$): 54.55<br>Original Application No: -<br>Original Start Date: 15/02/1966<br>Expiry Date: -<br>Issue No: 101<br>Version Start Date: 30/11/2009<br>Version End Date: - |

| ID | Location | Details | |
|---|---|---|---|
| - | 1310m SE | Status: Historical<br>Licence No: 2569002064<br>Details: Boiler Feed<br>Direct Source: "Surface, Non-Tidal - North West Region"<br>Point: "R BEAL AT NEWHEY, MILNROW, ROCHDALE"<br>Data Type: Point<br>Name: THE SECRETARY<br>Easting: 393000<br>Northing: 411700 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 18/01/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 21/06/1993<br>Version End Date: - |
| - | 1310m SE | Status: Historical<br>Licence No: 2569002064<br>Details: General Cooling (Existing Licences Only) (Low Loss)<br>Direct Source: "Surface, Non-Tidal - North West Region"<br>Point: "R BEAL AT NEWHEY, MILNROW, ROCHDALE"<br>Data Type: Point<br>Name: THE SECRETARY<br>Easting: 393000<br>Northing: 411700 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 18/01/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 21/06/1993<br>Version End Date: - |
| - | 1310m SE | Status: Historical<br>Licence No: 2569002064<br>Details: Boiler Feed<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: R BEAL AT NEWHEY, MILNROW, ROCHDALE<br>Data Type: Point<br>Name: THE SECRETARY<br>Easting: 393000<br>Northing: 411700 | Annual Volume ($m^3$): 327312<br>Max Daily Volume ($m^3$): 2954.9<br>Original Application No: -<br>Original Start Date: 18/01/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 21/06/1993<br>Version End Date: - |
| - | 1310m SE | Status: Historical<br>Licence No: 2569002064<br>Details: General Cooling (Existing Licences Only) (Low Loss)<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: R BEAL AT NEWHEY, MILNROW, ROCHDALE<br>Data Type: Point<br>Name: ELLENROAD TRUST LTD<br>Easting: 393000<br>Northing: 411700 | Annual Volume ($m^3$): 327312<br>Max Daily Volume ($m^3$): 2954.9<br>Original Application No: -<br>Original Start Date: 18/01/1966<br>Expiry Date: -<br>Issue No: 101<br>Version Start Date: 11/09/2008<br>Version End Date: - |

| ID | Location | Details | |
|---|---|---|---|
| - | 1310m SE | Status: Active<br>Licence No: 2569002064<br>Details: Non-Evaporative Cooling<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: R BEAL AT NEWHEY, MILNROW, ROCHDALE<br>Data Type: Point<br>Name: ELLENROAD TRUST LTD<br>Easting: 393000<br>Northing: 411700 | Annual Volume ($m^3$): 3,520<br>Max Daily Volume ($m^3$): 350<br>Original Application No: NPS/WR/015275<br>Original Start Date: 18/01/1966<br>Expiry Date: -<br>Issue No: 103<br>Version Start Date: 30/01/2014<br>Version End Date: - |
| - | 1310m SE | Status: Active<br>Licence No: 2569002233<br>Details: General Cooling (Existing Licences Only) (Low Loss)<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: R BEAL AT MILNROW<br>Data Type: Point<br>Name: SUN CHEMICAL LTD<br>Easting: 393000<br>Northing: 411700 | Annual Volume ($m^3$): 66,370<br>Max Daily Volume ($m^3$): 181.80<br>Original Application No: 2725<br>Original Start Date: 13/08/1986<br>Expiry Date: -<br>Issue No: 102<br>Version Start Date: 01/01/2005<br>Version End Date: - |
| - | 1468m E | Status: Historical<br>Licence No: 2569002207<br>Details: Boiler Feed<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: RESERVOIR FED BY UNNAMED TRIB OF BUTTERWORTH HALL BRK AT<br>Data Type: Point<br>Name: SONOCO INDUSTRIAL PACKAGING<br>Easting: 393400<br>Northing: 412200 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 26/06/1970<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/02/1990<br>Version End Date: - |
| - | 1468m E | Status: Historical<br>Licence No: 2569002207<br>Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: RESERVOIR FED BY UNNAMED TRIB OF BUTTERWORTH HALL BRK AT<br>Data Type: Point<br>Name: SONOCO INDUSTRIAL PACKAGING<br>Easting: 393400<br>Northing: 412200 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 26/06/1970<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/02/1990<br>Version End Date: - |

| ID | Location | Details | |
|---|---|---|---|
| - | 1468m E | Status: Historical<br>Licence No: 2569002207<br>Details: General Cooling (Existing Licences Only) (Low Loss)<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: RESERVOIR FED BY UNNAMED TRIB OF BUTTERWORTH HALL BRK AT<br>Data Type: Point<br>Name: SONOCO INDUSTRIAL PACKAGING<br>Easting: 393400<br>Northing: 412200 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 26/06/1970<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/02/1990<br>Version End Date: - |
| - | 1480m NW | Status: Historical<br>Licence No: 2569002249<br>Details: Process water<br>Direct Source: "Surface, Non-Tidal - North West Region"<br>Point: "RIVER ROCH AT MELLOROID WORKS, BELFIELD ROAD"<br>Data Type: Point<br>Name: BRITISH MILLERAIN 1922 CO LTD<br>Easting: 390800<br>Northing: 413800 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 04/11/1991<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 04/11/1991<br>Version End Date: - |
| - | 1480m NW | Status: Historical<br>Licence No: 2569002249<br>Details: Process water<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: RIVER ROCH AT MELLOROID WORKS, BELFIELD ROAD<br>Data Type: Point<br>Name: BRITISH MILLERAIN 1922 CO LTD<br>Easting: 390800<br>Northing: 413800 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 04/11/1991<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 04/11/1991<br>Version End Date: - |
| - | 1480m NW | Status: Historical<br>Licence No: 2569002249<br>Details: Process Water<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: RIVER ROCH AT MELLOROID WORKS BELFIELD ROAD<br>Data Type: Point<br>Name: BRITISH MILLERAIN 1922 CO LTD<br>Easting: 390800<br>Northing: 413800 | Annual Volume ($m^3$): 213662<br>Max Daily Volume ($m^3$): 1136.49<br>Original Application No: -<br>Original Start Date: 04/11/1991<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 04/11/1991<br>Version End Date: - |

| ID | Location | Details | |
|---|---|---|---|
| - | 1545m W | Status: Historical<br>Licence No: 2569002076<br>Details: Boiler Feed<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: ROCHDALE CANAL AT ROCHDALE, LANCS<br>Data Type: Point<br>Name: J & J MAKIN CONVERTORS LTD<br>Easting: 390300<br>Northing: 412300 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 18/01/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/04/1993<br>Version End Date: - |
| - | 1815m SW | Status: Historical<br>Licence No: 2569002178<br>Details: Boiler Feed<br>Direct Source: "Surface, Non-Tidal - North West Region"<br>Point: "CATCHPIT FED BY SURFACE DRAINAGE AT PREMISES, ROCHDALE"<br>Data Type: Point<br>Name: DUNPHY COMBUSTION LTD.<br>Easting: 390200<br>Northing: 411800 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 18/02/1966<br>Expiry Date: -<br>Issue No: 101<br>Version Start Date: 12/02/1991<br>Version End Date: - |
| - | 1815m SW | Status: Active<br>Licence No: 2569002178<br>Details: Boiler Feed<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: CATCHPIT FED BY SURFACE DRAINAGE AT PREMISES, ROCHDALE<br>Data Type: Point<br>Name: DUNPHY COMBUSTION LTD<br>Easting: 390200<br>Northing: 411800 | Annual Volume ($m^3$): 2,318.46<br>Max Daily Volume ($m^3$): 34.09<br>Original Application No: CW 1093<br>Original Start Date: 18/02/1966<br>Expiry Date: -<br>Issue No: 101<br>Version Start Date: 12/02/1991<br>Version End Date: - |
| - | 1866m W | Status: Historical<br>Licence No: 2569002107<br>Details: Boiler Feed<br>Direct Source: "Surface, Non-Tidal - North West Region"<br>Point: "ROCHDALE CANAL AT QUEENSWAY,ROCHDALE"<br>Data Type: Point<br>Name: SEALOCRETE PLA LTD<br>Easting: 390070<br>Northing: 411960 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 02/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 20/12/1993<br>Version End Date: - |

| ID | Location | Details | |
|---|---|---|---|
| - | 1866m W | Status: Historical<br>Licence No: 2569002107<br>Details: General Cooling (Existing Licences Only) (Low Loss)<br>Direct Source: "Surface, Non-Tidal - North West Region"<br>Point: "ROCHDALE CANAL AT QUEENSWAY,ROCHDALE"<br>Data Type: Point<br>Name: SEALOCRETE PLA LTD<br>Easting: 390070<br>Northing: 411960 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 02/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 20/12/1993<br>Version End Date: - |
| - | 1866m W | Status: Historical<br>Licence No: 2569002107<br>Details: Boiler Feed<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: ROCHDALE CANAL AT QUEENSWAY,ROCHDALE<br>Data Type: Point<br>Name: SEALOCRETE PLA LTD<br>Easting: 390070<br>Northing: 411960 | Annual Volume ($m^3$): 10455.8<br>Max Daily Volume ($m^3$): 45.46<br>Original Application No: -<br>Original Start Date: 02/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/04/2008<br>Version End Date: - |
| - | 1866m W | Status: Historical<br>Licence No: 2569002107<br>Details: General Cooling (Existing Licences Only) (Low Loss)<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: ROCHDALE CANAL AT QUEENSWAY,ROCHDALE<br>Data Type: Point<br>Name: SEALOCRETE PLA LTD<br>Easting: 390070<br>Northing: 411960 | Annual Volume ($m^3$): 10455.8<br>Max Daily Volume ($m^3$): 45.46<br>Original Application No: -<br>Original Start Date: 02/02/1966<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/04/2008<br>Version End Date: - |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 5.8 Potable abstractions

| **Records within 2000m** | **3** |
|---|---|

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 39**

| ID | Location | Details | |
|---|---|---|---|
| - | 1221m E | Status: Historical<br>Licence No: 2569002206<br>Details: Potable Water Supply - Direct<br>Direct Source: Ground Water - North West Region<br>Point: "COLLIERY SHAFT @ PREMISES, BUTTERWORTH HALL, MILNROW"<br>Data Type: Point<br>Name: UNITED UTILITIES WATER PLC<br>Easting: 393200<br>Northing: 412400 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 01/04/1969<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 31/03/1994<br>Version End Date: - |
| - | 1221m E | Status: Active<br>Licence No: 2569002206<br>Details: Potable Water Supply - Direct<br>Direct Source: Ground Water - North West Region<br>Point: COLLIERY SHAFT @ PREMISES, BUTTERWORTH HALL, MILNROW<br>Data Type: Point<br>Name: United Utilities Water Ltd<br>Easting: 393200<br>Northing: 412400 | Annual Volume ($m^3$): 3,982,296<br>Max Daily Volume ($m^3$): 13,638<br>Original Application No: 1567<br>Original Start Date: 01/04/1969<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 31/03/1994<br>Version End Date: - |
| - | 1468m E | Status: Historical<br>Licence No: 2569002207<br>Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services<br>Direct Source: Surface, Non-Tidal - North West Region<br>Point: RESERVOIR FED BY UNNAMED TRIB OF BUTTERWORTH HALL BRK AT<br>Data Type: Point<br>Name: SONOCO INDUSTRIAL PACKAGING<br>Easting: 393400<br>Northing: 412200 | Annual Volume ($m^3$): -<br>Max Daily Volume ($m^3$): -<br>Original Application No: -<br>Original Start Date: 26/06/1970<br>Expiry Date: -<br>Issue No: 100<br>Version Start Date: 01/02/1990<br>Version End Date: - |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 5.9 Source Protection Zones

| **Records within 500m** | **1** |
|---|---|

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

Features are displayed on the Abstractions and Source Protection Zones map on **page 39**

| ID | Location | Type | Description |
|---|---|---|---|
| **1** | **On site** | **2** | **Outer catchment** |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

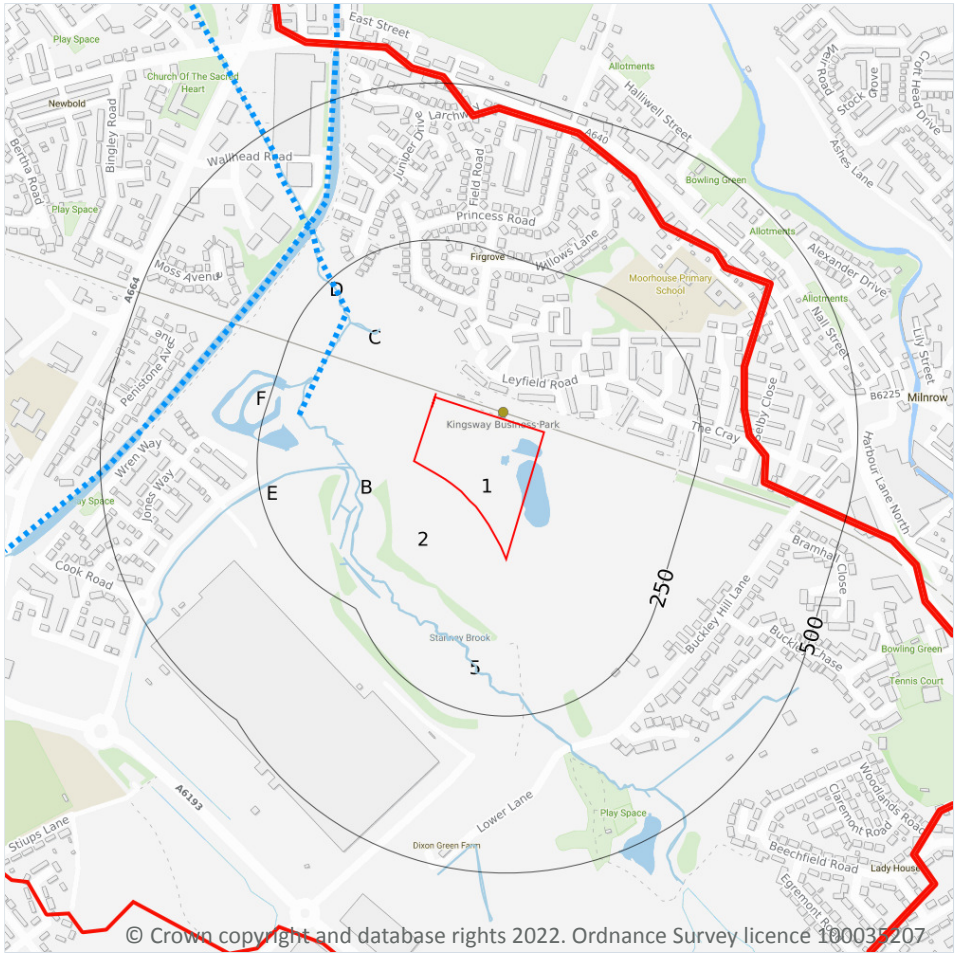
## 5.10 Source Protection Zones (confined aquifer)

| Records within 500m | 0 |
|---|---|

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

# 6 Hydrology




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Site Outline

Search buffers in metres (m)

Water Network (OS MasterMap)

Surface water features (wider than 5m)

Surface water features (narrower than 5m)

WFD River, canal and surface water transfer water bodies

WFD Lake water bodies

WFD Transitional and coastal water bodies

WFD Surface water body catchments boundaries

WFD Groundwater body boundaries

## 6.1 Water Network (OS MasterMap)

| Records within 250m | 29 |
|---|---|

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 51**

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| B | 93m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| B | 99m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| B | 99m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| 5 | 102m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| B | 106m W | Inland river not influenced by normal tidal action. | Underground | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| B | 107m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| B | 116m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| B | 116m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| B | 128m W | Lake, loch or reservoir. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| B | 130m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| B | 130m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| B | 131m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| B | 136m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| C | 137m NW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| C | 171m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| B | 172m W | Inland river not influenced by normal tidal action. | Underground | Watercourse contains water year round (in normal circumstances) | - |
| C | 176m NW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| C | 178m NW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| C | 178m NW | Inland river not influenced by normal tidal action. | Underground | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| C | 178m NW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| D | 179m NW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| E | 182m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| C | 186m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | Stanney Brook |
| B | 190m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| C | 192m W | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| B | 194m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |
| B | 194m SW | Inland river not influenced by normal tidal action. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |

| ID | Location | Type of water feature | Ground level | Permanence | Name |
|---|---|---|---|---|---|
| C | 208m W | Inland river not influenced by normal tidal action. | Underground | Watercourse contains water year round (in normal circumstances) | - |
| F | 223m W | Lake, loch or reservoir. | On ground surface | Watercourse contains water year round (in normal circumstances) | - |

*This data is sourced from the Ordnance Survey.*

## 6.2 Surface water features

| **Records within 250m** | **17** |
|---|---|

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 51**

*This data is sourced from the Ordnance Survey.*

## 6.3 WFD Surface water body catchments

| **Records on site** | **1** |
|---|---|

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on **page 51**

| ID | Location | Type | Water body catchment | Water body ID | Operational catchment | Management catchment |
|---|---|---|---|---|---|---|
| **2** | **On site** | **River** | **Roch (Source to Spodden)** | **GB112069064720** | **Roch Irk Medlock** | **Irwell** |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 6.4 WFD Surface water bodies

| Records identified | 1 |
|---|---|

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each water body listed.

Features are displayed on the Hydrology map on **page 51**

| ID | Location | Type | Name | Water body ID | Overall rating | Chemical rating | Ecological rating | Year |
|---|---|---|---|---|---|---|---|---|
| 6 | 184m NW | River | Roch (Source to Spodden) | GB112069064720 | Moderate | Fail | Moderate | 2019 |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 6.5 WFD Groundwater bodies

| Records on site | 1 |
|---|---|

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

Features are displayed on the Hydrology map on **page 51**

| ID | Location | Name | Water body ID | Overall rating | Chemical rating | Quantitative | Year |
|---|---|---|---|---|---|---|---|
| **1** | **On site** | **Northern Manchester Carboniferous Aquifers** | **GB41202G101800** | **Poor** | **Poor** | **Good** | **2019** |

*This data is sourced from the Environment Agency and Natural Resources Wales.*

# 7 River and coastal flooding

## 7.1 Risk of flooding from rivers and the sea

| Records within 50m | 0 |
|---|---|

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 chance) or High (greater than or equal to 1 in 30 chance).

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 7.2 Historical Flood Events

| Records within 250m | 0 |
|---|---|

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 7.3 Flood Defences

| Records within 250m | 0 |
|---|---|

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 7.4 Areas Benefiting from Flood Defences

| Records within 250m | 0 |
|---|---|

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

## 7.5 Flood Storage Areas

| Records within 250m | 0 |
|---|---|

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

# River and coastal flooding - Flood Zones

## 7.6 Flood Zone 2

| Records within 50m | 0 |
|---|---|

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

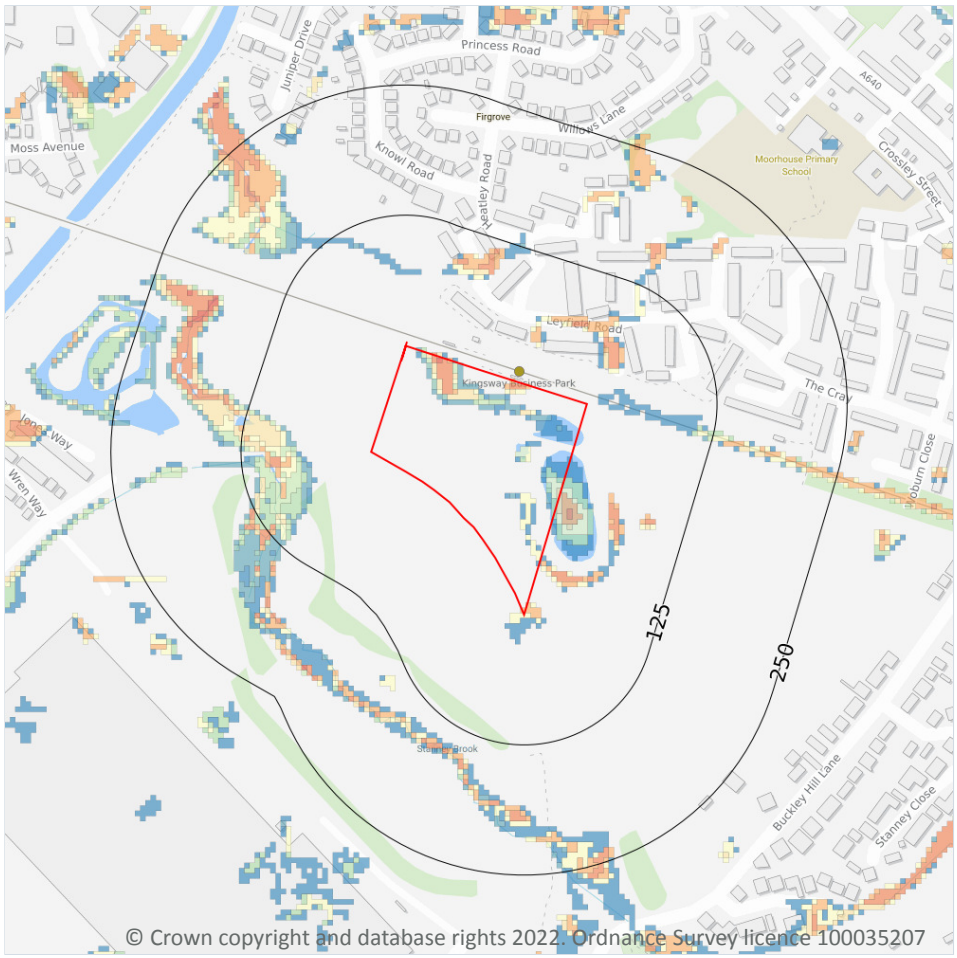
## 7.7 Flood Zone 3

| Records within 50m | 0 |
|---|---|

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

*This data is sourced from the Environment Agency and Natural Resources Wales.*

# 8 Surface water flooding




Site Outline
Search buffers in metres (m)

1 in 1000 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

## 8.1 Surface water flooding

| | |
|---|---|
| **Highest risk on site** | **1 in 30 year, Greater than 1.0m** |
| **Highest risk within 50m** | **1 in 30 year, Greater than 1.0m** |

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 59**

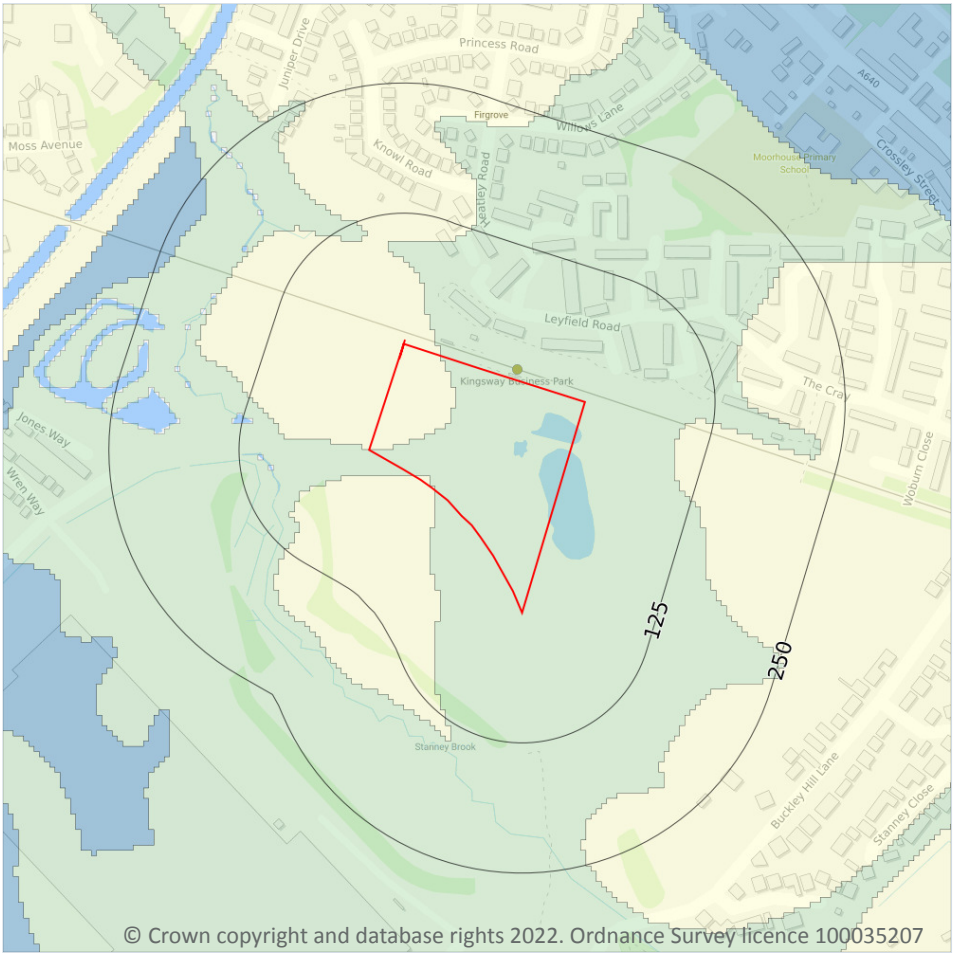
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

The table below shows the maximum flood depths for a range of return periods for the site.

| Return period | Maximum modelled depth |
|---|---|
| 1 in 1000 year | Greater than 1.0m |
| 1 in 250 year | Greater than 1.0m |
| 1 in 100 year | Greater than 1.0m |
| 1 in 30 year | Greater than 1.0m |

*This data is sourced from Ambiental Risk Analytics.*

# 9 Groundwater flooding




Site Outline

Search buffers in metres (m)

High

Moderate - High

Moderate

Low

Negligible

## 9.1 Groundwater flooding

| | |
|---|---|
| **Highest risk on site** | **Moderate** |
| **Highest risk within 50m** | **Moderate** |

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 61**

*This data is sourced from Ambiental Risk Analytics.*

# 10 Environmental designations




## 10.1 Sites of Special Scientific Interest (SSSI)

| Records within 2000m | 2 |
|---|---|

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

Features are displayed on the Environmental designations map on **page 62**

| ID | Location | Name | Data source |
|---|---|---|---|
| A | 314m NW | Rochdale Canal | Natural England |

| ID | Location | Name | Data source |
|---|---|---|---|
| B | 596m N | Rochdale Canal | Natural England |

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.2 Conserved wetland sites (Ramsar sites)

| **Records within 2000m** | **0** |
|---|---|

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.3 Special Areas of Conservation (SAC)

| **Records within 2000m** | **2** |
|---|---|

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

Features are displayed on the Environmental designations map on **page 62**

| ID | Location | Name | Features of interest | Habitat description | Data source |
|---|---|---|---|---|---|
| A | 314m NW | Rochdale Canal | Floating water-plantain. | Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Inland water bodies (Standing water, Running water) | Natural England |
| B | 596m N | Rochdale Canal | Floating water-plantain. | Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Inland water bodies (Standing water, Running water) | Natural England |

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.4 Special Protection Areas (SPA)

| Records within 2000m | 0 |
|---|---|

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.5 National Nature Reserves (NNR)

| Records within 2000m | 0 |
|---|---|

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.6 Local Nature Reserves (LNR)

| Records within 2000m | 0 |
|---|---|

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.7 Designated Ancient Woodland

| Records within 2000m | 0 |
|---|---|

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.8 Biosphere Reserves

| Records within 2000m | 0 |
|---|---|

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.9 Forest Parks

| Records within 2000m | 0 |
|---|---|

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

*This data is sourced from the Forestry Commission.*

## 10.10 Marine Conservation Zones

| Records within 2000m | 0 |
|---|---|

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 10.11 Green Belt

| Records within 2000m | 4 |
|---|---|

Areas designated to prevent urban sprawl by keeping land permanently open.

Features are displayed on the Environmental designations map on **page 62**

| ID | Location | Name | Local Authority name |
|---|---|---|---|
| 1 | 726m NE | Merseyside and Greater Manchester | Rochdale |
| 2 | 1120m SE | Merseyside and Greater Manchester | Rochdale |
| 3 | 1314m SE | Merseyside and Greater Manchester | Oldham |
| - | 1978m SE | Merseyside and Greater Manchester | Rochdale |

*This data is sourced from the Ministry of Housing, Communities and Local Government.*

## 10.12 Proposed Ramsar sites

| Records within 2000m | 0 |
|---|---|

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

*This data is sourced from Natural England.*

## 10.13 Possible Special Areas of Conservation (pSAC)

| Records within 2000m | 0 |
|---|---|

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

*This data is sourced from Natural England and Natural Resources Wales.*

## 10.14 Potential Special Protection Areas (pSPA)

| Records within 2000m | 0 |
|---|---|

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

*This data is sourced from Natural England.*

## 10.15 Nitrate Sensitive Areas

| Records within 2000m | 0 |
|---|---|

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

*This data is sourced from Natural England.*

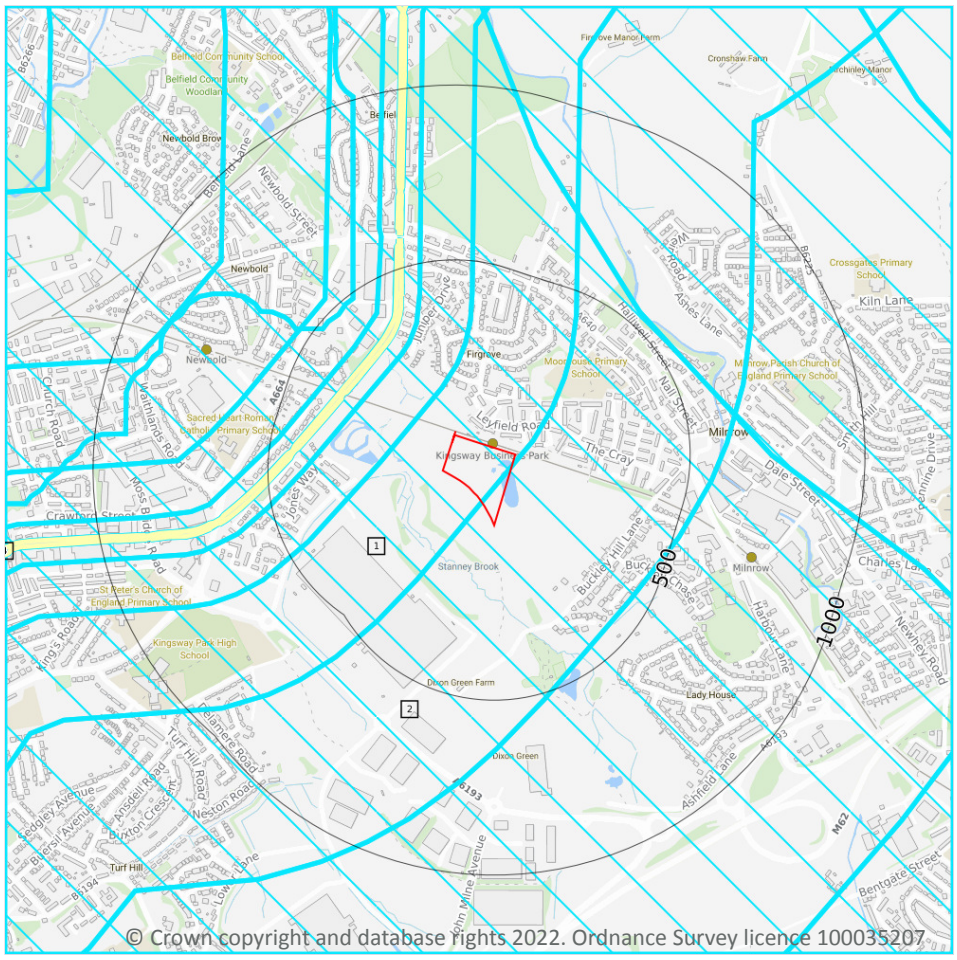
## 10.16 Nitrate Vulnerable Zones

| Records within 2000m | 0 |
|---|---|

Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

*This data is sourced from Natural England and Natural Resources Wales.*

# SSSI Impact Zones and Units




Site Outline

Search buffers in metres (m)

SSSI Impact Risk Zones

SSSI Units

- Not recorded
- Favourable
- Unfavourable - Recovering
- Unfavourable - No change
- Unfavourable - Declining
- Partially destroyed
- Destroyed

## 10.17 SSSI Impact Risk Zones

| Records on site | 2 |
|---|---|

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Features are displayed on the SSSI Impact Zones and Units map on **page 67**

| ID | Location | Type of developments requiring consultation |
|---|---|---|
| 1 | On site | **Infrastructure - Pipelines, pylons and overhead cables. any transport proposal including road, rail and by water (excluding routine maintenance). airports, helipads and other aviation proposals.<br>Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, review of minerals permissions (romp), extensions, variations to conditions etc. oil & gas exploration/extraction.<br>Rural non-residential - Large non residential developments outside existing settlements/urban areas where net additional gross internal floorspace is > 1,000m² or footprint exceeds 0.2ha.<br>Residential - Residential development of 100 units or more.<br>Rural residential - Any residential development of 50 or more houses outside existing settlements/urban areas.<br>Air pollution - Any development that could cause air pollution (incl: industrial/commercial processes, livestock & poultry units, slurry lagoons & digestate stores, manure stores).<br>Combustion - All general combustion processes. incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.<br>Waste - Mechanical and biological waste treatment, inert landfill, non-hazardous landfill, hazardous landfill, household civic amenity recycling facilities construction, demolition and excavation waste, other waste management.<br>Composting - Any composting proposal. incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management.<br>Discharges - Any discharge of water or liquid waste that is discharged to ground (ie to seep away) or to surface water, such as a beck or stream.<br>Water supply - Large infrastructure such as warehousing / industry where net additional gross internal floorspace is > 1,000m² or any development needing its own water supply .** |
| 2 | On site | **Infrastructure - Pipelines, pylons and overhead cables. any transport proposal including road, rail and by water (excluding routine maintenance). airports, helipads and other aviation proposals.<br>Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, review of minerals permissions (romp), extensions, variations to conditions etc. oil & gas exploration/extraction.<br>Rural non-residential - Large non residential developments outside existing settlements/urban areas where net additional gross internal floorspace is > 1,000m² or footprint exceeds 0.2ha.<br>Residential - Residential development of 100 units or more.<br>Rural residential - Any residential development of 50 or more houses outside existing settlements/urban areas.<br>Air pollution - Any industrial/agricultural development that could cause air pollution (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 200m², manure stores > 250t).<br>Combustion - General combustion processes >20mw energy input. incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.<br>Waste - Landfill. incl: inert landfill, non-hazardous landfill, hazardous landfill.<br>Composting - Any composting proposal with more than 500 tonnes maximum annual operational throughput. incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management.<br>Discharges - Any discharge of water or liquid waste of more than 2m³/day to ground (ie to seep away) or to surface water, such as a beck or stream.<br>Water supply - Large infrastructure such as warehousing / industry where net additional gross internal floorspace is > 1,000m² or any development needing its own water supply .** |

*This data is sourced from Natural England.*

## 10.18 SSSI Units

| Records within 2000m | 2 |
|---|---|

Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

Features are displayed on the SSSI Impact Zones and Units map on **page 67**

ID: 4
Location: 314m NW
SSSI name: Rochdale Canal
Unit name: Failsworth
Broad habitat: Standing Open Water And Canals
Condition: Unfavourable - Recovering
Reportable features:

| Feature name | Feature condition | Date of assessment |
|---|---|---|
| Population of Schedule 8 plant - Luronium natans, Floating Water-plantain | Unfavourable - Recovering | 25/11/2010 |

ID: 11
Location: 596m N
SSSI name: Rochdale Canal
Unit name: Failsworth
Broad habitat: Standing Open Water And Canals
Condition: Unfavourable - Recovering
Reportable features:

| Feature name | Feature condition | Date of assessment |
|---|---|---|
| Population of Schedule 8 plant - Luronium natans, Floating Water-plantain | Unfavourable - Recovering | 25/11/2010 |

*This data is sourced from Natural England and Natural Resources Wales.*

# 11 Visual and cultural designations

## 11.1 World Heritage Sites

| Records within 250m | 0 |
|---|---|

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 11.2 Area of Outstanding Natural Beauty

| Records within 250m | 0 |
|---|---|

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

*This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.*

## 11.3 National Parks

| Records within 250m | 0 |
|---|---|

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

*This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.*

## 11.4 Listed Buildings

| Records within 250m | 0 |
|---|---|

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 11.5 Conservation Areas

| Records within 250m | 0 |
|---|---|

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

## 11.6 Scheduled Ancient Monuments

| Records within 250m | 0 |
|---|---|

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

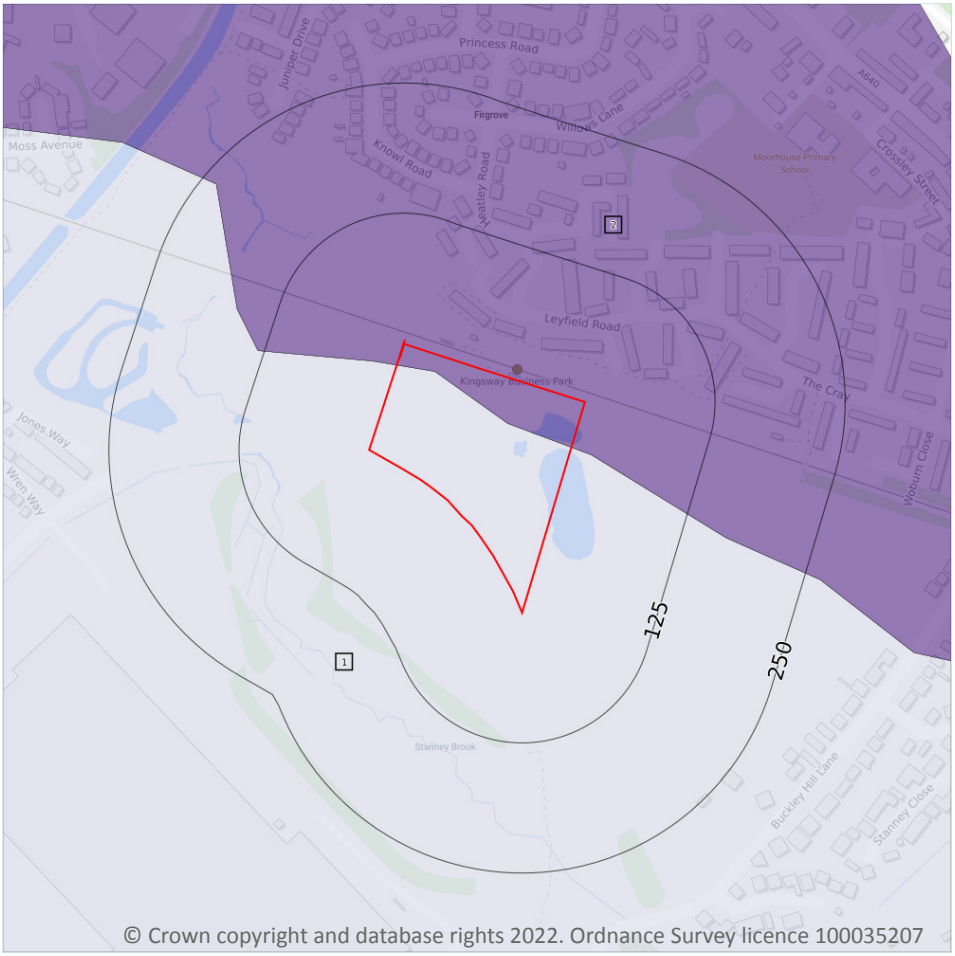
## 11.7 Registered Parks and Gardens

| Records within 250m | 0 |
|---|---|

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

*This data is sourced from Historic England, Cadw and Historic Environment Scotland.*

# 12 Agricultural designations




Site Outline

Search buffers in metres (m)

- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Non-agricultural land
- Urban land
- Exclusion land
- Tree felling licences
- Open Access land

## 12.1 Agricultural Land Classification

| Records within 250m | 2 |
|---|---|

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 72**

| ID | Location | Classification | Description |
|---|---|---|---|
| 1 | On site | Grade 4 | **Poor quality agricultural land. Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.** |

| ID | Location | Classification | Description |
|---|---|---|---|
| **2** | **On site** | **Urban** | **-** |

*This data is sourced from Natural England.*

## 12.2 Open Access Land

| **Records within 250m** | **0** |
|---|---|

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

*This data is sourced from Natural England and Natural Resources Wales.*

## 12.3 Tree Felling Licences

| **Records within 250m** | **0** |
|---|---|

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

*This data is sourced from the Forestry Commission.*

## 12.4 Environmental Stewardship Schemes

| **Records within 250m** | **0** |
|---|---|

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

*This data is sourced from Natural England.*

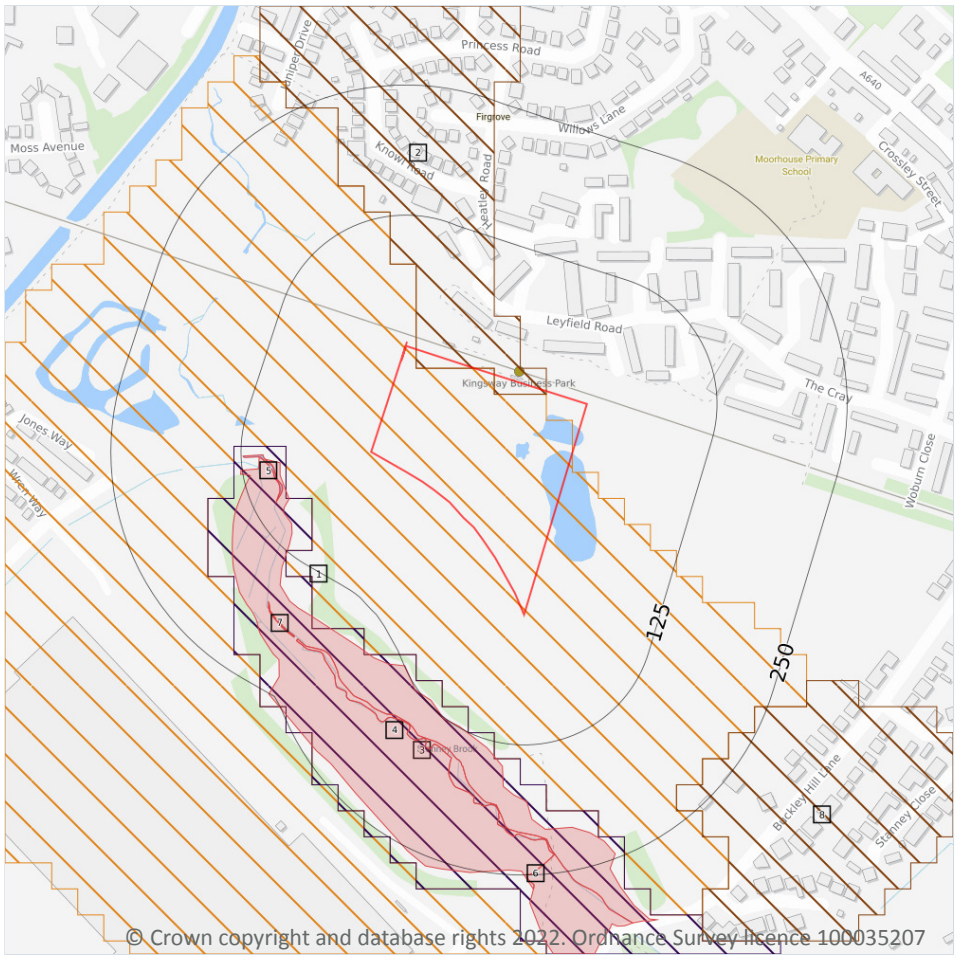
## 12.5 Countryside Stewardship Schemes

| **Records within 250m** | **0** |
|---|---|

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

*This data is sourced from Natural England.*

# 13 Habitat designations




Site Outline

Search buffers in metres (m)

Priority Habitat Inventory
Open Mosaic Habitat
Limestone Pavement Orders

Habitat Networks

Primary Habitat
Restorable Habitat
Associated Habitats
Habitat Restoration-Creation
Network Enhancement Zone 1
Network Enhancement Zone 2

## 13.1 Priority Habitat Inventory

| Records within 250m | 4 |
|---|---|

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

Features are displayed on the Habitat designations map on **page 74**

| ID | Location | Main Habitat | Other habitats |
|---|---|---|---|
| 4 | 88m W | Lowland fens | Main habitat: LFENS (INV > 50%) |
| 5 | 92m W | Lowland fens | Main habitat: LFENS (INV > 50%) |
| 6 | 148m SW | Lowland fens | Main habitat: LFENS (INV > 50%) |
| 7 | 175m SW | Lowland fens | Main habitat: LFENS (INV > 50%) |

*This data is sourced from Natural England.*

## 13.2 Habitat Networks

| Records within 250m | 4 |
|---|---|

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

Features are displayed on the Habitat designations map on **page 74**

| ID | Location | Type | Habitat |
|---|---|---|---|
| **1** | **On site** | **Network Enhancement Zone 1** | **Not specified** |
| **2** | **On site** | **Network Enhancement Zone 2** | **Not specified** |
| 3 | 72m SW | Primary Habitat | Lowland fens |
| 8 | 219m SE | Network Enhancement Zone 2 | Not specified |

*This data is sourced from Natural England.*

## 13.3 Open Mosaic Habitat

| Records within 250m | 0 |
|---|---|

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

*This data is sourced from Natural England.*

## 13.4 Limestone Pavement Orders

| Records within 250m | 0 |
|---|---|

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

*This data is sourced from Natural England.*

# 14 Geology 1:10,000 scale - Availability




## 14.1 10k Availability

| Records within 500m | 1 |
|---|---|

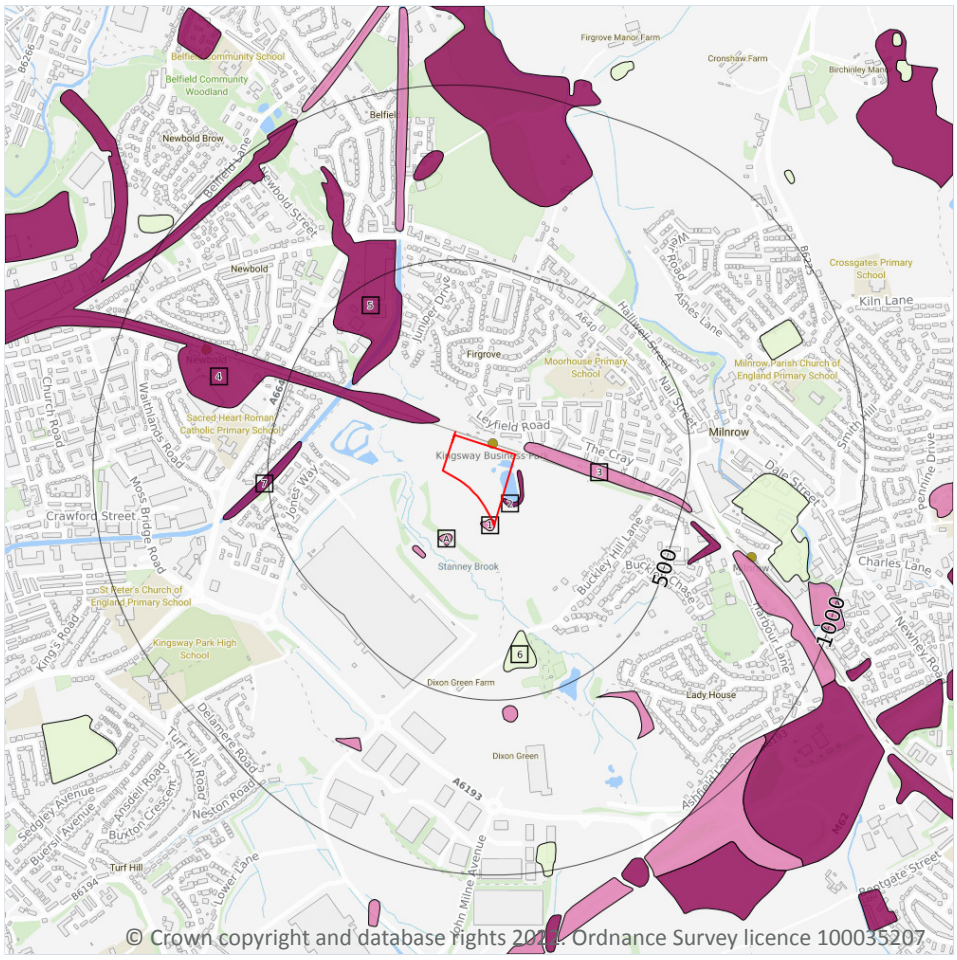
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 76**

| ID | Location | Artificial | Superficial | Bedrock | Mass movement | Sheet No. |
|---|---|---|---|---|---|---|
| **1** | **On site** | **Full** | **Full** | **Full** | **Full** | **SD91SW** |

*This data is sourced from the British Geological Survey.*

# Geology 1:10,000 scale - Artificial and made ground




## 14.2 Artificial and made ground (10k)

| Records within 500m | 9 |
|---|---|

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

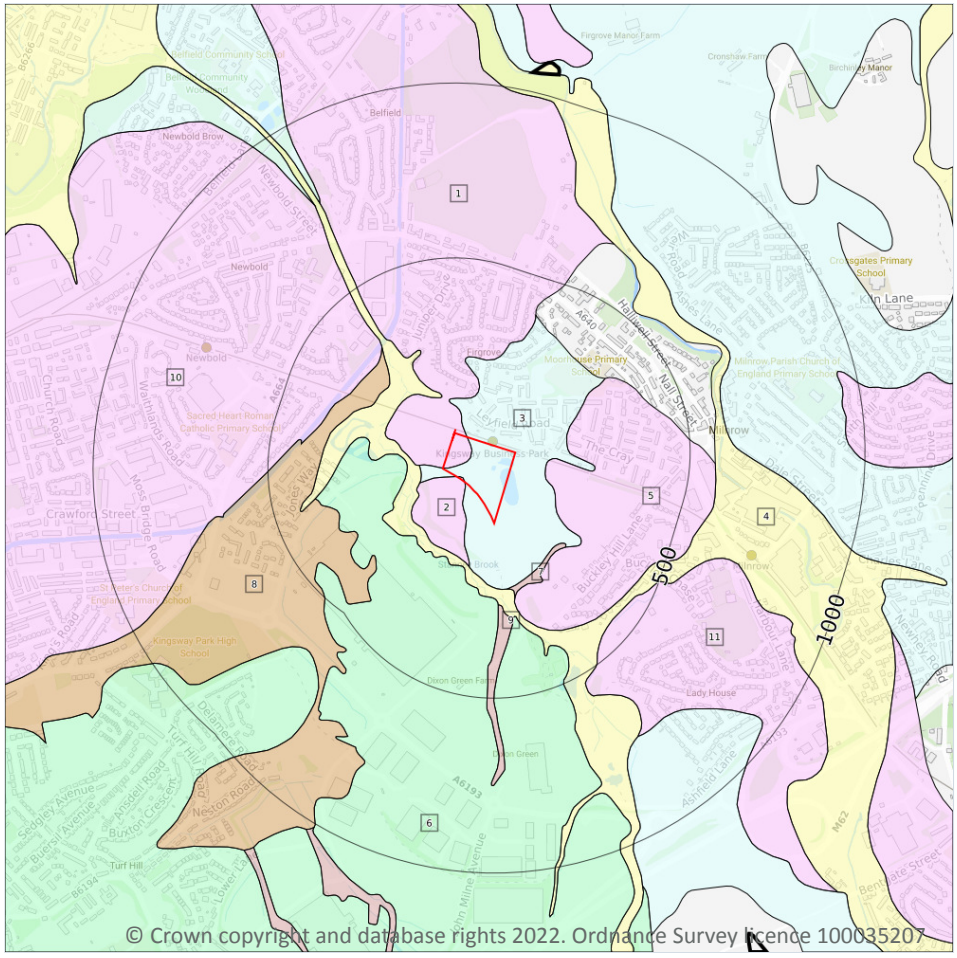
Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 77**

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| **1** | **On site** | **WGR-VOID** | **Worked Ground (Undivided)** | **Void** |
| 2 | 2m E | MGR-ARTDP | Made Ground (Undivided) | Artificial Deposit |
| 3 | 30m NE | WGR-VOID | Worked Ground (Undivided) | Void |
| 4 | 59m NW | MGR-ARTDP | Made Ground (Undivided) | Artificial Deposit |

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| A | 123m SW | WGR-VOID | Worked Ground (Undivided) | Void |
| A | 213m SW | WGR-VOID | Worked Ground (Undivided) | Void |
| 5 | 295m NW | MGR-ARTDP | Made Ground (Undivided) | Artificial Deposit |
| 6 | 311m S | WMGR-ARTDP | Infilled Ground | Artificial Deposit |
| 7 | 411m W | MGR-ARTDP | Made Ground (Undivided) | Artificial Deposit |

*This data is sourced from the British Geological Survey.*

# Geology 1:10,000 scale - Superficial




Site Outline

Search buffers in metres (m)

Landslip (10k)

Superficial geology (10k)
Please see table for more details.

## 14.3 Superficial geology (10k)

**Records within 500m** **11**

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 79**

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| **1** | **On site** | **GFDUD-XSV** | **Glaciofluvial Deposits, Devensian - Sand And Gravel** | **Sand And Gravel** |
| **2** | **On site** | **GFSDD-XSV** | **Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel** | **Sand And Gravel** |
| **3** | **On site** | **TILLD-DMTN** | **Till, Devensian - Diamicton** | **Diamicton** |

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| 4 | 63m W | ALV-XCZSV | Alluvium - Clay, Silt, Sand And Gravel | Clay, Silt, Sand And Gravel |
| 5 | 95m E | GFSDD-XSV | Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel | Sand And Gravel |
| 6 | 102m W | HMGDD-DMTN | Hummocky (moundy) Glacial Deposits, Devensian - Diamicton | Diamicton |
| 7 | 177m SE | HEAD-XCZSV | Head - Clay, Silt, Sand And Gravel | Clay, Silt, Sand And Gravel |
| 8 | 230m NW | PEAT-P | Peat - Peat | Peat |
| 9 | 233m S | HEAD-XCZSV | Head - Clay, Silt, Sand And Gravel | Clay, Silt, Sand And Gravel |
| 10 | 295m NW | GFDUD-XSV | Glaciofluvial Deposits, Devensian - Sand And Gravel | Sand And Gravel |
| 11 | 436m SE | GFSDD-XSV | Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel | Sand And Gravel |

*This data is sourced from the British Geological Survey.*

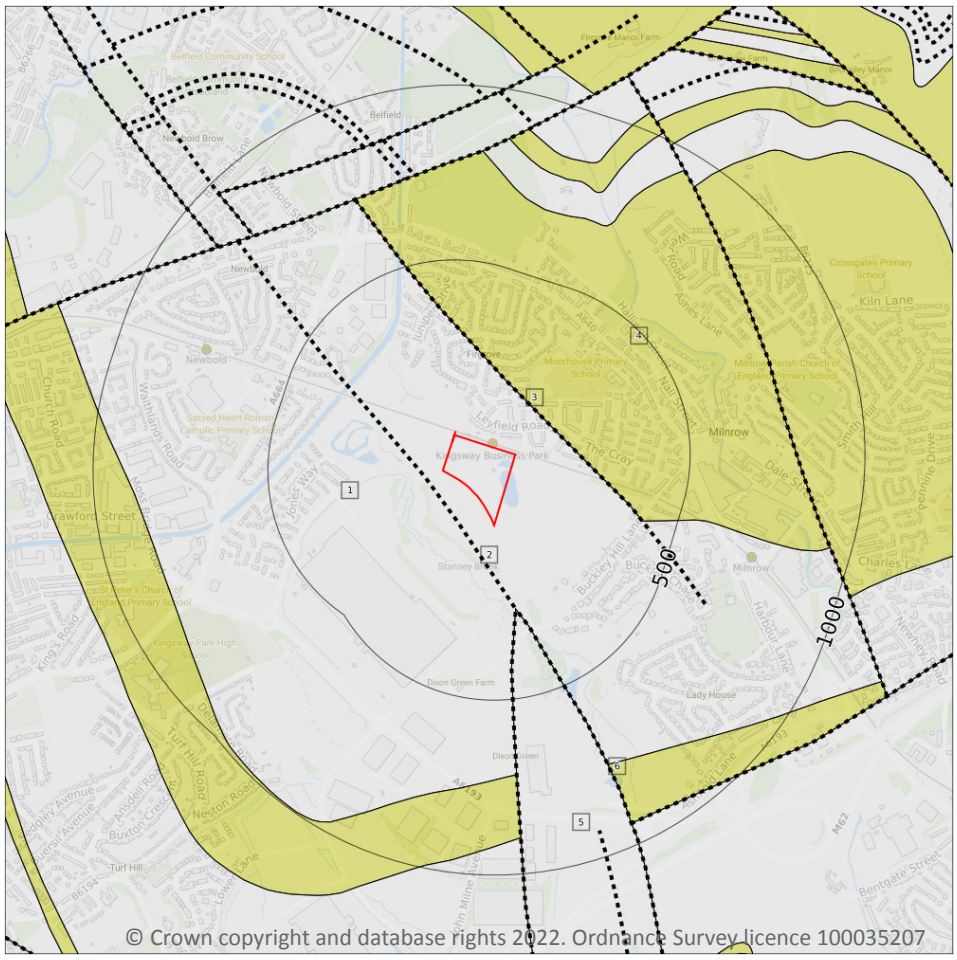
## 14.4 Landslip (10k)

| Records within 500m | 0 |
|---|---|

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

*This data is sourced from the British Geological Survey.*

# Geology 1:10,000 scale - Bedrock




Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (10k)

Bedrock geology (10k)
Please see table for more details.

## 14.5 Bedrock geology (10k)

| Records within 500m | 3 |
|---|---|

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 81**

| ID | Location | LEX Code | Description | Rock age |
|---|---|---|---|---|
| **1** | **On site** | **PLCM-MDSS** | **Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone** | **Langsettian Sub-age** |
| 4 | 130m NE | MLRS-SDST | Milnrow Sandstone - Sandstone | Langsettian Sub-age |
| 5 | 247m S | PLCM-MDSS | Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone | Langsettian Sub-age |

*This data is sourced from the British Geological Survey.*

## 14.6 Bedrock faults and other linear features (10k)

| **Records within 500m** | **3** |
|---|---|

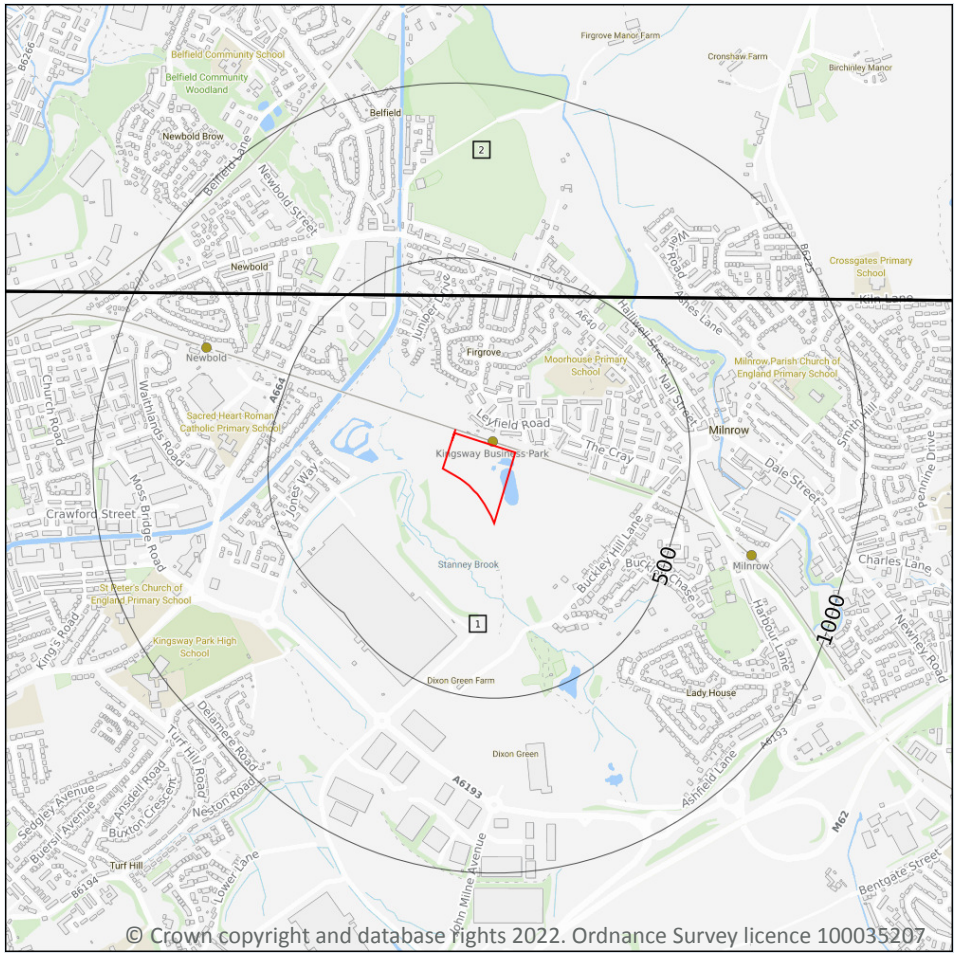
Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 81**

| ID | Location | Category | Description |
|---|---|---|---|
| 2 | 52m SW | FAULT | Normal fault, inferred; crossmarks on downthrow side |
| 3 | 130m NE | FAULT | Normal fault, inferred; crossmarks on downthrow side |
| 6 | 247m S | FAULT | Normal fault, inferred; crossmarks on downthrow side |

*This data is sourced from the British Geological Survey.*

# 15 Geology 1:50,000 scale - Availability




## 15.1 50k Availability

| Records within 500m | 2 |
|---|---|

An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 83**

| ID | Location | Artificial | Superficial | Bedrock | Mass movement | Sheet No. |
|---|---|---|---|---|---|---|
| **1** | **On site** | **No coverage** | **Full** | **Full** | **No coverage** | **EW085_manchester_v4** |
| 2 | 392m N | No coverage | Full | Full | Full | EW076_rochdale_v4 |

*This data is sourced from the British Geological Survey.*

# Geology 1:50,000 scale - Artificial and made ground

## 15.2 Artificial and made ground (50k)

| Records within 500m | 0 |
|---|---|

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

*This data is sourced from the British Geological Survey.*

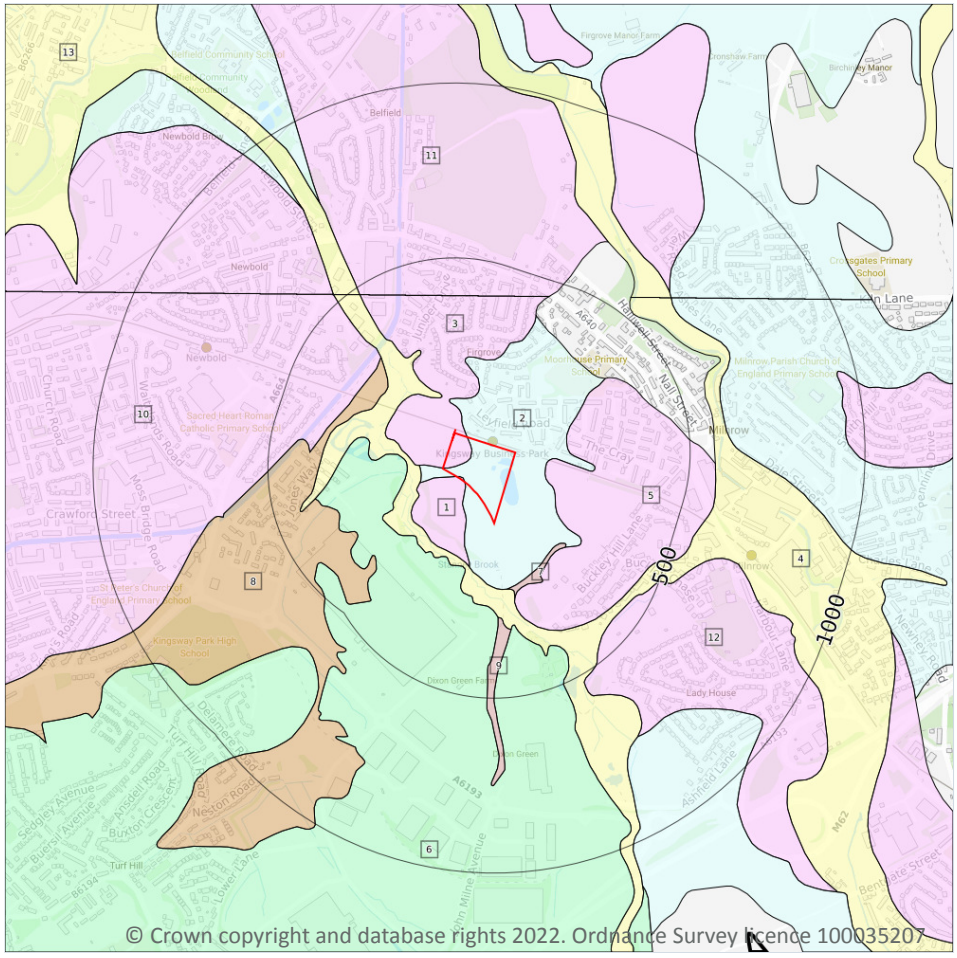
## 15.3 Artificial ground permeability (50k)

| Records within 50m | 0 |
|---|---|

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

*This data is sourced from the British Geological Survey.*

# Geology 1:50,000 scale - Superficial




Site Outline

Search buffers in metres (m)

Landslip (50k)

Superficial geology (50k)
Please see table for more details.

## 15.4 Superficial geology (50k)

**Records within 500m** **13**

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 85**

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| 1 | On site | GFSDD-XSV | GLACIOFLUVIAL SHEET DEPOSITS, DEVENSIAN | SAND AND GRAVEL |
| 2 | On site | TILLD-DMTN | TILL, DEVENSIAN | DIAMICTON |
| 3 | On site | GFDUD-XSV | GLACIOFLUVIAL DEPOSITS, DEVENSIAN | SAND AND GRAVEL |

| ID | Location | LEX Code | Description | Rock description |
|---|---|---|---|---|
| 4 | 63m W | ALV-XCZSV | ALLUVIUM | CLAY, SILT, SAND AND GRAVEL |
| 5 | 95m E | GFSDD-XSV | GLACIOFLUVIAL SHEET DEPOSITS, DEVENSIAN | SAND AND GRAVEL |
| 6 | 102m W | HMGDD-DMTN | HUMMOCKY (MOUNDY) GLACIAL DEPOSITS, DEVENSIAN | DIAMICTON |
| 7 | 177m SE | HEAD-XCZSV | HEAD | CLAY, SILT, SAND AND GRAVEL |
| 8 | 229m NW | PEAT-P | PEAT | PEAT |
| 9 | 270m S | HEAD-XCZSV | HEAD | CLAY, SILT, SAND AND GRAVEL |
| 10 | 289m NW | GFDUD-XSV | GLACIOFLUVIAL DEPOSITS, DEVENSIAN | SAND AND GRAVEL |
| 11 | 392m N | GFDUD-XSV | GLACIOFLUVIAL DEPOSITS, DEVENSIAN | SAND AND GRAVEL |
| 12 | 436m SE | GFSDD-XSV | GLACIOFLUVIAL SHEET DEPOSITS, DEVENSIAN | SAND AND GRAVEL |
| 13 | 479m NW | ALV-XCZSV | ALLUVIUM | CLAY, SILT, SAND AND GRAVEL |

*This data is sourced from the British Geological Survey.*

## 15.5 Superficial permeability (50k)

**Records within 50m** **3**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

| Location | Flow type | Maximum permeability | Minimum permeability |
|---|---|---|---|
| **On site** | **Mixed** | **High** | **Low** |
| **On site** | **Intergranular** | **Very High** | **High** |
| **On site** | **Intergranular** | **Very High** | **High** |

*This data is sourced from the British Geological Survey.*

## 15.6 Landslip (50k)

**Records within 500m** **0**

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

*This data is sourced from the British Geological Survey.*

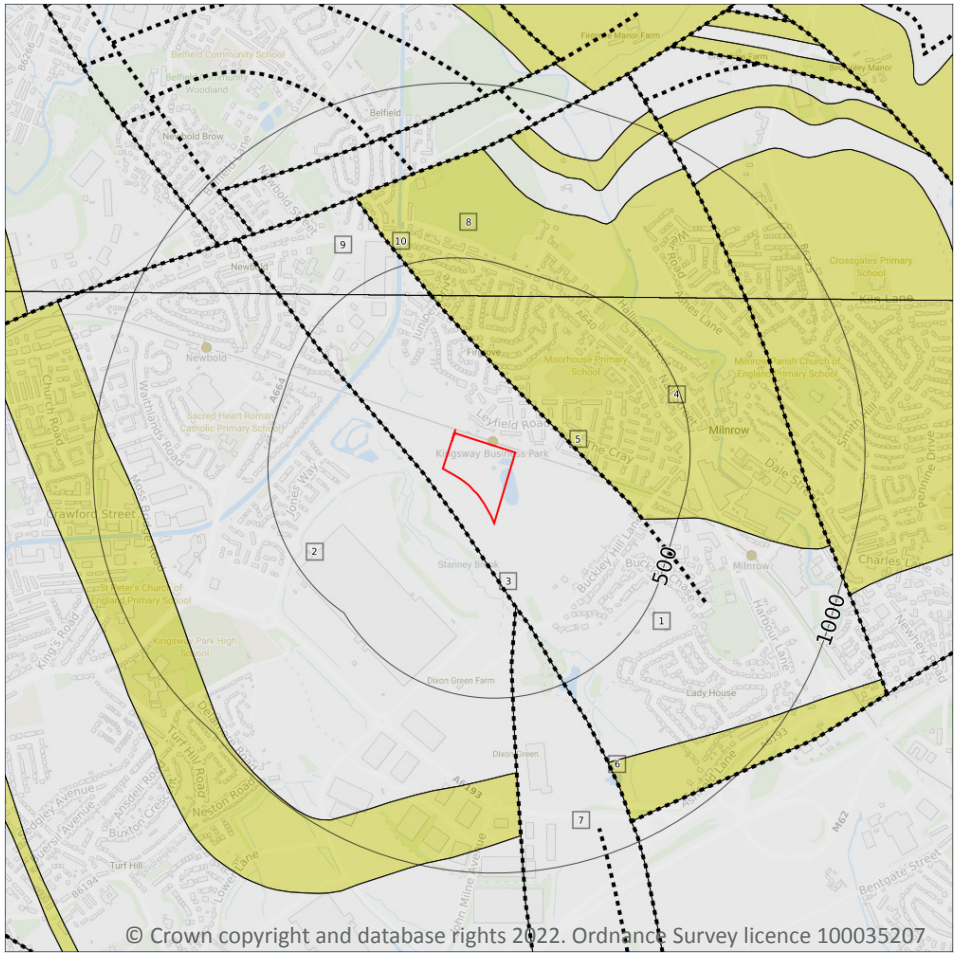
## 15.7 Landslip permeability (50k)

| Records within 50m | 0 |
|---|---|

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

*This data is sourced from the British Geological Survey.*

# Geology 1:50,000 scale - Bedrock




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Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

## 15.8 Bedrock geology (50k)

**Records within 500m** **6**

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 88**

| ID | Location | LEX Code | Description | Rock age |
|---|---|---|---|---|
| **1** | **On site** | **PLCM-MDSS** | **PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE** | **WESTPHALIAN** |
| 2 | 52m SW | PLCM-MDSS | PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE | WESTPHALIAN |
| 4 | 130m NE | MLRS-SDST | MILNROW SANDSTONE - SANDSTONE | WESTPHALIAN |

| ID | Location | LEX Code | Description | Rock age |
|---|---|---|---|---|
| 7 | 247m S | PLCM-MDSS | PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE | WESTPHALIAN |
| 8 | 392m N | MLRS-SDST | MILNROW SANDSTONE - SANDSTONE | WESTPHALIAN |
| 9 | 399m N | PLCM-MDSS | PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE | WESTPHALIAN |

*This data is sourced from the British Geological Survey.*

## 15.9 Bedrock permeability (50k)

**Records within 50m** **1**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

| Location | Flow type | Maximum permeability | Minimum permeability |
|---|---|---|---|
| **On site** | **Fracture** | **Moderate** | **Low** |

*This data is sourced from the British Geological Survey.*

## 15.10 Bedrock faults and other linear features (50k)

**Records within 500m** **4**

Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 88**

| ID | Location | Category | Description |
|---|---|---|---|
| 3 | 52m SW | FAULT | Fault, inferred |
| 5 | 130m NE | FAULT | Fault, inferred |
| 6 | 247m S | FAULT | Fault, inferred |
| 10 | 399m N | FAULT | Fault, inferred |

*This data is sourced from the British Geological Survey.*

# 16 Boreholes

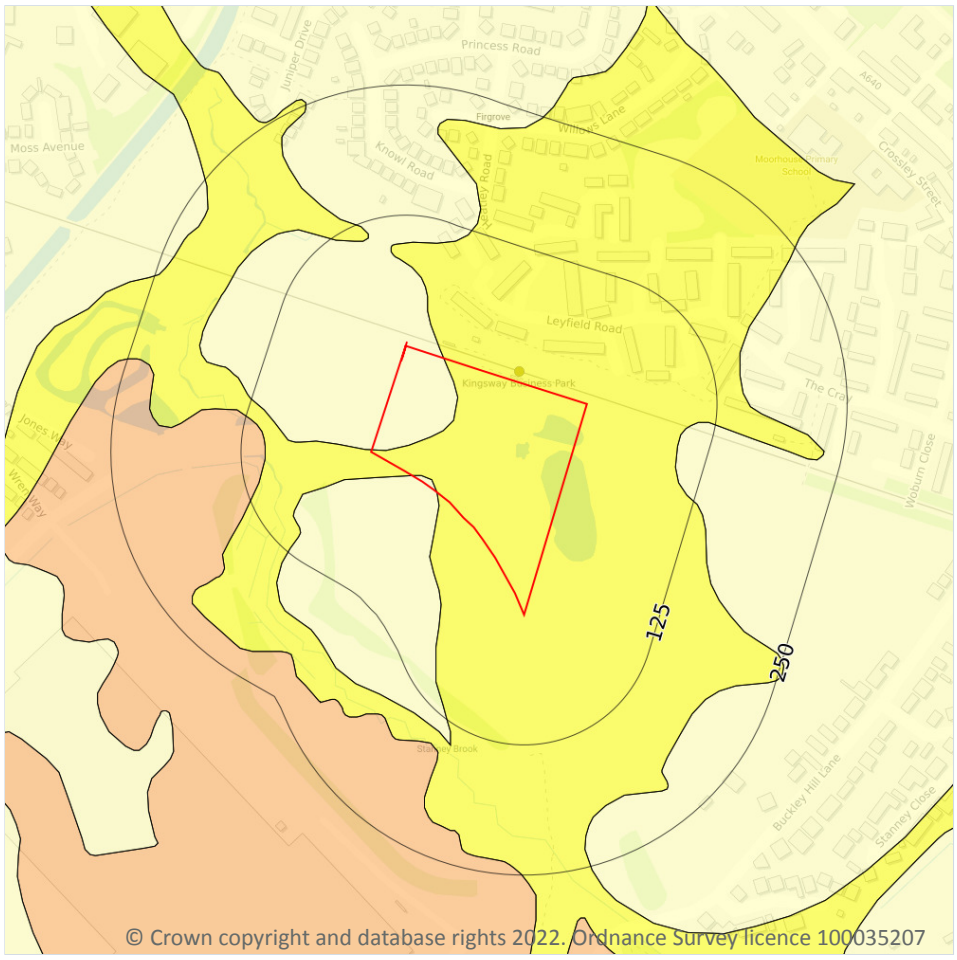
## 16.1 BGS Boreholes

| Records within 250m | 0 |
|---|---|

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

*This data is sourced from the British Geological Survey.*

# 17 Natural ground subsidence - Shrink swell clays




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.1 Shrink swell clays

| Records within 50m | 2 |
|---|---|

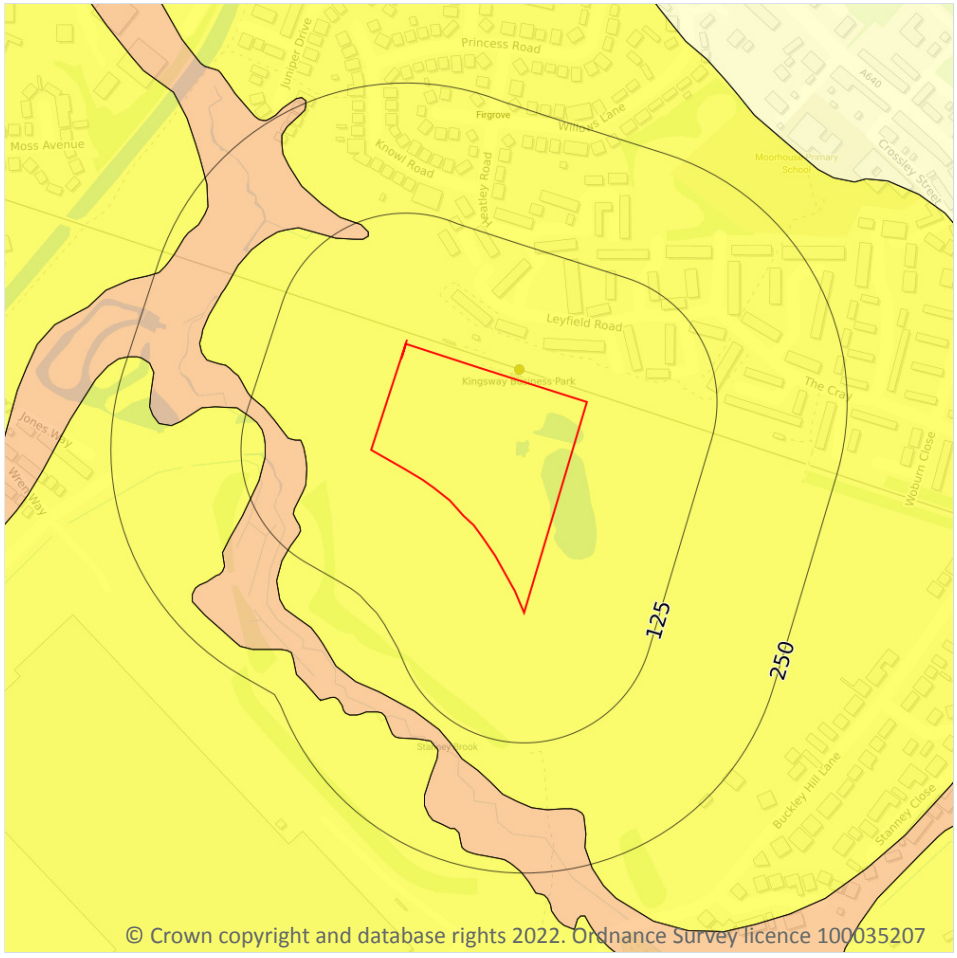
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 91**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Negligible** | **Ground conditions predominantly non-plastic.** |
| **On site** | **Very low** | **Ground conditions predominantly low plasticity.** |

*This data is sourced from the British Geological Survey.*

# Natural ground subsidence - Running sands




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.2 Running sands

| Records within 50m | 1 |
|---|---|

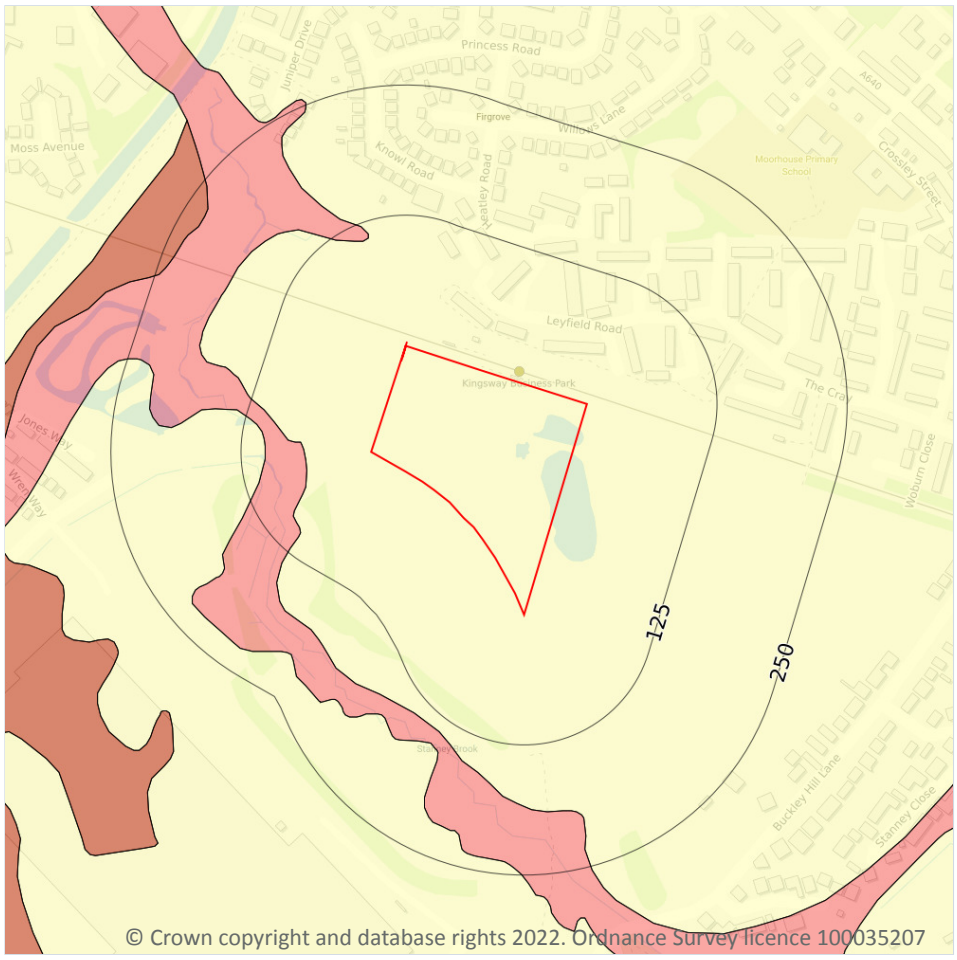
The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

Features are displayed on the Natural ground subsidence - Running sands map on **page 92**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Very low** | **Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.** |

*This data is sourced from the British Geological Survey.*

# Natural ground subsidence - Compressible deposits




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.3 Compressible deposits

| Records within 50m | 1 |
|---|---|

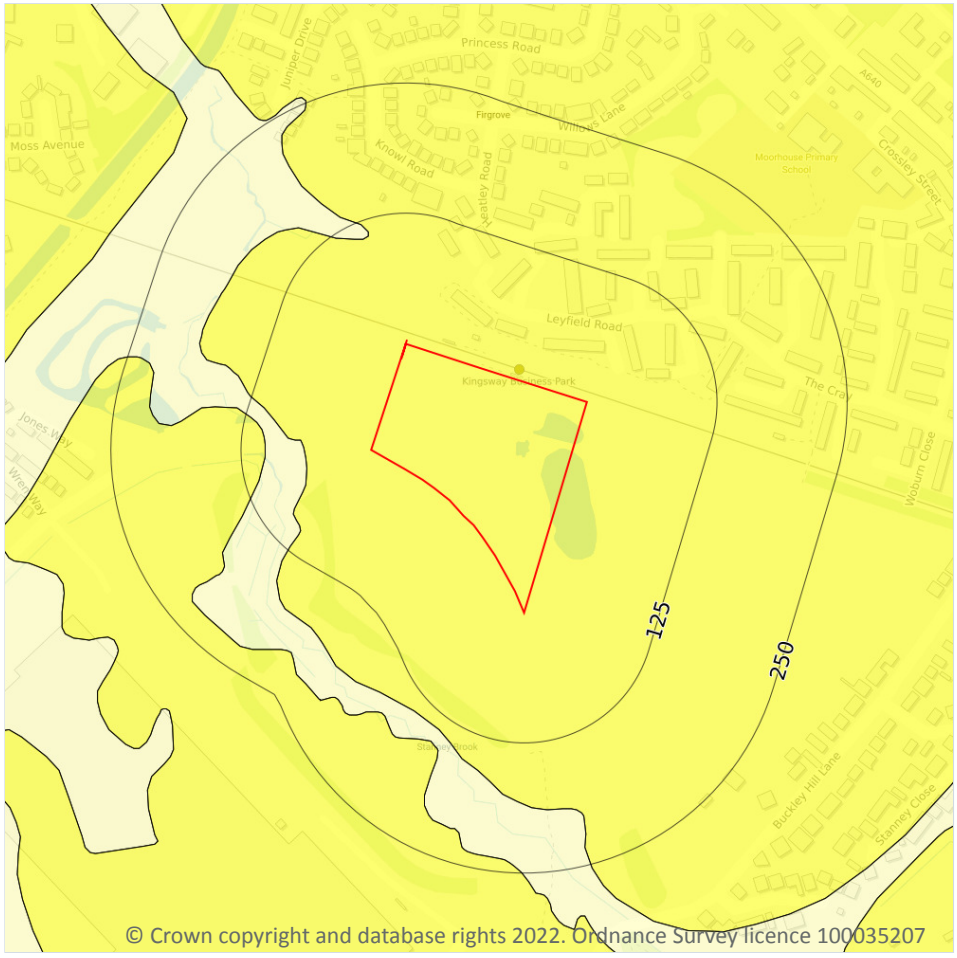
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 93**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Negligible** | **Compressible strata are not thought to occur.** |

*This data is sourced from the British Geological Survey.*

# Natural ground subsidence - Collapsible deposits




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.4 Collapsible deposits

| Records within 50m | 1 |
|---|---|

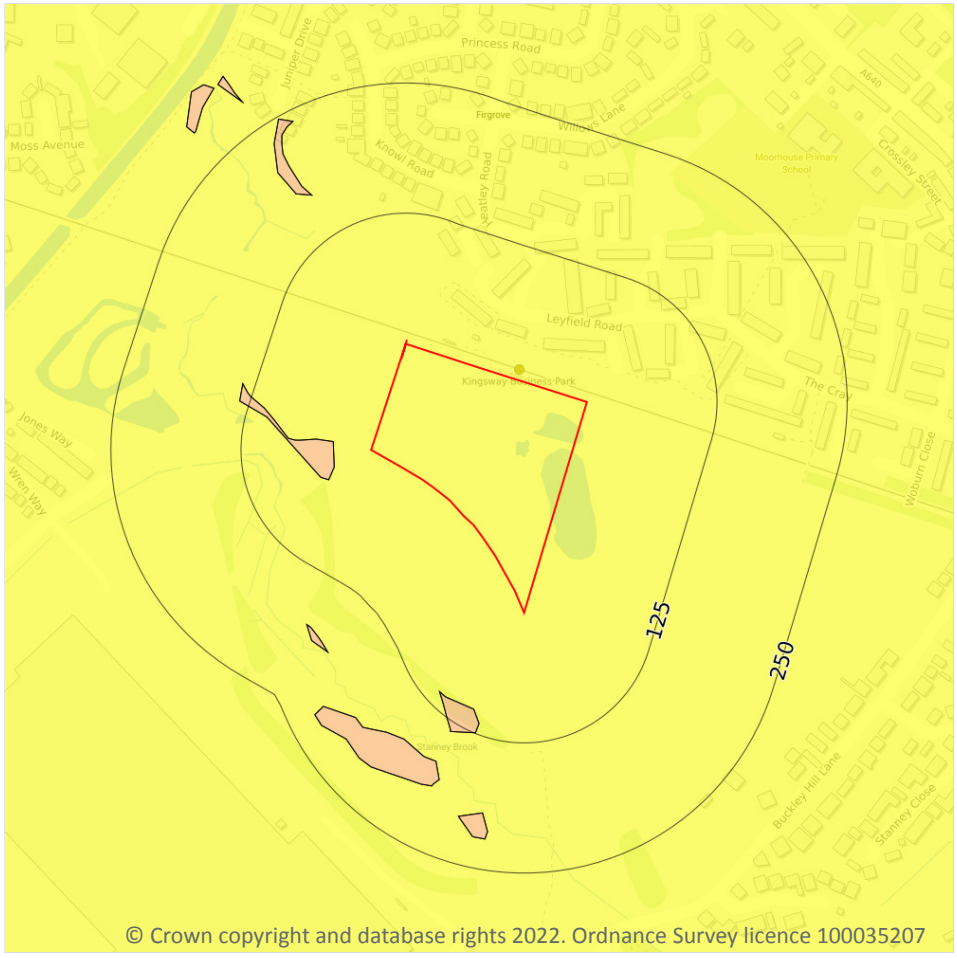
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 94**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Very low** | **Deposits with potential to collapse when loaded and saturated are unlikely to be present.** |

*This data is sourced from the British Geological Survey.*

# Natural ground subsidence - Landslides




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.5 Landslides

| Records within 50m | 2 |
|---|---|

The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

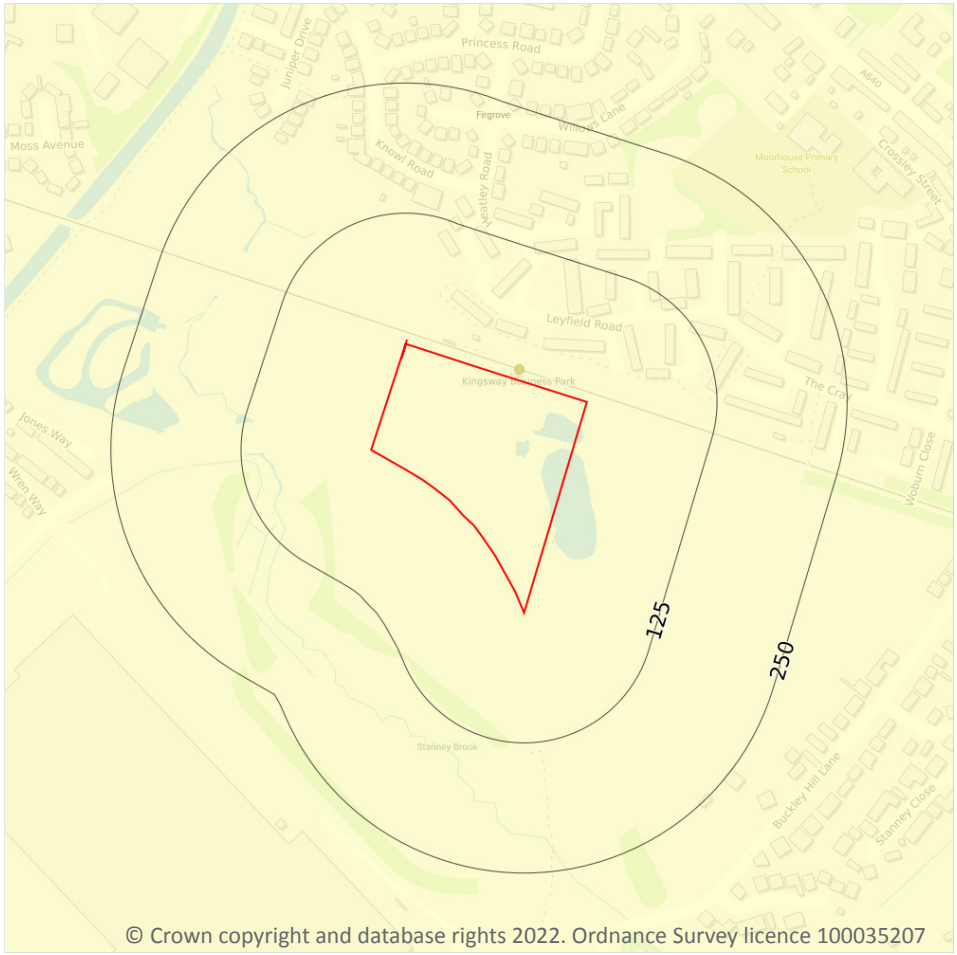
Features are displayed on the Natural ground subsidence - Landslides map on **page 95**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Very low** | **Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.** |

| Location | Hazard rating | Details |
|---|---|---|
| 36m W | Low | Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site. |

*This data is sourced from the British Geological Survey.*

# Natural ground subsidence - Ground dissolution of soluble rocks




Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

## 17.6 Ground dissolution of soluble rocks

| Records within 50m | 1 |
|---|---|

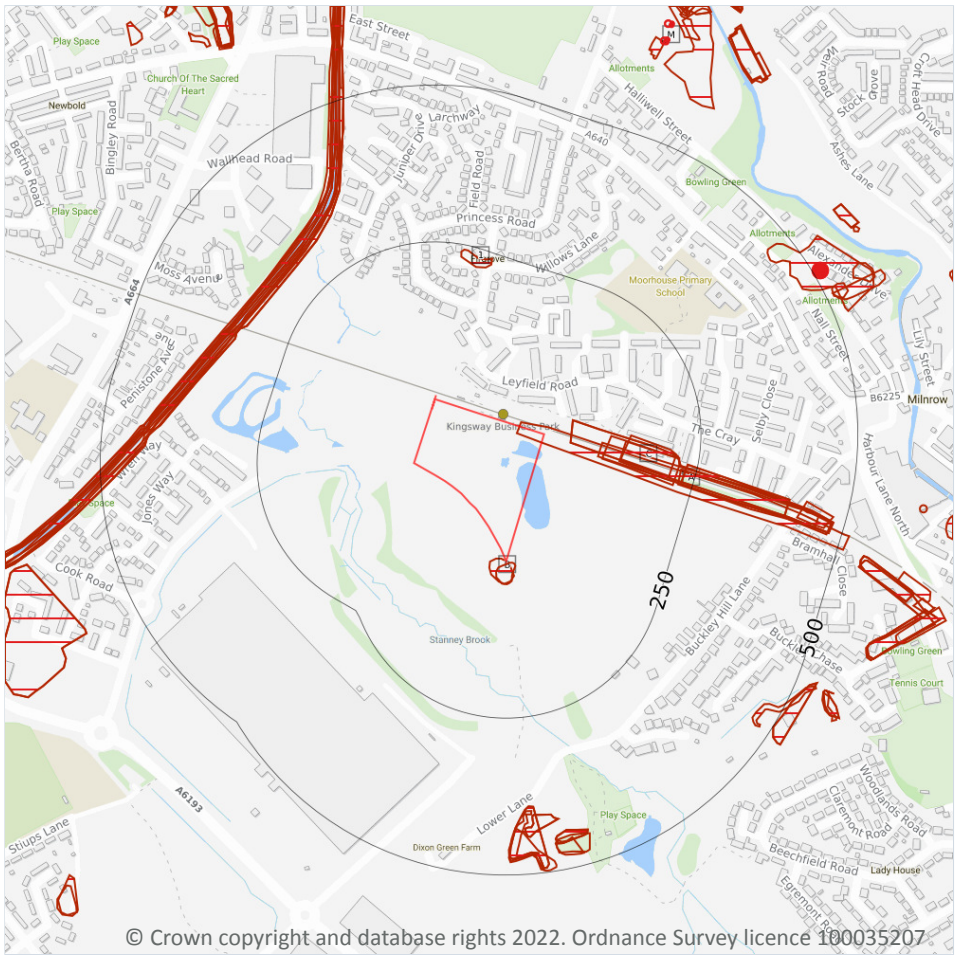
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 97**

| Location | Hazard rating | Details |
|---|---|---|
| **On site** | **Negligible** | **Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.** |

*This data is sourced from the British Geological Survey.*

# 18 Mining, ground workings and natural cavities




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Site Outline

Search buffers in metres (m)

- Natural cavities (Area)
- Natural cavities (Point)
- BritPits
- Surface ground workings
- Underground workings
- Historical Mineral Planning Areas
- Mining Cavities

Non Coal Mining

- Sporadic underground mining of restricted extent possible
- Localised small scale underground mining possible
- Small scale mining possible
- Underground mining known or likely within or in close proximity
- Underground mining known within or in very close proximity

## 18.1 Natural cavities

| Records within 500m | 0 |
|---|---|

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

*This data is sourced from Stantec UK Ltd.*

## 18.2 BritPits

| Records within 500m | 0 |
|---|---|

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

*This data is sourced from the British Geological Survey.*

## 18.3 Surface ground workings

| Records within 250m | 13 |
|---|---|

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining, ground workings and natural cavities map on **page 98**

| ID | Location | Land Use | Year of mapping | Mapping scale |
|---|---|---|---|---|
| **A** | **On site** | **Cuttings** | **1851** | **1:10560** |
| B | 0m SW | Pond | 1976 | 1:10000 |
| B | 4m S | Pond | 1851 | 1:10560 |
| A | 43m E | Cuttings | 1938 | 1:10560 |
| A | 43m E | Cuttings | 1928 | 1:10560 |
| A | 93m E | Cuttings | 1891 | 1:10560 |
| C | 100m E | Cuttings | 1954 | 1:10560 |
| A | 127m E | Cuttings | 1908 | 1:10560 |
| C | 129m E | Cuttings | 1976 | 1:10000 |
| 1 | 220m N | Gravel Pit | 1928 | 1:10560 |
| A | 225m E | Cuttings | 1954 | 1:10560 |
| A | 231m E | Cuttings | 1976 | 1:10000 |
| A | 231m E | Cuttings | 1967 | 1:10560 |

*This is data is sourced from Ordnance Survey/Groundsure.*

## 18.4 Underground workings

| Records within 1000m | 25 |
|---|---|

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

Features are displayed on the Mining, ground workings and natural cavities map on **page 98**

| ID | Location | Land Use | Year of mapping | Mapping scale |
|---|---|---|---|---|
| M | 650m N | Unspecified Disused Shafts | 1976 | 1:10000 |
| M | 650m N | Unspecified Disused Shafts | 1967 | 1:10560 |
| M | 651m N | Unspecified Old Shaft | 1954 | 1:10560 |
| M | 655m N | Old Coal Shafts | 1908 | 1:10560 |
| M | 655m N | Unspecified Old Shaft | 1938 | 1:10560 |
| M | 655m N | Unspecified Old Shaft | 1928 | 1:10560 |
| M | 655m N | Unspecified Old Shafts | 1891 | 1:10560 |
| M | 678m N | Unspecified Disused Shafts | 1976 | 1:10000 |
| M | 678m N | Unspecified Disused Shafts | 1967 | 1:10560 |
| M | 680m N | Unspecified Old Shaft | 1954 | 1:10560 |
| M | 682m N | Old Coal Shafts | 1908 | 1:10560 |
| M | 684m N | Unspecified Old Shaft | 1938 | 1:10560 |
| M | 684m N | Unspecified Old Shaft | 1928 | 1:10560 |
| M | 684m N | Unspecified Old Shafts | 1891 | 1:10560 |
| - | 971m NW | Unspecified Disused Shaft | 1967 | 1:10560 |
| - | 971m NW | Unspecified Disused Shafts | 1976 | 1:10000 |
| - | 972m NW | Unspecified Disused Shafts | 1976 | 1:10000 |
| - | 972m NW | Unspecified Disused Shaft | 1967 | 1:10560 |
| - | 989m NE | Unspecified Disused Shaft | 1976 | 1:10000 |
| - | 989m NE | Unspecified Disused Shaft | 1967 | 1:10560 |
| - | 992m NE | Unspecified Old Shaft | 1954 | 1:10560 |
| - | 994m NE | Disused Colliery | 1891 | 1:10560 |
| - | 996m NE | Old Coal Shaft | 1908 | 1:10560 |

| ID | Location | Land Use | Year of mapping | Mapping scale |
|---|---|---|---|---|
| - | 996m NE | Unspecified Old Shaft | 1938 | 1:10560 |
| - | 996m NE | Unspecified Old Shaft | 1928 | 1:10560 |

*This is data is sourced from Ordnance Survey/Groundsure.*

## 18.5 Historical Mineral Planning Areas

| **Records within 500m** | **0** |
|---|---|

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

*This data is sourced from the British Geological Survey.*

## 18.6 Non-coal mining

| **Records within 1000m** | **0** |
|---|---|

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

*This data is sourced from the British Geological Survey.*

## 18.7 Mining cavities

| **Records within 1000m** | **0** |
|---|---|

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

*This data is sourced from Stantec UK Ltd.*

## 18.8 JPB mining areas

| **Records on site** | **0** |
|---|---|

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

*This data is sourced from Johnson Poole and Bloomer.*

## 18.9 Coal mining

| Records on site | 1 |
|---|---|

Areas which could be affected by past, current or future coal mining.

| Location | Details |
|---|---|
| **On site** | **The site is located within a coal mining area as defined by the Coal Authority. A Consultants Coal Mining Report is recommended to further assess coal mining issues at the site. This can be ordered directly through Groundsure or your preferred search provider.** |

*This data is sourced from the Coal Authority.*

## 18.10 Brine areas

| Records on site | 0 |
|---|---|

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

*This data is sourced from the Cheshire Brine Subsidence Compensation Board.*

## 18.11 Gypsum areas

| Records on site | 0 |
|---|---|

Generalised areas that may be affected by gypsum extraction.

*This data is sourced from British Gypsum.*

## 18.12 Tin mining

| Records on site | 0 |
|---|---|

Generalised areas that may be affected by historical tin mining.

*This data is sourced from Groundsure.*

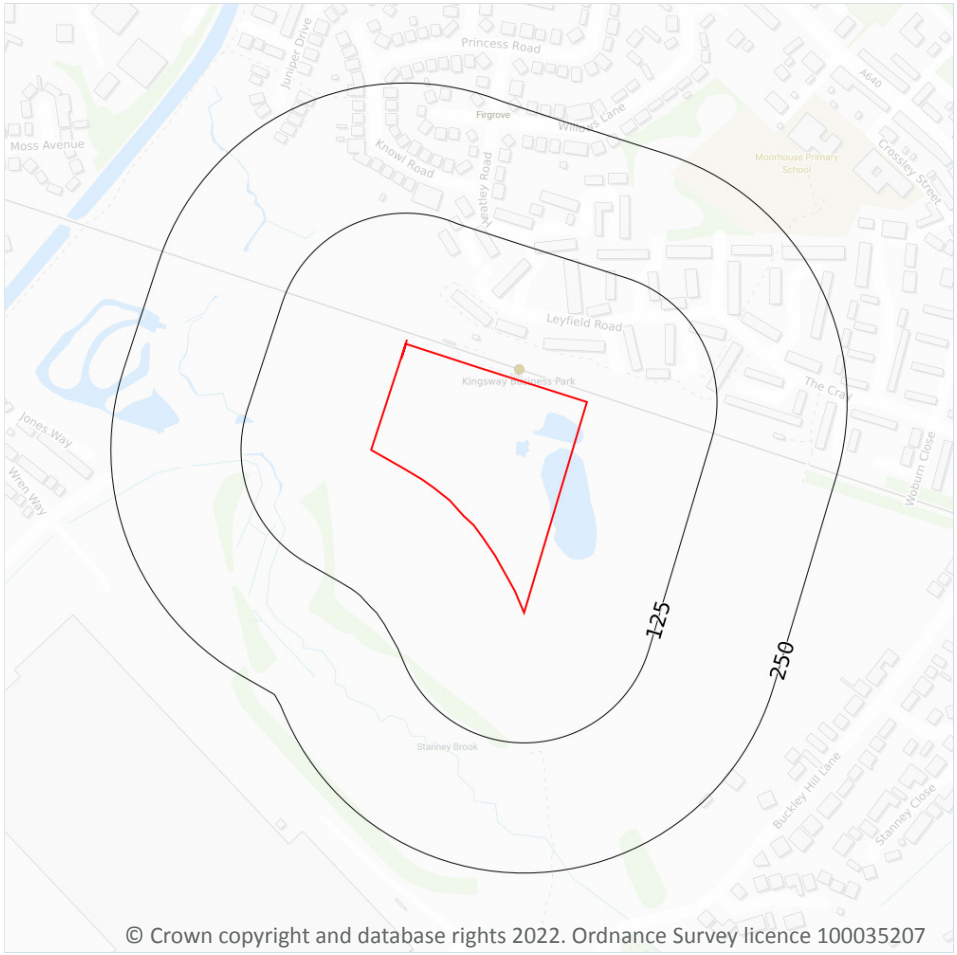
## 18.13 Clay mining

| Records on site | 0 |
|---|---|

Generalised areas that may be affected by kaolin and ball clay extraction.

*This data is sourced from the Kaolin and Ball Clay Association (UK).*

# 19 Radon




Site Outline

Search buffers in metres (m)

- Greater than 30%
- Between 10% and 30%
- Between 5% and 10%
- Between 3% and 5%
- Between 1% and 3%
- Less than 1%

## 19.1 Radon

| Records on site | 1 |
|---|---|

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on **page 103**

| Location | Estimated properties affected | Radon Protection Measures required |
|---|---|---|
| **On site** | **Less than 1%** | **None**** |

*This data is sourced from the British Geological Survey and Public Health England.*

# 20 Soil chemistry

## 20.1 BGS Estimated Background Soil Chemistry

| **Records within 50m** | **13** |
|---|---|

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 $km^2$. In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 $km^2$; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

| Location | Arsenic | Bioaccessible Arsenic | Lead | Bioaccessible Lead | Cadmium | Chromium | Nickel |
|---|---|---|---|---|---|---|---|
| **On site** | **15 - 25 mg/kg** | **No data** | **100 - 200 mg/kg** | **60 - 120 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |
| **On site** | **15 - 25 mg/kg** | **No data** | **100 - 200 mg/kg** | **60 - 120 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |
| **On site** | **15 - 25 mg/kg** | **No data** | **300 - 600 mg/kg** | **240 - 360 mg/kg** | **1.8 - 2.2 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |
| **On site** | **15 - 25 mg/kg** | **No data** | **100 mg/kg** | **60 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |
| **On site** | **25 - 35 mg/kg** | **No data** | **100 - 200 mg/kg** | **60 - 120 mg/kg** | **1.8 mg/kg** | **60 - 90 mg/kg** | **15 - 30 mg/kg** |
| 13m NW | 15 - 25 mg/kg | No data | 100 - 200 mg/kg | 60 - 120 mg/kg | 1.8 mg/kg | 90 - 120 mg/kg | 30 - 45 mg/kg |
| 13m SW | 25 - 35 mg/kg | No data | 100 - 200 mg/kg | 60 - 120 mg/kg | 1.8 mg/kg | 60 - 90 mg/kg | 15 - 30 mg/kg |
| 19m N | 15 - 25 mg/kg | No data | 100 - 200 mg/kg | 60 - 120 mg/kg | 1.8 mg/kg | 60 - 90 mg/kg | 30 - 45 mg/kg |
| 24m NE | 15 - 25 mg/kg | No data | 300 - 600 mg/kg | 240 - 360 mg/kg | 1.8 - 2.2 mg/kg | 60 - 90 mg/kg | 30 - 45 mg/kg |
| 24m NE | 15 - 25 mg/kg | No data | 100 - 200 mg/kg | 60 - 120 mg/kg | 1.8 mg/kg | 60 - 90 mg/kg | 30 - 45 mg/kg |
| 26m S | 25 - 35 mg/kg | No data | 100 mg/kg | 60 mg/kg | 1.8 mg/kg | 60 - 90 mg/kg | 15 - 30 mg/kg |
| 41m S | 15 - 25 mg/kg | No data | 100 mg/kg | 60 mg/kg | 1.8 mg/kg | 60 - 90 mg/kg | 15 - 30 mg/kg |

| Location | Arsenic | Bioaccessible Arsenic | Lead | Bioaccessible Lead | Cadmium | Chromium | Nickel |
|---|---|---|---|---|---|---|---|
| 41m SE | 15 - 25 mg/kg | No data | 100 mg/kg | 60 mg/kg | 1.8 mg/kg | 60 - 90 mg/kg | 15 - 30 mg/kg |

*This data is sourced from the British Geological Survey.*

## 20.2 BGS Estimated Urban Soil Chemistry

| Records within 50m | 0 |
|---|---|

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per $km^2$).

*This data is sourced from the British Geological Survey.*

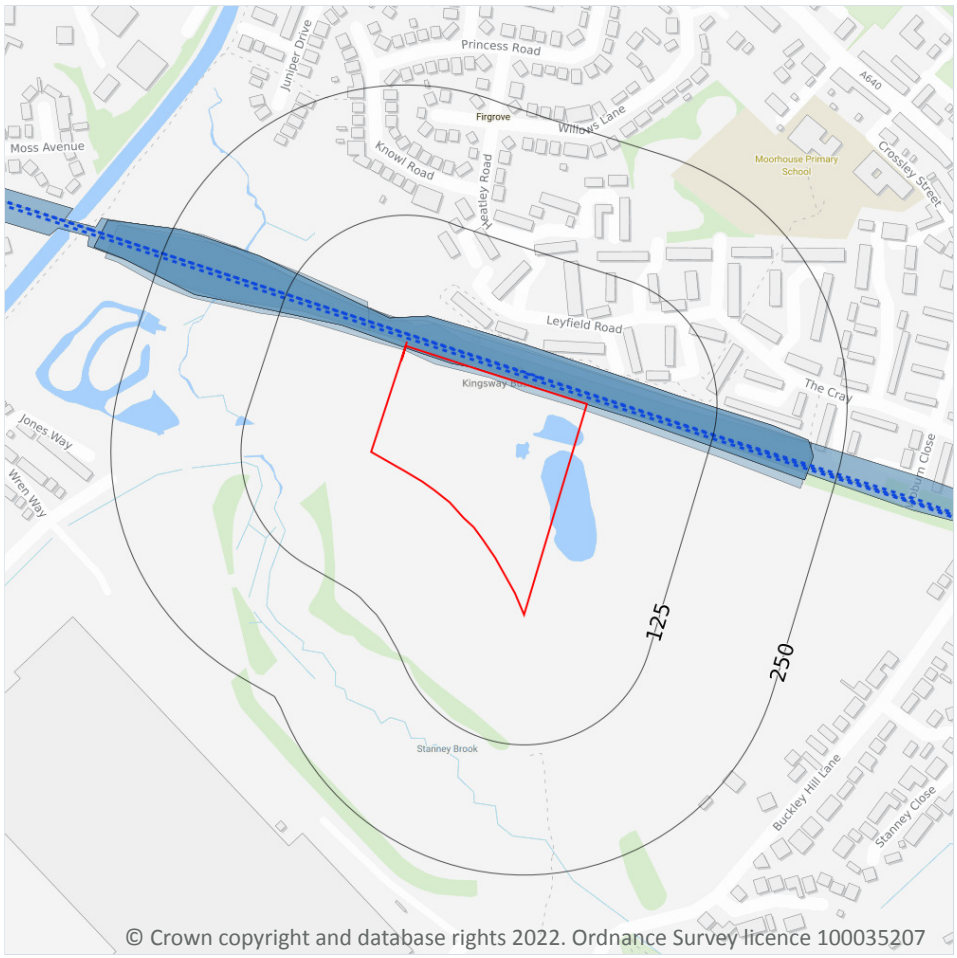
## 20.3 BGS Measured Urban Soil Chemistry

| Records within 50m | 0 |
|---|---|

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per $km^2$.

*This data is sourced from the British Geological Survey.*

# 21 Railway infrastructure and projects




Site Outline

Search buffers in metres (m)

- Crossrail 1 Stations
- Crossrail 1 Route
- Crossrail 1 Worksites
- Crossrail 2 Stations
- Crossrail 2 Route
- Crossrail 2 Worksites
- Crossrail 2 Safeguarding
- Crossrail 2 Headhouses
- Railway stations
- Active railways
- Active tunnels
- Abandoned railways
- Historic railways
- Historic tunnels
- Underground stations
- Underground Lines
- Royal Mail tunnels
- HS2 optimised route
- HS2 Stations
- HS2 Depots
- HS2 Surface Safeguarding
- HS2 Subsurface Safeguarding

## 21.1 Underground railways (London)

| Records within 250m | 0 |
|---|---|

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

*This data is sourced from publicly available information by Groundsure.*

## 21.2 Underground railways (Non-London)

| Records within 250m | 0 |
|---|---|

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

*This data is sourced from publicly available information by Groundsure.*

## 21.3 Railway tunnels

| Records within 250m | 0 |
|---|---|

Railway tunnels taken from contemporary Ordnance Survey mapping.

*This data is sourced from the Ordnance Survey.*

## 21.4 Historical railway and tunnel features

| Records within 250m | 8 |
|---|---|

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

Features are displayed on the Railway infrastructure and projects map on **page 106**

| Location | Land Use | Year of mapping | Mapping scale |
|---|---|---|---|
| **On site** | **Railway Sidings** | **1954** | **10560** |
| **On site** | **Railway Sidings** | **1938** | **10560** |
| **On site** | **Railway Sidings** | **1928** | **10560** |
| **On site** | **Railway Sidings** | **1908** | **10560** |
| 0m N | Railway | 1891 | - |
| 1m N | Railway | 1907 | - |
| 38m W | Railway | 1890 | - |
| 38m W | Railway | 1908 | - |

*This data is sourced from Ordnance Survey/Groundsure.*

## 21.5 Royal Mail tunnels

| Records within 250m | 0 |
|---|---|

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

*This data is sourced from Groundsure/the Postal Museum.*

## 21.6 Historical railways

| Records within 250m | 0 |
|---|---|

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

*This data is sourced from OpenStreetMap.*

## 21.7 Railways

| Records within 250m | 8 |
|---|---|

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

Features are displayed on the Railway infrastructure and projects map on **page 106**

| Location | Name | Type |
|---|---|---|
| 6m N | Metrolink | light_rail |
| 10m N | Not given | Multi Track |
| 10m N | Not given | Multi Track |
| 10m N | Not given | Multi Track |
| 10m N | Metrolink | light_rail |
| 10m N | Not given | Multi Track |
| 11m N | Not given | Multi Track |
| 223m E | Not given | Multi Track |

*This data is sourced from Ordnance Survey and OpenStreetMap.*

## 21.8 Crossrail 1

| Records within 500m | 0 |
|---|---|

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

*This data is sourced from publicly available information by Groundsure.*

## 21.9 Crossrail 2

| Records within 500m | 0 |
|---|---|

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

*This data is sourced from publicly available information by Groundsure.*

## 21.10 HS2

| Records within 500m | 0 |
|---|---|

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

*This data is sourced from HS2 ltd.*

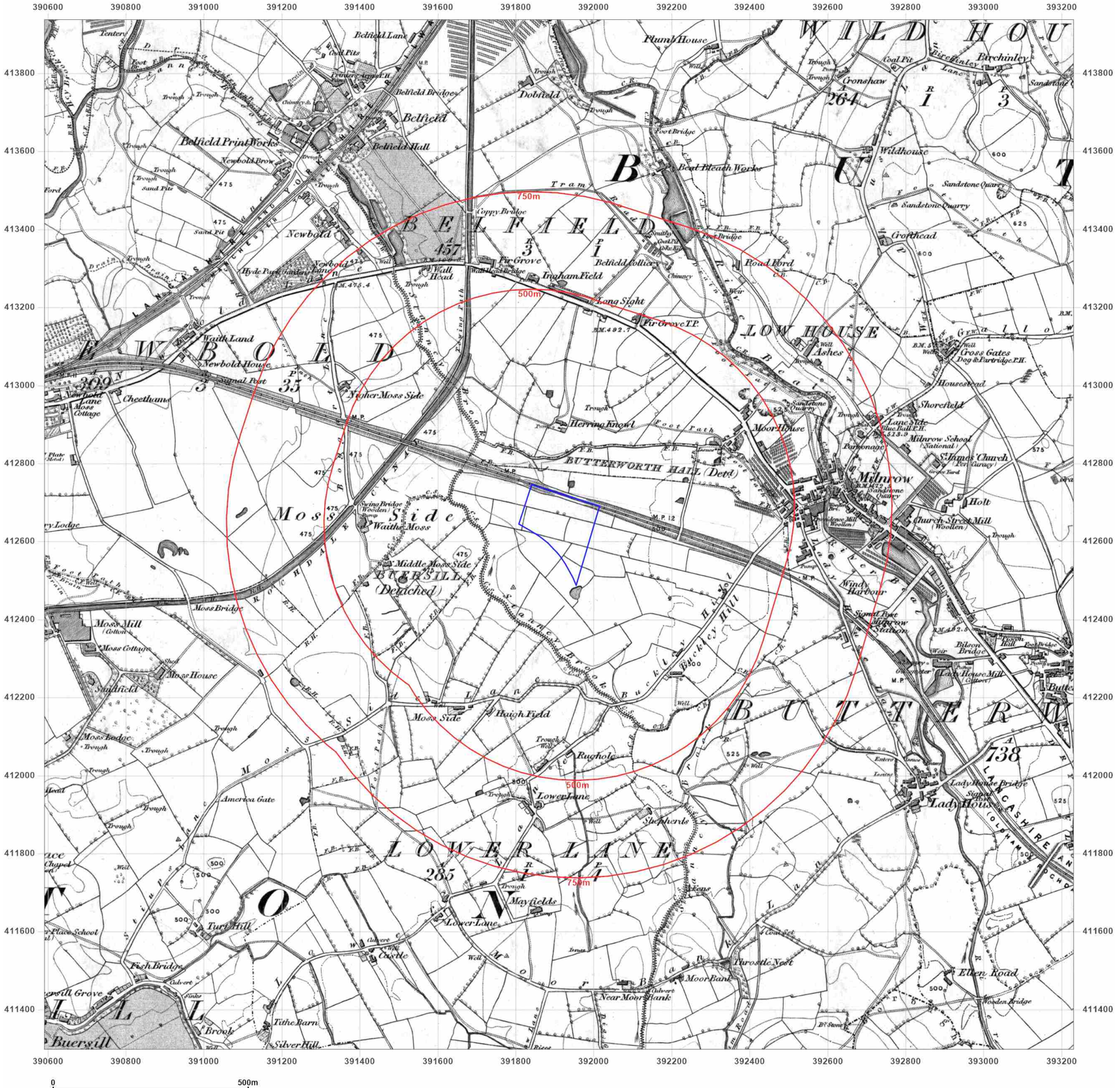
## Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see https://www.groundsure.com/sources-reference.

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# Appendix 4: Historical Mapping




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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** County Series
**Map date:** **1851**
**Scale:** 1:10,560
**Printed at:** 1:10,560

N
W E
S

Surveyed 1848
Revised N/A
Edition 1851
Copyright N/A
Levelled N/A

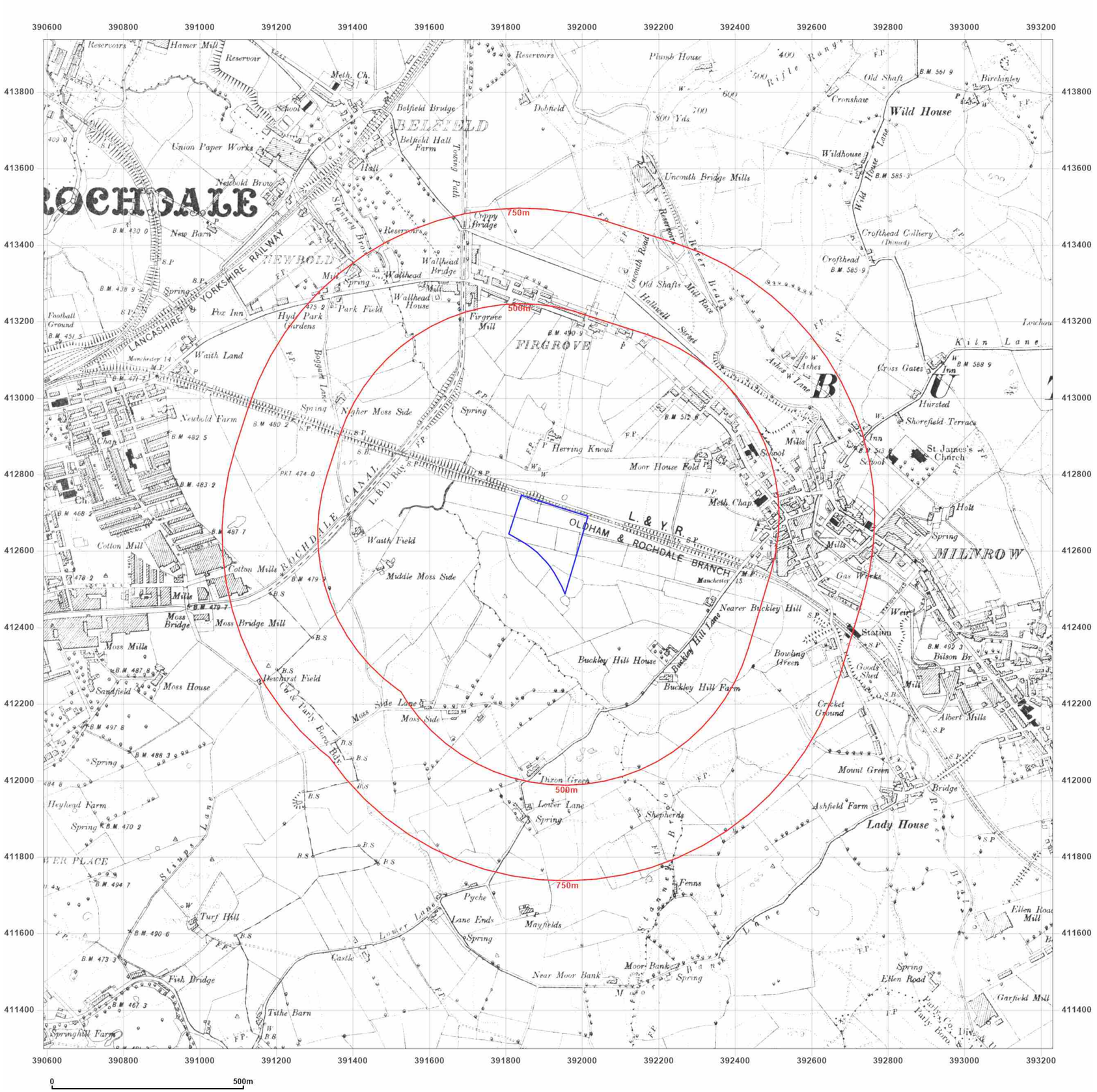
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** County Series

**Map date:** **1891**

**Scale:** 1:10,560

**Printed at:** 1:10,560

N
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Surveyed 1891
Revised 1891
Edition N/A
Copyright N/A
Levelled N/A

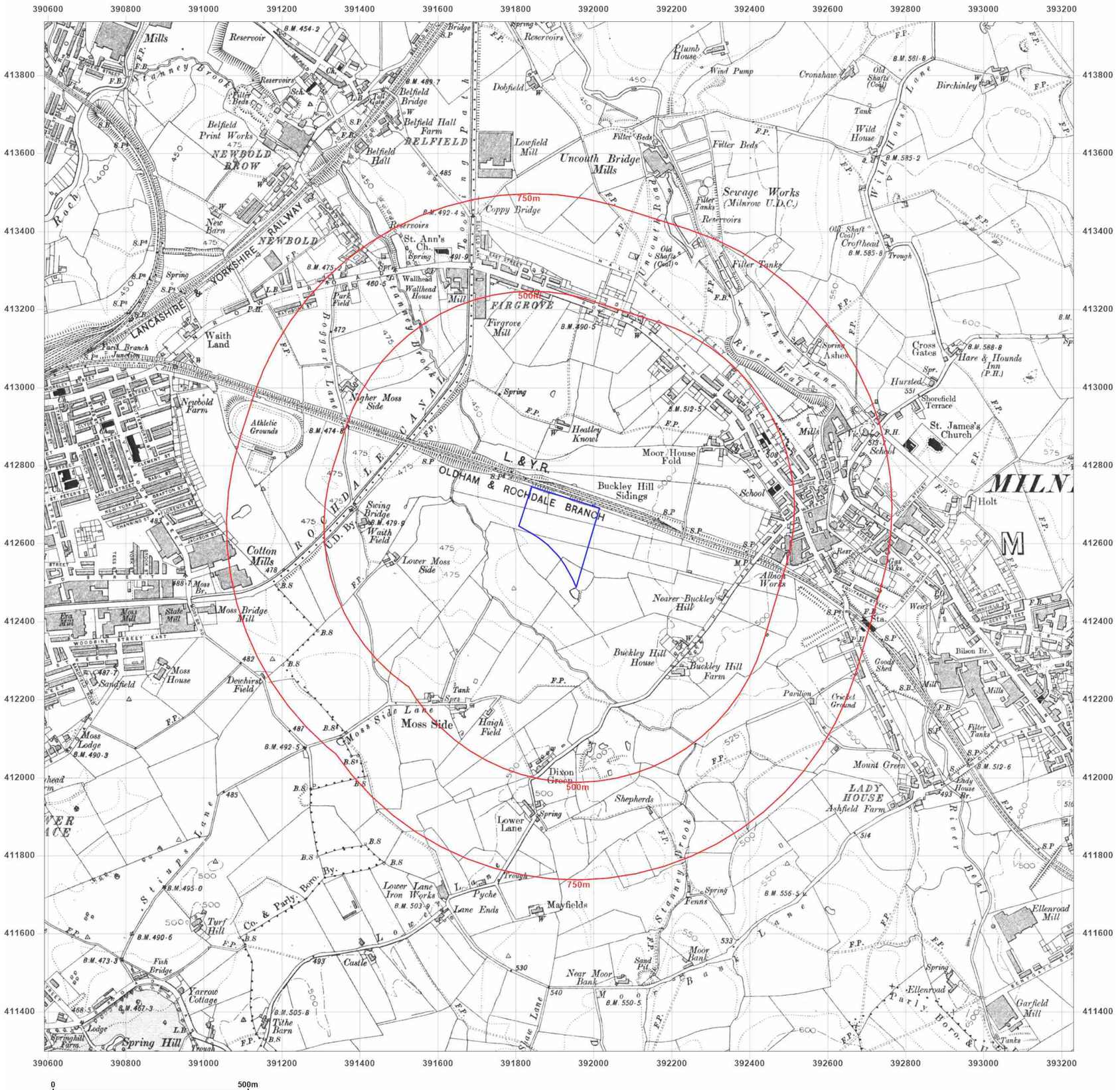
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** County Series

**Map date:** **1908**

**Scale:** 1:10,560

**Printed at:** 1:10,560

N
W E
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Surveyed 1848
Revised 1908
Edition N/A
Copyright N/A
Levelled N/A

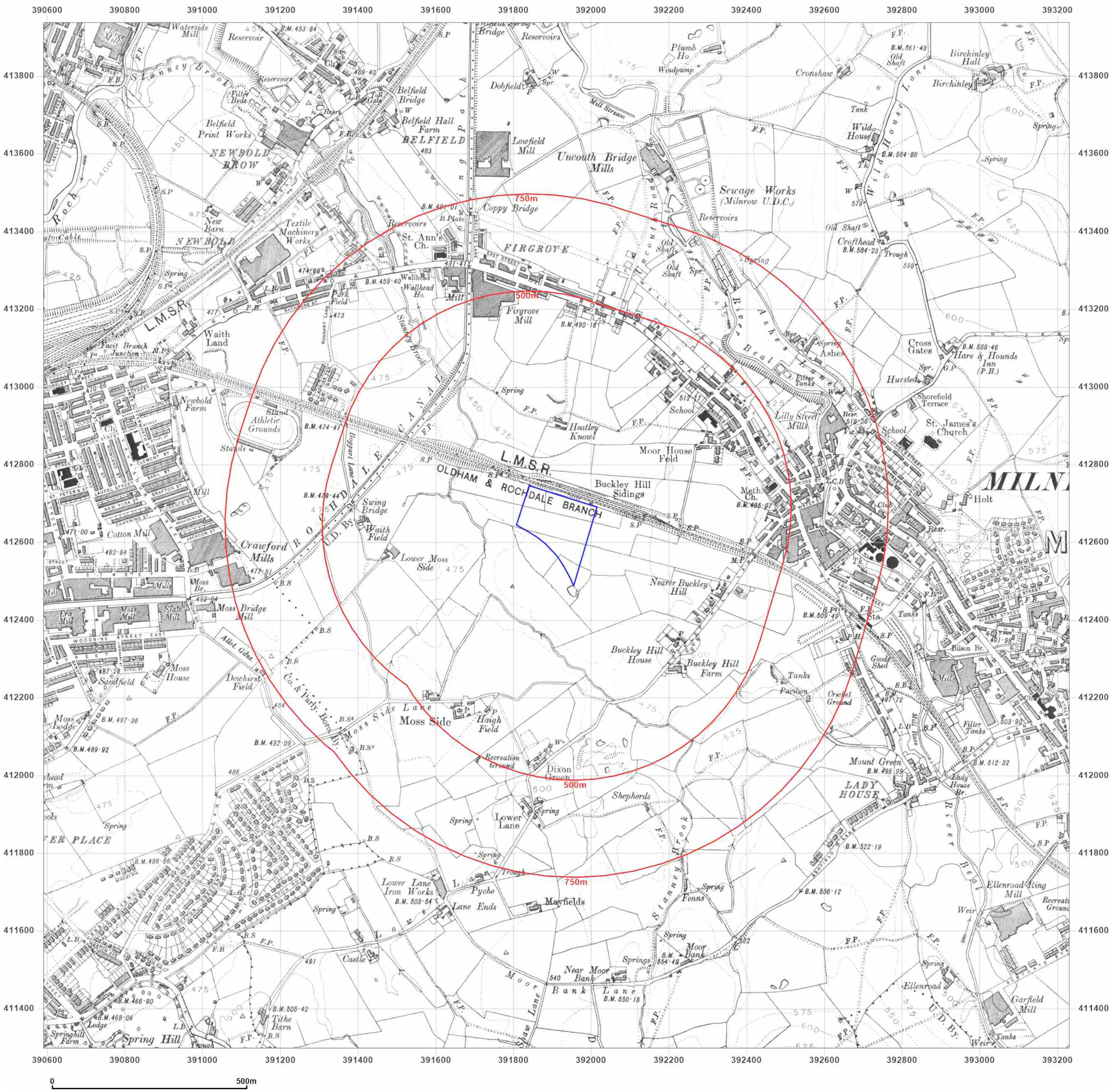
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** County Series

**Map date:** **1928**

**Scale:** 1:10,560

**Printed at:** 1:10,560

N
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Surveyed 1848
Revised 1928
Edition N/A
Copyright N/A
Levelled N/A

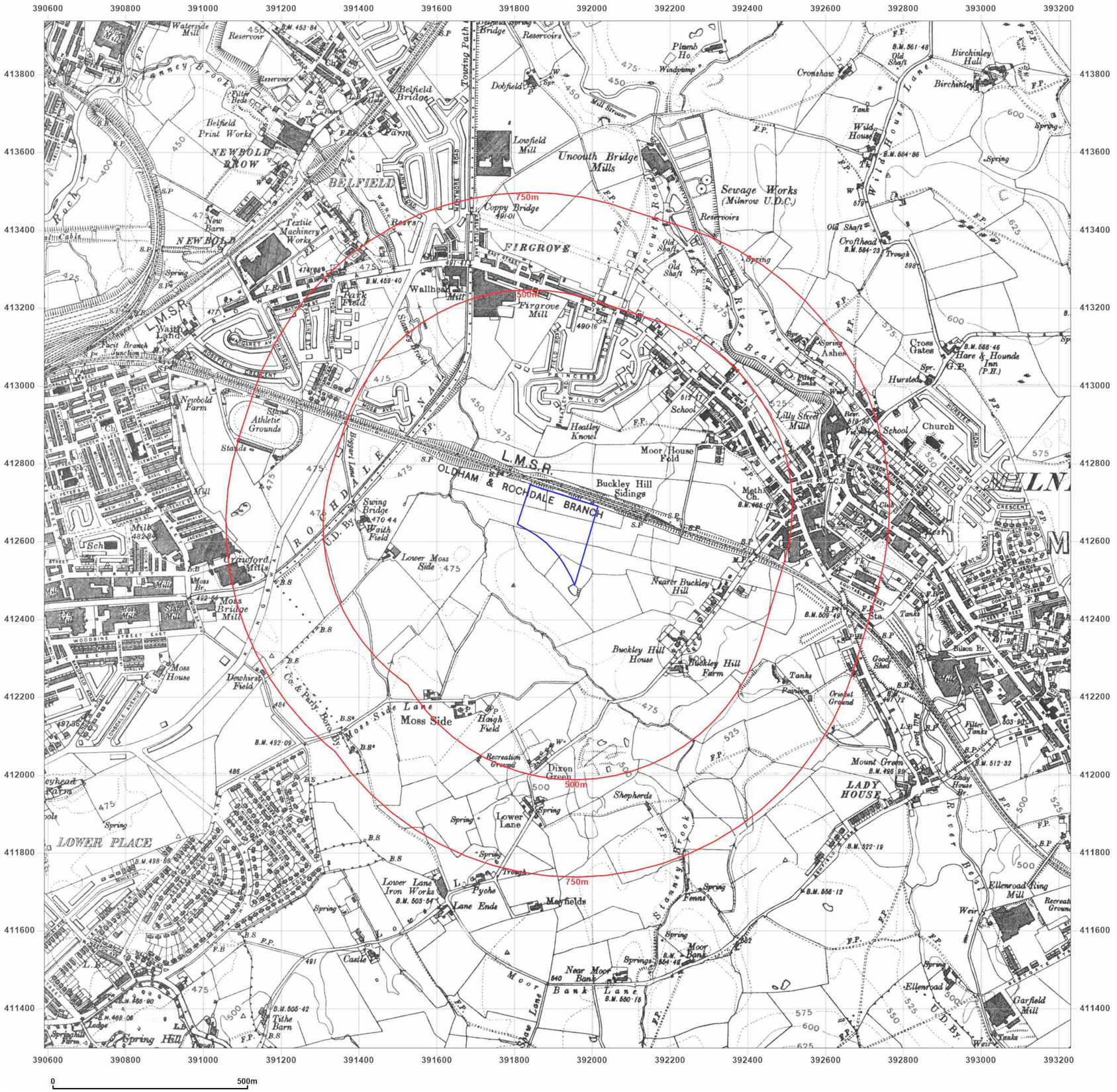

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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** County Series

**Map date:** **1938**

**Scale:** 1:10,560

**Printed at:** 1:10,560

N
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Surveyed 1848
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

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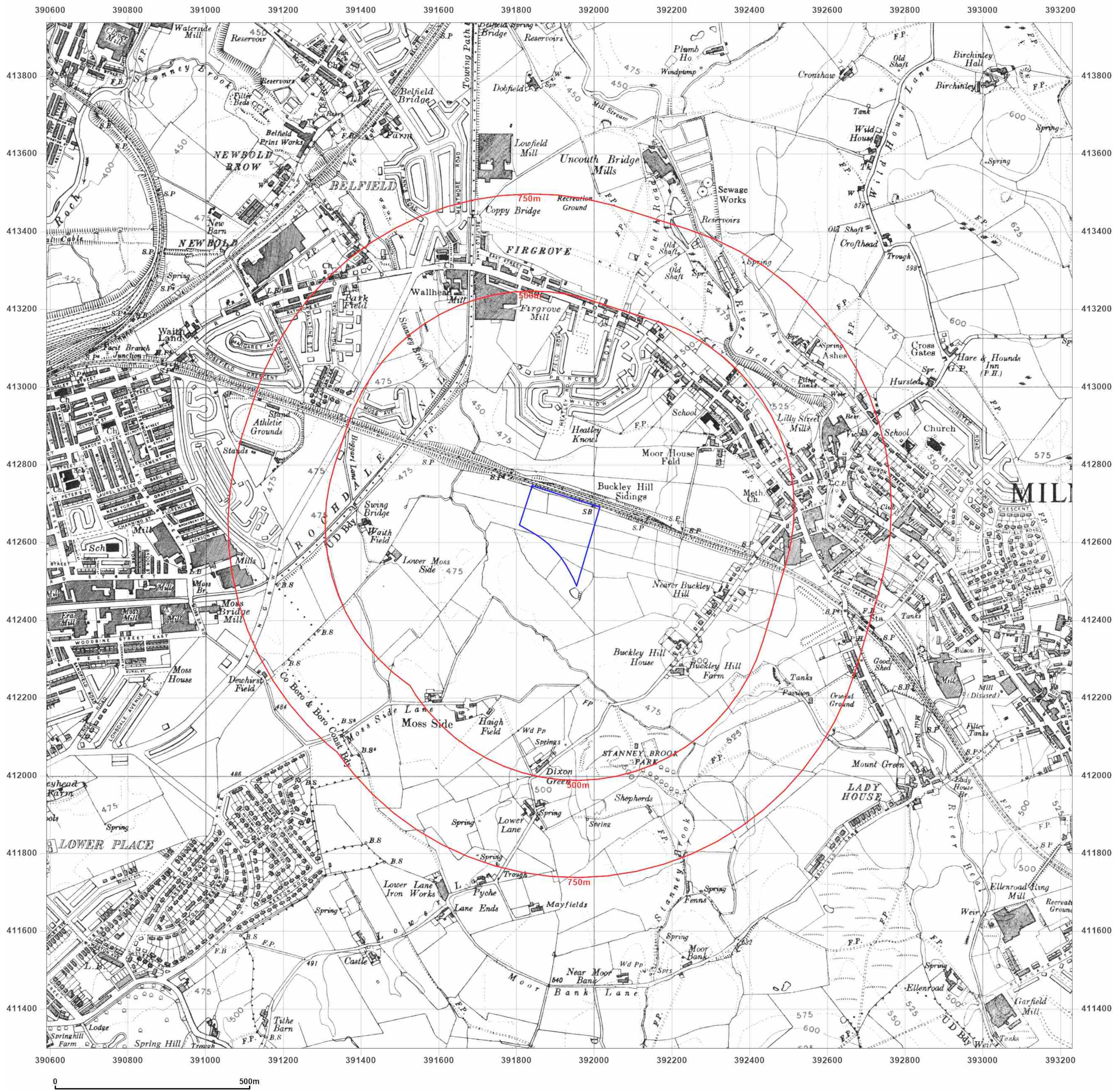
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** Provisional

**Map date:** **1954**

**Scale:** 1:10,560

**Printed at:** 1:10,560

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Surveyed 1954
Revised 1954
Edition N/A
Copyright N/A
Levelled N/A

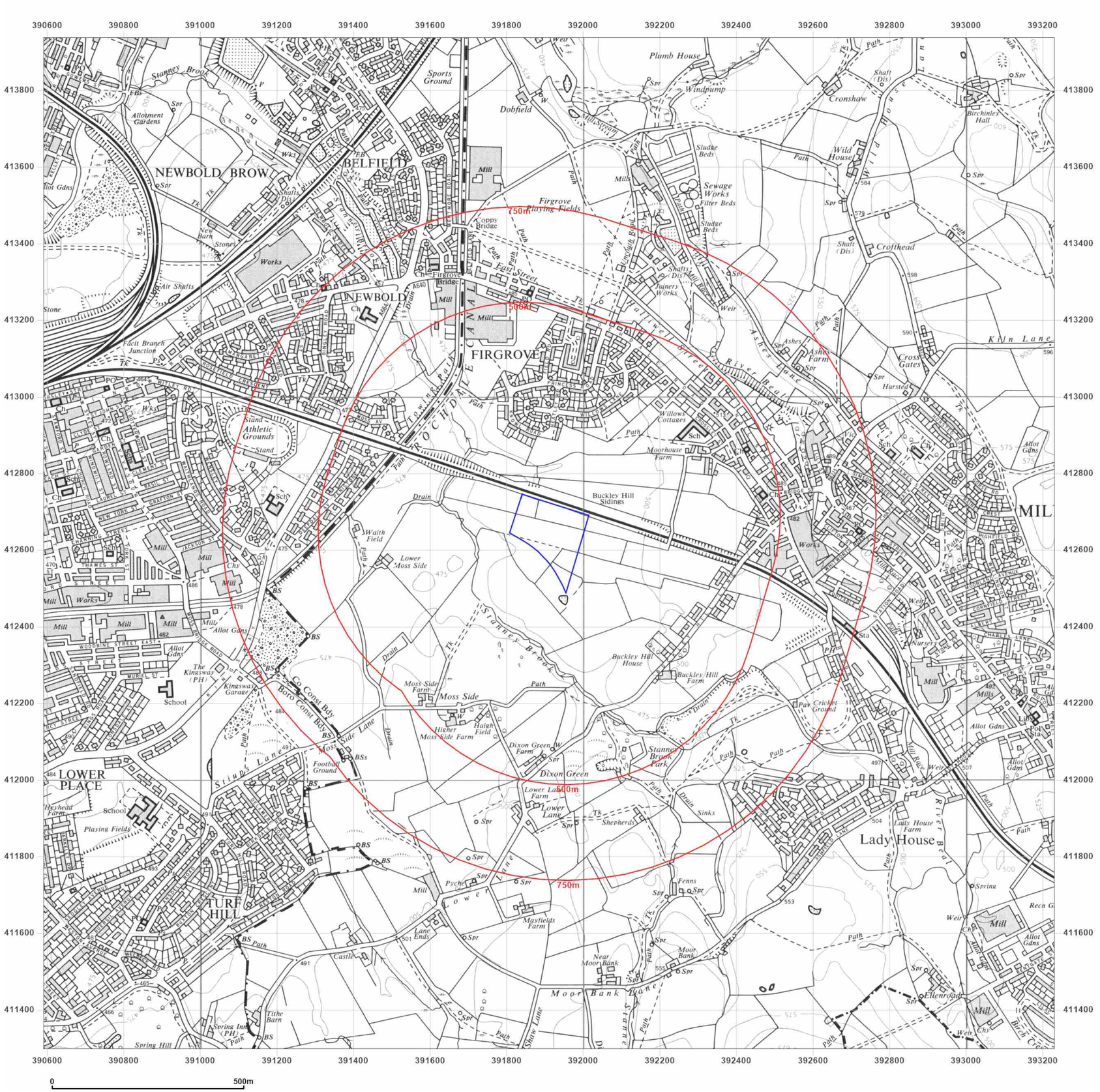
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** Provisional

**Map date:** **1967**

**Scale:** 1:10,560

**Printed at:** 1:10,560

N
W E
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Surveyed 1967
Revised 1967
Edition N/A
Copyright N/A
Levelled N/A

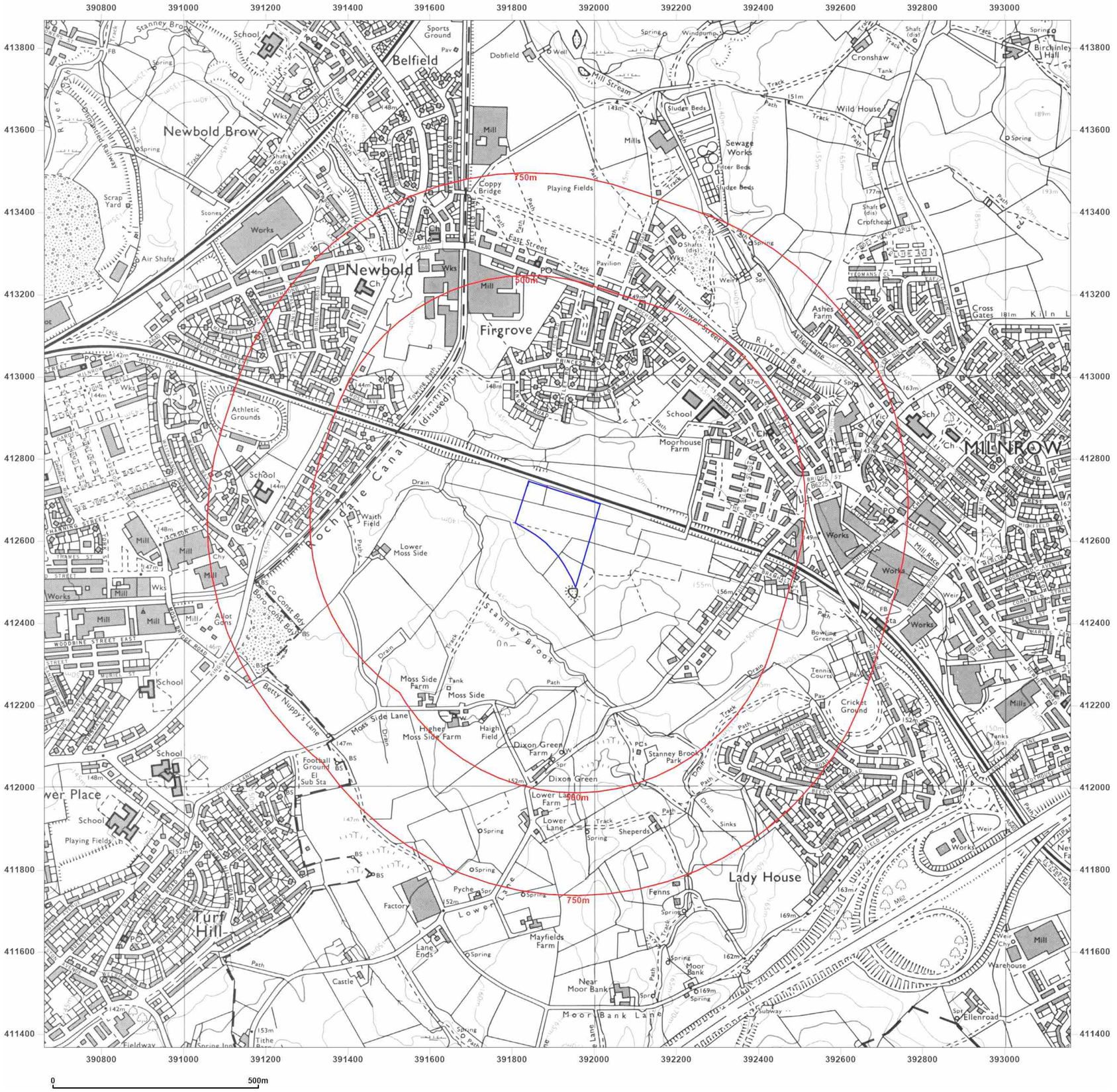
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid

**Map date:** **1976**

**Scale:** 1:10,000

**Printed at:** 1:10,000

N
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Surveyed 1976
Revised 1976
Edition N/A
Copyright N/A
Levelled N/A

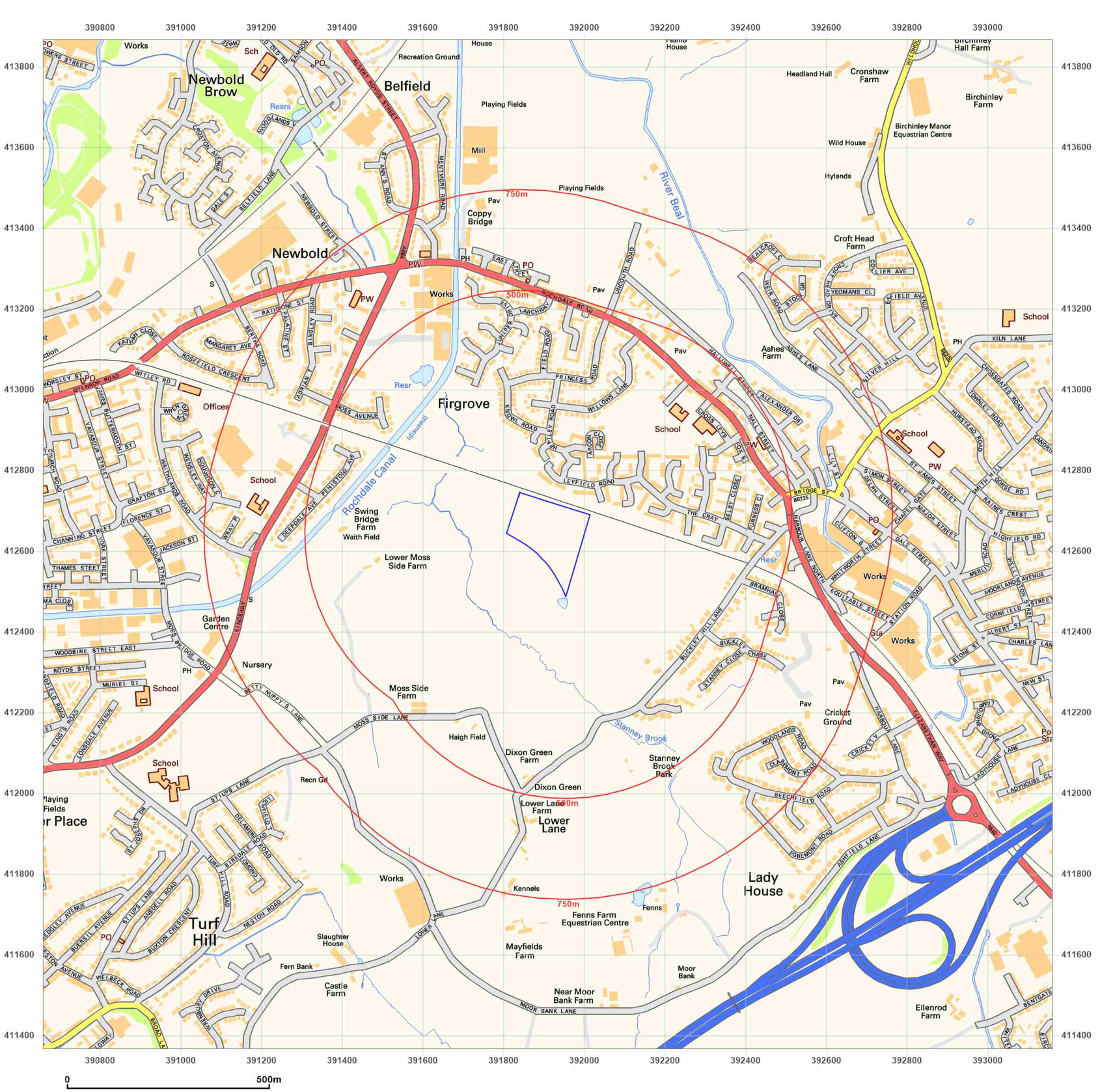
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid

**Map date:** **2001**

**Scale:** 1:10,000

**Printed at:** 1:10,000

N W E S

2001

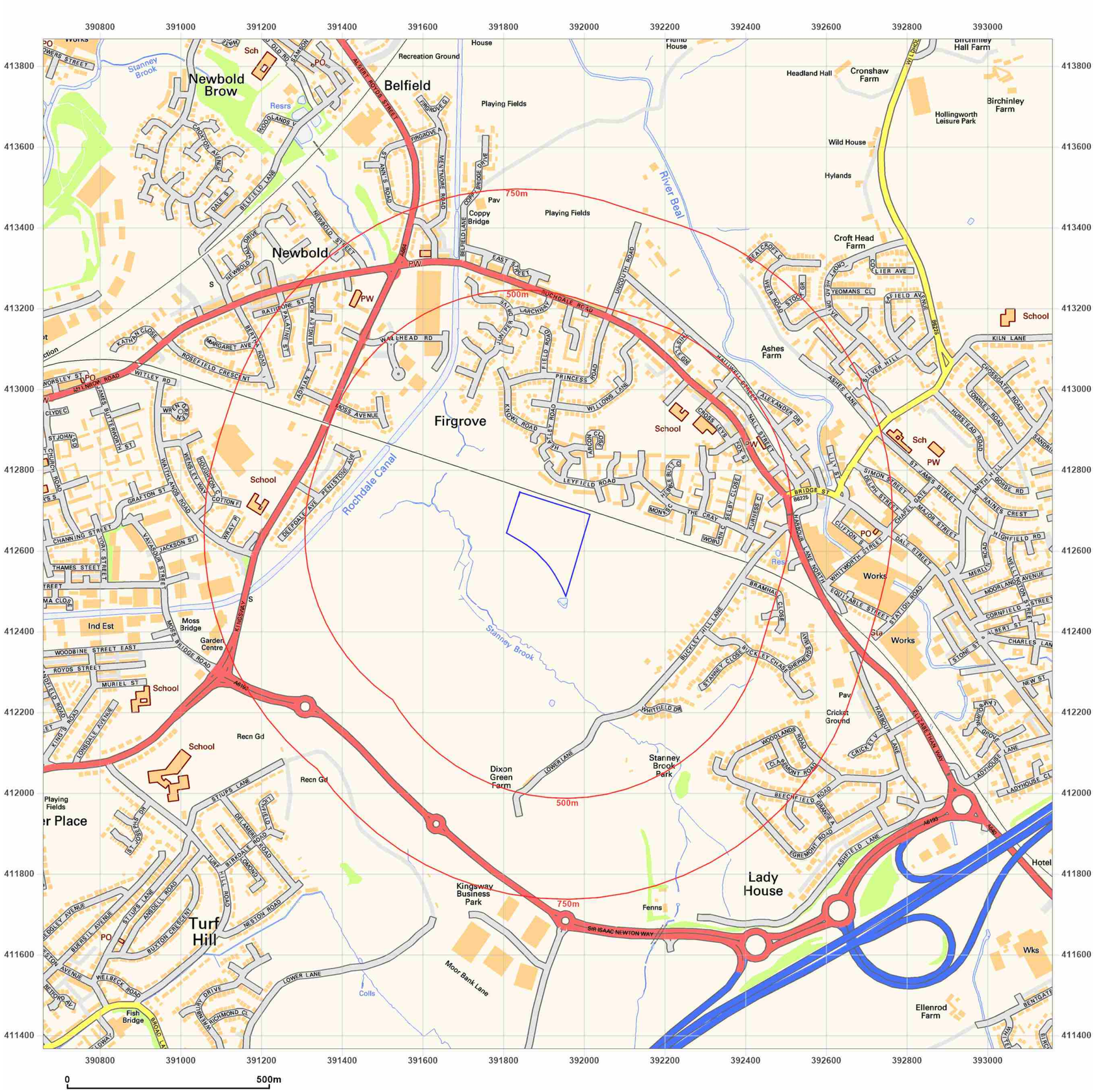
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**Site Details:**

PLOT P, KINGSWAY BUSINESS PARK, MICHAEL FARADAY AVENUE, ROCHDALE, OL16 4FW

**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid

**Map date:** **2010**

**Scale:** 1:10,000

**Printed at:** 1:10,000

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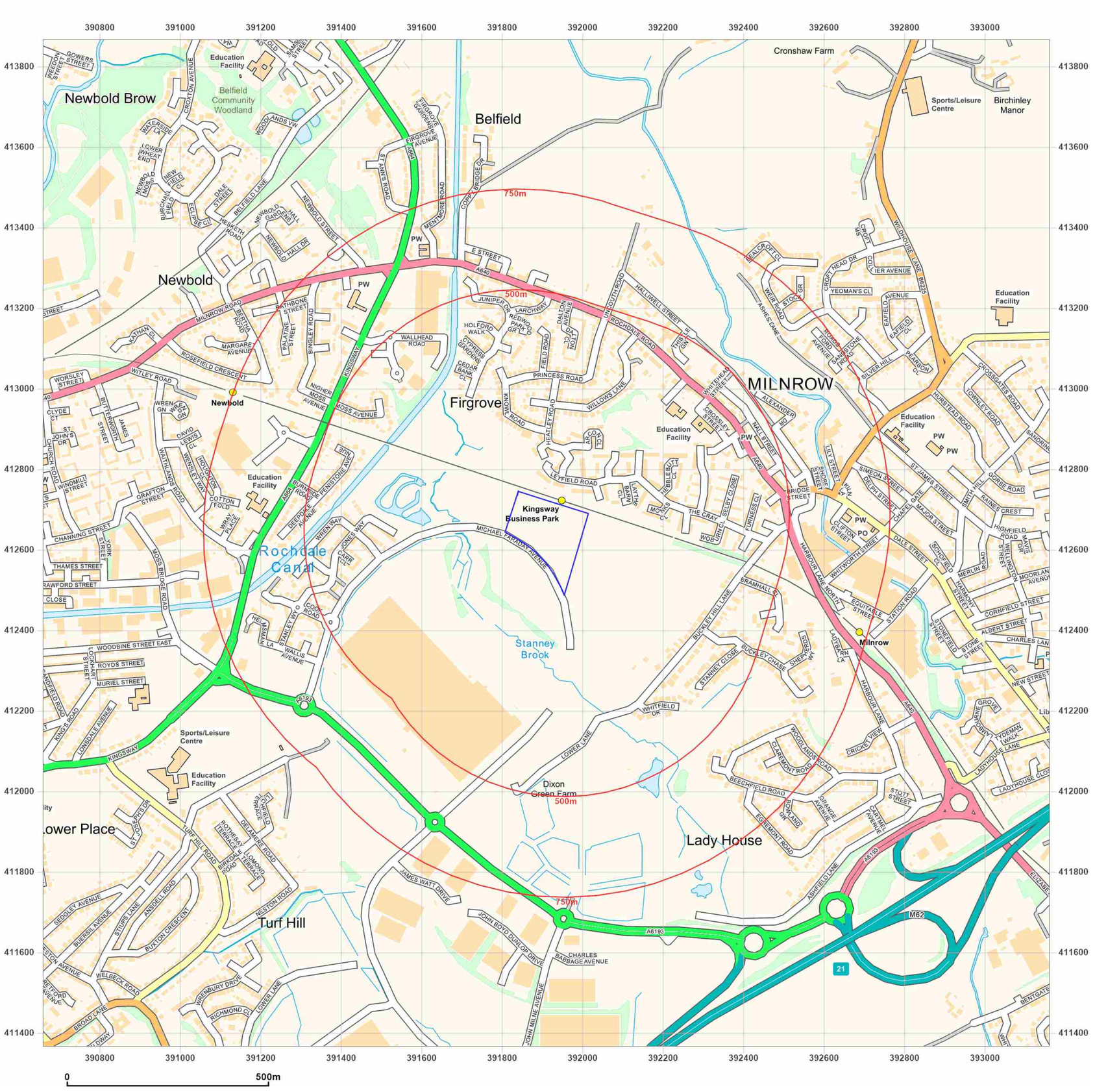
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**Site Details:**

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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid
**Map date:** **2022**
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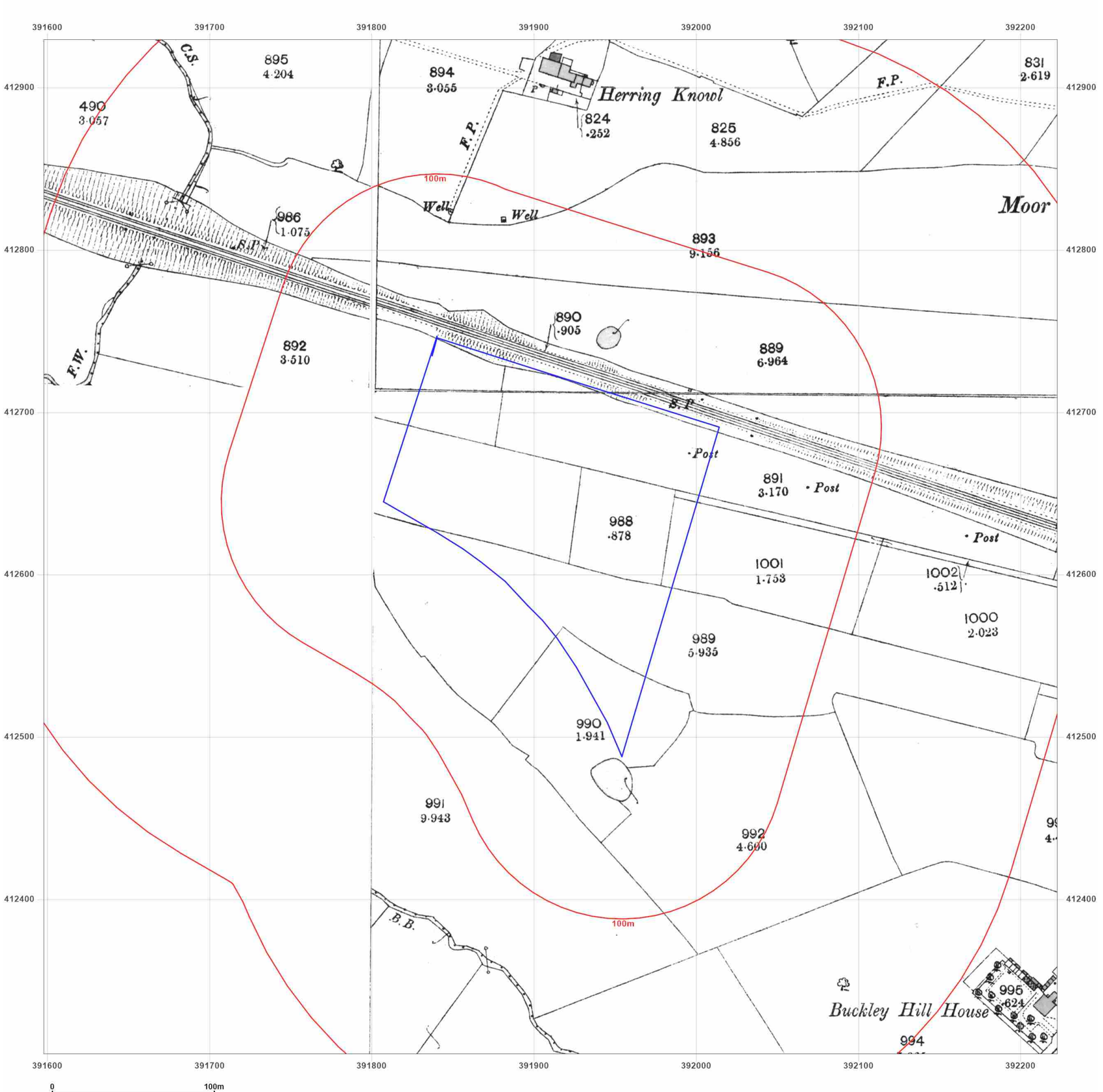
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**Site Details:**

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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** County Series

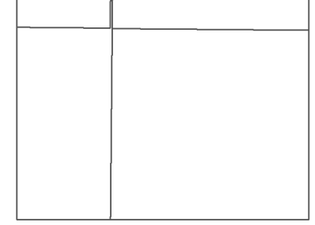
**Map date:** **1891**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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Surveyed 1891
Revised 1891
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1891
Revised 1891
Edition N/A
Copyright N/A
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Surveyed 1891
Revised 1891
Edition N/A
Copyright N/A
Levelled N/A

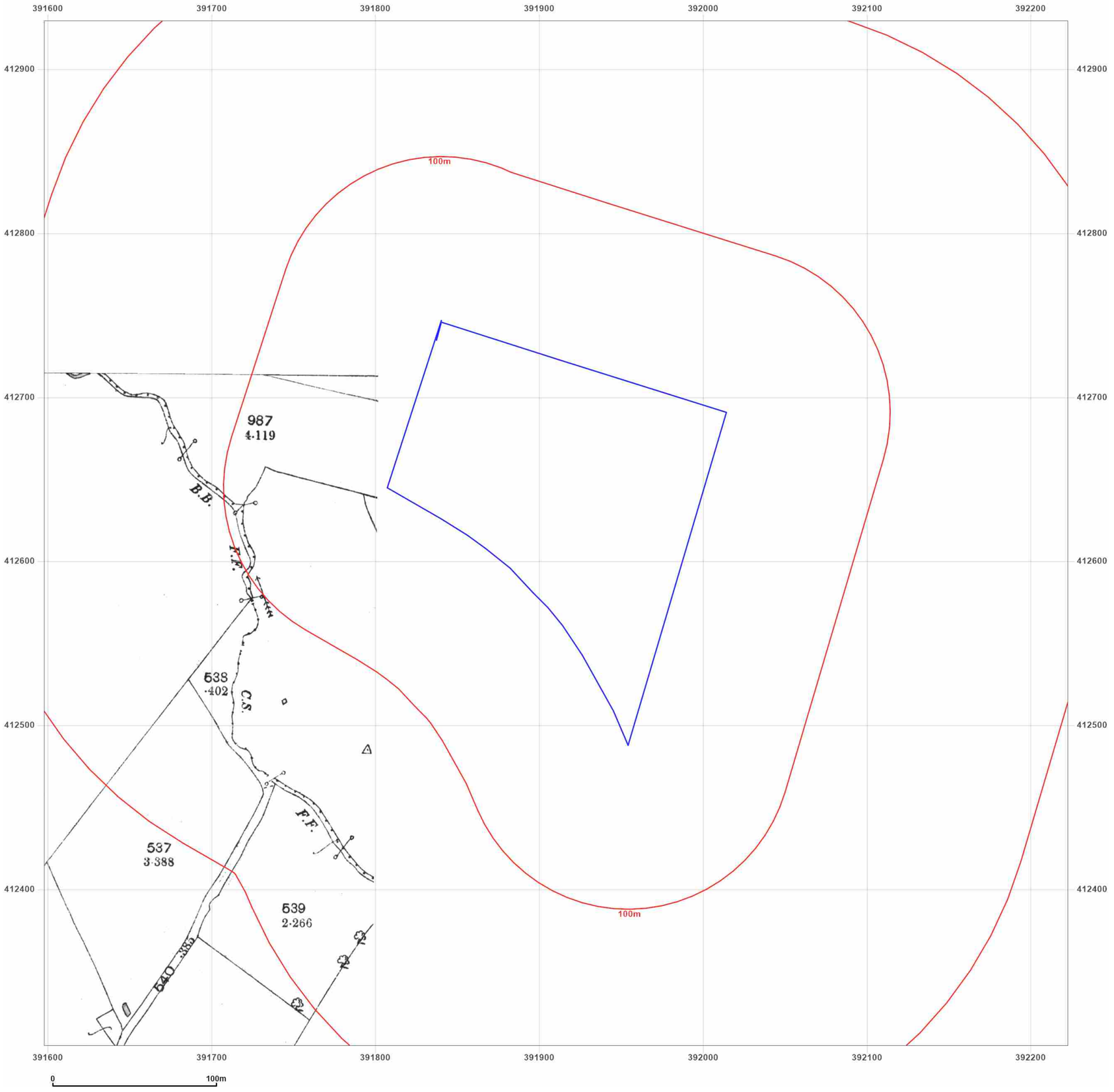
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**Site Details:**

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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** County Series

**Map date:** **1891**

**Scale:** 1:2,500

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Surveyed 1891
Revised 1891
Edition N/A
Copyright N/A
Levelled N/A

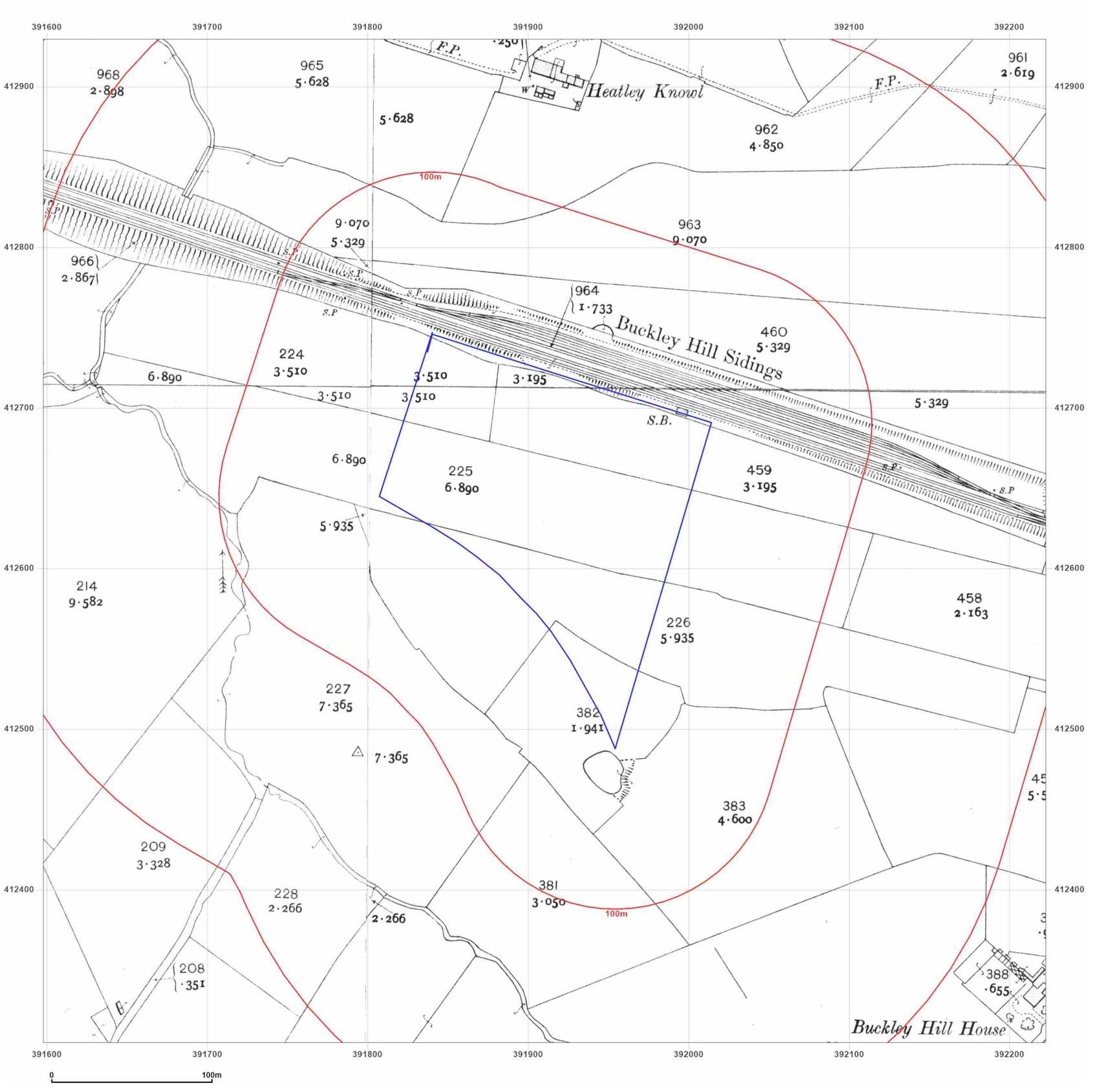
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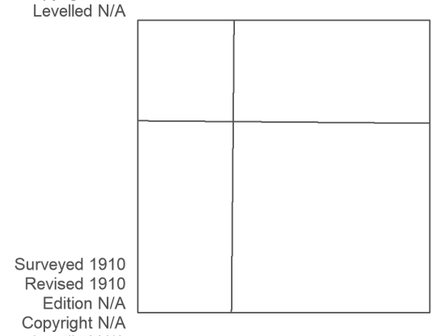
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** County Series
**Map date:** **1910**
**Scale:** 1:2,500
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Surveyed 1910
Revised 1910
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1910
Revised 1910
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1910
Revised 1910
Edition N/A
Copyright N/A
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Revised 1910
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Copyright N/A
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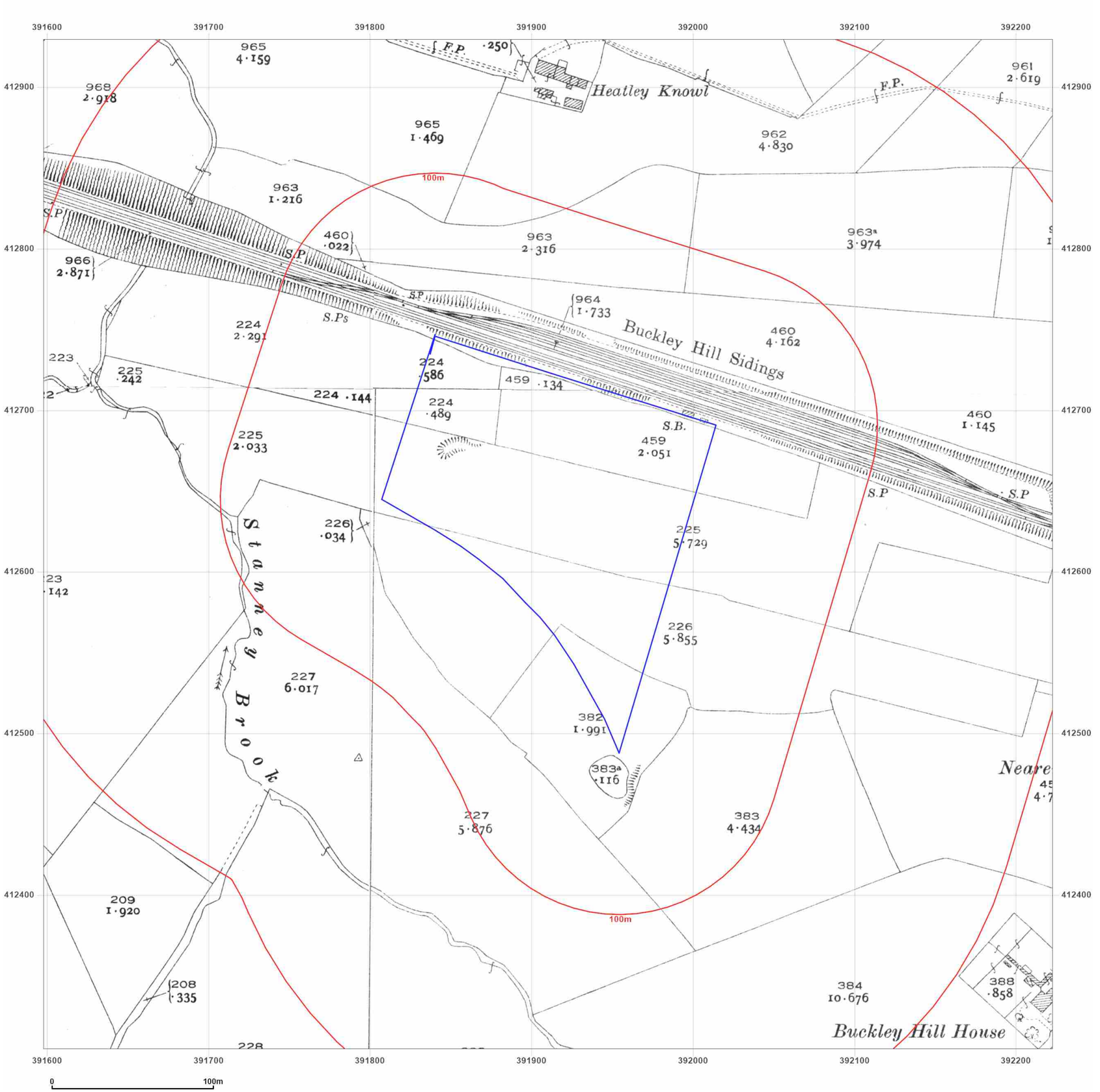
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** County Series

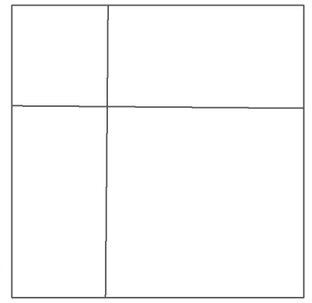
**Map date:** **1930**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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Surveyed 1930
Revised 1930
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1930
Revised 1930
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1930
Revised 1930
Edition N/A
Copyright N/A
Levelled N/A

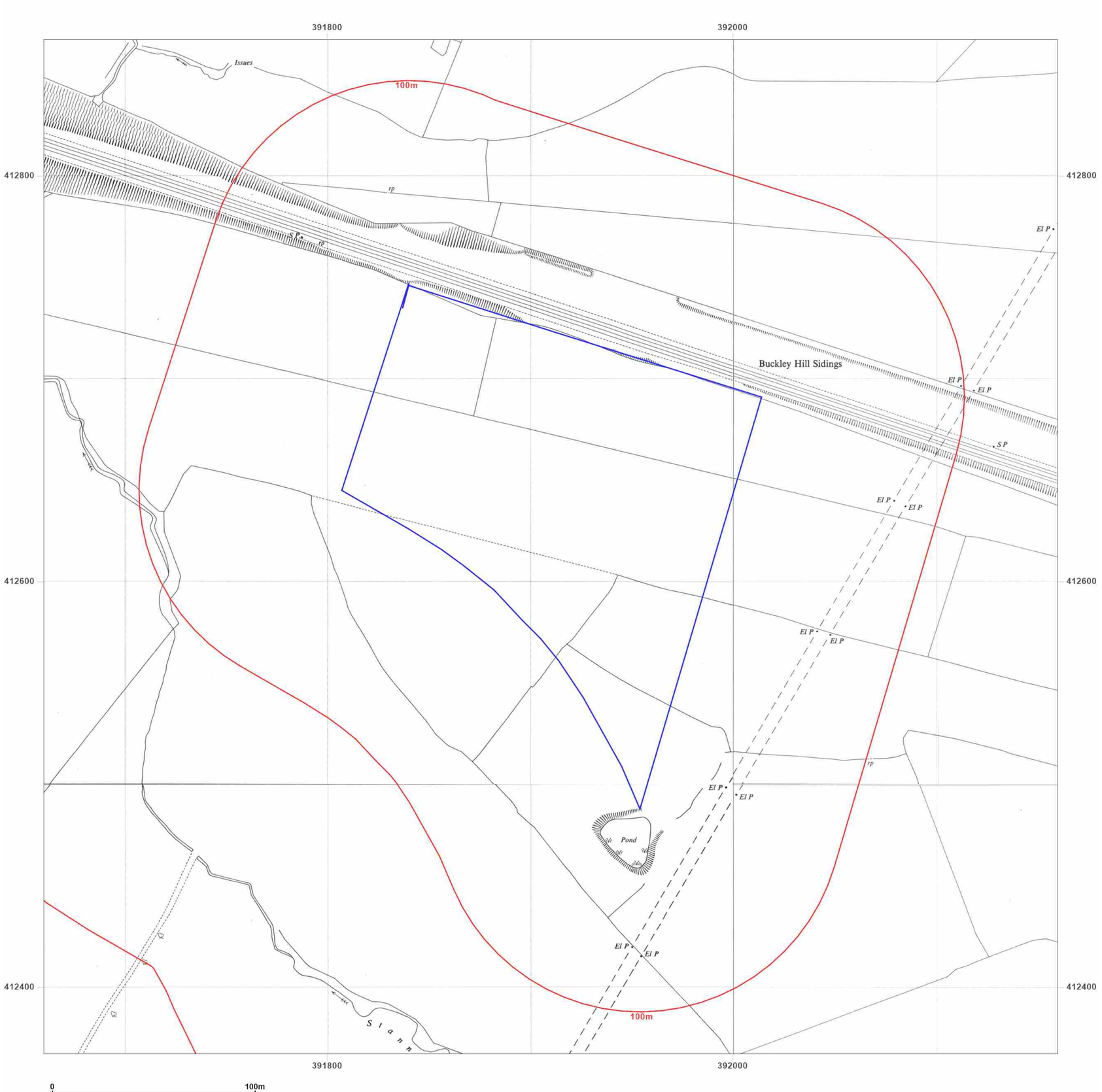
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**Site Details:**

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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid
**Map date:** **1955**
**Scale:** 1:1,250
**Printed at:** 1:2,000

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| ~~Surveyed 1955~~<br>Revised 1955<br>Edition N/A<br>Copyright N/A<br>Levelled 1928 | Surveyed 1955<br>Revised 1955<br>Edition N/A<br>Copyright N/A<br>Levelled 1928 |
| Surveyed 1955<br>Revised 1955<br>Edition N/A<br>Copyright N/A<br>Levelled 1928 | Surveyed 1955<br>Revised 1955<br>Edition N/A<br>Copyright N/A<br>Levelled 1928 |

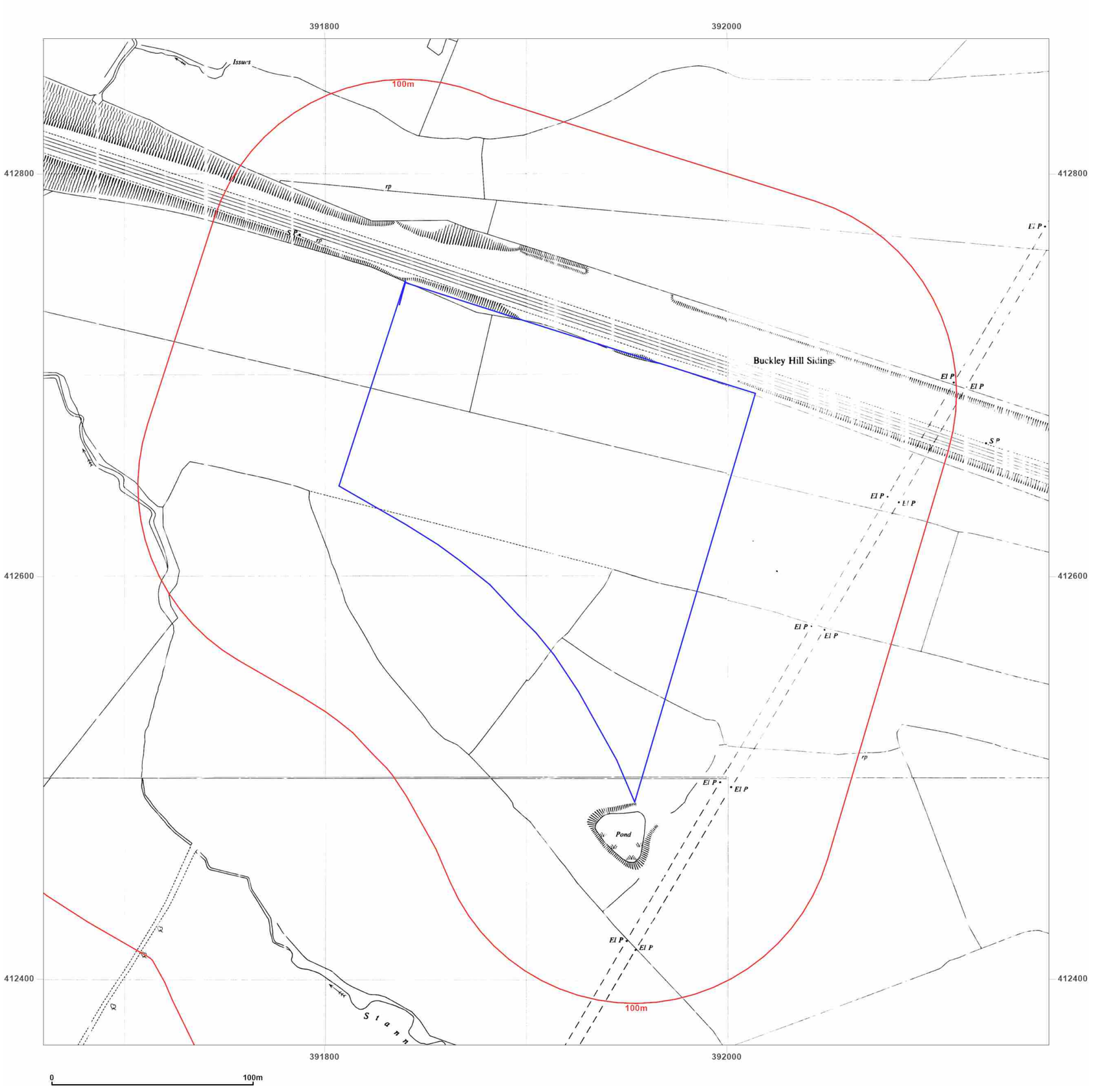
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**Site Details:**

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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid
**Map date:** **1956**
**Scale:** 1:1,250
**Printed at:** 1:2,000

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| Surveyed 1955<br>Revised N/A<br>Edition N/A<br>Copyright 1956<br>Levelled 1928 | Surveyed 1955<br>Revised N/A<br>Edition N/A<br>Copyright 1956<br>Levelled 1928 |

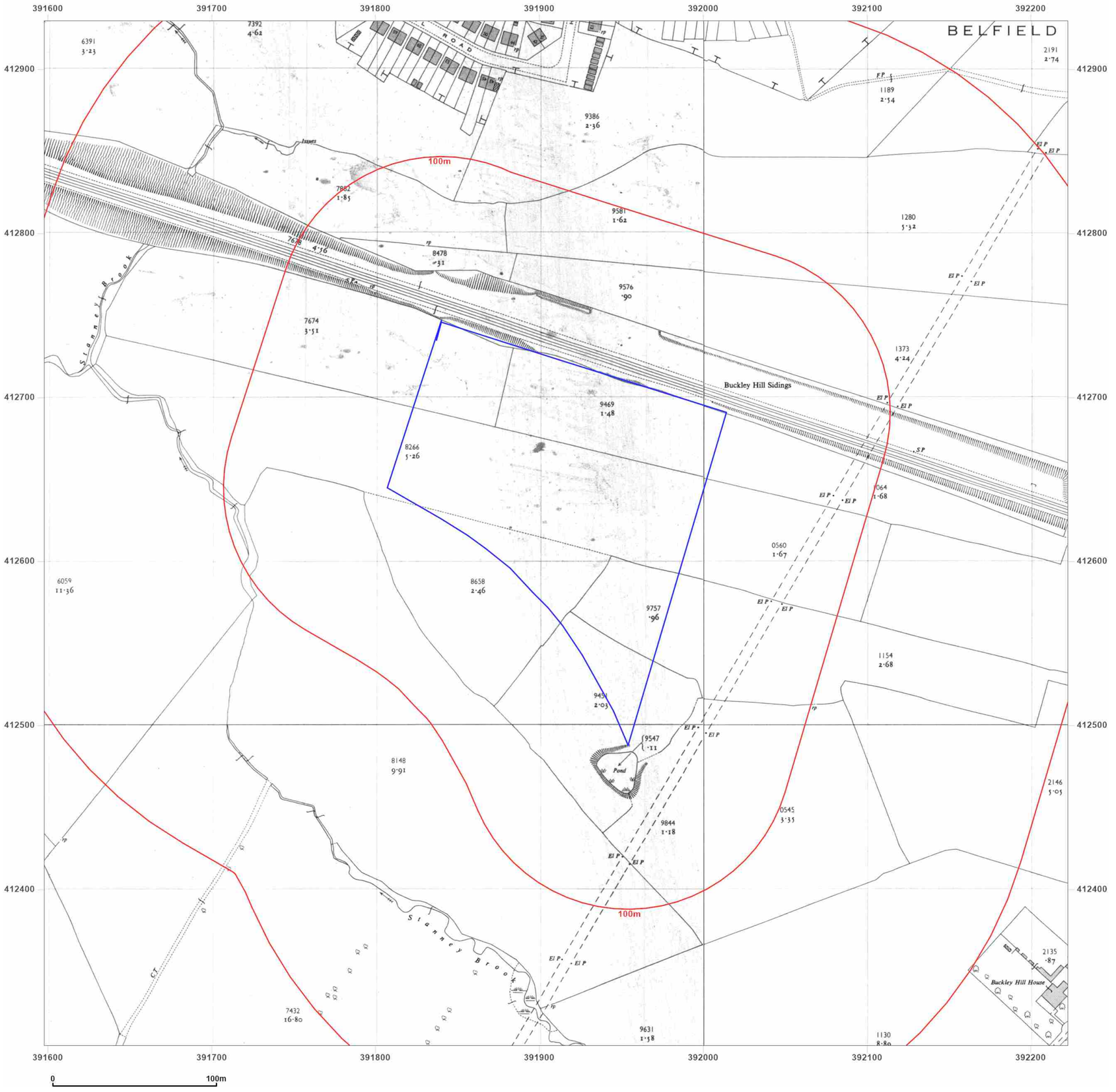
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid

**Map date:** **1956**

**Scale:** 1:2,500

**Printed at:** 1:2,500

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| Surveyed 1955 | Surveyed 1955 |
|---|---|
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| Edition 1956 | Edition 1956 |
| Copyright N/A | Copyright N/A |
| Levelled 1928 | Levelled 1928 |

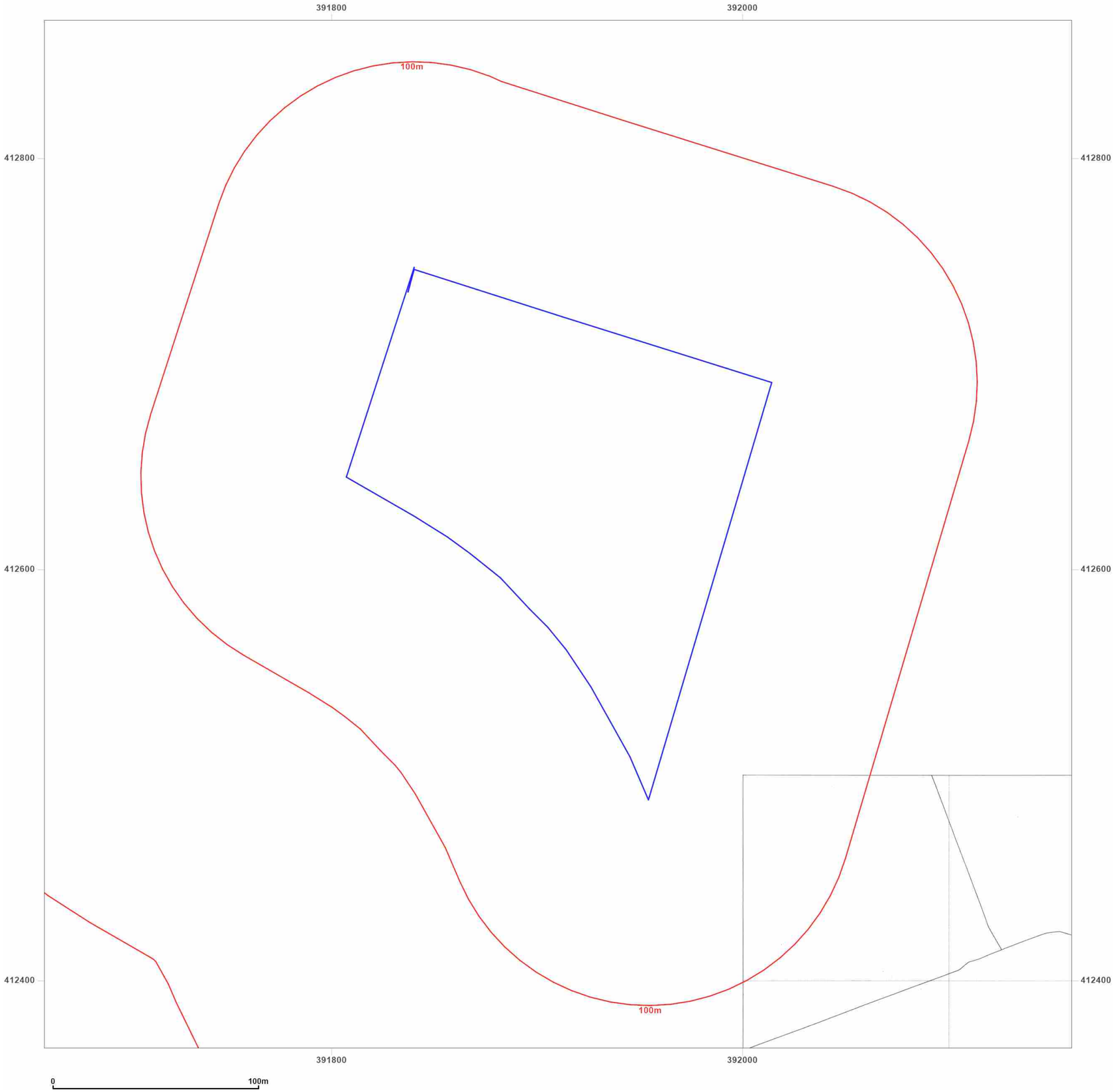
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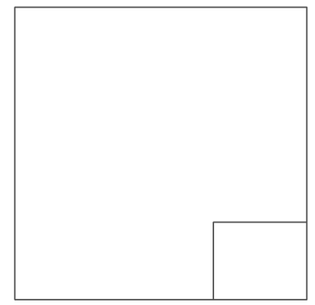
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid
**Map date:** **1967**
**Scale:** 1:1,250
**Printed at:** 1:2,000

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Surveyed 1966
Revised 1966
Edition N/A
Copyright 1967
Levelled 1956

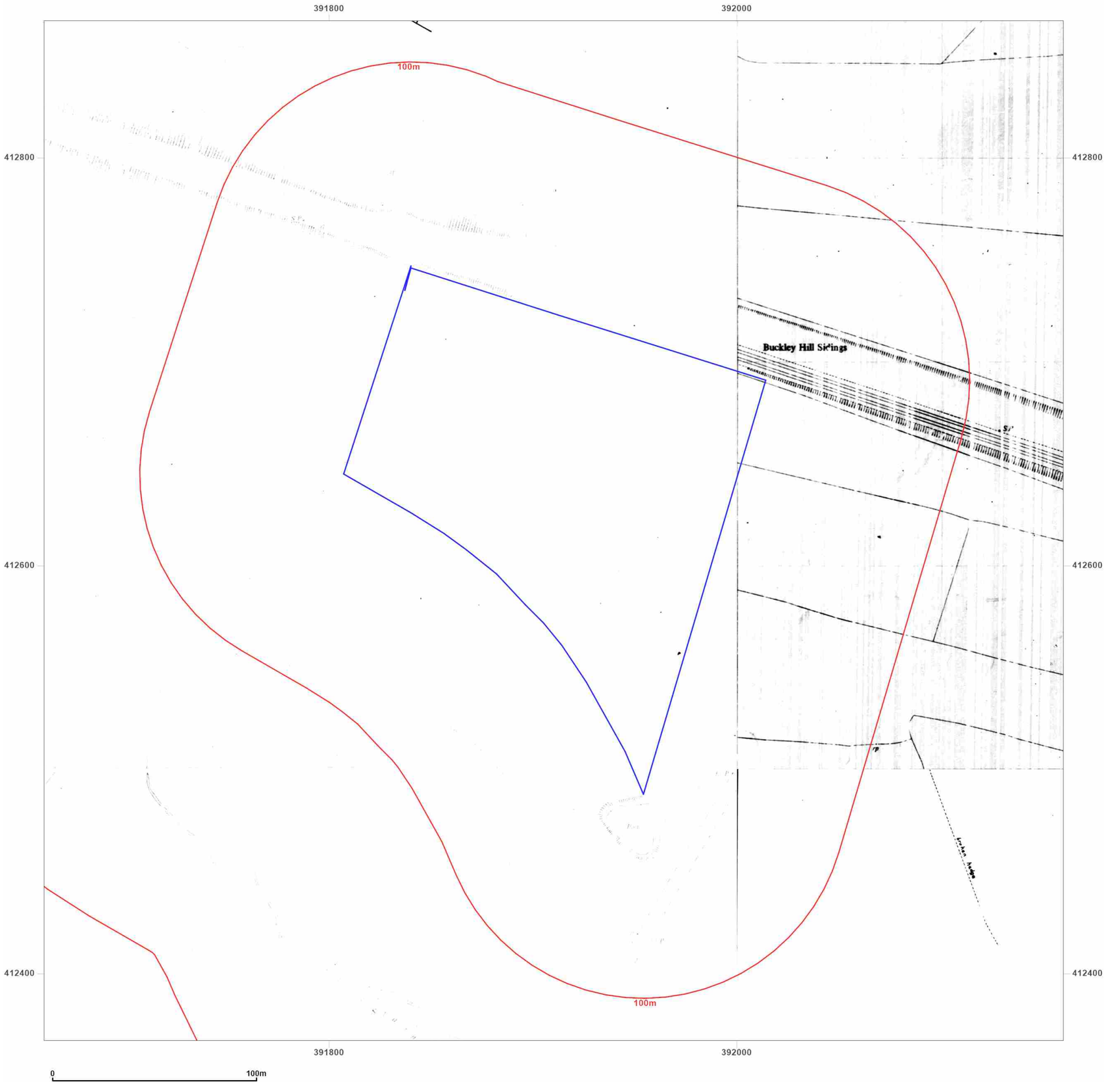
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**Site Details:**

PLOT P, KINGSWAY BUSINESS PARK, MICHAEL FARADAY AVENUE, ROCHDALE, OL16 4FW

**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid
**Map date:** **1973-1976**
**Scale:** 1:1,250
**Printed at:** 1:2,000

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| Surveyed N/A<br>Revised N/A<br>Edition N/A<br>Copyright 1975<br>Levelled N/A | Surveyed N/A<br>Revised N/A<br>Edition N/A<br>Copyright N/A<br>Levelled N/A |

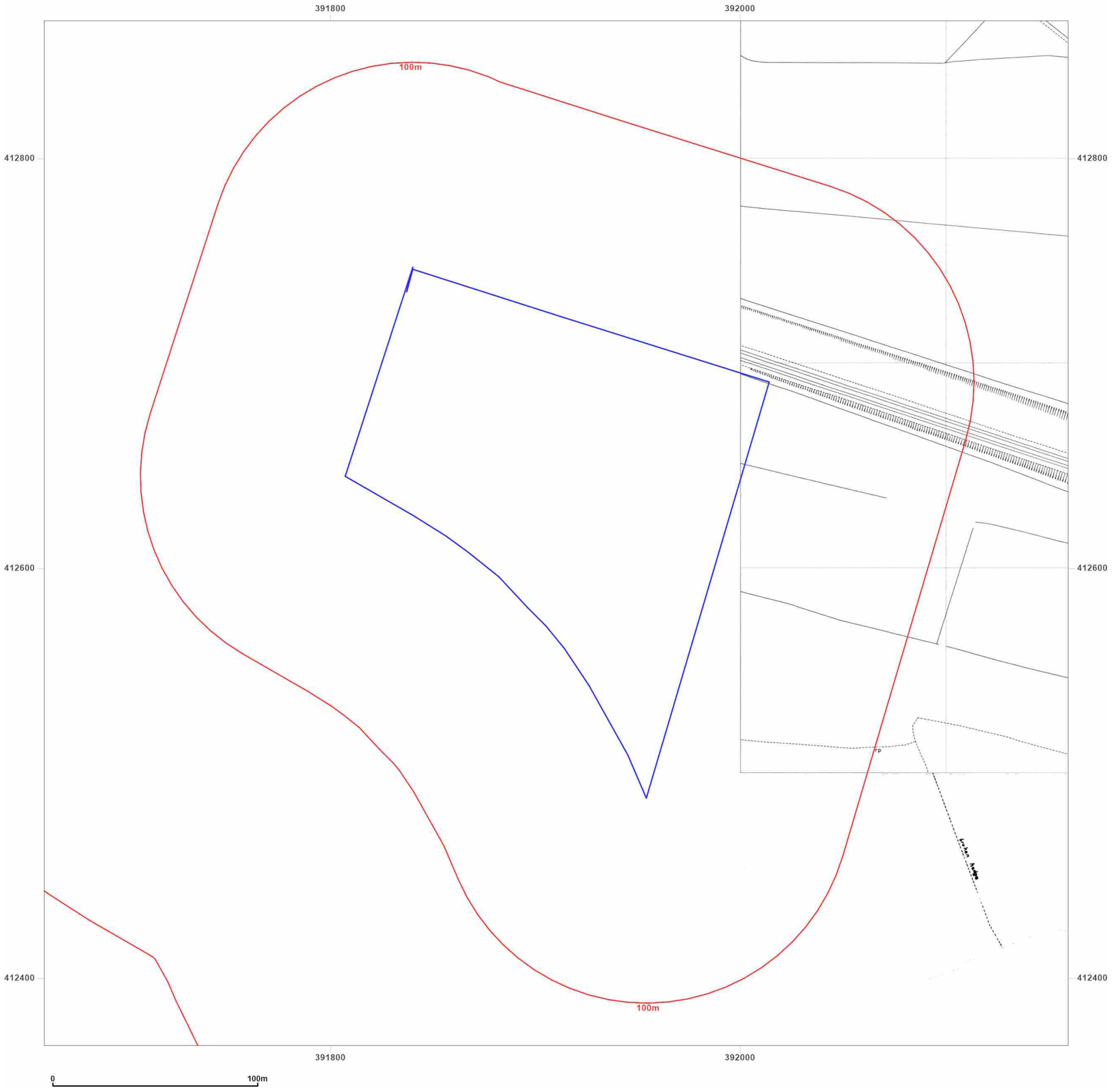
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**Site Details:**

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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid

**Map date:** **1975-1976**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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Surveyed 1955
Revised 1974
Edition N/A
Copyright 1975
Levelled 1962

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1975
Levelled N/A

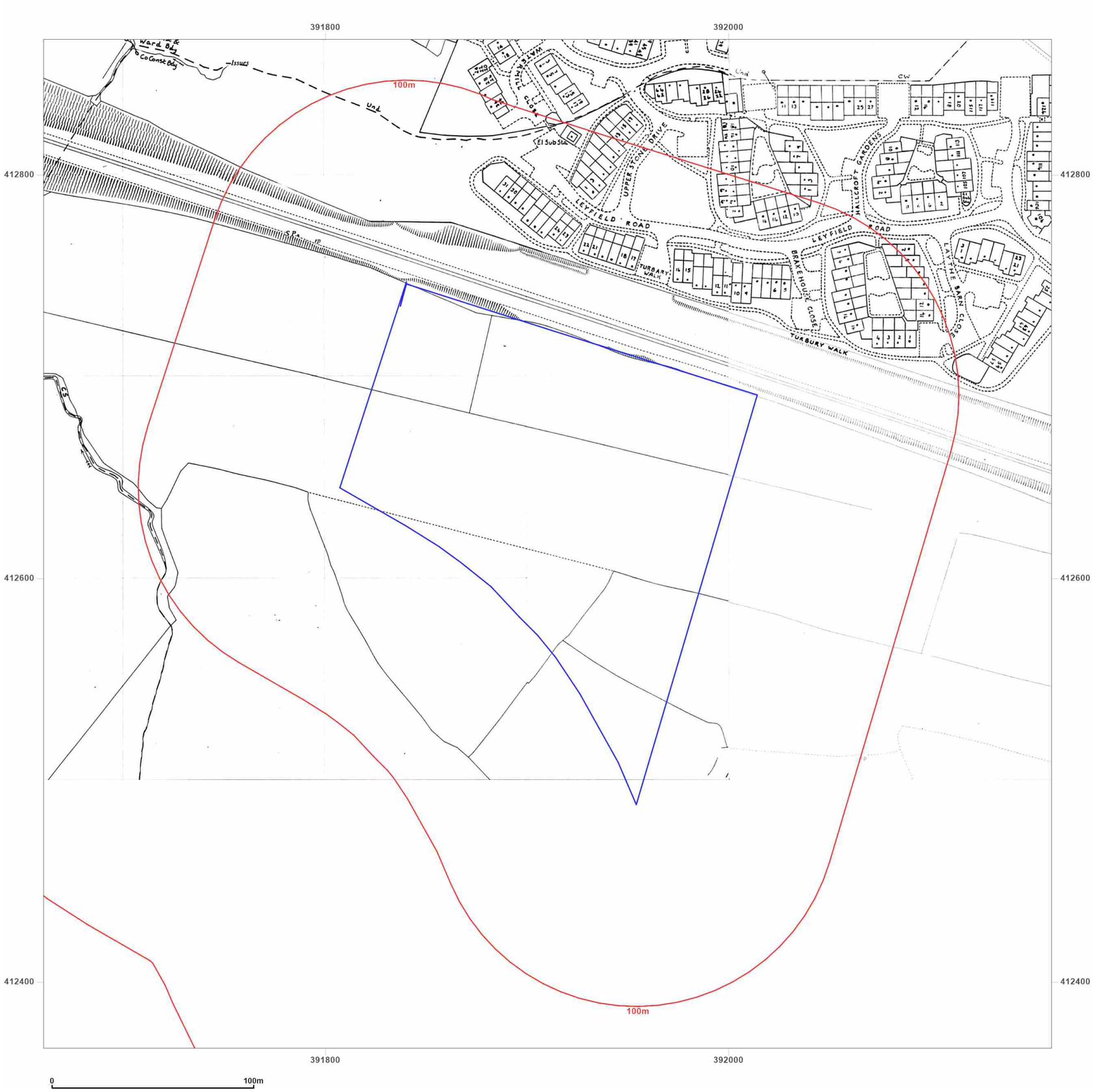
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**Site Details:**

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**Client Ref:** 210939_PO_1762
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**Grid Ref:** 391910, 412617

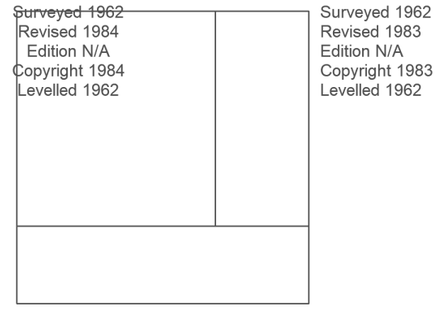
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**Map date:** **1983-1984**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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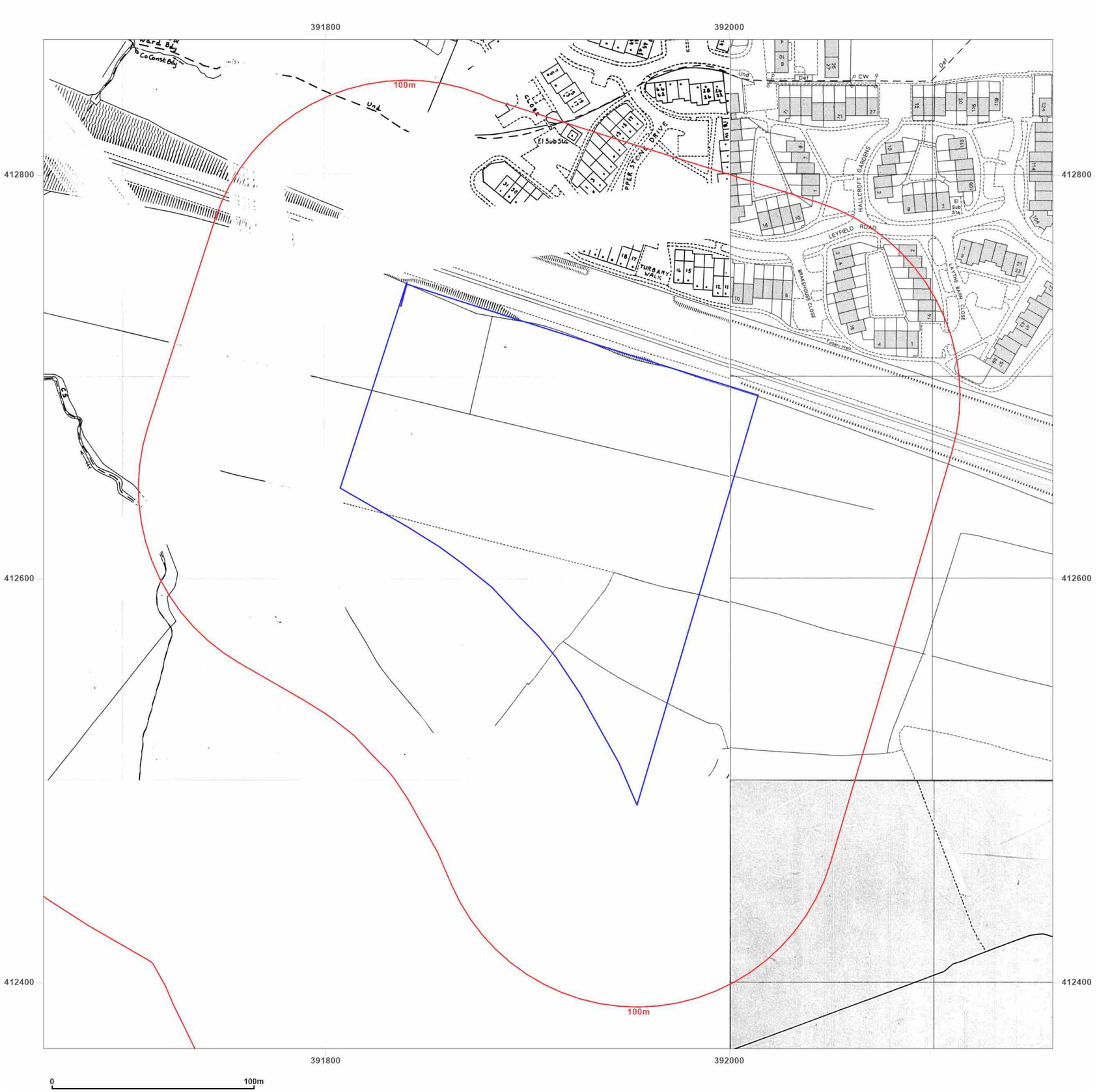

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**Site Details:**

PLOT P, KINGSWAY BUSINESS PARK, MICHAEL FARADAY AVENUE, ROCHDALE, OL16 4FW

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**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid

**Map date:** **1984-1989**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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| | Surveyed 1956<br>Revised 1984<br>Edition N/A<br>Copyright 1984<br>Levelled 1956 |

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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid

**Map date:** **1992**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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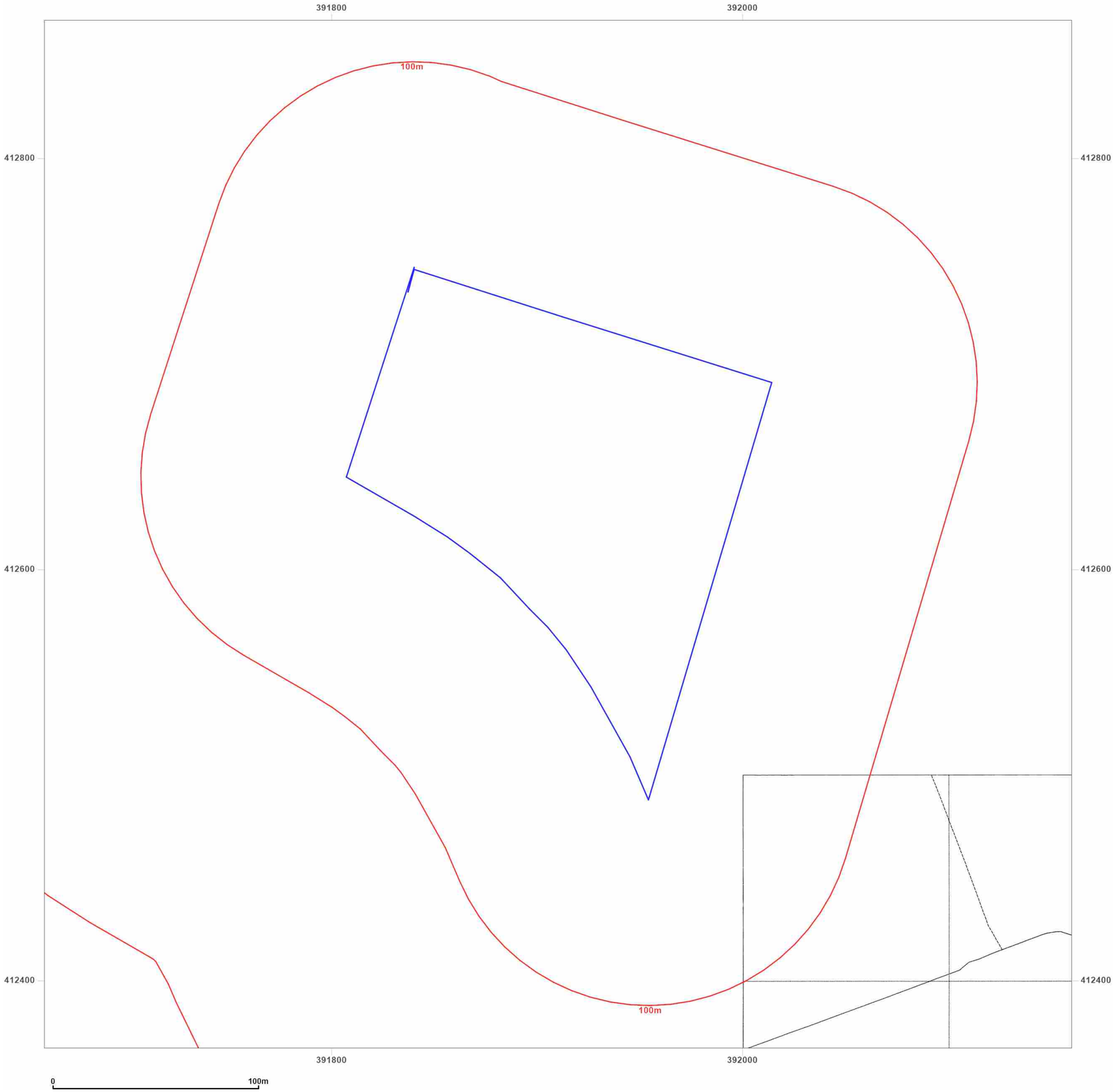
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**Site Details:**

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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

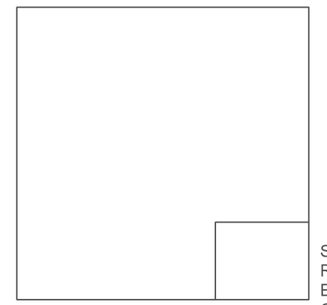
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**Map date:** **1994**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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Surveyed 1994
Revised 1994
Edition N/A
Copyright N/A
Levelled N/A

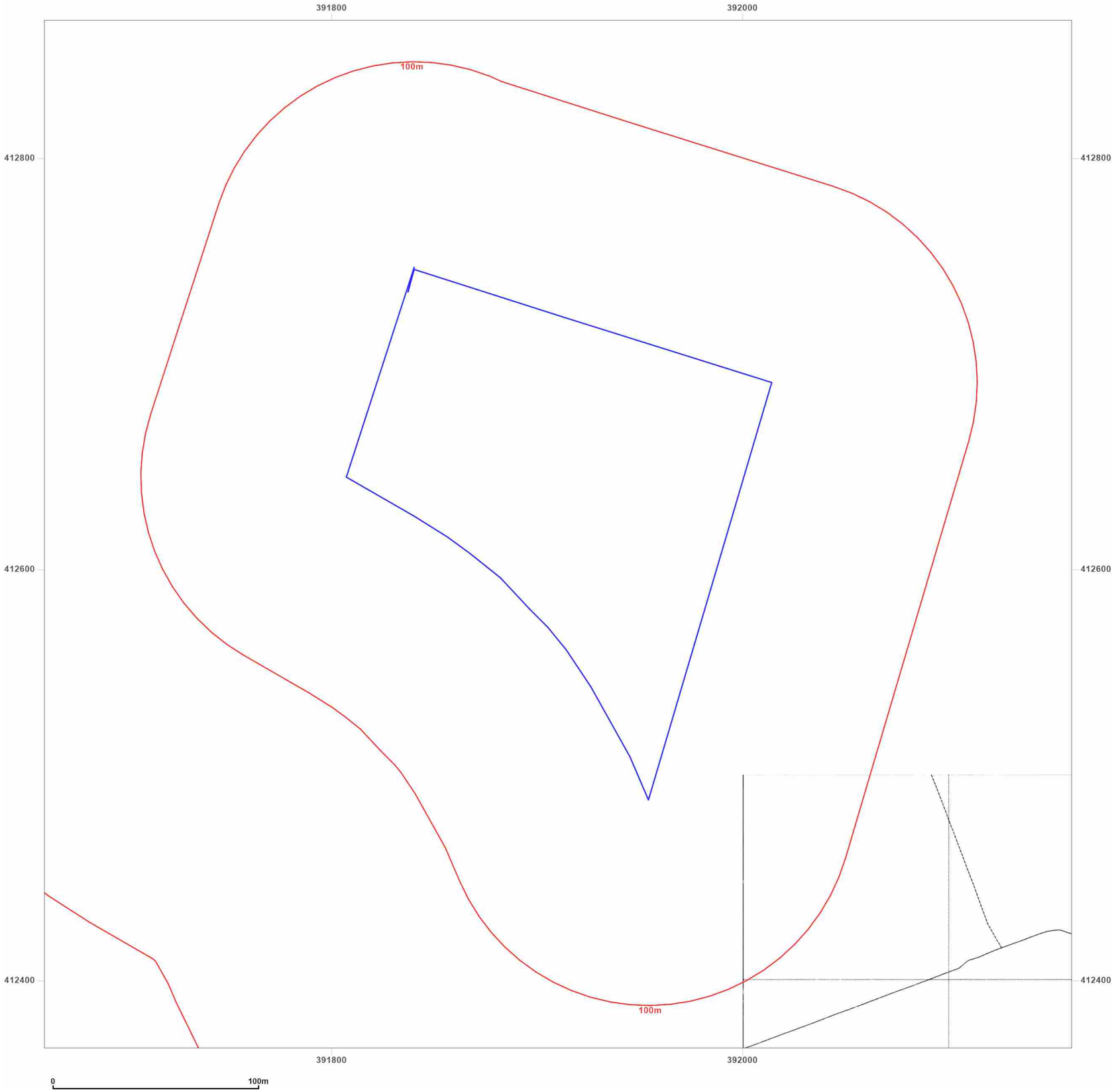
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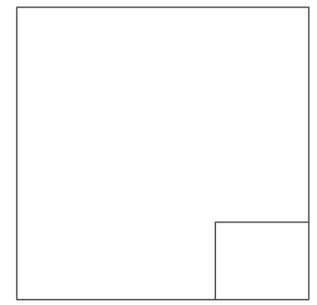
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** National Grid
**Map date:** **1994**
**Scale:** 1:1,250
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Surveyed 1994
Revised N/A
Edition N/A
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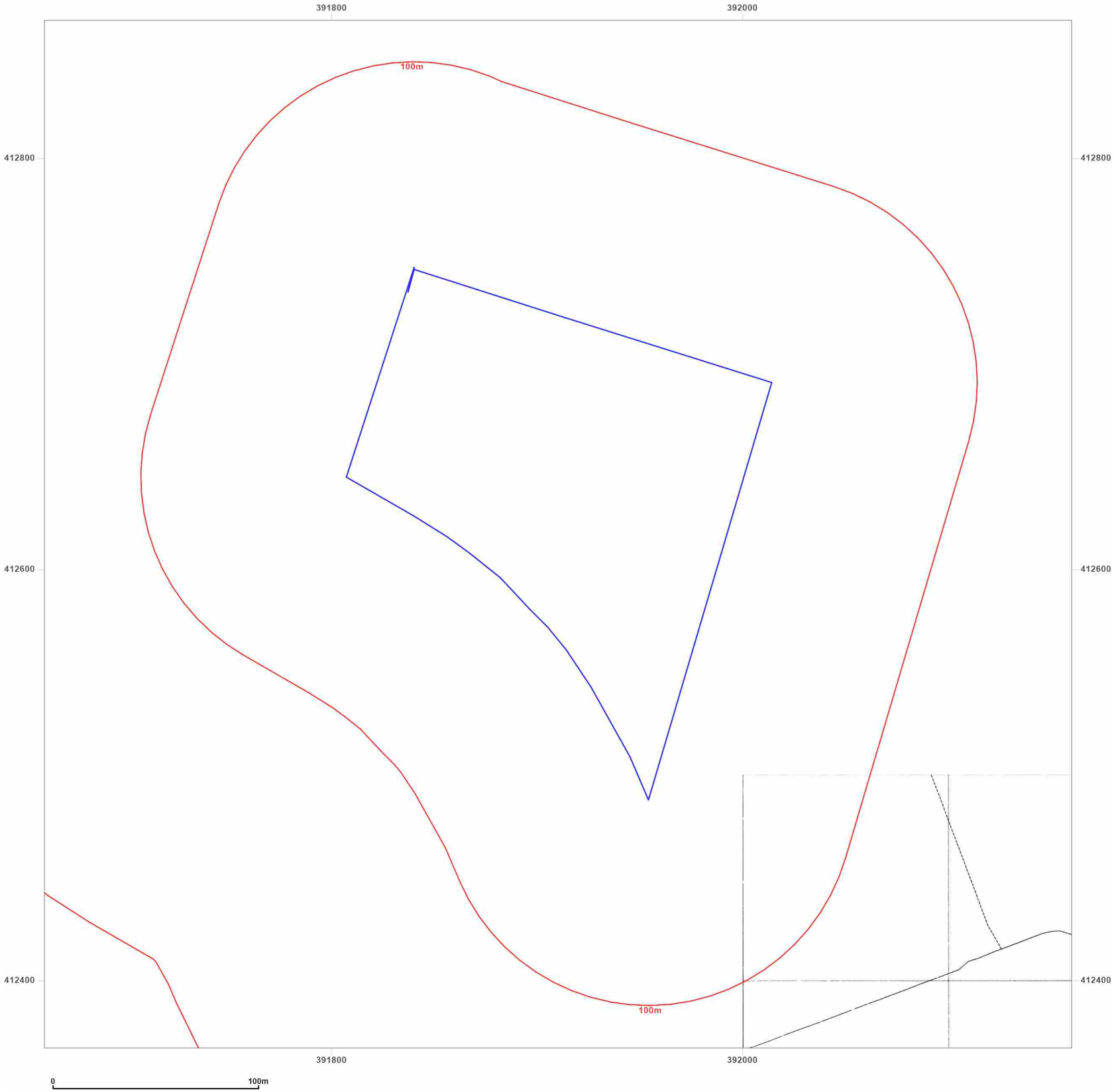
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**Site Details:**

PLOT P, KINGSWAY BUSINESS PARK, MICHAEL FARADAY AVENUE, ROCHDALE, OL16 4FW

**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

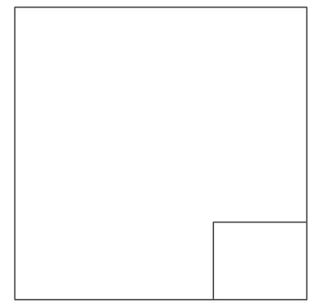
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**Map date:** **1995**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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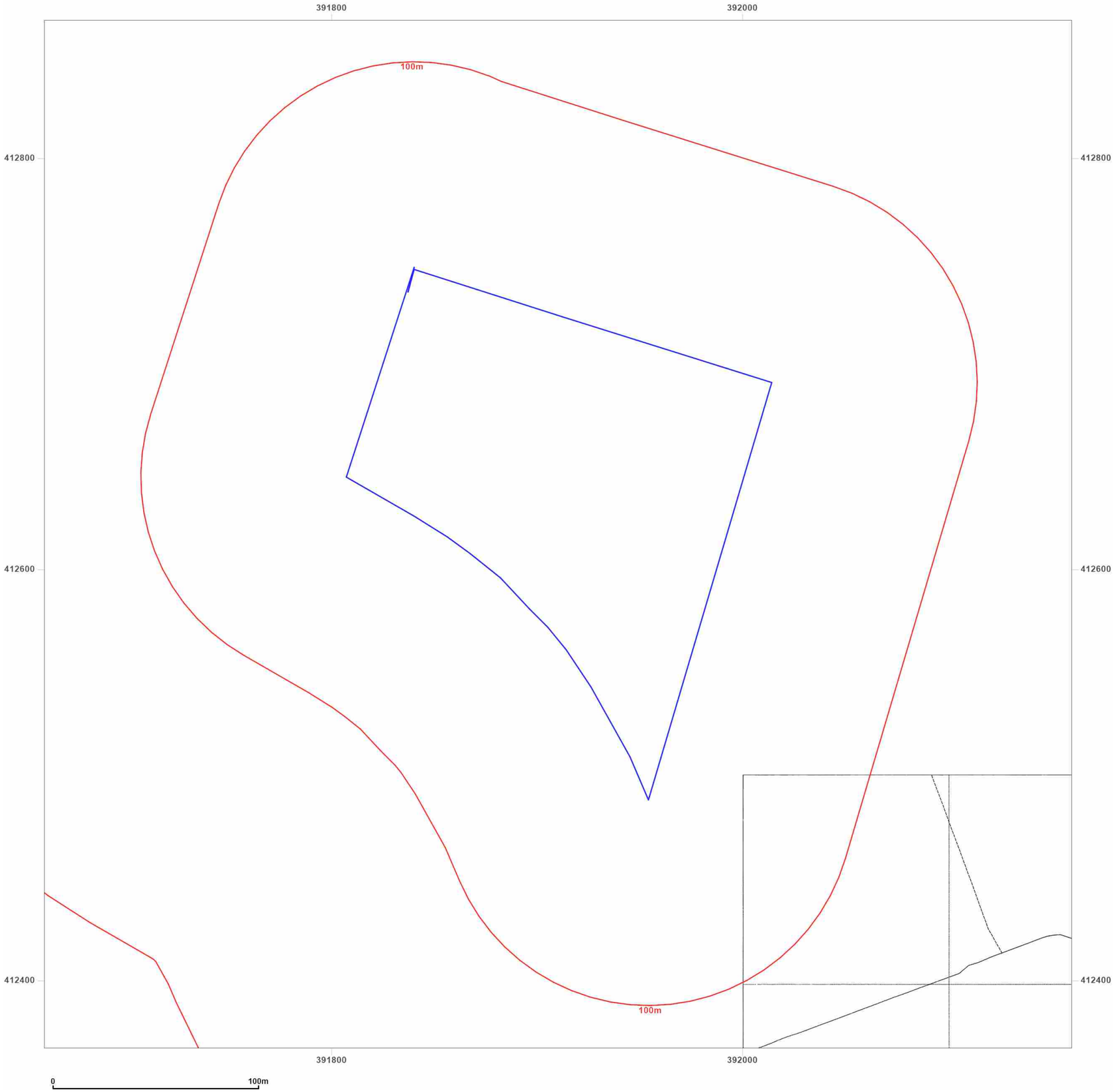
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**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

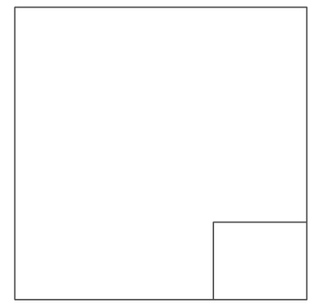
**Map Name:** National Grid

**Map date:** **1995**

**Scale:** 1:1,250

**Printed at:** 1:2,000

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Revised 1995
Edition N/A
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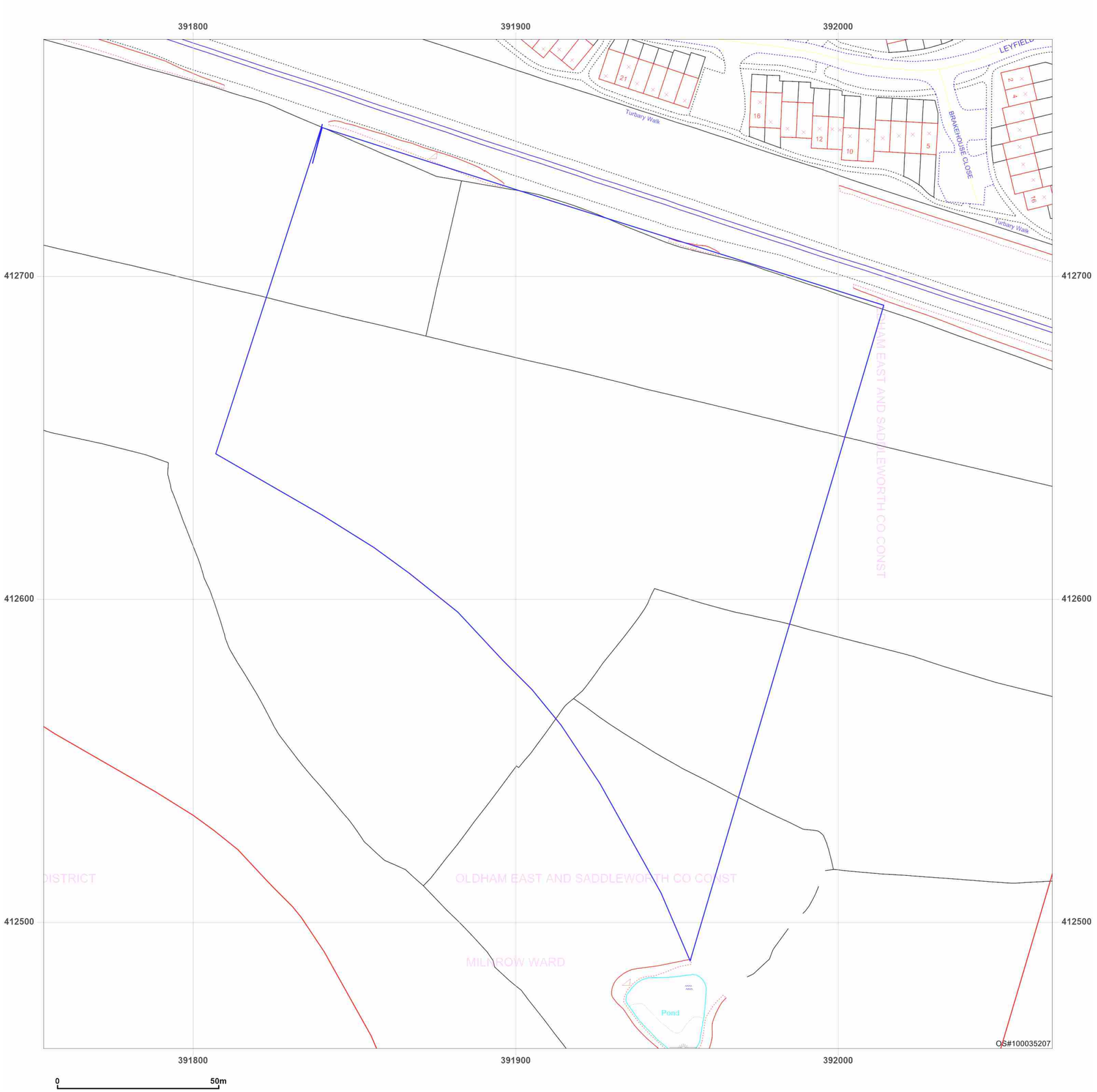
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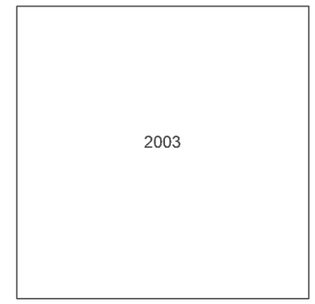
**Site Details:**

PLOT P, KINGSWAY BUSINESS PARK, MICHAEL FARADAY AVENUE, ROCHDALE, OL16 4FW

**Client Ref:** 210939_PO_1762
**Report Ref:** HMD-214-8800196
**Grid Ref:** 391910, 412617

**Map Name:** LandLine
**Map date:** **2003**
**Scale:** 1:1,250
**Printed at:** 1:1,250

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Production date: 07 June 2022

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# Appendix 5: Rochdale Council Correspondence

## Oliver Stewart

**From:** Michael Moore P <Michael.Moore@rochdale.gov.uk>
**Sent:** 21 June 2022 09:57
**To:** Oliver Stewart; Contaminated Land
**Subject:** RE: Possible Landfill - Kingsway Business Park

**This email originated from outside of our organisation. Please exercise caution with content, links and attachments.**

Good morning Oliver,

According to our records there is no landfill outlined in red below.

Regards

**Michael Moore P**
Environmental Health Senior Officer (Environment Prot)
Place

ROCHDALE BOROUGH COUNCIL

01706 924107
07976 059366
michael.moore@rochdale.gov.uk

Rochdale Borough Council
Floor 3, Number One Riverside
Smith Street, Rochdale, OL16 1XU

To access our services go to www.rochdale.gov.uk
For news, events and social media updates go to www.rochdale.gov.uk/newsandevents

Please consider the environment before printing this email.

**From:** Oliver Stewart <Oliver.Stewart@bwbconsulting.com>
**Sent:** 13 June 2022 12:28
**To:** Contaminated Land <Contaminated.Land@Rochdale.Gov.UK>
**Subject:** Possible Landfill - Kingsway Business Park

:CAUTION: This email originated from outside of the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

To Contaminated Land team,

I'm writing to enquire into an area of land situated just south of Kingsway Business Park tram station, postcode OL16 4JN.
There seems to be a discrepancy between data provided to us from a third party source and information gained through separate historical mapping and council records.
The third party data is showing a landfill recorded on site, sourcing local authority records, whereas the public council records and historical mapping are vacant of any development on this area of land entirely minus agriculture.
I have attached the relevant image provided, listing the dashed zone as Buckley Hill Lane.




Please let us know of any charges this may incur.

Thank you for any assistance,

**Oliver Stewart** BSc (Hons) MSc
Graduate Geoenvironmental Consultant | BWB Consulting Limited

Whitehall Waterfront, 2 Riverside Way, Leeds LS1 4EH
**M** 07469 295004 **T** 0113 233 8000 **W** www.bwbconsulting.com

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**Registered Office:** 5th Floor, Waterfront House, Station Street, Nottingham, NG2 3DQ
**Company No.** 5265863
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Rochdale Borough Council undertakes monitoring of both incoming and outgoing e-mails. You should therefore be aware that if you send an e-mail to a person within Rochdale Borough Council it may be subject to any monitoring deemed necessary by Rochdale Borough Council from time to time. Rochdale Borough Council cannot guarantee that this message or any attachment is virus free or has not been intercepted and amended.

As a public body, Rochdale Borough Council may be required to disclose this email (or any response to it) under the Freedom of Information Act 2000, unless the information in it is covered by one of the exemptions within the Act.

## Appendix 6: Coal Mining Report

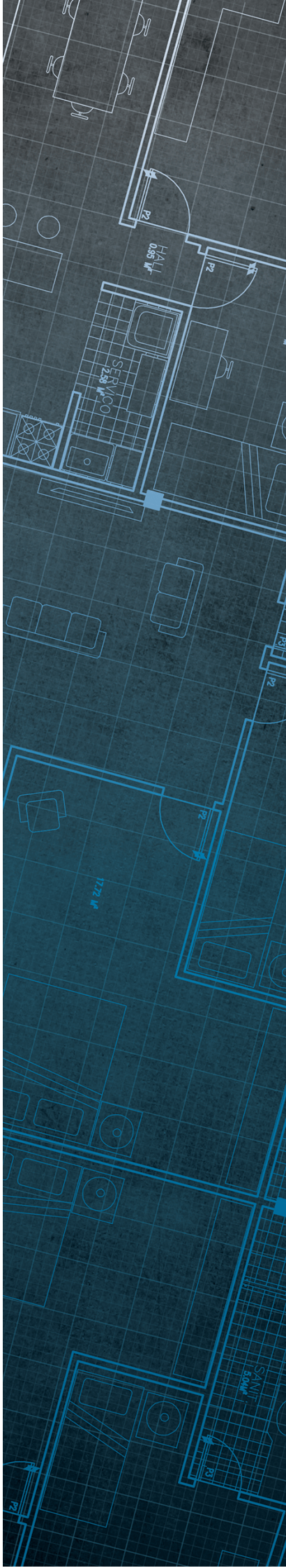
The Coal Authority

# Consultants

## Coal Mining Report

Plot P, Kingsway Business Park,
Michael Faraday Avenue, Rochdale,
Ol16 4fw
Greater Manchester

| | |
|---|---|
| Date of enquiry: | **7 June 2022** |
| Date enquiry received: | **7 June 2022** |
| Issue date: | **7 June 2022** |
| Our reference: | **51003165344001** |
| Your reference: | **HMD-214-8800197** |



# Consultants

# Coal Mining Report

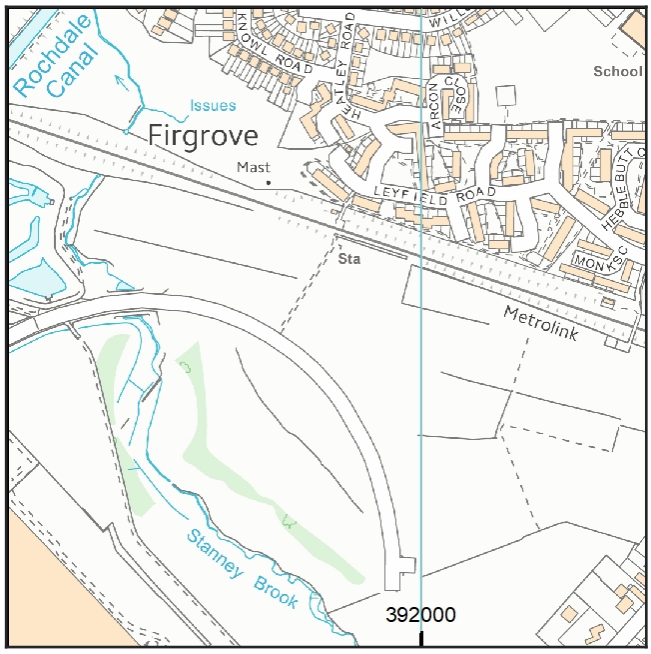
This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

**Client name**

GROUNDSURE LIMITED

**Enquiry address**

Plot P, Kingsway Business Park, Michael Faraday Avenue, Rochdale, Ol16 4fw
Greater Manchester




Approximate position of property

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**How to contact us**

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

www.groundstability.com

@coalauthority
/company/the-coal-authority
/thecoalauthority
/thecoalauthority

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# Section 1 – Mining activity and geology

## Past underground mining

| Colliery | Seam | Mineral | Coal Authority reference | Depth (m) | Direction to working | Dipping rate of seam worked (degrees) | Dipped direction of seam worked | Extraction thickness (cm) | Year last mined |
|---|---|---|---|---|---|---|---|---|---|
| unnamed | LOWER MOUNTAIN | Coal | 3XBO | 97 | West | 5.2 | South | 60 | 1907 |
| unnamed | LOWER MOUNTAIN | Coal | 3XB1 | 102 | Beneath Property | 5.2 | South | 60 | 1905 |
| unnamed | LOWER MOUNTAIN | Coal | A0DR | 107 | Beneath Property | | | 60 | 1915 |

## Probable unrecorded shallow workings

None.

## Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

## Mine entries

None recorded within 100 metres of the enquiry boundary.

## Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

| | | |
|---|---|---|
| NW1260 | 6600 | NW1261 |

**Please contact us on 0345 762 6848** to determine the exact abandoned mine plans you require based on your needs.

## Outcrops

No outcrops recorded.

## Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

## Opencast mines

None recorded within 500 metres of the enquiry boundary.

## Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

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# Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

### Site investigations
None recorded within 50 metres of the enquiry boundary.

### Remediated sites
None recorded within 50 metres of the enquiry boundary.

### Coal mining subsidence
The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal 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
None recorded within 500 metres of the enquiry boundary.

### Mine water treatment schemes
None recorded within 500 metres of the enquiry boundary.

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# Section 3 – Licensing and future mining activity

### Future underground mining
None recorded.

### Coal mining licensing
None recorded within 200 metres of the enquiry boundary.

### Court orders
None recorded.

### Section 46 notices
No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

### Withdrawal of support notices
The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

### Payments to owners of former copyhold land
The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

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# Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

### Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

**For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.**

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# Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk.**

### Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

### Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

### Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

### Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

### Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

### Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

### Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

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### Opencast mines
Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

### Coal Authority managed tips
Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

### Site investigations
Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

### Remediated sites
Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

### Coal mining subsidence
Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

### Mine gas
Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission.

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### Mine water treatment schemes
Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

### Future underground mining
Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

### Coal mining licensing
Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

### Court orders
Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

### Section 46 notices
Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

### Withdrawal of support notices
Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

### Payment to owners of former copyhold land
Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

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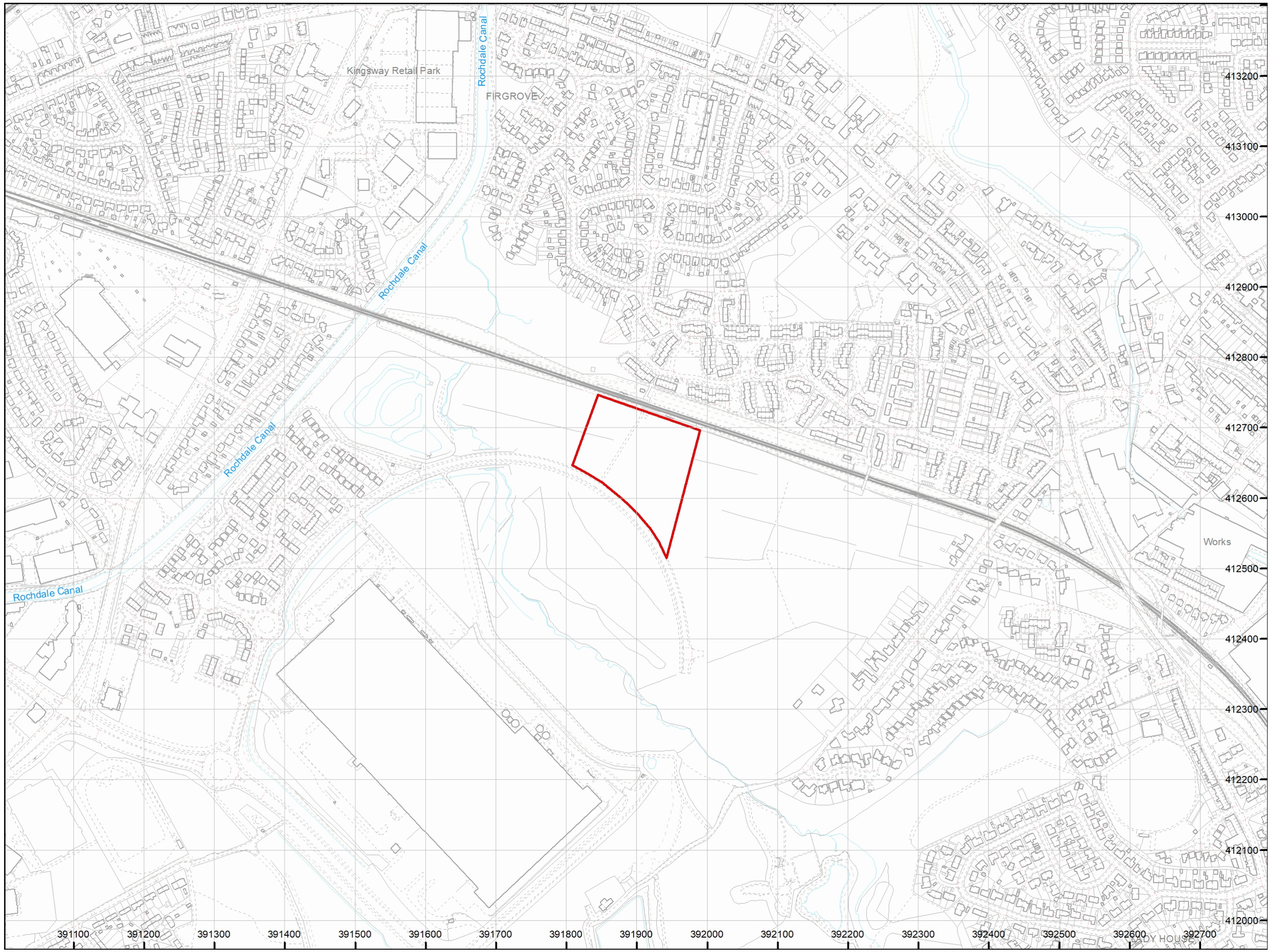
# Summary of findings

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Map data

The map highlights any specific surface or subsurface features within or near to the boundary of the site.

## Key

Approximate position of the enquiry boundary shown




**How to contact us**
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+44 (0)1623 637 000 (International)
www.groundstability.com

# Appendix 7: Classification of Risk

# BWB RISK ASSESSMENT CLASSIFICATION (REFERENCE CIRIA C552, *CONTAMINATED LAND RISK ASSESSMENT: A GUIDE TO GOOD PRACTICE*, 2001)

CIRIA C552, *Contaminated Land Risk Assessment A Guide to Good Practice*, 2001 sets out a methodology for estimating risk. The methodology for risk evaluation is a qualitative method for interpreting the output for the risk estimation stage of the assessment. It involves the classification of the:

- Magnitude of the potential consequence (severity) of risk occurring; and
- Magnitude of the probability (likelihood) of the risk occurring.

The classification of consequence and probability are replicated in **Table 1** and **Table 2**, respectively.

**Table 1: Classification of Consequence**

| Classification | Definition | Examples |
|---|---|---|
| **Severe (Sv)** | Short term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. Short term risk of pollution of sensitive water resource. Catastrophic damage to buildings/ property. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem. | High concentrations of cyanide on the surface of an informal recreation area.<br>Major spillage of contaminants from site into controlled water.<br>Explosion, causing building collapse (can also equate to a short-term human health risk if buildings are occupied). |
| **Medium (Md)** | Chronic damage to Human Health ("significant harm"). Pollution of sensitive water resources. A significant change in a particular ecosystem, or organism forming part of such ecosystem. | Concentrations of a contaminant from site exceeding the generic or site-specific assessment criteria.<br>Leaching of contaminants from a site to a major or minor aquifer.<br>Death of species within a designated nature reserve. |
| **Mild (Mi)** | Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services. Damage to sensitive buildings/structures/services or the environment. | Pollution of non-classified groundwater.<br>Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability). |
| **Minor (Mr)** | Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by measures such as protective clothing etc.). Easily repairable effects of damage to buildings, structures and services. | The presence of contaminants at such concentration that protective equipment is required during site works.<br>The loss of plants in a landscaping scheme.<br>Discolouration of concrete. |

The classification of consequence does not take into account the probability of the consequence being realised. Therefore, there may be more than one consequence for a particular pollutant linkage. Both a severe and medium classification can result in death.

Severe relates to short term (acute) risk while medium relates to long term (chronic) risk. Mild relates to significant harm but to less sensitive receptors. Minor classification relates to harm which is not significant but could have a financial cost.

**Table 2: Classification of Probability**

| Classification | Definition |
|---|---|
| **High likelihood (Hi)** | There is a pollutant linkage and an event that either appears very likely in the short term and almost inevitable in the long term, or there is evidence at the receptor of harm or pollution. |
| **Likely (Li)** | There is a pollutant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur.<br>Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term. |
| **Low likelihood (Lw)** | There is a pollutant linkage and circumstances are possible under which an event could occur.<br>However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term. |
| **Unlikely (Ul)** | There is a pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long term. |

The classification gives a guide as to the severity and consequence of identified risk when compared with other risk presented on the site. It should be noted that if a risk is identified it cannot be classified as "no risk" but as "very low risk". Differing stakeholders may have a different view on the acceptability of a risk.

Once the consequence and probability have been classified these can be compared using a matrix to identify an overall risk category, as shown in **Table 3**. These categories and the actions required are categorised in **Table 4**.

**Table 3: Risk Evaluation Matrix**

| | Consequence | Severe (Sv) | Medium (Md) | Mild (Mi) | Minor (Mr) |
|---|---|---|---|---|---|
| Probability | **High likelihood (Hi)** | Very High Risk (VH) | High Risk (H) | Moderate Risk (M) | Mod/Low Risk (M/L) |
| | **Likely (Li)** | High Risk (H) | Moderate Risk (M) | Mod/Low Risk (M/L) | Low Risk (L) |
| | **Low likelihood (Lw)** | Moderate Risk (M) | Mod/Low Risk (M/L) | Low Risk (L) | Very Low Risk (VL) |
| | **Unlikely (Ul)** | Mod/Low Risk (M/L) | Low Risk (L) | Very Low Risk (VL) | Very Low Risk (VL) |

**Table 4: Risk Categorisations**

| | |
|---|---|
| **Very High Risk (VH)** | There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening.<br>This risk, if realised, is likely to result in a substantial liability.<br>Urgent investigation (if not undertaken already) and remediation are likely to be required. |
| **High Risk (H)** | Harm is likely to arise to a designated receptor from an identified hazard.<br>Realisation of the risk is likely to present a substantial liability.<br>Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short-term and are likely over the longer-term. |
| **Moderate Risk (M)** | It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild.<br>Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer-term. |
| **Low Risk (L)** | It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild. |
| **Very Low Risk (VL)** | There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe. |

**Reference:**

CIRIA C552 *Contaminated land risk assessment. A guide to good practice*. Rudland, D J, Lancefield, R M, Mayell, P N, 2001.

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**ENVIRONMENT**

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Phase 2 Geo-Environmental Assessment

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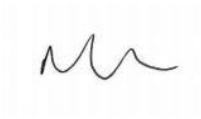
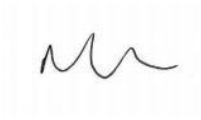
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# EXECUTIVE SUMMARY

| EXECUTIVE SUMMARY | |
|---|---|
| Site Address | The site is located on a collection of fields immediately south of Kingsway Business Park Tram Stop in Rochdale, postcode OL16 4JN. |
| Site Setting | The proposed development is anticipated to comprise a commercial and/or warehouse building with associated infrastructure. |
| Published Ground Conditions | Information published by the BGS indicates that the site is directly underlain by Glaciofluvial Deposits (Sand and Gravel) in the western part of the site and Glacial Till in the eastern part, these are underlain by Pennine Lower Coal Measures bedrock. The bedrock is inferred as faulted to the southwest and northeast of the site at 52m and 130m respectively (NW-SE trending). |
| Site Investigation | Intrusive ground investigation works were undertaken between 1st and 5th August 2022 and comprised the advancement of five cable percussive boreholes to a maximum depth of 15.00m bgl with completion of SPTs and installations of gas and groundwater monitoring wells; and twenty machine excavated trial pits (TP101 to TP121 inclusive) to a maximum depth of 4.50m bgl. |
| Ground Conditions Encountered | The ground conditions encountered generally confirmed the published geology discussed in the Phase 1 report and comprised Topsoil and Made Ground directly underlain by Glaciofluvial Deposits, locally underlain by Glacial Till, particularly in the eastern part, with both underlain by Pennine Lower Coal Measures bedrock. Peat and organic soils were observed in soils above the Till in the eastern area of the site associated with areas of former/existing low-lying waterlogged ground and ponds. |
| Geotechnical Appraisal | Given the ground conditions encountered, ground improvement will be required for the support of shallow foundations and the floor slab, utilising vibro-stone columns (VSC). Alternatively, ground improvement comprising rigid inclusions (RIs), with a load transfer platform is considered feasible.<br>Any organic soils/Peat beneath the building footprint will need to be delineated, chased out, removed and replaced with suitable engineered fill. The excavated organic soils/Peat could potentially be reused within non-structural areas of the development.<br>Compaction testing indicates soils are generally wet of optimum at natural moisture contents and would require dewatering (via chemical modification) for adequate compaction as engineered fill.<br>The design sulphate and ACEC class for below ground concrete at the site is DS-1 and AC-1.<br>For new pavement at the site, modification of the formation soils (e.g. by lime or cement) will be required to achieve the required design CBR value.<br>Based on the ground conditions encountered together with the variable and shallow groundwater issues in the area, soakaway drainage is unlikely to be a viable solution.<br>Groundwater is likely to vary seasonally at the site. The ground investigation will have likely captured a lowered groundwater situation, with some areas of the site displaying evidence of historical waterlogging (reeds, peat build up). If groundwater levels rise following extended periods of wet weather, groundwater control may be required during construction ground works. |
| Environmental Appraisal | High total Organic Carbon (TOC) content in the Made Ground was recorded and organic Superficial deposits associated with surface ponding were also identified, predominantly in the east of the site. Peat was recorded in two locations within the Superficial deposits.<br>Characteristic Gas Situation 1 (CS1) prevails on site within monitored boreholes, however, CS3 gas protection measures are recommended on structures |

| | |
|---|---|
| | constructed over natural soils with high organic content, as encountered at the site.<br>No soil samples tested had contaminant concentrations that exceeded the screening criteria for risks to human health for a commercial end-use. Asbestos was not detected in the five Made Ground samples tested.<br>Minor exceedances for leachable copper, lead, nickel and zinc were recorded. BWB consider these exceedances to not be significant given the distance to sensitive surface water receptors.<br>Minor exceedances for cadmium, copper, nickel, zinc, and ammonium were recorded in groundwater samples. Due to the proposed development on the site comprising large areas with hardstanding and buildings which will limit further infiltration and leaching, BWB do not consider that controlled waters will be exposed to an unacceptable risk as a result of the proposed development. |
| Waste Assessment | Soil samples have been characterised against hazardous waste criteria using Hazwasteonline. The results of the waste classification indicates that the soils analysed are likely to be classified as non-hazardous. |
| Recommendations | A Remediation Strategy should be completed for the site prior to development to provide remediation and mitigation requirements and provide verification requirements of any gas protection measures required. Should organic materials be removed from site, therefore removing the ground gas source, a Design Statement should be completed.<br>Additional ground investigation should be undertaken in the eastern part of the site to delineate the shallow organic soils in order to assess the feasibility for removal from the proposed building footprint.<br>To assist with the design of ground improvement by VSCs or RIs, additional investigation via cone penetration testing is recommended, focussing on the proposed building footprint.<br>Access to the farmer's field in the far eastern section of site was not possible at the time of the investigation due to the presence of livestock. Prior to development, ground conditions within this area of the site should be confirmed by further investigation to ensure consistency of ground conditions characterised in the remainder of the site, as described in this report. |
| This summary should be read in conjunction with BWB's full report (ref. KYP-BWB-ZZ-XX-RP-YE-0002_Ph2-P2 and reflects an assessment of the Site based on information received by BWB at the time of production. | |

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# 1. INTRODUCTION

## Instruction

1.1 BWB Consulting (BWB) was instructed by Wilson Bowden Developments Ltd (the Client) to carry out a Phase 2 Geo-Environmental Assessment for a site referred to as Plot P, Kingsway Business Park, Rochdale. Details of the project brief are included in BWB proposal reference 2100939 dated December 2021.

## Proposed Development

1.2 The proposed development is shown on the architect's masterplan in **Appendix 1**. An extract from the masterplan is shown in Figure 1.1. The development is anticipated to comprise a commercial warehouse with associated infrastructure and parking.

**Figure 1.1: Proposed Development**




1.3

## Previous Reports

1.4 The following geo-environmental reports have previously been completed for the site:

- '*Phase 1 Geo-Environmental Assessment*' by BWB Consulting Ltd for Wilson Bowden Developments Ltd, reference KYP-BWB-ZZ-XX-RP-YE-0001_Ph1, dated July 2022.

## Objectives

1.5 The objectives of the report are to assess:

- The prevailing ground and groundwater conditions across the site;
- The potential presence and extent of contamination in shallow soil and groundwater beneath the site;
- The significance and magnitude of the observed contamination through comparison of analytical data with appropriate published environmental screening criteria;
- The strength properties of the soil beneath the site to enable foundation design;
- The ability to rework the soils for earthworks required to achieve the development platform;
- Any precautions required with respect to attack on buried concrete;
- The drainage properties of the underlying strata; and
- The ground gas regime beneath the site.

1.6 The above objectives will allow the preliminary Conceptual Site Model presented in the Phase 1 report to be verified and updated. The report has been completed in accordance with BS10175:2011(+A2:2017) 'Investigation of Potentially Contaminated Sites, Code of Practice' and EA Guidance on Risk Management of Land Contamination https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm.

1.7 This report presents the information obtained from a desk study and the supplementary ground investigations and contains relevant factual information from the previous investigations undertaken by others. The report, together with the associated Figures and Appendices, provides a Ground Investigation Report (GIR), as defined in BS EN 1997-1:2004 and BS EN 1997-2:2007

## Scope of Works

1.8 The ground investigation scope of works was completed on 05/08/2022 and comprised the following

- Non-intrusive survey of exploratory hole locations for underground utilities;
- 17 no. machine excavated trial pits;
- 5 no. cable percussive boreholes;
- 4 no. gas and groundwater monitoring visits;

- Chemical analysis of soil samples; and
- Geotechnical testing of recovered soil samples.

# 2. THE SITE

## Site Location

2.1 The site is located at Plot P, Kingsway Business Park, in Rochdale, centred at National Grid reference 391907 412651, nearest postcode OL16 4JN. The approximate location of the site is shown below in Figure 2.1.

**Figure 2.1: Site Location Plan**




## Site Description

2.2 A full site description and site photographs are included within the BWB Phase 1 Geo-Environmental Assessment (Ref: KYP-BWB-ZZ-XX-RP-YE-0001_Ph1) dated July 2022.

2.3 The site comprises of an irregularly shaped parcel of grassed land to the east of Rochdale centre, covering approximately 2.6 hectares. The site is undulating, with ground levels typically around 149m above Ordnance Datum.

2.4 Site use is currently agricultural, and cows were being pastured in the field to the east of the site during the ground investigation.

2.5 The Oldham to Rochdale tram line is located adjoining the northern boundary of the site, with residential development beyond and to the north. The Kingsway Loop Road (Michael Faraday Avenue) bounds the site to the south. The land to the east and west of the site currently comprises undeveloped grassed fields with ponds and waterlogged areas.

2.6 Stanney Brook is present around 150m to the south and west of the site boundary. Beyond the Brook is a series of engineered ponds, and immediately adjacent to these ponds the Rochdale Canal is present around 380m to the west of site.

# 3. PUBLISHED GROUND CONDITIONS

## Published Geology

3.1 British Geological Survey (BGS) mapping for the site indicates that the site is directly underlain by Glaciofluvial Deposits (Sand and Gravel) to the west and Glacial Till to the east. These Superficial deposits are underlain by Pennine Lower Coal Measures bedrock (with seams last worked in 1915 at 97m to 107m bgl). The bedrock is inferred as faulted to the southwest and northeast of the site at 52m and 130m respectively (NW-SE trending). The BGS Lexicon database describes the bedrock as interbedded mudstone, siltstone and sandstone containing thicker coal seams towards the upper boundary.

3.2 The closest BGS borehole to the site is SD91SW-156, approximately 380 m west. The borehole recorded 1.4m of Made Ground, comprising of 200mm of topsoil over dark brown sandy topsoil with a small amount of gravel content. This is underlain by 4.6m of medium dense, brown silty fine to medium sand becoming loose at 5.2m to the borehole's termination at 6.0m bgl (below ground level). The Glacial Till on site are not present at this borehole location, but the Glaciofluvial Deposits and underlying Lower Coal Measures bedrock, which are present on site, are included in this record.

## Hydrogeology

3.3 The underlying ground conditions have been classified by the Environment Agency (EA) as follows:

- Glacial Till (in the east): Secondary Undifferentiated Aquifer;
- Glaciofluvial Deposits (in the west): Secondary A Aquifer; and
- Pennine Lower Coal Measures Bedrock: Secondary A Aquifer.

## Hydrology

3.4 There are three bodies of standing water located within the site boundary, that are wider than 5m. These are expected to be waterlogged areas / ponds caused by perched water on top of low permeability Superficial deposits (cohesive Till) in low-lying areas.

3.5 The following bodies of water are present within 400m of the site:

- Stanney Brook is present around 150m to the west of the site boundary;
- A series of engineered ponds around 250m to the west; and
- Rochdale Canal is present around 380m to the west.

3.6 There is a high risk of surface water flooding on site, primarily related to the observed on site surface water bodies, and within 50m.

3.7 There is risk of a maximum flood depth of 0.3m to 1m from surface water flooding on site for a 1 in 30-year event according to Environment Agency mapping. There is a low to moderate risk of groundwater flooding on site.

# 4. PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

## Introduction

4.1 The risk posed by any contaminants in soil or groundwater will depend on the nature of the hazard, the probability of exposure, the pathway by which exposure occurs, and the likely effects on the receptors. A contaminant is defined as a substance that has the potential to cause harm, while a risk is considered to exist if such a substance is present in sufficient concentration to cause harm and a pathway exists for a receptor to be exposed to the substance.

4.2 The following sections discuss all the identified potential on and off-site sources, pathways and receptors in the context of the proposed development and plausible pollutant linkages which may represent a risk to identified receptors such as human health and/or controlled waters from the data gained from the desk study. At this stage the assessment is qualitative and aimed to determine all pollutant linkages, irrespective of significance or allowing for uncertainty.

4.3 Three impact potentials exist for any given site; these are:

- The site impacting upon itself;
- The site impacting on its surroundings; and
- The surroundings impacting on the site.

4.4 All three impacts need to be considered in a risk assessment.

4.5 A Source, Pathway, Receptor analysis has been undertaken for the site based on the information provided in the preceding sections. This is presented as Table 5 and further information about the risk classification scheme is included within Appendix 5.

4.6 Sources (S); These are potential or known sources of contamination that may relate to a former land use or present site feature or process (e.g. fuel storage tanks).

4.7 Pathways (P); A pathway is defined as a mechanism or route by which a contaminant comes into contact with, or otherwise affects a receptor. Pathways by which the identified receptors may be impacted upon in the context of the proposed development.

4.8 Receptors (R); Receptors are defined as people, living organisms, ecological systems, controlled waters, atmosphere, structures and utilities that could be adversely affected by contaminant(s).

4.9 Under the Construction Design Management (CDM) Regulations 2015, construction and maintenance contractors must undertake their own risk assessments and mitigation to protect their staff, other human receptors and the environment from potential contamination. By law potential risks to human health and the environment from construction activities must appropriately identified and all necessary steps taken to eliminate/manage that risk. Therefore, construction / maintenance workers are excluded as a receptor in the CSM.

4.10 A tabulated version of the Preliminary CSM produced within the desk study is presented in Tables Table 4:1, Table 4:2 and Table 4:3.

**Table 4:1: Potential Sources of Contamination**

| Location | Potential Source | Contaminants of Potential Concern (CoPC) |
|---|---|---|
| On-site | **MADE GROUND** associated with previous infrastructure developments such as **RAILWAY SIDINGS** and **ROAD DEVELOPMENT** | • Heavy metals<br>• Inorganics, such as cyanides, sulphates and nitrates<br>• Arsenic<br>• Methane, carbon dioxide |
| | Former/current **SURFACE WATER/POND** features on site. | • Organic material<br>• Methane, carbon dioxide |
| | Contamination associated with **AGRICULTURAL** activities | • Semi-volatile organic compounds (SVOCs) including phenols and polycyclic aromatic hydrocarbons (PAHs)<br>• Inorganics, such as cyanides, sulphates and nitrates<br>• Methane, carbon dioxide |
| | Gas accumulation in **DEEP MINING WORKS** | • Methane, carbon dioxide |
| Off-site | Contamination associated with neighbouring activities including **RAILWAY CUTTING** and **QUARRIES** | • Heavy metals<br>• Semi-volatile organic compounds (SVOCs) including phenols and polycyclic aromatic hydrocarbons (PAHs)<br>• Petroleum hydrocarbons<br>• Inorganics, such as cyanides, sulphates and nitrates<br>• pH |

**Table 4:2: Relevant Potential Pathways and Receptors**

| Receptors | Pathways |
|---|---|
| **Human Health:**<br>• Future site users (commercial)<br>• Neighbouring public (residential/commercial)<br>• Intrusive maintenance workers | • Dermal contact with soil or dust<br>• Incidental ingestion of soil and/or dust<br>• Inhalation of dust and/or fibres<br>• Inhalation of vapours<br>• Migration and accumulation of ground gas in enclosed spaces leading to inhalation or explosion |
| **Controlled Waters:**<br>• Groundwater (Secondary A Aquifers)<br>• Surface water (Rochdale Canal, Stanney Brook) | • Leaching of soil contaminants<br>• Vertical and lateral migration<br>• Surface run-off |
| **Ecology:**<br>• Flora and Fauna | • Lateral migration<br>• Uptake and accumulation |
| **Property:**<br>• Underground utilities<br>• Building structures | • Direct Contact<br>• Accumulation and explosion of gas |

**Table 4:3: Preliminary Conceptual Site Model**

| Source | Pathway | Receptor | Con | Prob | Risk |
|---|---|---|---|---|---|
| On-site sources as detailed in **Table 4.1**. | Dermal contact with, and incidental ingestion of soil and/or dust.<br>Inhalation of dust and/or fibres. | Future site users (commercial) | Md | Ul | L |
| | | Intrusive maintenance workers | Md | Lw | M/L |
| | Inhalation of vapours. | Future site users (commercial) | Md | Ul | L |
| | | Neighbouring public | Md | Ul | L |
| | | Intrusive maintenance workers | Md | Lw | M/L |
| | Migration and accumulation of ground gases in enclosed spaces leading to asphyxiation (carbon dioxide) or explosion (methane). | Future site users (commercial) | Md | Lw | M/L |
| | Leaching and permeation through soil profile. | Groundwater: Underlying Secondary Superficial & Bedrock Aquifers | Md | Ul | L |
| | Vertical and lateral migration of contaminants. | | Md | Ul | L |
| | Surface run-off. | Stanney Brook<br>Rochdale Canal | Md | Ul | L |
| | Direct contact. | Water utility pipes | Md | Lw | M/L |
| | | Buried structures/ foundations. | Mi | Lw | L |
| Off-site sources as detailed in **Table 4.1**. | Dermal contact with, and incidental ingestion of soil and/or dust. | Future site users (commercial) | Md | Ul | L |
| | | Future site users (commercial) | Md | Ul | L |

| Source | Pathway | Receptor | Con | Prob | Risk |
|---|---|---|---|---|---|
| | Leaching and permeation through soil profile. | Groundwater: Underlying Secondary Superficial & Bedrock Aquifers | Md | Ul | L |
| | Vertical and lateral migration of contaminants. | | Md | Ul | L |

VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low

KEY: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor, Hi = High, Li = Likely, Lw = Low Likelihood, Ul = Unlikely

# 5. PHASE II GEO-ENVIRONMENTAL AND GEOTECHNICAL GROUND INVESTIGATION

5.1 Intrusive ground investigation works were undertaken by BWB between 1st and 5th August 2022 and comprised the following works:

- Clearance of investigation locations by a specialist buried services' tracing company;
- Collection of coordinates and elevations of exploratory hole locations;
- The advancement of 5 cable percussive boreholes (BH01 to BH05 inclusive) to a maximum depth of 15.00m bgl with completion of SPTs and installations of gas and groundwater monitoring wells;
- The advancement of 20 machine excavated trial pits (TP101 to TP121 inclusive) to a maximum depth of 4.50m bgl;
- Collection of environmental soil and groundwater water samples for chemical analysis at a UKAS and MCERTS accredited laboratory;
- Collection of large and small disturbed and undisturbed soil samples for geotechnical testing at a UKAS accredited laboratory; and
- 4 proposed post investigation ground gas and groundwater level monitoring visits.

5.2 An exploratory hole location plan is presented as Drawing 1. BWB exploratory hole records are presented as **Appendix 2**, the SPT calibration certificate is presented in **Appendix 3**, and the post-investigation gas and groundwater monitoring data is presented as **Appendix 4**.

5.3 The site investigation works were carried out in general accordance with BS5930:2015 'Code of Practice for Site Investigations' and BS10175:2011 'Investigation of Potentially Contaminated Sites'.

### Chemical Sampling Strategy

5.4 There was a non-targeted sampling strategy, considering the anticipated site-wide Made Ground (of limited thickness) and the natural shallow soils including areas of natural organic material.

5.5 Samples of Made Ground and natural soils were taken and subjected to testing to inform preliminary assessments of the potential for re-use of soils for fill and/or landscaping.

5.6 Cable percussive boreholes included single groundwater and gas installations to monitor and characterise the underlying groundwater regime within the Glaciofluvial Deposits.

**Table 5:1: Response Zones**

| Location | Response zone | Stratum |
|---|---|---|
| Borehole BH01 | Between 2.0m and 5.0m | Glaciofluvial Deposits (Sand) |
| Borehole BH02 | Between 3.0m and 15.0m | Glaciofluvial Deposits (Sand) |
| Borehole BH03 | Between 1.5m and 3.5m | Glaciofluvial Deposits (Sand/Clay) |
| Borehole BH04 | Between 5.0m and 15.0m | Glaciofluvial Deposits (Clay) |
| Borehole BH05 | Between 1.0m and 3.8m | Glaciofluvial Deposits (Sand) |

## Chemical Analytical Strategy

### Soil Strategy

5.7 Selected soil samples collected from exploratory hole locations were sent to i2 Analytical Ltd Services (UKAS and MCERTS accredited) for chemical analysis. The following chemical analytical testing was undertaken:

- 8 no. soil samples were tested for a soil suite (BWB Standard Suite) comprising arsenic, barium, beryllium, water soluble boron, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, vanadium, zinc, water soluble sulphate (2:1 extract), total phenols, total cyanide, free cyanide, complex cyanide, fraction of organic carbon, pH, Polycyclic Aromatic Hydrocarbons (PAHs) (United States Environment Protection Agency priority 16 compounds) and Total Petroleum Hydrocarbons (TPH) C6-C40;
- 5 no. soil samples underwent asbestos screening; and
- 3 no/ soil samples were tested for a suite of common leachable contaminants, namely arsenic, barium, beryllium, water soluble boron, cadmium, chromium, copper, lead, mercury, nickel, selenium, vanadium, zinc, water soluble sulphate (2:1 extract), sulphate, total cyanide and pH.

5.8 The results of the soil chemical testing are presented as **Appendix 5**.

### Groundwater Strategy

5.9 Groundwater samples obtained using a bailer following the removal of 3 times the well volume of water, or the well is to be bailed dry and allowed to recharge. The groundwater samples were sent to i2 Analytical (UKAS and MCERTS accredited) for the following suite of groundwater chemical testing:

- 4 no. of water samples are to be tested for arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, vanadium, zinc, conductivity, soluble sulphate, ammoniacal nitrogen, total phenols, total cyanide, pH, total organic carbon, PAHs (US EPA priority 16 compounds).

5.10 The results of the water chemical testing are presented as **Appendix 6**.

### Geotechnical Strategy

5.11 The cable percussive borehole locations were positioned around the site, in consideration of the proposed building footprint to assess underlying ground conditions for geotechnical purposes. The trial pits were positioned to assess ground conditions, strength properties and characteristics across the full site.

5.12 In situ soil strength testing comprising SPTs were undertaken within the cable percussive boreholes. SPT 'N' values are included on the exploratory hole logs in **Appendix 2**.

5.13 Selected large and small disturbed and undisturbed samples were collected from the investigation locations and sent to the geotechnical project laboratory (i2 Analytical Ltd Services), which is UKAS accredited. The following geotechnical testing was undertaken;

- 14 samples tested for moisture content;
- 14 samples tested for Atterberg (liquid and plastic) limits;
- 6 samples tested for particle size distribution by sieve and pipette;
- 7 samples tested for BRE Suite comprising aqueous sulphate and pH;
- 6 CBR tests were undertaken on recompacted samples (2.5kg rammer);
- 11 particle density by glass jar;
- 5 samples underwent (2.5kg rammer) compaction testing; and
- 5 sample underwent (4.5kg rammer) compaction testing
- 2 Samples underwent a one dimensional triaxial test
- 5 Samples underwent a quick undrained triaxial test

5.14 The results of the geotechnical testing are included as **Appendix 7**.

### Limitations and Uncertainty

5.15 Access to the farmer's field in the east of site was not possible at the time of the investigation due to the presence of livestock. Proposed exploratory holes originally planned in this area were therefore relocated and used to increase coverage in the area to the immediate west of the standing water bodies and delineate the organic soils that had been encountered.

# 6. GROUND CONDITIONS ENCOUNTERED

## Geological Summary

6.1 The ground conditions recorded generally confirmed the published geology discussed in the Phase 1 report, i.e., the site is directly underlain by Glaciofluvial Deposits in the western part of the site and Glacial Till in the eastern part, with both underlain by Pennine Lower Coal Measures bedrock. However, the Glaciofluvial Deposits were found to be much more extensive than indicated from BGS records, and extended over most of the site, overlying Glacial Till in the eastern section. It should be noted that differentiation between the Glaciofluvial Deposits and Glacial Till was not easy from the ground conditions encountered, as presented on the exploratory hole records.

6.2 The recorded ground conditions are summarised in **Table 6.1** below. Uncorrected SPT results collected from the borehole locations are presented on the exploratory hole records presented in **Appendix 2**.

**Table 6:1 : Summary of Ground Conditions**

| Stratum | Top Depth (m) | | Base Depth (m) | | Thickness (m) | | SPT N Value | |
|---|---|---|---|---|---|---|---|---|
| | Min | Max | Min | Max | Min | Max | Min | Max |
| Topsoil | Ground Level | | 0.20 | 1.00 | 0.20 | 1.00 | - | - |
| Made Ground | 0.00 | 1.00 | 0.40 | 1.70 | 0.30 | 1.80 | - | - |
| Peat | 0.00 | 0.90 | 0.50 | 1.00 | 0.10 | 0.50 | - | - |
| Glaciofluvial Deposits | 0.20 | 15.00 | 0.80 | >15.45 | 0.20 | >10.05 | 5 | 50 |
| Glacial Till | 1.50 | 11.80 | 1.90 | >15.16 | 0.40 | >3.36 | 44 | 50 |
| Pennine Lower Coal Measures | 2.50 | 3.50 | Not Proven | | Not Proven | | | |

## Geological Descriptions

### Topsoil

6.3 Topsoil was encountered in most exploratory holes excluding TP101, TP105, TP106, TP107, TP112, TP113, TP116, TP121 & BH04.

6.4 Topsoil was recorded with thicknesses of between 0.2m and 1.0m. Topsoil composition was variable, typically comprising dark brown slightly clayey to clayey sand with varying rootlet content and comprising very soft dark brown silty sandy clay at TP119. The topsoil is topped by grass across much of the site, with areas of reeds and bullrushes in the seasonally wet areas in the north-eastern section.

6.5 The depths of topsoil over the site may vary from that encountered at the locations investigated within the scope of this investigation, which should be considered when making estimates of topsoil quantities on the site.

### Made Ground

6.6 Made Ground was encountered in 10 no. exploratory holes (TP101, TP105, TP106, TP107, TP108, TP111, TP112, TP113, TP116, TP119). It was recorded with thicknesses of between 0.5m and 1.8m.

6.7 Made Ground encountered was variable in composition. It typically comprised a black or brown clayey, gravelly sand, or sandy gravelly clay, with some cobbles. Gravel and cobbles comprised various natural and artificial inclusions (clinker, brick, sandstone, mudstone, wood, concrete). High organic content and rootlets were observed in waterlogged areas (e.g., TP107, TP108).

6.8 Made Ground was not encountered in any of the boreholes, so no SPT $N_{60}$ values were taken in this stratum.

### Peat

6.9 Peat was encountered either at surface or below Topsoil in holes TP120 and at TP121 in the north-eastern site section and was recorded with thicknesses of between 0.1m (TP120) and 1.0m (TP121). Peat was described as very soft and black or dark brown in colour. Visible plant material was encountered within the peat between 0.5m and 1.0m in TP121.

6.10 Peat is inferred to be associated with the areas of standing water and waterlogged soils observed on site.

6.11 No SPT N60 values were taken within the Peat, only being found in the trial pit locations.

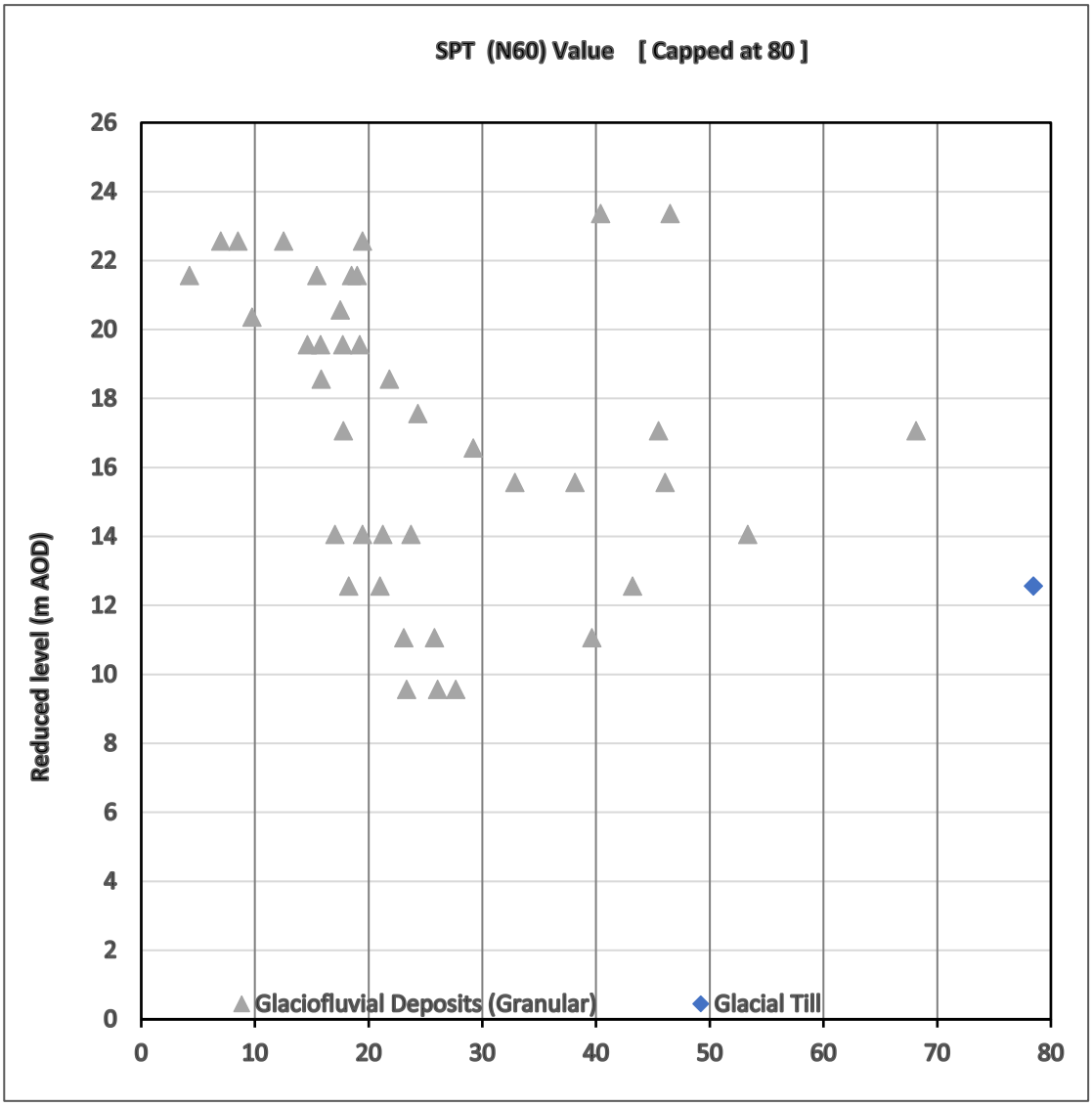
### Glaciofluvial Deposits

6.12 Soils inferred to be Glaciofluvial Deposits were encountered in all exploratory holes below Topsoil, Made Ground and/or Peat, with thicknesses of between 0.16m and (at least) 12.20m. These deposits were highly variable and comprised interbedded cohesive and granular horizons. Granular horizons typically comprised orange, brown or grey clayey, silty, gravelly sand with occasional cobbles. Cobbles and gravel comprise sandstone and mudstone. Cohesive horizons comprised silty, sandy gravelly clays with occasional cobbles. The proportion of the component particle sizes were also highly variable.

6.13 21 no. of the 26 no. exploratory hole positions terminated within the Glaciofluvial Deposits including 4 no. of the 5 no. borehole positions. BH01 encountered the base of the Glaciofluvial Deposits at 11.8m depth (135.48mAOD). Trial pits (TP110, TP111, TP117, TP118) encountered the base of the stratum at depths of approximately 1.5 to 3.0m bgl, i.e. levels of between 146.41mAOD and 147.04mAOD.

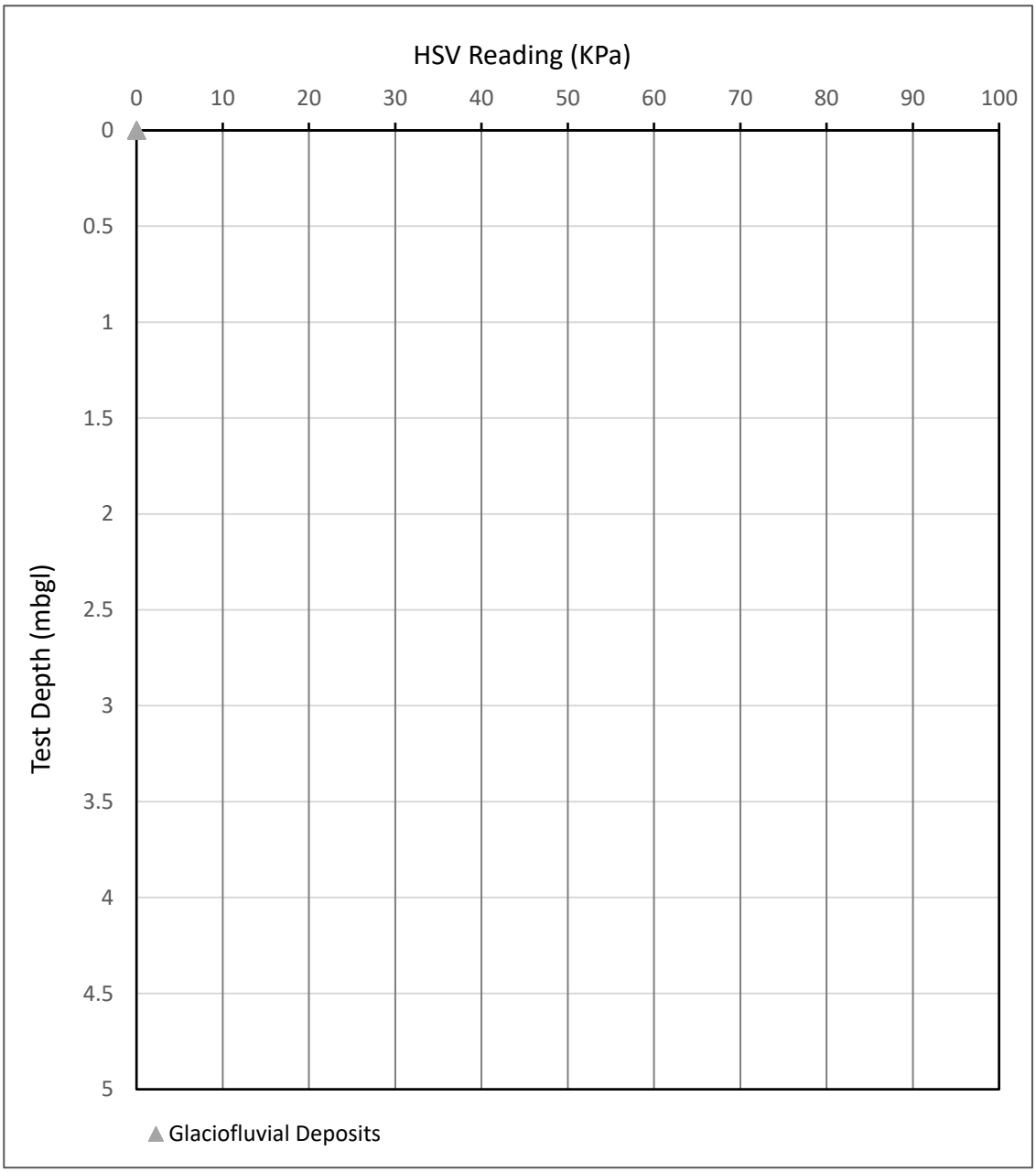
6.14 SPT N60 values within the Glaciofluvial Deposits were recorded ranging from 11 to refusal (in excess of 50 blow per 300mm) for the cohesive soils, and within the granular soils, SPT N60 values of between 3 and 40 were recorded. An SPT N60 versus depth plot is presented as Figure 6.1. While N60 values generally increased with depth, the data is broadly scattered.

**Figure 6.1: SPT '$N_{60}$' Values vs. Reduced Level.**




6.15

**Figure 6.2: Hand Shear Vane (HSV) vs. Depth (m bgl).**




6.16 14 no. samples from within the Glaciofluvial Deposits were tested for Atterberg Limits and indicate a range of low to intermediate plasticity clays and low plasticity silt. Plasticity Index (PI) results range from 11% to 26%.

6.17 Particle size distribution test results for Glaciofluvial Deposits are summarised below.

**Table 6:2 : PSD Results Summary**

| Stratum | Location | Depth (m) | Cobble Content (%) | Gravel Content (%) | Sand Content (%) | Clay/ Silt Content (%) | Earthworks Classification |
|---|---|---|---|---|---|---|---|
| Glaciofluvial Deposits | TP105 | 2.50 | 0 | 1 | 93 | 7 | 1A/1B |
| Glaciofluvial Deposits | TP107 | 2.30 | 0 | 2 | 76 | 22 | 2A/2B |
| Glaciofluvial Deposits | TP114 | 1.60 | 0 | 0 | 38 | 62 | 2A/2B |
| Glaciofluvial Deposits | BH03 | 2.00-2.45 | 0 | 0 | 69 | 31 | 2A/2B |
| Glaciofluvial Deposits | BH04 | 1.20-1.65 | 16 | 43 | 22 | 19 | 2C |
| Glaciofluvial Deposits | BH05 | 1.10 | 0 | 3 | 55 | 42 | 2A/2B |

### Glacial Till

6.18 Soils inferred to be Glacial Till were encountered in 3 no. exploratory holes (BH01, TP117 and TP118 - the latter two being located in the southern corner of the site) at depths of between 1.5m and 11.8m bgl, generally beneath Glaciofluvial Deposits. The base was not proven in any of these holes. The thicknesses penetrated varied between 0.40m and 3.36m.

6.19 The Glacial Till, as interpreted generally comprising stiff and very stiff brown and grey variably sandy/gravelly clay. It should be noted, however than similar soils were encountered in other exploratory holes that have been interpreted as Glaciofluvial Deposits, due to underlying granular horizons (e.g. Bh04 below 3.40m bgl, BH05 below 3.80m bgl, and also trial pits TP108, TP109, and TP114).

6.20 SPT N60 values within the Glacial Till were recorded in the range of 44 and refusal (in excess of 50 blow per 300mm). An SPT N60 versus depth plot is presented as Figure 6:1.

### Pennine Lower Coal Measures

6.21 Strata inferred to be of the Pennine Lower Coal Measures were encountered in 2 exploratory holes, TP110 and TP111 close to the central section of the site. These strata were encountered beneath the Glaciofluvial Deposits at depths of about 3.00m bgl (146.41m and 146.64m AOD). The base and full thickness was not proven with both holes being terminated within about 1m below the top of the lithology.

6.22 These strata were described as stiff grey, locally sandy clay with gravel to cobbles of mudstone.

6.23 No SPT N60 values were taken within the inferred Pennine Lower Coal Measures, as these strata were only encountered in the two defined trial pit locations.

6.24 These strata are similar in description to the Glacial Till, and it is possible these could be Till rather than intact weathered mudstone.

### Hydrogeology

6.25 Groundwater was encountered during drilling in BH04 and in several machine excavated trial pits. The depths of groundwater strikes varied from 3.0m bgl to 13.5m bgl within the Glaciofluvial Deposits in BH04 and 1.7m bgl (TP109) and 3.6m bgl (TP113) also within the Glaciofluvial Deposits . During monitoring, all borehole installations were found contain groundwater with levels varying in depth from 2.04m to 3.13m bgl in shallow installations and 9.34m to 11.34m bgl in deeper installations.

6.26 Groundwater levels varied from 144.15m AOD (BH01) to 147.09m AOD (BH03) in the shallow installations and from 137.75m AOD (BH02) to 139.22m AOD (BH04) in the deeper installations.

### Hydrology

6.27 There are two surface water features on site. One of which is associated with the adjacent farmland and is believed to have been constructed for use, as a cattle drinking source. No monitoring sampling or testing of the surface water was undertaken as part of the ground investigation.

6.28 No contamination observations were noted during the groundwater sampling visit or subsequent gas and groundwater monitoring period.

# 7. GEOTECHNICAL ASSESSMENT

## Introduction

7.1 The proposed development for Plot P is indicated to be a single commercial building with associated parking, loading bays and external forecourt areas. The building is likely to be a steel portal framed structure.

7.2 The generalised ground conditions across the development plot consist of Topsoil/ Made Ground overlying Glaciofluvial Deposits comprising interbedded clays, silts and sands, becoming stiffer/denser with depth. Glacial Till and possibly weathered Pennine Lower Coal Measures were encountered locally beneath the Glaciofluvial Deposits. Generally, Made Ground was present close to Michael Faraday Avenue, and in other localised zones at the site.

7.3 The shallow ground conditions are not laterally consistent, with a range and variation of Glaciofluvial Deposits, Glacial Till, and weathered Pennine Lower Coal Measures.

## Ground Model

7.4 For the purpose of this foundation appraisal, groundwater is considered to be at 2-3m bgl (reduced levels of about 144.2 – 147.1m AOD). This is based on groundwater strikes encountered and levels recorded within the Glaciofluvial Deposits during the groundwater monitoring. BWB's experience of the local area indicates that groundwater is very seasonal and may be at shallower depths after periods of extended inclement weather.

7.5 Based on the ground conditions discussed in Section 6, a geotechnical ground model, indicating various geotechnical parameters, has been developed. This model provides the basis for geotechnical analysis undertaken within this report. There is principally one main lithological unit at the site, the Glaciofluvial Deposits, which can be sub-divided into two types that have been identified in shallow soils beneath the site: granular layers and cohesive layers. For the purpose of the following foundation appraisal the following conditions have been adopted:

- Made Ground (from 0.20m to 1.40m deep);
- Glaciofluvial Deposits – Sands (base depth between 0.80 and 3.20); underlain by
- Glaciofluvial Deposits – Clays (base not proved).

## Foundation Solutions

### Simple Foundations Strip or Pads

7.6 Anticipated loads have not been provided for this development, however typical loading requirements for a commercial warehouse development of this nature are of the order of 150kPa, indicating that shallow strip or pad foundations are not likely be suitable for this development without ground improvement.

7.7 Within the Glaciofluvial Deposits, bearing capacity calculations based on in situ hand shear vanes, laboratory triaxial testing and an empirical correlation between SPT N values and undrained shear strength as of Stroud 1976, reference in CIRIA143, suggest an allowable bearing capacity that would be less than the anticipated loading requirements.

7.8 Therefore, shallow spread foundations transferring loads onto the (untreated) underlying Glaciofluvial Deposits are unlikely to be suitable for the building, as there would be a risk of excessive and unpredictable total and differential settlements.

7.9 If shallow foundations are adopted, ground improvement is likely to be required and viable, subject to removal of soft spots and unsuitable strata.

### Ground Improvement Techniques

7.10 Ground improvement should be feasible utilising vibro-stone columns (VSC) to support shallow (pad) spread foundations and a ground bearing floor slab. Alternatively, the option of ground improvement techniques comprising the installation of rigid inclusions (RIs), with a load transfer platform is also considered feasible, although likely to be more costly.

7.11 For a VCC solution, any organic soils/Peat encountered beneath the building footprint (as encountered in TP116, TP120 and TP121) should be chased out, removed and replaced with suitable engineered fill. The excavated organic soils/Peat could potentially be reused within non-structural areas of the development such as in landscaping zones. For a RI solution, it may be possible to leave such organic soils in situ, from a geotechnical perspective, although this would have implications on ground gas regime and protection requirements.

7.12 Assuming vibro stone columns or rigid inclusions are adopted, settlement under the slab and foundations is expected to be limited to 25mm under typically expected loads. This will need to be subject to detailed assessment by the foundation and ground improvement designers when loads are confirmed.

7.13 Designs may need to allow for mitigation of differential settlement, between the main structure and external areas; this may need to include for articulation of threshold elements/structures and or dock levellers.

7.14 A specialist ground improvement contractor should be consulted in order to confirm the viability of ground improvement and to advise which technique would be best/most cost effective for this site.

### Ground Floor Slabs

7.15 Loading requirements of the ground floor slab are expected to be lower than beneath pad or strip foundations, approximately 50KPa. Nevertheless, in order to mitigate risks of excessive total/differential settlement, in situ ground improvement as described above, should also be undertaken beneath the ground floor slab.

7.16 As above, all peat and organic soils, as encountered in TP116, TP120 and TP121, should be removed from beneath ground floor slabs and replaced with suitable engineered fill. Such organic soils may be reused on site as topsoil or in landscaping, subject to acceptability testing.

### Piled Foundations

7.17 A piled foundation solution could be adopted for the support of the proposed building. A specialist piling contractor should be consulted to further assess the most economical and suitable piling solution.

### Roads and Pavements

7.18 Laboratory recompacted CBR testing undertaken for samples recovered has indicated variable values for the underlying Glaciofluvial Deposits ranging from 0.1% (sandy clay in TP121 at 1.20m) to 17% (sandy clay in TP104 at 0.5m), with values generally less than 3.0% and often less than 1.0%.

7.19 Plasticity Index testing undertaken on near-surface cohesive soil samples (upper 1-2m below ground level) are in the range of 7% to 26% (mean value 16%). CBR values of about 3% are indicated based on these PI values with reference to Table C1 of TRRL 1132 (Structural Design of Bituminous Roads) according to guidance in National Highways document CD225, Design for New Pavement Foundations).

7.20 Minimum design CBR values for pavement foundations is typically 3% and if pavements are required on the natural soils at the site, modification of these formation soils (e.g. by lime or cement) will be required to achieve the minimum design CBR value. An improved CBR of minimum 5% would likely be possible in modified formation soils.

7.21 The design of chemical modification to provide a suitable thickness of subgrade should take account of potentially high organic matter content and high water contents in the underlying soils. Ground improvement techniques and thickness of improved in situ ground should be designed to limit settlement under pavements to 25mm after the accommodation of the sub-base, base and surface courses. This should be subject to detailed design.

7.22 It is recommended that in situ CBR tests at formation level should be carried out to confirm the strength of sub grade and finalise the required pavement construction thickness.

### Drainage

7.23 No soakaway drainage tests have been undertaken at the site. Additional soil infiltration tests would be required to inform whether traditional soakaways would be suitable, if required. However, based on the ground conditions encountered together with the variable and shallow groundwater issues in the area, soakaway drainage is unlikely to be a viable solution.

### Ease of Excavation

7.24 Conventional plant equipment is expected to be suitable for excavations at the site.

### Stability of Excavation

7.25 Excavations displayed generally good stability across the site, with all trial pits achieving target depth. However, granular Glaciofluvial Deposits are present. If groundwater levels rise at Plot P following periods of wet weather, running sands could present an issue within excavations and the use of temporary shoring may need to be considered. The potential for stability issues will be reduced if works are undertaken in the drier summer months.

7.26 Excavations may become unstable if left open for any significant periods. Where personnel entry is required for inspection; excavations should be sufficiently enlarged, and an assessment of safe temporary angles should be made. Alternatively, temporary shoring should be provided.

### Legislation on Personnel Entry to Excavations

7.27 It is recommended that no excavations should be entered without appropriate support and a full risk assessment should be completed prior to entry. Mitigation measures to protect from accumulating ground gases should be implemented.

### Groundwater

7.28 Groundwater is likely to vary greatly seasonally at the site. The ground investigation, undertaken in August (after a particularly dry spring/summer), will have likely captured a lowered groundwater situation at the site, with various areas of the site displaying evidence of historical waterlogging (e.g. reeds, peat build up).

7.29 If groundwater levels rise following extended periods of wet weather, groundwater control may be required during construction ground works, and standard pumping equipment is likely to be suitable. The local water authority should be consulted to assess whether a temporary drainage consent is required, for discharging to the local drainage network.

### Chemical Attack on Buried Concrete

7.30 At the site, water soluble sulphate concentrations in soils ranged from 0.0052 g/l to 0.29 g/l with soil pH values ranging from 7.3 to 8.4. Total sulphur concentrations ranged from 0.01% to 0.149%.

7.31 In accordance with the recommendations of BRE Special Digest 1, 'Concrete in Aggressive Ground' 2005, the conditions of soils at the site would therefore be classed as Design Sulphate Class DS-1 and ACEC Class AC-1 for soils, when considering the most appropriate type of concrete to be used at the site in order to resist chemical attack from sulphate.

## Earthworks

7.32 Small scale earthworks will be required to create a suitable, level development platform across the plot. Based on the results obtained, near-surface soil materials are likely to conform to Highway Works Class 1A/1B or, more commonly, 2A/2B/2C general fill.

7.33 The results of the compaction testing indicate Optimum Moisture Contents generally in the range of 14 – 16% (2.5kg rammer) and 13 – 16% (4.5 kg/rammer) with one exception of 29% (2.5kg rammer) that appears to be an outlier. This correlates with Maximum Dry Density values of 1.78 – 1.82 Mg/m3 (2.5 kg rammer) and 1.59 – 1.88 Mg/m3 (4.5 kg rammer) again with the exceptional outlier of 1.28 Mg/m3. Natural moisture content value were found to range from 4.6% to 24%, but with most results greater than 18%.

7.34 From these results the near-surface soils likely to be re-used in earthworks are significantly wet of their Optimum Moisture Contents, and hence would require dewatering (probably via chemical modification) to achieve adequate compaction as engineered fill.

7.35 The suitability of earthworks materials has been assessed on the basis of the testing carried out as part of this investigation. The materials encountered on site may vary from those analysed; furthermore, inclement weather, winter working or seasonal variations in groundwater may result in materials being unsuitable for incorporation within the works without modification by lime, cement or other methods. In particular, cohesive soils are very susceptible to 'wet weather working' and BWB strongly recommends that consideration should be given to lime and/or cement stabilisation of these materials if the earthworks are undertaken during inclement weather or the winter period.

7.36 Stockpiled materials often deteriorate due to water infiltration, and they may become unsuitable for incorporation in the works; further testing and re-assessment should be made prior to the finalisation and implementation of the earthworks design.

# 8. GROUND GAS ASSESSMENT

## Introduction

8.1 Ground gas assessment has been undertaken to assess the risks associated with ground gases and volatile vapours to the proposed new building and occupants. The results obtained have been assessed in line with relevant guidance (notably CIRIA C665).

8.2 Based on the desk study and the ground investigation undertaken, the following potential sources of hazardous ground gas have been identified:

- Made Ground across the site; and
- Underlying locally organic soils.

8.3 Based on the potential sources identified, CIRIA C665 guidance indicates that for a site with (low/moderate) gas generation potential and a (low) sensitivity development (the proposed commercial land use), a typical monitoring programme may comprise four visits over a period of 2-3 months.

8.4 BWB have undertaken three visits (to date) over a period of two months and therefore this assessment is considered to be preliminary. An additional monitoring event is yet to be undertaken.

## Methodology

8.5 The assessment of potential ground gas generation is based on the observation of trends and changes in gas evolution by the direct measurement of ground gases from gas wells. The works included measurement of methane, carbon dioxide, oxygen, hydrogen sulphide, carbon monoxide, gas flows and barometric pressure. A PID survey was undertaken to measure volatile organic compounds within the borehole response zones.

## Results

8.6 The minimum and maximum steady state concentrations recorded for borehole flow, oxygen, carbon dioxide and methane are summarised below in **Table 8.1**. The full ground gas monitoring results are presented in **Appendix 4**.

**Table 8:1 : Summary of Recorded Ground Gas Results**

| Borehole ID | Targeted Geology | Steady Flow (l/hr) | | Carbon Dioxide (%v/v) | | Methane (%v/v) | |
|---|---|---|---|---|---|---|---|
| | | min. | max. | min. | max. | min. | max. |
| BH01 | GF | <0.1 | <0.1 | <0.1 | 0.1 | <0.1 | <0.1 |
| BH02 | GF | <0.1 | <0.1 | <0.1 | 0.7 | <0.1 | <0.1 |
| BH03 | GF | <0.1 | <0.1 | <0.1 | 3.4 | <0.1 | 1.8 |
| BH04 | GF | <0.1 | <0.1 | 0.1 | 0.1 | <0.1 | <0.1 |
| BH05 | GF | <0.1 | <0.1 | 0.7 | 1.0 | <0.1 | <0.1 |

8.7 The atmospheric pressures were recorded as follows:

- Round 1 – 1017mB during the site visit rising from 1009mB over the preceding 12 hours;
- Round 2 – 1015mB during the site visit rising from 1005mB over the preceding 12 hours;
- Round 3 - 991mB during the site visit remaining static over the preceding 12 hours;
- Round 4 – 1015mB during the site visit falling slightly from 1017mB over the preceding 12 hours.

8.8 On this basis, the monitoring events are considered unlikely to have captured the worst-case gassing scenario at the site as generally, ground gas emissions tend to increase when atmospheric pressure falls rapidly. Low pressure was however recorded during the third monitoring round.

8.9 Hydrogen sulphide and carbon monoxide concentrations were generally not recorded above the limit of detection of the equipment during the monitoring visits with the exception of carbon monoxide in BH01 (Round 3) at 2.2ppm.

8.10 PID concentrations were not recorded above <0.1ppm (the limit of detection of the equipment).

**Risk Assessment**

8.11 CIRIA Report 665 "Assessing Risks Posed by Hazardous Ground Gases to Buildings" presents current best practice on the assessment of ground gases for commercial and residential buildings (with the exception of low-rise traditional housing). The report presents a risk-based approach based on gas screening levels which depend on both the concentration and emission rate of gas from the ground. Gas screening levels are calculated as follows:

$$Gas\ screening\ value\ (l/hr) = \frac{gas\ concentration\ (\%)\ X\ measured\ borehole\ flow\ rate\ (l/h)}{100}$$

8.12 Gas screening values should be calculated on a borehole basis in the first instance. Consideration of worst case i.e., highest flow and highest concentrations should only be considered if the CSM warrants it.

8.13 Maximum gas screening levels of 0.0034 were recorded giving a classification of 1. Gas protection measures would not be required. Methane concentrations above 1% have been recorded in BH103 (1.8%) on one occasion and so consideration should be given to raising the gas classification to 2 **(**BS8485:2015 (+A1 2019)).

8.14 Total Organic Carbon (TOC) content of the Made Ground was recorded between 1.5% and 5.1% (TP113 0.3m) and at 9% in organic rich Glaciofluvial Deposits (TP116 0.9m).

8.15 Sulphur and organic odours were recorded in TP114 (1.7-3.0m bgl), TP115 (1.2-3.4m bgl), TP116 (0.8-1.0m bgl) and TP120 (0.0-0.9m bgl). Peat was recorded in TP120 (0.9-1.0mbgl) and TP121 (0.0-1.0m bgl) with organic rich material extending to 2.3m bgl in TP121.

8.16 CL:AIRE RB17 (November 2012) and Table D.1 included within BS8485:2015 (+A1 2019) recommends a Characteristic Situation 2, for TOC (%) between ≤1.0 and ≤1.5% and Characteristic Situation 3, for TOC (%) between ≤1.5 and ≤4.0% recorded in Made Ground with thicknesses of less than 3.0m that has been in place for less than 20 years.

8.17 CL:AIRE RB17 (November 2012) Appendix A , Table A.1 recommends CS3 gas protection for natural soils with high organic content.

### Recommendations

8.18 Gas protection measures should be installed in accordance with BS848: 2015. Based on a Type D development and CS3 classification a gas protection score of 2.5 will need to be achieved. Type C uses within the larger building (offices etc) would require a gas protection score of 3.0 to be achieved. **Table 8.2** provides suggested combinations of floor slab, ventilation and membrane that can achieve a suitable level of protection.

**Table 8:2: Gas Protection Matrix**

| Building Type | Points score Required | Structural Slab | Ventilation | Membrane |
|---|---|---|---|---|
| C | 3.0 | 1.0-1.5 | 1.5-2.5 | 2 |
| D | 2.5 | 1.0-1.5 | 1.5-2.5 | 2 |

8.19 Additional ground investigation should be undertaken in the east of the site to target shallow organic material to delineate their extent relative to the proposed building footprint and to assess their gas production potential. The results of this may lower the gas classification for the site.

8.20 Should organic soils be removed from beneath the proposed building, then the gas regime should also be re-assessed.

# 9. CONTAMINANT DISTRIBUTION

## Soils

9.1 Contamination data have been compared to generic site assessment criteria (GSAC) for a commercial end use. The soil chemical laboratory results are presented as **Appendix 5** and details of the derivation of the GSACs are presented in **Appendix 8**. The criteria include reference to the LQM/CIEH S4ULs for Human Health Risk Assessment Copyright Land Quality Management Limited reproduced with permission; publication number S4UL3271.

9.2 No soil samples tested exceeded the respective LQM/CIEH S4UL, for a commercial end use, screening criteria for risks to human health. Asbestos was not recorded in the five Made Ground samples tested.

9.3 No visual or olfactory observations of contamination were noted during the ground investigation.

9.4 Organic and sulphur odours recorded are attributed to decaying organic materials associated with waterlogged and former pond areas of the site, predominantly in the eastern section.

## Surface Water

9.5 No surface water samples were recovered or tested as part of the investigation.

# 10. HUMAN HEALTH RISK ASSESSMENT

10.1 Soil contaminant data have been compared against Generic Site Assessment Criteria (GSAC) developed by BWB using the CLEA model 1.06 and the updated CLEA framework (2009) for assessing risk from soil contamination to human health. The results of the soil chemical laboratory analysis are provided within **Appendix 5**. Details of the derivation of the GSACs and a table summarising the results presented are presented in **Appendix 8**.

10.2 The GSACs have been developed with the following assumptions which have been changed from the CLEA default parameter set. Soil type is a sandy loam with an organic matter content of 1% for the natural strata and 2.5% for the Made Ground. This is considered to be more representative of natural strata and shallow Made Ground found on site than the CLEA default of 6% organic matter (excluding areas of Peat and visible high organic matter). The building type for a commercial development is assumed to be a post 1970s office which is representative of new commercial buildings.

## Pathways

10.3 Contamination data have been compared to generic site assessment criteria (GSAC) for a commercial end use (i.e. using all pathways for that end use) based on an organic matter content of 1% and 2.5%. Details of the derivation of the GSACs are presented in **Appendix 8**.

10.4 The site is to be developed for commercial end use and therefore the key receptor is considered to be an adult female worker and GSACs for a commercial industrial end use have been adopted.

10.5 Exposure pathways considered in this assessment are presented in **Table 10.1**.

**Table 10:1 : Commercial Exposure Pathways**

| Source | Shallow Soils | | Deep Soils |
|---|---|---|---|
| Pathway | Commercial / Industrial with managed landscaped areas | Commercial / Industrial with Hard standing areas | Commercial / Industrial |
| Ingestion of Soil | ✓ | × | × |
| Ingestion of site derived household dust | ✓ | × | × |
| Ingestion of contaminated vegetables | × | × | × |
| Ingestion of soil attached to vegetables | × | × | × |
| Dermal contact with Soil | ✓ | × | × |
| Dermal contact with site derived household dust | ✓ | × | × |
| Inhalation of fugitive soil dust | ✓ | × | × |
| Inhalation of fugitive site derived household dust | ✓ | × | × |

| Source | Shallow Soils | | Deep Soils |
|---|---|---|---|
| Inhalation of vapours outside | ✓ | ✓ | ✓ |
| Inhalation of vapours inside | ✓ | ✓ | ✓ |

10.6 CLAIRE report "Guidance on Comparing Soil Contamination Data with a Critical Concentration" sets out a structured approach for the statistical assessment of contaminant data with respect to risks to human health. A flow chart showing the approach is presented as **Appendix 8.** The CLEA assessment is made in four stages:

- Stage 1 – The site is split into what are known as Averaging Areas, these are those sections of the site as determined by the assessor as being of a similar nature, this can be defined by strata, contaminant impact, location, development zones, etc.
- Stage 2 – The dataset is reviewed using graphical, visual and statistical tools whereby all the samples (per contaminant) are combined to establish whether or not the highest values recorded are representative or not of the Averaging Area as a whole. This is known as the Outlier Test. A sample that is considered as representative of the whole is referred to as an '*inlier*' and one which is considered unrepresentative as an '*outlier*'.
- Stage 3 – The samples are assessed using graphical, visual and statistical tools to determine whether the dataset is normally distributed. A statistical calculation is then used to determine the upper confidence level (UCL) of the mean to determine whether or not the Averaging Area, as a whole meets the critical concentration. The UCL value is considered against the appropriate generic or site-specific screening value as to whether or not a risk exists.
- Stage 4 – The outliers in Stage 2 are compared directly against the critical concentration. Thus, indicating whether those removed samples represent an Anomalous Zone (or hotspot).

### Sources

10.7 No significant sources of soil contamination have been identified on site.

# 11. CONTROLLED WATERS RISK ASSESSMENT

11.1 Soil leachability has been undertaken for a number of metals on samples from the Made Ground. The soil leachability results are presented within **Appendix 5**.

- The controlled waters assessment considers the potential impact of on-site contamination to pertinent controlled waters receptors identified at the site including:
- Secondary A Aquifer beneath the site within the glaciofluvial superficial deposits;
- Secondary A Aquifer in the surrounding area within the Pennine Lower Coal Measures bedrock;
- Surface water (Rochdale Canal, Stanney Brook)

## Pathways

11.2 Controlled water risk assessment has been undertaken through assessment of leachable concentrations of contaminants in soil referring to exposure pathways considered and referencing **Table 16**.

**Table 11:1 : Controlled Water Exposure Pathways**

| Controlled Waters Exposure Pathway | Receptor |
|---|---|
| Leaching of soil contamination into recharge infiltration | ✓ |
| Vertical migration of impacted pore water through unsaturated zone into underlying aquifer | ✓ |
| Horizontal migration of groundwater through aquifer to offsite receptors | ✓ |

## Soil Leachability

11.3 The soil leachate concentrations have been compared to the UK Drinking Water Standards (UK DWS) to assess the risk to the underlying aquifers. None of the samples screened exceeded the UK DWS.

11.4 In addition, the leachate results were also screened against the Environmental Quality Standards (EQS) for freshwater to assess the risk to surface waters. A summary of the results is presented in **Table 11:2** below.

**Table 11:2: Summary of Leachate Exceedances – EQS**

| Leachable Contaminant | Exceedance Concentration Range (µg/l) | Location (& Depth (m bgl)) | EQS (µg/l) |
|---|---|---|---|
| Copper | 6.3-31 | TP104 0.3m, TP113 0.3m, TP101 0.3m | 1 |
| Lead | 3.0-5.2 | TP104 0.3m, TP113 0.3m, TP101 0.3m | 1.2 |
| Nickel | 4.6-7.3 | TP113 0.3m, TP101 0.3m | 4 |
| Zinc | 11-17 | TP113 0.3m, TP101 0.3m | 10.9 |

11.5 BWB consider these exceedances to not be significant given the distance to sensitive surface water receptors.

11.6 Leachate summary worksheets are presented as **Appendix 9**.

### Groundwater

11.7 The groundwater results have been compared to the EQS freshwater criteria to assess the risk to surface water features and UK DWS for the underlying aquifers. The exceedances following a direct comparison to the screening criteria are detailed in Error! Reference source not found. **Table 11.3** and **Table 11.4** and Error! Reference source not found.Groundwater summary worksheets are presented as **Appendix 10.**

**Table 11:3: Summary of Water Sample Exceedances - EQS**

| Contaminant | Exceedance Concentration Range (µg/l) | Location | EQS (µg/l) |
|---|---|---|---|
| Cadmium | 0.15-0.23 | BH02 & BH05 | 0.08 |
| Copper | 1.7 - 12 | All | 1 |
| Nickel | 4.4 – 8.6 | All | 4 |
| Zinc | 42 | BH02 | 10.9 |
| Ammonia | 25 - 72 | All | 15 |

**Table 11:4: Summary of Water Sample Exceedances - DWS**

| Contaminant | Exceedance Concentration Range (µg/l) | Location | DWS (µg/l) |
|---|---|---|---|
| Ammonia | 25 - 72 | All | 15 |

### Risk Assessment

11.8 Total TPH and PAH were not recorded above the laboratories lowest level of detection, in all samples collected.

11.9 Low levels of metals and inorganics have been recorded in the groundwater and leachate samples, with a symmetry between the two sets of results. BWB consider it possible that the shallow soils on site could be impacting upon the groundwater quality. However, the levels of exceedances are not considered significant to the recorded levels of contaminants in samples.

11.10 Due to the proposed development on the site comprising large areas with hardstanding and buildings which will limit further infiltration and leaching, BWB do not consider that nearby controlled waters (Stanley Brook 150m to the south) will be exposed to an unacceptable risk as a result of the proposed development.

# 12. ENVIRONMENTAL RISK ASSESSMENT

## Introduction

12.1 An updated assessment of pollutant linkages has been undertaken following completion of a ground investigation at the Site. The preliminary risk assessment presented in **Section 4** has been updated in light of the findings of the ground investigation and the revised conceptual site model developed, as presented in **Table 12:1**.

## Sources

- Total Organic Carbon (TOC) content of the Made Ground was recorded between 1.5% and 5.1% (TP113 0.3m) and at 9% in organic rich Glaciofluvial Deposits (TP116 0.9m present;
- Marginally elevated leachable heavy metals have been recorded in the shallow Made Ground above EQS assessment criteria.

## Pathways

- Inhalation of fibres and particle dust.
- Dermal contact.
- Vertical migration of contaminants in the soil leachate.
- Lateral migration of contaminants within the groundwater; and
- Accumulation leading to explosion and asphyxiation within the new developments.

## Receptors

- Future site users.
- Construction and groundworkers.
- Underlying Secondary Undifferentiated Aquifer & Secondary A Aquifers.
- Stanley Brook 150m to the south and west of the site

**Table 12:1 : Preliminary Conceptual Site Model**

| Source | Pathway | Receptor | Con | Prob | Risk | Potential Mitigation/Investigation Requirements |
|---|---|---|---|---|---|---|
| **MADE GROUND**<br>Former/current **SURFACE WATER/POND** features on site (organic materials)<br>Contamination associated with **AGRICULTURAL** activities<br>Gas accumulation in **DEEP MINING WORKS** | Migration and accumulation of ground gases in enclosed spaces leading to asphyxiation (carbon dioxide) or explosion (methane). | Future site users (commercial)<br>Construction and groundworkers | Sv | Lw | M | Made Ground is expected across the site, with organic material related to surface water pond features present in the north west and east of the site.<br>High TOC indicates a potential risk from ground gases.<br>Given the elevated TOC of organic soils on site it is considered appropriate to adopt a CS3 classification for the development area.<br>Migration of hazardous ground is not considered to be occurring given the low concentrations being recorded on site. Installing protection measures as described above is considered sufficient to protection end site users from any previously unidentified hazardous gas migration. |
| | Leaching and permeation through soil profile. | Groundwater: Underlying Secondary Superficial & Bedrock Aquifers | Md | Ul | L | The leachate and groundwater concentrations are considered low. Given that the site is principally underlain by cohesive deposits, it is considered unlikely that the low leachate and groundwater concentrations would migrate towards the aquifer or nearby surface water bodies at elevated concentrations. The development is likely to be predominantly covered by buildings and hard standing surface cover, therefore limiting any potential for mobilisation of contaminants within the Made Ground. Therefore, BWB considers that leachable contaminants and contaminants within groundwater do not represent a plausible risk to controlled waters.<br>The recommendations of DEFRA and EA guidance document '*Pollution prevention for businesses*' should be considered during construction. |
| | Vertical and lateral migration of contaminants in groundwater. | | Md | Ul | L | |
| | Surface run-off. | Stanney Brook<br>Rochdale Canal | Md | Ul | L | |
| | Vertical and lateral migration of contaminants in groundwater. | | Md | Ul | L | |

VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low

KEY: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor, Hi = High, Li = Likely, Lw = Low Likelihood, Ul = Unlikely

**Pollutant Linkage Assessment Summary**

When considered in the context of the conceptual site model and the historical activities that have taken place, the proposed development is considered to pose a **MODERATE** risk to human health. It is considered that the main driver for the risk rating for human health is Migration and accumulation of ground gases related to potential Made Ground and organic rich soils on the site.

| Source | Pathway | Receptor | Con | Prob | Risk | Potential Mitigation/Investigation Requirements |
|---|---|---|---|---|---|---|
| The risk posed to controlled waters is predominantly considered to be **LOW** due to the limited contaminative sources identified on site. | | | | | | |

# 13. ENVIRONMENT LIABILITY ASSESSMENT AND DEVELOPMENT IMPLICATIONS

### Statutory Liability

13.1 Based on the information available regarding the site, the potential for Statutory Authority action based on "*pollution of controlled water*" or "*significant harm*" as defined by Part IIA of the Environmental Protection Act 1990 is considered to be **LOW** based on to lack of significant contaminant sources on site.

### Third Party Liability

13.2 Based on the information contained in this report, it is the opinion of BWB that the potential for legal action by surrounding landowners, based on the potential for contamination to migrate off-site, is considered to be **LOW** when considering the nature of the surrounding land use.

### Public Relations

13.3 The likelihood of public relations being tarnished due to contamination issues at the site is considered to be **LOW.**

### Development Implications

13.4 Further consideration into drainage design will be required as soakaway testing was not completed as part of this assessment.

### Development Implications

13.5 It is recommended that the requirement for earthworks and potential for re-use of or disposal of waste is established at an early stage in the project.

# 14. WASTE MANAGEMENT

## Waste Classification

14.1 Soil samples have been characterised against hazardous waste criteria using Hazwasteonline. The results of the waste classification are presented in **Appendix 11**. The assessment indicates that the soils analysed are likely to be classified as non-hazardous. The waste classification assessment only applies to those soils that have been tested. If other soils are to be disposed of off-site then further analysis may be required.

14.2 Asbestos has not been found at the site. The presence of visible asbestos containing materials in waste or at concentrations exceeding 0.1% by weight will classify the waste as mixed and require disposal as hazardous waste irrespective of the chemical properties of the waste.

14.3 Should any soils require disposal off site an assessment of waste classification of the soils for disposal should be made by a competent person. Further chemical analysis may be required to fully characterise waste soils for disposal to landfill or re-use off site. WAC analysis may be required for disposal of soils as inert or hazardous.

## Waste Acceptance Criteria

14.4 WAC testing was not completed. Should disposal of soils off-site be required, further classification and WAC testing of waste soils should be undertaken.

# 15. CONCLUSIONS AND RECOMMENDATIONS

## Conclusions

15.1 The proposed development for Plot P is indicated to be a single commercial building with associated parking, loading bays and external forecourt areas. This is likely to be a steel portal framed structure.

15.2 The generalised ground conditions across the development plot consist of Topsoil/ Made Ground overlying Glaciofluvial Deposits comprising interbedded clays, silts and sands, becoming stiffer/denser with depth. Glacial Till and possibly weathered Pennine Lower Coal Measures were encountered locally beneath the Glaciofluvial Deposits. Generally, Made Ground was present close to Michael Faraday Avenue, and in other localised zones at the site. Differentiation between the Glaciofluvial Deposits and Glacial Till was not easy from the ground conditions encountered, as presented on the exploratory hole records.

## Environmental

15.3 Total Organic Carbon (TOC) content of the Made Ground was recorded between 1.5% and 5.1% (TP113 0.3m) and at 9% in organic rich Glaciofluvial Deposits (TP116 0.9m). Sulphur and organic odours were recorded in TP114 (1.7-3.0m bgl), TP115 (1.2-3.4m bgl), TP116 (0.8-1.0m bgl) and TP120 (0.0-0.9m bgl). Peat was recorded in TP120 (0.9-1.0mbgl) and TP121 (0.0-1.0m bgl).

15.4 CS3 gas protection are recommended for natural soils with high organic content (CL:AIRE RB17 (November 2012) Appendix A , Table A.1).

15.5 No soil samples tested exceeded the respective LQM/CIEH S4UL, for a commercial end use, screening criteria for risks to human health. Asbestos was not recorded in the five Made Ground samples tested.

15.6 The soil leachate concentrations have been compared to the UK Drinking Water Standards (UK DWS) to assess the risk to the underlying aquifers. None of the samples screened exceeded the UK DWS. Leachate results were also screened against the Environmental Quality Standards (EQS) for freshwater to assess the risk to surface waters. Minor exceedances for copper, lead, nickel and zinc were recorded. BWB consider these exceedances to not be significant given the distance to sensitive surface water receptors.

15.7 Low levels of metals and inorganics have been recorded in the groundwater above UK DWS and EQS screening criteria. BWB consider it possible that the shallow soils on site could be impacting upon the groundwater quality. However, the levels of exceedances are not considered significant to the recorded levels of contaminants in samples.

**15.8** Due to the proposed development on the site comprising large areas with hardstanding and buildings which will limit further infiltration and leaching, BWB do not consider that controlled waters will be exposed to an unacceptable risk as a result of the proposed development.

### Geotechnical

15.9 Shallow spread foundations transferring loads onto the (untreated) underlying Glaciofluvial Deposits are unlikely to be suitable for the building, as there would be a risk of excessive and unpredictable total and differential settlements.

15.10 Ground improvement will be required, utilising vibro-stone columns (VSC) to support shallow (pad) spread foundations and a ground bearing floor slab. Alternatively, ground improvement comprising installation of rigid inclusions (RIs), with a load transfer platform is considered feasible.

15.11 Any organic soils/Peat beneath the building footprint will need to be delineated, chased out, removed and replaced with suitable engineered fill. The excavated organic soils/Peat could potentially be reused within non-structural areas of the development.

15.12 Grading and Atterberg Limit tests for the near-surface Glaciofluvial Deposits indicated that excavated site-won materials would generally classify as either Class 1A/1B and Class 2A/2B or 2C in accordance with 'Table 6/2 of the SHW, Series 600'. Compaction testing indicates soils are generally wet of optimum at natural moisture contents and would require dewatering (via chemical modification) for adequate compaction as engineered fill.

15.13 The design sulphate and ACEC class for below ground concrete at the site is DS-1 and AC-1.

15.14 Laboratory testing indicates a range of CBR values for the design of new pavements, with most results giving values of less than 3.0%.and often less than 1%. Minimum design CBR values for pavement foundations is typically 3% and for pavements on the natural soils at the site, modification of the formation soils (e.g. by lime or cement) will be required to achieve the required design CBR value.

15.15 Based on the ground conditions encountered together with the variable and shallow groundwater issues in the area, soakaway drainage is unlikely to be a viable solution.

15.16 Groundwater is likely to vary greatly seasonally at the site. The ground investigation, undertaken in August (after a particularly dry spring/summer), will have likely captured a lowered groundwater situation at the site, with some areas of the site displaying evidence of historical waterlogging (reeds, peat build up).

15.17 If groundwater levels rise following extended periods of wet weather, groundwater pumping may be required during construction ground works.

### Recommendations

### Environmental

15.18 Additional ground investigation should be undertaken in the eastern part of the site to target and delineate shallow organic soils to assess their gas production potential. This may lower the gas classification for the site.

15.19 A Remediation Strategy should be completed for the site prior to development to provide remediation and mitigation requirements, identify those soils on site likely to require disposal, set remediation targets if required and provide verification requirements of any gas protection measures required.

15.20 Should it be feasible to excavate and remove the organic soils from the eastern of the site, then the gas regime should be re-assessed. A Design Statement should then be produced.

### Geotechnical

15.21 As above, additional ground investigation should be undertaken in the eastern part of the site to delineate the shallow organic soils in order to assess the feasibility for removal from the proposed building footprint.

15.22 To assist with the design of ground improvement by VSCs or RIs, additional investigation via cone penetration testing is recommended, focussing on the proposed building footprint.

15.23 Access to the farmer's field in the far eastern section of site was not possible at the time of the investigation due to the presence of livestock. Exploratory holes were relocated to increase coverage to the immediate west of standing water bodies. Prior to development, ground conditions within this area of the site should be confirmed by further investigation to ensure consistency of ground conditions characterised in the remainder of the site, as described in this report.

# 16. REFERENCES

1. British Standards Institution, (BSI), BS 8485:2015+A1:2019, Code of Practice for the characterization and remediation from ground gas in affected developments

2. British Standards Institution, (BSI), BS 8576:2013, Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)

3. British Standards Institution, (BSI), BS 10175:2011+A2:2017, Investigation of Contaminated Sites – Code of Practice

4. British Standards Institution, (BSI), BS5930:2015+A1:2020 Code of practice for ground investigations

5. British Standards Institution, (BSI), BS EN 1997-1:2004+A1:2013, Incorporating corrigendum February 2009, Eurocode 7 – Geotechnical Design – Part 1: General rules.

6. British Standards Institution, (BSI), BS EN 1997-2:2007 Incorporating corrigendum June 2010, Eurocode 7 – Geotechnical Design – Part 2: Ground Investigation and testing.

7. Building Research Establishment Special Digest 1 *Third Edition*. Concrete in Aggressive Ground (2005)

8. Building Research Establishment (BRE) BR211, Radon; Guidance on Protective Measures for New Buildings (2015)

9. Construction Industry Research and Information Association (CIRIA), Report 132, A Guide to Safe working on Contaminated Sites (1996).

10. Construction Industry Research and Information Association (CIRIA). 2001, C522 Contaminated land risk assessment, A guide to good practice.

11. Construction Industry Research and Information Association (CIRIA). 2007, Report C665, Assessing Risk Posed by on Hazardous Ground Gases to Buildings

12. Department for Communities and Local Government (DCLG), 2012, National Planning Policy Framework.

13. Department for Environment Food and Rural Affairs (DEFRA), 2012, Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance.

14. Environment Agency report Land Contamination Risk Management, 2020.

15. Environment Agency 2008, Updated technical background to the CLEA model Science Report – SC050021/SR3

16. Environment Agency 2008, Human health toxicological assessment of contaminants in soil Science Report – SC050021/SR2

17. Environment Agency 2009, CLEA Software (Version 1.05) Handbook Better Regulation Science Programme Science report: SC050021/SR4

18. Environment Agency 2008, A review of body weight and height data used within the Contaminated Land Exposure Assessment model (CLEA) Project SC050021/ Technical Review 1

19. Environment Agency, 2006, Remedial Targets Methodology, Hydrogeological Risk Assessment for Land Contamination

20. Health and Safety Executive (HSE) 'Protection of workers and the general public during the Development of Contaminated Land (1991).

# *DRAWINGS*

**Drawing 1: Site Layout**




## NOTES

1. DO NOT SCALE THIS DRAWING. ALL DIMENSIONS MUCT BE CHECKED/ VERIFIED ON SITE. IF IN DOUBT ASK.

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALISTS DRAWINGS AND SPECIFICATIONS.

3.ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE. ALL LEVELS IN METERES UNLESS NOTED OTHERWISE.

4. ANY DISCREPANCIES NOTED ON SITE ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY.

## LEGEND

- Borehole
- Trial Pit

**Building, Infrastructure and Environmental Consultancy**

5th Floor, Waterfront House, Station Street,
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**T** 0115 924 1100 **F** 0115 950 3966 **W** bwbconsulting.com

Client:

Wilson Bowden Developments Ltd

Project Title:

Plot P Kingsway Business Park, Rochdale

Drawing Title:

Proposed Exploratory Hole Location Plan

| Scale: | Date: | Drawn: | Authorised: |
|---|---|---|---|
| Not to Scale | Jul-22 | M.Harper | |

Drawing Status: Draft

| Drawing No: | Revision: |
|---|---|
| 210939/PEHLP/EN/001 | - |

# *APPENDICES*

# Appendix 1: Masterplan

Scale Bar

N

Tram Stop

LEYFIELD ROAD

LEYFIELD ROA

Turbary Walk

BRAKEHOUSE CLOSE

Turbary Walk

Tram Stop

176 Spaces

Bin Store

Forklift Access

AMPI Building

Forklift Access

Main Entrance

Pedestrian Boulevard

HGV Turning

67 Spaces

# AMPI - Site Plan

FDG
fairhursts design group

# Appendix 2: Exploratory Hole Logs

# BOREHOLE LOG

Scale 1:50 Sheet 1 of 2

| LOCATION ID | | | | |
|---|---|---|---|---|
| **BH01** | **Project Name:** Plot P, Kingsway Business Park | | **Ground Level (m AOD):** | 147.28 |
| | **Project Number:** 210939 | | **Eastings:** | 391871.42 |
| | **Client:** Wilson Bowden Developments Ltd | | **Northings:** | 412707.88 |
| **Hole Type:** CP | **Rig:** Dando 2000 | **Start & End Date:** 02/08/2022 | **Engineer:** TF | **Checker:** MH |

| Boring | | Strata | | | Samples | | | In-Situ Tests | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Strike | Well | Level (m AOD) & (Thickness (m)) | Description | Legend / Depth (m bgl) | Type (Ublows) | From (m) | To (m) | Type | Depth (m) | Result | Casing Depth & (Water Level) |
| | | [1.00] | Grass over dark brown slightly clayey fine SAND with high rootlet content. (Topsoil) | | B1 | 0.20 | 1.00 | | | | |
| | | 146.28 [0.80] | Loose brown very clayey SAND.() | 1.00 | B2 | 1.20 | 1.65 | SPT | 1.20 | N=8 (1,1/2,2,2,2) | |
| | | | | | D1 | 1.20 | | | | | |
| | | 145.48 [10.00] | Medium dense reddish brown clayey SAND.() | 1.80 | B3 | 2.00 | 2.45 | SPT | 2.00 | N=12 (1,2/3,3,3,3) | |
| | | | | | D2 | 2.00 | | | | | |
| | | | | | B4 | 3.00 | 3.45 | SPT | 3.00 | N=13 (2,2/3,3,3,4) | |
| | | | | | D3 | 3.00 | | | | | |
| | | | | | B5 | 4.00 | 4.45 | SPT | 4.00 | N=20 (4,4/4,5,5,6) | |
| | | | | | D4 | 4.00 | | | | | |
| | | | | | B6 | 5.00 | 5.45 | SPT | 5.00 | N=24 (4,5/6,6,6,6) | |
| | | | | | D5 | 5.00 | | | | | |
| | | | | | B7 | 6.00 | 6.45 | SPT | 6.00 | N=27 (4,5/6,7,7,7) | |
| | | | | | D6 | 6.00 | | | | | |
| | | | | | D7 | 7.00 | 7.00 | | | | |
| | | | | | B8 | 7.50 | 7.95 | SPT | 7.50 | N=14 (2,3/3,3,4,4) | |
| | | | | | D8 | 7.50 | | | | | |
| | | | | | B9 | 9.00 | 9.45 | SPT | 9.00 | N=15 (2,3/3,4,4,4) | |
| | | | | | D9 | 9.00 | | | | | |

| Chiseling | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Time (hh:mm) |
| | | |

| Water Added | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Volume (l) |
| | | |

## Remarks

**Reason for Termination:**

Designated depth reached

**Groundwater Remarks:**

No groundwater encountered.

**Other Remarks:**

Cleared of buried services. Handpit dug to 1.20mbgl. Installed with monitoring standpipe upon completion.

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# BOREHOLE LOG

Scale 1:50 Sheet 2 of 2

| LOCATION ID | | | | |
|---|---|---|---|---|
| **BH01** | **Project Name:** Plot P, Kingsway Business Park | | **Ground Level (m AOD):** | 147.28 |
| | **Project Number:** 210939 | | **Eastings:** | 391871.42 |
| | **Client:** Wilson Bowden Developments Ltd | | **Northings:** | 412707.88 |
| **Hole Type:** CP | **Rig:** Dando 2000 | **Start & End Date:** 02/08/2022 | **Engineer:** TF | **Checker:** MH |

| Boring | | Strata | | | | Samples | | | In-Situ Tests | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strike | Well | Level (m AOD) & [Thickness (m)] | Description | Legend | Depth (m bgl) | Type (Ublows) | From (m) | To (m) | Type | Depth (m) | Result | Casing Depth & (Water Level) |
| | | | Medium dense reddish brown clayey SAND.() | | | D10 | 10.00 | 10.00 | | | | |
| | | | | | | D11 | 10.50 | 10.95 | SPT | 10.50 | N=16 (2,3/4,3,4,5) | |
| | | 135.48 [3.20] | Very stiff grey slightly gravelly sandy CLAY. Gravel is subangular to subrounded, fine to coarse of sandstone.() | | 11.80 | D12 | 11.80 | 11.80 | | | | |
| | | | | | | B10 D13 | 12.00 12.00 | 12.45 | SPT | 12.00 | N=44 (4,8/8,10,12,14) | |
| | | | | | | D14 | 13.00 | 13.45 | | | | |
| | | | | | | U1 (120) | 13.50 | 13.95 | | | | |
| | | | | | | D15 | 14.00 | 14.00 | | | | |
| | | 132.28 [0.16] 132.12 | Very stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded, fine to coarse of sandstone.() | | 15.00 15.16 | D16 | 15.00 | 15.00 | SPT | 15.00 | 50 (25 for 105mm/50 for 50mm) | |
| | | | Hole Terminated at 15.16m bgl. | | | | | | | | | |

| Chiseling | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Time (hh:mm) |
| | | |

| Water Added | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Volume (l) |
| | | |

## Remarks

**Reason for Termination:**

Designated depth reached

**Groundwater Remarks:**

No groundwater encountered.

**Other Remarks:**

Cleared of buried services. Handpit dug to 1.20mbgl. Installed with monitoring standpipe upon completion.

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# BOREHOLE LOG

Scale 1:50 Sheet 1 of 2

| LOCATION ID | | | | | |
|---|---|---|---|---|---|
| **BH02** | **Project Name:** Plot P, Kingsway Business Park | | | **Ground Level (m AOD):** | 149.09 |
| | **Project Number:** 210939 | | | **Eastings:** | 391832.89 |
| | **Client:** Wilson Bowden Developments Ltd | | | **Northings:** | 412660.50 |
| **Hole Type:** CP | **Rig:** Dando 2000 | **Start & End Date:** | 04/08/2022 - 05/08/2022 | **Engineer:** TF | **Checker:** MH |

| Boring | | Strata | | | Samples | | | In-Situ Tests | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Strike | Well | Level (m AOD) & [Thickness (m)] | Description | Legend / Depth (m bgl) | Type (Ublows) | From (m) | To (m) | Type | Depth (m) | Result | Casing Depth & (Water Level) |
| | | [1.00] | Grass over dark brown slightly clayey fine SAND with high rootlet content. (Topsoil) | | B1 | 0.10 | 1.00 | | | | |
| | | 148.09 [0.90] | Firm orange mottled grey sandy CLAY.() | 1.00 | D1 | 1.00 | 1.00 | | | | |
| | | | | | U1 (55) | 1.20 | 1.65 | | | | |
| | | | | | D2 | 1.70 | 1.70 | | | | |
| | | 147.19 [3.50] | Medium dense orange slightly clayey SAND() | 1.90 | B2 | 2.00 | 2.45 | SPT | 2.00 | N=16 (3,3/3,4,4,5) | |
| | | | | | | | | SPT | 3.00 | N=15 (2,2/3,4,4,4) | |
| | | | | | D3 | 3.70 | 3.70 | | | | |
| | | | | | B3 | 4.00 | 4.45 | SPT | 4.00 | N=14 (2,3/3,3,4,4) | |
| | | | | | D4 | 5.00 | 5.45 | SPT | 5.00 | N=14 (2,2/3,3,4,4) | |
| | | 143.69 [9.60] [10.05] | Reddish brown slightly clayey slightly gravelly SAND. Gravel is subangular, fine to medium of sandstone and mudstone() | 5.40 | | | | | | | |
| | | | Medium dense becoming dense reddish brown slightly clayey slightly gravelly SAND. Gravel is subangular, fine to medium of sandstone and mudstone() | | B4 | 6.00 | 6.45 | SPT | 6.00 | N=17 (2,3/4,4,4,5) | |
| | | | | | D5 | 7.00 | 7.00 | | | | |
| | | | | | B5 | 7.50 | 7.95 | SPT | 7.50 | N=35 (5,7/7,9,9,10) | |
| | | | | | | | | SPT | 9.00 | N=35 (4,7/8,8,9,10) | |

| Chiseling | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Time (hh:mm) |
| | | |

| Water Added | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Volume (l) |
| | | |

## Remarks

**Reason for Termination:**

Designated depth reached

**Groundwater Remarks:**

No groundwater encountered.

**Other Remarks:**

Cleared of buried services. Handpit dug to 1.20mbgl. Installed with monitoring standpipe upon completion.

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# BOREHOLE LOG

Scale 1:50 Sheet 2 of 2

| LOCATION ID | | | | | |
|---|---|---|---|---|---|
| **BH02** | **Project Name:** Plot P, Kingsway Business Park | | | **Ground Level (m AOD):** | 149.09 |
| | **Project Number:** 210939 | | | **Eastings:** | 391832.89 |
| | **Client:** Wilson Bowden Developments Ltd | | | **Northings:** | 412660.50 |
| **Hole Type:** CP | **Rig:** Dando 2000 | **Start & End Date:** | 04/08/2022 - 05/08/2022 | **Engineer:** TF | **Checker:** MH |

| Boring | | Strata | | | Samples | | | In-Situ Tests | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Strike | Well | Level (m AOD) & (Thickness (m)) | Description | Legend / Depth (m bgl) | Type (Ublows) | From (m) | To (m) | Type | Depth (m) | Result | Casing Depth & (Water Level) |
| | | | Medium dense becoming dense reddish brown slightly clayey slightly gravelly SAND. Gravel is subangular, fine to medium of sandstone and mudstone() | | D6 | 10.00 | 10.00 | | | | |
| | | | | | B6 | 10.50 | 10.95 | SPT | 10.50 | N=40 (6,8/9,10,10,11) | |
| | | | | | D7 | 11.50 | 11.50 | | | | |
| | | | | | B7 | 12.00 | 12.45 | SPT | 12.00 | N=32 (3,5/7,8,9,8) | |
| | | | | | | | | SPT | 13.50 | N=29 (3,5/6,7,8,8) | |
| | | | | | D8 | 13.80 | 13.80 | | | | |
| | | | | | D9 | 14.50 | 14.50 | | | | |
| | | 134.09 | | 15.00 | | | | SPT | 15.00 | N=20 (2,3/4,4,5,7) | |
| | | 133.64 | Hole Terminated at 15.45m bgl. | 15.45 | | | | | | | |

| Chiseling | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Time (hh:mm) |
| | | |

| Water Added | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Volume (l) |
| | | |

## Remarks

**Reason for Termination:**

Designated depth reached

**Groundwater Remarks:**

No groundwater encountered.

**Other Remarks:**

Cleared of buried services. Handpit dug to 1.20mbgl. Installed with monitoring standpipe upon completion.

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# BOREHOLE LOG

Scale 1:50 Sheet 1 of 2

| LOCATION ID | | | | |
|---|---|---|---|---|
| **BH03** | **Project Name:** Plot P, Kingsway Business Park | | **Ground Level (m AOD):** | 149.47 |
| | **Project Number:** 210939 | | **Eastings:** | 391896.60 |
| | **Client:** Wilson Bowden Developments Ltd | | **Northings:** | 412630.48 |
| **Hole Type:** CP | **Rig:** Dando 2000 | **Start & End Date:** 01/08/2022 - 02/08/2022 | **Engineer:** TF | **Checker:** MH |

| Boring | | Strata | | | | Samples | | | In-Situ Tests | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strike | Well | Level (m AOD) & [Thickness (m)] | Description | Legend | Depth (m bgl) | Type (Ublows) | From (m) | To (m) | Type | Depth (m) | Result | Casing Depth & (Water Level) |
| | | [0.80] | Grass over dark brown slightly clayey fine SAND with high rootlet content. (Topsoil) | | | B1 | 0.40 | 0.80 | | | | |
| | | 148.67 [0.60] | Firm orange mottled brown sandy slightly gravelly CLAY. Gravel is subangular, fine to medium of mudstone.() | | 0.80 | D1 | 1.00 | 1.00 | | | | |
| | | | | | | U1 (60) | 1.20 | 1.65 | | | | |
| | | 148.07 [1.80] | Loose brown clayey SAND() | | 1.40 | D2 | 1.70 | 1.70 | | | | |
| | | | | | | B2 | 2.00 | 2.45 | SPT | 2.00 | N=5 (2,2/1,2,1,1) | |
| | | | | | | B3 | 2.00 | | | | | |
| | | | | | | | | | SPT | 3.00 | N=3 (1,0/1,0,1,1) | |
| | | 146.27 [5.10] | Soft to firm brown slightly sandy slightly gravelly CLAY. Gravel is subangular, fine to medium of mudstone.() | | 3.20 | D3 | 3.50 | 3.50 | | | | |
| | | | | | | U2 (85) | 4.00 | 4.50 | | | | |
| | | | | | | D4 | 4.50 | 4.50 | | | | |
| | | | | | | B4 | 5.00 | 5.45 | SPT | 5.00 | N=11 (1,2/2,2,3,4) | |
| | | | | | | U3 (80) | 6.00 | 6.45 | | | | |
| | | | | | | D5 | 6.50 | 6.50 | | | | |
| | | | | | | D6 | 7.00 | 7.00 | | | | |
| | | | | | | B5 | 7.50 | 7.95 | SPT | 7.50 | N=47 (7,12/12,12,12,11) | |
| | | 141.17 [6.70] [7.15] | Reddish brown clayey SAND.() | | 8.30 | D7 | 8.30 | 8.30 | | | | |
| | | | Medium dense reddish brown clayey SAND.() | | | | | | | | | |
| | | | | | | B6 | 9.00 | 9.45 | SPT | 9.00 | N=26 (4,4/5,6,7,8) | |

| Chiseling | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Time (hh:mm) |
| | | |

| Water Added | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Volume (l) |
| | | |

## Remarks

**Reason for Termination:**
Designated depth reached

**Groundwater Remarks:**
No groundwater encountered.

**Other Remarks:**
Cleared of buried services. Handpit dug to 1.20mbgl. Installed with monitoring standpipe upon completion.

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# BOREHOLE LOG

Scale 1:50 Sheet 2 of 2

| LOCATION ID | | | | | |
|---|---|---|---|---|---|
| **BH03** | **Project Name:** Plot P, Kingsway Business Park | | | **Ground Level (m AOD):** | 149.47 |
| | **Project Number:** 210939 | | | **Eastings:** | 391896.60 |
| | **Client:** Wilson Bowden Developments Ltd | | | **Northings:** | 412630.48 |
| **Hole Type:** CP | **Rig:** Dando 2000 | **Start & End Date:** | 01/08/2022 - 02/08/2022 | **Engineer:** TF | **Checker:** MH |

| Boring | | Strata | | | | Samples | | | In-Situ Tests | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strike | Well | Level (m AOD) & (Thickness (m)) | Description | Legend | Depth (m bgl) | Type (Ublows) | From (m) | To (m) | Type | Depth (m) | Result | Casing Depth & (Water Level) |
| | | | Medium dense reddish brown clayey SAND.() | | | D8 | 10.00 | 10.00 | | | | |
| | | | | | | | | | SPT | 10.50 | N=16 (2,3/4,3,4,5) | |
| | | | | | | D9 | 11.50 | 11.50 | | | | |
| | | | | | | | | | SPT | 12.00 | N=14 (2,2/3,3,4,4) | |
| | | | | | | D10 | 13.00 | 13.00 | | | | |
| | | | | | | | | | SPT | 13.50 | N=17 (2,3/4,5,4,4) | |
| | | | | | | D11 | 14.50 | 14.50 | | | | |
| | | 134.47 | | | 15.00 | B7 | 15.00 | 15.45 | SPT | 15.00 | N=17 (3,3/4,4,4,5) | |
| | | 134.02 | Hole Terminated at 15.45m bgl. | | 15.45 | | | | | | | |

| Chiseling | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Time (hh:mm) |
| | | |

| Water Added | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Volume (l) |
| | | |

## Remarks

**Reason for Termination:**

Designated depth reached

**Groundwater Remarks:**

No groundwater encountered.

**Other Remarks:**

Cleared of buried services. Handpit dug to 1.20mbgl. Installed with monitoring standpipe upon completion.

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# BOREHOLE LOG

Scale 1:50 Sheet 1 of 2

| LOCATION ID | | | | | |
|---|---|---|---|---|---|
| **BH04** | **Project Name:** Plot P, Kingsway Business Park | | | **Ground Level (m AOD):** | 148.77 |
| | **Project Number:** 210939 | | | **Eastings:** | 391963.46 |
| | **Client:** Wilson Bowden Developments Ltd | | | **Northings:** | 412682.65 |
| **Hole Type:** CP | **Rig:** Dando 2000 | **Start & End Date:** | 04/08/2022 | **Engineer:** TF | **Checker:** MH |

| Boring | | Strata | | | Samples | | | In-Situ Tests | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Strike | Well | Level (m AOD) & [Thickness (m)] | Description | Legend / Depth (m bgl) | Type (Ublows) | From (m) | To (m) | Type | Depth (m) | Result | Casing Depth & (Water Level) |
| | | [2.60] | Grass over medium dense to dense dark brown slightly clayey fine SAND with high rootlet content.() | | B1 | 0.70 | 1.20 | | | | |
| | | | | | B2 | 1.20 | 1.65 | SPT | 1.20 | N=30 (4,7/9,7,7,7) | |
| | | | | | B3 | 2.00 | 2.45 | SPT | 2.00 | N=8 (1,2/2,2,2,2) | |
| | | 146.17 [0.20] | Firm brown slightly sandy CLAY.() | 2.60 | D1 | 2.60 | 2.60 | | | | |
| | | 145.97 [0.60] | Firm to stiff brown sandy CLAY.() | 2.80 | D2 | 2.80 | 2.80 | | | | |
| | | | | | B4 | 3.00 | 3.45 | SPT | 3.00 | N=12 (3,3/3,3,3,3) | |
| | | 145.37 [10.10] | Stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular , fine to medium of mudstone.() | 3.40 | U1 (65) | 4.00 | 4.45 | | | | |
| | | | | | D3 | 4.50 | 4.50 | | | | |
| | | | | | B5 | 5.00 | 5.45 | SPT | 5.00 | N=12 (2,2/2,3,3,4) | |
| | | | | | U2 (88) | 6.00 | 6.45 | | | | |
| | | | | | D4 | 6.50 | 6.50 | | | | |
| | | | | | D5 | 7.00 | 7.00 | | | | |
| | | | | | B6 | 7.50 | 7.95 | SPT | 7.50 | N=11 (2,2/2,3,3,3) | |
| | | | | | D6 | 8.80 | 8.80 | | | | |
| | | | | | U3 (75) | 9.00 | 9.45 | | | | |
| | | | | | D7 | 9.50 | 9.50 | | | | |

| Chiseling | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Time (hh:mm) |
| | | |

| Water Added | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Volume (l) |
| | | |

## Remarks

**Reason for Termination:**

Designated depth reached

**Groundwater Remarks:**

Groundwater AT 3.00mbgl, rising to 2.50mbgl and at 13.50mbgl, rising to 10.00mbgl

**Other Remarks:**

Cleared of buried services. Handpit dug to 1.20mbgl. Installed with monitoring standpipe upon completion.

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# BOREHOLE LOG

Scale 1:50 Sheet 2 of 2

| LOCATION ID | | | | | |
|---|---|---|---|---|---|
| **BH04** | **Project Name:** Plot P, Kingsway Business Park | | | **Ground Level (m AOD):** | 148.77 |
| | **Project Number:** 210939 | | | **Eastings:** | 391963.46 |
| | **Client:** Wilson Bowden Developments Ltd | | | **Northings:** | 412682.65 |
| **Hole Type:** CP | **Rig:** Dando 2000 | **Start & End Date:** | 04/08/2022 | **Engineer:** TF | **Checker:** MH |

| Boring | | Strata | | | Samples | | | In-Situ Tests | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Strike | Well | Level (m AOD) & [Thickness (m)] | Description | Legend / Depth (m bgl) | Type (Ublows) | From (m) | To (m) | Type | Depth (m) | Result | Casing Depth & (Water Level) |
| | | | Stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular , fine to medium of mudstone.() | | D8 | 10.00 | 10.50 | | | | |
| | | | | | B7 | 10.50 | 10.95 | SPT | 10.50 | N=13 (2,2/3,3,3,4) | |
| | | | | | D9 | 11.00 | 11.00 | | | | |
| | | | | | U4 (78) | 12.00 | 12.45 | | | | |
| | | | | | D10 | 12.50 | 12.50 | | | | |
| | | | | | D11 | 13.00 | 13.00 | | | | |
| | | 135.27 [1.50] [1.95] | Coarse slightly gravelly SAND () | 13.50 | B8 | 13.50 | 13.95 | SPT | 13.50 | N=14 (2,2/3,3,4,4) | |
| | | | Medium dense reddish brown slightly gravelly SAND. Gravel is subangular to subrounded, fine to coarse of sandstone.() | | | | | | | | |
| | | | | | D12 | 14.50 | 14.50 | | | | |
| | | 133.77 | | 15.00 | | | | SPT | 15.00 | N=14 (2,2/3,4,3,4) | |
| | | 133.32 | Hole Terminated at 15.45m bgl. | 15.45 | | | | | | | |

| Chiseling | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Time (hh:mm) |
| | | |

| Water Added | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Volume (l) |
| | | |

## Remarks

**Reason for Termination:**

Designated depth reached

**Groundwater Remarks:**

Groundwater AT 3.00mbgl, rising to 2.50mbgl and at 13.50mbgl, rising to 10.00mbgl

**Other Remarks:**

Cleared of buried services. Handpit dug to 1.20mbgl. Installed with monitoring standpipe upon completion.

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# BOREHOLE LOG

Scale 1:50 Sheet 1 of 2

| LOCATION ID | | | | |
|---|---|---|---|---|
| **BH05** | **Project Name:** Plot P, Kingsway Business Park | | **Ground Level (m AOD):** | 148.77 |
| | **Project Number:** 210939 | | **Eastings:** | 391940.56 |
| | **Client:** Wilson Bowden Developments Ltd | | **Northings:** | 412578.73 |
| **Hole Type:** CP | **Rig:** Dando 2000 | **Start & End Date:** 03/08/2022 | **Engineer:** TF | **Checker:** MH |

| Boring | | Strata | | | | Samples | | | In-Situ Tests | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strike | Well | Level (m AOD) & [Thickness (m)] | Description | Legend | Depth (m bgl) | Type (Ublows) | From (m) | To (m) | Type | Depth (m) | Result | Casing Depth & (Water Level) |
| | | [0.50] | Grass over dark brown clayey SAND. (Topsoil) | | | B1 | 0.10 | 0.50 | | | | |
| | | | | | | ES1 | 0.20 | 0.20 | | | | |
| | | 148.27 [3.30] | Loose light grey silty SAND() | | 0.50 | B2 | 0.50 | 1.00 | | | | |
| | | | | | | D1 | 1.10 | 1.10 | | | | |
| | | | | | | B3 | 1.20 | 1.65 | SPT | 1.20 | N=24 (2,3/4,5,7,8) | |
| | | | | | | | | | SPT | 2.00 | N=5 (3,2/2,1,1,1) | |
| | | | | | | D2 | 2.50 | 2.50 | | | | |
| | | | | | | B4 | 3.00 | 3.45 | SPT | 3.00 | N=9 (1,1/2,3,2,2) | |
| | | 144.97 [11.20] | Soft to firm brown slightly sandy slightly gravelly CLAY. Gravel is subangular, fine to medium of mudstone.() | | 3.80 | U1 (78) | 4.00 | 4.45 | | | | |
| | | | | | | D3 | 4.50 | 4.50 | | | | |
| | | | | | | B5 | 5.00 | 5.45 | SPT | 5.00 | N=14 (2,2/3,3,4,4) | |
| | | | | | | U2 (84) | 6.00 | 6.45 | | | | |
| | | | | | | D4 | 6.50 | 6.50 | | | | |
| | | | | | | D5 | 7.00 | 7.00 | | | | |
| | | | | | | B6 | 7.50 | 7.95 | SPT | 7.50 | N=14 (3,3/3,3,4,4) | |
| | | | | | | D6 | 8.50 | 8.50 | | | | |
| | | | | | | U3 (68) | 9.00 | 9.45 | | | | |
| | | | | | | D7 | 9.50 | 9.50 | | | | |
| | | | | | | D8 | 9.70 | 9.70 | | | | |

| Chiseling | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Time (hh:mm) |
| | | |

| Water Added | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Volume (l) |
| | | |

## Remarks

**Reason for Termination:**

Designated depth reached

**Groundwater Remarks:**

No groundwater encountered.

**Other Remarks:**

Cleared of buried services. Handpit dug to 1.20mbgl. Installed with monitoring standpipe upon completion.

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# BOREHOLE LOG

Scale 1:50 Sheet 2 of 2

| LOCATION ID | | | | | |
|---|---|---|---|---|---|
| **BH05** | **Project Name:** Plot P, Kingsway Business Park | | | **Ground Level (m AOD):** | 148.77 |
| | **Project Number:** 210939 | | | **Eastings:** | 391940.56 |
| | **Client:** Wilson Bowden Developments Ltd | | | **Northings:** | 412578.73 |
| **Hole Type:** CP | **Rig:** Dando 2000 | **Start & End Date:** | 03/08/2022 | **Engineer:** TF | **Checker:** MH |

| Boring | | Strata | | | Samples | | | In-Situ Tests | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Strike | Well | Level (m AOD) & (Thickness (m)) | Description | Legend / Depth (m bgl) | Type (Ublows) | From (m) | To (m) | Type | Depth (m) | Result | Casing Depth & (Water Level) |
| | | | Soft to firm brown slightly sandy slightly gravelly CLAY. Gravel is subangular, fine to medium of mudstone.() | | | | | | | | |
| | | | | | B7 | 10.50 | 10.95 | SPT | 10.50 | N=19 (3,3/4,4,5,6) | |
| | | | | | D9 | 11.50 | 11.50 | | | | |
| | | | | | U4 (73) | 12.00 | 12.45 | | | | |
| | | | | | D10 | 12.50 | 12.50 | | | | |
| | | | | | D11 | 12.80 | 12.80 | | | | |
| | | | | | B8 | 13.50 | 13.95 | SPT | 13.50 | N=13 (2,2/3,3,4,3) | |
| | | | | | D12 | 14.50 | 14.50 | | | | |
| | | 133.77 | Hole Terminated at 15.00m bgl. | 15.00 | U5 (81) | 15.00 | 15.45 | | | | |
| | | | | | D13 | 15.50 | 15.50 | | | | |

| Chiseling | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Time (hh:mm) |
| | | |

| Water Added | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Volume (l) |
| | | |

## Remarks

**Reason for Termination:**

Designated depth reached

**Groundwater Remarks:**

No groundwater encountered.

**Other Remarks:**

Cleared of buried services. Handpit dug to 1.20mbgl. Installed with monitoring standpipe upon completion.

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.50 |
| **TP101** | **Project Number:** 210939 | | 1.00 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** JCB 3CX | **Start & End Date:** 01/08/2022 | Stability: Unstable below 1.80mbgl |
| **Ground Level (m AOD):** 148.94 | **Eastings & Northings:** 391840E 412729N | | Engineer: TF Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | | Grass over black gravelly SAND with low cobble content. Gravel is subangular to subrounded, fine to coarse of clinker, brick, sandstone and wood. Cobbles are subangular of slag. (Made Ground) | | | ES1 | 0.30 | 0.30 | | | |
| | | 1.80m | | | | B1 | 1.00 | 1.00 | | | |
| | | | | | | ES2 | 1.50 | 1.50 | | | |
| | | 147.14 | Light brown slightly clayey SAND.() | | 1.80 | D1 | 2.00 | 2.00 | | | |
| | | 1.70m | | | | B2 | 3.00 | 3.00 | | | |
| | | 145.44 | Hole Terminated at 3.50m bgl. | | 3.50 | D2 | 3.50 | 3.50 | | | |

## Remarks

**Reason for Termination:**

Sides Collapsing

**Groundwater Notes:**

No groundwater encountered.

**Other Remarks:**

Cleared of services, backfilled with arisings

# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.40 |
| **TP102** | **Project Number:** 210939 | | 1.00 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** JCB 3CX | **Start & End Date:** 03/08/2022 | Stability: Unstable at groundwater contact |
| **Ground Level (m AOD):** 147.22 | **Eastings & Northings:** 391868E 412717N | | Engineer: OS Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.30m<br>146.92 | Dark brown sightly clayey fine to medium SAND with rootlet content. (Topsoil) | | | ES | 0.20 | | | | |
| | | 0.70m<br>146.22 | Blackish brown slightly gravelly slightly clayey fine to medium SAND with high cobble content. Gravel is subangular, coarse of sandstone. Cobbles are subangular to subrounded of sandstone.() | | 0.30 | ES | 0.60 | | | | |
| | | 0.60m<br>145.62 | Orangey light grey slightly silty fine to medium SAND.() | | 1.00 | B<br>ES | 1.30<br>1.30 | | | | |
| | | 0.90m<br>144.72 | Orange silty fine to medium SAND.() | | 1.60 | | | | | | |
| ▼ | | 0.70m<br>144.02 | Orange slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded, fine to medium of coal and sandstone.() | | 2.50 | B<br>D | 2.80<br>2.80 | | | | |
| | | | Hole Terminated at 3.20m bgl. | | 3.20 | | | | | | |

## Remarks

**Reason for Termination:**

Sides Collapsing

**Groundwater Notes:**

Seepage at 2.70mbgl

**Other Remarks:**

Cleared of services, black plastic sheet at 0.10mmgl, backfilled with arisings

# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.40 |
| **TP103** | **Project Number:** 210939 | | 1.20 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** JCB 3CX | **Start & End Date:** 01/08/2022 | Stability: Unstable below 2.00mbgl |
| **Ground Level (m AOD):** 149.08 | **Eastings & Northings:** 391823E 412714N | | Engineer: TF Checker: MH |

| Strata | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend / Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.40m | Grass over dark brown clayey SAND with high rootlet content (Topsoil) | | ES1 | 0.30 | 0.30 | | | |
| | | 148.68 | | 0.40 | D1 | 0.50 | 0.50 | | | |
| | | 0.50m | Black and brown clayey gravelly SAND with low boulder content. Gravel is subangular to subrounded, fine to coarse of sandstone. Boulders are subangular of sandstone.() | | ES2 | 0.50 | 0.50 | | | |
| | | 148.18 | | 0.90 | B1 | 0.80 | 0.80 | | | |
| | | | Firm light grey mottled orangish brown sandy slightly gravelly CLAY. Gravel is subangular to subrounded, fine to medium of coal and sandstone.() | | D2 | 1.00 | 1.00 | HSV | 1.00 | (58, 75, 56)kPa |
| | | 1.10m | | | B2 | 1.80 | 1.80 | | | |
| | | 147.08 | Light orangish brown slightly clayey slightly gravelly SAND. Gravel is subrounded, medium to coarse of sandstone.() | 2.00 | | | | | | |
| ▼ | | 2.00m | | | D3 | 2.50 | 2.50 | | | |
| | | 145.08 | Hole Terminated at 4.00m bgl. | 4.00 | B3 | 4.00 | 4.00 | | | |

## Remarks

**Reason for Termination:**

Sides Collapsing

**Groundwater Notes:**

No Groundwater Encountered

**Other Remarks:**

Cleared of services, backfilled with arisings

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.30 |
| **TP104** | **Project Number:** 210939 | | 1.10 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** JCB 3CX | **Start & End Date:** 01/08/2022 | Stability: Unstable below 0.80mbgl |
| **Ground Level (m AOD):** 149.01 | **Eastings & Northings:** 391854E 412690N | | Engineer: TF Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.20m 148.81 | Grass over dark brown clayey SAND with high rootlet content (Topsoil) | | 0.20 | ES1 | 0.10 | 0.10 | | | |
| | | 0.60m | Stiff orangish brown mottled light grey sandy gravelly CLAY with high rootlet content.() | | | ES2 | 0.30 | 0.30 | | | |
| | | 148.21 | Orange clayey slightly gravelly SAND Gravel is subangular to subrounded, fine to coarse of sandstone.() | | 0.80 | B1 | 0.50 | 0.50 | | | |
| | | | | | | D1 | 0.70 | 0.70 | | | |
| | | | | | | B2 | 1.00 | 1.00 | | | |
| | | | | | | D2 | 1.50 | 1.50 | | | |
| ▼ | | 3.00m | | | | B3 | 2.80 | 2.80 | | | |
| | | | | | | D3 | 3.50 | 3.50 | | | |
| | | 145.21 | Hole Terminated at 3.80m bgl. | | 3.80 | | | | | | |

## Remarks

**Reason for Termination:**

Sides Collapsing

**Groundwater Notes:**

No Groundwater Encountered

**Other Remarks:**

Cleared of services, backfilled with arisings

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.50 |
| **TP105** | **Project Number:** 210939 | | 1.20 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** JCB 3CX | **Start & End Date:** 02/08/2022 | Stability: Stable |
| **Ground Level (m AOD):** 148.54 | **Eastings & Northings:** 391810E 412660N | | Engineer: TF Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.80m | Grass over brown clayey gravely SAND, with low cobble content. Gravel is subangular to subrounded, fine to coarse of sandstone and brick. Cobbles are subangular to subrounded of sandstone. (Made Ground) | | | ES1 | 0.20 | 0.20 | | | |
| | | 147.74 | | | 0.80 | | | | | | |
| | | | Firm light grey mottled orange silty sandy gravelly CLAY with medium cobble content. Gravel is subangular to subrounded, fine to coarse of sandstone. Cobbles are subrounded of sandstone.() | | | D1 | 1.00 | 1.00 | HSV | 1.00 | (58, 47, 54)kPa |
| | | | | | | ES2 | 1.00 | 1.00 | | | |
| | | 1.40m | | | | B1 | 1.50 | 1.50 | | | |
| | | | | | | D2 | 2.00 | 2.00 | | | |
| | | 146.34 | | | 2.20 | | | | | | |
| ▼ | | | Light grayish brown slightly clayey slightly gravelly SAND. Gravel is subrounded, fine to coarse of sandstone.() | | | B2 | 2.50 | 2.50 | | | |
| | | 2.30m | | | | D3 | 3.50 | 3.50 | | | |
| | | 144.04 | Hole Terminated at 4.50m bgl. | | 4.50 | B3 | 4.50 | 4.50 | | | |

## Remarks

**Reason for Termination:**

Undercutting below machine

**Groundwater Notes:**

No Groundwater Encountered

**Other Remarks:**

Cleared of services, backfilled with arisings

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.10 | |
| **TP106** | **Project Number:** 210939 | | 1.20 Pit Dimensions (m) | 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | Stability: Unstable below 1.70mbgl | |
| | **Plant:** JCB 3CX | **Start & End Date:** 02/08/2022 | | |
| **Ground Level (m AOD):** 149.37 | | **Eastings & Northings:** 391857E 412660N | Engineer: TF | Checker: MH |

| Strata | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend / Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.50m | Grass over dark brown slightly clayey gravelly SAND. Gravel is subangular to subrounded, fine to coarse of sandstone and brick. (Made Ground) | | ES1 | 0.20 | 0.20 | | | |
| | | 148.87 | Stiff grey mottled brown sandy CLAY.() | 0.50 | ES2 | 0.60 | 0.60 | | | |
| | | 1.20m | | | D1 | 1.00 | 1.00 | | | |
| | | | | | B1 | 1.50 | 1.50 | HSV | 1.50 | (70, 100, 40)kPa |
| | | 147.67 | Light brownish orange SAND.() | 1.70 | | | | | | |
| | | | | | D2 | 2.00 | 2.00 | | | |
| ▼ | | 2.30m | | | | | | | | |
| | | | | | B2 | 3.00 | 3.00 | | | |
| | | 145.37 | Hole Terminated at 4.00m bgl. | 4.00 | D3 | 4.00 | 4.00 | | | |

## Remarks

**Reason for Termination:**

Sides Collapsing

**Groundwater Notes:**

No Groundwater Encountered

**Other Remarks:**

Cleared of services, backfilled with arisings

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.40 |
| **TP107** | **Project Number:** 210939 | | 1.00 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** JCB 3CX | **Start & End Date:** 04/08/2022 | Stability: Unstable below 1.90mbgl |
| **Ground Level (m AOD):** 148.62 | **Eastings & Northings:** 391918E 412706N | | Engineer: TF Checker: MH |

| Strata | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend / Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.50m | Reeds over dark brown sandy gravelly CLAY. Gravel is subangular to rounded, fine to coarse of sandstone and brick. High rootlet content. (Made Ground) | | ES1 | 0.20 | 0.20 | | | |
| | | 148.12 | | | ES2 | 0.40 | 0.40 | | | |
| | | | Firm orangish brown sandy gravelly CLAY. Gravel is subangular, fine to coarse of sandstone.() | 0.50 | | | | | | |
| | | | | | D1 | 0.90 | 0.90 | HSV | 1.00 | (60, 65, 75)kPa |
| | | 1.40m | | | | | | | | |
| | | | | | B1 | 1.40 | 1.40 | | | |
| | | | | | D2 | 1.70 | 1.70 | HSV | 1.80 | (40, 35, 40)kPa |
| | | 146.72 | | 1.90 | | | | | | |
| | | | Orangish brown slightly clayey slightly gravelly SAND. Gravel is subangular to rounded, fine to coarse of sandstone.() | | | | | | | |
| ▼ | | 1.10m | | | B2 | 2.30 | 2.30 | | | |
| | | 145.62 | Hole Terminated at 3.00m bgl. | 3.00 | D3 | 3.00 | 3.00 | | | |

## Remarks

**Reason for Termination:**

Sides Collapsing

**Groundwater Notes:**

Seepage from 2.60mbgl

**Other Remarks:**

Cleared of services, backfilled with arisings

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| **LOCATION ID:** | **Project Name:** | Plot P, Kingsway Business Park | 2.60 | |
| **TP108** | **Project Number:** | 210939 | 1.00 Pit Dimensions (m) | 0 Degrees |
| | **Client:** | Wilson Bowden Developments Ltd | | |
| | **Plant:** 8 Tonne excavator | **Start & End Date:** 04/08/2022 | Stability: Stable | |
| **Ground Level (m AOD):** 149.04 | | **Eastings & Northings:** 391952E 412699N | Engineer: TF | Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.30m<br>148.74 | Reeds over dark brown clayey gravelly SAND. Gravel is subangular to subrounded, fine to coarse of sandstone. (Topsoil) | | 0.30 | ES1 | 0.20 | 0.20 | | | |
| | | 1.10m | Dark brown clayey sandy GRAVEL. Gravel is subangular to subrounded, fine to coarse of sandstone and brick. Rare subangular cobbles of sandstone. (Made Ground) | | | ES2 | 0.50 | 0.50 | | | |
| | | 147.64 | | | | B1 | 0.80 | 0.80 | | | |
| | | 1.40m | Firm grey mottled brown CLAY.() | | 1.40 | D1<br>ES3 | 1.50<br>1.60 | 1.50<br>1.60 | HSV | 1.50 | (94, 98, 77)kPa |
| ▼ | | 146.24 | Hole Terminated at 2.80m bgl. | | 2.80 | B2<br>D2 | 2.20<br>2.70 | 2.20<br>2.70 | HSV | 2.60 | (46, 46, 52)kPa |

## Remarks

**Reason for Termination:**

Backfilled with Ballast from side of pit

**Groundwater Notes:**

Dry

**Other Remarks:**

Cleared of services, backfilled with arisings

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| **LOCATION ID:** | **Project Name:** | Plot P, Kingsway Business Park | 2.20 | |
| **TP109** | **Project Number:** | 210939 | 1.10 Pit Dimensions (m) | 0 Degrees |
| | **Client:** | Wilson Bowden Developments Ltd | | |
| | **Plant:** 8 Tonne excavator | **Start & End Date:** 04/08/2022 | Stability: Stable | |
| **Ground Level (m AOD):** 148.73 | **Eastings & Northings:** 391956E 412668N | | Engineer: TF | Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.20m<br>148.53 | Reeds over dark brown clayey SAND with high rootlet content. (Topsoil) | | 0.20 | ES1 | 0.10 | 0.10 | | | |
| | | 0.60m | Light grey sandy SILT() | | | D1<br>ES2 | 0.40<br>0.40 | 0.40<br>0.40 | | | |
| | | 147.93<br>0.80m | Soft orange mottled grey slightly silty slightly sandy slightly gravelly CLAY with low cobble content. Gravel is subangular to subrounded, fine to coarse of sandstone. Cobbles are subrounded of sandstone.() | | 0.80 | D2 | 1.00 | 1.00 | HSV | 1.00 | (30, 40, 31)kPa |
| | | 147.13 | Stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded, fine to coarse of sandstone and mudstone.() | | 1.60 | B1 | 2.00 | 2.00 | HSV | 2.00 | (32, 40, 50)kPa |
| ▼ | | 1.80m | | | | D3 | 2.80 | 2.80 | | | |
| | | 145.33 | Hole Terminated at 3.40m bgl. | | 3.40 | B2 | 3.40 | 3.40 | | | |

## Remarks

**Reason for Termination:**

Material too stiff to dig

**Groundwater Notes:**

Seepage from 1.70mbgl

**Other Remarks:**

Cleared of services, backfilled with arisings

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.50 |
| **TP110** | **Project Number:** 210939 | | 1.00 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** JCB 3CX | **Start & End Date:** 03/08/2022 | Stability: Pit stable |
| **Ground Level (m AOD):** 149.41 | **Eastings & Northings:** 391920E 412667N | | Engineer: OS Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.20m<br>149.21 | Dark brown sightly clayey fine to medium SAND with rootlet content. (Topsoil) | | 0.20 | ES | 0.30 | | | | |
| | | 0.20m<br>149.01 | Brown slightly gravelly fine to medium SAND. Gravel is subangular to suubrounded, fine to coarse of sandstone.() | | 0.40 | B<br>ES | 0.50<br>0.50 | | | | |
| | | 0.50m<br>148.51 | Black gravelly fine to coarse SAND. Gravel is subangular to subrounded, fine to coarse of sandstone.() | | 0.90 | | | | | | |
| ▼ | | 0.80m | Firm light grey slightly sandy CLAY.() | | | | | | HSV | 1.10 | (30, 25, 25)kPa |
| | | 147.71 | Firm grey slightly sandy CLAY.() | | 1.70 | B<br>D | 2.00<br>2.00 | | HSV | 2.00 | (34, 38, 30)kPa |
| | | 1.30m<br>146.41 | Stiff grey CLAY with low cobble content. Cobble is angular to subangular of mudstone.() | | 3.00 | | | | | | |
| | | 0.30m<br>146.11 | Weathered MUDSTONE recovered as stiff grey slightly gravelly clay. Gravel is subangular to subrounded, fine to coarse of mudstone.() | | 3.30 | D<br>B | 3.40<br>3.60 | | | | |
| | | 0.50m<br>145.61 | Hole Terminated at 3.80m bgl. | | 3.80 | | | | | | |

## Remarks

**Reason for Termination:**

Limit of machine reached

**Groundwater Notes:**

Seepage at 1.40mbgl

**Other Remarks:**

Cleared of services, backfilled with arisings

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.50 |
| **TP111** | **Project Number:** 210939 | | 1.00 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** JCB 3CX | **Start & End Date:** 03/08/2022 | Stability: Unstable below 2m |
| **Ground Level (m AOD):** 149.64 | **Eastings & Northings:** 391895E 412669N | | Engineer: OS Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.20m<br>149.44 | Dark brown slightly clayey fine to medium SAND with rootlet content. (Topsoil) | | 0.20 | ES | 0.10 | | | | |
| | | 0.30m<br>149.14 | Blackish brown slightly gravelly SAND. Gravel is subangular to subrounded, fine to coarse of brick and sandstone. (Made Ground) | | 0.50 | ES | 0.30 | | | | |
| | | 0.80m | Firm light grey slightly silty CLAY.() | | | B<br>D<br>ES | 0.80<br>0.80<br>0.80 | | HSV | 0.70 | (76, 72, 72)kPa |
| | | 148.34<br>1.70m | Orange slightly gravelly slightly clayey fine to medium SAND with low cobble content. Gravel is subangular to subrounded, fine to coarse of sandstone. Cobble is subangular of sandstone.() | | 1.30 | B<br>D | 1.50<br>1.50 | | | | |
| | | 146.64<br>0.50m | Stiff grey slightly sandy CLAY.() | | 3.00 | D | 3.40 | | | | |
| | | 146.14<br>0.50m | Weathered MUDSTONE recovered as stiff slightly gravelly clay. Gravel is subangular to subrounded, fine to coarse of mudstone.() | | 3.50 | B | 3.50 | | | | |
| | | 145.64 | Hole Terminated at 4.00m bgl. | | 4.00 | | | | | | |

## Remarks

**Reason for Termination:**

Limit of machine reached

**Groundwater Notes:**

No groundwater encountered.

**Other Remarks:**

Cleared of services, backfilled with arisings

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.40 |
| **TP112** | **Project Number:** 210939 | | 1.10 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** 8 Tonne excavator | **Start & End Date:** 02/08/2022 | Stability: Stable |
| **Ground Level (m AOD):** 148.85 | **Eastings & Northings:** 391864E 412625N | Engineer: TF | Checker: MH |

| Strata | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend / Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | | Grass over firm dark brown sandy gravelly CLAY with moderate cobble content. Gravel is subangular to subrounded, fine to coarse of brick and sandstone. Cobbles are subangular of brick, sandstone and concrete. (Made Ground) | | ES1 | 0.30 | 0.30 | | | |
| | | 1.00m | | | B1 | 0.50 | 0.50 | | | |
| | | | | | ES2 | 0.70 | 0.70 | | | |
| | | 147.85 | Dark brown clayey gravelly SAND. Gravel is subangular to subrounded, fine to coarse of brick and sandstone (Made Ground) | 1.00 | | | | | | |
| | | 0.70m | | | ES4 | 1.50 | 1.50 | HSV | 1.50 | (55, 50, 80)kPa |
| | | 147.15 | Soft light grey sandy SILT with lenses of firm orange mottled light grey CLAY.() | 1.70 | ES3 | 1.80 | 1.80 | | | |
| | | 0.50m | | | D1 | 2.00 | 2.00 | | | |
| | | 146.65 | Soft to firm grey mottled orangish brown slightly sandy CLAY.() | 2.20 | | | | | | |
| | | 0.50m | | | B2 | 2.40 | 2.40 | HSV | 2.50 | (54, 70, 52)kPa |
| | | 146.15 | Orange clayey SAND.() | 2.70 | D2 | 2.60 | 2.60 | | | |
| | | | | | B3 | 3.00 | 3.00 | | | |
| | | 1.50m | | | D3 | 3.20 | 3.20 | | | |
| | | | | | D4 | 4.00 | 4.00 | | | |
| | | 144.65 | Brownish red clayey slightly gravelly SAND. Gravel is rounded to subrou nded, fine to coarse of sandstone.() | 4.20 | | | | | | |
| | | 0.30m | | | | | | | | |
| | | 144.35 | Hole Terminated at 4.50m bgl. | 4.50 | B4 | 4.50 | 4.50 | | | |

## Remarks

**Reason for Termination:**

Target Depth Reached

**Groundwater Notes:**

No groundwater encountered.

**Other Remarks:**

Cleared of services, backfilled with arisings

# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.50 |
| **TP113** | **Project Number:** 210939 | | 1.00 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** JCB 3CX | **Start & End Date:** 03/08/2022 | Stability: Unstable below 1.2m |
| **Ground Level (m AOD):** 149.30 | **Eastings & Northings:** 391896E 412619N | | Engineer: OS Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.40m<br>148.90 | Dark brown slightly clayey slightly gravelly fine SAND. Gravel is subangular to subrounded, fine to coarse of brick and sandstone. (Made Ground) | | 0.40 | ES | 0.30 | | | | |
| | | 0.40m<br>148.50 | Firm grey slightly gravelly CLAY. Gravel is subangular to subrounded, fine to coarse of brick and sandstone.() | | 0.80 | B<br>ES | 0.60<br>0.60 | | HSV | 0.60 | (62, 74, 58)kPa |
| | | 1.00m | Light grey slightly gravelly clayey SILT. Gravel is subangular to subrounded, fine to medium of coal.() | | | D<br>ES | 1.00<br>1.00 | | | | |
| | | 147.50<br>1.70m | Reddish orange silty fine to medium SAND.() | | 1.80 | B | 3.00 | | | | |
| ▼ | | 145.80<br>0.70m | Firm grey slightly sandy CLAY.() | | 3.50 | D | 3.60 | | HSV | 3.60 | (51, 55, 52)kPa |
| | | 145.10 | Hole Terminated at 4.20m bgl. | | 4.20 | | | | | | |

## Remarks

**Reason for Termination:**

Limit of machine reached

**Groundwater Notes:**

Seepage at 3.60mbgl

**Other Remarks:**

Cleared of services, backfilled with arisings

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.50 |
| **TP114** | **Project Number:** 210939 | | 1.00 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** JCB 3CX | **Start & End Date:** 03/08/2022 | Stability: Pit stable |
| **Ground Level (m AOD):** 148.83 | **Eastings & Northings:** 391943E 412622N | | Engineer: OS Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.40m<br>148.43 | Dark brown slightly clayey SAND with rootlet content (Topsoil) | | | ES | 0.30 | | | | |
| | | 0.30m<br>148.13 | greyish orange slightly gravelly fine to medium SAND. Gravel is subangular to subrounded, fine to coarse of sandstone.() | | 0.40 | B<br>D<br>ES | 0.60<br>0.60<br>0.60 | | | | |
| | | 1.00m | Soft light grey sandy SILT.() | | 0.70 | | | | | | |
| | | 147.13 | Soft reddish grey slightly gravelly sandy SILT with lenses of clay. Gravel is subangular to subrounded, fine to medium of coal. Odour of hydrogen sulfide present.() | | 1.70 | B<br>D<br>ES | 1.60<br>1.80<br>1.80 | | HSV | 1.60 | (24, 26, 30)kPa |
| ▼ | | 1.30m | | | | B | 2.30 | | | | |
| | | 145.83 | Stiff grey slightly sandy slightly gravelly CLAY with low cobble content. Gravel is subangular to subrounded, medium to coarse of mudstone. Cobble is subrounded of mudstone.() | | 3.00 | D<br>ES<br>B | 3.20<br>3.20<br>3.40 | | HSV | 3.20 | (94, 86, 94)kPa |
| | | 1.00m | | | | | | | HSV | 3.90 | (104, 88, 84)kPa |
| | | 144.83 | Hole Terminated at 4.00m bgl. | | 4.00 | D | 4.00 | | | | |

## Remarks

**Reason for Termination:**

Limit of machine reached

**Groundwater Notes:**

Seepage at 2.40mbgl

**Other Remarks:**

Cleared of services, backfilled with arisings

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.40 |
| **TP115** | **Project Number:** 210939 | | 1.00 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** JCB 3CX | **Start & End Date:** 03/08/2022 | Stability: Pit stable |
| **Ground Level (m AOD):** 148.83 | **Eastings & Northings:** 391948E 412595N | | Engineer: OS Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.40m<br>148.43 | Dark brown slightly clayey fine SAND with rootlet content. (Topsoil) | | | ES | 0.30 | | | | |
| | | 0.25m<br>148.18 | Orangey brown slightly clayey fine to medium SAND.() | | 0.40 | D<br>ES | 0.50<br>0.50 | | | | |
| | | 0.55m<br>147.63 | Orangey light grey clayey SAND.() | | 0.65 | B | 1.00 | | | | |
| | | 2.20m | Soft reddish grey slightly gravelly sandy SILT with lenses of clay. Gravel is subangular to subrounded, fine to medium of coal. Sulphuric odour present() | | 1.20 | ES | 1.50 | | | | |
| | | 145.43 | Hole Terminated at 3.40m bgl. | | 3.40 | B | 2.50 | | | | |

## Remarks

**Reason for Termination:**

Limit of machine reached

**Groundwater Notes:**

No groundwater encountered.

**Other Remarks:**

Cleared of services, backfilled with arisings

# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.40 |
| **TP116** | **Project Number:** 210939 | | 1.00 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** JCB 3CX | **Start & End Date:** 02/08/2022 | Stability: Unstable below 3.40mbgl |
| **Ground Level (m AOD):** 149.47 | **Eastings & Northings:** 391908E 412585N | | Engineer: TF Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.60m | Grass over dark brown clayey slightly gravelly SAND with high rootlet content and low cobble content. Gravel is subangular to subrounded, fine to coarse of brick.Cobbles are subangular of brick. | | | ES1 | 0.30 | 0.30 | | | |
| | | 148.87 | (Made Ground) | | 0.60 | | | | | | |
| | | 0.20m | Light brown clayey slightly gravelly SAND. Gravel is subangular, fine to coarse of brick. | | | D1 | 0.70 | 0.70 | | | |
| | | 148.67 | | | 0.80 | ES2 | 0.70 | 0.70 | | | |
| | | 0.20m | | | | ES3 | 0.90 | 0.90 | | | |
| | | 148.47 | (Made Ground) | | 1.00 | | | | | | |
| | | | Firm dark brown sandy CLAY with high plant material content and organic odour.() | | | D2 | 1.20 | 1.20 | HSV | 1.20 | (40, 38, 40)kPa |
| | | 1.10m | Soft to firm light grey sandy SILT with lenses of firm grey mottled brown clay() | | | B1 | 1.50 | 1.50 | | | |
| | | | | | | D5 | 1.80 | 1.80 | HSV | 1.80 | (38, 38, 30)kPa |
| | | | | | | D3 | 2.00 | 2.00 | | | |
| | | 147.37 | Light brown slightly clayey SAND with lenses of subangular fine gravel.() | | 2.10 | | | | | | |
| | | 1.30m | | | | B2 | 3.00 | 3.00 | | | |
| ▼ | | 146.07 | Greyish brown very silty SAND with lenses of subangular, fine black gravel.() | | 3.40 | D4 | 3.50 | 3.50 | | | |
| | | 0.60m | | | | | | | | | |
| | | 145.47 | Hole Terminated at 4.00m bgl. | | 4.00 | B3 | 4.00 | 4.00 | | | |

## Remarks

**Reason for Termination:**

Sides Collapsing

**Groundwater Notes:**

Seepage at 3.40mbgl

**Other Remarks:**

Cleared of services, backfilled with arisings

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 1.80 |
| **TP117** | **Project Number:** 210939 | | 1.00 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** 8 Tonne excavator | **Start & End Date:** 04/08/2022 | Stability: Stable |
| **Ground Level (m AOD):** 148.54 | **Eastings & Northings:** 391954E 412533N | | Engineer: TF Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.50m<br>148.04 | Grass over dark brown clayey SAND with high rootlet content (Topsoil) | | | ES1 | 0.20 | 0.20 | | | |
| | | | Soft to firm greyish very sandy CLAY. () | | 0.50 | ES2 | 0.70 | 0.70 | HSV | 0.80 | (44, 43, 48)kPa |
| | | 1.00m | | | | D1 | 1.00 | 1.00 | | | |
| | | | | | | B1 | 1.40 | 1.40 | HSV | 1.50 | (45, 40, 59)kPa |
| | | 147.04<br>0.40m<br>146.64 | Stiff sandy gravelly CLAY. Gravel is subangular to subrounded, fine to coarse of mudstone.() | | 1.50 | | | | | | |
| | | | Hole Terminated at 1.90m bgl. | | 1.90 | D2 | 1.90 | 1.90 | HSV | 1.90 | (130, 124, 118)kPa |

## Remarks

**Reason for Termination:**

Material too stiff to dig

**Groundwater Notes:**

No groundwater encountered.

**Other Remarks:**

Cleared of services, backfilled with arisings

# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| **LOCATION ID:** | **Project Name:** | Plot P, Kingsway Business Park | 1.80 | |
| **TP118** | **Project Number:** | 210939 | 1.20 Pit Dimensions (m) | 0 Degrees |
| | **Client:** | Wilson Bowden Developments Ltd | | |
| | **Plant:** 8 Tonne excavator | **Start & End Date:** 04/08/2022 | Stability: Stable | |
| **Ground Level (m AOD):** 148.54 | **Eastings & Northings:** 391972E 412511N | | Engineer: TF | Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.40m<br>148.14 | Reeds over dark brown clayey SAND. (Topsoil) | | | ES1 | 0.30 | 0.30 | | | |
| | | | Firm brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded, fine to coarse of sandstone and mudstone. () | | 0.40 | ES2<br>D1 | 0.50<br>0.60 | 0.50<br>0.60 | | | |
| | | 1.20m | | | | B1 | 1.00 | 1.00 | | | |
| | | 146.94 | Stiff brown mottled dark grey sandy gravelly CLAY. Gravel is subangular, fine to coarse of mudstone. Rare subangular cobbles of sandstone.() | | 1.60 | B2 | 1.70 | 1.70 | | | |
| | | 0.90m | | | | | | | | | |
| | | 146.04 | Hole Terminated at 2.50m bgl. | | 2.50 | D2 | 2.50 | 2.50 | | | |

## Remarks

**Reason for Termination:**

Material too stiff to dig

**Groundwater Notes:**

No groundwater encountered.

**Other Remarks:**

Cleared of services, backfilled with arisings

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| **LOCATION ID:** | **Project Name:** | Plot P, Kingsway Business Park | 1.60 | |
| **TP119** | **Project Number:** | 210939 | 1.30 Pit Dimensions (m) | 0 Degrees |
| | **Client:** | Wilson Bowden Developments Ltd | | |
| | **Plant:** 8 Tonne excavator | **Start & End Date:** 05/08/2022 | Stability: Stable | |
| **Ground Level (m AOD):** 148.73 | **Eastings & Northings:** 391918E 412707N | | Engineer: TF | Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.40m<br>148.33 | Bullrushes over very soft dark brown silty sandy CLAY. (Topsoil) | | | ES1 | 0.20 | 0.20 | | | |
| | | 0.40m<br>147.93 | Dark brown gravelly SAND. Gravel is subangular to subrounded, fine to coarse of brick, sandstone and mudstone. (Made Ground) | | 0.40 | ES2 | 0.60 | 0.60 | | | |
| | | 0.60m<br>147.33 | Firm brown slightly sandy CLAY() | | 0.80 | D1<br>ES3 | 1.00<br>1.00 | 1.00<br>1.00 | HSV | 1.00 | (58, 60, 58)kPa |
| | | | Hole Terminated at 1.40m bgl. | | 1.40 | | | | | | |

## Remarks

**Reason for Termination:**

Depth of organic material proved

**Groundwater Notes:**

Seepage from 0.20mbgl

**Other Remarks:**

Cleared of services, backfilled with arisings

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| **LOCATION ID:** | **Project Name:** | Plot P, Kingsway Business Park | 2.20 | |
| **TP120** | **Project Number:** | 210939 | 1.10 Pit Dimensions (m) | 0 Degrees |
| | **Client:** | Wilson Bowden Developments Ltd | | |
| | **Plant:** 8 Tonne excavator | **Start & End Date:** 05/08/2022 | Stability: Stable | |
| **Ground Level (m AOD):** 148.73 | | **Eastings & Northings:** 391979E 412671N | Engineer: TF | Checker: MH |

| Strata | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend / Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.90m | Bullrushes over dark brown sandy CLAY with high rootlet content. Organic odour present (Topsoil) | | B1 | 0.30 | 0.30 | | | |
| | | 147.83 | | 0.90 | | | | | | |
| | | 0.10m | Very soft black PEAT. | 1.00 | D1 | 0.95 | 0.95 | | | |
| | | 147.73 | (Peat) | | D2 | 1.10 | 1.10 | | | |
| | | 0.20m | Soft brownish grey slightly sandy silty CLAY.() | 1.20 | | | | | | |
| | | 147.53 | Hole Terminated at 1.20m bgl. | | | | | | | |

## Remarks

**Reason for Termination:**

Depth of organic material proved

**Groundwater Notes:**

Water strike at 0.80mbgl

**Other Remarks:**

Cleared of services, backfilled with arisings

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.60 |
| **TP121** | **Project Number:** 210939 | | 1.20 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** 8 Tonne excavator | **Start & End Date:** 05/08/2022 | Stability: Stable |
| **Ground Level (m AOD):** 148.73 | **Eastings & Northings:** 391950E 412648N | | Engineer: TF Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.50m<br>148.23 | Very soft black PEAT.<br>(Peat) | | | ES1 | 0.20 | 0.20 | | | |
| | | | | | | B1 | 0.40 | 0.40 | | | |
| | | 0.50m<br>147.73 | Very soft dark brown PEAT with high plant material content.<br>(Peat) | | 0.50 | D1 | 0.60 | 0.60 | | | |
| | | 1.30m | Very soft grey silty CLAY with high plant material content.() | | 1.00 | B2<br>ES2 | 1.20<br>1.20 | 1.20<br>1.20 | HSV | 1.10 | (12, 6, 5)kPa |
| | | 146.43<br>0.30m<br>146.13 | Greyish brown clayey silty SAND.() | | 2.30 | | | | | | |
| | | | Hole Terminated at 2.60m bgl. | | 2.60 | D2 | 2.60 | 2.60 | | | |

## Remarks

**Reason for Termination:**

Depth of organic material proved

**Groundwater Notes:**

Water strike at 0.40mbgl

**Other Remarks:**

Cleared of services, backfilled with arisings

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# Appendix 3: SPT Calibration Certificate

# SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

**ARCHWAY ENGINEERING UK LTD**
**AINLEYS INDUSTRIAL ESTATE**
**ELLAND**
**WEST YORKSHIRE**
**HX5 9JP**

| | |
|---|---|
| SPT Hammer Ref: | PBD02 |
| Test Date: | 17/02/2022 |
| Report Date: | 17/02/2022 |
| File Name: | PBD02.spt |
| Test Operator: | CM |

## Instrumented Rod Data

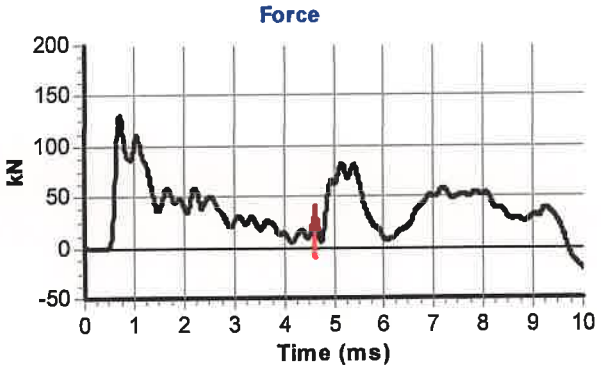
| | |
|---|---|
| Diameter $d_r$ (mm): | 54 |
| Wall Thickness $t_r$ (mm): | 6.0 |
| Assumed Modulus $E_a$ (GPa): | 200 |
| Accelerometer No.1: | 7080 |
| Accelerometer No.2: | 11609 |

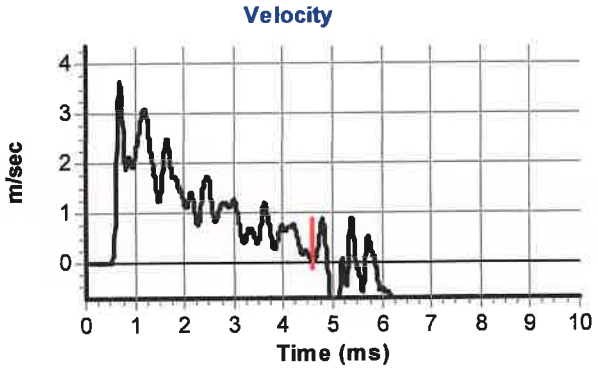
## SPT Hammer Information

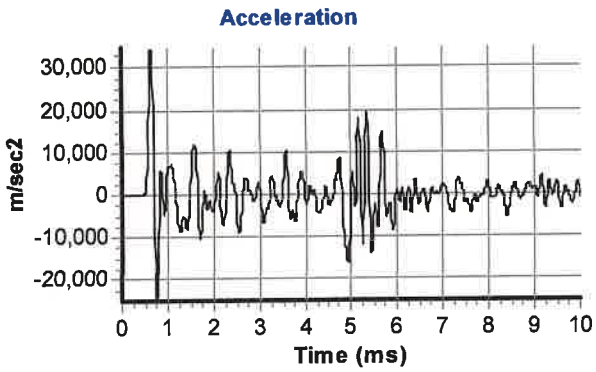
| | |
|---|---|
| Hammer Mass m (kg): | 63.5 |
| Falling Height h (mm): | 760 |
| SPT String Length L (m): | 10.0 |

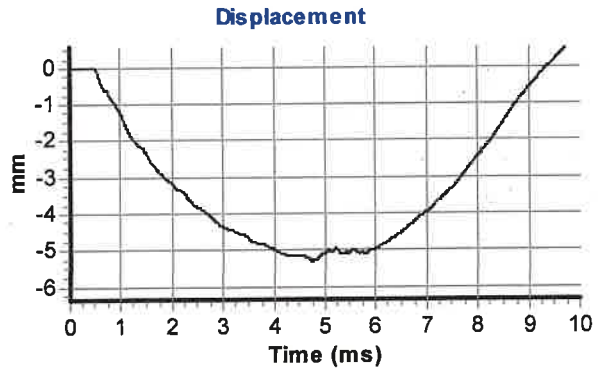
## Comments / Location

PB DRILLING LTD/79197




## Calculations

| | |
|---|---|
| Area of Rod A (mm2): | 905 |
| Theoretical Energy $E_{theor}$ (J): | 473 |
| Measured Energy $E_{meas}$ (J): | 331 |

**Energy Ratio $E_r$ (%):** **70**

The recommended calibration interval is 12 months

Signed: C.McCLUSKEY

Title: FITTER

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# Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

| | |
|---|---|
| Hammer Ref: | PBD5 |
| Test Date: | 05/01/2022 |
| Report Date: | |
| File Name: | PBD5.spt |
| Test Operator: | B HUNTER |

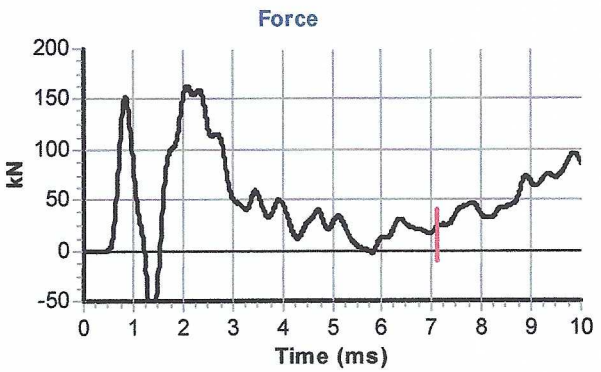
**Instrumented Rod Data**

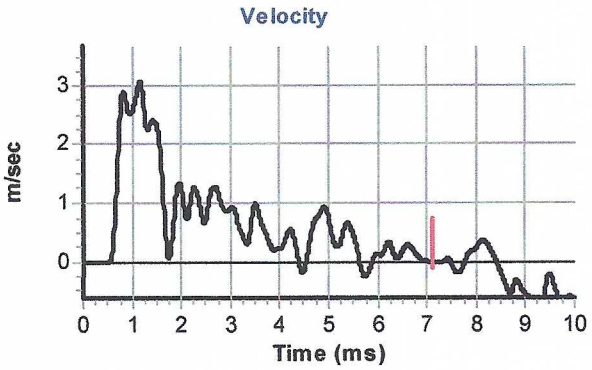
| | |
|---|---|
| Diameter $d_r$ (mm): | 54 |
| Wall Thickness $t_r$ (mm): | 6.0 |
| Assumed Modulus $E_a$ (GPa): | 208 |
| Accelerometer No.1: | 62901 |
| Accelerometer No.2: | 62902 |

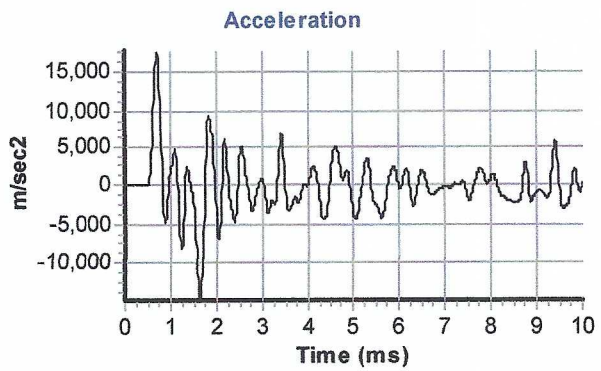
**Hammer Information**

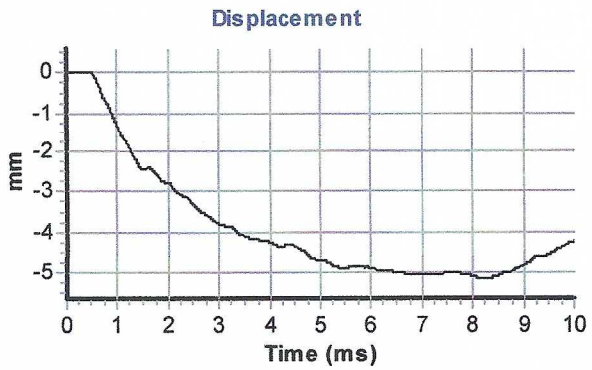
| | |
|---|---|
| Hammer Mass m (kg): | 63.5 |
| Falling Height h (mm): | 760 |
| String Length L (m): | 10.0 |

**Comments / Location**




**Calculations**

| | |
|---|---|
| Area of Rod A (mm2): | 905 |
| Theoretical Energy $E_{theor}$ (J): | 473 |
| Measured Energy $E_{meas}$ (J): | 309 |

**Energy Ratio $E_r$ (%):** **65**

Signed:

Title: Operations Manager

The recommended calibration interval is 12 months

*SPTMAN ver.Hammer Energy ver. 1.93 All rights reserved, Testconsult ©2010*

## Appendix 4: Gas and Groundwater Monitoring Data

**BWB GAS AND GROUNDWATER MONITORING**

| | | |
|---|---|---|
| **Site:** | | Plot P Kingsway Business Park |
| **Client:** | | Wilson Bowden Developments |
| **Job No.:** | | 210939 |
| **Date:** | | 26 August 2022 |
| **Start / End Time:** | | 10:45 - 12:00 |
| **Engineer:** | | OS |
| **Monitoring Equipment:** | **Gas Meter ID** | |
| | **PID ID** | |
| | **Dip Tape** | |
| | **Other** | |

NR = Not Recorded
Dry = No Groundwater

BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

| **Weather Conditions** | **Start** | **End** |
|---|---|---|
| **(Dry / Raining)** | Dry | Dry |
| **Wind Strength (m/s)** | | |
| **Wind Direction (from)** | | |
| **Temperature (°C)** | 14.0 | 14.0 |
| **Barometric Pressure (h Pa / mB)** | 1017.0 | 1017.0 |
| **App 12 Hour Pressure (h Pa / mB)** | 1019.0 | |
| **12 Hour Pressure Trend** | | |
| **PID - Air** | <0.1 | <0.1 |
| **PID - Calibration Gas** | | |

| **Location Reference** | **Relative Pressure (Pa)** | **Flow (l/hr)** | | **Methane (%v/v)** | | **Carbon Dioxide (%v/v)** | | **Oxygen (%v/v)** | | **Hydrogen Sulphide (ppm)** | **Carbon Monoxide (ppm)** | **PID (ppm)** | **Depth to water (m)** | **Base of Response Zone (m)** | **Free-Phase Product Level Top (m)** | **Groundwater Elevation (m AOD)** | **Notes** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Peak** | **Steady** | **Peak** | **Steady** | **Peak** | **Steady** | **Min** | **Steady** | | | | | | | | |
| **Ambient Air Start (Calibration)** | | | | | | | | | | | | | | | | | |
| **Ambient Air Finish (Calibration)** | | | | | | | | | | | | | | | | | |
| **BH01** | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 20.8 | 20.8 | <0.1 | <0.1 | <0.1 | 3.13 | 3.61 | | 144.15 | |
| **BH02** | | <0.1 | <0.1 | <0.1 | <0.1 | 0.6 | 0.5 | 20.2 | 20.4 | <0.1 | <0.1 | <0.1 | 11.34 | 14.74 | | 137.75 | |
| **BH03** | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 21.1 | 21.6 | <0.1 | <0.1 | <0.1 | 2.42 | 3.27 | | 147.05 | |
| **BH04** | | <0.1 | <0.1 | <0.1 | <0.1 | 0.1 | 0.1 | 21.1 | 20.6 | <0.1 | <0.1 | <0.1 | 9.56 | 14.23 | | 139.21 | |
| **BH05** | | <0.1 | <0.1 | <0.1 | <0.1 | 0.9 | 0.9 | 19.9 | 19.9 | <0.1 | <0.1 | <0.1 | 2.04 | 3.70 | | 146.73 | |

**BWB GAS AND GROUNDWATER MONITORING**

| | | |
|---|---|---|
| Site: | | Plot P Kingsway Business Park |
| Client: | | Wilson Bowden Developments |
| Job No.: | | 210939 |
| Date: | | 06/09/2022 |
| Start / End Time: | | 10:30 - 11:30 |
| Engineer: | | OS |
| Monitoring Equipment: | Gas Meter ID | |
| | PID ID | |
| | Dip Tape | |
| | Other | |

NR = Not Recorded
Dry = No Groundwater

BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

| Weather Conditions | Start | End |
|---|---|---|
| (Dry / Raining) | Dry | Light rain |
| Wind Strength (m/s) | | |
| Wind Direction (from) | | |
| Temperature (°C) | 10.0 | 10.0 |
| Barometric Pressure (h Pa / mB) | 1015.0 | 1015.0 |
| App 12 Hour Pressure (h Pa / mB) | 1018.0 | |
| 12 Hour Pressure Trend | | |
| PID - Air | <0.1 | <0.1 |
| PID - Calibration Gas | | |

| Location Reference | Relative Pressure (Pa) | Flow (l/hr) | | Methane (%v/v) | | Carbon Dioxide (%v/v) | | Oxygen (%v/v) | | Hydrogen Sulphide (ppm) | Carbon Monoxide (ppm) | PID (ppm) | Depth to water (m) | Base of Response Zone (m) | Free-Phase Product Level Top (m) | Groundwater Elevation (m AOD) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak | Steady | Peak | Steady | Peak | Steady | Min | Steady | | | | | | | | |
| **Ambient Air Start (Calibration)** | | | | | | | | | | | | | | | | | |
| **Ambient Air Finish (Calibration)** | | | | | | | | | | | | | | | | | |
| **BH01** | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 20.5 | 20.6 | <0.1 | <0.1 | <0.1 | 3.10 | 3.61 | | 144.18 | |
| **BH02** | | <0.1 | <0.1 | <0.1 | <0.1 | 0.7 | 0.4 | 20.3 | 20.3 | <0.1 | <0.1 | <0.1 | 11.32 | 14.70 | | 137.77 | |
| **BH03** | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 21.2 | 21.6 | <0.1 | <0.1 | <0.1 | 2.38 | 3.25 | | 147.09 | |
| **BH04** | | <0.1 | <0.1 | <0.1 | <0.1 | 0.1 | 0.1 | 20.1 | 20.6 | <0.1 | <0.1 | <0.1 | 9.55 | 14.20 | | 139.22 | |
| **BH05** | | <0.1 | <0.1 | <0.1 | <0.1 | 0.7 | 0.7 | 19.9 | 19.9 | <0.1 | <0.1 | <0.1 | 2.03 | 3.70 | | 146.74 | |

**BWB GAS AND GROUNDWATER MONITORING**

| | | |
|---|---|---|
| Site: | | Plot P Kingsway Business Park |
| Client: | | Wilson Bowden Developments |
| Job No.: | | 210939 |
| Date: | | 29/09/2022 |
| Start / End Time: | | |
| Engineer: | | OS |
| Monitoring Equipment: | Gas Meter ID | |
| | PID ID | |
| | Dip Tape | |
| | Other | |

NR = Not Recorded
Dry = No Groundwater

BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

| Weather Conditions | Start | End |
|---|---|---|
| (Dry / Raining) | Dry | Dry |
| Wind Strength (m/s) | | |
| Wind Direction (from) | | |
| Temperature (°C) | 15.0 | 14.0 |
| Barometric Pressure (h Pa / mB) | 991.0 | 991.0 |
| App 12 Hour Pressure (h Pa / mB) | 1001.0 | |
| 12 Hour Pressure Trend | | |
| PID - Air | <0.1 | <0.1 |
| PID - Calibration Gas | | |

| Location Reference | Relative Pressure (Pa) | Flow (l/hr) | | Methane (%v/v) | | Carbon Dioxide (%v/v) | | Oxygen (%v/v) | | Hydrogen Sulphide (ppm) | Carbon Monoxide (ppm) | PID (ppm) | Depth to water (m) | Base of Response Zone (m) | Free-Phase Product Level Top (m) | Groundwater Elevation (m AOD) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak | Steady | Peak | Steady | Peak | Steady | Min | Steady | | | | | | | | |
| **Ambient Air Start (Calibration)** | | | | | | | | | | | | | | | | | |
| **Ambient Air Finish (Calibration)** | | | | | | | | | | | | | | | | | |
| **BH01** | | <0.1 | <0.1 | <0.1 | <0.1 | 0.1 | 0.1 | 21.4 | 21.4 | 0 | 2.2 | <0.1 | Dry | 3.55 | | | Lock removed, sandy sediment at base of hole. |
| **BH02** | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 21.6 | 21.9 | 0 | 0 | <0.1 | 11.40 | 14.62 | | 137.69 | Lock removed, tap clearly removed prior to monitoring |
| **BH03** | | <0.1 | <0.1 | 1.8 | 1.8 | 3.4 | 3.4 | 2.6 | 2.6 | 0 | 0 | <0.1 | 2.45 | 3.30 | | 147.02 | Lock removed |
| **BH04** | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 22.3 | 22.5 | 0 | 0 | <0.1 | 10.76 | 14.00 | | 138.01 | Lock removed, tap clearly removed prior to monitoring, bailer lost |
| **BH05** | | <0.1 | <0.1 | <0.1 | <0.1 | 1.0 | 1.0 | 10.4 | 10.4 | 0 | 0 | <0.1 | 2.10 | 3.70 | | 146.67 | Lock removed, tap clearly removed prior to monitoring |

**BWB GAS AND GROUNDWATER MONITORING**

| | | |
|---|---|---|
| **Site:** | | Plot P Kingsway Business Park |
| **Client:** | | Wilson Bowden Developments |
| **Job No.:** | | 210939 |
| **Date:** | | 13/10/2022 |
| **Start / End Time:** | | |
| **Engineer:** | | OS |
| **Monitoring Equipment:** | **Gas Meter ID** | |
| | **PID ID** | |
| | **Dip Tape** | |
| | **Other** | |

NR = Not Recorded
Dry = No Groundwater

BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

| Weather Conditions | Start | End |
|---|---|---|
| (Dry / Raining) | Dry | Dry |
| Wind Strength (m/s) | | |
| Wind Direction (from) | | |
| Temperature (°C) | 15.0 | 15.0 |
| Barometric Pressure (h Pa / mB) | 1015.0 | 1015.0 |
| App 12 Hour Pressure (h Pa / mB) | 1017.0 | |
| 12 Hour Pressure Trend | | |
| PID - Air | | |
| PID - Calibration Gas | | |

| Location Reference | Relative Pressure (Pa) | Flow (l/hr) | | Methane (%v/v) | | Carbon Dioxide (%v/v) | | Oxygen (%v/v) | | Hydrogen Sulphide (ppm) | Carbon Monoxide (ppm) | PID (ppm) | Depth to water (m) | Base of Response Zone (m) | Free-Phase Product Level Top (m) | Groundwater Elevation (m AOD) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak | Steady | Peak | Steady | Peak | Steady | Min | Steady | | | | | | | | |
| **Ambient Air Start (Calibration)** | | | | | | | | | | | | | | | | | |
| **Ambient Air Finish (Calibration)** | | | | | | | | | | | | | | | | | |
| **BH01** | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 20.9 | 21.0 | <0.1 | <0.1 | <0.1 | 3.40 | 3.48 | | 143.88 | |
| **BH02** | | <0.1 | <0.1 | <0.1 | <0.1 | 0.8 | 0.7 | 20.5 | 20.8 | <0.1 | <0.1 | <0.1 | 12.10 | 14.60 | | 136.99 | |
| **BH03** | | <0.1 | <0.1 | 0.5 | 0.5 | 0.3 | 0.2 | 19.3 | 19.6 | <0.1 | <0.1 | <0.1 | 2.95 | 3.28 | | 146.52 | |
| **BH04** | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 21.2 | 21.5 | <0.1 | <0.1 | <0.1 | 11.32 | 13.97 | | 137.45 | |
| **BH05** | | <0.1 | <0.1 | <0.1 | <0.1 | 0.7 | 0.7 | 20.2 | 20.4 | <0.1 | <0.1 | <0.1 | 2.78 | 3.70 | | 145.99 | |

# Appendix 5: Soil Chemical Analysis Results

**Thomas Flame**
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# Analytical Report Number : 22-79454

| | | | |
|---|---|---|---|
| **Project / Site name:** | Plot P Kingsway Business Park | **Samples received on:** | 05/08/2022 |
| **Your job number:** | 210939 | **Samples instructed on/ Analysis started on:** | 19/08/2022 |
| **Your order number:** | 2412 | **Analysis completed by:** | 06/09/2022 |
| **Report Issue Number:** | 1 | **Report issued on:** | 06/09/2022 |
| **Samples Analysed:** | 4 leachate samples - 13 soil samples | | |

Izabela Wójcik
**Signed:**

Izabela Wójcik
Reporting Specialist
**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.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 22-79454**
**Project / Site name: Plot P Kingsway Business Park**
**Your Order No: 2412**

| Lab Sample Number | | | | 2397561 | 2397562 | 2397563 | 2397564 | 2397565 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP101 | TP104 | TP107 | TP112 | TP112 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.30 | 0.30 | 0.40 | 0.30 | 0.70 |
| **Date Sampled** | | | | 01/08/2022 | 01/08/2022 | 01/08/2022 | 01/08/2022 | 01/08/2022 |
| **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 | 10 | 11 | - | - | 14 |
| Total mass of sample received | kg | 0.001 | NONE | 0.8 | 0.3 | - | - | 0.3 |
| Asbestos in Soil | Type | N/A | ISO 17025 | Not-detected | - | Not-detected | Not-detected | - |
| Asbestos Analyst ID | N/A | N/A | N/A | GFI | N/A | GFI | GFI | N/A |

**General Inorganics**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| pH - Automated | pH Units | N/A | MCERTS | 6.9 | 8 | - | - | 9.2 |
| Total Cyanide | mg/kg | 1 | MCERTS | 19 | < 1.0 | - | - | < 1.0 |
| Complex Cyanide | mg/kg | 1 | MCERTS | 19 | < 1.0 | - | - | < 1.0 |
| Free Cyanide | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | - | - | < 1.0 |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | 0.062 | 0.01 | - | - | 0.82 |
| Total Sulphur | mg/kg | 50 | MCERTS | 1100 | 80 | - | - | 1300 |
| Organic Matter | % | 0.1 | MCERTS | - | - | - | - | - |
| Fraction Organic Carbon (FOC) Automated | N/A | 0.001 | MCERTS | 0.023 | 0.0058 | - | - | 0.015 |
| Fraction Organic Carbon (FOC) | N/A | 0.001 | MCERTS | - | - | - | - | - |
| Total Organic Carbon (TOC) - Automated | % | 0.1 | MCERTS | 2.3 | 0.6 | - | - | 1.5 |
| Total Organic Carbon (TOC) – Manual | % | 0.1 | MCERTS | - | - | - | - | - |

**Total Phenols**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | - | - | < 1.0 |

**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 | 0.4 | < 0.05 | - | - | 0.33 |
| Fluorene | mg/kg | 0.05 | MCERTS | 0.27 | < 0.05 | - | - | 0.3 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | 3.5 | < 0.05 | - | - | 2 |
| Anthracene | mg/kg | 0.05 | MCERTS | 0.98 | < 0.05 | - | - | 0.54 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | 5.7 | < 0.05 | - | - | 2.1 |
| Pyrene | mg/kg | 0.05 | MCERTS | 4.9 | < 0.05 | - | - | 2.1 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | 4.1 | < 0.05 | - | - | 1.2 |
| Chrysene | mg/kg | 0.05 | MCERTS | 2.7 | < 0.05 | - | - | 0.99 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | MCERTS | 3.5 | < 0.05 | - | - | 0.89 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | MCERTS | 1.9 | < 0.05 | - | - | 0.53 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | 3.6 | < 0.05 | - | - | 0.98 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | 2.2 | < 0.05 | - | - | 0.41 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | 0.54 | < 0.05 | - | - | < 0.05 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | 2.3 | < 0.05 | - | - | 0.51 |

**Total PAH**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | MCERTS | 36.5 | < 0.80 | - | - | 12.8 |

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

**Analytical Report Number: 22-79454**
**Project / Site name: Plot P Kingsway Business Park**
**Your Order No: 2412**

| Lab Sample Number | | | | 2397561 | 2397562 | 2397563 | 2397564 | 2397565 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | TP101 | TP104 | TP107 | TP112 | TP112 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 0.30 | 0.30 | 0.40 | 0.30 | 0.70 |
| Date Sampled | | | | 01/08/2022 | 01/08/2022 | 01/08/2022 | 01/08/2022 | 01/08/2022 |
| 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 | 52 | 7.4 | - | - | 6.7 |
| Barium (aqua regia extractable) | mg/kg | 1 | MCERTS | 560 | 36 | - | - | 110 |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | 2.6 | 0.51 | - | - | 0.78 |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | 0.3 | < 0.2 | - | - | 0.4 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | - | - | < 0.2 |
| Chromium (hexavalent) | mg/kg | 1.8 | MCERTS | < 1.8 | < 1.8 | - | - | < 1.8 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 31 | 27 | - | - | 22 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 140 | 17 | - | - | 19 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 180 | 11 | - | - | 41 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | - | - | < 0.3 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 55 | 18 | - | - | 21 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | - | - | < 1.0 |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | 83 | 27 | - | - | 23 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 63 | 37 | - | - | 56 |
| **Monoaromatics & Oxygenates** | | | | | | | | |
| Benzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | - | - | - |
| Toluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | - | - | - |
| Ethylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | - | - | - |
| p & m-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | - | - | - |
| o-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | - | - | - |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | - | - | - |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$ | mg/kg | 10 | MCERTS | 42 | < 10 | - | - | 20 |
| TPH2 (C6 - C10) $_{HS\_1D\_TOTAL}$ | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | - | - | < 0.1 |
| TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$ | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | - | - | - |
| TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$ | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | - | - | - |
| TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$ | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | - | - | - |
| TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$ | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | - | - | - |
| TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$ | mg/kg | 2 | MCERTS | < 2.0 | < 2.0 | - | - | - |
| TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | - | - | - |
| TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | - | - | - |
| TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$ | mg/kg | 10 | MCERTS | < 10 | < 10 | - | - | - |
| TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$ | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | - | - | - |
| TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$ | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | - | - | - |
| TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$ | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | - | - | - |
| TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$ | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | - | - | - |
| TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$ | mg/kg | 2 | MCERTS | < 2.0 | < 2.0 | - | - | - |
| TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | 14 | < 10 | - | - | - |
| TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | 24 | < 10 | - | - | - |
| TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$ | mg/kg | 10 | MCERTS | 38 | < 10 | - | - | - |

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: 22-79454**
**Project / Site name: Plot P Kingsway Business Park**
**Your Order No: 2412**

| Lab Sample Number | | | | 2397566 | 2397567 | 2397568 | 2397569 | 2397570 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP112 | TP113 | TP114 | TP114 | TP115 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 1.50 | 0.30 | 0.60 | 1.80 | 0.30 |
| **Date Sampled** | | | | 01/08/2022 | 01/08/2022 | 01/08/2022 | 01/08/2022 | 01/08/2022 |
| **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 | 15 | 22 | 13 | 20 | 19 |
| Total mass of sample received | kg | 0.001 | NONE | 0.4 | 0.8 | 0.4 | 0.3 | 0.4 |
| Asbestos in Soil | Type | N/A | ISO 17025 | - | Not-detected | - | - | - |
| Asbestos Analyst ID | N/A | N/A | N/A | N/A | GFI | N/A | N/A | N/A |

**General Inorganics**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| pH - Automated | pH Units | N/A | MCERTS | - | 6.9 | - | 7.6 | - |
| Total Cyanide | mg/kg | 1 | MCERTS | - | < 1.0 | - | < 1.0 | - |
| Complex Cyanide | mg/kg | 1 | MCERTS | - | < 1.0 | - | < 1.0 | - |
| Free Cyanide | mg/kg | 1 | MCERTS | - | < 1.0 | - | < 1.0 | - |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | - | 0.32 | - | 0.031 | - |
| Total Sulphur | mg/kg | 50 | MCERTS | - | 590 | - | 490 | - |
| Organic Matter | % | 0.1 | MCERTS | - | - | - | - | - |
| Fraction Organic Carbon (FOC) Automated | N/A | 0.001 | MCERTS | - | 0.051 | - | 0.0045 | - |
| Fraction Organic Carbon (FOC) | N/A | 0.001 | MCERTS | - | - | - | - | - |
| Total Organic Carbon (TOC) - Automated | % | 0.1 | MCERTS | 2.8 | 5.1 | 1 | 0.5 | 6.5 |
| Total Organic Carbon (TOC) – Manual | % | 0.1 | MCERTS | - | - | - | - | - |

**Total Phenols**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | - | < 1.0 | - | < 1.0 | - |

**Speciated PAHs**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Naphthalene | mg/kg | 0.05 | MCERTS | - | < 0.05 | - | < 0.05 | - |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | - | < 0.05 | - | < 0.05 | - |
| Acenaphthene | mg/kg | 0.05 | MCERTS | - | < 0.05 | - | < 0.05 | - |
| Fluorene | mg/kg | 0.05 | MCERTS | - | < 0.05 | - | < 0.05 | - |
| Phenanthrene | mg/kg | 0.05 | MCERTS | - | < 0.05 | - | < 0.05 | - |
| Anthracene | mg/kg | 0.05 | MCERTS | - | < 0.05 | - | < 0.05 | - |
| Fluoranthene | mg/kg | 0.05 | MCERTS | - | 0.35 | - | < 0.05 | - |
| Pyrene | mg/kg | 0.05 | MCERTS | - | 0.33 | - | < 0.05 | - |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | - | 0.23 | - | < 0.05 | - |
| Chrysene | mg/kg | 0.05 | MCERTS | - | 0.22 | - | < 0.05 | - |
| Benzo(b)fluoranthene | mg/kg | 0.05 | MCERTS | - | < 0.05 | - | < 0.05 | - |
| Benzo(k)fluoranthene | mg/kg | 0.05 | MCERTS | - | < 0.05 | - | < 0.05 | - |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | - | < 0.05 | - | < 0.05 | - |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | - | < 0.05 | - | < 0.05 | - |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | - | < 0.05 | - | < 0.05 | - |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | - | < 0.05 | - | < 0.05 | - |

**Total PAH**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | MCERTS | - | 1.13 | - | < 0.80 | - |

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**Analytical Report Number: 22-79454**
**Project / Site name: Plot P Kingsway Business Park**
**Your Order No: 2412**

| Lab Sample Number | | | | 2397566 | 2397567 | 2397568 | 2397569 | 2397570 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP112 | TP113 | TP114 | TP114 | TP115 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 1.50 | 0.30 | 0.60 | 1.80 | 0.30 |
| **Date Sampled** | | | | 01/08/2022 | 01/08/2022 | 01/08/2022 | 01/08/2022 | 01/08/2022 |
| **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 | - | 11 | - | 3.5 | - |
| Barium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | 42 | - | 21 | - |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | - | 0.45 | - | 0.33 | - |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | - | 0.8 | - | < 0.2 | - |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | - | < 0.2 | - | < 0.2 | - |
| Chromium (hexavalent) | mg/kg | 1.8 | MCERTS | - | < 1.8 | - | < 1.8 | - |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | 13 | - | 7.9 | - |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | - | 28 | - | 11 | - |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | - | 65 | - | 7 | - |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | - | < 0.3 | - | < 0.3 | - |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | - | 9 | - | 20 | - |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | < 1.0 | - | < 1.0 | - |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | - | 18 | - | 8.2 | - |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | - | 37 | - | 26 | - |
| **Monoaromatics & Oxygenates** | | | | | | | | |
| Benzene | µg/kg | 1 | MCERTS | - | < 1.0 | - | - | - |
| Toluene | µg/kg | 1 | MCERTS | - | < 1.0 | - | - | - |
| Ethylbenzene | µg/kg | 1 | MCERTS | - | < 1.0 | - | - | - |
| p & m-xylene | µg/kg | 1 | MCERTS | - | < 1.0 | - | - | - |
| o-xylene | µg/kg | 1 | MCERTS | - | < 1.0 | - | - | - |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | - | < 1.0 | - | - | - |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$ | mg/kg | 10 | MCERTS | - | 38 | - | < 10 | - |
| TPH2 (C6 - C10) $_{HS\_1D\_TOTAL}$ | mg/kg | 0.1 | MCERTS | - | < 0.1 | - | < 0.1 | - |
| TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$ | mg/kg | 0.001 | MCERTS | - | < 0.001 | - | - | - |
| TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$ | mg/kg | 0.001 | MCERTS | - | < 0.001 | - | - | - |
| TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$ | mg/kg | 0.001 | MCERTS | - | < 0.001 | - | - | - |
| TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$ | mg/kg | 1 | MCERTS | - | < 1.0 | - | - | - |
| TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$ | mg/kg | 2 | MCERTS | - | < 2.0 | - | - | - |
| TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | - | < 8.0 | - | - | - |
| TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | - | < 8.0 | - | - | - |
| TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$ | mg/kg | 10 | MCERTS | - | < 10 | - | - | - |
| TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$ | mg/kg | 0.001 | MCERTS | - | < 0.001 | - | - | - |
| TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$ | mg/kg | 0.001 | MCERTS | - | < 0.001 | - | - | - |
| TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$ | mg/kg | 0.001 | MCERTS | - | < 0.001 | - | - | - |
| TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$ | mg/kg | 1 | MCERTS | - | < 1.0 | - | - | - |
| TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$ | mg/kg | 2 | MCERTS | - | < 2.0 | - | - | - |
| TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | - | < 10 | - | - | - |
| TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | - | 25 | - | - | - |
| TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$ | mg/kg | 10 | MCERTS | - | 31 | - | - | - |

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

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**Analytical Report Number: 22-79454**
**Project / Site name: Plot P Kingsway Business Park**
**Your Order No: 2412**

| Lab Sample Number | | | | 2397571 | 2397572 | 2397573 |
|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP115 | TP116 | TP119 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 1.50 | 0.90 | 0.60 |
| **Date Sampled** | | | | 01/08/2022 | 01/08/2022 | 01/08/2022 |
| **Time Taken** | | | | 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 | 20 | 27 | 7.5 |
| Total mass of sample received | kg | 0.001 | NONE | 0.8 | 0.5 | 0.5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Asbestos in Soil | Type | N/A | ISO 17025 | - | - | Not-detected |
| Asbestos Analyst ID | N/A | N/A | N/A | N/A | N/A | GFI |

**General Inorganics**

| | | | | | | |
|---|---|---|---|---|---|---|
| pH - Automated | pH Units | N/A | MCERTS | 8.6 | 5.6 | 8.6 |
| Total Cyanide | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 |
| Complex Cyanide | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 |
| Free Cyanide | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | 0.047 | 3.1 | 0.1 |
| Total Sulphur | mg/kg | 50 | MCERTS | 750 | 2600 | 760 |
| Organic Matter | % | 0.1 | MCERTS | - | 16 | - |
| Fraction Organic Carbon (FOC) Automated | N/A | 0.001 | MCERTS | 0.0047 | - | 0.021 |
| Fraction Organic Carbon (FOC) | N/A | 0.001 | MCERTS | - | 0.09 | - |
| Total Organic Carbon (TOC) - Automated | % | 0.1 | MCERTS | 0.5 | - | 2.1 |
| Total Organic Carbon (TOC) – Manual | % | 0.1 | MCERTS | - | 9 | - |

**Total Phenols**

| | | | | | | |
|---|---|---|---|---|---|---|
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 |

**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 | < 0.05 | < 0.05 | < 0.05 |
| Fluorene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.58 | 0.77 |
| Anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.35 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | 1.2 | 1.5 |
| Pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.99 | 1.4 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.61 | 0.86 |
| Chrysene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.54 | 0.77 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.72 | 0.99 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.25 | 0.36 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.59 | 0.75 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.3 | 0.37 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.41 | 0.45 |

**Total PAH**

| | | | | | | |
|---|---|---|---|---|---|---|
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | MCERTS | < 0.80 | 6.14 | 8.56 |

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**Analytical Report Number: 22-79454**
**Project / Site name: Plot P Kingsway Business Park**
**Your Order No: 2412**

| Lab Sample Number | | | | 2397571 | 2397572 | 2397573 |
|---|---|---|---|---|---|---|
| Sample Reference | | | | TP115 | TP116 | TP119 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 1.50 | 0.90 | 0.60 |
| Date Sampled | | | | 01/08/2022 | 01/08/2022 | 01/08/2022 |
| Time Taken | | | | 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 | 3.8 | 9.4 | 16 |
| Barium (aqua regia extractable) | mg/kg | 1 | MCERTS | 25 | 49 | 220 |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | 0.33 | 0.45 | 1.1 |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | < 0.2 | 3.8 | 0.4 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 |
| Chromium (hexavalent) | mg/kg | 1.8 | MCERTS | < 1.8 | 3.3 | < 1.8 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 9.8 | 13 | 30 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 9.8 | 23 | 92 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 6.1 | 56 | 270 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 10 | 10 | 31 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | 1.1 |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | 9.6 | 14 | 42 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 26 | 52 | 81 |
| **Monoaromatics & Oxygenates** | | | | | | |
| Benzene | µg/kg | 1 | MCERTS | - | - | - |
| Toluene | µg/kg | 1 | MCERTS | - | - | - |
| Ethylbenzene | µg/kg | 1 | MCERTS | - | - | - |
| p & m-xylene | µg/kg | 1 | MCERTS | - | - | - |
| o-xylene | µg/kg | 1 | MCERTS | - | - | - |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | - | - | - |
| **Petroleum Hydrocarbons** | | | | | | |
| TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$ | mg/kg | 10 | MCERTS | < 10 | < 10 | 19 |
| TPH2 (C6 - C10) $_{HS\_1D\_TOTAL}$ | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$ | mg/kg | 0.001 | MCERTS | - | - | - |
| TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$ | mg/kg | 0.001 | MCERTS | - | - | - |
| TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$ | mg/kg | 0.001 | MCERTS | - | - | - |
| TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$ | mg/kg | 1 | MCERTS | - | - | - |
| TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$ | mg/kg | 2 | MCERTS | - | - | - |
| TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | - | - | - |
| TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | - | - | - |
| TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$ | mg/kg | 10 | MCERTS | - | - | - |
| TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$ | mg/kg | 0.001 | MCERTS | - | - | - |
| TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$ | mg/kg | 0.001 | MCERTS | - | - | - |
| TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$ | mg/kg | 0.001 | MCERTS | - | - | - |
| TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$ | mg/kg | 1 | MCERTS | - | - | - |
| TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$ | mg/kg | 2 | MCERTS | - | - | - |
| TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | - | - | - |
| TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | - | - | - |
| TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$ | mg/kg | 10 | MCERTS | - | - | - |

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

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**Analytical Report Number: 22-79454**
**Project / Site name: Plot P Kingsway Business Park**

**Your Order No: 2412**

| **Lab Sample Number** | | | | 2397574 | 2397575 | 2398319 |
|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP104 | TP113 | TP101 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.30 | 0.30 | 0.30 |
| **Date Sampled** | | | | 01/08/2022 | 01/08/2022 | 01/08/2022 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Leachate Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | |
| **General Inorganics** | | | | | | |
| pH (automated) | pH Units | N/A | ISO 17025 | 6.3 | 7.2 | 5.9 |
| Total Cyanide | µg/l | 10 | ISO 17025 | < 10 | < 10 | < 10 |
| Sulphate as $SO_4$ | mg/l | 0.1 | ISO 17025 | 1.4 | 4.1 | 14.4 |
| **Heavy Metals / Metalloids** | | | | | | |
| Arsenic (dissolved) | µg/l | 1 | ISO 17025 | 2.7 | 3.6 | < 1.0 |
| Barium (dissolved) | µg/l | 0.05 | ISO 17025 | 1.6 | 22 | 94 |
| Beryllium (dissolved) | µg/l | 0.2 | ISO 17025 | 0.3 | 0.3 | 0.3 |
| Boron (dissolved) | µg/l | 10 | ISO 17025 | 13 | 20 | 18 |
| Cadmium (dissolved) | µg/l | 0.08 | ISO 17025 | < 0.08 | < 0.08 | < 0.08 |
| Chromium (dissolved) | µg/l | 0.4 | ISO 17025 | 0.6 | 1.4 | 1.1 |
| Copper (dissolved) | µg/l | 0.7 | ISO 17025 | 6.3 | 31 | 16 |
| Lead (dissolved) | µg/l | 1 | ISO 17025 | 3 | 4.7 | 5.2 |
| Mercury (dissolved) | µg/l | 0.5 | ISO 17025 | < 0.5 | < 0.5 | < 0.5 |
| Nickel (dissolved) | µg/l | 0.3 | ISO 17025 | 3.5 | 4.6 | 7.3 |
| Selenium (dissolved) | µg/l | 4 | ISO 17025 | < 4.0 | < 4.0 | < 4.0 |
| Vanadium (dissolved) | µg/l | 1.7 | ISO 17025 | < 1.7 | < 1.7 | 6.8 |
| Zinc (dissolved) | µg/l | 0.4 | ISO 17025 | 8.2 | 11 | 17 |

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**Analytical Report Number : 22-79454**
**Project / Site name: Plot P Kingsway Business Park**

* 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 * |
|---|---|---|---|---|
| 2397561 | TP101 | None Supplied | 0.3 | Brown loam and sand with gravel and ash. |
| 2397562 | TP104 | None Supplied | 0.3 | Brown clay and loam with vegetation. |
| 2397565 | TP112 | None Supplied | 0.7 | Brown clay and loam with vegetation. |
| 2397566 | TP112 | None Supplied | 1.5 | Brown loam and clay with gravel and vegetation. |
| 2397567 | TP113 | None Supplied | 0.3 | Brown loam and clay with gravel and vegetation. |
| 2397568 | TP114 | None Supplied | 0.6 | Brown sand. |
| 2397569 | TP114 | None Supplied | 1.8 | Brown clay and sand. |
| 2397570 | TP115 | None Supplied | 0.3 | Brown loam and clay with gravel and vegetation. |
| 2397571 | TP115 | None Supplied | 1.5 | Brown clay and sand. |
| 2397572 | TP116 | None Supplied | 0.9 | Brown loam and clay with gravel and vegetation. |
| 2397573 | TP119 | None Supplied | 0.6 | Brown clay and sand with gravel and vegetation. |

**Analytical Report Number : 22-79454**
**Project / Site name: Plot P Kingsway Business Park**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| 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 |
| BS EN 12457-1 (2:1) Leachate Prep | 2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis. | In-house method based on BSEN12457-1. | L043-PL | W | NONE |
| Asbestos identification in soil | Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques. | In house method based on HSG 248 | A001-PL | D | ISO 17025 |
| Metals by ICP-OES in leachate | Determination of metals in leachate by acidification followed by ICP-OES. | In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil. | L039-PL | W | ISO 17025 |
| Boron in leachate | Determination of boron in leachate. Sample acidified and followed by ICP-OES. | In-house method based on MEWAM | L039-PL | W | 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 |
| Complex Cyanide in soil | Determination of complex cyanide by calculation. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar) | 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 |
| Fraction of Organic Carbon in soil | Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate. | In house method. | L023 | D | MCERTS |
| Moisture Content | Moisture content, determined gravimetrically. (30 oC) | In house method. | L019-UK/PL | W | NONE |
| Monohydric phenols in soil | Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar) | L080-PL | W | MCERTS |
| Organic matter 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 |
| 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 |
| pH at 20oC in leachate (automated) | Determination of pH in leachate by electrometric measurement. | In house method. | L099B | W | ISO 17025 |
| 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 |

**Analytical Report Number : 22-79454**
**Project / Site name: Plot P Kingsway Business Park**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| Total Sulphur in soil | Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES. | In house method. | L038-PL | D | MCERTS |
| TPH2 (Soil) | Determination of hydrocarbons C6-C10 by headspace GC-MS. | In-house method based on USEPA8260 | L088-PL | W | MCERTS |
| Total cyanide in leachate | 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 | ISO 17025 |
| 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 |
| BTEX and MTBE in soil (Monoaromatics) | Determination of BTEX in soil by headspace GC-MS. | In-house method based on USEPA8260 | L073B-PL | W | MCERTS |
| TPHCWG (Soil) | Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID. | In-house method with silica gel split/clean up. | L088/76-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 |
| 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 | D | MCERTS |
| Sulphate in leachates | Determination of sulphate in leachate by acidification followed by ICP-OES. | In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil"" | L039-PL | W | ISO 17025 |
| Fraction Organic Carbon FOC Automated | Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate. | In house method | L009 | D | MCERTS |
| Hexavalent chromium in soil | Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry. | In-house method | L080-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.**

## Information in Support of Analytical Results

### List of HWOL Acronyms and Operators

| Acronym | Descriptions |
|---|---|
| HS | Headspace Analysis |
| MS | Mass spectrometry |
| FID | Flame Ionisation Detector |
| GC | Gas Chromatography |

**Analytical Report Number : 22-79454**
**Project / Site name: Plot P Kingsway Business Park**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| EH | Extractable Hydrocarbons (i.e. everything extracted by the solvent(s)) | | | | |
| CU | Clean-up - e.g. by Florisil®, silica gel | | | | |
| 1D | GC - Single coil/column gas chromatography | | | | |
| 2D | GC-GC - Double coil/column gas chromatography | | | | |
| Total | Aliphatics & Aromatics | | | | |
| AL | Aliphatics | | | | |
| AR | Aromatics | | | | |
| #1 | EH_2D_Total but with humics mathematically subtracted | | | | |
| #2 | EH_2D_Total but with fatty acids mathematically subtracted | | | | |
| _ | Operator - understore to separate acronyms (exception for +) | | | | |
| + | Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total | | | | |

# Sample Deviation Report

**Analytical Report Number : 22-79454**
**Project / Site name: Plot P Kingsway Business Park**

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

| Sample ID | Other ID | Sample Type | Lab Sample Number | Sample Deviation | Test Name | Test Ref | Test Deviation |
|---|---|---|---|---|---|---|---|
| TP101 | None Supplied | S | 2397561 | c | Free cyanide in soil | L080-PL | c |
| TP101 | None Supplied | S | 2397561 | c | BTEX and MTBE in soil (Monoaromatics) | L073B-PL | c |
| TP101 | None Supplied | S | 2397561 | c | Complex Cyanide in soil | L080-PL | c |
| TP101 | None Supplied | S | 2397561 | c | Monohydric phenols in soil | L080-PL | c |
| TP101 | None Supplied | S | 2397561 | c | Speciated EPA-16 PAHs in soil | L064-PL | c |
| TP101 | None Supplied | S | 2397561 | c | TPH Banding in Soil by FID | L076-PL | c |
| TP101 | None Supplied | S | 2397561 | c | TPH2 (Soil) | L088-PL | c |
| TP101 | None Supplied | S | 2397561 | c | TPHCWG (Soil) | L088/76-PL | c |
| TP101 | None Supplied | S | 2397561 | c | Total cyanide in soil | L080-PL | c |
| TP104 | None Supplied | S | 2397562 | c | Free cyanide in soil | L080-PL | c |
| TP104 | None Supplied | S | 2397562 | c | BTEX and MTBE in soil (Monoaromatics) | L073B-PL | c |
| TP104 | None Supplied | S | 2397562 | c | Complex Cyanide in soil | L080-PL | c |
| TP104 | None Supplied | S | 2397562 | c | Monohydric phenols in soil | L080-PL | c |
| TP104 | None Supplied | S | 2397562 | c | Speciated EPA-16 PAHs in soil | L064-PL | c |
| TP104 | None Supplied | S | 2397562 | c | TPH Banding in Soil by FID | L076-PL | c |
| TP104 | None Supplied | S | 2397562 | c | TPH2 (Soil) | L088-PL | c |
| TP104 | None Supplied | S | 2397562 | c | TPHCWG (Soil) | L088/76-PL | c |
| TP104 | None Supplied | S | 2397562 | c | Total cyanide in soil | L080-PL | c |
| TP112 | None Supplied | S | 2397565 | c | Free cyanide in soil | L080-PL | c |
| TP112 | None Supplied | S | 2397565 | c | Complex Cyanide in soil | L080-PL | c |
| TP112 | None Supplied | S | 2397565 | c | Monohydric phenols in soil | L080-PL | c |
| TP112 | None Supplied | S | 2397565 | c | Speciated EPA-16 PAHs in soil | L064-PL | c |
| TP112 | None Supplied | S | 2397565 | c | TPH Banding in Soil by FID | L076-PL | c |
| TP112 | None Supplied | S | 2397565 | c | TPH2 (Soil) | L088-PL | c |
| TP112 | None Supplied | S | 2397565 | c | Total cyanide in soil | L080-PL | c |
| TP113 | None Supplied | S | 2397567 | c | Free cyanide in soil | L080-PL | c |
| TP113 | None Supplied | S | 2397567 | c | BTEX and MTBE in soil (Monoaromatics) | L073B-PL | c |
| TP113 | None Supplied | S | 2397567 | c | Complex Cyanide in soil | L080-PL | c |
| TP113 | None Supplied | S | 2397567 | c | Monohydric phenols in soil | L080-PL | c |
| TP113 | None Supplied | S | 2397567 | c | Speciated EPA-16 PAHs in soil | L064-PL | c |
| TP113 | None Supplied | S | 2397567 | c | TPH Banding in Soil by FID | L076-PL | c |
| TP113 | None Supplied | S | 2397567 | c | TPH2 (Soil) | L088-PL | c |
| TP113 | None Supplied | S | 2397567 | c | TPHCWG (Soil) | L088/76-PL | c |
| TP113 | None Supplied | S | 2397567 | c | Total cyanide in soil | L080-PL | c |
| TP114 | None Supplied | S | 2397569 | c | Free cyanide in soil | L080-PL | c |
| TP114 | None Supplied | S | 2397569 | c | Complex Cyanide in soil | L080-PL | c |
| TP114 | None Supplied | S | 2397569 | c | Monohydric phenols in soil | L080-PL | c |
| TP114 | None Supplied | S | 2397569 | c | Speciated EPA-16 PAHs in soil | L064-PL | c |
| TP114 | None Supplied | S | 2397569 | c | TPH Banding in Soil by FID | L076-PL | c |
| TP114 | None Supplied | S | 2397569 | c | TPH2 (Soil) | L088-PL | c |
| TP114 | None Supplied | S | 2397569 | c | Total cyanide in soil | L080-PL | c |
| TP115 | None Supplied | S | 2397571 | c | Free cyanide in soil | L080-PL | c |
| TP115 | None Supplied | S | 2397571 | c | Complex Cyanide in soil | L080-PL | c |
| TP115 | None Supplied | S | 2397571 | c | Monohydric phenols in soil | L080-PL | c |
| TP115 | None Supplied | S | 2397571 | c | Speciated EPA-16 PAHs in soil | L064-PL | c |
| TP115 | None Supplied | S | 2397571 | c | TPH Banding in Soil by FID | L076-PL | c |
| TP115 | None Supplied | S | 2397571 | c | TPH2 (Soil) | L088-PL | c |
| TP115 | None Supplied | S | 2397571 | c | Total cyanide in soil | L080-PL | c |
| TP116 | None Supplied | S | 2397572 | bc | Free cyanide in soil | L080-PL | c |
| TP116 | None Supplied | S | 2397572 | bc | Complex Cyanide in soil | L080-PL | c |
| TP116 | None Supplied | S | 2397572 | bc | Monohydric phenols in soil | L080-PL | bc |
| TP116 | None Supplied | S | 2397572 | bc | Speciated EPA-16 PAHs in soil | L064-PL | bc |
| TP116 | None Supplied | S | 2397572 | bc | TPH Banding in Soil by FID | L076-PL | c |
| TP116 | None Supplied | S | 2397572 | bc | TPH2 (Soil) | L088-PL | bc |
| TP116 | None Supplied | S | 2397572 | bc | Total cyanide in soil | L080-PL | c |
| TP119 | None Supplied | S | 2397573 | bc | Free cyanide in soil | L080-PL | c |
| TP119 | None Supplied | S | 2397573 | bc | Complex Cyanide in soil | L080-PL | c |
| TP119 | None Supplied | S | 2397573 | bc | Monohydric phenols in soil | L080-PL | c |
| TP119 | None Supplied | S | 2397573 | bc | Speciated EPA-16 PAHs in soil | L064-PL | c |

# Sample Deviation Report

**Analytical Report Number : 22-79454**
**Project / Site name: Plot P Kingsway Business Park**

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

| Sample ID | Other ID | Sample Type | Lab Sample Number | Sample Deviation | Test Name | Test Ref | Test Deviation |
|---|---|---|---|---|---|---|---|
| TP101 | None Supplied | S | 2397561 | c | Free cyanide in soil | L080-PL | c |
| TP119 | None Supplied | S | 2397573 | bc | TPH Banding in Soil by FID | L076-PL | c |
| TP119 | None Supplied | S | 2397573 | bc | TPH2 (Soil) | L088-PL | bc |
| TP119 | None Supplied | S | 2397573 | bc | Total cyanide in soil | L080-PL | c |

## Appendix 6: Groundwater Analysis Results

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# Analytical Report Number : 22-87539

Replaces Analytical Report Number: 22-87539, issue no. 1
Additional analysis undertaken.

| | | | |
|---|---|---|---|
| **Project / Site name:** | Plot P, Kingsway Business park | **Samples received on:** | 30/09/2022 |
| **Your job number:** | 210939 | **Samples instructed on/ Analysis started on:** | 30/09/2022 |
| **Your order number:** | PO 2881 | **Analysis completed by:** | 11/10/2022 |
| **Report Issue Number:** | 2 | **Report issued on:** | 17/10/2022 |
| **Samples Analysed:** | 4 water samples | | |

**Signed:**

Adam Fenwick
Technical Reviewer
**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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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 22-87539**
**Project / Site name: Plot P, Kingsway Business park**

**Your Order No: PO 2881**

| **Lab Sample Number** | | | | 2445272 | 2445273 | 2445274 | 2445275 |
|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | BH02 | BH03 | BH04 | BH05 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Date Sampled** | | | | 29/09/2022 | 29/09/2022 | 29/09/2022 | 29/09/2022 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Water Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | |
| **General Inorganics** | | | | | | | |
| pH | pH Units | N/A | ISO 17025 | 6.3 | 6.4 | 7.2 | 7.1 |
| Electrical Conductivity at 20 °C | µS/cm | 10 | ISO 17025 | 320 | 580 | 670 | 430 |
| Total Cyanide | µg/l | 10 | ISO 17025 | < 10 | < 10 | < 10 | < 10 |
| Sulphate as SO4 | µg/l | 45 | ISO 17025 | 93200 | 65600 | 31600 | 10400 |
| Sulphate as SO4 | mg/l | 0.045 | ISO 17025 | 93.2 | 65.6 | 31.6 | 10.4 |
| Ammoniacal Nitrogen as N | µg/l | 15 | ISO 17025 | 72 | 28 | 25 | 41 |
| Dissolved Organic Carbon (DOC) | mg/l | 0.1 | ISO 17025 | 2.28 | 13.3 | 5.4 | 18.9 |
| Hardness - Total | mgCaCO3/l | 1 | ISO 17025 | 478 | 374 | 443 | 290 |
| **Total Phenols** | | | | | | | |
| Total Phenols (monohydric) | µg/l | 10 | ISO 17025 | < 10 | < 10 | < 10 | < 10 |
| **Speciated PAHs** | | | | | | | |
| Naphthalene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Acenaphthylene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Acenaphthene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Fluorene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Phenanthrene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Anthracene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Fluoranthene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Pyrene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Benzo(a)anthracene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Chrysene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Benzo(b)fluoranthene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Benzo(k)fluoranthene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Benzo(a)pyrene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Indeno(1,2,3-cd)pyrene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Dibenz(a,h)anthracene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Benzo(ghi)perylene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| **Total PAH** | | | | | | | |
| Total EPA-16 PAHs | µg/l | 0.16 | ISO 17025 | < 0.16 | < 0.16 | < 0.16 | < 0.16 |

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

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**Analytical Report Number: 22-87539**
**Project / Site name: Plot P, Kingsway Business park**

**Your Order No: PO 2881**

| **Lab Sample Number** | | | | 2445272 | 2445273 | 2445274 | 2445275 |
|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | BH02 | BH03 | BH04 | BH05 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Date Sampled** | | | | 29/09/2022 | 29/09/2022 | 29/09/2022 | 29/09/2022 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Water Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | |
| **Heavy Metals / Metalloids** | | | | | | | |
| Boron (dissolved) | µg/l | 10 | ISO 17025 | 83 | 29 | 96 | 20 |
| Calcium (dissolved) | mg/l | 0.012 | ISO 17025 | 170 | 140 | 120 | 110 |
| Chromium (hexavalent) | µg/l | 5 | ISO 17025 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Magnesium (dissolved) | mg/l | 0.005 | ISO 17025 | 12 | 3.9 | 34 | 3.6 |
| Arsenic (dissolved) | µg/l | 0.15 | ISO 17025 | 0.16 | 3.05 | 0.31 | 1.34 |
| Barium (dissolved) | µg/l | 0.06 | ISO 17025 | 55 | 190 | 220 | 180 |
| Beryllium (dissolved) | µg/l | 0.1 | ISO 17025 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Cadmium (dissolved) | µg/l | 0.02 | ISO 17025 | 0.23 | 0.04 | 0.05 | 0.15 |
| Chromium (dissolved) | µg/l | 0.2 | ISO 17025 | < 0.2 | 1.2 | < 0.2 | 1.4 |
| Copper (dissolved) | µg/l | 0.5 | ISO 17025 | 1.7 | 3 | 8.6 | 12 |
| Lead (dissolved) | µg/l | 0.2 | ISO 17025 | < 0.2 | 0.2 | < 0.2 | 0.5 |
| Mercury (dissolved) | µg/l | 0.05 | ISO 17025 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Nickel (dissolved) | µg/l | 0.5 | ISO 17025 | 4.4 | 5.8 | 4.8 | 8.6 |
| Selenium (dissolved) | µg/l | 0.6 | ISO 17025 | 1.5 | 1.5 | < 0.6 | 1 |
| Vanadium (dissolved) | µg/l | 0.2 | ISO 17025 | < 0.2 | 2.3 | 0.3 | 3.8 |
| Zinc (dissolved) | µg/l | 0.5 | ISO 17025 | 42 | 9.6 | 6.5 | 4.7 |
| **Petroleum Hydrocarbons** | | | | | | | |
| TPH1 (C10 - C40) EH_1D_TOTAL_MS | µg/l | 10 | ISO 17025 | < 10 | < 10 | < 10 | < 10 |
| TPH2 (C6 - C10) HS_1D_TOTAL | µg/l | 10 | ISO 17025 | < 10 | < 10 | < 10 | < 10 |

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.

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**Analytical Report Number : 22-87539**
**Project / Site name: Plot P, Kingsway Business park**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| Metals in water by ICP-OES (dissolved) | Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn). | In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil. | L039-PL | W | ISO 17025 |
| Metals in water by ICP-MS (dissolved) | Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW. | In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS. | L012-PL | W | ISO 17025 |
| Boron in water | Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW | In-house method based on MEWAM | L039-PL | W | ISO 17025 |
| Hexavalent chromium in water | Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry. | In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW. | L080-PL | W | ISO 17025 |
| Electrical conductivity at 20oC of water | Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW | In-house method | L031-PL | W | ISO 17025 |
| Total Hardness of water | Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L045-PL | W | ISO 17025 |
| Monohydric phenols in water | Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar) | L080-PL | W | ISO 17025 |
| Speciated EPA-16 PAHs in water | Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW | In-house method based on USEPA 8270 | L102B-PL | W | ISO 17025 |
| Sulphate in water | Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW. | In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil. | L039-PL | W | ISO 17025 |
| TPH2 (Waters) | Determination of hydrocarbons C6-C10 by headspace GC-MS. Accredited Matrices SW, PW. GW. | In-house method based on USEPA8260 | L088-PL | W | ISO 17025 |
| Total cyanide in water | Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar) | L080-PL | W | ISO 17025 |
| Dissolved Organic Carbon in water | Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L037-PL | W | ISO 17025 |
| Ammoniacal Nitrogen as N in water | Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method. Accredited matrices SW, GW, PW. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L082-PL | W | ISO 17025 |

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**Analytical Report Number : 22-87539**
**Project / Site name: Plot P, Kingsway Business park**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| pH at 20oC in water (automated) | Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW | In house method. | L099-PL | W | ISO 17025 |
| TPH1 (Waters) | Determination of dichloromethane extractable hydrocarbons in water by GC-MS. | In-house method | L070-PL | W | ISO 17025 |

**For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).**
**For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).**
**For method numbers ending in 'PL or B' 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.**

## Information in Support of Analytical Results

### List of HWOL Acronyms and Operators

| Acronym | Descriptions |
|---|---|
| HS | Headspace Analysis |
| MS | Mass spectrometry |
| FID | Flame Ionisation Detector |
| GC | Gas Chromatography |
| EH | Extractable Hydrocarbons (i.e. everything extracted by the solvent(s)) |
| CU | Clean-up - e.g. by Florisil®, silica gel |
| 1D | GC - Single coil/column gas chromatography |
| 2D | GC-GC - Double coil/column gas chromatography |
| Total | Aliphatics & Aromatics |
| AL | Aliphatics |
| AR | Aromatics |
| #1 | EH_2D_Total but with humics mathematically subtracted |
| #2 | EH_2D_Total but with fatty acids mathematically subtracted |
| _ | Operator - understore to separate acronyms (exception for +) |
| + | Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total |

# Sample Deviation Report

**Analytical Report Number : 22-87539**
**Project / Site name: Plot P, Kingsway Business park**

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

| Sample ID | Other ID | Sample Type | Lab Sample Number | Sample Deviation | Test Name | Test Ref | Test Deviation |
|---|---|---|---|---|---|---|---|
| BH02 | None Supplied | W | 2445272 | c | Ammoniacal Nitrogen as N in water | L082-PL | c |
| BH02 | None Supplied | W | 2445272 | c | Electrical conductivity at 20oC of water | L031-PL | c |
| BH02 | None Supplied | W | 2445272 | c | pH at 20oC in water (automated) | L099-PL | c |
| BH03 | None Supplied | W | 2445273 | c | Ammoniacal Nitrogen as N in water | L082-PL | c |
| BH03 | None Supplied | W | 2445273 | c | Electrical conductivity at 20oC of water | L031-PL | c |
| BH03 | None Supplied | W | 2445273 | c | pH at 20oC in water (automated) | L099-PL | c |
| BH04 | None Supplied | W | 2445274 | c | Ammoniacal Nitrogen as N in water | L082-PL | c |
| BH04 | None Supplied | W | 2445274 | c | Electrical conductivity at 20oC of water | L031-PL | c |
| BH04 | None Supplied | W | 2445274 | c | pH at 20oC in water (automated) | L099-PL | c |
| BH05 | None Supplied | W | 2445275 | c | Ammoniacal Nitrogen as N in water | L082-PL | c |
| BH05 | None Supplied | W | 2445275 | c | Electrical conductivity at 20oC of water | L031-PL | c |
| BH05 | None Supplied | W | 2445275 | c | pH at 20oC in water (automated) | L099-PL | c |

# Appendix 7 : Geotechnical Analysis Results

# TEST CERTIFICATE

**DETERMINATION OF LIQUID AND PLASTIC LIMITS**
Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

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

4041

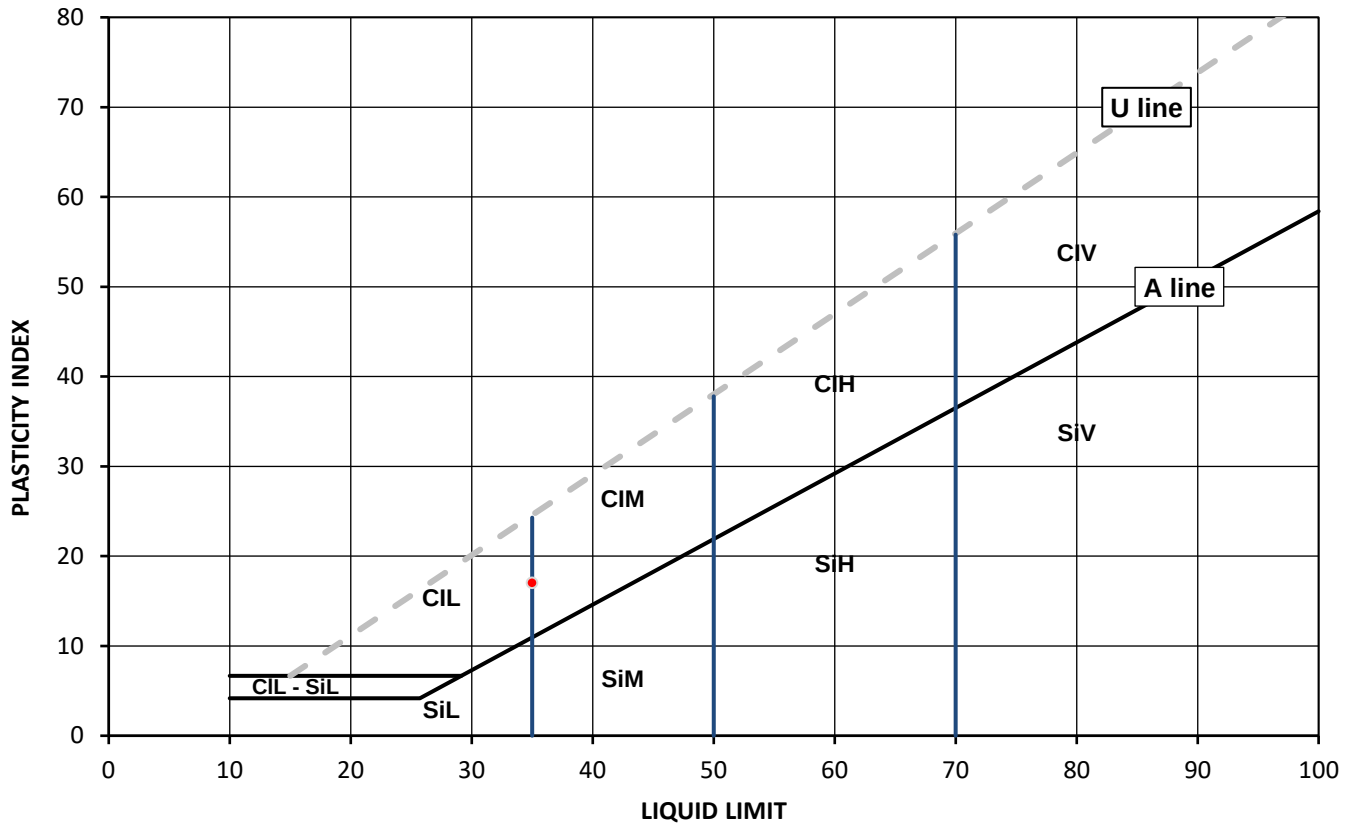
| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409075 | Depth Top [m]: | 1.00 |
| Hole No.: | TP103 | Depth Base [m]: | 1.00 |
| Sample Reference: | Not Given | Sample Type: | D |
| Sample Description: | Brownish grey sandy CLAY | | |
| Sample Preparation: | Tested in natural condition | | |

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 21 | 35 | 18 | 17 | 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: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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**Signed:**

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 236.12**

# TEST CERTIFICATE

**DETERMINATION OF LIQUID AND PLASTIC LIMITS**
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Northampton NN4 7EB

4041

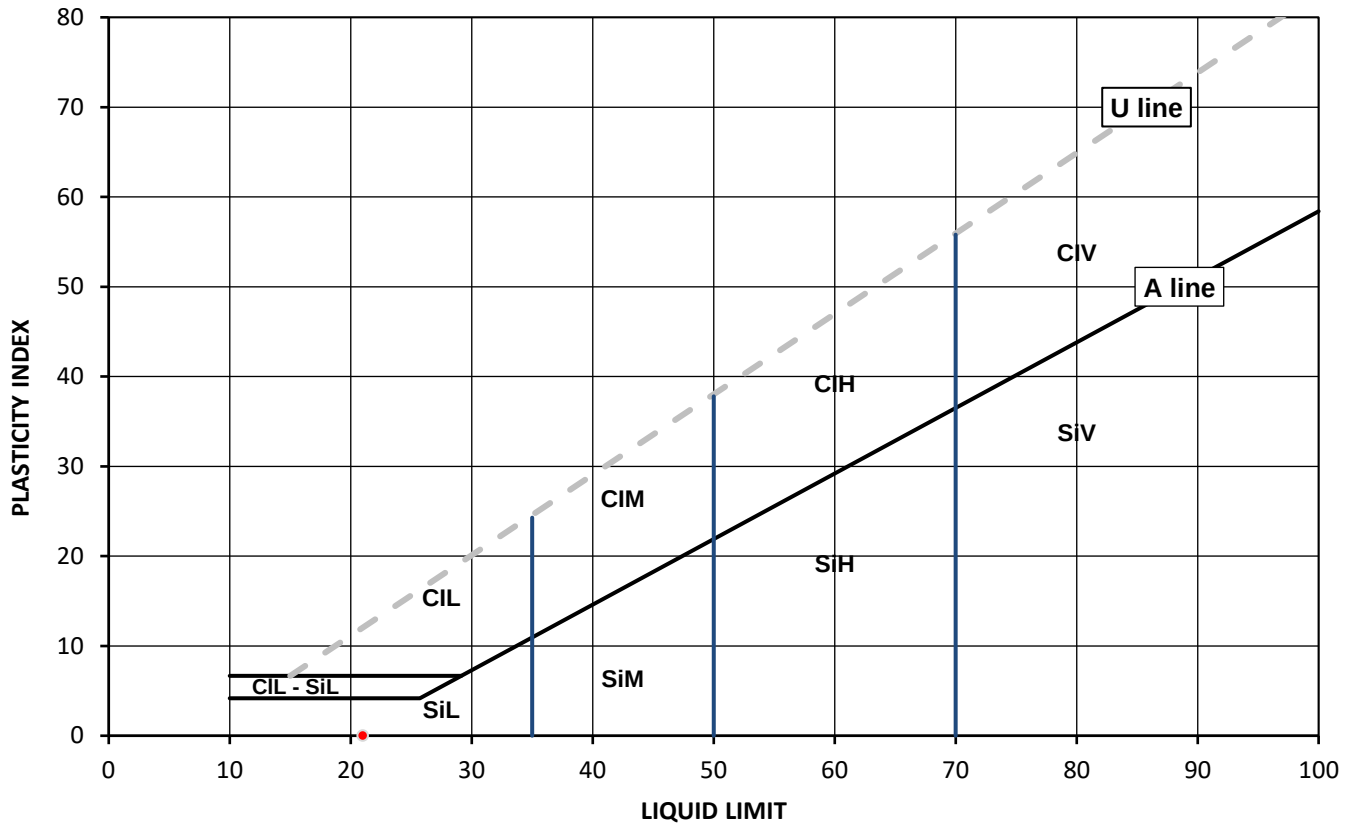
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|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409081 | Depth Top [m]: | 0.40 |
| Hole No.: | TP109 | Depth Base [m]: | 0.40 |
| Sample Reference: | Not Given | Sample Type: | D |
| Sample Description: | Brownish grey slightly gravelly silty SAND | | |
| Sample Preparation: | Tested after washing to remove >425um | | |

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 19 | 21 | NP | NP | 96 |




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: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks: NP - non plastic

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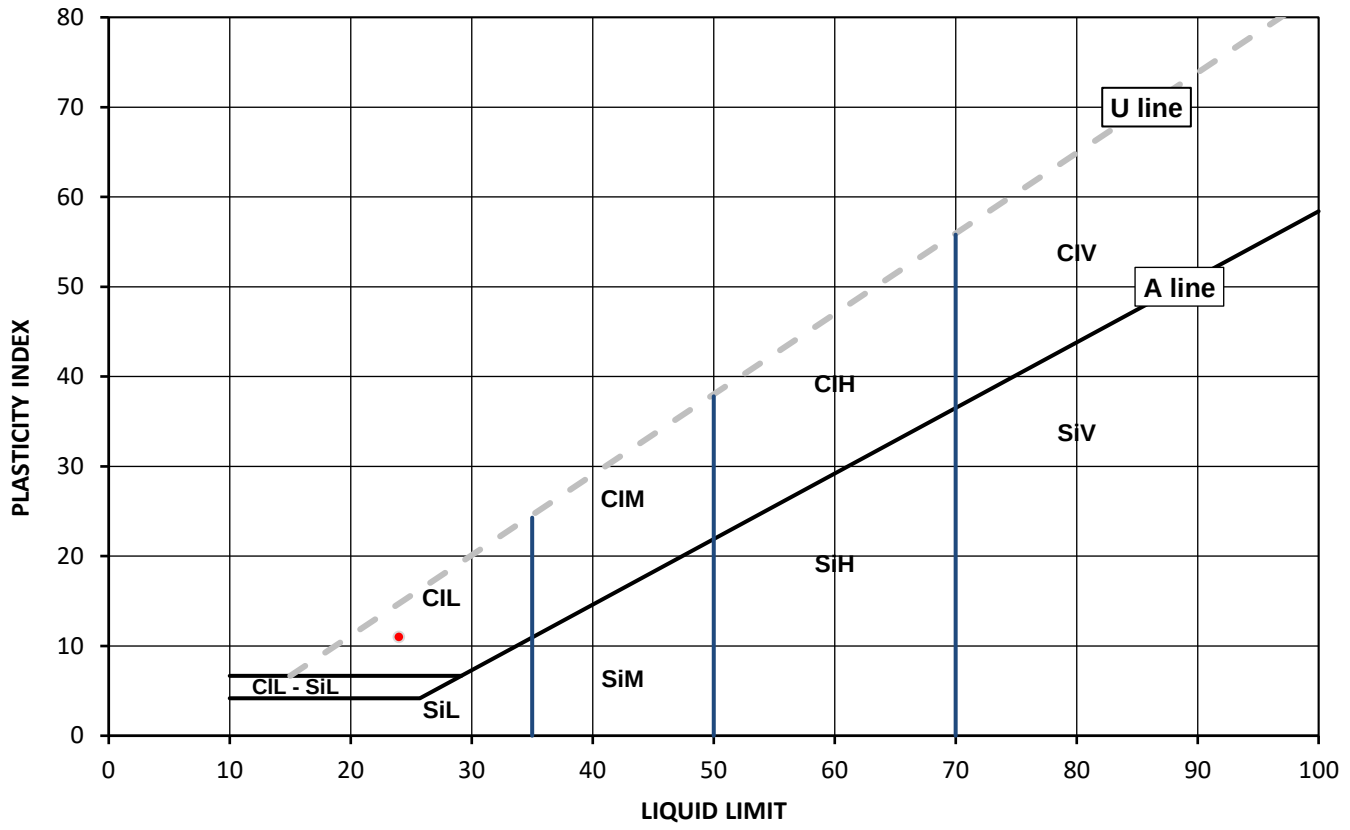
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|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409084 | Depth Top [m]: | 2.00 |
| Hole No.: | TP110 | Depth Base [m]: | 2.00 |
| Sample Reference: | Not Given | Sample Type: | D |
| Sample Description: | Brownish grey slightly gravelly very sandy CLAY | | |
| Sample Preparation: | Tested after >425um removed by hand | | |

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 18 | 24 | 13 | 11 | 95 |




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: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Brackmills Industrial Estate
Northampton NN4 7EB

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Environmental Science

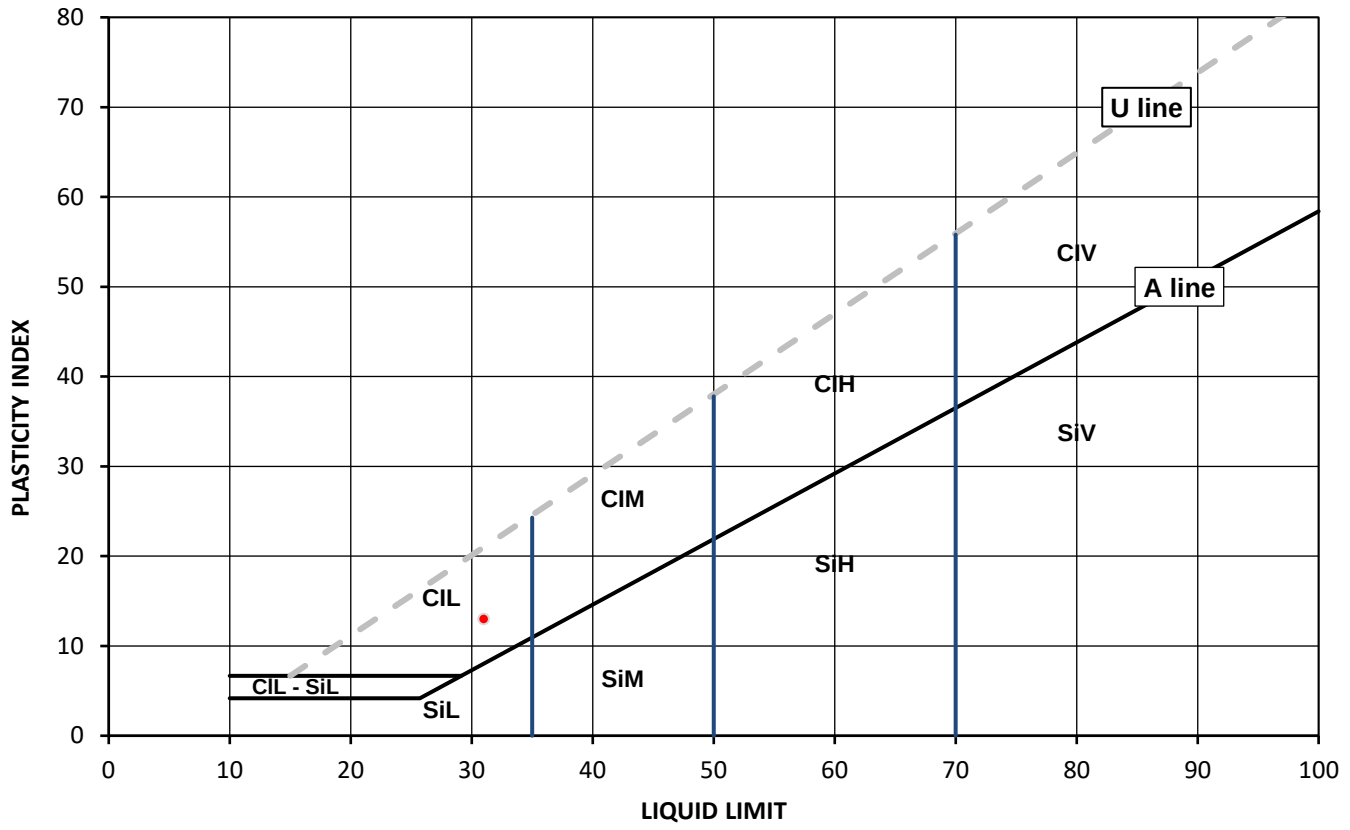
| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409085 | Depth Top [m]: | 0.80 |
| Hole No.: | TP111 | Depth Base [m]: | 0.80 |
| Sample Reference: | Not Given | Sample Type: | D |
| Sample Description: | Brownish grey slightly gravelly very sandy CLAY | | |
| Sample Preparation: | Tested after >425um removed by hand | | |

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 18 | 31 | 18 | 13 | 98 |




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: Water Content by BS 1377-2: 1990: Clause 3.2

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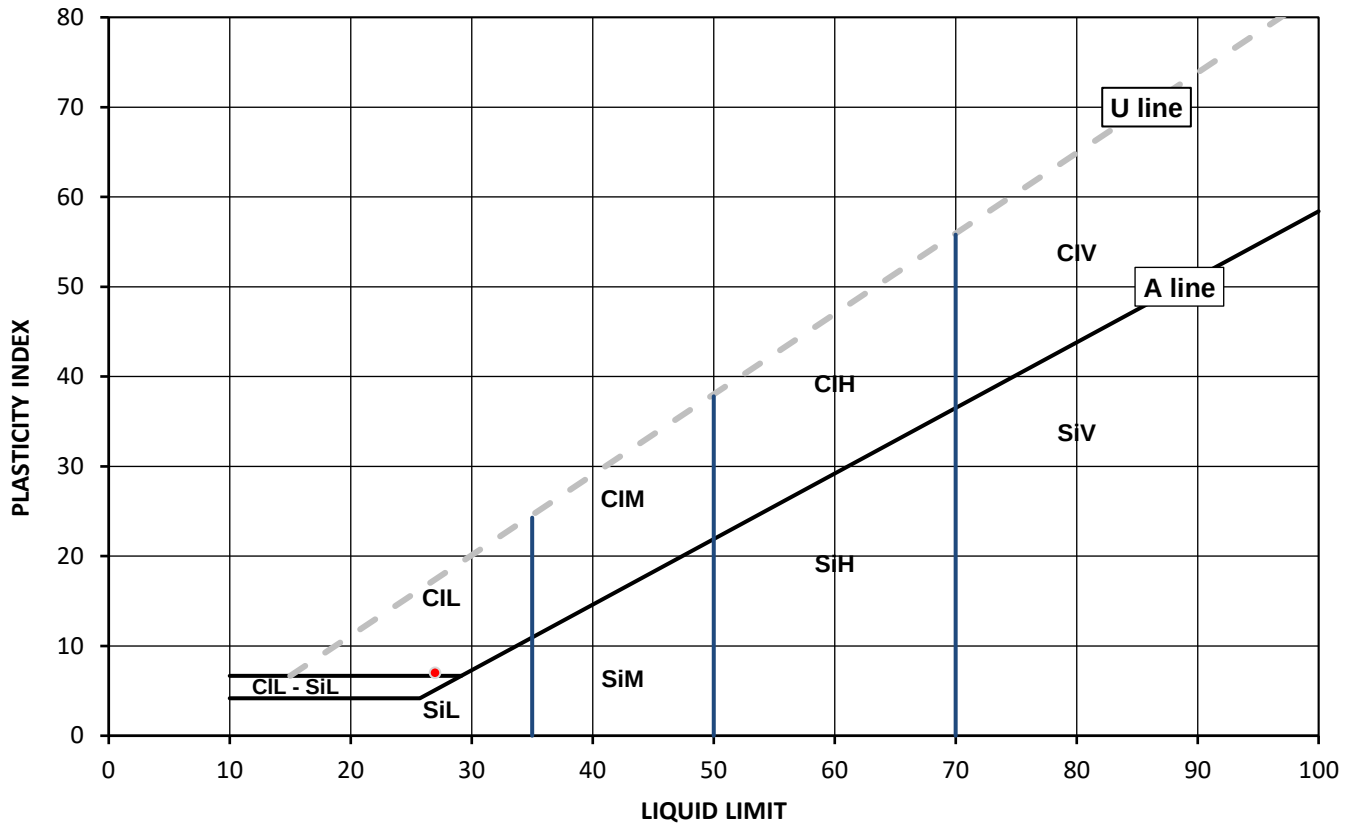
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|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409086 | Depth Top [m]: | 1.00 |
| Hole No.: | TP113 | Depth Base [m]: | 1.00 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brown very sandy silty CLAY | | |
| Sample Preparation: | Tested in natural condition | | |

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 18 | 27 | 20 | 7 | 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: Water Content by BS 1377-2: 1990: Clause 3.2

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**GF 236.12**

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Northampton NN4 7EB

4041

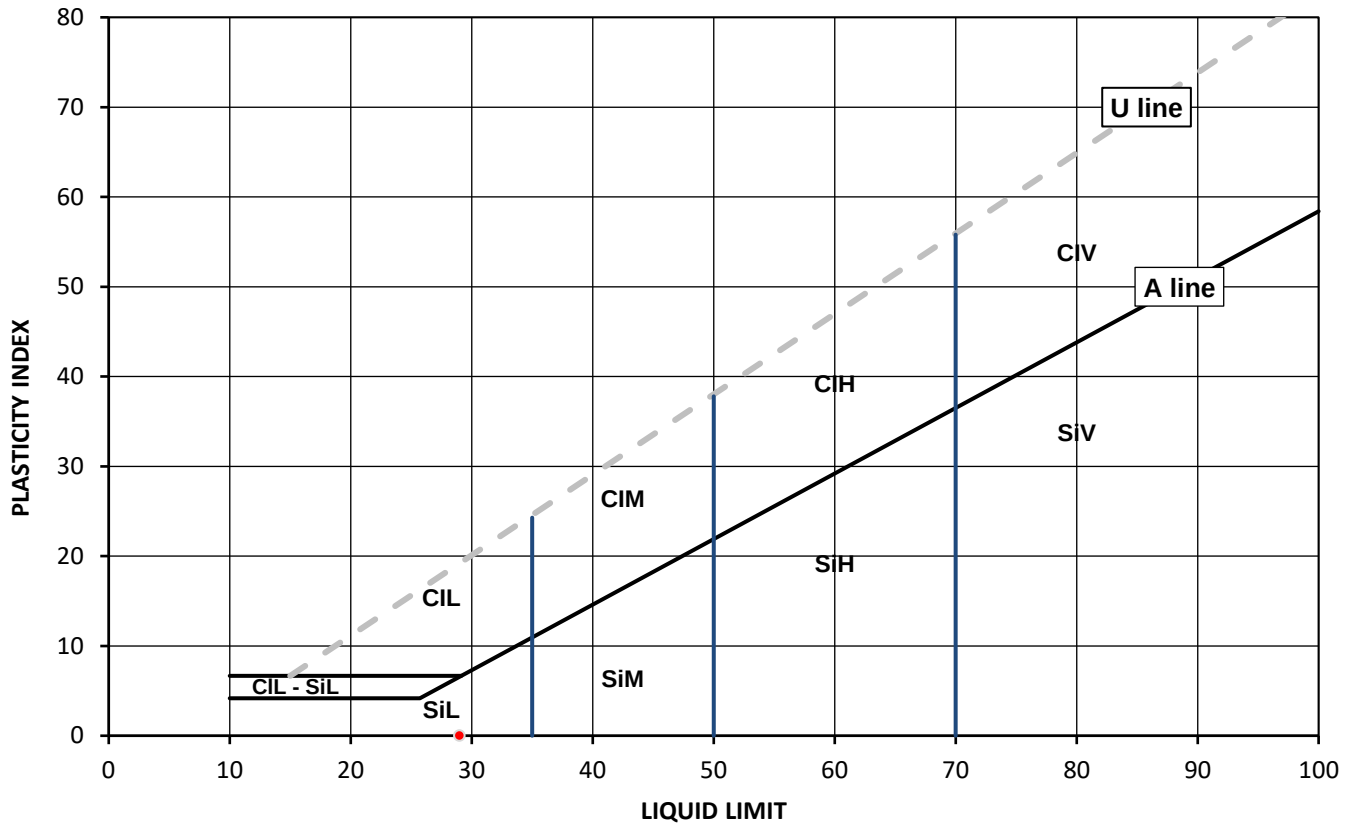
| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409088 | Depth Top [m]: | 1.80 |
| Hole No.: | TP114 | Depth Base [m]: | 1.80 |
| Sample Reference: | Not Given | Sample Type: | D |
| Sample Description: | Brown slightly clayey SILT | | |
| Sample Preparation: | Tested in natural condition | | |

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 22 | 29 | NP | NP | 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: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks: NP - non plastic

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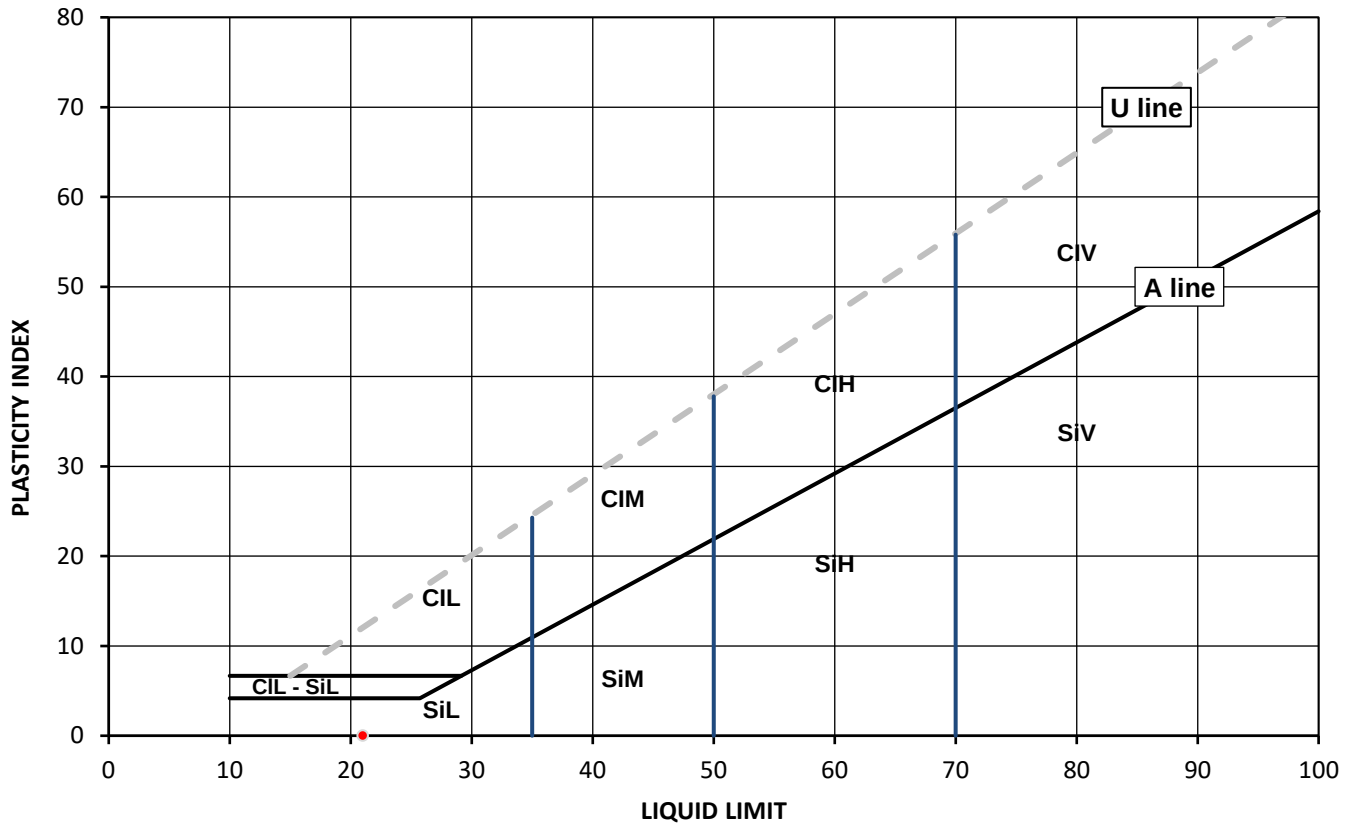
| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409090 | Depth Top [m]: | 1.50 |
| Hole No.: | TP115 | Depth Base [m]: | 1.50 |
| Sample Reference: | Not Given | Sample Type: | D |
| Sample Description: | Light brown slightly gravelly slightly clayey SAND | | |
| Sample Preparation: | Tested after washing to remove >425um | | |

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 12 | 21 | NP | NP | 86 |




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: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks: NP - non plastic

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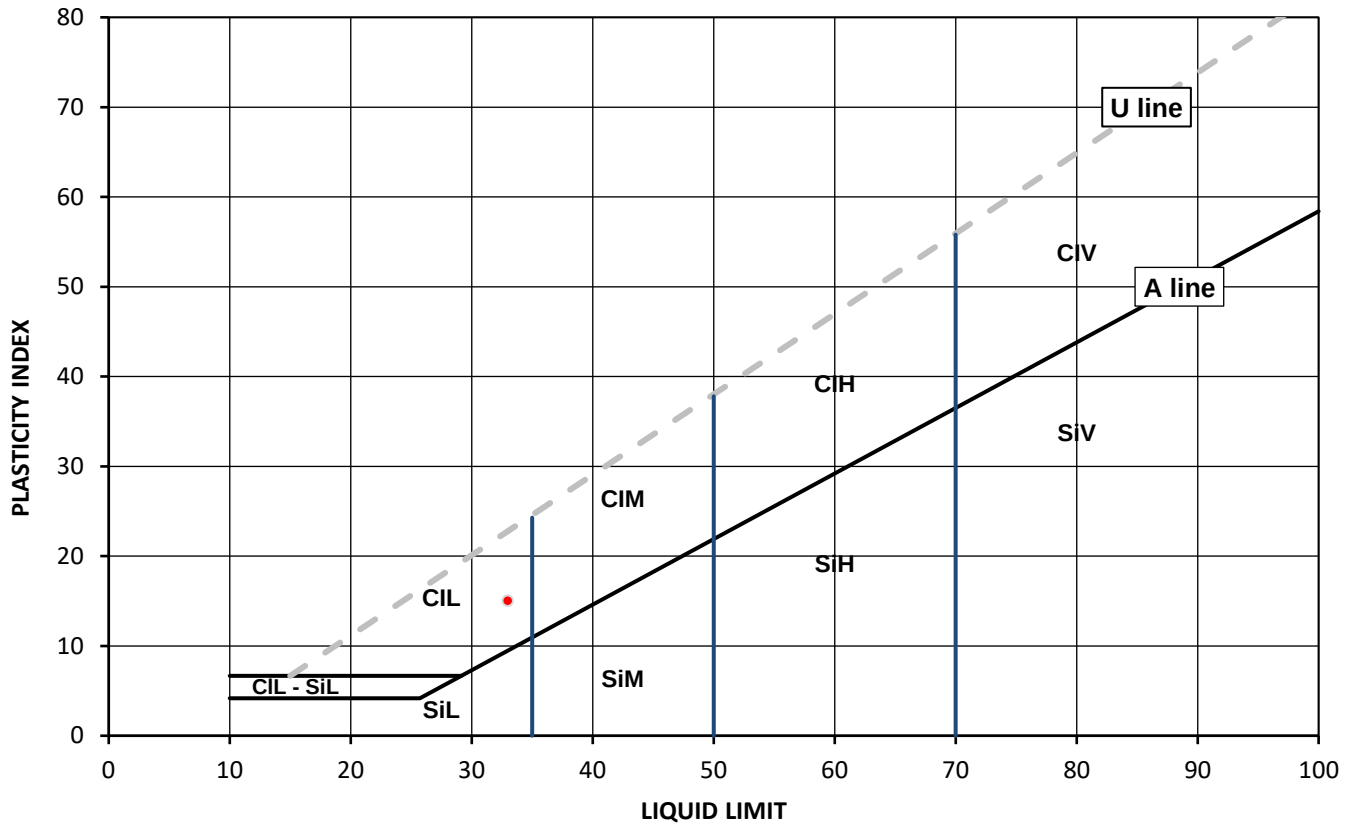
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|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409091 | Depth Top [m]: | 1.20 |
| Hole No.: | TP116 | Depth Base [m]: | 1.20 |
| Sample Reference: | Not Given | Sample Type: | D |
| Sample Description: | Brownish grey slightly gravelly very sandy CLAY | | |
| Sample Preparation: | Tested after >425um removed by hand | | |

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 20 | 33 | 18 | 15 | 99 |




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: Water Content by BS 1377-2: 1990: Clause 3.2

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UKAS TESTING 4041

Environmental Science

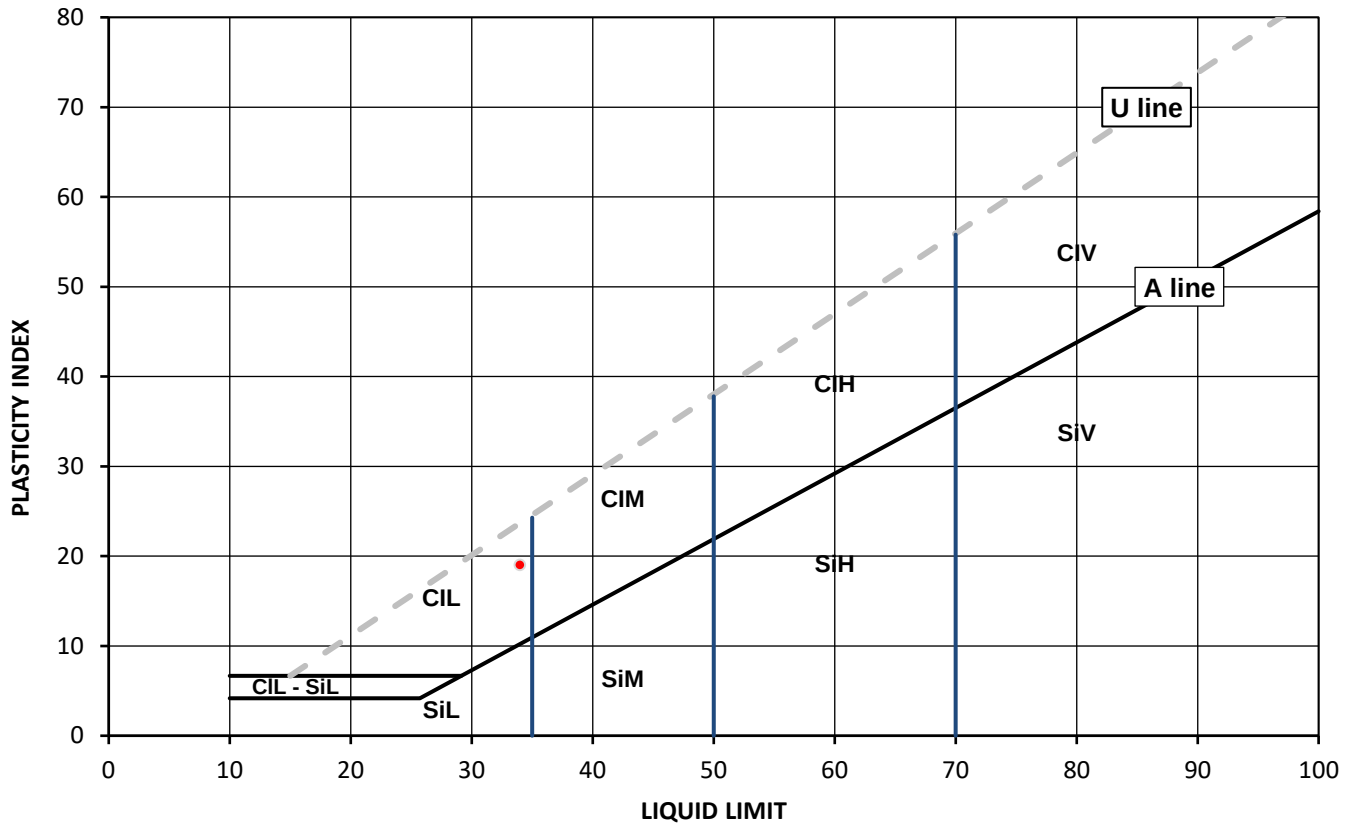
| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409093 | Depth Top [m]: | 1.00 |
| Hole No.: | TP117 | Depth Base [m]: | 1.00 |
| Sample Reference: | Not Given | Sample Type: | D |
| Sample Description: | Dark brown slightly gravelly very sandy CLAY | | |
| Sample Preparation: | Tested after >425um removed by hand | | |

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 19 | 34 | 15 | 19 | 99 |




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: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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.

**Signed:** Monika Siewior

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 236.12**

# TEST CERTIFICATE

**DETERMINATION OF LIQUID AND PLASTIC LIMITS**
Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

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

4041

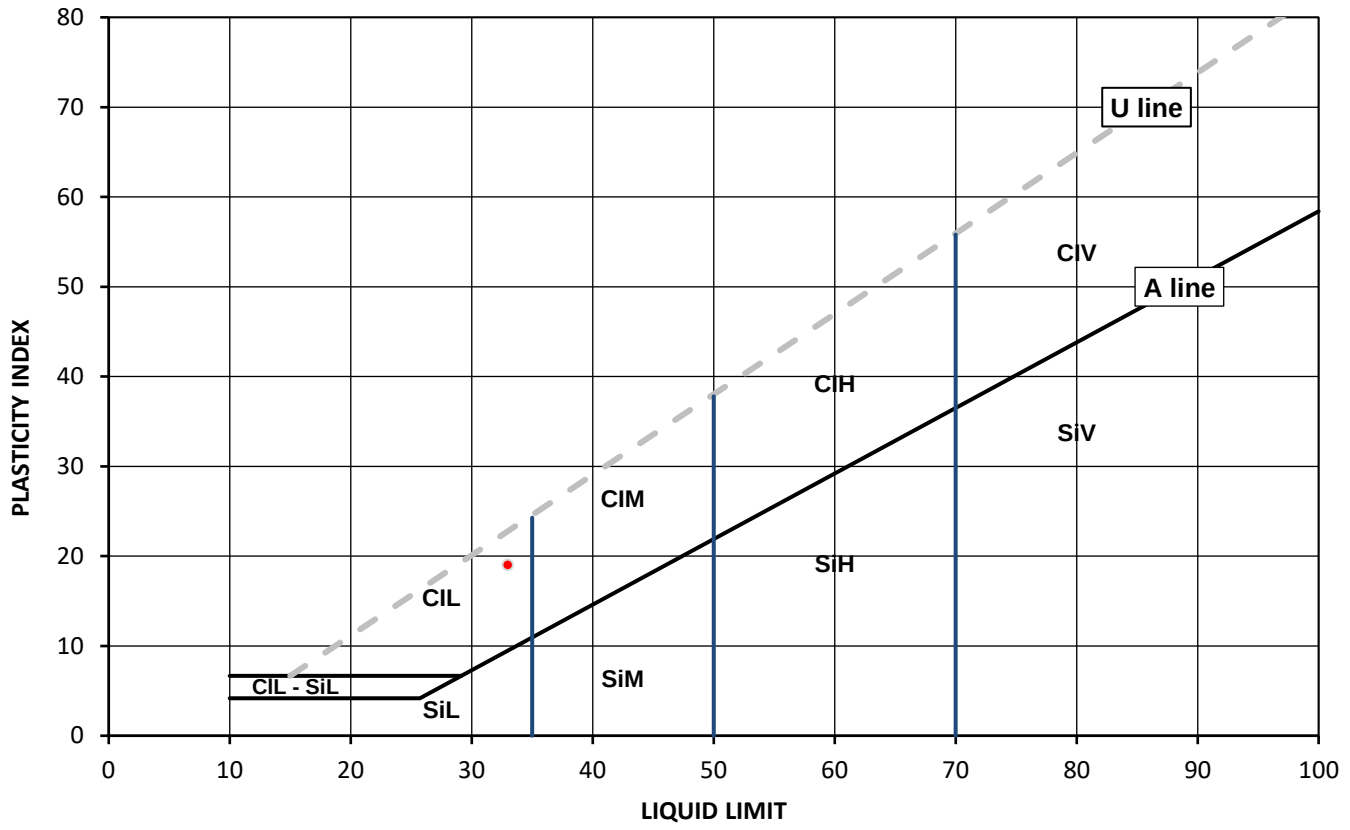
| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409094 | Depth Top [m]: | 0.60 |
| Hole No.: | TP118 | Depth Base [m]: | 0.60 |
| Sample Reference: | Not Given | Sample Type: | D |
| Sample Description: | Dark brown very sandy CLAY | | |
| Sample Preparation: | Tested in natural condition | | |

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 18 | 33 | 14 | 19 | 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: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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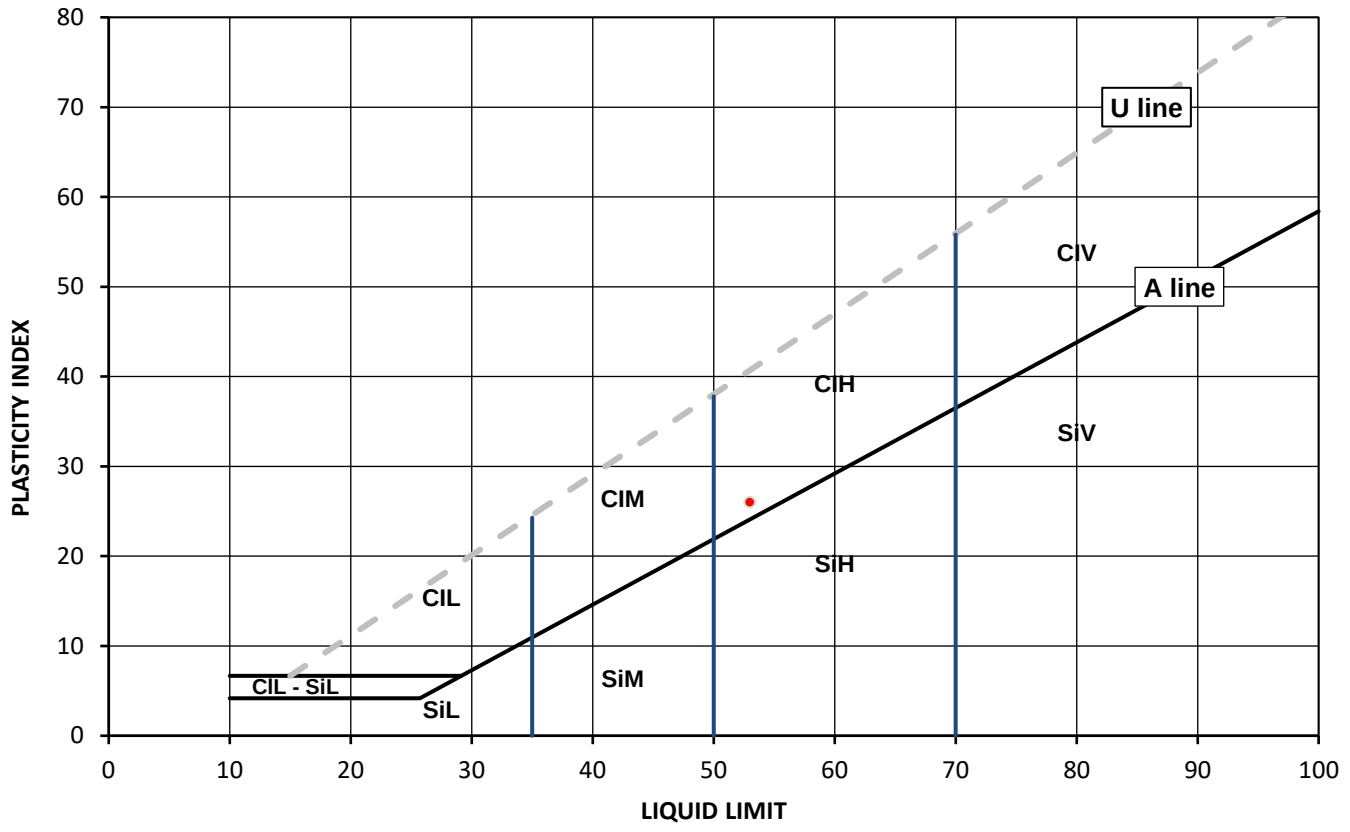
| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409098 | Depth Top [m]: | 1.20 |
| Hole No.: | TP121 | Depth Base [m]: | 1.20 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Dark grey slightly sandy CLAY | | |
| Sample Preparation: | Tested in natural condition | | |

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 54 | 53 | 27 | 26 | 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: Water Content by BS 1377-2: 1990: Clause 3.2

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**Date Reported:** 15/09/2022

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# TEST CERTIFICATE

**DETERMINATION OF LIQUID AND PLASTIC LIMITS**
Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

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4041

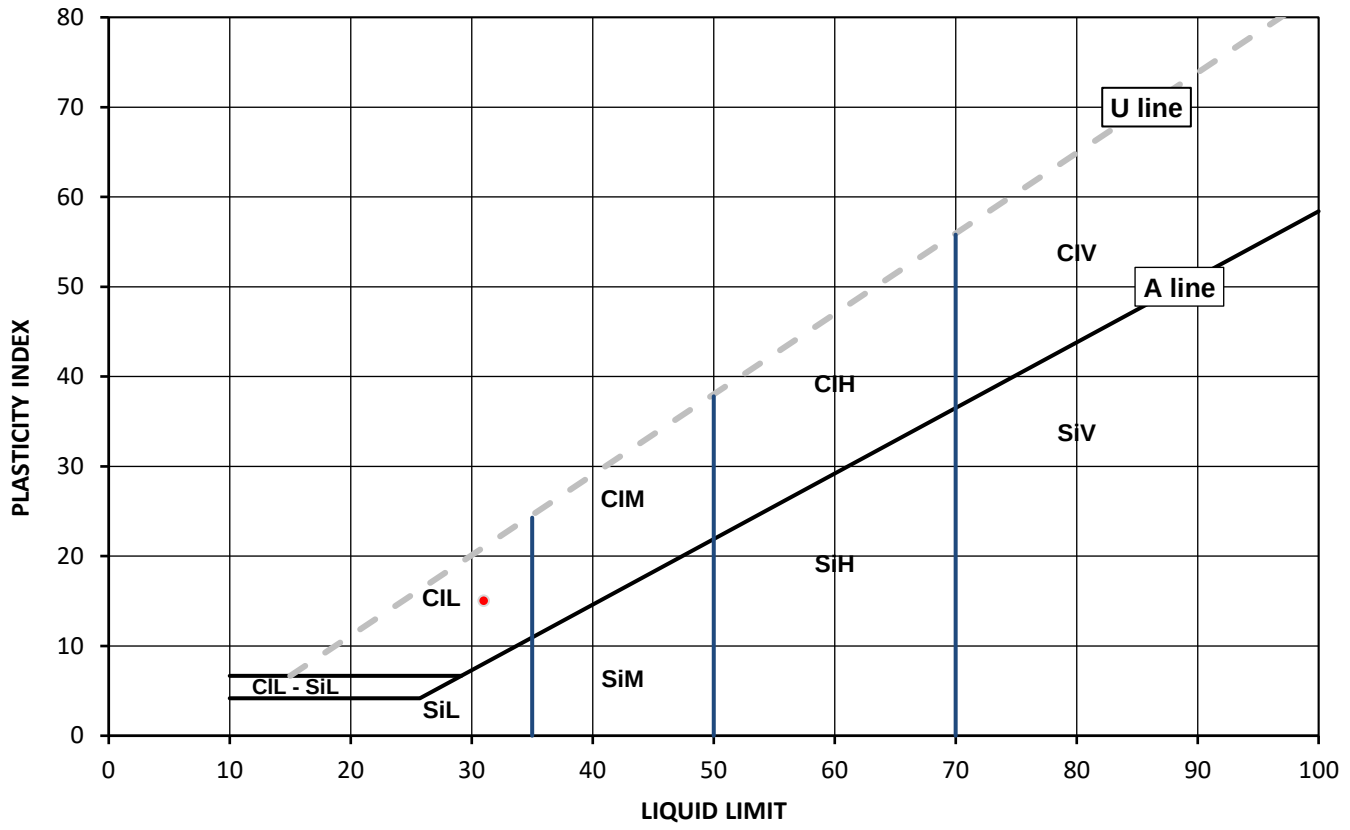
| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409099 | Depth Top [m]: | 1.00 |
| Hole No.: | BH03 | Depth Base [m]: | 1.00 |
| Sample Reference: | Not Given | Sample Type: | D |
| Sample Description: | Dark brown slightly gravelly very sandy CLAY | | |
| Sample Preparation: | Tested after washing to remove >425um | | |

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 19 | 31 | 16 | 15 | 93 |




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: Water Content by BS 1377-2: 1990: Clause 3.2

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**Date Reported:** 15/09/2022

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# TEST CERTIFICATE

**DETERMINATION OF LIQUID AND PLASTIC LIMITS**
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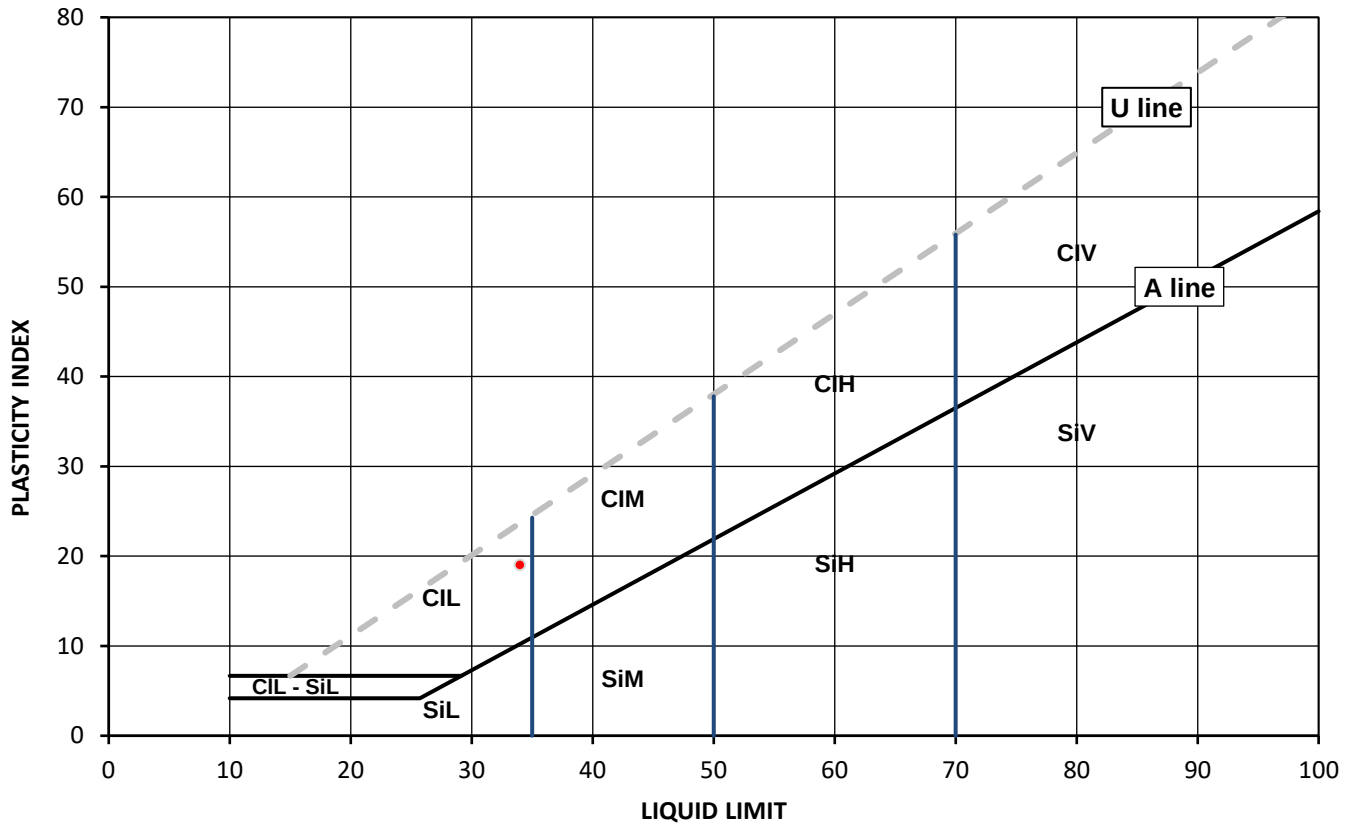
| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409101 | Depth Top [m]: | 3.50 |
| Hole No.: | BH03 | Depth Base [m]: | 3.50 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brown slighty gravelly very sandy CLAY | | |
| Sample Preparation: | Tested after washing to remove >425um | | |

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 16 | 34 | 15 | 19 | 90 |




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: Water Content by BS 1377-2: 1990: Clause 3.2

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**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 236.12**

# TEST CERTIFICATE

**DETERMINATION OF LIQUID AND PLASTIC LIMITS**
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Northampton NN4 7EB

4041

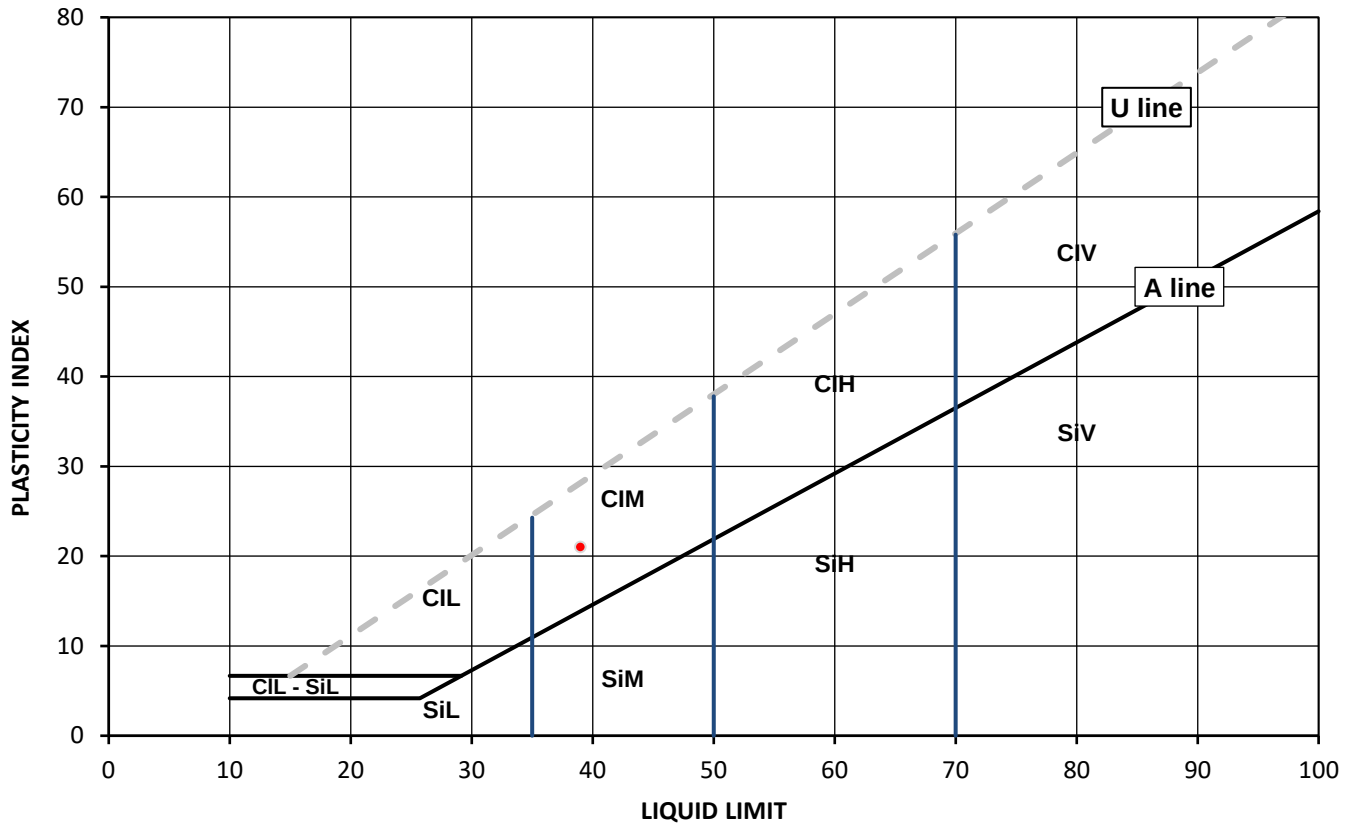
| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409108 | Depth Top [m]: | 4.50 |
| Hole No.: | BH04 | Depth Base [m]: | 4.50 |
| Sample Reference: | Not Given | Sample Type: | D |
| Sample Description: | Brown slightly gravelly sandy CLAY | | |
| Sample Preparation: | Tested after >425um removed by hand | | |

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 18 | 39 | 18 | 21 | 98 |




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: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 236.12**

# SUMMARY REPORT

## SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

Water Content by BS 1377-2:1990: Clause 3.2; 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

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

4041

Client: BWB Consulting Limited

Client Address: Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH

Contact: Mike Harper

Site Address: Plot P, Kingsway Bus. Park

Client Reference: 210939
Job Number: 22-81413
Date Sampled: Not Given
Date Received: 05/08/2022
Date Tested: 07/09/2022
Sampled By: Not Given

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

### Test results

| Laboratory Reference | Hole No. | Sample | | | | Description | Remarks | Water Content BS 1377-2 [ W ] | Water Content BS EN ISO 17892-2 [ W ] | Atterberg | | | | Density | | | Total Porosity# | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Reference | Depth Top | Depth Base | Type | | | | | % Passing 425um | WL | Wp | Ip | bulk | dry | PD | | | |
| | | | m | m | | | | % | % | % | % | % | % | Mg/m3 | Mg/m3 | Mg/m3 | % | | |
| 2409099 | BH03 | Not Given | 1.00 | 1.00 | D | Dark brown slightly gravelly very sandy CLAY | Atterberg 4 Point | 19 | | 93 | 31 | 16 | 15 | | | | | | |
| 2409101 | BH03 | Not Given | 3.50 | 3.50 | B | Brown slighty gravelly very sandy CLAY | Atterberg 4 Point | 16 | | 90 | 34 | 15 | 19 | | | | | | |
| 2409105 | BH04 | Not Given | 0.70 | 1.20 | B | Dark grey sandy gravelly CLAY | | | | | | | | | | 2.54 | | | |
| 2409108 | BH04 | Not Given | 4.50 | 4.50 | D | Brown slightly gravelly sandy CLAY | Atterberg 4 Point | 18 | | 98 | 39 | 18 | 21 | | | | | | |
| 2409111 | BH05 | Not Given | 1.20 | 1.65 | B | Grey silty SAND | | | | | | | | | | 2.60 | | | |
| 2409073 | TP101 | Not Given | 1.00 | 1.00 | B | Mottled brown sandy GRAVEL | | | | | | | | | | 2.28 | | | |
| 2409074 | TP102 | Not Given | 1.30 | 1.30 | B | Brown slightly clayey SAND | | | | | | | | | | 2.63 | | | |
| 2409075 | TP103 | Not Given | 1.00 | 1.00 | D | Brownish grey sandy CLAY | Atterberg 4 Point | 21 | | 100 | 35 | 18 | 17 | | | | | | |
| 2409077 | TP104 | Not Given | 1.00 | 1.00 | B | Light brown slightly clayey slightly gravelly SAND | | | | | | | | | | 2.66 | | | |
| 2409078 | TP105 | Not Given | 1.50 | 1.50 | D | Yellowish brown slightly sandy CLAY | | | | | | | | | | 2.65 | | | |

Note: # Non accredited; NP - Non plastic

Comments:

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**Signed:**

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 238.14**

# SUMMARY REPORT

## SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

Water Content by BS 1377-2:1990: Clause 3.2; 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

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

4041

Client: BWB Consulting Limited

Client Address: Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH

Contact: Mike Harper

Site Address: Plot P, Kingsway Bus. Park

Client Reference: 210939
Job Number: 22-81413
Date Sampled: Not Given
Date Received: 05/08/2022
Date Tested: 07/09/2022
Sampled By: Not Given

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

### Test results

| Laboratory Reference | Hole No. | Sample | | | | Description | Remarks | Water Content BS 1377-2 [ W ] | Water Content BS EN ISO 17892-2 [ 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 | % | | |
| 2409081 | TP109 | Not Given | 0.40 | 0.40 | D | Brownish grey slightly gravelly silty SAND | Atterberg 4 Point | 19 | | 96 | 21 | NP | NP | | | | | | |
| 2409083 | TP110 | Not Given | 0.50 | 0.50 | B | Dark grey gravelly clayey SAND | | | | | | | | | | 2.22 | | | |
| 2409084 | TP110 | Not Given | 2.00 | 2.00 | D | Brownish grey slightly gravelly very sandy CLAY | Atterberg 4 Point | 18 | | 95 | 24 | 13 | 11 | | | | | | |
| 2409085 | TP111 | Not Given | 0.80 | 0.80 | D | Brownish grey slightly gravelly very sandy CLAY | Atterberg 4 Point | 18 | | 98 | 31 | 18 | 13 | | | | | | |
| 2409086 | TP113 | Not Given | 1.00 | 1.00 | B | Brown very sandy silty CLAY | Atterberg 4 Point | 18 | | 100 | 27 | 20 | 7 | | | | | | |
| 2409087 | TP114 | Not Given | 1.60 | 1.60 | B | Grey clayey very sandy SILT | | | | | | | | | | 2.63 | | | |
| 2409088 | TP114 | Not Given | 1.80 | 1.80 | D | Brown slightly clayey SILT | Atterberg 4 Point | 22 | | 100 | 29 | NP | NP | | | | | | |
| 2409089 | TP115 | Not Given | 1.00 | 1.00 | B | Light brown slightly gravelly SAND | | | | | | | | | | 2.65 | | | |
| 2409090 | TP115 | Not Given | 1.50 | 1.50 | D | Light brown slightly gravelly slightly clayey SAND | Atterberg 4 Point | 12 | | 86 | 21 | NP | NP | | | | | | |
| 2409091 | TP116 | Not Given | 1.20 | 1.20 | D | Brownish grey slightly gravelly very sandy CLAY | Atterberg 4 Point | 20 | | 99 | 33 | 18 | 15 | | | | | | |

Note: # Non accredited; NP - Non plastic

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**Signed:**

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 238.14**

# SUMMARY REPORT

## SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

Water Content by BS 1377-2:1990: Clause 3.2; 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

i2 Analytical Ltd
Unit 8 Harrowden Road
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Northampton NN4 7EB

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Client: BWB Consulting Limited

Client Address: Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH

Contact: Mike Harper

Site Address: Plot P, Kingsway Bus. Park

Client Reference: 210939
Job Number: 22-81413
Date Sampled: Not Given
Date Received: 05/08/2022
Date Tested: 07/09/2022
Sampled By: Not Given

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

### Test results

| Laboratory Reference | Hole No. | Sample | | | | Description | Remarks | Water Content BS 1377-2 [ W ] | Water Content BS EN ISO 17892-2 [ W ] | Atterberg | | | | Density | | | Total Porosity# | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Reference | Depth Top | Depth Base | Type | | | | | % Passing 425um | WL | Wp | Ip | bulk | dry | PD | | | |
| | | | m | m | | | | % | % | % | % | % | % | Mg/m3 | Mg/m3 | Mg/m3 | % | | |
| 2409093 | TP117 | Not Given | 1.00 | 1.00 | D | Dark brown slightly gravelly very sandy CLAY | Atterberg 4 Point | 19 | | 99 | 34 | 15 | 19 | | | | | | |
| 2409094 | TP118 | Not Given | 0.60 | 0.60 | D | Dark brown very sandy CLAY | Atterberg 4 Point | 18 | | 100 | 33 | 14 | 19 | | | | | | |
| 2409095 | TP118 | Not Given | 1.00 | 1.00 | B | Brown slightly gravelly CLAY | | | | | | | | | | 2.56 | | | |
| 2409096 | TP118 | Not Given | 1.70 | 1.70 | B | Dark brown slightly gravelly CLAY | | | | | | | | | | 2.66 | | | |
| 2409098 | TP121 | Not Given | 1.20 | 1.20 | B | Dark grey slightly sandy CLAY | Atterberg 4 Point | 54 | | 100 | 53 | 27 | 26 | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

Note: # Non accredited; NP - Non plastic

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**Signed:**

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 238.14**

# SUMMARY REPORT

## DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

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

4041

Client: BWB Consulting Limited

Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EH

Contact: Mike Harper

Site Address: Plot P, Kingsway Bus. Park

Client Reference: 210939
Job Number: 22-81413
Date Sampled: Not Given
Date Received: 05/08/2022
Date Tested: 07/09/2022
Sampled By: Not Given

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

### Test results

| Laboratory Reference | Hole No. | Sample | | | | Description | Remarks | WC | Sample preparation / Oven temperature at the time of testing | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Reference | Depth Top m | Depth Base m | Type | | | % | | | | |
| 2409099 | BH03 | Not Given | 1.00 | 1.00 | D | Dark brown slightly gravelly very sandy CLAY | | 19 | Sample was quartered, oven dried at 106.2 °C | | | |
| 2409101 | BH03 | Not Given | 3.50 | 3.50 | B | Brown slighty gravelly very sandy CLAY | | 16 | Sample was quartered, oven dried at 106.2 °C | | | |
| 2409108 | BH04 | Not Given | 4.50 | 4.50 | D | Brown slightly gravelly sandy CLAY | | 18 | Sample was quartered, oven dried at 106.2 °C | | | |
| 2409075 | TP103 | Not Given | 1.00 | 1.00 | D | Brownish grey sandy CLAY | | 21 | Sample was quartered, oven dried at 106.2 °C | | | |
| 2409081 | TP109 | Not Given | 0.40 | 0.40 | D | Brownish grey slightly gravelly silty SAND | | 19 | Sample was quartered, oven dried at 106.2 °C | | | |
| 2409084 | TP110 | Not Given | 2.00 | 2.00 | D | Brownish grey slightly gravelly very sandy CLAY | | 18 | Sample was quartered, oven dried at 106.2 °C | | | |
| 2409085 | TP111 | Not Given | 0.80 | 0.80 | D | Brownish grey slightly gravelly very sandy CLAY | | 18 | Sample was quartered, oven dried at 106.2 °C | | | |
| 2409086 | TP113 | Not Given | 1.00 | 1.00 | B | Brown very sandy silty CLAY | | 18 | Sample was quartered, oven dried at 106.2 °C | | | |
| 2409088 | TP114 | Not Given | 1.80 | 1.80 | D | Brown slightly clayey SILT | | 22 | Sample was quartered, oven dried at 106.2 °C | | | |
| 2409090 | TP115 | Not Given | 1.50 | 1.50 | D | Light brown slightly gravelly slightly clayey SAND | | 12 | Sample was quartered, oven dried at 106.2 °C | | | |

Comments:

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**Signed:**

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 099.16**

# SUMMARY REPORT

**DETERMINATION OF WATER CONTENT**

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

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

4041

Client: BWB Consulting Limited

Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EH

Contact: Mike Harper

Site Address: Plot P, Kingsway Bus. Park

Client Reference: 210939
Job Number: 22-81413
Date Sampled: Not Given
Date Received: 05/08/2022
Date Tested: 07/09/2022
Sampled By: Not Given

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

## Test results

| Laboratory Reference | Hole No. | Sample | | | | Description | Remarks | WC | Sample preparation / Oven temperature at the time of testing | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Reference | Depth Top m | Depth Base m | Type | | | % | | | | |
| 2409091 | TP116 | Not Given | 1.20 | 1.20 | D | Brownish grey slightly gravelly very sandy CLAY | | 20 | Sample was quartered, oven dried at 106.2 °C | | | |
| 2409093 | TP117 | Not Given | 1.00 | 1.00 | D | Dark brown slightly gravelly very sandy CLAY | | 19 | Sample was quartered, oven dried at 106.2 °C | | | |
| 2409094 | TP118 | Not Given | 0.60 | 0.60 | D | Dark brown very sandy CLAY | | 18 | Sample was quartered, oven dried at 106.2 °C | | | |
| 2409098 | TP121 | Not Given | 1.20 | 1.20 | B | Dark grey slightly sandy CLAY | | 54 | Sample was quartered, oven dried at 107.8 °C | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

Comments:

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**Signed:**

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 099.16**

# TEST CERTIFICATE

**DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Tested in Accordance with: BS 1377-2: 1990

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

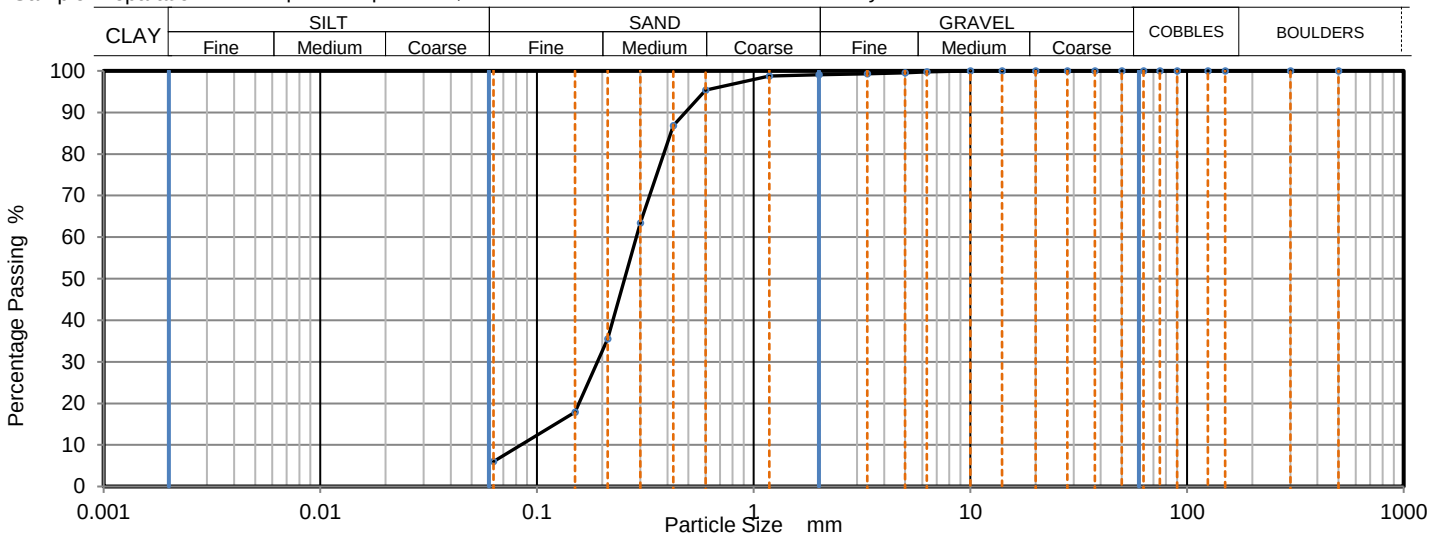
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409079 | Depth Top [m]: | 2.50 |
| Hole No.: | TP105 | Depth Base [m]: | 2.50 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brown slightly clayey SAND | | |
| Sample Preparation: | Sample was quartered, oven dried at 106.2 °C and broken down by hand. | | |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | 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 | 99 | | |
| 2 | 99 | | |
| 1.18 | 99 | | |
| 0.6 | 95 | | |
| 0.425 | 87 | | |
| 0.3 | 63 | | |
| 0.212 | 36 | | |
| 0.15 | 18 | | |
| 0.063 | 7 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 1 |
| Sand | 93 |
| | |
| Fines <0.063mm | 7 |

| Grading Analysis | | |
|---|---|---|
| D100 | mm | 10 |
| D60 | mm | 0.288 |
| D30 | mm | 0.19 |
| D10 | mm | 0.0818 |
| Uniformity Coefficient | | 3.5 |
| Curvature Coefficient | | 1.5 |

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

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

Remarks:

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**Signed:** Monika Siewior

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 100.21**

# TEST CERTIFICATE

**DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Tested in Accordance with: BS 1377-2: 1990

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

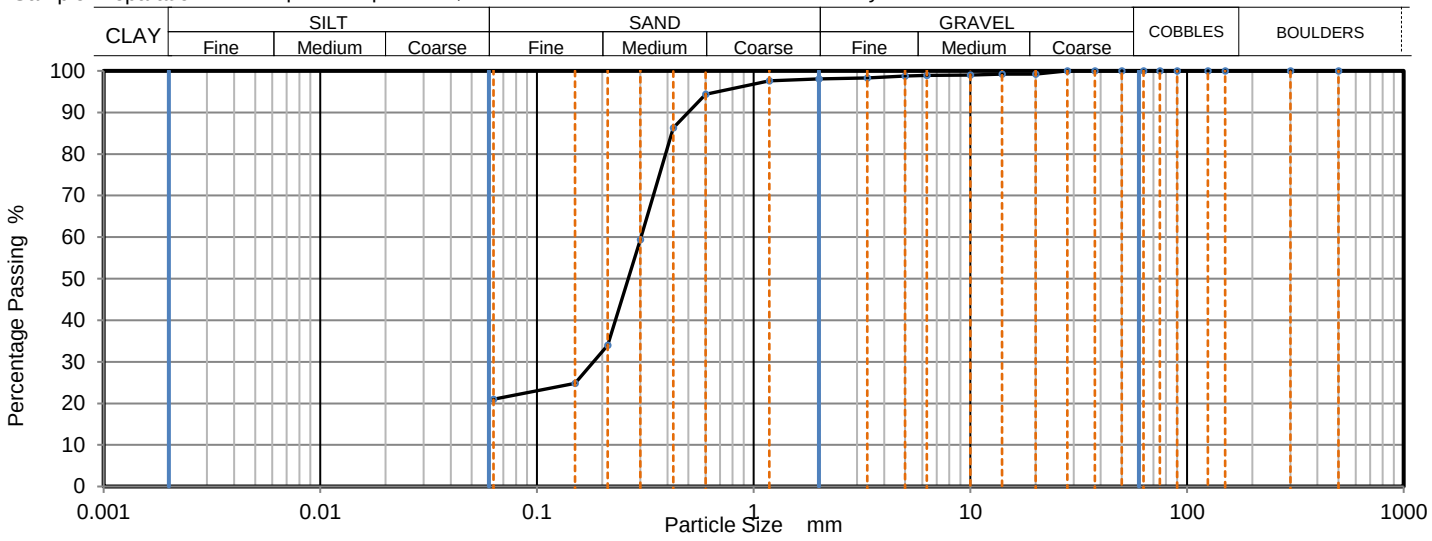
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409080 | Depth Top [m]: | 2.30 |
| Hole No.: | TP107 | Depth Base [m]: | 2.30 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brown slightly gravelly clayey SAND | | |
| Sample Preparation: | Sample was quartered, oven dried at 107.7 °C and broken down by hand. | | |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | 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 | 99 | | |
| 14 | 99 | | |
| 10 | 99 | | |
| 6.3 | 99 | | |
| 5 | 99 | | |
| 3.35 | 98 | | |
| 2 | 98 | | |
| 1.18 | 98 | | |
| 0.6 | 94 | | |
| 0.425 | 86 | | |
| 0.3 | 59 | | |
| 0.212 | 34 | | |
| 0.15 | 25 | | |
| 0.063 | 22 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 2 |
| Sand | 76 |
| | |
| Fines <0.063mm | 22 |

| Grading Analysis | | |
|---|---|---|
| D100 | mm | 28 |
| D60 | mm | 0.303 |
| D30 | mm | 0.182 |
| D10 | mm | |
| Uniformity Coefficient | | > 4.8 |
| Curvature Coefficient | | |

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

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

Remarks:

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**Signed:** Monika Siewior

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 100.21**

# TEST CERTIFICATE

**DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Tested in Accordance with: BS 1377-2: 1990

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

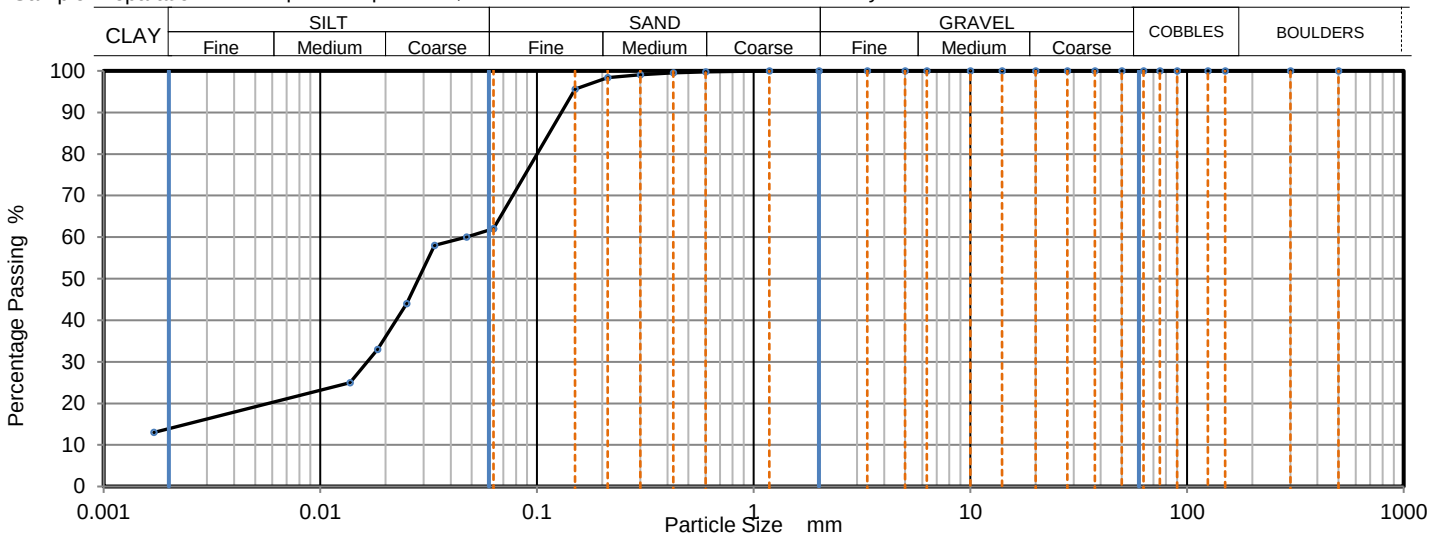
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409087 | Depth Top [m]: | 1.60 |
| Hole No.: | TP114 | Depth Base [m]: | 1.60 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Grey clayey very sandy SILT | | |
| Sample Preparation: | Sample was quartered, oven dried at 108.2 °C and broken down by hand. | | |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 500 | 100 | 0.0630 | 62 |
| 300 | 100 | 0.0473 | 60 |
| 150 | 100 | 0.0337 | 58 |
| 125 | 100 | 0.0250 | 44 |
| 90 | 100 | 0.0184 | 33 |
| 75 | 100 | 0.0137 | 25 |
| 63 | 100 | 0.0017 | 13 |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 100 | Particle density | (assumed) |
| 2 | 100 | 2.65 | Mg/m3 |
| 1.18 | 100 | | |
| 0.6 | 100 | | |
| 0.425 | 100 | | |
| 0.3 | 99 | | |
| 0.212 | 98 | | |
| 0.15 | 96 | | |
| 0.063 | 62 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 0 |
| Sand | 38 |
| Silt | 48 |
| Clay | 14 |

| Grading Analysis | | |
|---|---|---|
| D100 | mm | 3.35 |
| D60 | mm | 0.0504 |
| D30 | mm | 0.0166 |
| D10 | mm | |
| Uniformity Coefficient | | > 30 |
| Curvature Coefficient | | |

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

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**Signed:**

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 100.21**

# TEST CERTIFICATE

**DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Tested in Accordance with: BS 1377-2: 1990

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

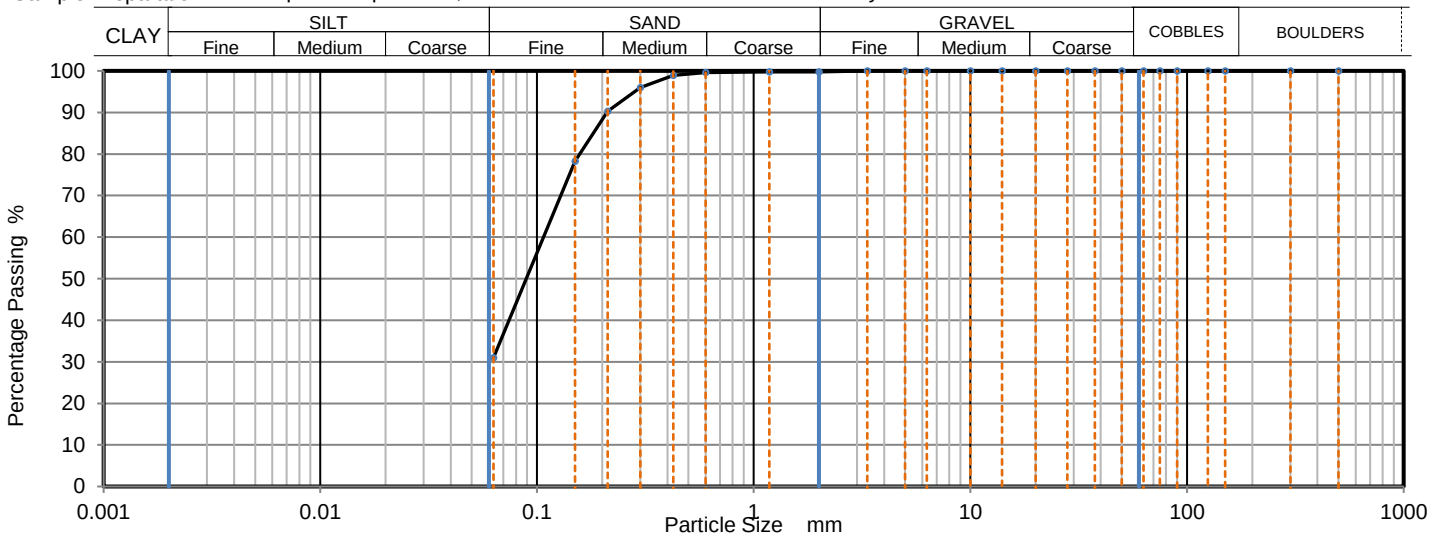
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409100 | Depth Top [m]: | 2.00 |
| Hole No.: | BH03 | Depth Base [m]: | 2.45 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brown clayey SAND | | |
| Sample Preparation: | Sample was quartered, oven dried at 106.3 °C and broken down by hand. | | |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | 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 | 100 | | |
| 1.18 | 100 | | |
| 0.6 | 100 | | |
| 0.425 | 99 | | |
| 0.3 | 96 | | |
| 0.212 | 90 | | |
| 0.15 | 78 | | |
| 0.063 | 31 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 0 |
| Sand | 69 |
| | |
| Fines <0.063mm | 31 |

| Grading Analysis | | |
|---|---|---|
| D100 | mm | 3.35 |
| D60 | mm | 0.107 |
| D30 | mm | |
| D10 | mm | |
| Uniformity Coefficient | | > 1.7 |
| Curvature Coefficient | | |

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

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

Remarks:

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**Signed:** Monika Siewior

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 100.21**

# TEST CERTIFICATE

**DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Tested in Accordance with: BS 1377-2: 1990

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

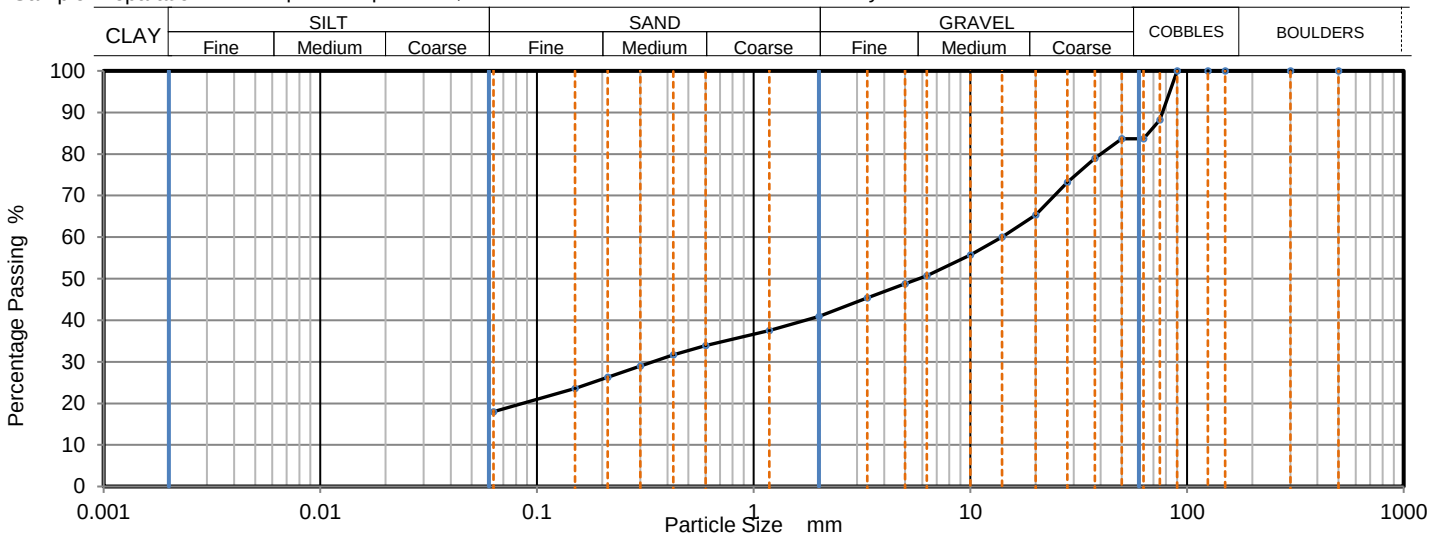
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409106 | Depth Top [m]: | 1.20 |
| Hole No.: | BH04 | Depth Base [m]: | 1.65 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Dark grey clayey very sandy GRAVEL with cobbles | | |
| Sample Preparation: | Sample was quartered, oven dried at 106.3 °C and broken down by hand. | | |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 500 | 100 | | |
| 300 | 100 | | |
| 150 | 100 | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 88 | | |
| 63 | 84 | | |
| 50 | 84 | | |
| 37.5 | 79 | | |
| 28 | 73 | | |
| 20 | 65 | | |
| 14 | 60 | | |
| 10 | 56 | | |
| 6.3 | 51 | | |
| 5 | 49 | | |
| 3.35 | 45 | | |
| 2 | 41 | | |
| 1.18 | 38 | | |
| 0.6 | 34 | | |
| 0.425 | 32 | | |
| 0.3 | 29 | | |
| 0.212 | 26 | | |
| 0.15 | 24 | | |
| 0.063 | 19 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 16 |
| Gravel | 43 |
| Sand | 22 |
| | |
| Fines <0.063mm | 19 |

| Grading Analysis | | |
|---|---|---|
| D100 | mm | 90 |
| D60 | mm | 14 |
| D30 | mm | 0.341 |
| D10 | mm | |
| Uniformity Coefficient | | > 220 |
| Curvature Coefficient | | |

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

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

Remarks:

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**Signed:**

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 100.21**

# TEST CERTIFICATE

**DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Tested in Accordance with: BS 1377-2: 1990

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

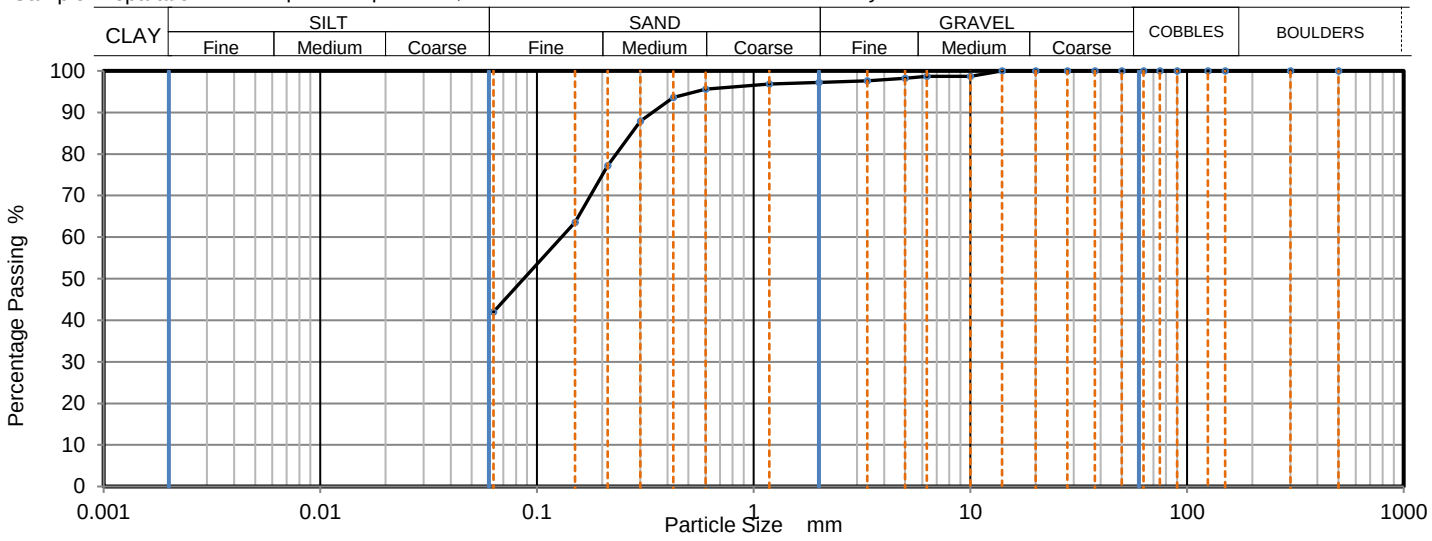
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409110 | Depth Top [m]: | 1.10 |
| Hole No.: | BH05 | Depth Base [m]: | 1.10 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Greenish grey slightly gravelly very clayey SAND | | |
| Sample Preparation: | Sample was quartered, oven dried at 106.2 °C and broken down by hand. | | |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | 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 | 99 | | |
| 6.3 | 99 | | |
| 5 | 98 | | |
| 3.35 | 98 | | |
| 2 | 97 | | |
| 1.18 | 97 | | |
| 0.6 | 96 | | |
| 0.425 | 94 | | |
| 0.3 | 88 | | |
| 0.212 | 77 | | |
| 0.15 | 64 | | |
| 0.063 | 43 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 3 |
| Sand | 55 |
| | |
| Fines <0.063mm | 42 |

| Grading Analysis | | |
|---|---|---|
| D100 | mm | 14 |
| D60 | mm | 0.129 |
| D30 | mm | |
| D10 | mm | |
| Uniformity Coefficient | | > 2.1 |
| Curvature Coefficient | | |

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

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

Remarks:

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**Signed:** Monika Siewior

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 100.21**

# TEST CERTIFICATE

**DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP METHOD USING 2.5 KG RAMMER**

Tested in Accordance with: BS 1377-4: 1990

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

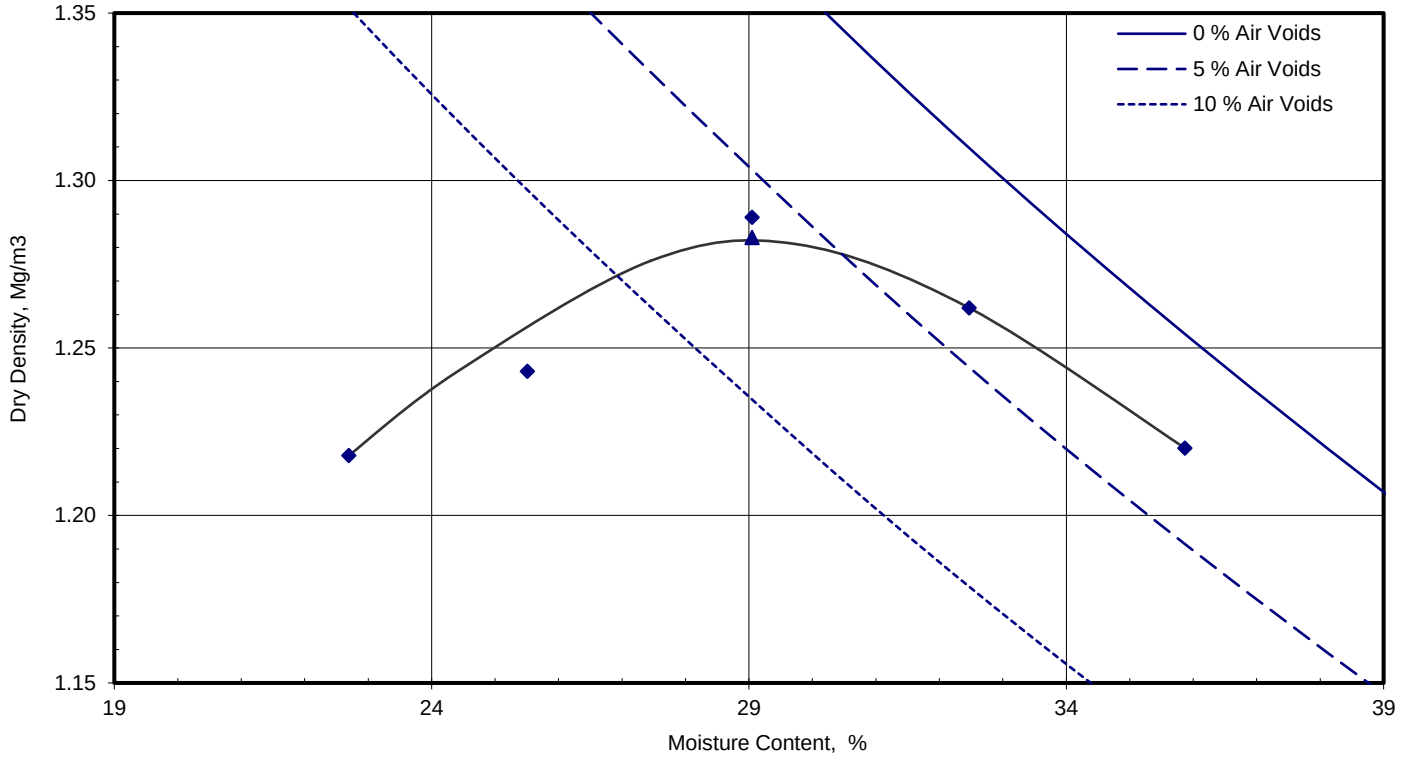
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 13/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409073 | Depth Top [m]: | 1.00 |
| Hole No.: | TP101 | Depth Base [m]: | 1.00 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Mottled brown sandy GRAVEL | | |
| Sample Preparation: | Sample was quartered and broken down by hand. Material used was natural. | | |




| Compaction Point No. | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Moisture Content | % | 23 | 26 | 29 | 32 | 36 |
| Dry Density | Mg/m³ | 1.22 | 1.24 | 1.29 | 1.26 | 1.22 |

| | | |
|---|---|---|
| Mould Type | | 1 Litre |
| Samples Used | | Single sample tested |
| Material Retained on 37.5 mm Sieve | % | 5 |
| Material Retained on 20.0 mm Sieve | % | 19 |
| Particle Density - Measured using gas jar | Mg/m³ | 2.28 |
| As received Moisture Content | % | 20 |
| **Maximum Dry Density** | Mg/m³ | **1.28** |

| | | |
|---|---|---|
| **Optimum Moisture Content** | % | **29** |

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks: Insufficient amount of material - compacted in 1 litre mould

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**Signed:** Monika Siewior

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 109.22**

# TEST CERTIFICATE

**DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP METHOD USING 2.5 KG RAMMER**

Tested in Accordance with: BS 1377-4: 1990

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

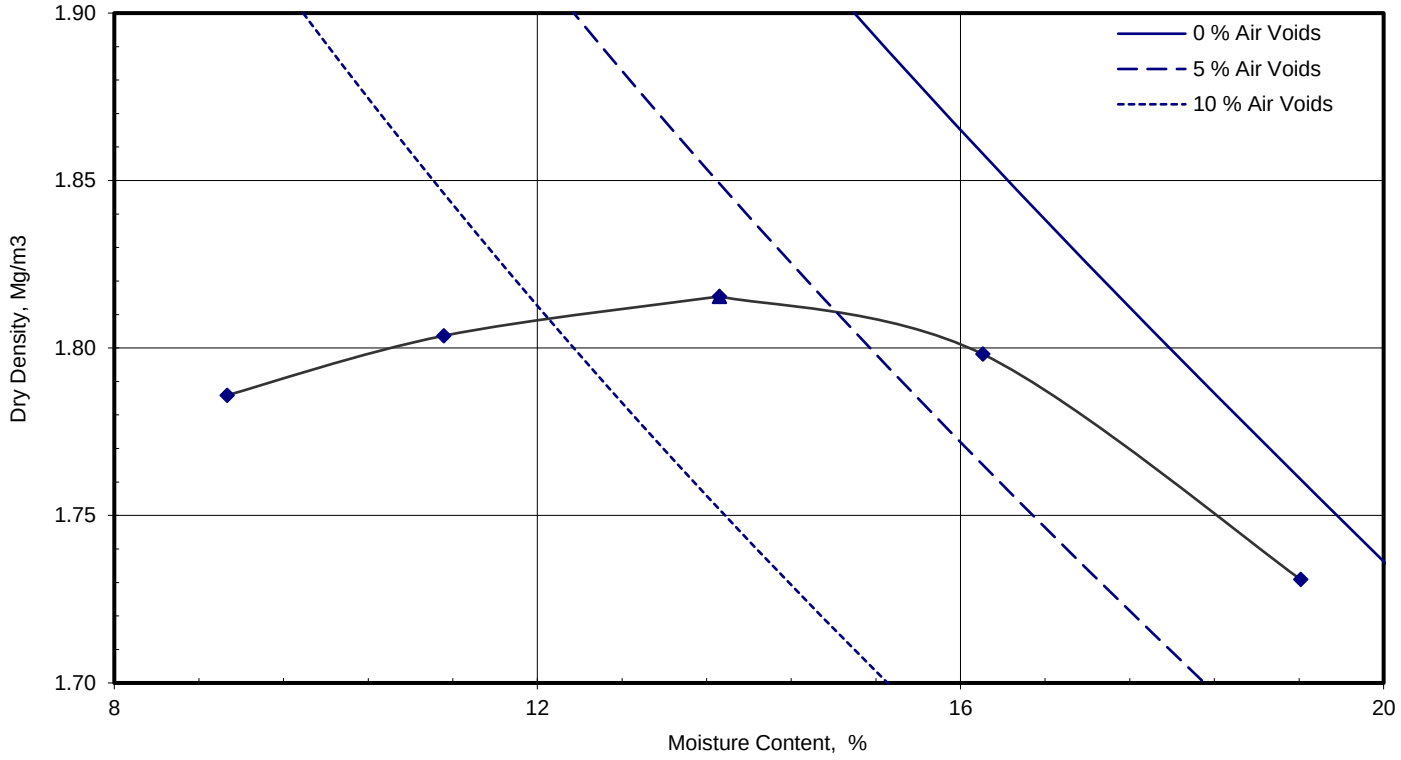
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 13/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409077 | Depth Top [m]: | 1.00 |
| Hole No.: | TP104 | Depth Base [m]: | 1.00 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Light brown slightly clayey slightly gravelly SAND | | |
| Sample Preparation: | Sample was quartered and broken down by hand. Material used was natural. | | |




| Compaction Point No. | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Moisture Content | % | 9.1 | 11 | 14 | 16 | 19 |
| Dry Density | Mg/m³ | 1.79 | 1.80 | 1.82 | 1.80 | 1.73 |

| | | |
|---|---|---|
| Mould Type | | 1 Litre |
| Samples Used | | Single sample tested |
| Material Retained on 37.5 mm Sieve | % | 0 |
| Material Retained on 20.0 mm Sieve | % | 3 |
| Particle Density - Measured using gas jar | Mg/m³ | 2.66 |
| As received Moisture Content | % | 4.6 |
| **Maximum Dry Density** | Mg/m³ | **1.82** |

| | | |
|---|---|---|
| **Optimum Moisture Content** | % | **14** |

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks:

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**Signed:**

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 109.22**

# TEST CERTIFICATE

**DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP METHOD USING 2.5 KG RAMMER**

Tested in Accordance with: BS 1377-4: 1990

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

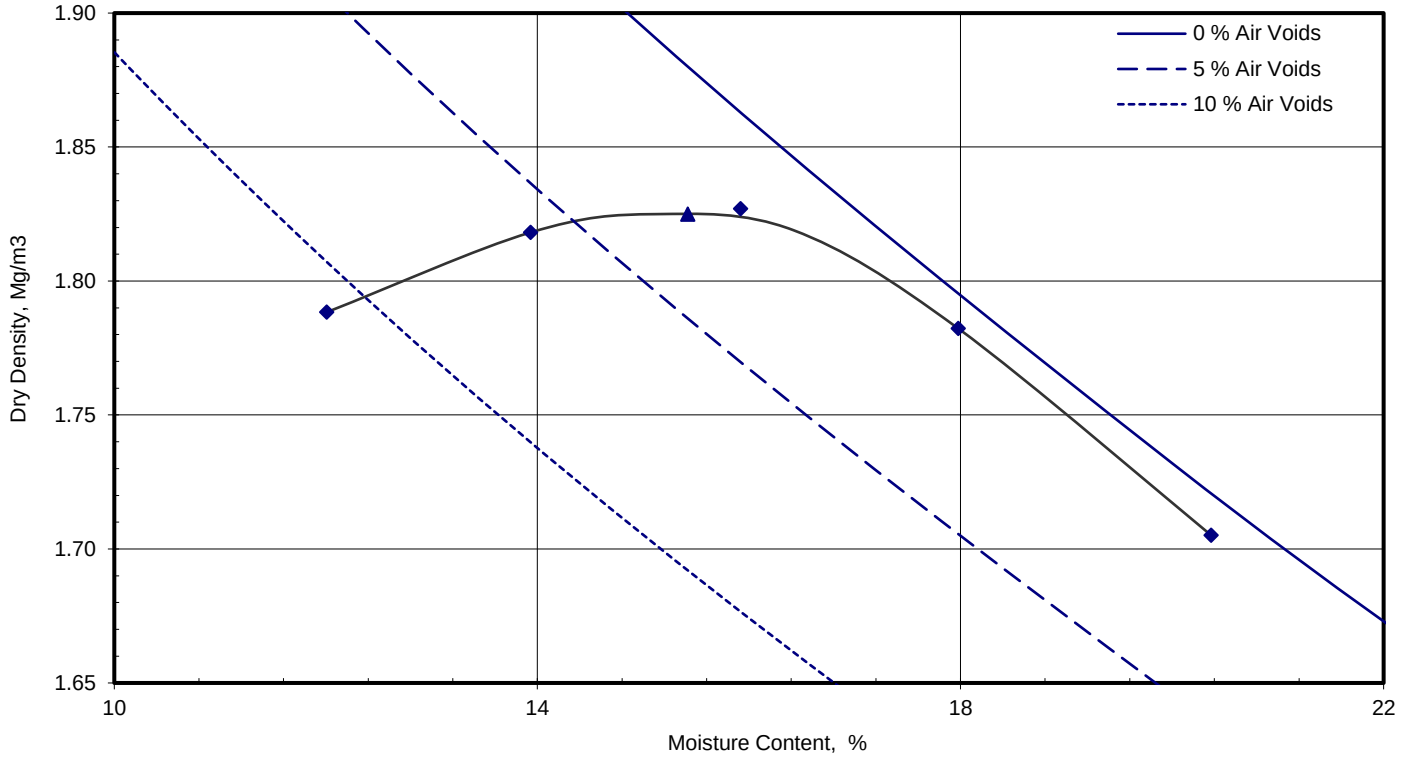
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 13/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409078 | Depth Top [m]: | 1.50 |
| Hole No.: | TP105 | Depth Base [m]: | 1.50 |
| Sample Reference: | Not Given | Sample Type: | D |
| Sample Description: | Yellowish brown slightly sandy CLAY | | |
| Sample Preparation: | Sample was quartered and broken down by hand. Material used was natural. | | |




| Compaction Point No. | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Moisture Content | % | 12 | 14 | 16 | 18 | 20 |
| Dry Density | Mg/m³ | 1.79 | 1.82 | 1.83 | 1.78 | 1.71 |

| | | |
|---|---|---|
| Mould Type | | 1 Litre |
| Samples Used | | Single sample tested |
| Material Retained on 37.5 mm Sieve | % | 0 |
| Material Retained on 20.0 mm Sieve | % | 0 |
| Particle Density - Measured using gas jar | Mg/m³ | 2.65 |
| As received Moisture Content | % | 18 |
| **Maximum Dry Density** | Mg/m³ | **1.82** |

| | | |
|---|---|---|
| **Optimum Moisture Content** | % | **15** |

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks:

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**Signed:**

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 109.22**

# TEST CERTIFICATE

**DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP METHOD USING 2.5 KG RAMMER**

Tested in Accordance with: BS 1377-4: 1990

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

UKAS TESTING 4041

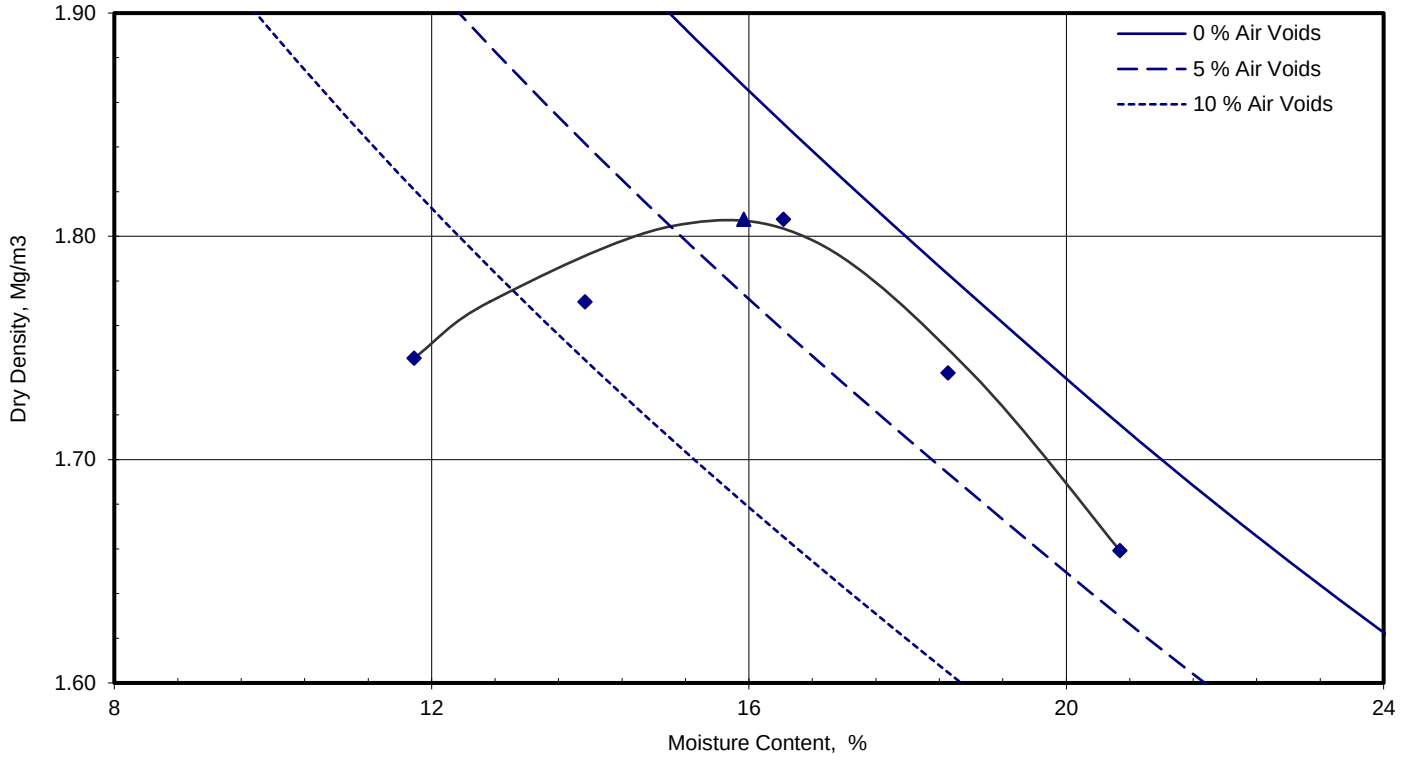
Environmental Science

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 13/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409096 | Depth Top [m]: | 1.70 |
| Hole No.: | TP118 | Depth Base [m]: | 1.70 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Dark brown slightly gravelly CLAY | | |
| Sample Preparation: | Sample was quartered and broken down by hand. Material used was natural. | | |




| Compaction Point No. | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Moisture Content | % | 12 | 14 | 16 | 19 | 21 |
| Dry Density | Mg/m³ | 1.75 | 1.77 | 1.81 | 1.74 | 1.66 |

| | | |
|---|---|---|
| Mould Type | | 1 Litre |
| Samples Used | | Single sample tested |
| Material Retained on 37.5 mm Sieve | % | 0 |
| Material Retained on 20.0 mm Sieve | % | 0 |
| Particle Density - Measured using gas jar | Mg/m³ | 2.66 |
| As received Moisture Content | % | 16 |
| **Maximum Dry Density** | Mg/m³ | **1.81** |

| | | |
|---|---|---|
| **Optimum Moisture Content** | % | **16** |

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks:

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**Signed:** Monika Siewior

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 109.22**

# TEST CERTIFICATE

**DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP METHOD USING 2.5 KG RAMMER**

Tested in Accordance with: BS 1377-4: 1990

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

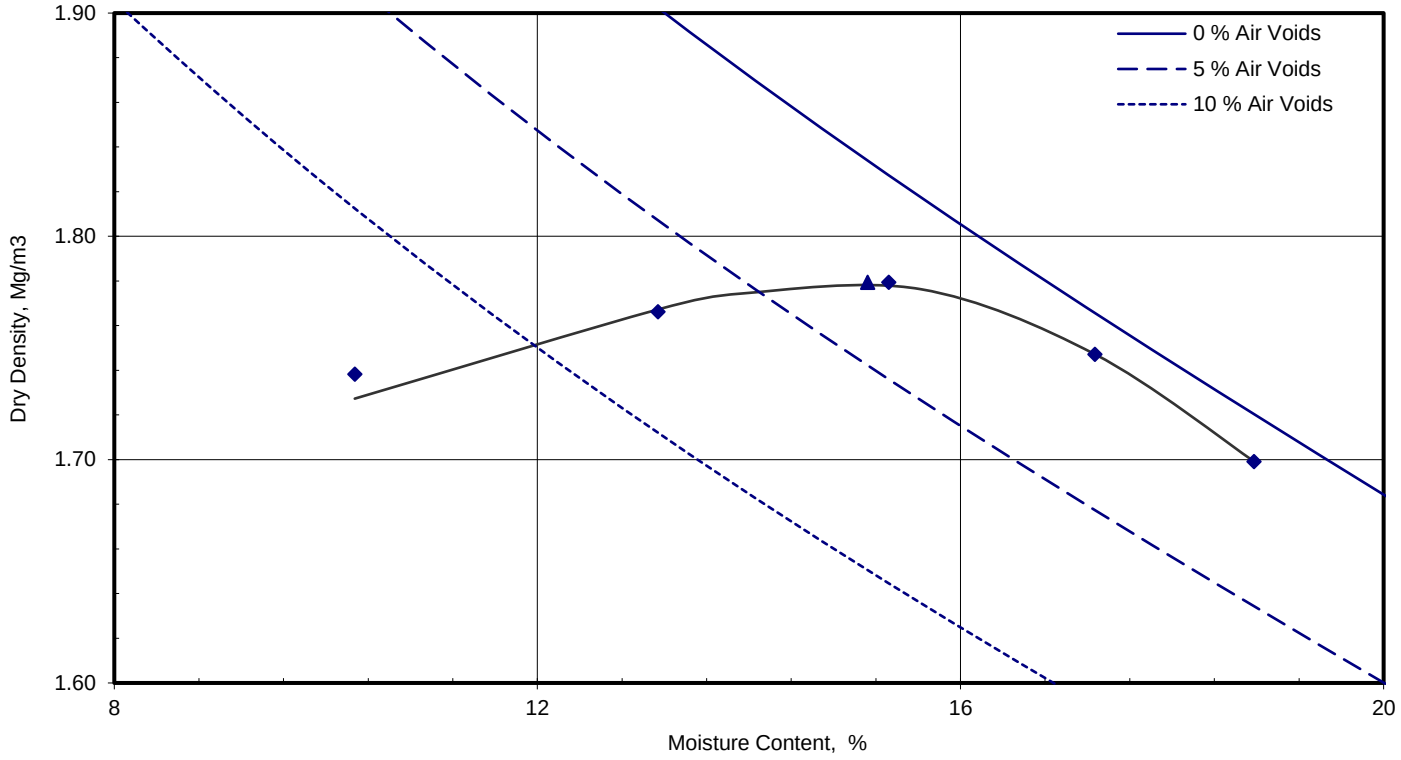
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 13/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409105 | Depth Top [m]: | 0.70 |
| Hole No.: | BH04 | Depth Base [m]: | 1.20 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Dark grey sandy gravelly CLAY | | |
| Sample Preparation: | Sample was quartered and broken down by hand. Material used was natural. | | |




| Compaction Point No. | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Moisture Content | % | 10 | 13 | 15 | 17 | 19 |
| Dry Density | Mg/m³ | 1.74 | 1.77 | 1.78 | 1.75 | 1.70 |

| | | |
|---|---|---|
| Mould Type | | 1 Litre |
| Samples Used | | Single sample tested |
| Material Retained on 37.5 mm Sieve | % | 8 |
| Material Retained on 20.0 mm Sieve | % | 46 |
| Particle Density - Measured using gas jar | Mg/m³ | 2.54 |
| As received Moisture Content | % | 13 |
| **Maximum Dry Density** | Mg/m³ | **1.78** |

| | | |
|---|---|---|
| **Optimum Moisture Content** | % | **15** |

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks: Zone X - test carried out as per client request.
Insufficient amount of material - compacted in 1 litre mould.

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**Signed:** Monika Siewior

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 109.22**

# TEST CERTIFICATE

**DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP METHOD USING 4.5 KG RAMMER**

Tested in Accordance with: BS 1377-4: 1990

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

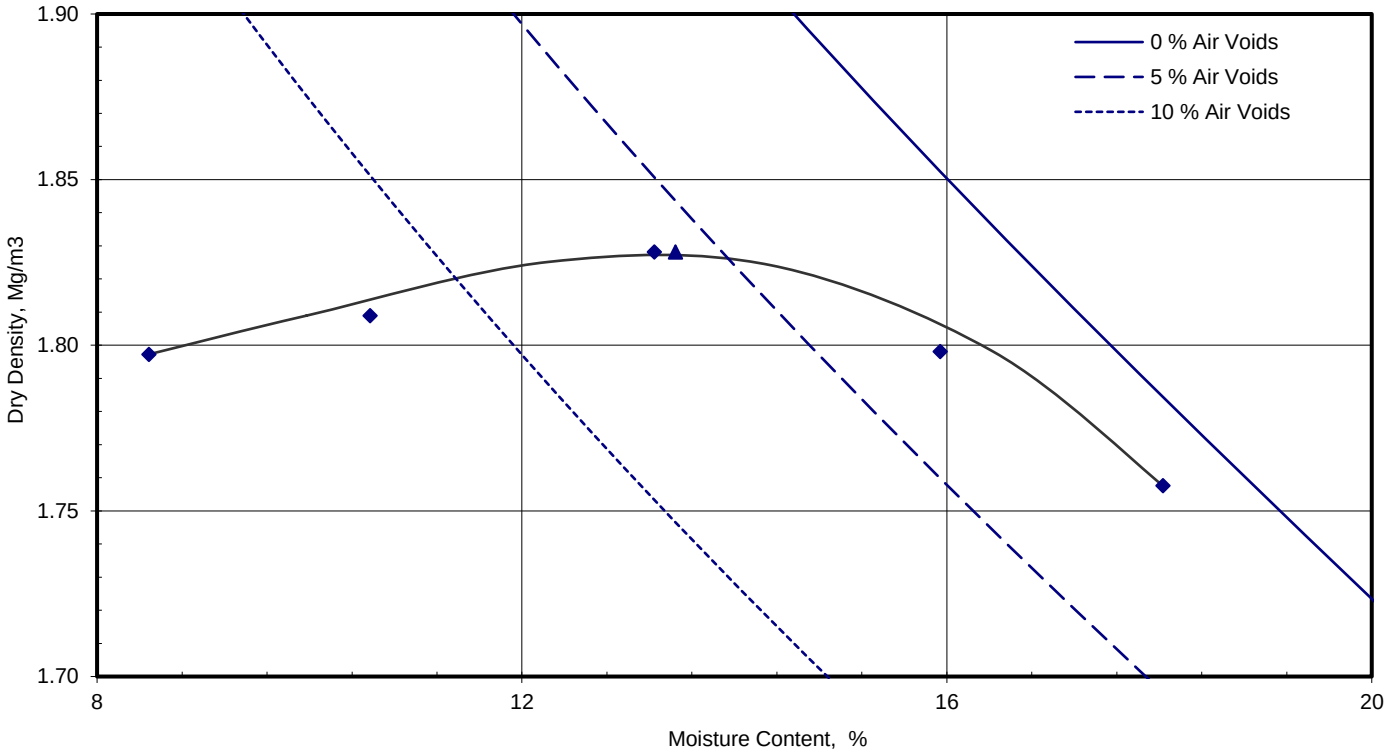
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 13/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409074 | Depth Top [m]: | 1.30 |
| Hole No.: | TP102 | Depth Base [m]: | 1.30 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brown slightly clayey SAND | | |
| Sample Preparation: | Sample was quartered and broken down by hand. Material used was natural. | | |




| Compaction Point No. | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Moisture Content | % | 8.5 | 11 | 13 | 16 | 18 |
| Dry Density | Mg/m³ | 1.80 | 1.81 | 1.83 | 1.80 | 1.76 |

| | | |
|---|---|---|
| Mould Type | | 1 Litre |
| Samples Used | | Single sample tested |
| Material Retained on 37.5 mm Sieve | % | 0 |
| Material Retained on 20.0 mm Sieve | % | 0 |
| Particle Density - Measured using gas jar | Mg/m³ | 2.63 |
| As received Moisture Content | % | 13 |
| **Maximum Dry Density** | Mg/m³ | **1.83** |

| | | |
|---|---|---|
| **Optimum Moisture Content** | % | **13** |

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks:

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**Signed:**

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 110.22**

# TEST CERTIFICATE

**DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP METHOD USING 4.5 KG RAMMER**

Tested in Accordance with: BS 1377-4: 1990

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

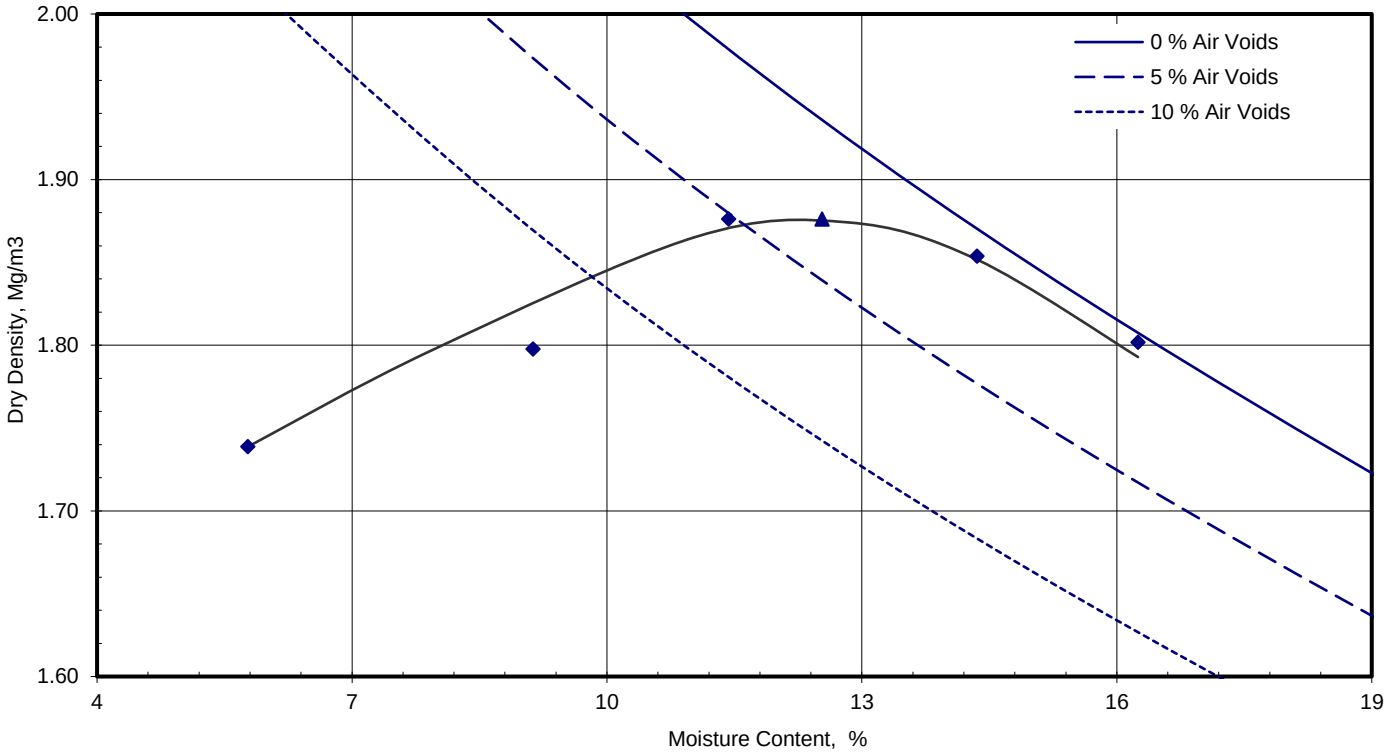
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 13/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409095 | Depth Top [m]: | 1.00 |
| Hole No.: | TP118 | Depth Base [m]: | 1.00 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brown slightly gravelly CLAY | | |
| Sample Preparation: | Sample was quartered and broken down by hand. Material used was natural. | | |




| Compaction Point No. | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Moisture Content | % | 5.8 | 9.1 | 11 | 14 | 16 |
| Dry Density | Mg/m³ | 1.74 | 1.80 | 1.88 | 1.85 | 1.80 |

| | | |
|---|---|---|
| Mould Type | | 1 Litre |
| Samples Used | | Single sample tested |
| Material Retained on 37.5 mm Sieve | % | 0 |
| Material Retained on 20.0 mm Sieve | % | 1 |
| Particle Density - Measured using gas jar | Mg/m³ | 2.56 |
| As received Moisture Content | % | 24 |
| **Maximum Dry Density** | Mg/m³ | **1.88** |

| | | |
|---|---|---|
| **Optimum Moisture Content** | % | **13** |

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks:

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**Signed:**

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 110.22**

# TEST CERTIFICATE

**DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP METHOD USING 4.5 KG RAMMER**

Tested in Accordance with: BS 1377-4: 1990

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

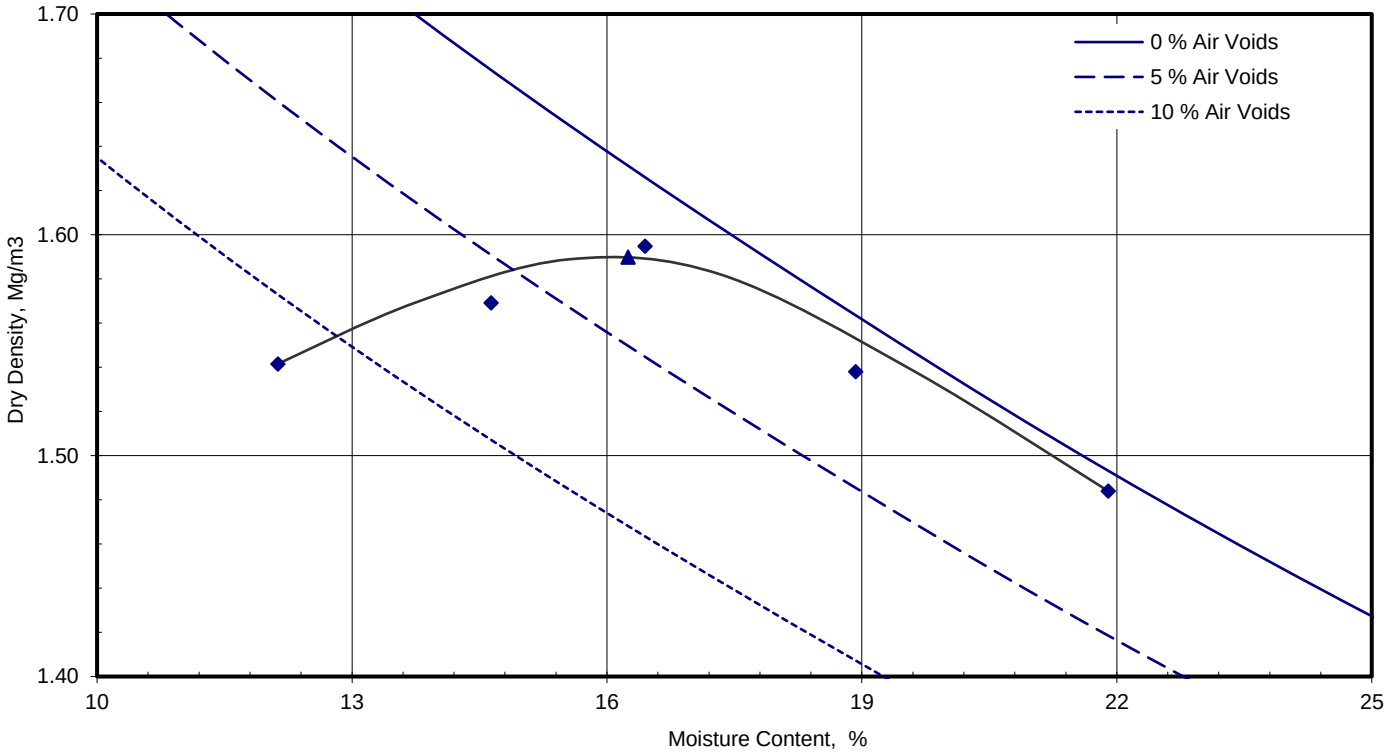
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 13/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409083 | Depth Top [m]: | 0.50 |
| Hole No.: | TP110 | Depth Base [m]: | 0.50 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Dark grey gravelly clayey SAND | | |
| Sample Preparation: | Sample was quartered and broken down by hand. Material used was natural. | | |




| Compaction Point No. | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Moisture Content | % | 12 | 15 | 16 | 19 | 22 |
| Dry Density | Mg/m³ | 1.54 | 1.57 | 1.59 | 1.54 | 1.48 |

| | | |
|---|---|---|
| Mould Type | | 1 Litre |
| Samples Used | | Single sample tested |
| Material Retained on 37.5 mm Sieve | % | 0 |
| Material Retained on 20.0 mm Sieve | % | 6 |
| Particle Density - Measured using gas jar | Mg/m³ | 2.22 |
| As received Moisture Content | % | 24 |
| **Maximum Dry Density** | Mg/m³ | **1.59** |

| | | |
|---|---|---|
| **Optimum Moisture Content** | % | **16** |

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks:

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**Signed:**

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 110.22**

# TEST CERTIFICATE

**DETERMINATION OF THE CALIFORNIA BEARING RATIO (CBR)**

Tested in Accordance with: BS 1377-4: 1990: Clause 7

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

4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 13/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

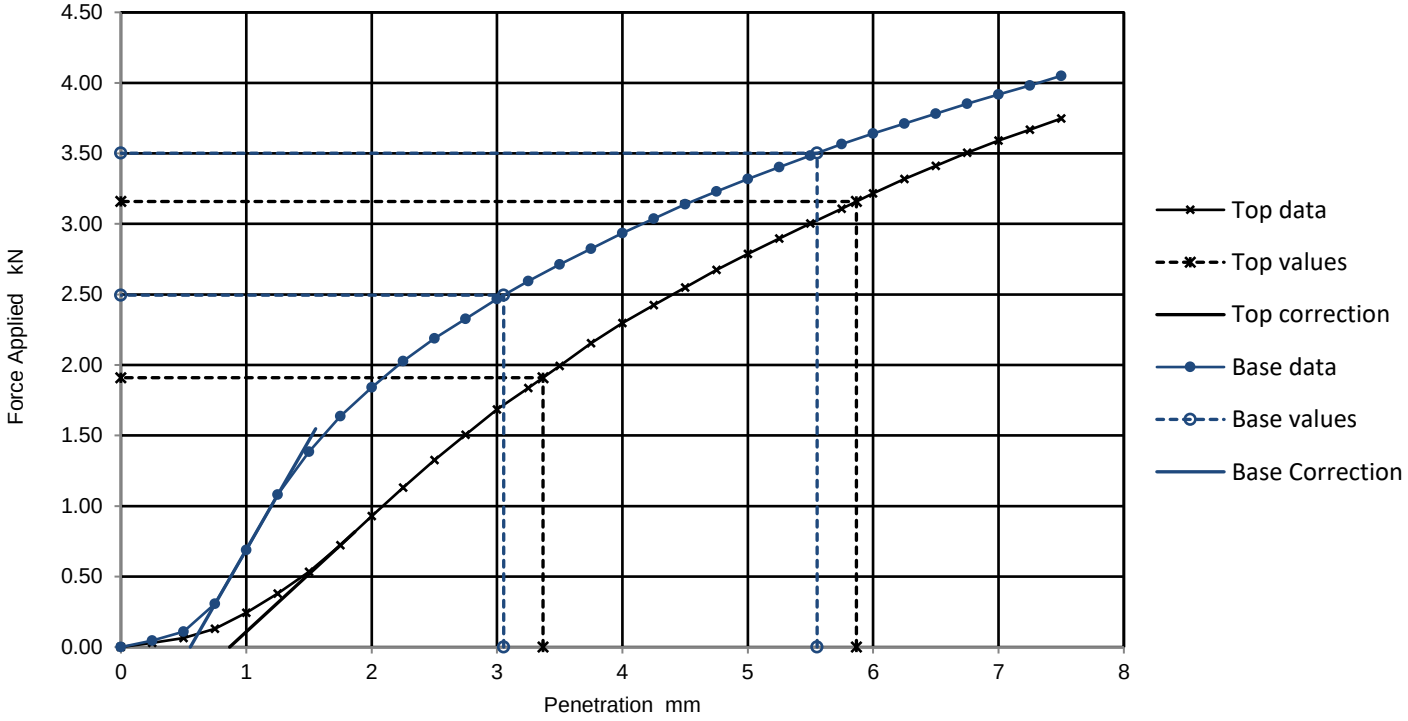
## Test Results:

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409076 | Depth Top [m]: | 0.50 |
| Hole No.: | TP104 | Depth Base [m]: | 0.50 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brownish grey slightly sandy CLAY | | |

**Specimen Preparation:**

| | | | | | |
|---|---|---|---|---|---|
| Condition | Remoulded | | | Soaking details | Not soaked |
| Details | Recompacted with specified standard effort using 2.5kg rammer | | | Period of soaking | days |
| | | | | Time to surface | days |
| | | | | Amount of swell recorded | mm |
| Material retained on 20mm sieve removed | | 1 | % | Dry density after soaking | Mg/m3 |
| Initial Specimen details | Bulk density | 2.03 | Mg/m3 | Surcharge applied | 8 kg |
| | Dry density | 1.76 | Mg/m3 | | 4.9 kPa |
| | Moisture content | 15 | % | | |

**Force v Penetration Plots**




Results

| | Curve correction applied | CBR Values, % | | | | Moisture Content % |
|---|---|---|---|---|---|---|
| | | 2.5mm | 5mm | Highest | Average | |
| TOP | Yes | 14.0 | 16.0 | 16.0 | 17.0 | 15 |
| BASE | Yes | 19.0 | 18.0 | 19.0 | | 15 |

Remarks:

Test/ Specimen specific remarks:

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**Signed:**

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 108.16**

# TEST CERTIFICATE

**DETERMINATION OF THE CALIFORNIA BEARING RATIO (CBR)**

Tested in Accordance with: BS 1377-4: 1990: Clause 7

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

4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 13/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

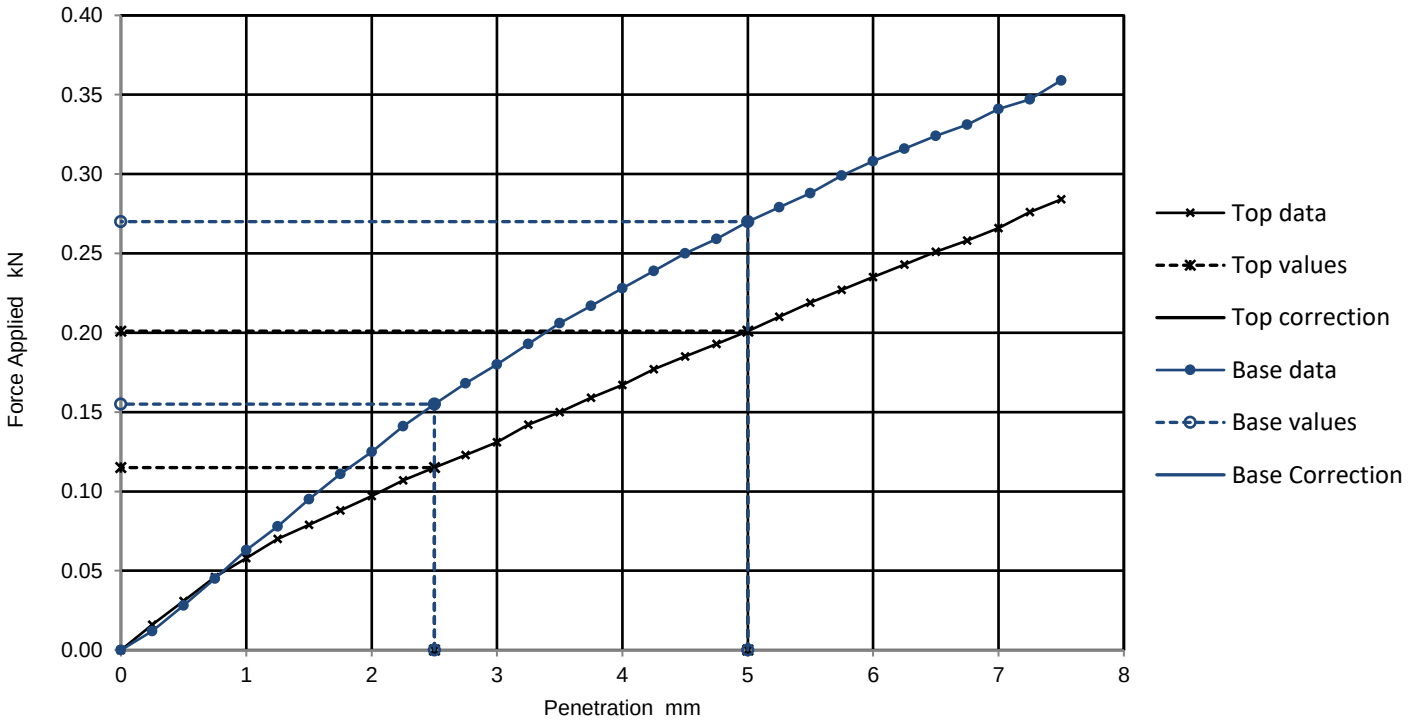
| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409082 | Depth Top [m]: | 2.00 |
| Hole No.: | TP109 | Depth Base [m]: | 2.00 |
| Sample Reference: | Not Given | Sample Type: | D |
| Sample Description: | Grreyish brown slightly sandy CLAY | | |

**Specimen Preparation:**

| | | | |
|---|---|---|---|
| Condition | Remoulded | Soaking details | Not soaked |
| Details | Recompacted with specified standard effort using 2.5kg rammer | Period of soaking | days |
| | | Time to surface | days |
| | | Amount of swell recorded | mm |
| Material retained on 20mm sieve removed | 1 % | Dry density after soaking | Mg/m3 |

| | | | | | |
|---|---|---|---|---|---|
| Initial Specimen details | Bulk density | 2.10 | Mg/m3 | Surcharge applied | 8 kg |
| | Dry density | 1.74 | Mg/m3 | | 4.9 kPa |
| | Moisture content | 21 | % | | |

**Force v Penetration Plots**




Results

| | Curve correction applied | CBR Values, % | | | | Moisture Content % |
|---|---|---|---|---|---|---|
| | | 2.5mm | 5mm | Highest | Average | |
| TOP | No | 0.9 | 1.0 | 1.0 | | 19 |
| BASE | No | 1.2 | 1.4 | 1.4 | | 20 |

Remarks:

Test/ Specimen specific remarks:

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**Signed:** Monika Siewior

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 108.16**

# TEST CERTIFICATE

**DETERMINATION OF THE CALIFORNIA BEARING RATIO (CBR)**

Tested in Accordance with: BS 1377-4: 1990: Clause 7

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

4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 13/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

## Test Results:

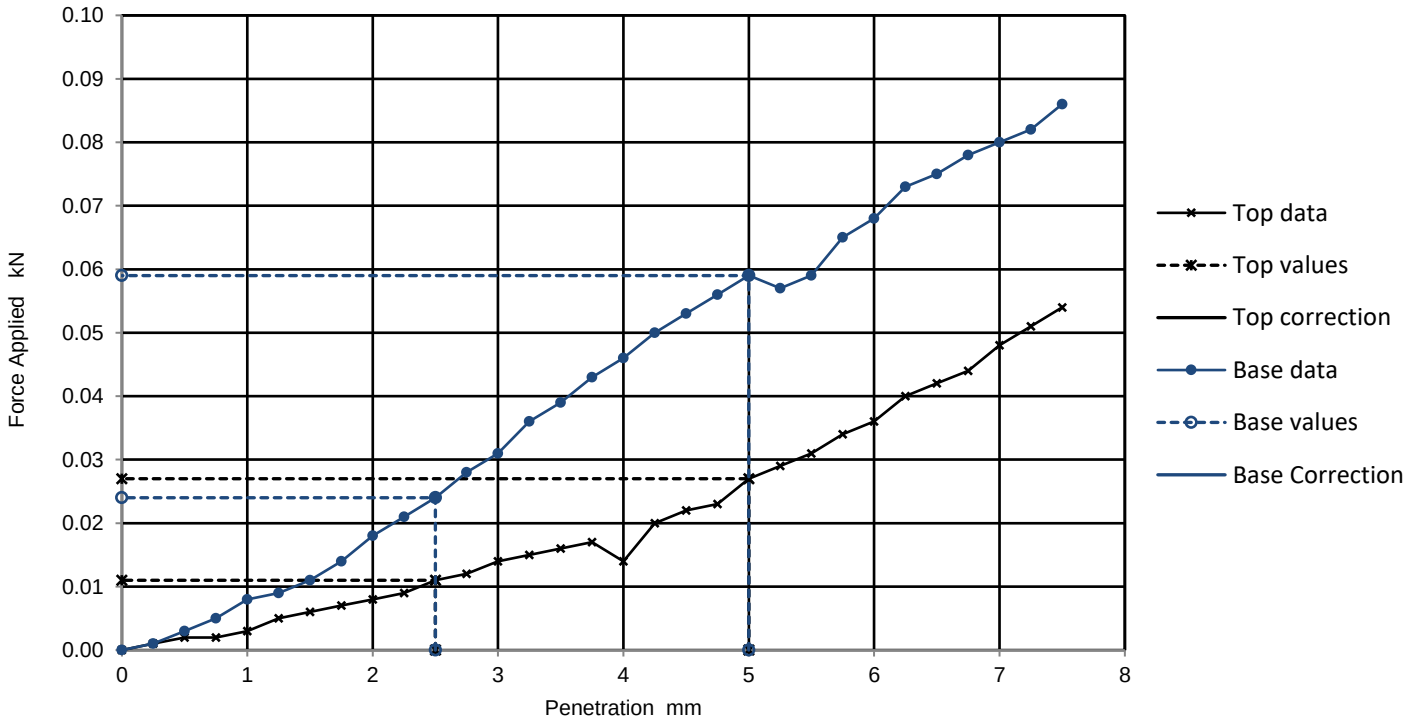
| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409092 | Depth Top [m]: | 1.50 |
| Hole No.: | TP116 | Depth Base [m]: | 1.50 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brownish grey gravelly CLAY | | |

**Specimen Preparation:**

| | | | |
|---|---|---|---|
| Condition | Remoulded | Soaking details | Not soaked |
| Details | Recompacted with specified standard effort using 2.5kg rammer | Period of soaking | days |
| | | Time to surface | days |
| | | Amount of swell recorded | mm |
| Material retained on 20mm sieve removed | 7 % | Dry density after soaking | Mg/m3 |

| | | | | | |
|---|---|---|---|---|---|
| Initial Specimen details | Bulk density | 1.98 | Mg/m3 | Surcharge applied | 8 kg |
| | Dry density | 1.59 | Mg/m3 | | 4.9 kPa |
| | Moisture content | 24 | % | | |

**Force v Penetration Plots**




Results

| | Curve correction applied | CBR Values, % | | | | Moisture Content % |
|---|---|---|---|---|---|---|
| | | 2.5mm | 5mm | Highest | Average | |
| TOP | No | 0.1 | 0.1 | 0.1 | | 24 |
| BASE | No | 0.2 | 0.3 | 0.3 | | 20 |

Remarks:

Test/ Specimen specific remarks:

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**Signed:** Monika Siewior

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 108.16**

# TEST CERTIFICATE

**DETERMINATION OF THE CALIFORNIA BEARING RATIO (CBR)**

Tested in Accordance with: BS 1377-4: 1990: Clause 7

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

4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 13/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

## Test Results:

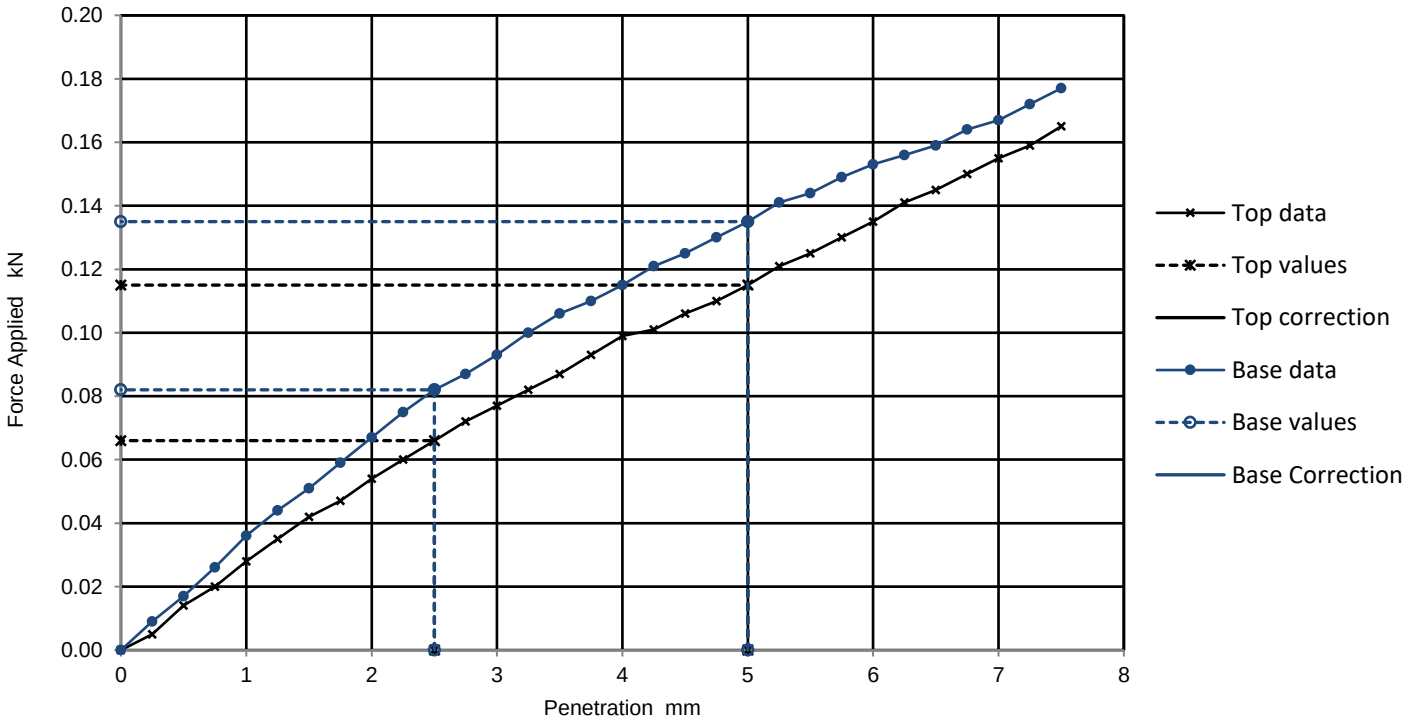
| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409097 | Depth Top [m]: | 0.30 |
| Hole No.: | TP120 | Depth Base [m]: | 0.30 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Black CLAY | | |

**Specimen Preparation:**

| | | | |
|---|---|---|---|
| Condition | Remoulded | Soaking details | Not soaked |
| Details | Recompacted with specified standard effort using 2.5kg rammer | Period of soaking | days |
| | | Time to surface | days |
| | | Amount of swell recorded | mm |
| Material retained on 20mm sieve removed | 0 % | Dry density after soaking | Mg/m3 |

| | | | | | |
|---|---|---|---|---|---|
| Initial Specimen details | Bulk density | 1.84 | Mg/m3 | Surcharge applied | 8 kg |
| | Dry density | 1.29 | Mg/m3 | | 4.9 kPa |
| | Moisture content | 43 | % | | |

**Force v Penetration Plots**




Results

| | Curve correction applied | CBR Values, % | | | | Moisture Content % |
|---|---|---|---|---|---|---|
| | | 2.5mm | 5mm | Highest | Average | |
| TOP | No | 0.5 | 0.6 | 0.6 | 0.6 | 47 |
| BASE | No | 0.6 | 0.7 | 0.7 | | 42 |

Remarks:

Test/ Specimen specific remarks:

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**Signed:** Monika Siewior

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 108.16**

# TEST CERTIFICATE

**DETERMINATION OF THE CALIFORNIA BEARING RATIO (CBR)**

Tested in Accordance with: BS 1377-4: 1990: Clause 7

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

4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 14/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

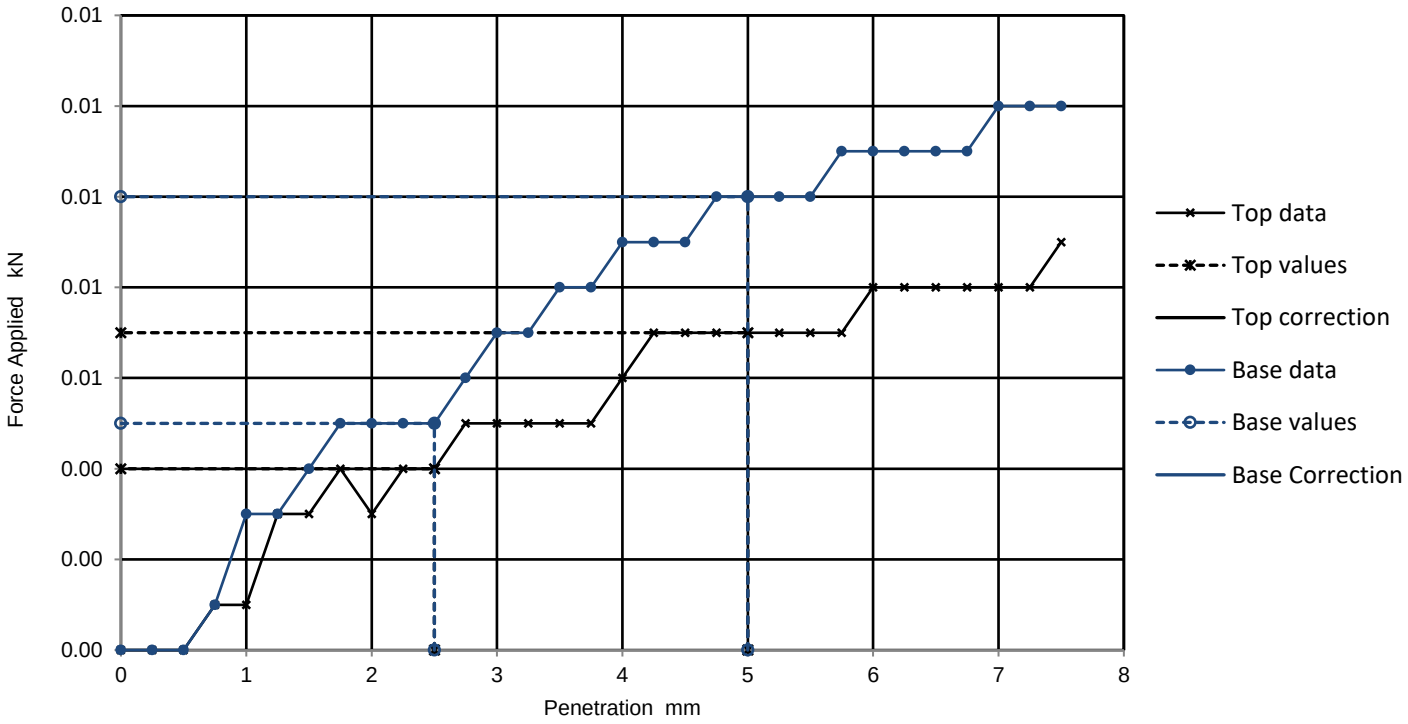
| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409098 | Depth Top [m]: | 1.20 |
| Hole No.: | TP121 | Depth Base [m]: | 1.20 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Dark grey slightly sandy CLAY | | |

**Specimen Preparation:**

| | | | |
|---|---|---|---|
| Condition | Remoulded | Soaking details | Not soaked |
| Details | Recompacted with specified standard effort using 2.5kg rammer | Period of soaking | days |
| | | Time to surface | days |
| | | Amount of swell recorded | mm |
| Material retained on 20mm sieve removed | 0 % | Dry density after soaking | Mg/m3 |

| | | | | | |
|---|---|---|---|---|---|
| Initial Specimen details | Bulk density | 1.62 | Mg/m3 | Surcharge applied | 8 kg |
| | Dry density | 1.00 | Mg/m3 | | 4.8 kPa |
| | Moisture content | 62 | % | | |

**Force v Penetration Plots**




Results

| | Curve correction applied | CBR Values, % | | | | Moisture Content % |
|---|---|---|---|---|---|---|
| | | 2.5mm | 5mm | Highest | Average | |
| TOP | No | 0.0 | 0.0 | 0.0 | | 52 |
| BASE | No | 0.0 | 0.1 | 0.1 | | 60 |

Remarks:

Test/ Specimen specific remarks:

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Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 108.16**

# TEST CERTIFICATE

**DETERMINATION OF THE CALIFORNIA BEARING RATIO (CBR)**

Tested in Accordance with: BS 1377-4: 1990: Clause 7

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

4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 14/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

## Test Results:

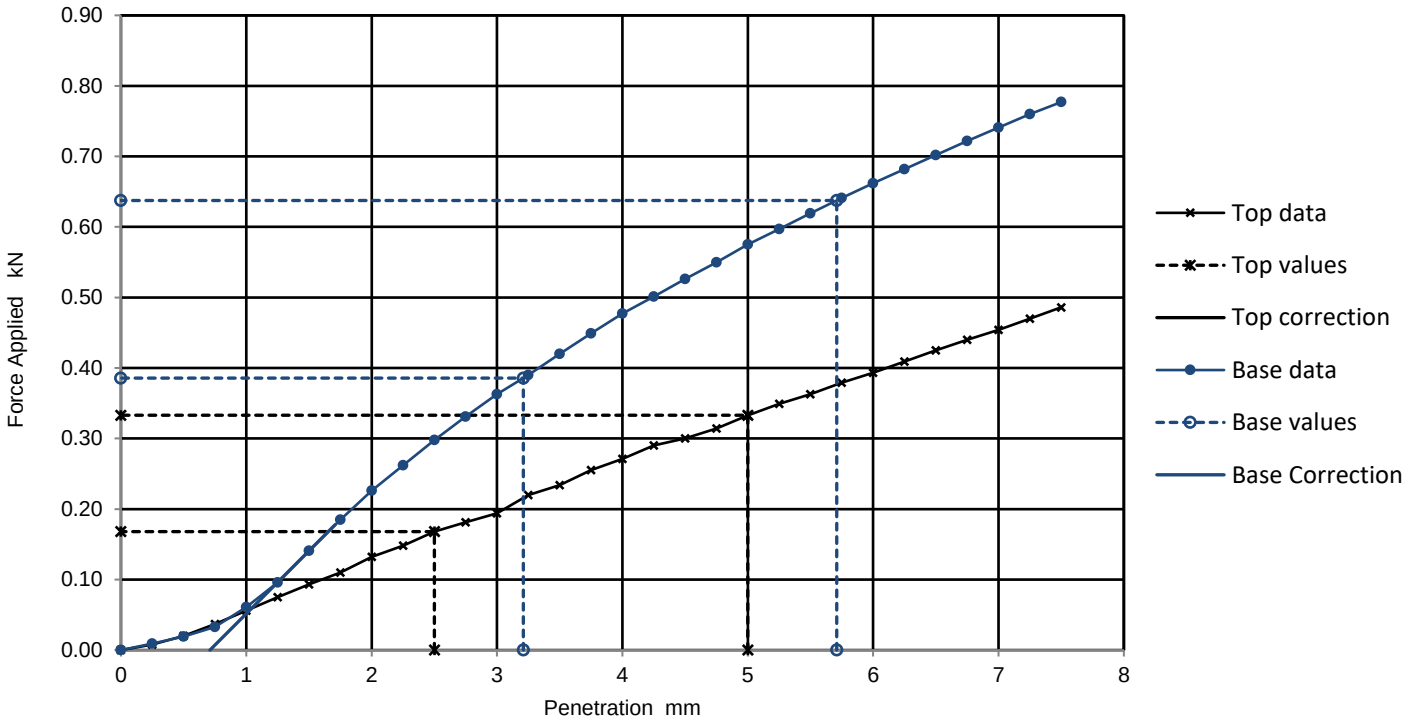
| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409109 | Depth Top [m]: | 0.10 |
| Hole No.: | BH05 | Depth Base [m]: | 0.50 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Dark grey TOPSOIL | | |

**Specimen Preparation:**

| | | | |
|---|---|---|---|
| Condition | Remoulded | Soaking details | Not soaked |
| Details | Recompacted with specified standard effort using 2.5kg rammer | Period of soaking | days |
| | | Time to surface | days |
| | | Amount of swell recorded | mm |
| Material retained on 20mm sieve removed | 8 % | Dry density after soaking | Mg/m3 |

| | | | | | |
|---|---|---|---|---|---|
| Initial Specimen details | Bulk density | 1.63 | Mg/m3 | Surcharge applied | 8 kg |
| | Dry density | 1.03 | Mg/m3 | | 4.8 kPa |
| | Moisture content | 58 | % | | |

**Force v Penetration Plots**




Results

| | Curve correction applied | CBR Values, % | | | | Moisture Content % |
|---|---|---|---|---|---|---|
| | | 2.5mm | 5mm | Highest | Average | |
| TOP | No | 1.3 | 1.7 | 1.7 | | 58 |
| BASE | Yes | 2.9 | 3.2 | 3.2 | | 61 |

Remarks:

Test/ Specimen specific remarks:

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**Signed:**

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 108.16**

# TEST CERTIFICATE

**DETERMINATION OF THE UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE**

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

UKAS TESTING 4041

Tested in Accordance with: BS 1377-7: 1990: Clause 8

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

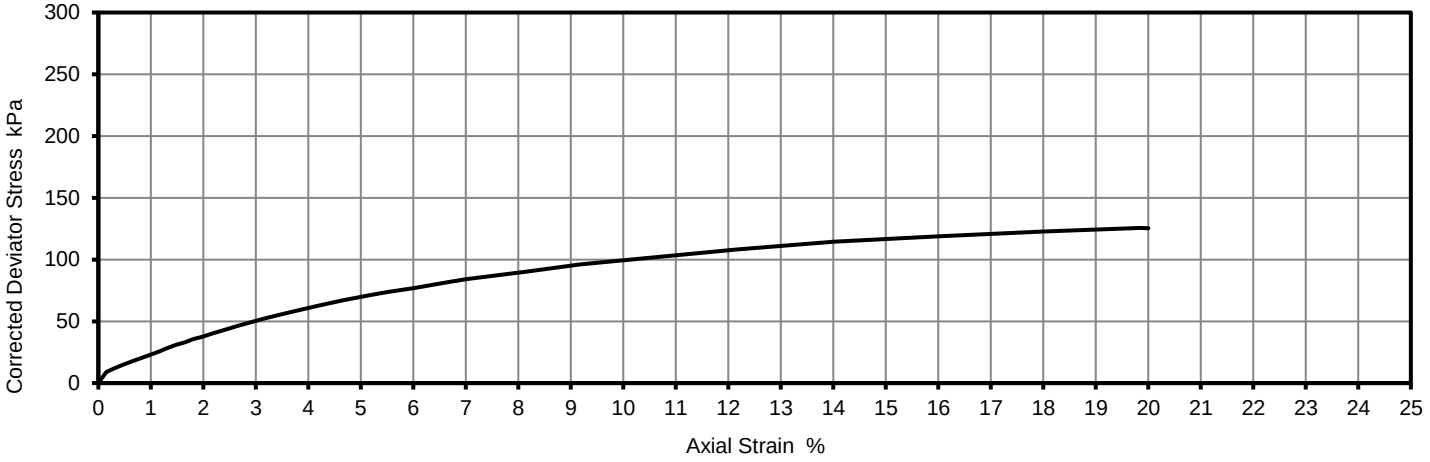
*Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland*

**Test Results:**

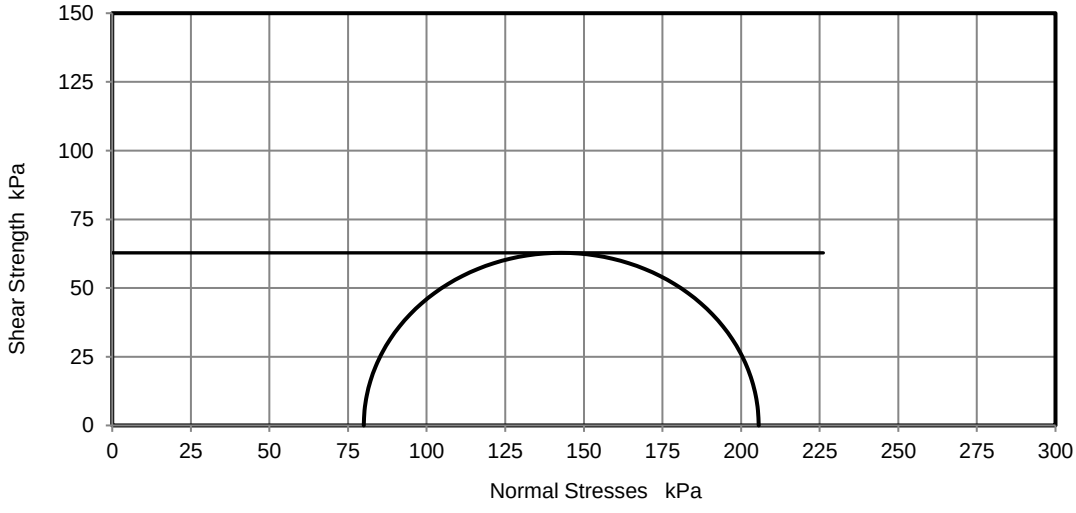
| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409102 | Depth Top [m]: | 4.00 |
| Hole No.: | BH03 | Depth Base [m]: | 4.50 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brown slightly gravelly slightly sandy CLAY | | |
| Sample Preparation: | Sample prepared in accordance with BS 1377-1:2016 Clause 9.1.1. | | |

| | | | | | |
|---|---|---|---|---|---|
| Test Number | 1 | | Rate of Strain | 1.98 | %/min |
| Length | 201.59 | mm | Cell Pressure | 80 | kPa |
| Diameter | 100.84 | mm | Axial Strain at failure | 19.8 | % |
| Bulk Density | 2.23 | Mg/m3 | Deviator Stress, ( σ1 - σ3 )f | 126 | kPa |
| Moisture Content | 18 | % | Undrained Shear Strength, cu | 63 | kPa ½( σ1 - σ3 )f |
| Dry Density | 1.88 | Mg/m3 | Mode of Failure | Compound | |
| Membrane Correction | 1.06 | kPa | Membrane thickness | 0.28 | mm |

**Deviator Stress v Axial Strain**

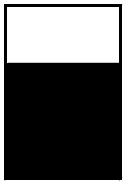



**Mohr Circles**






Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

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**Signed:** Monika Siewior

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 184.12**

# TEST CERTIFICATE

**DETERMINATION OF THE UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE**

Tested in Accordance with: BS 1377-7: 1990: Clause 8

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

UKAS TESTING 4041

Environmental Science

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

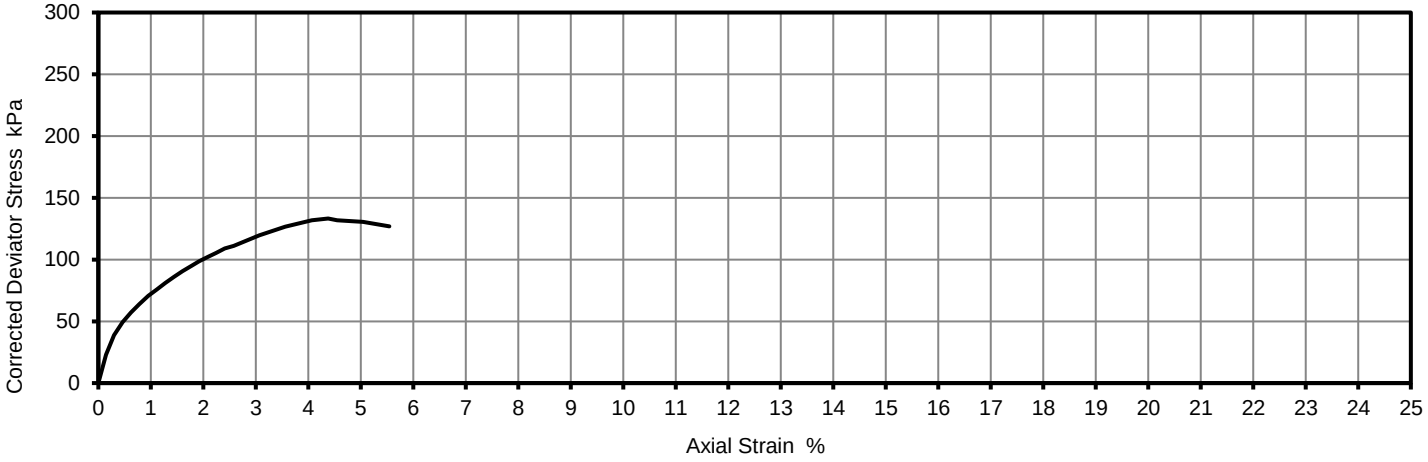
*Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland*

**Test Results:**

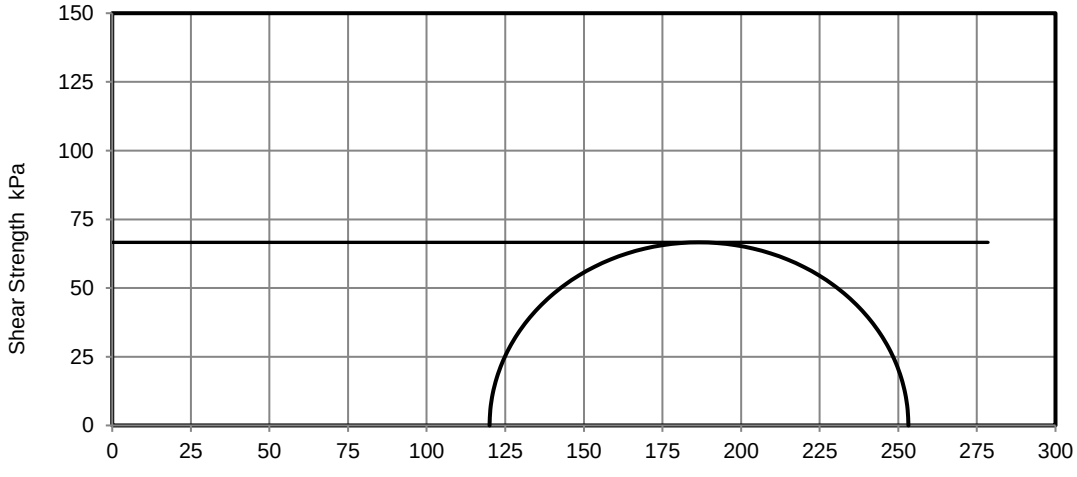
| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409103 | Depth Top [m]: | 6.00 |
| Hole No.: | BH03 | Depth Base [m]: | 6.45 |
| Sample Reference: | Not Given | Sample Type: | U |
| Sample Description: | Brown slightly sandy CLAY | | |
| Sample Preparation: | Sample prepared in accordance with BS 1377-1:2016 Clause 9.1.1. | | |

| | | | | | |
|---|---|---|---|---|---|
| Test Number | 1 | | Rate of Strain | 1.97 | %/min |
| Length | 202.78 | mm | Cell Pressure | 120 | kPa |
| Diameter | 102.03 | mm | Axial Strain at failure | 4.4 | % |
| Bulk Density | 2.03 | Mg/m3 | Deviator Stress, ( σ1 - σ3 )f | 133 | kPa |
| Moisture Content | 29 | % | Undrained Shear Strength, cu | 67 | kPa ½( σ1 - σ3 )f |
| Dry Density | 1.57 | Mg/m3 | Mode of Failure | Brittle | |
| Membrane Correction | 0.34 | kPa | Membrane thickness | 0.29 | mm |

**Deviator Stress v Axial Strain**

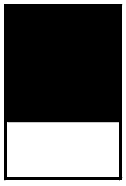



**Mohr Circles**






Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

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Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 184.12**

# TEST CERTIFICATE

**DETERMINATION OF THE UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE**

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

UKAS TESTING 4041

Tested in Accordance with: BS 1377-7: 1990: Clause 8

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

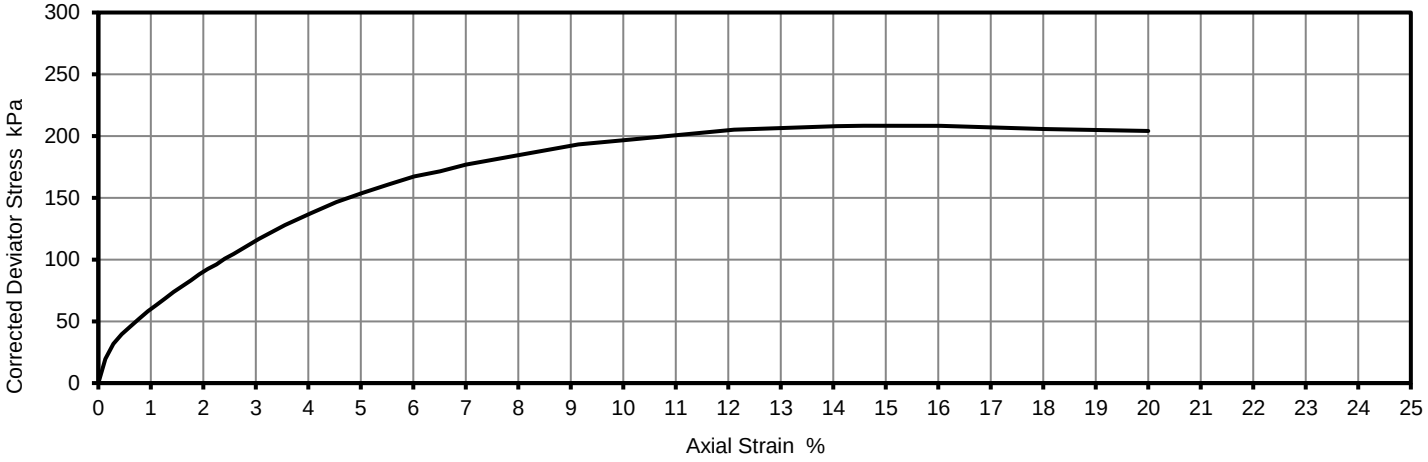
*Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland*

**Test Results:**

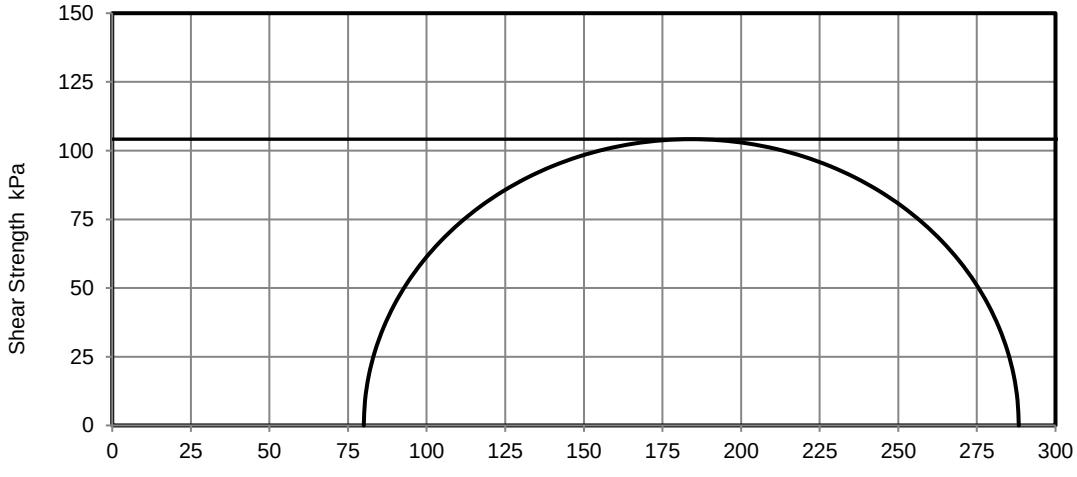
| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409107 | Depth Top [m]: | 4.00 |
| Hole No.: | BH04 | Depth Base [m]: | 4.45 |
| Sample Reference: | Not Given | Sample Type: | U |
| Sample Description: | Brown slightly gravelly slightly sandy CLAY | | |
| Sample Preparation: | Sample prepared in accordance with BS 1377-1:2016 Clause 9.1.1. | | |

| | | | | | |
|---|---|---|---|---|---|
| Test Number | 1 | | Rate of Strain | 1.97 | %/min |
| Length | 203.42 | mm | Cell Pressure | 80 | kPa |
| Diameter | 103.62 | mm | Axial Strain at failure | 14.6 | % |
| Bulk Density | 2.08 | Mg/m3 | Deviator Stress, ( σ1 - σ3 )f | 208 | kPa |
| Moisture Content | 15 | % | Undrained Shear Strength, cu | 104 | kPa ½( σ1 - σ3 )f |
| Dry Density | 1.80 | Mg/m3 | Mode of Failure | Compound | |
| Membrane Correction | 0.74 | kPa | Membrane thickness | 0.26 | mm |

**Deviator Stress v Axial Strain**

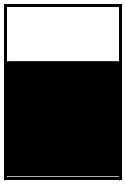



**Mohr Circles**






Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

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.

**Signed:** Monika Siewior

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 184.12**

# TEST CERTIFICATE

**DETERMINATION OF THE UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE**

Tested in Accordance with: BS 1377-7: 1990: Clause 8

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

UKAS TESTING 4041

Environmental Science

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

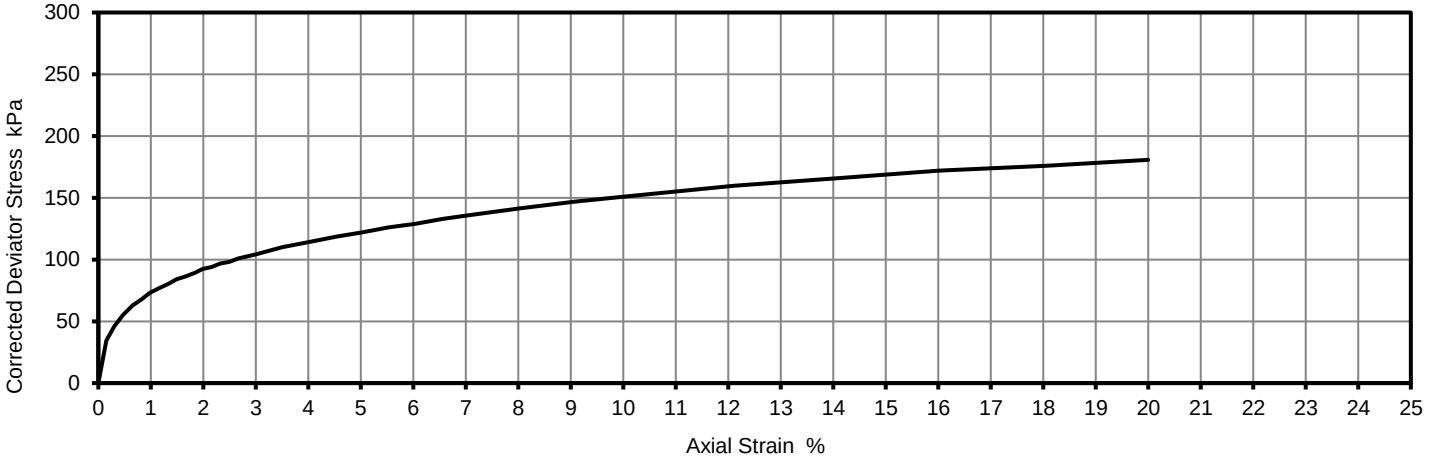
*Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland*

**Test Results:**

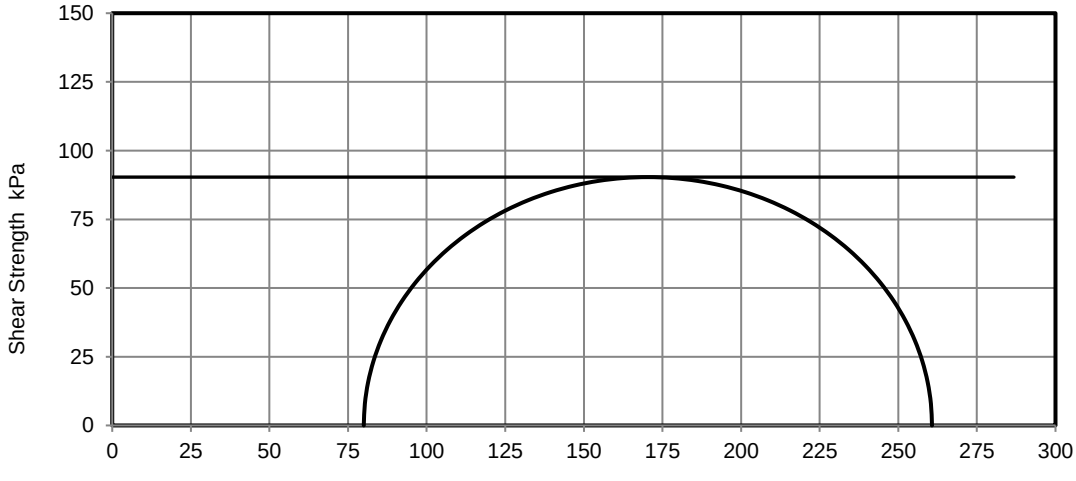
| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409112 | Depth Top [m]: | 4.00 |
| Hole No.: | BH05 | Depth Base [m]: | 4.45 |
| Sample Reference: | Not Given | Sample Type: | D |
| Sample Description: | Brown slightly sandy CLAY | | |
| Sample Preparation: | Sample prepared in accordance with BS 1377-1:2016 Clause 9.1.1. | | |

| | | | | | |
|---|---|---|---|---|---|
| Test Number | 1 | | Rate of Strain | 2.00 | %/min |
| Length | 139.83 | mm | Cell Pressure | 80 | kPa |
| Diameter | 69.03 | mm | Axial Strain at failure | 20.0 | % |
| Bulk Density | 2.11 | Mg/m3 | Deviator Stress, ( σ1 - σ3 )f | 181 | kPa |
| Moisture Content | 23 | % | Undrained Shear Strength, cu | 90 | kPa ½( σ1 - σ3 )f |
| Dry Density | 1.71 | Mg/m3 | Mode of Failure | Compound | |
| Membrane Correction | 1.39 | kPa | Membrane thickness | 0.25 | mm |

**Deviator Stress v Axial Strain**

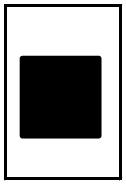



**Mohr Circles**






Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

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**Signed:** Monika Siewior

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 184.12**

# TEST CERTIFICATE

**DETERMINATION OF THE UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE**

Tested in Accordance with: BS 1377-7: 1990: Clause 8

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

UKAS TESTING 4041

Environmental Science

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 07/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

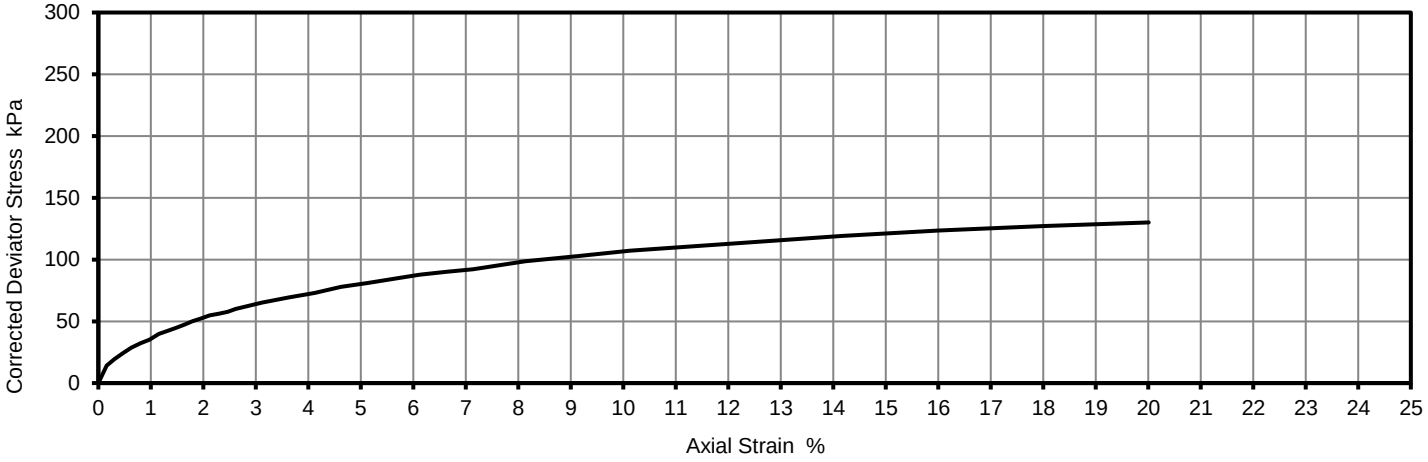
*Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland*

**Test Results:**

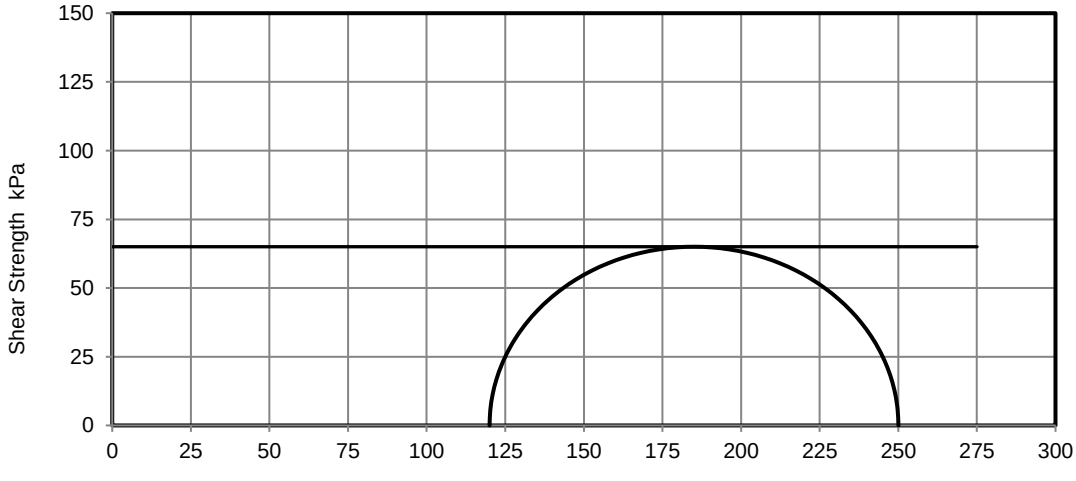
| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409113 | Depth Top [m]: | 6.00 |
| Hole No.: | BH05 | Depth Base [m]: | 6.45 |
| Sample Reference: | Not Given | Sample Type: | U |
| Sample Description: | Brown slightly sandy CLAY | | |
| Sample Preparation: | Sample prepared in accordance with BS 1377-1:2016 Clause 9.1.1. | | |

| | | | | | |
|---|---|---|---|---|---|
| Test Number | 1 | | Rate of Strain | 2.00 | %/min |
| Length | 140.65 | mm | Cell Pressure | 120 | kPa |
| Diameter | 69.44 | mm | Axial Strain at failure | 20.0 | % |
| Bulk Density | 2.10 | Mg/m3 | Deviator Stress, ( σ1 - σ3 )f | 130 | kPa |
| Moisture Content | 22 | % | Undrained Shear Strength, cu | 65 | kPa ½( σ1 - σ3 )f |
| Dry Density | 1.72 | Mg/m3 | Mode of Failure | Compound | |
| Membrane Correction | 1.33 | kPa | Membrane thickness | 0.24 | mm |

**Deviator Stress v Axial Strain**

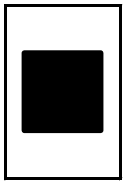



**Mohr Circles**






Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

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**Signed:** Monika Siewior

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 184.12**

# TEST CERTIFICATE

**DETERMINATION OF THE ONE-DIMENSIONAL CONSOLIDATION PROPERTIES**

Tested in Accordance with: BS 1377-5:1990: Clause 3

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

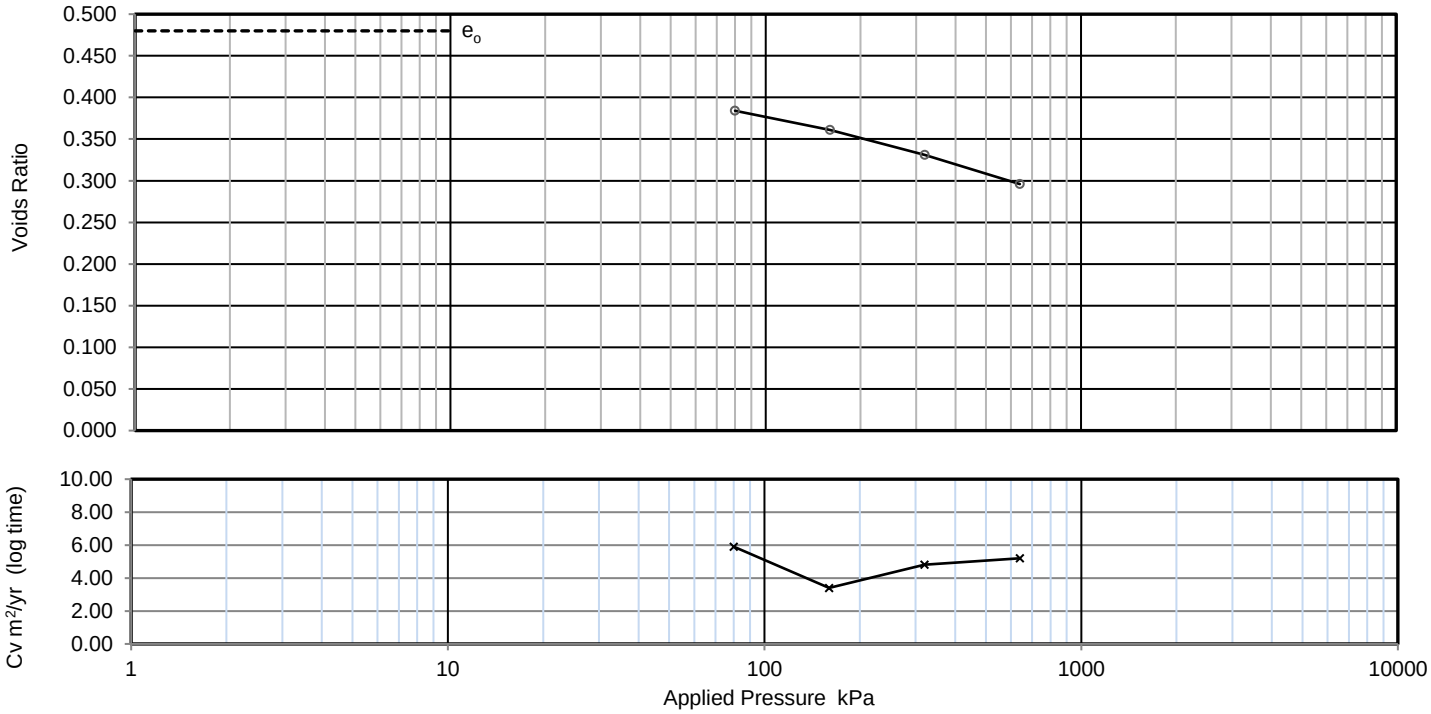
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 08/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409102 | Depth Top [m]: | 4.00 |
| Hole No.: | BH03 | Depth Base [m]: | 4.50 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brown slightly gravelly slightly silty CLAY | | |




| Applied Pressure kPa | Voids ratio | Mv m2/MN | Cv ( t50, log ) m2/yr | Cv ( t90, root m2/yr | Csec |
|---|---|---|---|---|---|
| 0 | 0.480 | - | - | - | - |
| 80 | 0.384 | 0.81 | 5.9 | 6.1 | 0.00083 |
| 160 | 0.361 | 0.21 | 3.4 | 3.6 | 0.00064 |
| 320 | 0.331 | 0.14 | 4.8 | 3.4 | 0.00088 |
| 640 | 0.296 | 0.082 | 5.2 | 4.1 | 0.0013 |

Preparation: Carried out on top of U100

Index tests

| | | | |
|---|---|---|---|
| Orientation of the sample | Vertical | | |
| Particle density | assumed | 2.65 | Mg/m3 |
| Liquid limit | N/A | | % |
| Plastic limit | N/A | | % |

| Specimen details | Initial | Final | |
|---|---|---|---|
| Diameter | 50.05 | - | mm |
| Height | 20.04 | 17.55 | mm |
| Moisture Content | 18 | 14 | % |
| Bulk density | 2.11 | 2.33 | Mg/m3 |
| Dry density | 1.79 | 2.05 | Mg/m3 |
| Voids Ratio | 0.480 | 0.296 | |
| Saturation | 98 | 123 | % |
| Avg. temperature for test | 22.0 | | °C |
| Swelling Pressure | Not measured | | kPa |
| Settlement on saturation | | | % |
| Total test time | 4 | | days |

Note: Cv corrected to 20°C

Remarks:

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.

**Signed:** Monika Siewior

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 172.16**

# TEST CERTIFICATE

**DETERMINATION OF THE ONE-DIMENSIONAL CONSOLIDATION PROPERTIES**

Tested in Accordance with: BS 1377-5:1990: Clause 3

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

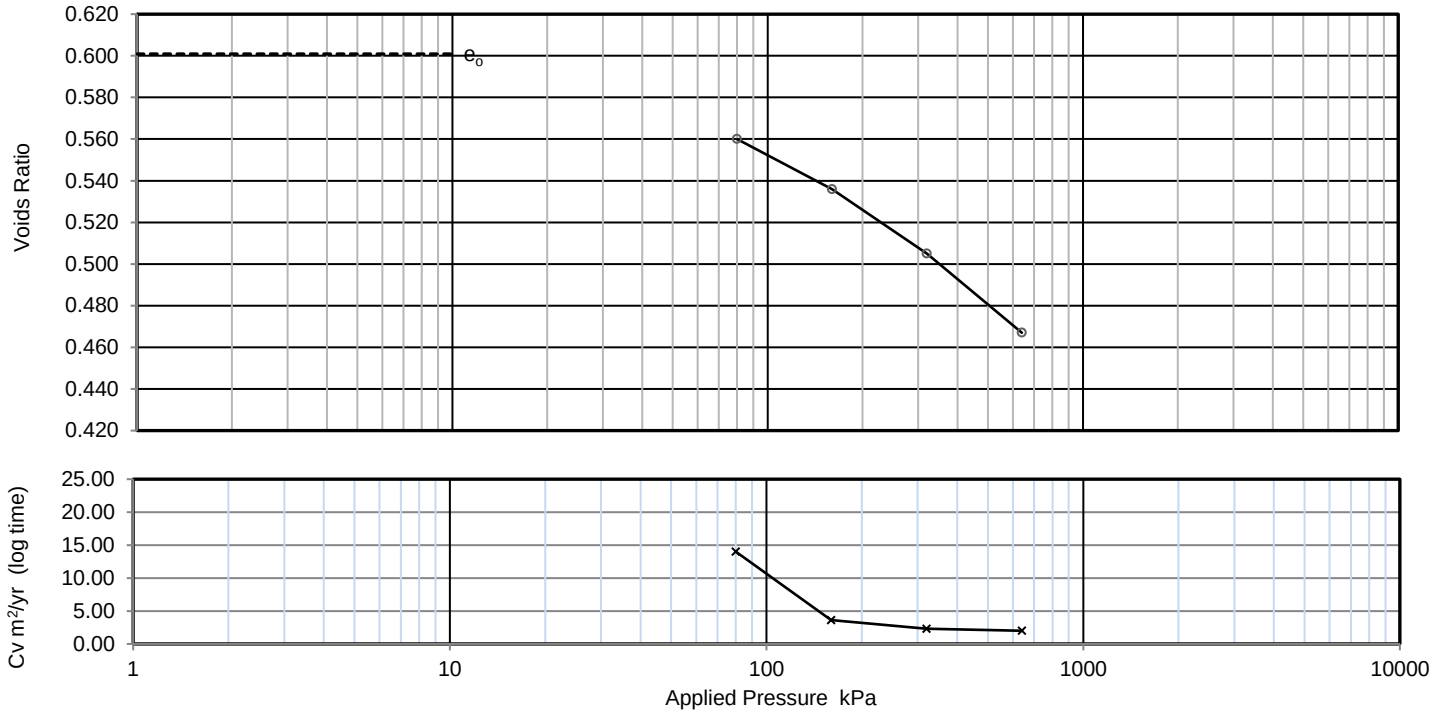
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 210939 |
| Client Address: | Whitehall Waterfront, 2 Riverside Way, Leeds, LS1 4EH | Job Number: | 22-81413 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/08/2022 |
| Contact: | Mike Harper | Date Tested: | 08/09/2022 |
| Site Address: | Plot P, Kingsway Bus. Park | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2409112 | Depth Top [m]: | 4.00 |
| Hole No.: | BH05 | Depth Base [m]: | 4.45 |
| Sample Reference: | Not Given | Sample Type: | D |
| Sample Description: | Brown slightly sandy CLAY | | |




| Applied Pressure kPa | Voids ratio | Mv m2/MN | Cv ( t50, log ) m2/yr | Cv ( t90, root m2/yr | Csec |
|---|---|---|---|---|---|
| 0 | 0.601 | - | - | - | - |
| 80 | 0.560 | 0.32 | 14 | 11 | 0.0008 |
| 160 | 0.536 | 0.19 | 3.6 | 2.9 | 0.001 |
| 320 | 0.505 | 0.12 | 2.3 | 2.1 | 0.0013 |
| 640 | 0.467 | 0.079 | 2 | 2 | 0.0014 |

Preparation: Carried out on top of U100

Index tests

| | | | |
|---|---|---|---|
| Orientation of the sample | Vertical | | |
| Particle density | assumed | 2.65 | Mg/m3 |
| Liquid limit | N/A | | % |
| Plastic limit | N/A | | % |

| Specimen details | Initial | Final | |
|---|---|---|---|
| Diameter | 50.04 | - | mm |
| Height | 20.16 | 18.48 | mm |
| Moisture Content | 22 | 21 | % |
| Bulk density | 2.03 | 2.18 | Mg/m3 |
| Dry density | 1.66 | 1.81 | Mg/m3 |
| Voids Ratio | 0.601 | 0.467 | |
| Saturation | 99 | 119 | % |
| Avg. temperature for test | 22.0 | | °C |
| Swelling Pressure | Not measured | | kPa |
| Settlement on saturation | | | % |
| Total test time | 4 | | days |

Note: Cv corrected to 20°C

Remarks:

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.

**Signed:** Monika Siewior

Monika Siewior
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 15/09/2022

**GF 172.16**

**Mike Harper**
BWB Consulting Limited
Whitehall Waterfront
2 Riverside Way
Leeds
LS1 4EH

**e:** mike.harper@bwbconsulting.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

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

# Analytical Report Number : 22-81416

| | | | |
|---|---|---|---|
| **Project / Site name:** | Plot P, Kingsway Bus. Park | **Samples received on:** | 05/08/2022 |
| **Your job number:** | 210939 | **Samples instructed on/ Analysis started on:** | 01/09/2022 |
| **Your order number:** | 2412 | **Analysis completed by:** | 09/09/2022 |
| **Report Issue Number:** | 1 | **Report issued on:** | 09/09/2022 |
| **Samples Analysed:** | 8 soil samples | | |

Izabela Wójcik

**Signed:**

Izabela Wójcik
Reporting Specialist
**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.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 22-81416**
**Project / Site name: Plot P, Kingsway Bus. Park**
**Your Order No: 2412**

| **Lab Sample Number** | | | | 2409118 | 2409119 | 2409120 | 2409121 | 2409122 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP101 | TP103 | TP110 | TP112 | TP114 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 1.00-1.00 | 0.50-0.50 | 3.60-3.60 | 0.50-0.50 | 2.30-2.30 |
| **Date Sampled** | | | | Deviating | Deviating | Deviating | Deviating | Deviating |
| **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 | 15 | 13 | 12 | 12 | 17 |
| Total mass of sample received | kg | 0.001 | NONE | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |

**General Inorganics**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| pH - Automated | pH Units | N/A | MCERTS | 7.8 | 7.5 | 7.6 | 7.9 | 7.8 |
| Total Sulphate as SO4 | % | 0.005 | MCERTS | 0.124 | 0.024 | 0.019 | 0.065 | 0.01 |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | 0.046 | 0.0073 | 0.029 | 0.29 | 0.021 |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | mg/l | 1.25 | MCERTS | 45.6 | 7.3 | 29.1 | 291 | 20.7 |
| Total Sulphur | % | 0.005 | MCERTS | 0.149 | 0.022 | 0.062 | 0.052 | 0.036 |

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: 22-81416**
**Project / Site name: Plot P, Kingsway Bus. Park**
**Your Order No: 2412**

| **Lab Sample Number** | | | | 2409123 | 2409124 | 2409125 |
|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP116 | TP120 | BH03 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 1.80-1.80 | 1.10-1.10 | 6.50-6.50 |
| **Date Sampled** | | | | Deviating | Deviating | Deviating |
| **Time Taken** | | | | 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 | 25 | 17 | 19 |
| Total mass of sample received | kg | 0.001 | NONE | 0.5 | 0.5 | 0.5 |

**General Inorganics**

| | | | | | | |
|---|---|---|---|---|---|---|
| pH - Automated | pH Units | N/A | MCERTS | 7.3 | 7.3 | 8.4 |
| Total Sulphate as SO4 | % | 0.005 | MCERTS | 0.016 | 0.014 | 0.013 |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | 0.027 | 0.0052 | 0.013 |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | mg/l | 1.25 | MCERTS | 27 | 5.2 | 12.6 |
| Total Sulphur | % | 0.005 | MCERTS | 0.01 | 0.014 | 0.019 |

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 : 22-81416**
**Project / Site name: Plot P, Kingsway Bus. Park**

* 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 * |
|---|---|---|---|---|
| 2409118 | TP101 | None Supplied | 1.00-1.00 | Brown loam and sand with gravel and vegetation. |
| 2409119 | TP103 | None Supplied | 0.50-0.50 | Brown loam and sand with gravel and vegetation. |
| 2409120 | TP110 | None Supplied | 3.60-3.60 | Brown clay. |
| 2409121 | TP112 | None Supplied | 0.50-0.50 | Brown clay. |
| 2409122 | TP114 | None Supplied | 2.30-2.30 | Brown sand. |
| 2409123 | TP116 | None Supplied | 1.80-1.80 | Brown clay and sand. |
| 2409124 | TP120 | None Supplied | 1.10-1.10 | Brown clay. |
| 2409125 | BH03 | None Supplied | 6.50-6.50 | Brown clay. |

**Analytical Report Number : 22-81416**
**Project / Site name: Plot P, Kingsway Bus. Park**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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

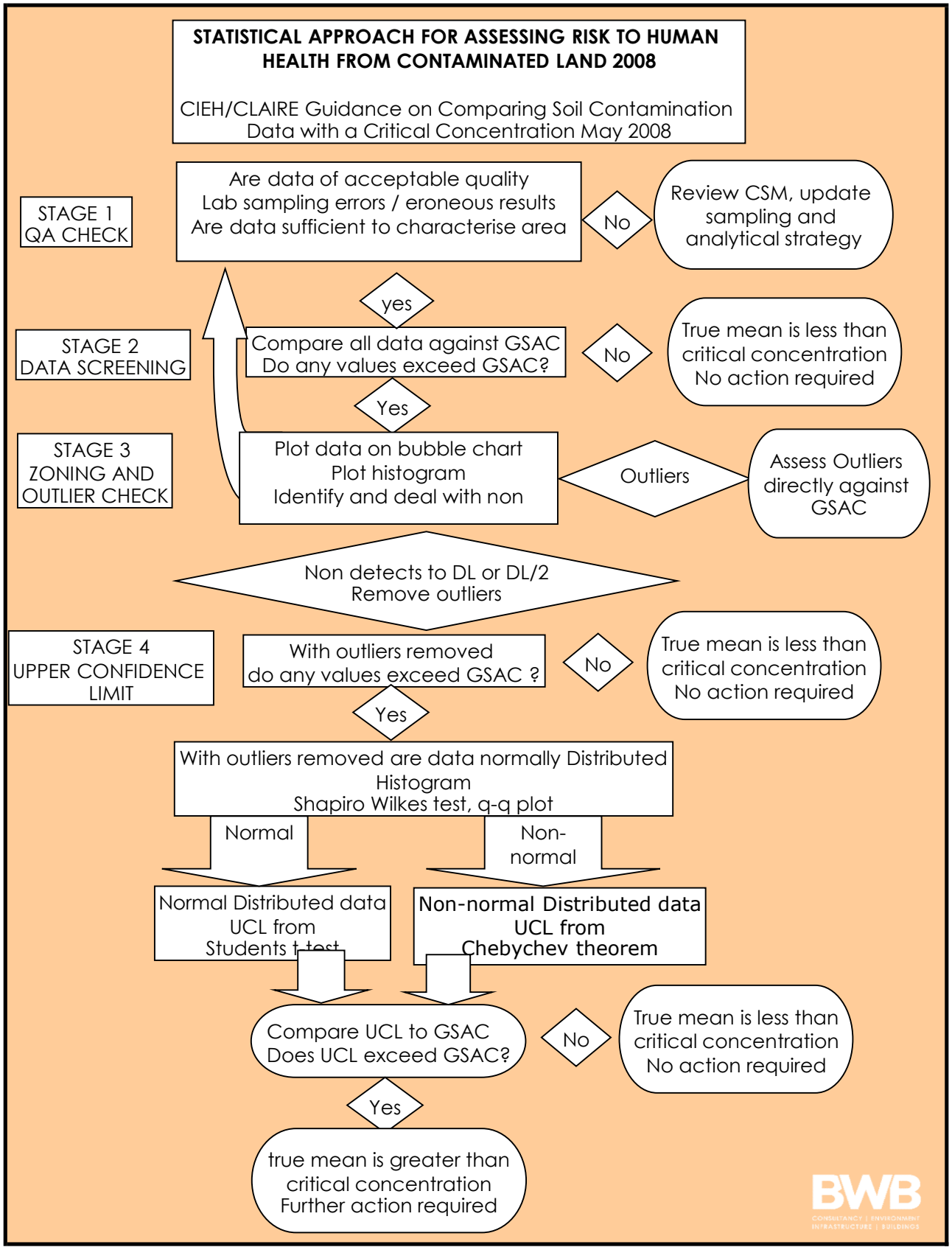
**Analytical Report Number : 22-81416**
**Project / Site name: Plot P, Kingsway Bus. Park**

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

| Sample ID | Other ID | Sample Type | Lab Sample Number | Sample Deviation | Test Name | Test Ref | Test Deviation |
|---|---|---|---|---|---|---|---|
| BH03 | None Supplied | S | 2409125 | a | None Supplied | None Supplied | None Supplied |
| TP101 | None Supplied | S | 2409118 | a | None Supplied | None Supplied | None Supplied |
| TP103 | None Supplied | S | 2409119 | a | None Supplied | None Supplied | None Supplied |
| TP110 | None Supplied | S | 2409120 | a | None Supplied | None Supplied | None Supplied |
| TP112 | None Supplied | S | 2409121 | a | None Supplied | None Supplied | None Supplied |
| TP114 | None Supplied | S | 2409122 | a | None Supplied | None Supplied | None Supplied |
| TP116 | None Supplied | S | 2409123 | a | None Supplied | None Supplied | None Supplied |
| TP120 | None Supplied | S | 2409124 | a | None Supplied | None Supplied | None Supplied |

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

# Appendix 8: CLEA Assessment Worksheets


STATISTICAL APPROACH FOR ASSESSING RISK TO HUMAN HEALTH FROM CONTAMINATED LAND 2008
CIEH/CLAIRE Guidance on Comparing Soil Contamination Data with a Critical Concentration May 2008
STAGE 1 QA CHECK
Are data of acceptable quality
Lab sampling errors / eroneous results
Are data sufficient to characterise area
No
Review CSM, update sampling and analytical strategy
yes
STAGE 2 DATA SCREENING
Compare all data against GSAC
Do any values exceed GSAC?
No
True mean is less than critical concentration
No action required
Yes
STAGE 3 ZONING AND OUTLIER CHECK
Plot data on bubble chart
Plot histogram
Identify and deal with non
Outliers
Assess Outliers directly against GSAC
Non detects to DL or DL/2
Remove outliers
STAGE 4 UPPER CONFIDENCE LIMIT
With outliers removed
do any values exceed GSAC ?
No
True mean is less than critical concentration
No action required
Yes
With outliers removed are data normally Distributed
Histogram
Shapiro Wilkes test, q-q plot
Normal
Non-normal
Normal Distributed data
UCL from
Students t-test
Non-normal Distributed data
UCL from
Chebychev theorem
Compare UCL to GSAC
Does UCL exceed GSAC?
No
True mean is less than critical concentration
No action required
Yes
true mean is greater than critical concentration
Further action required
BWB
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# Human Health Generic QRA Worksheet

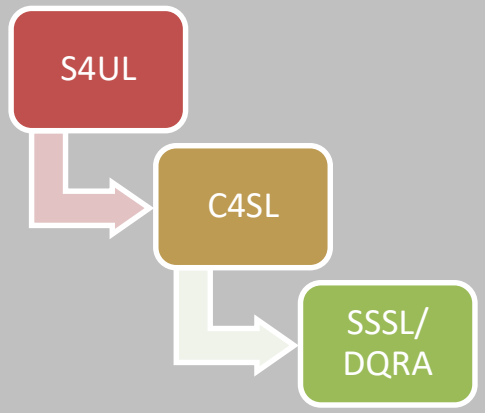
| | |
|---|---|
| **Job Name: Plot P, Kingsway Business Park Rochdale** | **Job Number: 2100939** |
| description: The site is located on a collection of fields, immediately south of Kingsway Business Park tram station in Rochdale, OL16 4JN. The proposed development is anticipated to comprise a commercial and/or warehouse use with associated infrastructure. | |

Define CSM – Is site represented by a standard land use?

Residential with / without homegrown produce
Commercial / Industrial
Public Open Space - Residential (S4UL/C4SL only)
Public Open Space - Park (S4UL/C4SL only)

| | |
|---|---|
| **GSAC Type (BWB, LQM S4UL, C4SL, Bespoke)** | **LQM_CIEH_S4UL** |
| **Key Receptor/CSM (Residential/Commercial/POS)** | **S4UL Commercial** |
| **Organic Matter % (If unknown use 1%)** | **1** |

GSAC Hierarcy




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Publication Number S4UL3271

| Generic Assessment Criteria<br><br>Job Name: Plot P, Kingsway Business ParkRochdal<br>Job Number: 2100939 | S4UL Commercial<br>mg/kg |  <br>Source |
|---|---|---|
| **Arsenic** | 6.40E+02 | LQM_CIEH_S4UL |
| **Barium** | 2.21E+04 | LQM_CIEH_S4UL |
| **Beryllium** | 1.20E+01 | LQM_CIEH_S4UL |
| **Boron** | 2.40E+05 | LQM_CIEH_S4UL |
| **Cadmium** | 1.90E+02 | LQM_CIEH_S4UL |
| **Chromium VI** | 3.30E+01 | LQM_CIEH_S4UL |
| **Chromium III** | 8.60E+03 | LQM_CIEH_S4UL |
| **Copper** | 6.80E+04 | LQM_CIEH_S4UL |
| **Lead*** | 2.33E+03 | DEFRA_C4SL |
| **Inorganic Mercury** | 1.10E+03 | LQM_CIEH_S4UL |
| **Nickel** | 9.80E+02 | LQM_CIEH_S4UL |
| **Selenium** | 1.20E+04 | LQM_CIEH_S4UL |
| **Vanadium** | 9.00E+03 | LQM_CIEH_S4UL |
| **Zinc** | 7.30E+05 | LQM_CIEH_S4UL |
| **Cyanide (Free)** | 4.30E+01 | BWB |
| **Cyanide (Complex)** | 2.13E+02 | BWB |
| **Phenols (Total)** | 4.40E+02 | LQM_CIEH_S4UL |
| **Benzene** | 2.70E+01 | LQM_CIEH_S4UL |
| **Toluene** | 5.60E+04 | LQM_CIEH_S4UL |
| **Ethyl benzene** | 5.70E+03 | LQM_CIEH_S4UL |
| **Total Xylene** | 5.90E+03 | LQM_CIEH_S4UL |
| **TPH (EC5-6) aliphatic** | 3.20E+03 | LQM_CIEH_S4UL |
| **TPH (>EC6-8) aliphatic** | 7.80E+03 | LQM_CIEH_S4UL |
| **TPH (>EC8-10) aliphatic** | 2.00E+03 | LQM_CIEH_S4UL |
| **TPH (>EC10-12) aliphatic** | 9.70E+03 | LQM_CIEH_S4UL |
| **TPH (>EC12-16) aliphatic** | 5.90E+04 | LQM_CIEH_S4UL |
| **TPH (>EC16-21) aliphatic** | 1.60E+06 | LQM_CIEH_S4UL |
| **TPH (>EC21-35) aliphatic** | 1.60E+06 | LQM_CIEH_S4UL |
| **TPH (>EC35-44) aliphatic** | 1.60E+06 | LQM_CIEH_S4UL |
| **TPH (>EC6-7) aromatic (benzene)** | 2.60E+04 | LQM_CIEH_S4UL |
| **TPH (>EC7-8) aromatic (toluene)** | 5.60E+04 | LQM_CIEH_S4UL |
| **TPH (>EC8-10) aromatic** | 3.50E+03 | LQM_CIEH_S4UL |
| **TPH (>EC10-12) aromatic** | 1.60E+04 | LQM_CIEH_S4UL |
| **TPH (>EC12-16) aromatic** | 3.60E+04 | LQM_CIEH_S4UL |
| **TPH (>EC16-21) aromatic** | 2.80E+04 | LQM_CIEH_S4UL |
| **TPH (>EC21-35) aromatic** | 2.80E+04 | LQM_CIEH_S4UL |
| **TPH (>EC35-44) aromatic** | 2.80E+04 | LQM_CIEH_S4UL |
| **Total TPH** | 5.00E+02 | LQM_CIEH_S4UL |
| **Naphthalene** | 1.90E+02 | LQM_CIEH_S4UL |
| **Acenaphthylene** | 8.30E+04 | LQM_CIEH_S4UL |
| **Acenaphthene** | 8.40E+04 | LQM_CIEH_S4UL |
| **Fluorene** | 6.30E+04 | LQM_CIEH_S4UL |
| **Phenanthrene** | 2.20E+04 | LQM_CIEH_S4UL |
| **Anthracene** | 5.20E+05 | LQM_CIEH_S4UL |
| **Fluoranthene** | 2.30E+04 | LQM_CIEH_S4UL |
| **Pyrene** | 5.40E+04 | LQM_CIEH_S4UL |
| **Benzo(a)anthracene** | 1.70E+02 | LQM_CIEH_S4UL |
| **Chrysene** | 3.50E+02 | LQM_CIEH_S4UL |
| **Benzo(b)fluoranthene** | 4.40E+01 | LQM_CIEH_S4UL |
| **Benzo(k)fluoranthene** | 1.20E+03 | LQM_CIEH_S4UL |
| **Benzo(a)pyrene** | 3.50E+01 | LQM_CIEH_S4UL |
| **Indeno(1,2,3-c,d)pyrene** | 5.00E+02 | LQM_CIEH_S4UL |

| Generic Assessment Criteria<br><br>Job Name: Plot P, Kingsway Business ParkRochdal<br>Job Number: 2100939 | S4UL Commercial<br>mg/kg | Source |
|---|---|---|
| **Dibenzo(a,h)anthracene** | 3.50E+00 | LQM_CIEH_S4UL |
| **Benzo(g,hi)perylene** | 3.90E+03 | LQM_CIEH_S4UL |
| **Coal Tar (B(a)P as surrogate marker** | 1.50E+01 | LQM_CIEH_S4UL |
| **Tetrachloroethene (PCE)** | 1.90E+01 | LQM_CIEH_S4UL |
| **Trichloroethene (TCE)** | 1.20E+00 | LQM_CIEH_S4UL |
| ***cis* -1,2-Dichloroethene** | 1.40E+01 | LQM_CIEH_S4UL |
| **Vinyl Chloride (VC)** | 5.90E-02 | LQM_CIEH_S4UL |
| **1,1,2,2-Tetrachloroethane (PCA)** | 2.70E+02 | LQM_CIEH_S4UL |
| **1,1,1-Trichloroethane (TCA)** | 6.60E+02 | LQM_CIEH_S4UL |
| **1,2-Dichloroethane** | 6.70E-01 | LQM_CIEH_S4UL |
| **Carbon Tetrachloride** | 2.90E+00 | LQM_CIEH_S4UL |
| **Carbon disulphide** | 1.10E+01 | LQM_CIEH_S4UL |

| Location | Sample depth | Easting | Northing | Strata Type | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium VI | Chromium III | Copper | Lead | Inorganic Mercury | Nickel | Selenium | Vanadium | Zinc | Cyanide (Free) | Cyanide (Complex) | Phenols (Total) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Detection Limit** | | | | | 1 | 1 | 0.06 | 0.2 | 0.2 | 1.8 | 1 | 1 | 1 | 0.3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **GSAC** | | | | | 6.40E+02 | 2.21E+04 | 1.20E+01 | 2.40E+05 | 1.90E+02 | 3.30E+01 | 8.60E+03 | 6.80E+04 | 2.33E+03 | 1.10E+03 | 9.80E+02 | 1.20E+04 | 9.00E+03 | 7.30E+05 | 4.30E+01 | 2.13E+02 | 4.40E+02 |
| TP101 | 0.30 | | | | 52 | 560 | 2.6 | 0.3 | 0.2 | 1.8 | 31 | 140 | 180 | 0.3 | 55 | 1 | 83 | 63 | 1 | 19 | 1 |
| TP104 | 0.30 | | | | 7.4 | 36 | 0.51 | 0.2 | 0.2 | 1.8 | 27 | 17 | 11 | 0.3 | 18 | 1 | 27 | 37 | 1 | 1 | 1 |
| TP112 | 0.70 | | | | 6.7 | 110 | 0.78 | 0.4 | 0.2 | 1.8 | 22 | 19 | 41 | 0.3 | 21 | 1 | 23 | 56 | 1 | 1 | 1 |
| TP113 | 0.30 | | | | 11 | 42 | 0.45 | 0.8 | 0.2 | 1.8 | 13 | 28 | 65 | 0.3 | 9 | 1 | 18 | 37 | 1 | 1 | 1 |
| TP114 | 1.80 | | | | 3.5 | 21 | 0.33 | 0.2 | 0.2 | 1.8 | 7.9 | 11 | 7 | 0.3 | 20 | 1 | 8.2 | 26 | 1 | 1 | 1 |
| TP115 | 1.50 | | | | 3.8 | 25 | 0.33 | 0.2 | 0.2 | 1.8 | 9.8 | 9.8 | 6.1 | 0.3 | 10 | 1 | 9.6 | 26 | 1 | 1 | 1 |
| TP116 | 0.90 | | | | 9.4 | 49 | 0.45 | 3.8 | 0.2 | 3.3 | 13 | 23 | 56 | 0.3 | 10 | 1 | 14 | 52 | 1 | 1 | 1 |
| TP119 | 0.60 | | | | 16 | 220 | 1.1 | 0.4 | 0.2 | 1.8 | 30 | 92 | 270 | 0.3 | 31 | 1.1 | 42 | 81 | 1 | 1 | 1 |

| Location | Sample depth | Benzene | Toluene | Ethyl benzene | Total Xylene | TPH (EC5-6) aliphatic | TPH (>EC6-8) aliphatic | TPH (>EC8-10) aliphatic | TPH (>EC10-12) aliphatic | TPH (>EC12-16) aliphatic | TPH (>EC16-21) aliphatic | TPH (>EC21-35) aliphatic | TPH (>EC6-7) aromatic (benzene) | TPH (>EC7-8) aromatic (toluene) | TPH (>EC8-10) aromatic | TPH (>EC10-12) aromatic | TPH (>EC12-16) aromatic | TPH (>EC16-21) aromatic | TPH (>EC21-35) aromatic |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Detection Limit** | | 0.001 | 0.001 | 0.001 | 0.001 | | | | | | | | | | | | | | |
| **GSAC** | | 2.70E+01 | 5.60E+04 | 5.70E+03 | 5.90E+03 | 3.20E+03 | 7.80E+03 | 2.00E+03 | 9.70E+03 | 5.90E+04 | 1.60E+06 | 1.60E+06 | 2.60E+04 | 5.60E+04 | 3.50E+03 | 1.60E+04 | 3.60E+04 | 2.80E+04 | 2.80E+04 |
| TP101 | 0.30 | 0.001 | 0.001 | 0.001 | 0.002 | 0.001 | 0.001 | 0.001 | 1 | 2 | 8 | 8 | 0.001 | | 0.001 | 1 | | 14 | 24 |
| TP104 | 0.30 | 0.001 | 0.001 | 0.001 | 0.002 | 0.001 | 0.001 | 0.001 | 1 | 2 | 8 | 8 | 0.001 | | 0.001 | 1 | | 10 | 10 |
| TP112 | 0.70 | | | | | | | | | | | | | | | | | | |
| TP113 | 0.30 | 0.001 | 0.001 | 0.001 | 0.002 | 0.001 | 0.001 | 0.001 | 1 | 2 | 8 | 8 | 0.001 | | 0.001 | 1 | | 10 | 25 |
| TP114 | 1.80 | | | | | | | | | | | | | | | | | | |
| TP115 | 1.50 | | | | | | | | | | | | | | | | | | |
| TP116 | 0.90 | | | | | | | | | | | | | | | | | | |
| TP119 | 0.60 | | | | | | | | | | | | | | | | | | |

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| Location | Sample depth | TPH (>EC35-44) aromatic | Total TPH | Naphthalene | Acenaphthylene | Acenaphthene | Fluorene | Phenanthrene | Anthracene | Fluoranthene | Pyrene | Benzo(a)anthracene | Chrysene | Benzo(b)fluoranthene | Benzo(k)fluoranthene | Benzo(a)pyrene | Indeno(1,2,3-c,d)pyrene | Dibenzo(a,h)anthracene | Benzo(g,hi)perylene | Benzo(a)pyrene (as surrogate marker) | Tetrachloroethene (PCE) | *Trichloroethene (TCE)* | cis-1,2-Dichloroethene | Vinyl Chloride (VC) | 1,1,2,2-Tetrachloroethane (PCA) | 1,1,1-Trichloroethane (TCA) | 1,2-Dichloroethane |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Detection Limit** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **GSAC** | | 2.80E+04 | 5.00E+02 | 1.90E+02 | 8.30E+04 | 8.40E+04 | 6.30E+04 | 2.20E+04 | 5.20E+05 | 2.30E+04 | 5.40E+04 | 1.70E+02 | 3.50E+02 | 4.40E+01 | 1.20E+03 | 3.50E+01 | 5.00E+02 | 3.50E+00 | 3.90E+03 | 1.50E+01 | 1.90E+01 | 1.20E+00 | 1.40E+01 | 5.90E-02 | 2.70E+02 | 6.60E+02 | 6.70E-01 |
| TP101 | 0.30 | | | 0.05 | 0.05 | 0.4 | 0.27 | 3.5 | 0.98 | 5.7 | 4.9 | 4.1 | 2.7 | 3.5 | 1.9 | 3.6 | 2.2 | 0.54 | 2.3 | 3.6 | | | | | | | |
| TP104 | 0.30 | | | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | | |
| TP112 | 0.70 | | | 0.05 | 0.05 | 0.33 | 0.3 | 2 | 0.54 | 2.1 | 2.1 | 1.2 | 0.99 | 0.89 | 0.53 | 0.98 | 0.41 | 0.05 | 0.51 | 0.98 | | | | | | | |
| TP113 | 0.30 | | | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.35 | 0.33 | 0.23 | 0.22 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | | |
| TP114 | 1.80 | | | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | | |
| TP115 | 1.50 | | | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | | |
| TP116 | 0.90 | | | 0.05 | 0.05 | 0.05 | 0.05 | 0.58 | 0.05 | 1.2 | 0.99 | 0.61 | 0.54 | 0.72 | 0.25 | 0.59 | 0.3 | 0.05 | 0.41 | 0.59 | | | | | | | |
| TP119 | 0.60 | | | 0.05 | 0.05 | 0.05 | 0.05 | 0.77 | 0.35 | 1.5 | 1.4 | 0.86 | 0.77 | 0.99 | 0.36 | 0.75 | 0.37 | 0.05 | 0.45 | 0.75 | | | | | | | |

| Location | Sample depth | Carbon Tetrachloride |
|---|---|---|
| **Detection Limit** | | |
| **GSAC** | | 2.90E+00 |
| TP101 | 0.30 | |
| TP104 | 0.30 | |
| TP112 | 0.70 | |
| TP113 | 0.30 | |
| TP114 | 1.80 | |
| TP115 | 1.50 | |
| TP116 | 0.90 | |
| TP119 | 0.60 | |

| Determinand | Number of tests | Range (mg/kg) | S4UL Commercial GSAC (m | Detection Limit (mg/kg) | Min | Max | No. of Exceedances | No. Non detects | < or not |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 8 | 3.5 to 52 | 6.40E+02 | 1 | 3.5 | 52 | 0 | 0 | |
| Barium | 8 | 21 to 560 | 2.21E+04 | 1 | 21 | 560 | 0 | 0 | |
| Beryllium | 8 | 0.33 to 2.6 | 1.20E+01 | 0.06 | 0.33 | 2.6 | 0 | 0 | |
| Boron | 8 | <0.2 to 3.8 | 2.40E+05 | 0.2 | 0.2 | 3.8 | 0 | 3 | < |
| Cadmium | 8 | <0.2 to 0.2 | 1.90E+02 | 0.2 | 0.2 | 0.2 | 0 | 8 | < |
| Chromium VI | 8 | <1.8 to 3.3 | 3.30E+01 | 1.8 | 1.8 | 3.3 | 0 | 7 | < |
| Chromium III | 8 | 7.9 to 31 | 8.60E+03 | 1 | 7.9 | 31 | 0 | 0 | |
| Copper | 8 | 9.8 to 140 | 6.80E+04 | 1 | 9.8 | 140 | 0 | 0 | |
| Lead* | 8 | 6.1 to 270 | 2.33E+03 | 1 | 6.1 | 270 | 0 | 0 | |
| Inorganic Mercury | 8 | <0.3 to 0.3 | 1.10E+03 | 0.3 | 0.3 | 0.3 | 0 | 8 | < |
| Nickel | 8 | 9 to 55 | 9.80E+02 | 1 | 9 | 55 | 0 | 0 | |
| Selenium | 8 | <1 to 1.1 | 1.20E+04 | 1 | 1 | 1.1 | 0 | 7 | < |
| Vanadium | 8 | 8.2 to 83 | 9.00E+03 | 1 | 8.2 | 83 | 0 | 0 | |
| Zinc | 8 | 26 to 81 | 7.30E+05 | 1 | 26 | 81 | 0 | 0 | |
| Cyanide (Free) | 8 | <1 to 1 | 4.30E+01 | 1 | 1 | 1 | 0 | 8 | < |
| Cyanide (Complex) | 8 | <1 to 19 | 2.13E+02 | 1 | 1 | 19 | 0 | 7 | < |
| Phenols (Total) | 8 | <1 to 1 | 4.40E+02 | 1 | 1 | 1 | 0 | 8 | < |
| Benzene | 3 | <0.001 to 0.001 | 2.70E+01 | 0.001 | 0.001 | 0.001 | 0 | 3 | < |
| Toluene | 3 | <0.001 to 0.001 | 5.60E+04 | 0.001 | 0.001 | 0.001 | 0 | 3 | < |
| Ethyl benzene | 3 | <0.001 to 0.001 | 5.70E+03 | 0.001 | 0.001 | 0.001 | 0 | 3 | < |
| Total Xylene | 3 | 0.002 to 0.002 | 5.90E+03 | 0.001 | 0.002 | 0.002 | 0 | 0 | |
| TPH (EC5-6) aliphatic | 3 | <0.001 to 0.001 | 3.20E+03 | 0 | 0.001 | 0.001 | 0 | 197 | < |
| TPH (>EC6-8) aliphatic | 3 | <0.001 to 0.001 | 7.80E+03 | 0 | 0.001 | 0.001 | 0 | 197 | < |
| TPH (>EC8-10) aliphatic | 3 | <0.001 to 0.001 | 2.00E+03 | 0 | 0.001 | 0.001 | 0 | 197 | < |
| TPH (>EC10-12) aliphatic | 3 | <1 to 1 | 9.70E+03 | 0 | 1 | 1 | 0 | 197 | < |
| TPH (>EC12-16) aliphatic | 3 | <2 to 2 | 5.90E+04 | 0 | 2 | 2 | 0 | 197 | < |
| TPH (>EC16-21) aliphatic | 3 | <8 to 8 | 1.60E+06 | 0 | 8 | 8 | 0 | 197 | < |
| TPH (>EC21-35) aliphatic | 3 | <8 to 8 | 1.60E+06 | 0 | 8 | 8 | 0 | 197 | < |
| TPH (>EC35-44) aliphatic | 0 | <0 to 0 | 1.60E+06 | 0 | 0 | 0 | 0 | 197 | < |
| TPH (>EC6-7) aromatic (benzene) | 3 | <0.001 to 0.001 | 2.60E+04 | 0 | 0.001 | 0.001 | 0 | 197 | < |
| TPH (>EC7-8) aromatic (toluene) | 0 | <0 to 0 | 5.60E+04 | 0 | 0 | 0 | 0 | 200 | < |
| TPH (>EC8-10) aromatic | 3 | <0.001 to 0.001 | 3.50E+03 | 0 | 0.001 | 0.001 | 0 | 197 | < |
| TPH (>EC10-12) aromatic | 3 | <1 to 1 | 1.60E+04 | 0 | 1 | 1 | 0 | 197 | < |
| TPH (>EC12-16) aromatic | 0 | <0 to 0 | 3.60E+04 | 0 | 0 | 0 | 0 | 200 | < |
| TPH (>EC16-21) aromatic | 3 | <10 to 14 | 2.80E+04 | 0 | 10 | 14 | 0 | 197 | < |
| TPH (>EC21-35) aromatic | 3 | <10 to 25 | 2.80E+04 | 0 | 10 | 25 | 0 | 197 | < |
| TPH (>EC35-44) aromatic | 0 | <0 to 0 | 2.80E+04 | 0 | 0 | 0 | 0 | 200 | < |
| Total TPH | 0 | <0 to 0 | 5.00E+02 | 0 | 0 | 0 | 0 | 200 | < |
| Naphthalene | 8 | <0.05 to 0.05 | 1.90E+02 | 0 | 0.05 | 0.05 | 0 | 192 | < |
| Acenaphthylene | 8 | <0.05 to 0.05 | 8.30E+04 | 0 | 0.05 | 0.05 | 0 | 192 | < |
| Acenaphthene | 8 | <0.05 to 0.4 | 8.40E+04 | 0 | 0.05 | 0.4 | 0 | 192 | < |
| Fluorene | 8 | <0.05 to 0.3 | 6.30E+04 | 0 | 0.05 | 0.3 | 0 | 192 | < |
| Phenanthrene | 8 | <0.05 to 3.5 | 2.20E+04 | 0 | 0.05 | 3.5 | 0 | 192 | < |
| Anthracene | 8 | <0.05 to 0.98 | 5.20E+05 | 0 | 0.05 | 0.98 | 0 | 192 | < |
| Fluoranthene | 8 | <0.05 to 5.7 | 2.30E+04 | 0 | 0.05 | 5.7 | 0 | 192 | < |
| Pyrene | 8 | <0.05 to 4.9 | 5.40E+04 | 0 | 0.05 | 4.9 | 0 | 192 | < |
| Benzo(a)anthracene | 8 | <0.05 to 4.1 | 1.70E+02 | 0 | 0.05 | 4.1 | 0 | 192 | < |
| Chrysene | 8 | <0.05 to 2.7 | 3.50E+02 | 0 | 0.05 | 2.7 | 0 | 192 | < |
| Benzo(b)fluoranthene | 8 | <0.05 to 3.5 | 4.40E+01 | 0 | 0.05 | 3.5 | 0 | 192 | < |
| Benzo(k)fluoranthene | 8 | <0.05 to 1.9 | 1.20E+03 | 0 | 0.05 | 1.9 | 0 | 192 | < |
| Benzo(a)pyrene | 8 | <0.05 to 3.6 | 3.50E+01 | 0 | 0.05 | 3.6 | 0 | 192 | < |
| Indeno(1,2,3-c,d)pyrene | 8 | <0.05 to 2.2 | 5.00E+02 | 0 | 0.05 | 2.2 | 0 | 192 | < |
| Dibenzo(a,h)anthracene | 8 | <0.05 to 0.54 | 3.50E+00 | 0 | 0.05 | 0.54 | 0 | 192 | < |
| Benzo(g,hi)perylene | 8 | <0.05 to 2.3 | 3.90E+03 | 0 | 0.05 | 2.3 | 0 | 192 | < |
| Coal Tar (B(a)P as surrogate mark | 8 | <0.05 to 3.6 | 1.50E+01 | 0 | 0.05 | 3.6 | 0 | 192 | < |
| Tetrachloroethene (PCE) | 0 | <0 to 0 | 1.90E+01 | 0 | 0 | 0 | 0 | 200 | < |
| Trichloroethene (TCE) | 0 | <0 to 0 | 1.20E+00 | 0 | 0 | 0 | 0 | 200 | < |
| cis-1,2-Dichloroethene | 0 | <0 to 0 | 1.40E+01 | 0 | 0 | 0 | 0 | 200 | < |
| Vinyl Chloride (VC) | 0 | <0 to 0 | 5.90E-02 | 0 | 0 | 0 | 0 | 200 | < |
| 1,1,2,2-Tetrachloroethane (PCA) | 0 | <0 to 0 | 2.70E+02 | 0 | 0 | 0 | 0 | 200 | < |

# Human Health Generic QRA Worksheet

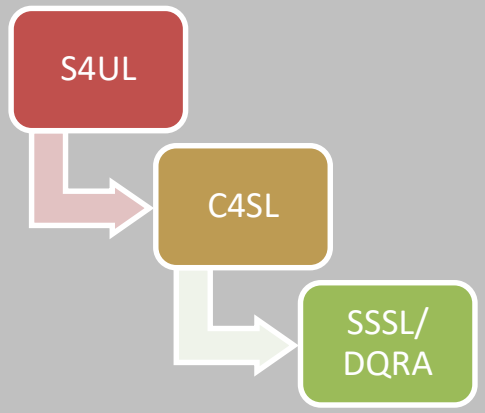
| | |
|---|---|
| **Job Name: Plot P, Kingsway Business Park Rochdale** | **Job Number: 2100939** |
| description: The site is located on a collection of fields, immediately south of Kingsway Business Park tram station in Rochdale, OL16 4JN. The proposed development is anticipated to comprise a commercial and/or warehouse use with associated infrastructure. | |

Define CSM – Is site represented by a standard land use?

Residential with / without homegrown produce
Commercial / Industrial
Public Open Space - Residential (S4UL/C4SL only)
Public Open Space - Park (S4UL/C4SL only)

| | |
|---|---|
| **GSAC Type (BWB, LQM S4UL, C4SL, Bespoke)** | **LQM_CIEH_S4UL** |
| **Key Receptor/CSM (Residential/Commercial/POS)** | **S4UL Commercial** |
| **Organic Matter % (If unknown use 1%)** | **2.5** |

GSAC Hierarcy




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Publication Number S4UL3271

| Generic Assessment Criteria<br><br>Job Name: Plot P, Kingsway Business ParkRochdal<br>Job Number: 2100939 | S4UL Commercial<br>mg/kg |  <br>Source |
|---|---|---|
| **Arsenic** | 6.40E+02 | LQM_CIEH_S4UL |
| **Barium** | 2.21E+04 | LQM_CIEH_S4UL |
| **Beryllium** | 1.20E+01 | LQM_CIEH_S4UL |
| **Boron** | 2.40E+05 | LQM_CIEH_S4UL |
| **Cadmium** | 1.90E+02 | LQM_CIEH_S4UL |
| **Chromium VI** | 3.30E+01 | LQM_CIEH_S4UL |
| **Chromium III** | 8.60E+03 | LQM_CIEH_S4UL |
| **Copper** | 6.80E+04 | LQM_CIEH_S4UL |
| **Lead*** | 2.33E+03 | DEFRA_C4SL |
| **Inorganic Mercury** | 1.10E+03 | LQM_CIEH_S4UL |
| **Nickel** | 9.80E+02 | LQM_CIEH_S4UL |
| **Selenium** | 1.20E+04 | LQM_CIEH_S4UL |
| **Vanadium** | 9.00E+03 | LQM_CIEH_S4UL |
| **Zinc** | 7.30E+05 | LQM_CIEH_S4UL |
| **Cyanide (Free)** | 4.30E+01 | BWB |
| **Cyanide (Complex)** | 2.13E+02 | BWB |
| **Phenols (Total)** | 6.90E+02 | LQM_CIEH_S4UL |
| **Benzene** | 4.70E+01 | LQM_CIEH_S4UL |
| **Toluene** | 1.10E+05 | LQM_CIEH_S4UL |
| **Ethyl benzene** | 1.30E+04 | LQM_CIEH_S4UL |
| **Total Xylene** | 1.40E+04 | LQM_CIEH_S4UL |
| **TPH (EC5-6) aliphatic** | 5.90E+03 | LQM_CIEH_S4UL |
| **TPH (>EC6-8) aliphatic** | 1.70E+04 | LQM_CIEH_S4UL |
| **TPH (>EC8-10) aliphatic** | 4.80E+03 | LQM_CIEH_S4UL |
| **TPH (>EC10-12) aliphatic** | 2.30E+04 | LQM_CIEH_S4UL |
| **TPH (>EC12-16) aliphatic** | 8.20E+04 | LQM_CIEH_S4UL |
| **TPH (>EC16-21) aliphatic** | 1.70E+06 | LQM_CIEH_S4UL |
| **TPH (>EC21-35) aliphatic** | 1.70E+06 | LQM_CIEH_S4UL |
| **TPH (>EC35-44) aliphatic** | 1.70E+06 | LQM_CIEH_S4UL |
| **TPH (>EC6-7) aromatic (benzene)** | 4.60E+04 | LQM_CIEH_S4UL |
| **TPH (>EC7-8) aromatic (toluene)** | 1.10E+05 | LQM_CIEH_S4UL |
| **TPH (>EC8-10) aromatic** | 8.10E+03 | LQM_CIEH_S4UL |
| **TPH (>EC10-12) aromatic** | 2.80E+04 | LQM_CIEH_S4UL |
| **TPH (>EC12-16) aromatic** | 3.70E+04 | LQM_CIEH_S4UL |
| **TPH (>EC16-21) aromatic** | 2.80E+04 | LQM_CIEH_S4UL |
| **TPH (>EC21-35) aromatic** | 2.80E+04 | LQM_CIEH_S4UL |
| **TPH (>EC35-44) aromatic** | 2.80E+04 | LQM_CIEH_S4UL |
| **Total TPH** | 5.00E+02 | LQM_CIEH_S4UL |
| **Naphthalene** | 4.60E+02 | LQM_CIEH_S4UL |
| **Acenaphthylene** | 9.70E+04 | LQM_CIEH_S4UL |
| **Acenaphthene** | 9.70E+04 | LQM_CIEH_S4UL |
| **Fluorene** | 6.80E+04 | LQM_CIEH_S4UL |
| **Phenanthrene** | 2.20E+04 | LQM_CIEH_S4UL |
| **Anthracene** | 5.40E+05 | LQM_CIEH_S4UL |
| **Fluoranthene** | 2.30E+04 | LQM_CIEH_S4UL |
| **Pyrene** | 5.40E+04 | LQM_CIEH_S4UL |
| **Benzo(a)anthracene** | 1.70E+02 | LQM_CIEH_S4UL |
| **Chrysene** | 3.50E+02 | LQM_CIEH_S4UL |
| **Benzo(b)fluoranthene** | 4.40E+01 | LQM_CIEH_S4UL |
| **Benzo(k)fluoranthene** | 1.20E+03 | LQM_CIEH_S4UL |
| **Benzo(a)pyrene** | 3.50E+01 | LQM_CIEH_S4UL |
| **Indeno(1,2,3-c,d)pyrene** | 5.10E+02 | LQM_CIEH_S4UL |

| Generic Assessment Criteria<br><br>Job Name: Plot P, Kingsway Business ParkRochdal<br>Job Number: 2100939 | S4UL Commercial<br>mg/kg | Source |
|---|---|---|
| **Dibenzo(a,h)anthracene** | 3.60E+00 | LQM_CIEH_S4UL |
| **Benzo(g,hi)perylene** | 4.00E+03 | LQM_CIEH_S4UL |
| **Coal Tar (B(a)P as surrogate marker** | 1.50E+01 | LQM_CIEH_S4UL |
| **Tetrachloroethene (PCE)** | 4.20E+01 | LQM_CIEH_S4UL |
| **Trichloroethene (TCE)** | 2.60E+00 | LQM_CIEH_S4UL |
| ***cis* -1,2-Dichloroethene** | 2.40E+01 | LQM_CIEH_S4UL |
| **Vinyl Chloride (VC)** | 7.70E-02 | LQM_CIEH_S4UL |
| **1,1,2,2-Tetrachloroethane (PCA)** | 5.50E+02 | LQM_CIEH_S4UL |
| **1,1,1-Trichloroethane (TCA)** | 1.30E+03 | LQM_CIEH_S4UL |
| **1,2-Dichloroethane** | 9.70E-01 | LQM_CIEH_S4UL |
| **Carbon Tetrachloride** | 6.30E+00 | LQM_CIEH_S4UL |
| **Carbon disulphide** | 2.20E+01 | LQM_CIEH_S4UL |

| Location | Sample depth | Easting | Northing | Strata Type | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium VI | Chromium III | Copper | Lead | Inorganic Mercury | Nickel | Selenium | Vanadium | Zinc | Cyanide (Free) | Cyanide (Complex) | Phenols (Total) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Detection Limit** | | | | | 1 | 1 | 0.06 | 0.2 | 0.2 | 1.8 | 1 | 1 | 1 | 0.3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **GSAC** | | | | | 6.40E+02 | 2.21E+04 | 1.20E+01 | 2.40E+05 | 1.90E+02 | 3.30E+01 | 8.60E+03 | 6.80E+04 | 2.33E+03 | 1.10E+03 | 9.80E+02 | 1.20E+04 | 9.00E+03 | 7.30E+05 | 4.30E+01 | 2.13E+02 | 6.90E+02 |
| TP101 | 0.30 | | | | 52 | 560 | 2.6 | 0.3 | 0.2 | 1.8 | 31 | 140 | 180 | 0.3 | 55 | 1 | 83 | 63 | 1 | 19 | 1 |
| TP104 | 0.30 | | | | 7.4 | 36 | 0.51 | 0.2 | 0.2 | 1.8 | 27 | 17 | 11 | 0.3 | 18 | 1 | 27 | 37 | 1 | 1 | 1 |
| TP112 | 0.70 | | | | 6.7 | 110 | 0.78 | 0.4 | 0.2 | 1.8 | 22 | 19 | 41 | 0.3 | 21 | 1 | 23 | 56 | 1 | 1 | 1 |
| TP113 | 0.30 | | | | 11 | 42 | 0.45 | 0.8 | 0.2 | 1.8 | 13 | 28 | 65 | 0.3 | 9 | 1 | 18 | 37 | 1 | 1 | 1 |
| TP114 | 1.80 | | | | 3.5 | 21 | 0.33 | 0.2 | 0.2 | 1.8 | 7.9 | 11 | 7 | 0.3 | 20 | 1 | 8.2 | 26 | 1 | 1 | 1 |
| TP115 | 1.50 | | | | 3.8 | 25 | 0.33 | 0.2 | 0.2 | 1.8 | 9.8 | 9.8 | 6.1 | 0.3 | 10 | 1 | 9.6 | 26 | 1 | 1 | 1 |
| TP116 | 0.90 | | | | 9.4 | 49 | 0.45 | 3.8 | 0.2 | 3.3 | 13 | 23 | 56 | 0.3 | 10 | 1 | 14 | 52 | 1 | 1 | 1 |
| TP119 | 0.60 | | | | 16 | 220 | 1.1 | 0.4 | 0.2 | 1.8 | 30 | 92 | 270 | 0.3 | 31 | 1.1 | 42 | 81 | 1 | 1 | 1 |

| Location | Sample depth | Benzene | Toluene | Ethyl benzene | Total Xylene | TPH (EC5-6) aliphatic | TPH (>EC6-8) aliphatic | TPH (>EC8-10) aliphatic | TPH (>EC10-12) aliphatic | TPH (>EC12-16) aliphatic | TPH (>EC16-21) aliphatic | TPH (>EC21-35) aliphatic | TPH (>EC6-7) aromatic (benzene) | TPH (>EC7-8) aromatic (toluene) | TPH (>EC8-10) aromatic | TPH (>EC10-12) aromatic | TPH (>EC12-16) aromatic | TPH (>EC16-21) aromatic | TPH (>EC21-35) aromatic |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Detection Limit** | | 0.001 | 0.001 | 0.001 | 0.001 | | | | | | | | | | | | | | |
| **GSAC** | | 4.70E+01 | 1.10E+05 | 1.30E+04 | 1.40E+04 | 5.90E+03 | 1.70E+04 | 4.80E+03 | 2.30E+04 | 8.20E+04 | 1.70E+06 | 1.70E+06 | 4.60E+04 | 1.10E+05 | 8.10E+03 | 2.80E+04 | 3.70E+04 | 2.80E+04 | 2.80E+04 |
| TP101 | 0.30 | 0.001 | 0.001 | 0.001 | 0.002 | 0.001 | 0.001 | 0.001 | 1 | 2 | 8 | 8 | 0.001 | | 0.001 | 1 | | 14 | 24 |
| TP104 | 0.30 | 0.001 | 0.001 | 0.001 | 0.002 | 0.001 | 0.001 | 0.001 | 1 | 2 | 8 | 8 | 0.001 | | 0.001 | 1 | | 10 | 10 |
| TP112 | 0.70 | | | | | | | | | | | | | | | | | | |
| TP113 | 0.30 | 0.001 | 0.001 | 0.001 | 0.002 | 0.001 | 0.001 | 0.001 | 1 | 2 | 8 | 8 | 0.001 | | 0.001 | 1 | | 10 | 25 |
| TP114 | 1.80 | | | | | | | | | | | | | | | | | | |
| TP115 | 1.50 | | | | | | | | | | | | | | | | | | |
| TP116 | 0.90 | | | | | | | | | | | | | | | | | | |
| TP119 | 0.60 | | | | | | | | | | | | | | | | | | |

BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

| Location | Sample depth | TPH (>EC35-44) aromatic | Total TPH | Naphthalene | Acenaphthylene | Acenaphthene | Fluorene | Phenanthrene | Anthracene | Fluoranthene | Pyrene | Benzo(a)anthracene | Chrysene | Benzo(b)fluoranthene | Benzo(k)fluoranthene | Benzo(a)pyrene | Indeno(1,2,3-c,d)pyrene | Dibenzo(a,h)anthracene | Benzo(g,hi)perylene | Benzo(a)pyrene (as surrogate marker) | Tetrachloroethene (PCE) | *Trichloroethene (TCE)* | cis-1,2-Dichloroethene | Vinyl Chloride (VC) | 1,1,2,2-Tetrachloroethane (PCA) | 1,1,1-Trichloroethane (TCA) | 1,2-Dichloroethane |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Detection Limit** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **GSAC** | | 2.80E+04 | 5.00E+02 | 4.60E+02 | 9.70E+04 | 9.70E+04 | 6.80E+04 | 2.20E+04 | 5.40E+05 | 2.30E+04 | 5.40E+04 | 1.70E+02 | 3.50E+02 | 4.40E+01 | 1.20E+03 | 3.50E+01 | 5.10E+02 | 3.60E+00 | 4.00E+03 | 1.50E+01 | 4.20E+01 | 2.60E+00 | 2.40E+01 | 7.70E-02 | 5.50E+02 | 1.30E+03 | 9.70E-01 |
| TP101 | 0.30 | | | 0.05 | 0.05 | 0.4 | 0.27 | 3.5 | 0.98 | 5.7 | 4.9 | 4.1 | 2.7 | 3.5 | 1.9 | 3.6 | 2.2 | 0.54 | 2.3 | 3.6 | | | | | | | |
| TP104 | 0.30 | | | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | | |
| TP112 | 0.70 | | | 0.05 | 0.05 | 0.33 | 0.3 | 2 | 0.54 | 2.1 | 2.1 | 1.2 | 0.99 | 0.89 | 0.53 | 0.98 | 0.41 | 0.05 | 0.51 | 0.98 | | | | | | | |
| TP113 | 0.30 | | | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.35 | 0.33 | 0.23 | 0.22 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | | |
| TP114 | 1.80 | | | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | | |
| TP115 | 1.50 | | | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | | |
| TP116 | 0.90 | | | 0.05 | 0.05 | 0.05 | 0.05 | 0.58 | 0.05 | 1.2 | 0.99 | 0.61 | 0.54 | 0.72 | 0.25 | 0.59 | 0.3 | 0.05 | 0.41 | 0.59 | | | | | | | |
| TP119 | 0.60 | | | 0.05 | 0.05 | 0.05 | 0.05 | 0.77 | 0.35 | 1.5 | 1.4 | 0.86 | 0.77 | 0.99 | 0.36 | 0.75 | 0.37 | 0.05 | 0.45 | 0.75 | | | | | | | |

| Location | Sample depth | Carbon Tetrachloride |
|---|---|---|
| **Detection Limit** | | |
| **GSAC** | | 6.30E+00 |
| TP101 | 0.30 | |
| TP104 | 0.30 | |
| TP112 | 0.70 | |
| TP113 | 0.30 | |
| TP114 | 1.80 | |
| TP115 | 1.50 | |
| TP116 | 0.90 | |
| TP119 | 0.60 | |

| Determinand | Number of tests | Range (mg/kg) | S4UL Commercial GSAC (m | Detection Limit (mg/kg) | Min | Max | No. of Exceedances | No. Non detects | < or not |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 8 | 3.5 to 52 | 6.40E+02 | 1 | 3.5 | 52 | 0 | 0 | |
| Barium | 8 | 21 to 560 | 2.21E+04 | 1 | 21 | 560 | 0 | 0 | |
| Beryllium | 8 | 0.33 to 2.6 | 1.20E+01 | 0.06 | 0.33 | 2.6 | 0 | 0 | |
| Boron | 8 | <0.2 to 3.8 | 2.40E+05 | 0.2 | 0.2 | 3.8 | 0 | 3 | < |
| Cadmium | 8 | <0.2 to 0.2 | 1.90E+02 | 0.2 | 0.2 | 0.2 | 0 | 8 | < |
| Chromium VI | 8 | <1.8 to 3.3 | 3.30E+01 | 1.8 | 1.8 | 3.3 | 0 | 7 | < |
| Chromium III | 8 | 7.9 to 31 | 8.60E+03 | 1 | 7.9 | 31 | 0 | 0 | |
| Copper | 8 | 9.8 to 140 | 6.80E+04 | 1 | 9.8 | 140 | 0 | 0 | |
| Lead* | 8 | 6.1 to 270 | 2.33E+03 | 1 | 6.1 | 270 | 0 | 0 | |
| Inorganic Mercury | 8 | <0.3 to 0.3 | 1.10E+03 | 0.3 | 0.3 | 0.3 | 0 | 8 | < |
| Nickel | 8 | 9 to 55 | 9.80E+02 | 1 | 9 | 55 | 0 | 0 | |
| Selenium | 8 | <1 to 1.1 | 1.20E+04 | 1 | 1 | 1.1 | 0 | 7 | < |
| Vanadium | 8 | 8.2 to 83 | 9.00E+03 | 1 | 8.2 | 83 | 0 | 0 | |
| Zinc | 8 | 26 to 81 | 7.30E+05 | 1 | 26 | 81 | 0 | 0 | |
| Cyanide (Free) | 8 | <1 to 1 | 4.30E+01 | 1 | 1 | 1 | 0 | 8 | < |
| Cyanide (Complex) | 8 | <1 to 19 | 2.13E+02 | 1 | 1 | 19 | 0 | 7 | < |
| Phenols (Total) | 8 | <1 to 1 | 6.90E+02 | 1 | 1 | 1 | 0 | 8 | < |
| Benzene | 3 | <0.001 to 0.001 | 4.70E+01 | 0.001 | 0.001 | 0.001 | 0 | 3 | < |
| Toluene | 3 | <0.001 to 0.001 | 1.10E+05 | 0.001 | 0.001 | 0.001 | 0 | 3 | < |
| Ethyl benzene | 3 | <0.001 to 0.001 | 1.30E+04 | 0.001 | 0.001 | 0.001 | 0 | 3 | < |
| Total Xylene | 3 | 0.002 to 0.002 | 1.40E+04 | 0.001 | 0.002 | 0.002 | 0 | 0 | |
| TPH (EC5-6) aliphatic | 3 | <0.001 to 0.001 | 5.90E+03 | 0 | 0.001 | 0.001 | 0 | 197 | < |
| TPH (>EC6-8) aliphatic | 3 | <0.001 to 0.001 | 1.70E+04 | 0 | 0.001 | 0.001 | 0 | 197 | < |
| TPH (>EC8-10) aliphatic | 3 | <0.001 to 0.001 | 4.80E+03 | 0 | 0.001 | 0.001 | 0 | 197 | < |
| TPH (>EC10-12) aliphatic | 3 | <1 to 1 | 2.30E+04 | 0 | 1 | 1 | 0 | 197 | < |
| TPH (>EC12-16) aliphatic | 3 | <2 to 2 | 8.20E+04 | 0 | 2 | 2 | 0 | 197 | < |
| TPH (>EC16-21) aliphatic | 3 | <8 to 8 | 1.70E+06 | 0 | 8 | 8 | 0 | 197 | < |
| TPH (>EC21-35) aliphatic | 3 | <8 to 8 | 1.70E+06 | 0 | 8 | 8 | 0 | 197 | < |
| TPH (>EC35-44) aliphatic | 0 | <0 to 0 | 1.70E+06 | 0 | 0 | 0 | 0 | 197 | < |
| TPH (>EC6-7) aromatic (benzene) | 3 | <0.001 to 0.001 | 4.60E+04 | 0 | 0.001 | 0.001 | 0 | 197 | < |
| TPH (>EC7-8) aromatic (toluene) | 0 | <0 to 0 | 1.10E+05 | 0 | 0 | 0 | 0 | 200 | < |
| TPH (>EC8-10) aromatic | 3 | <0.001 to 0.001 | 8.10E+03 | 0 | 0.001 | 0.001 | 0 | 197 | < |
| TPH (>EC10-12) aromatic | 3 | <1 to 1 | 2.80E+04 | 0 | 1 | 1 | 0 | 197 | < |
| TPH (>EC12-16) aromatic | 0 | <0 to 0 | 3.70E+04 | 0 | 0 | 0 | 0 | 200 | < |
| TPH (>EC16-21) aromatic | 3 | <10 to 14 | 2.80E+04 | 0 | 10 | 14 | 0 | 197 | < |
| TPH (>EC21-35) aromatic | 3 | <10 to 25 | 2.80E+04 | 0 | 10 | 25 | 0 | 197 | < |
| TPH (>EC35-44) aromatic | 0 | <0 to 0 | 2.80E+04 | 0 | 0 | 0 | 0 | 200 | < |
| Total TPH | 0 | <0 to 0 | 5.00E+02 | 0 | 0 | 0 | 0 | 200 | < |
| Naphthalene | 8 | <0.05 to 0.05 | 4.60E+02 | 0 | 0.05 | 0.05 | 0 | 192 | < |
| Acenaphthylene | 8 | <0.05 to 0.05 | 9.70E+04 | 0 | 0.05 | 0.05 | 0 | 192 | < |
| Acenaphthene | 8 | <0.05 to 0.4 | 9.70E+04 | 0 | 0.05 | 0.4 | 0 | 192 | < |
| Fluorene | 8 | <0.05 to 0.3 | 6.80E+04 | 0 | 0.05 | 0.3 | 0 | 192 | < |
| Phenanthrene | 8 | <0.05 to 3.5 | 2.20E+04 | 0 | 0.05 | 3.5 | 0 | 192 | < |
| Anthracene | 8 | <0.05 to 0.98 | 5.40E+05 | 0 | 0.05 | 0.98 | 0 | 192 | < |
| Fluoranthene | 8 | <0.05 to 5.7 | 2.30E+04 | 0 | 0.05 | 5.7 | 0 | 192 | < |
| Pyrene | 8 | <0.05 to 4.9 | 5.40E+04 | 0 | 0.05 | 4.9 | 0 | 192 | < |
| Benzo(a)anthracene | 8 | <0.05 to 4.1 | 1.70E+02 | 0 | 0.05 | 4.1 | 0 | 192 | < |
| Chrysene | 8 | <0.05 to 2.7 | 3.50E+02 | 0 | 0.05 | 2.7 | 0 | 192 | < |
| Benzo(b)fluoranthene | 8 | <0.05 to 3.5 | 4.40E+01 | 0 | 0.05 | 3.5 | 0 | 192 | < |
| Benzo(k)fluoranthene | 8 | <0.05 to 1.9 | 1.20E+03 | 0 | 0.05 | 1.9 | 0 | 192 | < |
| Benzo(a)pyrene | 8 | <0.05 to 3.6 | 3.50E+01 | 0 | 0.05 | 3.6 | 0 | 192 | < |
| Indeno(1,2,3-c,d)pyrene | 8 | <0.05 to 2.2 | 5.10E+02 | 0 | 0.05 | 2.2 | 0 | 192 | < |
| Dibenzo(a,h)anthracene | 8 | <0.05 to 0.54 | 3.60E+00 | 0 | 0.05 | 0.54 | 0 | 192 | < |
| Benzo(g,hi)perylene | 8 | <0.05 to 2.3 | 4.00E+03 | 0 | 0.05 | 2.3 | 0 | 192 | < |
| Coal Tar (B(a)P as surrogate mark | 8 | <0.05 to 3.6 | 1.50E+01 | 0 | 0.05 | 3.6 | 0 | 192 | < |
| Tetrachloroethene (PCE) | 0 | <0 to 0 | 4.20E+01 | 0 | 0 | 0 | 0 | 200 | < |
| Trichloroethene (TCE) | 0 | <0 to 0 | 2.60E+00 | 0 | 0 | 0 | 0 | 200 | < |
| cis-1,2-Dichloroethene | 0 | <0 to 0 | 2.40E+01 | 0 | 0 | 0 | 0 | 200 | < |
| Vinyl Chloride (VC) | 0 | <0 to 0 | 7.70E-02 | 0 | 0 | 0 | 0 | 200 | < |
| 1,1,2,2-Tetrachloroethane (PCA) | 0 | <0 to 0 | 5.50E+02 | 0 | 0 | 0 | 0 | 200 | < |

## Appendix 9: Leachate Screening Worksheets

*EQS Standard: Phenol and Benzene annual average of 300µg/l; Toluene 500µg/l for Freshwater, 400µg/l for Saltwater; 1,1,1-TCA 1,000µg/l.

| | |
|---|---|
| **Project Name:** | Plot P |
| **Project Number:** | 210939 |
| **Assessment for:** | Soil Leachate Assessment |
| **Laboratory:** | i2 |
| **Receptor:** | Drinking Water |
| **Receptor Water Hardness:** | >200 |

BWB A CAF GROUP COMPANY

100 = Assessment Criteria Exceedance)
50 = M-BAT Bioavailability Assessment Required

| | Contaminant | Units | Detection Limit | Guideline Concentration | Source | Number of Samples | Min | Max | No of Exceedences | TP104 | TP113 | TP101 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 0.30 | 0.30 | 0.30 | | | |
| Heavy Metals | Arsenic | µg/l | 1 | 10 | UK DWS | 2 | 2.70 | 3.60 | 0 | 2.70 | 3.60 | < 1.0 | | | |
| | Barium | mg/l | 0.05 | 700 | UK DWS | 3 | 1.60 | 94.00 | 0 | 1.60 | 22.00 | 94.00 | | | |
| | Beryllium | µg/l | 0.2 | None Available | | 3 | 0.30 | 0.30 | 0 | 0.30 | 0.30 | 0.30 | | | |
| | Cadmium | µg/l | 0.08 | 3 | UK DWS | 0 | 0.00 | 0.00 | 0 | < 0.08 | < 0.08 | < 0.08 | | | |
| | Chromium III | µg/l | 0.4 | 4.7 | UK DWS | 3 | 0.60 | 1.40 | 0 | 0.60 | 1.40 | 1.10 | | | |
| | Chromium VI | µg/l | | 3.4 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Copper | µg/l | 0.7 | 2000 | UK DWS | 3 | 6.30 | 31.00 | 0 | 6.30 | 31.00 | 16.00 | | | |
| | Lead | µg/l | 1 | 10 | UK DWS | 3 | 3.00 | 5.20 | 0 | 3.00 | 4.70 | 5.20 | | | |
| | Mercury | µg/l | 0.5 | 1 | UK DWS | 0 | 0.00 | 0.00 | 0 | < 0.5 | < 0.5 | < 0.5 | | | |
| | Nickel | µg/l | 0.3 | 20 | UK DWS | 3 | 3.50 | 7.30 | 0 | 3.50 | 4.60 | 7.30 | | | |
| | Selenium | µg/l | 4 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | < 4.0 | < 4.0 | < 4.0 | | | |
| | Vanadium | µg/l | 1.7 | None Available | | 1 | 6.80 | 6.80 | 0 | < 1.7 | < 1.7 | 6.80 | | | |
| | Zinc | µg/l | 0.4 | 5000 | EQS Freshwater | 3 | 8.20 | 17.00 | 0 | 8.20 | 11.00 | 17.00 | | | |
| | Sulphate | mg/l | 0.1 | 400 | EQS Freshwater | 3 | 1.40 | 14.40 | 0 | 1.40 | 4.10 | 14.40 | | | |
| | Boron | µg/l | 10 | 300 | UK DWS | 3 | 13.00 | 20.00 | 0 | 13.00 | 20.00 | 18.00 | | | |
| | pH | | | | | 0 | 0.00 | 0.00 | 0 | | | | | | |
| Inorganics | Cyanide (total) | µg/l | 10 | 70 | UK DWS | 0 | 0.00 | 0.00 | 0 | < 10 | < 10 | < 10 | | | |
| | Phenol* | µg/l | | 7.7 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Ammonia (NH3 as N) | mg/l | | 0.015 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |

*EQS Standard: Phenol and Benzene annual average of 300µg/l; Toluene 500µg/l for Freshwater, 400µg/l for Saltwater; 1,1,1-TCA 1,000µg/l.

| | |
|---|---|
| **Project Name:** | Plot P |
| **Project Number:** | 210939 |
| **Assessment for:** | Soil Leachate Assessment |
| **Laboratory:** | i2 |
| **Receptor:** | Freshwater |
| **Receptor Water Hardness:** | >200 |

A CAF GROUP COMPANY

100 = Assessment Criteria Exceedance)
50 = M-BAT Bioavailability Assessment Required

| | Contaminant | Units | Detection Limit | Guideline Concentration | Source | Number of Samples | Min | Max | No of Exceedences | TP104 | TP113 | TP101 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 0.30 | 0.30 | 0.30 | | | |
| Heavy Metals | Arsenic | µg/l | 1 | 50 | EQS Freshwater | 2 | 2.70 | 3.60 | 0 | 2.70 | 3.60 | < 1.0 | | | |
| | Barium | mg/l | 0.05 | 700 | UK DWS | 3 | 1.60 | 94.00 | 0 | 1.60 | 22.00 | 94.00 | | | |
| | Beryllium | µg/l | 0.2 | None Available | | 3 | 0.30 | 0.30 | 0 | 0.30 | 0.30 | 0.30 | | | |
| | Cadmium | µg/l | 0.08 | 0.25 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 0.08 | < 0.08 | < 0.08 | | | |
| | Chromium III | µg/l | 0.4 | 4.7 | EQS Freshwater | 3 | 0.60 | 1.40 | 0 | 0.60 | 1.40 | 1.10 | | | |
| | Chromium VI | µg/l | | 3.4 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Copper | µg/l | 0.7 | 1 | EQS Freshwater | 3 | 6.30 | 31.00 | 3 | 6.30 | 31.00 | 16.00 | | | |
| | Lead | µg/l | 1 | 1.2 | EQS Freshwater | 3 | 3.00 | 5.20 | 3 | 3.00 | 4.70 | 5.20 | | | |
| | Mercury | µg/l | 0.5 | 0.07 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 0.5 | < 0.5 | < 0.5 | | | |
| | Nickel | µg/l | 0.3 | 4 | EQS Freshwater | 3 | 3.50 | 7.30 | 2 | 3.50 | 4.60 | 7.30 | | | |
| | Selenium | µg/l | 4 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | < 4.0 | < 4.0 | < 4.0 | | | |
| | Vanadium | µg/l | 1.7 | None Available | | 1 | 6.80 | 6.80 | 0 | < 1.7 | < 1.7 | 6.80 | | | |
| | Zinc | µg/l | 0.4 | 10.9 | EQS Freshwater | 3 | 8.20 | 17.00 | 2 | 8.20 | 11.00 | 17.00 | | | |
| | Sulphate | mg/l | 0.1 | 400 | EQS Freshwater | 3 | 1.40 | 14.40 | 0 | 1.40 | 4.10 | 14.40 | | | |
| | Boron | µg/l | 10 | 2000 | EQS Freshwater | 3 | 13.00 | 20.00 | 0 | 13.00 | 20.00 | 18.00 | | | |
| | pH | | | | | 0 | 0.00 | 0.00 | 0 | | | | | | |
| Inorganics | Cyanide (total) | µg/l | 10 | 1 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 10 | < 10 | < 10 | | | |
| | Phenol* | µg/l | | 7.7 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Ammonia (NH3 as N) | mg/l | | 0.015 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |

## Appendix 10: Groundwater Screening Worksheets

*EQS Standard: Phenol and Benzene annual average of 300µg/l; Toluene 500µg/l for Freshwater, 400µg/l for Saltwater; 1,1,1-TCA 1,000µg/l.

| | |
|---|---|
| **Project Name:** | Plot P Kingsway |
| **Project Number:** | 210939 |
| **Assessment for:** | Water Assessment |
| **Laboratory:** | i2 |
| **Receptor:** | Drinking Water |
| **Receptor Water Hardness:** | <40 (No Data) |

A CAF GROUP COMPANY

100 = Assessment Criteria Exceedance)

50 = M-BAT Bioavailability Assessment Required

| | Contaminant | Units | Detection Limit | Guideline Concentration | Source | Number of Samples | Min | Max | No of Exceedences | BH02 | BH03 | BH04 | BH05 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Heavy Metals | Arsenic | µg/l | 0.15 | 10 | UK DWS | 4 | 0.16 | 3.05 | 0 | 0.16 | 3.05 | 0.31 | 1.34 | | |
| | Barium | mg/l | 0.06 | 700 | UK DWS | 4 | 55.00 | 220.00 | 0 | 55.00 | 190.00 | 220.00 | 180.00 | | |
| | Beryllium | µg/l | 0.10 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | | |
| | Cadmium | µg/l | 0.02 | 3 | UK DWS | 4 | 0.04 | 0.23 | 0 | 0.23 | 0.04 | 0.05 | 0.15 | | |
| | Chromium III | µg/l | 0.20 | 4.7 | UK DWS | 2 | 1.20 | 1.40 | 0 | < 0.2 | 1.20 | < 0.2 | 1.40 | | |
| | Copper | µg/l | 0.50 | 2000 | UK DWS | 4 | 1.70 | 12.00 | 0 | 1.70 | 3.00 | 8.60 | 12.00 | | |
| | Lead | µg/l | 0.20 | 10 | UK DWS | 2 | 0.20 | 0.50 | 0 | < 0.2 | 0.20 | < 0.2 | 0.50 | | |
| | Mercury | µg/l | 0.05 | 1 | UK DWS | 0 | 0.00 | 0.00 | 0 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | | |
| | Nickel | µg/l | 0.50 | 20 | UK DWS | 4 | 4.40 | 8.60 | 0 | 4.40 | 5.80 | 4.80 | 8.60 | | |
| | Selenium | µg/l | 0.60 | 10 | UK DWS | 3 | 1.00 | 1.50 | 0 | 1.50 | 1.50 | < 0.6 | 1.00 | | |
| | Vanadium | µg/l | 0.20 | None Available | | 3 | 0.30 | 3.80 | 0 | < 0.2 | 2.30 | 0.30 | 3.80 | | |
| | Zinc | µg/l | 0.50 | 5000 | UK DWS | 4 | 4.70 | 42.00 | 0 | 42.00 | 9.60 | 6.50 | 4.70 | | |
| | Sulphate | mg/l | 0.045 | 250 | UK DWS | 4 | 10.40 | 93.20 | 0 | 93.20 | 65.60 | 31.60 | 10.40 | | |
| | Boron | µg/l | 10.00 | 1000 | UK DWS | 4 | 20.00 | 96.00 | 0 | 83.00 | 29.00 | 96.00 | 20.00 | | |
| | pH | | | | | 4 | 6.30 | 7.20 | 0 | 6.30 | 6.40 | **7.20** | **7.10** | | |
| Inorganics | Cyanide (total) | µg/l | 10 | 70 | UK DWS | 0 | 0.00 | 0.00 | 0 | < 10 | < 10 | < 10 | < 10 | | |
| | Phenol* | µg/l | 10 | 7.7 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 10 | < 10 | < 10 | < 10 | | |
| | Ammonia (NH3 as N) | mg/l | | 0.015 | EQS Freshwater | 4 | 0.03 | 0.07 | 4 | **0.07** | **0.03** | **0.03** | **0.04** | | |
| BTEX | Benzene* | µg/l | 1 | 10 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Ethylbenzene | µg/l | 1 | 300 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Toluene* | µg/l | 1 | 700 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Xylene | µg/l | | 500 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| Total Petroleum Hydrocarbons | Aliphatic C5-C6 | µg/l | 1 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aliphatic C6-C8 | µg/l | 1 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aliphatic C8-C10 | µg/l | 1 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aliphatic C10-C12 | µg/l | 10 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aliphatic C12-C16 | µg/l | 10 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aliphatic C16-C21 | µg/l | 10 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aliphatic C21-C35 | µg/l | 10 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aromatic EC5-EC7 | µg/l | 1 | 10 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aromatic EC7-EC8 | µg/l | 1 | 700 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aromatic EC8-EC10 | µg/l | 1 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aromatic EC10-EC12 | µg/l | 10 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aromatic EC12-EC16 | µg/l | 10 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aromatic EC16-EC21 | µg/l | 10 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aromatic EC21-EC35 | µg/l | 10 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Total TPH (EC5-EC35) | µg/l | | 10 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |
| Polycyclic Aromatic Hydrocarbons | Acenaphthene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Acenaphthylene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Anthracene | µg/l | 0.01 | 0.1 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Benzo(a)anthracene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Benzo(a)pyrene | µg/l | 0.01 | 0.7 | UK DWS | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Benzo(b)fluoranthene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Benzo(k)fluoranthene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Benzo(g,h,i)perylene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Chrysene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Dibenzo(a,h)anthracene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Fluoranthene | µg/l | 0.01 | 0.0063 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Fluorene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Indeno(1,2,3-c,d)pyrene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Naphthalene | µg/l | 0.01 | 2 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Phenanthrene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Pyrene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Total PAH | µg/l | 0.16 | 0.1 | WHO (Health) | 0 | 0.00 | 0.00 | 0 | < 0.16 | < 0.16 | < 0.16 | < 0.16 | | |

*EQS Standard: Phenol and Benzene annual average of 300µg/l; Toluene 500µg/l for Freshwater, 400µg/l for Saltwater; 1,1,1-TCA 1,000µg/l.

| | |
|---|---|
| **Project Name:** | Plot P Kingsway |
| **Project Number:** | 210939 |
| **Assessment for:** | Water Assessment |
| **Laboratory:** | i2 |
| **Receptor:** | Freshwater |
| **Receptor Water Hardness:** | <40 (No Data) |

A CAF GROUP COMPANY

100 = Assessment Criteria Exceedance)

50 = M-BAT Bioavailability Assessment Required

| | Contaminant | Units | Detection Limit | Guideline Concentration | Source | Number of Samples | Min | Max | No of Exceedences | BH02 | BH03 | BH04 | BH05 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Heavy Metals | Arsenic | µg/l | 0.15 | 50 | EQS Freshwater | 4 | 0.16 | 3.05 | 0 | 0.16 | 3.05 | 0.31 | 1.34 | | |
| | Barium | mg/l | 0.06 | 700 | UK DWS | 4 | 55.00 | 220.00 | 0 | 55.00 | 190.00 | 220.00 | 180.00 | | |
| | Beryllium | µg/l | 0.10 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | | |
| | Cadmium | µg/l | 0.02 | 0.08 | EQS Freshwater | 4 | 0.04 | 0.23 | 2 | **0.23** | 0.04 | 0.05 | **0.15** | | |
| | Chromium III | µg/l | 0.20 | 4.7 | EQS Freshwater | 2 | 1.20 | 1.40 | 0 | < 0.2 | 1.20 | < 0.2 | 1.40 | | |
| | Copper | µg/l | 0.50 | 1 | EQS Freshwater | 4 | 1.70 | 12.00 | **4** | **1.70** | **3.00** | **8.60** | **12.00** | | |
| | Lead | µg/l | 0.20 | 1.2 | EQS Freshwater | 2 | 0.20 | 0.50 | 0 | < 0.2 | 0.20 | < 0.2 | 0.50 | | |
| | Mercury | µg/l | 0.05 | 0.07 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | | |
| | Nickel | µg/l | 0.50 | 4 | EQS Freshwater | 4 | 4.40 | 8.60 | **4** | **4.40** | **5.80** | **4.80** | **8.60** | | |
| | Selenium | µg/l | 0.60 | 10 | UK DWS | 3 | 1.00 | 1.50 | 0 | 1.50 | 1.50 | < 0.6 | 1.00 | | |
| | Vanadium | µg/l | 0.20 | None Available | | 3 | 0.30 | 3.80 | 0 | < 0.2 | 2.30 | 0.30 | 3.80 | | |
| | Zinc | µg/l | 0.50 | 10.9 | EQS Freshwater | 4 | 4.70 | 42.00 | **1** | **42.00** | 9.60 | 6.50 | 4.70 | | |
| | Sulphate | mg/l | 0.045 | 400 | EQS Freshwater | 4 | 10.40 | 93.20 | 0 | 93.20 | 65.60 | 31.60 | 10.40 | | |
| | Boron | µg/l | 10.00 | 2000 | EQS Freshwater | 4 | 20.00 | 96.00 | 0 | 83.00 | 29.00 | 96.00 | 20.00 | | |
| | pH | | | | | 4 | 6.30 | 7.20 | 0 | 6.30 | 6.40 | **7.20** | **7.10** | | |
| Inorganics | Cyanide (total) | µg/l | 10 | 1 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 10 | < 10 | < 10 | < 10 | | |
| | Phenol* | µg/l | 10 | 7.7 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 10 | < 10 | < 10 | < 10 | | |
| | Ammonia (NH3 as N) | mg/l | | 0.015 | EQS Freshwater | 4 | 0.03 | 0.07 | 4 | **0.07** | **0.03** | **0.03** | **0.04** | | |
| BTEX | Benzene* | µg/l | 1 | 10 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Ethylbenzene | µg/l | 1 | 300 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Toluene* | µg/l | 1 | 74 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Xylene | µg/l | | 30 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |
| Total Petroleum Hydrocarbons | Aliphatic C5-C6 | µg/l | 1 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aliphatic C6-C8 | µg/l | 1 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aliphatic C8-C10 | µg/l | 1 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aliphatic C10-C12 | µg/l | 10 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aliphatic C12-C16 | µg/l | 10 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aliphatic C16-C21 | µg/l | 10 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aliphatic C21-C35 | µg/l | 10 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aromatic EC5-EC7 | µg/l | 1 | 10 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aromatic EC7-EC8 | µg/l | 1 | 74 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aromatic EC8-EC10 | µg/l | 1 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aromatic EC10-EC12 | µg/l | 10 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aromatic EC12-EC16 | µg/l | 10 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aromatic EC16-EC21 | µg/l | 10 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Aromatic EC21-EC35 | µg/l | 10 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Total TPH (EC5-EC35) | µg/l | | 10 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |
| Polycyclic Aromatic Hydrocarbons | Acenaphthene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Acenaphthylene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Anthracene | µg/l | 0.01 | 0.1 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Benzo(a)anthracene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Benzo(a)pyrene | µg/l | 0.01 | 0.00017 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Benzo(b)fluoranthene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Benzo(k)fluoranthene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Benzo(g,h,i)perylene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Chrysene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Dibenzo(a,h)anthracene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Fluoranthene | µg/l | 0.01 | 0.0063 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Fluorene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Indeno(1,2,3-c,d)pyrene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Naphthalene | µg/l | 0.01 | 2 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Phenanthrene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Pyrene | µg/l | 0.01 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| | Total PAH | µg/l | 0.16 | 0.1 | WHO (Health) | 0 | 0.00 | 0.00 | 0 | < 0.16 | < 0.16 | < 0.16 | < 0.16 | | |

# Appendix 11 : Waste Classification

HazWasteOnline™

# Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

a) understand the origin of the waste
b) select the correct List of Waste code(s)
c) confirm that the list of determinands, results and sampling plan are fit for purpose
d) select and justify the chosen metal species (Appendix B)
e) correctly apply moisture correction and other available corrections
f) add the meta data for their user-defined substances (Appendix A)
g) check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

730Z2-IRWBF-RV6TF

## Job name

210939 Plot P Kingsway

## Description/Comments

## Project

210939 Plot P Kingsway

## Site

210939 Plot P Kingsway

## Classified by

Name:
**Richard Robinson**
Date:
**26 Sep 2022 11:08 GMT**
Telephone:
**0115 924 1100**

Company:
**BWB Consulting Ltd**
**Waterfront House, Station Street**
**Nottingham**
**NG2 3DQ**

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

| HazWasteOnline™ Certification: | - |
|---|---|
| **Course** | **Date** |
| Hazardous Waste Classification | 08 Dec 2016 |
| 3 year Refresher overdue | - |

## Job summary

| # | Sample name | Depth [m] | Classification Result | Hazard properties | Page |
|---|---|---|---|---|---|
| 1 | TP101 | 0.30 | Non Hazardous | | 2 |
| 2 | TP104 | 0.30 | Non Hazardous | | 5 |
| 3 | TP112 | 0.70 | Non Hazardous | | 8 |
| 4 | TP113 | 0.30 | Non Hazardous | | 11 |
| 5 | TP114 | 1.80 | Non Hazardous | | 14 |
| 6 | TP115 | 1.50 | Non Hazardous | | 16 |
| 7 | TP116 | 0.90 | Non Hazardous | | 18 |
| 8 | TP119 | 0.60 | Non Hazardous | | 20 |

## Related documents

| # | Name | Description |
|---|---|---|
| 1 | BWB Contaminated Land Suite WM3 | waste stream template used to create this Job |

## Report

Created by: Richard Robinson

Created date: 26 Sep 2022 11:08 GMT


| Appendices | Page |
|---|---|
| Appendix A: Classifier defined and non GB MCL determinands | 23 |
| Appendix B: Rationale for selection of metal species | 24 |
| Appendix C: Version | 25 |

## Classification of sample: TP101

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**TP101**
Sample Depth:
**0.30 m**
Moisture content:
**10%**
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 10% No Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | confirm TPH has NOT arisen from diesel or petrol | | | | | ☑ | | | | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 52 mg/kg | 1.32 | 68.657 mg/kg | 0.00687 % | | |
| 3 | beryllium { beryllium oxide } | 004-003-00-8 | 215-133-1 | 1304-56-9 | | 2.6 mg/kg | 2.775 | 7.216 mg/kg | 0.000722 % | | |
| 4 | boron { boron tribromide/trichloride/trifluoride (combined) } | | | 10294-33-4, 10294-34-5, 7637-07-2 | | 0.3 mg/kg | 13.43 | 4.029 mg/kg | 0.000403 % | | |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 mg/kg | 1.285 | <0.257 mg/kg | <0.00002 % | | <**LOD** |
| 6 | chromium { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 31 mg/kg | 1.462 | 45.308 mg/kg | 0.00453 % | | |
| 7 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 140 mg/kg | 1.126 | 157.624 mg/kg | 0.0158 % | | |
| 8 | lead { lead chromate } | 082-004-00-2 | 231-846-0 | 7758-97-6 | 1 | 180 mg/kg | 1.56 | 280.767 mg/kg | 0.018 % | | |
| 9 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | <0.3 mg/kg | 1.353 | <0.406 mg/kg | <0.0000406 % | | <**LOD** |
| 10 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1] 234-348-1 [2] | 12054-48-7 [1] 11113-74-9 [2] | | 55 mg/kg | 1.579 | 86.872 mg/kg | 0.00869 % | | |
| 11 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | <1 mg/kg | 1.405 | <1.405 mg/kg | <0.000141 % | | <**LOD** |
| 12 | zinc { zinc chromate } | 024-007-00-3 | 236-878-9 | 13530-65-9 | | 63 mg/kg | 2.774 | 174.771 mg/kg | 0.0175 % | | |
| 13 | pH | | | PH | | 6.9 pH | | 6.9 pH | 6.9 pH | | |

| # | | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | 006-007-00-5 | | | | 19 | mg/kg | 1.884 | 35.796 | mg/kg | 0.00358 % | | |
| 15 | | TPH (C6 to C40) petroleum group | | | TPH | | 42 | mg/kg | | 42 | mg/kg | 0.0042 % | | |
| 16 | | benzene | 601-020-00-8 | 200-753-7 | 71-43-2 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| 17 | | ethylbenzene | 601-023-00-4 | 202-849-4 | 100-41-4 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| 18 | | toluene | 601-021-00-3 | 203-625-9 | 108-88-3 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| 19 | | xylene | 601-022-00-9 | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4] | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4] | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| 20 | | acenaphthene | | 201-469-6 | 83-32-9 | | 0.4 | mg/kg | | 0.4 | mg/kg | 0.00004 % | | |
| 21 | | acenaphthylene | | 205-917-1 | 208-96-8 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 22 | | anthracene | | 204-371-1 | 120-12-7 | | 0.98 | mg/kg | | 0.98 | mg/kg | 0.000098 % | | |
| 23 | | benzo[a]anthracene | 601-033-00-9 | 200-280-6 | 56-55-3 | | 4.1 | mg/kg | | 4.1 | mg/kg | 0.00041 % | | |
| 24 | | benzo[a]pyrene; benzo[def]chrysene | 601-032-00-3 | 200-028-5 | 50-32-8 | | 3.6 | mg/kg | | 3.6 | mg/kg | 0.00036 % | | |
| 25 | | benzo[b]fluoranthene | 601-034-00-4 | 205-911-9 | 205-99-2 | | 3.5 | mg/kg | | 3.5 | mg/kg | 0.00035 % | | |
| 26 | | benzo[ghi]perylene | | 205-883-8 | 191-24-2 | | 2.3 | mg/kg | | 2.3 | mg/kg | 0.00023 % | | |
| 27 | | benzo[k]fluoranthene | 601-036-00-5 | 205-916-6 | 207-08-9 | | 1.9 | mg/kg | | 1.9 | mg/kg | 0.00019 % | | |
| 28 | | chrysene | 601-048-00-0 | 205-923-4 | 218-01-9 | | 2.7 | mg/kg | | 2.7 | mg/kg | 0.00027 % | | |
| 29 | | dibenz[a,h]anthracene | 601-041-00-2 | 200-181-8 | 53-70-3 | | 0.54 | mg/kg | | 0.54 | mg/kg | 0.000054 % | | |
| 30 | | fluoranthene | | 205-912-4 | 206-44-0 | | 5.7 | mg/kg | | 5.7 | mg/kg | 0.00057 % | | |
| 31 | | fluorene | | 201-695-5 | 86-73-7 | | 0.27 | mg/kg | | 0.27 | mg/kg | 0.000027 % | | |
| 32 | | indeno[123-cd]pyrene | | 205-893-2 | 193-39-5 | | 2.2 | mg/kg | | 2.2 | mg/kg | 0.00022 % | | |
| 33 | | naphthalene | 601-052-00-2 | 202-049-5 | 91-20-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 34 | | phenanthrene | | 201-581-5 | 85-01-8 | | 3.5 | mg/kg | | 3.5 | mg/kg | 0.00035 % | | |
| 35 | | pyrene | | 204-927-3 | 129-00-0 | | 4.9 | mg/kg | | 4.9 | mg/kg | 0.00049 % | | |
| 36 | | phenol | 604-001-00-2 | 203-632-7 | 108-95-2 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| | | | | | | | | | | | Total: | 0.0846 % | | |

| Key | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| **ND** | Not detected |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No significant volatile contamination or calorific materials present.

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0042%)

## Classification of sample: TP104

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**TP104**
Sample Depth:
**0.30 m**
Moisture content:
**11%**
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 11% No Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | confirm TPH has NOT arisen from diesel or petrol | | | | | ☑ | | | | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 7.4 mg/kg | 1.32 | 9.77 mg/kg | 0.000977 % | | |
| 3 | beryllium { beryllium oxide } | 004-003-00-8 | 215-133-1 | 1304-56-9 | | 0.51 mg/kg | 2.775 | 1.415 mg/kg | 0.000142 % | | |
| 4 | boron { boron tribromide/trichloride/trifluoride (combined) } | | | 10294-33-4, 10294-34-5, 7637-07-2 | | <0.2 mg/kg | 13.43 | <2.686 mg/kg | <0.000269 % | | <LOD |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 mg/kg | 1.285 | <0.257 mg/kg | <0.00002 % | | <LOD |
| 6 | chromium { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 27 mg/kg | 1.462 | 39.462 mg/kg | 0.00395 % | | |
| 7 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 17 mg/kg | 1.126 | 19.14 mg/kg | 0.00191 % | | |
| 8 | lead { lead chromate } | 082-004-00-2 | 231-846-0 | 7758-97-6 | 1 | 11 mg/kg | 1.56 | 17.158 mg/kg | 0.0011 % | | |
| 9 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | <0.3 mg/kg | 1.353 | <0.406 mg/kg | <0.0000406 % | | <LOD |
| 10 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1] 234-348-1 [2] | 12054-48-7 [1] 11113-74-9 [2] | | 18 mg/kg | 1.579 | 28.431 mg/kg | 0.00284 % | | |
| 11 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | <1 mg/kg | 1.405 | <1.405 mg/kg | <0.000141 % | | <LOD |
| 12 | zinc { zinc chromate } | 024-007-00-3 | 236-878-9 | 13530-65-9 | | 37 mg/kg | 2.774 | 102.643 mg/kg | 0.0103 % | | |
| 13 | pH | | | PH | | 8 pH | | 8 pH | 8pH | | |

| # | | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | 006-007-00-5 | | | | <1 | mg/kg | 1.884 | <1.884 | mg/kg | <0.000188 % | | <**LOD** |
| 15 | | TPH (C6 to C40) petroleum group | | | TPH | | <10 | mg/kg | | <10 | mg/kg | <0.001 % | | <**LOD** |
| 16 | | benzene | 601-020-00-8 | 200-753-7 | 71-43-2 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| 17 | | ethylbenzene | 601-023-00-4 | 202-849-4 | 100-41-4 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| 18 | | toluene | 601-021-00-3 | 203-625-9 | 108-88-3 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| 19 | | xylene | 601-022-00-9 | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4] | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4] | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| 20 | | acenaphthene | | 201-469-6 | 83-32-9 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 21 | | acenaphthylene | | 205-917-1 | 208-96-8 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 22 | | anthracene | | 204-371-1 | 120-12-7 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 23 | | benzo[a]anthracene | 601-033-00-9 | 200-280-6 | 56-55-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 24 | | benzo[a]pyrene; benzo[def]chrysene | 601-032-00-3 | 200-028-5 | 50-32-8 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 25 | | benzo[b]fluoranthene | 601-034-00-4 | 205-911-9 | 205-99-2 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 26 | | benzo[ghi]perylene | | 205-883-8 | 191-24-2 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 27 | | benzo[k]fluoranthene | 601-036-00-5 | 205-916-6 | 207-08-9 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 28 | | chrysene | 601-048-00-0 | 205-923-4 | 218-01-9 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 29 | | dibenz[a,h]anthracene | 601-041-00-2 | 200-181-8 | 53-70-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 30 | | fluoranthene | | 205-912-4 | 206-44-0 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 31 | | fluorene | | 201-695-5 | 86-73-7 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 32 | | indeno[123-cd]pyrene | | 205-893-2 | 193-39-5 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 33 | | naphthalene | 601-052-00-2 | 202-049-5 | 91-20-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 34 | | phenanthrene | | 201-581-5 | 85-01-8 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 35 | | pyrene | | 204-927-3 | 129-00-0 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 36 | | phenol | 604-001-00-2 | 203-632-7 | 108-95-2 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| | | | | | | | | | | | Total: | 0.0234 % | | |

| Key | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| **ND** | Not detected |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Classification of sample: TP112

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**TP112**
Sample Depth:
**0.70 m**
Moisture content:
**14%**
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 14% No Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | confirm TPH has NOT arisen from diesel or petrol | | | | | ☑ | | | | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 6.7 mg/kg | 1.32 | 8.846 mg/kg | 0.000885 % | | |
| 3 | beryllium { beryllium oxide } | 004-003-00-8 | 215-133-1 | 1304-56-9 | | 0.78 mg/kg | 2.775 | 2.165 mg/kg | 0.000216 % | | |
| 4 | boron { boron tribromide/trichloride/trifluoride (combined) } | | | 10294-33-4, 10294-34-5, 7637-07-2 | | 0.4 mg/kg | 13.43 | 5.372 mg/kg | 0.000537 % | | |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 mg/kg | 1.285 | <0.257 mg/kg | <0.00002 % | | <**LOD** |
| 6 | chromium { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 22 mg/kg | 1.462 | 32.154 mg/kg | 0.00322 % | | |
| 7 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 19 mg/kg | 1.126 | 21.392 mg/kg | 0.00214 % | | |
| 8 | lead { lead chromate } | 082-004-00-2 | 231-846-0 | 7758-97-6 | 1 | 41 mg/kg | 1.56 | 63.952 mg/kg | 0.0041 % | | |
| 9 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | <0.3 mg/kg | 1.353 | <0.406 mg/kg | <0.0000406 % | | <**LOD** |
| 10 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1] 234-348-1 [2] | 12054-48-7 [1] 11113-74-9 [2] | | 21 mg/kg | 1.579 | 33.169 mg/kg | 0.00332 % | | |
| 11 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | <1 mg/kg | 1.405 | <1.405 mg/kg | <0.000141 % | | <**LOD** |
| 12 | zinc { zinc chromate } | 024-007-00-3 | 236-878-9 | 13530-65-9 | | 56 mg/kg | 2.774 | 155.352 mg/kg | 0.0155 % | | |
| 13 | pH | | | PH | | 9.2 pH | | 9.2 pH | 9.2 pH | | |

| # | | Determinand | | | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EU CLP index number | EC Number | CAS Number | | | | | | | | | |
| 14 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | <1 | mg/kg | 1.884 | <1.884 | mg/kg | <0.000188 % | | <**LOD** |
| | | 006-007-00-5 | | | | | | | | | | | |
| 15 | | TPH (C6 to C40) petroleum group | | | | 20 | mg/kg | | 20 | mg/kg | 0.002 % | | |
| | | | | TPH | | | | | | | | | |
| 16 | | acenaphthene | | | | 0.33 | mg/kg | | 0.33 | mg/kg | 0.000033 % | | |
| | | | 201-469-6 | 83-32-9 | | | | | | | | | |
| 17 | | acenaphthylene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| | | | 205-917-1 | 208-96-8 | | | | | | | | | |
| 18 | | anthracene | | | | 0.54 | mg/kg | | 0.54 | mg/kg | 0.000054 % | | |
| | | | 204-371-1 | 120-12-7 | | | | | | | | | |
| 19 | | benzo[a]anthracene | | | | 1.2 | mg/kg | | 1.2 | mg/kg | 0.00012 % | | |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | | | |
| 20 | | benzo[a]pyrene; benzo[def]chrysene | | | | 0.98 | mg/kg | | 0.98 | mg/kg | 0.000098 % | | |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | | | |
| 21 | | benzo[b]fluoranthene | | | | 0.89 | mg/kg | | 0.89 | mg/kg | 0.000089 % | | |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | | | |
| 22 | | benzo[ghi]perylene | | | | 0.51 | mg/kg | | 0.51 | mg/kg | 0.000051 % | | |
| | | | 205-883-8 | 191-24-2 | | | | | | | | | |
| 23 | | benzo[k]fluoranthene | | | | 0.53 | mg/kg | | 0.53 | mg/kg | 0.000053 % | | |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | | | |
| 24 | | chrysene | | | | 0.99 | mg/kg | | 0.99 | mg/kg | 0.000099 % | | |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | | | |
| 25 | | dibenz[a,h]anthracene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | | | |
| 26 | | fluoranthene | | | | 2.1 | mg/kg | | 2.1 | mg/kg | 0.00021 % | | |
| | | | 205-912-4 | 206-44-0 | | | | | | | | | |
| 27 | | fluorene | | | | 0.3 | mg/kg | | 0.3 | mg/kg | 0.00003 % | | |
| | | | 201-695-5 | 86-73-7 | | | | | | | | | |
| 28 | | indeno[123-cd]pyrene | | | | 0.41 | mg/kg | | 0.41 | mg/kg | 0.000041 % | | |
| | | | 205-893-2 | 193-39-5 | | | | | | | | | |
| 29 | | naphthalene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | | | |
| 30 | | phenanthrene | | | | 2 | mg/kg | | 2 | mg/kg | 0.0002 % | | |
| | | | 201-581-5 | 85-01-8 | | | | | | | | | |
| 31 | | pyrene | | | | 2.1 | mg/kg | | 2.1 | mg/kg | 0.00021 % | | |
| | | | 204-927-3 | 129-00-0 | | | | | | | | | |
| 32 | | phenol | | | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| | | 604-001-00-2 | 203-632-7 | 108-95-2 | | | | | | | | | |
| | | | | | | | | | | Total: | 0.0337 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| **ND** | Not detected |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No significant volatile contamination or calorific materials present.

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.002%)

## Classification of sample: TP113

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**TP113**
Sample Depth:
**0.30 m**
Moisture content:
**22%**
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 22% No Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | confirm TPH has NOT arisen from diesel or petrol | | | | | ☑ | | | | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 11 mg/kg | 1.32 | 14.524 mg/kg | 0.00145 % | | |
| 3 | beryllium { beryllium oxide } | 004-003-00-8 | 215-133-1 | 1304-56-9 | | 0.45 mg/kg | 2.775 | 1.249 mg/kg | 0.000125 % | | |
| 4 | boron { boron tribromide/trichloride/trifluoride (combined) } | | | 10294-33-4, 10294-34-5, 7637-07-2 | | 0.8 mg/kg | 13.43 | 10.744 mg/kg | 0.00107 % | | |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 mg/kg | 1.285 | <0.257 mg/kg | <0.00002 % | | <**LOD** |
| 6 | chromium { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 13 mg/kg | 1.462 | 19 mg/kg | 0.0019 % | | |
| 7 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 28 mg/kg | 1.126 | 31.525 mg/kg | 0.00315 % | | |
| 8 | lead { lead chromate } | 082-004-00-2 | 231-846-0 | 7758-97-6 | 1 | 65 mg/kg | 1.56 | 101.388 mg/kg | 0.0065 % | | |
| 9 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | <0.3 mg/kg | 1.353 | <0.406 mg/kg | <0.0000406 % | | <**LOD** |
| 10 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1] 234-348-1 [2] | 12054-48-7 [1] 11113-74-9 [2] | | 9 mg/kg | 1.579 | 14.215 mg/kg | 0.00142 % | | |
| 11 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | <1 mg/kg | 1.405 | <1.405 mg/kg | <0.000141 % | | <**LOD** |
| 12 | zinc { zinc chromate } | 024-007-00-3 | 236-878-9 | 13530-65-9 | | 37 mg/kg | 2.774 | 102.643 mg/kg | 0.0103 % | | |
| 13 | pH | | | PH | | 6.9 pH | | 6.9 pH | 6.9 pH | | |

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | 006-007-00-5 | | | | <1 mg/kg | 1.884 | <1.884 mg/kg | <0.000188 % | | <LOD |
| 15 | TPH (C6 to C40) petroleum group | | | TPH | | 38 mg/kg | | 38 mg/kg | 0.0038 % | | |
| 16 | benzene | 601-020-00-8 | 200-753-7 | 71-43-2 | | <1 mg/kg | | <1 mg/kg | <0.0001 % | | <LOD |
| 17 | ethylbenzene | 601-023-00-4 | 202-849-4 | 100-41-4 | | <1 mg/kg | | <1 mg/kg | <0.0001 % | | <LOD |
| 18 | toluene | 601-021-00-3 | 203-625-9 | 108-88-3 | | <1 mg/kg | | <1 mg/kg | <0.0001 % | | <LOD |
| 19 | xylene | 601-022-00-9 | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4] | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4] | | <1 mg/kg | | <1 mg/kg | <0.0001 % | | <LOD |
| 20 | acenaphthene | | 201-469-6 | 83-32-9 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <LOD |
| 21 | acenaphthylene | | 205-917-1 | 208-96-8 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <LOD |
| 22 | anthracene | | 204-371-1 | 120-12-7 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <LOD |
| 23 | benzo[a]anthracene | 601-033-00-9 | 200-280-6 | 56-55-3 | | 0.23 mg/kg | | 0.23 mg/kg | 0.000023 % | | |
| 24 | benzo[a]pyrene; benzo[def]chrysene | 601-032-00-3 | 200-028-5 | 50-32-8 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <LOD |
| 25 | benzo[b]fluoranthene | 601-034-00-4 | 205-911-9 | 205-99-2 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <LOD |
| 26 | benzo[ghi]perylene | | 205-883-8 | 191-24-2 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <LOD |
| 27 | benzo[k]fluoranthene | 601-036-00-5 | 205-916-6 | 207-08-9 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <LOD |
| 28 | chrysene | 601-048-00-0 | 205-923-4 | 218-01-9 | | 0.22 mg/kg | | 0.22 mg/kg | 0.000022 % | | |
| 29 | dibenz[a,h]anthracene | 601-041-00-2 | 200-181-8 | 53-70-3 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <LOD |
| 30 | fluoranthene | | 205-912-4 | 206-44-0 | | 0.35 mg/kg | | 0.35 mg/kg | 0.000035 % | | |
| 31 | fluorene | | 201-695-5 | 86-73-7 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <LOD |
| 32 | indeno[123-cd]pyrene | | 205-893-2 | 193-39-5 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <LOD |
| 33 | naphthalene | 601-052-00-2 | 202-049-5 | 91-20-3 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <LOD |
| 34 | phenanthrene | | 201-581-5 | 85-01-8 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <LOD |
| 35 | pyrene | | 204-927-3 | 129-00-0 | | 0.33 mg/kg | | 0.33 mg/kg | 0.000033 % | | |
| 36 | phenol | 604-001-00-2 | 203-632-7 | 108-95-2 | | <1 mg/kg | | <1 mg/kg | <0.0001 % | | <LOD |
| | | | | | | | | Total: | 0.0308 % | | |

| Key | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| **ND** | Not detected |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No significant volatile contamination or calorific materials present.

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0038%)

## Classification of sample: TP114

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**TP114**
Sample Depth:
**1.80 m**
Moisture content:
**20%**
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 20% No Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | confirm TPH has NOT arisen from diesel or petrol | | | | | ☑ | | | | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 3.5 mg/kg | 1.32 | 4.621 mg/kg | 0.000462 % | | |
| 3 | beryllium { beryllium oxide } | 004-003-00-8 | 215-133-1 | 1304-56-9 | | 0.33 mg/kg | 2.775 | 0.916 mg/kg | 0.0000916 % | | |
| 4 | boron { boron tribromide/trichloride/trifluoride (combined) } | | | 10294-33-4, 10294-34-5, 7637-07-2 | | <0.2 mg/kg | 13.43 | <2.686 mg/kg | <0.000269 % | | <LOD |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 mg/kg | 1.285 | <0.257 mg/kg | <0.00002 % | | <LOD |
| 6 | chromium { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 7.9 mg/kg | 1.462 | 11.546 mg/kg | 0.00115 % | | |
| 7 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 11 mg/kg | 1.126 | 12.385 mg/kg | 0.00124 % | | |
| 8 | lead { lead chromate } | 082-004-00-2 | 231-846-0 | 7758-97-6 | 1 | 7 mg/kg | 1.56 | 10.919 mg/kg | 0.0007 % | | |
| 9 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | <0.3 mg/kg | 1.353 | <0.406 mg/kg | <0.0000406 % | | <LOD |
| 10 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1] 234-348-1 [2] | 12054-48-7 [1] 11113-74-9 [2] | | 20 mg/kg | 1.579 | 31.59 mg/kg | 0.00316 % | | |
| 11 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | <1 mg/kg | 1.405 | <1.405 mg/kg | <0.000141 % | | <LOD |
| 12 | zinc { zinc chromate } | 024-007-00-3 | 236-878-9 | 13530-65-9 | | 26 mg/kg | 2.774 | 72.128 mg/kg | 0.00721 % | | |
| 13 | pH | | | PH | | 7.6 pH | | 7.6 pH | 7.6 pH | | |

| # | | Determinand | | | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EU CLP index number | EC Number | CAS Number | | | | | | | | | |
| 14 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | <1 | mg/kg | 1.884 | <1.884 | mg/kg | <0.000188 % | | <LOD |
| | | 006-007-00-5 | | | | | | | | | | | |
| 15 | | TPH (C6 to C40) petroleum group | | | | <10 | mg/kg | | <10 | mg/kg | <0.001 % | | <LOD |
| | | | | TPH | | | | | | | | | |
| 16 | | acenaphthene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 201-469-6 | 83-32-9 | | | | | | | | | |
| 17 | | acenaphthylene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 205-917-1 | 208-96-8 | | | | | | | | | |
| 18 | | anthracene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 204-371-1 | 120-12-7 | | | | | | | | | |
| 19 | | benzo[a]anthracene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | | | |
| 20 | | benzo[a]pyrene; benzo[def]chrysene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | | | |
| 21 | | benzo[b]fluoranthene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | | | |
| 22 | | benzo[ghi]perylene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 205-883-8 | 191-24-2 | | | | | | | | | |
| 23 | | benzo[k]fluoranthene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | | | |
| 24 | | chrysene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | | | |
| 25 | | dibenz[a,h]anthracene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | | | |
| 26 | | fluoranthene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 205-912-4 | 206-44-0 | | | | | | | | | |
| 27 | | fluorene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 201-695-5 | 86-73-7 | | | | | | | | | |
| 28 | | indeno[123-cd]pyrene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 205-893-2 | 193-39-5 | | | | | | | | | |
| 29 | | naphthalene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | | | |
| 30 | | phenanthrene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 201-581-5 | 85-01-8 | | | | | | | | | |
| 31 | | pyrene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 204-927-3 | 129-00-0 | | | | | | | | | |
| 32 | | phenol | | | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <LOD |
| | | 604-001-00-2 | 203-632-7 | 108-95-2 | | | | | | | | | |
| | | | | | | | | | | Total: | 0.0159 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| **ND** | Not detected |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Classification of sample: TP115

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**TP115**
Sample Depth:
**1.50 m**
Moisture content:
**20%**
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 20% No Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | confirm TPH has NOT arisen from diesel or petrol | | | | | ☑ | | | | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 3.8 mg/kg | 1.32 | 5.017 mg/kg | 0.000502 % | | |
| 3 | beryllium { beryllium oxide } | 004-003-00-8 | 215-133-1 | 1304-56-9 | | 0.33 mg/kg | 2.775 | 0.916 mg/kg | 0.0000916 % | | |
| 4 | boron { boron tribromide/trichloride/trifluoride (combined) } | | | 10294-33-4, 10294-34-5, 7637-07-2 | | <0.2 mg/kg | 13.43 | <2.686 mg/kg | <0.000269 % | | <LOD |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 mg/kg | 1.285 | <0.257 mg/kg | <0.00002 % | | <LOD |
| 6 | chromium { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 9.8 mg/kg | 1.462 | 14.323 mg/kg | 0.00143 % | | |
| 7 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 9.8 mg/kg | 1.126 | 11.034 mg/kg | 0.0011 % | | |
| 8 | lead { lead chromate } | 082-004-00-2 | 231-846-0 | 7758-97-6 | 1 | 6.1 mg/kg | 1.56 | 9.515 mg/kg | 0.00061 % | | |
| 9 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | <0.3 mg/kg | 1.353 | <0.406 mg/kg | <0.0000406 % | | <LOD |
| 10 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1] 234-348-1 [2] | 12054-48-7 [1] 11113-74-9 [2] | | 10 mg/kg | 1.579 | 15.795 mg/kg | 0.00158 % | | |
| 11 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | <1 mg/kg | 1.405 | <1.405 mg/kg | <0.000141 % | | <LOD |
| 12 | zinc { zinc chromate } | 024-007-00-3 | 236-878-9 | 13530-65-9 | | 26 mg/kg | 2.774 | 72.128 mg/kg | 0.00721 % | | |
| 13 | pH | | | PH | | 8.6 pH | | 8.6 pH | 8.6 pH | | |

| # | | Determinand | | | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EU CLP index number | EC Number | CAS Number | | | | | | | | | |
| 14 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | <1 | mg/kg | 1.884 | <1.884 | mg/kg | <0.000188 % | | <LOD |
| | | 006-007-00-5 | | | | | | | | | | | |
| 15 | | TPH (C6 to C40) petroleum group | | | | <10 | mg/kg | | <10 | mg/kg | <0.001 % | | <LOD |
| | | | | TPH | | | | | | | | | |
| 16 | | acenaphthene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 201-469-6 | 83-32-9 | | | | | | | | | |
| 17 | | acenaphthylene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 205-917-1 | 208-96-8 | | | | | | | | | |
| 18 | | anthracene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 204-371-1 | 120-12-7 | | | | | | | | | |
| 19 | | benzo[a]anthracene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | | | |
| 20 | | benzo[a]pyrene; benzo[def]chrysene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | | | |
| 21 | | benzo[b]fluoranthene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | | | |
| 22 | | benzo[ghi]perylene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 205-883-8 | 191-24-2 | | | | | | | | | |
| 23 | | benzo[k]fluoranthene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | | | |
| 24 | | chrysene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | | | |
| 25 | | dibenz[a,h]anthracene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | | | |
| 26 | | fluoranthene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 205-912-4 | 206-44-0 | | | | | | | | | |
| 27 | | fluorene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 201-695-5 | 86-73-7 | | | | | | | | | |
| 28 | | indeno[123-cd]pyrene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 205-893-2 | 193-39-5 | | | | | | | | | |
| 29 | | naphthalene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | | | |
| 30 | | phenanthrene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 201-581-5 | 85-01-8 | | | | | | | | | |
| 31 | | pyrene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| | | | 204-927-3 | 129-00-0 | | | | | | | | | |
| 32 | | phenol | | | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <LOD |
| | | 604-001-00-2 | 203-632-7 | 108-95-2 | | | | | | | | | |
| | | | | | | | | | | Total: | 0.0144 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| **ND** | Not detected |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Classification of sample: TP116

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**TP116**
Sample Depth:
**0.90 m**
Moisture content:
**27%**
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 27% No Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | confirm TPH has NOT arisen from diesel or petrol | | | | | ☑ | | | | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 9.4 mg/kg | 1.32 | 12.411 mg/kg | 0.00124 % | | |
| 3 | beryllium { beryllium oxide } | 004-003-00-8 | 215-133-1 | 1304-56-9 | | 0.45 mg/kg | 2.775 | 1.249 mg/kg | 0.000125 % | | |
| 4 | boron { boron tribromide/trichloride/trifluoride (combined) } | | | 10294-33-4, 10294-34-5, 7637-07-2 | | 3.8 mg/kg | 13.43 | 51.034 mg/kg | 0.0051 % | | |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 mg/kg | 1.285 | <0.257 mg/kg | <0.00002 % | | <**LOD** |
| 6 | chromium { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 13 mg/kg | 1.462 | 19 mg/kg | 0.0019 % | | |
| 7 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 23 mg/kg | 1.126 | 25.895 mg/kg | 0.00259 % | | |
| 8 | lead { lead chromate } | 082-004-00-2 | 231-846-0 | 7758-97-6 | 1 | 56 mg/kg | 1.56 | 87.35 mg/kg | 0.0056 % | | |
| 9 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | <0.3 mg/kg | 1.353 | <0.406 mg/kg | <0.0000406 % | | <**LOD** |
| 10 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1] 234-348-1 [2] | 12054-48-7 [1] 11113-74-9 [2] | | 10 mg/kg | 1.579 | 15.795 mg/kg | 0.00158 % | | |
| 11 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | <1 mg/kg | 1.405 | <1.405 mg/kg | <0.000141 % | | <**LOD** |
| 12 | zinc { zinc chromate } | 024-007-00-3 | 236-878-9 | 13530-65-9 | | 52 mg/kg | 2.774 | 144.256 mg/kg | 0.0144 % | | |
| 13 | pH | | | PH | | 5.6 pH | | 5.6 pH | 5.6 pH | | |

| # | | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | 006-007-00-5 | | | | <1 | mg/kg | 1.884 | <1.884 | mg/kg | <0.000188 % | | <**LOD** |
| 15 | | TPH (C6 to C40) petroleum group | | | TPH | | <10 | mg/kg | | <10 | mg/kg | <0.001 % | | <**LOD** |
| 16 | | acenaphthene | | 201-469-6 | 83-32-9 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 17 | | acenaphthylene | | 205-917-1 | 208-96-8 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 18 | | anthracene | | 204-371-1 | 120-12-7 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 19 | | benzo[a]anthracene | 601-033-00-9 | 200-280-6 | 56-55-3 | | 0.61 | mg/kg | | 0.61 | mg/kg | 0.000061 % | | |
| 20 | | benzo[a]pyrene; benzo[def]chrysene | 601-032-00-3 | 200-028-5 | 50-32-8 | | 0.59 | mg/kg | | 0.59 | mg/kg | 0.000059 % | | |
| 21 | | benzo[b]fluoranthene | 601-034-00-4 | 205-911-9 | 205-99-2 | | 0.72 | mg/kg | | 0.72 | mg/kg | 0.000072 % | | |
| 22 | | benzo[ghi]perylene | | 205-883-8 | 191-24-2 | | 0.41 | mg/kg | | 0.41 | mg/kg | 0.000041 % | | |
| 23 | | benzo[k]fluoranthene | 601-036-00-5 | 205-916-6 | 207-08-9 | | 0.25 | mg/kg | | 0.25 | mg/kg | 0.000025 % | | |
| 24 | | chrysene | 601-048-00-0 | 205-923-4 | 218-01-9 | | 0.54 | mg/kg | | 0.54 | mg/kg | 0.000054 % | | |
| 25 | | dibenz[a,h]anthracene | 601-041-00-2 | 200-181-8 | 53-70-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 26 | | fluoranthene | | 205-912-4 | 206-44-0 | | 1.2 | mg/kg | | 1.2 | mg/kg | 0.00012 % | | |
| 27 | | fluorene | | 201-695-5 | 86-73-7 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 28 | | indeno[123-cd]pyrene | | 205-893-2 | 193-39-5 | | 0.3 | mg/kg | | 0.3 | mg/kg | 0.00003 % | | |
| 29 | | naphthalene | 601-052-00-2 | 202-049-5 | 91-20-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 30 | | phenanthrene | | 201-581-5 | 85-01-8 | | 0.58 | mg/kg | | 0.58 | mg/kg | 0.000058 % | | |
| 31 | | pyrene | | 204-927-3 | 129-00-0 | | 0.99 | mg/kg | | 0.99 | mg/kg | 0.000099 % | | |
| 32 | | phenol | 604-001-00-2 | 203-632-7 | 108-95-2 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| | | | | | | | | | | | Total: | 0.0347 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| **ND** | Not detected |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Classification of sample: TP119

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**TP119**
Sample Depth:
**0.60 m**
Moisture content:
**7.5%**
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 7.5% No Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | confirm TPH has NOT arisen from diesel or petrol | | | | | ☑ | | | | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 16 mg/kg | 1.32 | 21.125 mg/kg | 0.00211 % | | |
| 3 | beryllium { beryllium oxide } | 004-003-00-8 | 215-133-1 | 1304-56-9 | | 1.1 mg/kg | 2.775 | 3.053 mg/kg | 0.000305 % | | |
| 4 | boron { boron tribromide/trichloride/trifluoride (combined) } | | | 10294-33-4, 10294-34-5, 7637-07-2 | | 0.4 mg/kg | 13.43 | 5.372 mg/kg | 0.000537 % | | |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 mg/kg | 1.285 | <0.257 mg/kg | <0.00002 % | | <**LOD** |
| 6 | chromium { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 30 mg/kg | 1.462 | 43.847 mg/kg | 0.00438 % | | |
| 7 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 92 mg/kg | 1.126 | 103.582 mg/kg | 0.0104 % | | |
| 8 | lead { lead chromate } | 082-004-00-2 | 231-846-0 | 7758-97-6 | 1 | 270 mg/kg | 1.56 | 421.15 mg/kg | 0.027 % | | |
| 9 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | <0.3 mg/kg | 1.353 | <0.406 mg/kg | <0.0000406 % | | <**LOD** |
| 10 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1] 234-348-1 [2] | 12054-48-7 [1] 11113-74-9 [2] | | 31 mg/kg | 1.579 | 48.964 mg/kg | 0.0049 % | | |
| 11 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | 1.1 mg/kg | 1.405 | 1.546 mg/kg | 0.000155 % | | |
| 12 | zinc { zinc chromate } | 024-007-00-3 | 236-878-9 | 13530-65-9 | | 81 mg/kg | 2.774 | 224.706 mg/kg | 0.0225 % | | |
| 13 | pH | | | PH | | 8.6 pH | | 8.6 pH | 8.6 pH | | |

| # | | Determinand | | | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EU CLP index number | EC Number | CAS Number | | | | | | | | | |
| 14 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | <1 | mg/kg | 1.884 | <1.884 | mg/kg | <0.000188 % | | <**LOD** |
| | | 006-007-00-5 | | | | | | | | | | | |
| 15 | | TPH (C6 to C40) petroleum group | | | | 19 | mg/kg | | 19 | mg/kg | 0.0019 % | | |
| | | | | TPH | | | | | | | | | |
| 16 | | acenaphthene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| | | | 201-469-6 | 83-32-9 | | | | | | | | | |
| 17 | | acenaphthylene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| | | | 205-917-1 | 208-96-8 | | | | | | | | | |
| 18 | | anthracene | | | | 0.35 | mg/kg | | 0.35 | mg/kg | 0.000035 % | | |
| | | | 204-371-1 | 120-12-7 | | | | | | | | | |
| 19 | | benzo[a]anthracene | | | | 0.86 | mg/kg | | 0.86 | mg/kg | 0.000086 % | | |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | | | |
| 20 | | benzo[a]pyrene; benzo[def]chrysene | | | | 0.75 | mg/kg | | 0.75 | mg/kg | 0.000075 % | | |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | | | |
| 21 | | benzo[b]fluoranthene | | | | 0.99 | mg/kg | | 0.99 | mg/kg | 0.000099 % | | |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | | | |
| 22 | | benzo[ghi]perylene | | | | 0.45 | mg/kg | | 0.45 | mg/kg | 0.000045 % | | |
| | | | 205-883-8 | 191-24-2 | | | | | | | | | |
| 23 | | benzo[k]fluoranthene | | | | 0.36 | mg/kg | | 0.36 | mg/kg | 0.000036 % | | |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | | | |
| 24 | | chrysene | | | | 0.77 | mg/kg | | 0.77 | mg/kg | 0.000077 % | | |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | | | |
| 25 | | dibenz[a,h]anthracene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | | | |
| 26 | | fluoranthene | | | | 1.5 | mg/kg | | 1.5 | mg/kg | 0.00015 % | | |
| | | | 205-912-4 | 206-44-0 | | | | | | | | | |
| 27 | | fluorene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| | | | 201-695-5 | 86-73-7 | | | | | | | | | |
| 28 | | indeno[123-cd]pyrene | | | | 0.37 | mg/kg | | 0.37 | mg/kg | 0.000037 % | | |
| | | | 205-893-2 | 193-39-5 | | | | | | | | | |
| 29 | | naphthalene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | | | |
| 30 | | phenanthrene | | | | 0.77 | mg/kg | | 0.77 | mg/kg | 0.000077 % | | |
| | | | 201-581-5 | 85-01-8 | | | | | | | | | |
| 31 | | pyrene | | | | 1.4 | mg/kg | | 1.4 | mg/kg | 0.00014 % | | |
| | | | 204-927-3 | 129-00-0 | | | | | | | | | |
| 32 | | phenol | | | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| | | 604-001-00-2 | 203-632-7 | 108-95-2 | | | | | | | | | |
| | | | | | | | | | | Total: | 0.0754 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| **ND** | Not detected |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No significant volatile contamination or calorific materials present.

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0019%)

## Appendix A: Classifier defined and non GB MCL determinands

**confirm TPH has NOT arisen from diesel or petrol**

Description/Comments: Chapter 3, section 4b requires a positive confirmation for benzo[a]pyrene to be used as a marker in evaluating Carc. 1B; H350 (HP 7) and Muta. 1B; H340 (HP 11)
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

**boron tribromide/trichloride/trifluoride (combined)** (CAS Number: 10294-33-4, 10294-34-5, 7637-07-2)

Description/Comments: Combines the hazard statements and the average of the conversion factors for boron tribromide, boron trichloride and boron trifluoride
Data source: N/A
Data source date: 06 Aug 2015
Hazard Statements: EUH014 , Acute Tox. 2; H330 , Acute Tox. 2; H300 , Skin Corr. 1A; H314 , Skin Corr. 1B; H314

**chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

**pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

**salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

GB MCL index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

**TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

**ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

**acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

**acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

- **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

- **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

- **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

## Appendix B: Rationale for selection of metal species

**arsenic {arsenic trioxide}**

Worst case species based on risk phrases

**beryllium {beryllium oxide}**

Worst case species based on risk phrases

**boron {boron tribromide/trichloride/trifluoride (combined)}**

Worst case species based on risk phrases

**cadmium {cadmium sulfide}**

Worst case species based on risk phrases

**chromium {chromium(III) oxide (worst case)}**

All chromium VI concentrations below the laboratory LoD.

**copper {dicopper oxide; copper (I) oxide}**

Most likely common species

**lead {lead chromate}**

Worst case species based on risk phrases

**mercury {mercury dichloride}**

Worst case species based on risk phrases

**nickel {nickel dihydroxide}**

Worst case species based on risk phrases

**selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}**

Worst case species based on risk phrases

**zinc {zinc chromate}**

Worst case species based on risk phrases

**cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}**

Worst case species

## Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2022.263.5340.9974 (20 Sep 2022)
HazWasteOnline Database: 2022.263.5340.9974 (20 Sep 2022)

This classification utilises the following guidance and legislation:
**WM3 v1.2.GB - Waste Classification** - 1st Edition v1.2.GB - Oct 2021
**CLP Regulation** - Regulation 1272/2008/EC of 16 December 2008
**1st ATP** - Regulation 790/2009/EC of 10 August 2009
**2nd ATP** - Regulation 286/2011/EC of 10 March 2011
**3rd ATP** - Regulation 618/2012/EU of 10 July 2012
**4th ATP** - Regulation 487/2013/EU of 8 May 2013
**Correction to 1st ATP** - Regulation 758/2013/EU of 7 August 2013
**5th ATP** - Regulation 944/2013/EU of 2 October 2013
**6th ATP** - Regulation 605/2014/EU of 5 June 2014
**WFD Annex III replacement** - Regulation 1357/2014/EU of 18 December 2014
**Revised List of Waste 2014** - Decision 2014/955/EU of 18 December 2014
**7th ATP** - Regulation 2015/1221/EU of 24 July 2015
**8th ATP** - Regulation (EU) 2016/918 of 19 May 2016
**9th ATP** - Regulation (EU) 2016/1179 of 19 July 2016
**10th ATP** - Regulation (EU) 2017/776 of 4 May 2017
**HP14 amendment** - Regulation (EU) 2017/997 of 8 June 2017
**13th ATP** - Regulation (EU) 2018/1480 of 4 October 2018
**14th ATP** - Regulation (EU) 2020/217 of 4 October 2019
**15th ATP** - Regulation (EU) 2020/1182 of 19 May 2020
**The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020** - UK: 2020 No. 1567 of 16th December 2020
**The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020** - UK: 2020 No. 1540 of 16th December 2020
**GB MCL List** - version 1.1 of 09 June 2021

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**ENVIRONMENT**

# Wilson Bowden Developments Ltd & Rochdale Borough Council
# Plot R2, Atom Valley Innovation Centre (Plot R2 AVIC) Rochdale
# Phase 2 Geo-Environmental Assessment

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**ENVIRONMENT**

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May 2024

# DOCUMENT ISSUE RECORD

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| **Approver:** | Ralph Sibley BSc PhD CGeol FGS RoGEP Advisor | Technical Director |  |

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|---|---|---|---|---|---|
| P02 | September 2023 | S2 | Update with additional hand pitting data and remaining monitoring data. | Paolo Moniz BSc (Hons) | Mike Harper BSc (Hons) MSc CEnv |
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| P05 | April 2024 | S2 | Updated with new scheme name, development description, and masterplan. | Alex Booer BSc (Hons) MSc MA CGeol FGS | Richard Robinson BSc (Hons) MCIWEM |
| P06 | May 2024 | S2 | Updated with v. P02 of the new masterplan. | Alex Booer BSc (Hons) MSc MA CGeol FGS | Richard Robinson BSc (Hons) MCIWEM |

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# EXECUTIVE SUMMARY

| EXECUTIVE SUMMARY | |
|---|---|
| Site Address | The site is located on a collection of fields immediately south of Kingsway Business Park Tram Stop in Rochdale, postcode OL16 4JN. |
| Site Setting | The proposed development is indicated to comprise erection of a research & development building (Use Class E) including office, laboratory & production space, function space & café, new access, car parking, servicing, boundary treatments, hard and soft landscaping and other associated works.. |
| Published Ground Conditions | Information published by the BGS indicates that the site is directly underlain by Hummocky Glacial Deposits (Sand and Gravel) with a small zone of Glacial Till in the very eastern section. These Superficial deposits are underlain by Pennine Lower Coal Measures bedrock. The bedrock is inferred as faulted to the southwest and northeast of the site at distances of 50m and 130m respectively (NW-SE trending). |
| Site Investigation | Previous ground investigation within the Plot R2 AVIC site boundary included six trial pits and two cable percussive boreholes undertaken as part of the adjacent Plot P investigation (1st to 5th August 2022). The associated data has been incorporated into this report.<br>Further intrusive ground investigation works were undertaken between 3rd and 5th July 2023 and comprised the advancement of two cable percussive boreholes (BH01 and BH02) to a maximum depth of 10.45m bgl with completion of SPTs and installations of gas and groundwater monitoring wells; and four machine excavated trial pits (TP01 to TP04 inclusive) to a maximum depth of 3.90m bgl.<br>To delineate the extent of asbestos fibres recorded within the 2023 investigation, another sampling visit was undertaken on 30/08/23. Ten shallow Made Ground samples were recovered from the Made Ground across the site and in the vicinity of both positive identifications. |
| Ground Conditions Encountered | The ground conditions encountered during the 2022 and 2023 ground investigations generally confirmed the published geology discussed in the Phase 1 Desk Study report. Ground conditions comprised Topsoil and Made Ground (from 0.2m to 2.3m thickness) directly underlain by Hummocky Glacial Deposits. A layer of relict topsoil between 2.3m and 2.5m was encountered below Made Ground in BH02 (2023). Hummocky Glacial Deposits typically comprised a layer of soft to firm clay (base depths of 0.8m to 3.0m) over medium dense to dense sands and sandy clays to a maximum proven depth of 15.45m. Bedrock was not encountered during either investigation. |
| Geotechnical Appraisal | Given the variable thickness of Made Ground and underlying soft clays up to 3.0m below ground level, ground improvement will be required for the support of shallow foundations and the floor slab of the proposed building. Ground improvement utilising vibro-stone columns (VSC) is considered feasible. Alternatively, ground improvement comprising rigid inclusions (RIs), with a load transfer platform is likewise considered feasible. Excavation and re-compaction of the upper 2m of soils is also a potential option, although feasibility is strongly weather-dependent and limited by spatial constraints.<br>Significant thicknesses of organic soils or peat were not encountered during the investigation, save for the relict topsoil in BH02 (2023). If any organic soils/Peat are found the building footprint will need to be delineated, chased out, removed and replaced with suitable engineered fill. Excavated organic soils/Peat, if present, could potentially be reused within non-structural areas of the development. |

| | |
|---|---|
| | Compaction testing indicates soils are generally wet of optimum at natural moisture contents and would require dewatering (via chemical modification) for adequate compaction as engineered fill.<br>The design sulphate and ACEC class for below ground concrete at the site is DS-1 and AC-1.<br>For new pavement at the site, modification of the formation soils (e.g. by lime or cement) will be required to achieve the required design CBR value.<br>Based on the ground conditions encountered, together with the variable and shallow groundwater issues in the area, soakaway drainage is not likely to be viable and is not recommended.<br>Groundwater is likely to vary seasonally at the site. The ground investigation will have likely captured the low range of groundwater conditions, with some areas of the site displaying evidence of historical waterlogging at the surface (reeds, organic topsoil build up). If groundwater levels rise following extended periods of wet weather, groundwater control may be required during construction ground works. |
| Environmental Appraisal | Moderate total Organic Carbon (TOC) content in the Made Ground was recorded was recorded within the 2022 investigation.<br>Characteristic Gas Situation 2 (CS2) prevails on site within monitored boreholes.<br>No soil samples tested during 2023 had contaminant concentrations that exceeded the screening criteria for risks to human health for a commercial end-use.<br>Asbestos fibres were recorded in two locations (TP01and TP03 during the 2023 investigation – see Waste Assessment section below).<br>Ten samples further shallow Made Ground samples were recovered from across the site and in the area of both positive identifications. No further positive asbestos identifications were recorded. Asbestos fibres recorded in the Made Ground of TP01and TP03 are considered isolated areas of contamination.<br>No groundwater samples were taken during the 2023 investigation as the groundwater levels were too low to achieve sufficient volume for sampling at the time.<br>Minor exceedances for leachable copper, lead, nickel and zinc were recorded in the 2022 investigation. BWB consider these exceedances to not be significant given the distance to sensitive surface water receptors.<br>Minor exceedances for cadmium, copper, nickel, zinc, and ammonium were recorded in groundwater samples within the 2022 investigation. Due to the proposed development on the site comprising large areas with hardstanding and buildings which will limit further infiltration and leaching, BWB does not consider that controlled waters will be exposed to an unacceptable risk as a result of the proposed development. |
| Waste Assessment | Soil samples from both investigations have been characterised against hazardous waste criteria using Hazwasteonline. The results of the waste classification indicates that most of the soil samples analysed are likely to be classified as non-hazardous.<br>Asbestos was recorded in two locations (TP01and TP03). Quantification results recorded <0.001% and 0.359% respectively. Concentrations of asbestos within the soils in TP03 would be classified as hazardous. |
| Recommendations | A Remediation Strategy should be completed for the site prior to development to provide remediation and mitigation requirements and provide verification requirements of any gas protection measures required.<br>Any earthworks will need to be undertaken in accordance with a suitable specification document, which will need to be prepared to describe the materials and their requirements including placement and acceptability limits. |

| | |
|---|---|
| | Ground improvement will likewise need to be undertaken in accordance with a suitable specification.<br>Allowance should be made for temporary shoring of excavations due to likely stability issues associated with running sands.<br>Contingency for groundwater control should be considered especially if development is undertaken during winter months. |
| This summary should be read in conjunction with BWB's full report (ref. KYP-BWB-ZZ-XX-RP-YE-0002_Ph2-P02 and reflects an assessment of the Site based on information received by BWB at the time of production. | |

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# 1. INTRODUCTION

## Instruction

1.1 This Phase 2 Geo-Environmental Assessment has been undertaken on behalf of Wilson Bowden Developments Ltd for the Plot R2 AVIC site, Kingsway Business Park, Rochdale. Details of the project brief are included in BWB proposal reference 230505/P02/0001/210939 dated May 2023.

## Proposed Development

1.2 The proposed development is shown on the architect's masterplan in **Appendix 1**. The proposed development is indicated to comprise erection of research & development building (Use Class E) including office, laboratory & production space, function space & café, new access, car parking, servicing, boundary treatments, hard and soft landscaping and other associated works.

## Previous Reports

1.3 The following geo-environmental reports have previously been completed for the site, or part of the site:

- '*Phase 1 Geo-Environmental Assessment*' by BWB Consulting Ltd for Wilson Bowden Developments Ltd, reference KYP-BWB-ZZ-XX-RP-YE-0001_Ph1, dated July 2022.
- '*Phase 2 Geo-Environmental Assessment*' by BWB Consulting Ltd for Wilson Bowden Developments Ltd, reference KYP-BWB-ZZ-XX-RP-YE-0001_Ph1, dated October 2022.

1.4 The Phase 1 report listed above refers to Plot P, but covers the area now known as Plot R2 AVIC as well as the adjacent Plot P. The Plot P ground investigation covered part of the area of the current Plot R2 AVIC site, and information from that investigation has been incorporated into this Phase 2 Report for Plot R2 AVIC. Details are discussed further in **Section 2** below.

## Objectives

1.5 The objectives of this assessment and report are to assess:

- The prevailing ground and groundwater conditions across the site;
- The potential presence and extent of contamination in shallow soil and groundwater beneath the site;
- The significance and magnitude of the observed contamination through comparison of analytical data with appropriate published environmental screening criteria;
- The strength properties of the soil beneath the site to enable foundation design;
- The ability to rework the soils for earthworks required to achieve the development platform;
- Any precautions required with respect to attack on buried concrete;

- The drainage properties of the underlying strata; and
- The ground gas regime beneath the site.

1.6 The above objectives will allow the preliminary Conceptual Site Model presented in the Phase 1 report to be verified and updated. The report has been completed in accordance with BS10175:2011(+A2:2017) 'Investigation of Potentially Contaminated Sites, Code of Practice' and EA Guidance on Risk Management of Land Contamination https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm.

1.7 This report presents the information obtained from a desk study and two ground investigations, one undertaken in 2023 specifically for the current development, and one undertaken for the adjacent Plot P site which at the time overlapped with the Plot R2 AVIC boundary. Relevant factual information from the Plot P investigation has been included in this report. The report, together with the associated Figures and Appendices, provides a Ground Investigation Report (GIR), as defined in BS EN 1997-1:2004 and BS EN 1997-2:2007

## Scope of Works

1.8 The recent ground investigation scope of works for Plot R2 AVIC was completed on 05/07/2023 and comprised the following:

- Non-intrusive survey of exploratory hole locations for underground utilities;
- 4 no. machine excavated trial pits;
- 2 no. cable percussive boreholes;
- 10 no. hand dug pits (undertaken 31st August 2023);
- 4 no. gas and groundwater monitoring visits;
- Chemical analysis of soil samples; and
- Geotechnical testing of recovered soil samples.

1.9 The aspects of the Plot P ground investigation relevant to the current Plot R2 AVIC site included:

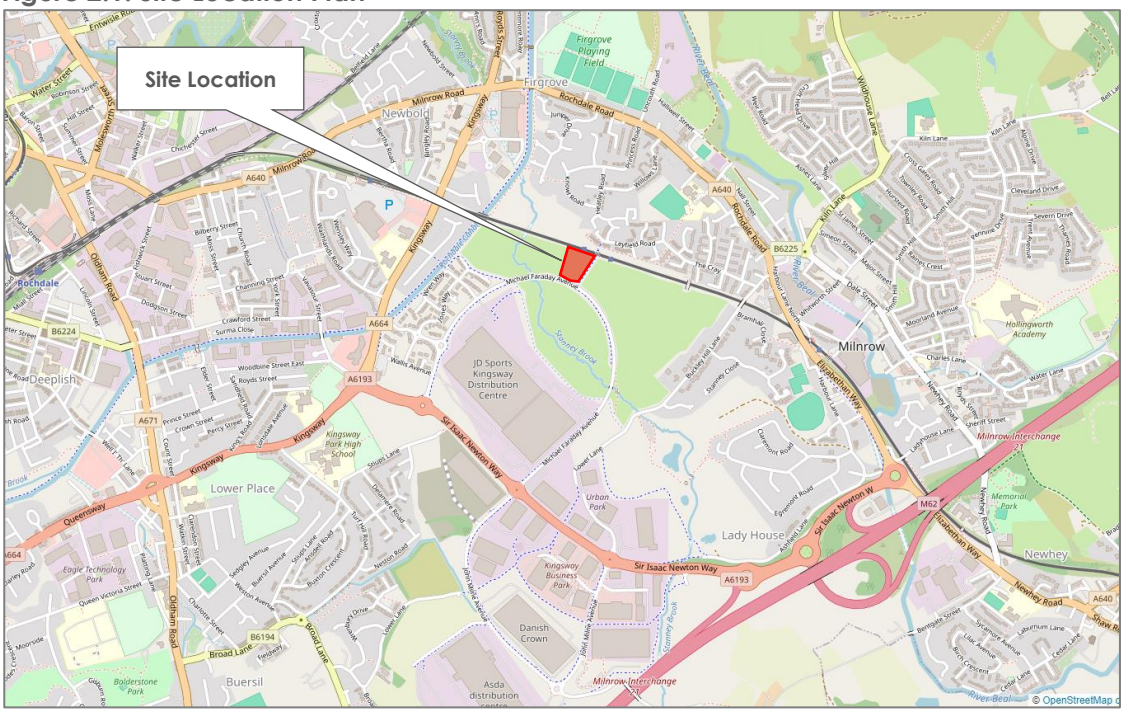
- 6 no. machine excavated trial pits;
- 2 no. cable percussive boreholes;
- 4 no. gas and groundwater monitoring visits;
- Chemical analysis of soil samples; and
- Geotechnical testing of recovered soil samples.

# 2. THE SITE

## Site Location

2.1 The site is located at Plot R2, Atom Valley Innovation Centre (Plot R2 AVIC), in Rochdale, centred at National Grid Reference 391907 412651, nearest postcode OL16 4JN. The approximate location of the site is shown below in **Figure 2.1**.

**Figure 2.1: Site Location Plan**




## Site Description

2.2 A full site description and site photographs are included within the BWB Phase 1 Geo-Environmental Assessment (Ref: KYP-BWB-ZZ-XX-RP-YE-0001_Ph1) dated July 2022, which included the current footprint of the Plot R2 AVIC site as well as adjacent land.

2.3 The current Plot R2 AVIC site comprises of an undeveloped, irregularly shaped parcel of grassed land to the east of Rochdale town centre, covering approximately 2.5 hectares. The site is undulating, with ground levels typically around 149m to 150.5m above Ordnance Datum.

2.4 The Oldham to Rochdale tram line is located adjoining the northern boundary of the site, with residential development beyond and to the north. The Kingsway Loop Road (Michael Faraday Avenue) bounds the site to the south. The land to the east and west of the site currently comprises undeveloped grassed fields.

2.5 The Stanney Brook watercourse is present around 150m to the south and west of the site boundary. Beyond the Brook is a series of engineered ponds, and immediately adjacent to these ponds the Rochdale Canal is present around 350m to the west of site.

# 3. PUBLISHED GROUND CONDITIONS

## Published Geology

3.1 British Geological Survey (BGS) mapping for the site indicates that the site is underlain by Hummocky Glacial Deposits (Sand and Gravel) and/or Glacial Till. These Superficial deposits are underlain by Pennine Lower Coal Measures bedrock (with seams last worked in 1915 at depths of 97m to 107m bgl). The bedrock is inferred as faulted to the southwest and northeast of the site at distances of 52m and 130m respectively (both NW-SE trending faults). The BGS Lexicon database describes the bedrock as interbedded mudstone, siltstone and sandstone containing thicker coal seams towards the upper boundary.

3.2 The closest BGS borehole to the site is SD91SW-156, approximately 350 m west. The borehole recorded 1.4m of Made Ground, comprising of 200mm of topsoil over dark brown sandy topsoil with a small amount of gravel content. This is underlain by 4.6m of medium dense, brown silty fine to medium sand becoming loose at 5.2m to the borehole's termination at 6.0m bgl (below ground level). The Glacial Till is not present at this borehole location, but the Hummocky Glacial Deposits and underlying Lower Coal Measures bedrock, which are present on site, are included in this record.

## Hydrogeology

3.3 The underlying ground conditions have been classified by the Environment Agency (EA) as follows:

- Glacial Till: Secondary Undifferentiated Aquifer;
- Hummocky Glacial Deposits (Sand and Gravel): Secondary A Aquifer; and
- Pennine Lower Coal Measures Bedrock: Secondary A Aquifer.

## Hydrology

3.4 The following bodies of water are present within 400m of the site:

- Stanney Brook is present around 150m to the south of the site boundary;
- A series of engineered ponds are present around 230m to the west; and
- Rochdale Canal is present around 350m to the west.

3.5 There is a high risk of surface water flooding on site, primarily related to the surface water bodies listed above. There is risk of a maximum flood depth of 0.3m to 1m from surface water flooding on site for a 1 in 30-year event according to Environment Agency mapping.

3.6 There is a low to moderate risk of groundwater flooding on site according to Environment Agency mapping.

# 4. PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

## Introduction

4.1 The risk posed by any contaminants in soil or groundwater will depend on the nature of the hazard, the probability of exposure, the pathway by which exposure occurs, and the likely effects on the receptors. A contaminant is defined as a substance that has the potential to cause harm, while a risk is considered to exist if such a substance is present in sufficient concentration to cause harm and a pathway exists for a receptor to be exposed to the substance.

4.2 The following sections discuss all the identified potential on and off-site sources, pathways and receptors in the context of the proposed development and plausible pollutant linkages which may represent a risk to identified receptors such as human health and/or controlled waters from the data gained from the desk study. At this stage the assessment is qualitative and aimed to determine all pollutant linkages, irrespective of significance or allowing for uncertainty.

4.3 Three impact potentials exist for any given site; these are:

- The site impacting upon itself;
- The site impacting on its surroundings; and
- The surroundings impacting on the site.

All three impacts need to be considered in a risk assessment.

4.4 A Source, Pathway, Receptor analysis has been undertaken for the site based on the information provided in the preceding sections. This is presented as Table 5 and further information about the risk classification scheme is included within **Appendix 5**.

4.5 Sources (S); These are potential or known sources of contamination that may relate to a former land use or present site feature or process (e.g. fuel storage tanks).

4.6 Pathways (P); A pathway is defined as a mechanism or route by which a contaminant comes into contact with, or otherwise affects a receptor. Pathways by which the identified receptors may be impacted upon in the context of the proposed development.

4.7 Receptors (R); Receptors are defined as people, living organisms, ecological systems, controlled waters, atmosphere, structures and utilities that could be adversely affected by contaminant(s).

4.8 Under the Construction Design Management (CDM) Regulations 2015, construction and maintenance contractors must undertake their own risk assessments and mitigation to protect their staff, other human receptors and the environment from potential contamination. By law potential risks to human health and the environment from construction activities must appropriately identified and all necessary steps taken to eliminate/manage that risk. Therefore, construction / maintenance workers are excluded as a receptor in the CSM.

4.9 A tabulated version of the Preliminary CSM produced within the Phase 1 is presented in **Table 4-1**, **Table 4-2** and **Table 4-3**.

**Table 4-1: Potential Sources of Contamination**

| Location | Potential Source | Contaminants of Potential Concern (CoPC) |
|---|---|---|
| On-site | **MADE GROUND** associated with previous infrastructure developments such as **RAILWAY (TRAM) SIDINGS** and **ROAD DEVELOPMENT** | • Heavy metals<br>• Inorganics, such as cyanides, sulphates and nitrates<br>• Arsenic<br>• Methane, carbon dioxide |
| | Contamination associated with **AGRICULTURAL** activities | • Semi-volatile organic compounds (SVOCs) including phenols and polycyclic aromatic hydrocarbons (PAHs)<br>• Inorganics, such as cyanides, sulphates and nitrates<br>• Methane, carbon dioxide |
| | Gas accumulation in **DEEP MINING WORKS** | • Methane, carbon dioxide |
| Off-site | Contamination associated with neighbouring activities including **RAILWAY CUTTING** and **QUARRIES** | • Heavy metals<br>• Semi-volatile organic compounds (SVOCs) including phenols and polycyclic aromatic hydrocarbons (PAHs)<br>• Petroleum hydrocarbons<br>• Inorganics, such as cyanides, sulphates and nitrates<br>• pH |

**Table 4-2: Relevant Potential Pathways and Receptors**

| Receptors | Pathways |
|---|---|
| **Human Health:**<br>• Future site users (commercial)<br>• Neighbouring public (residential/commercial)<br>• Intrusive maintenance workers | • Dermal contact with soil or dust<br>• Incidental ingestion of soil and/or dust<br>• Inhalation of dust and/or fibres<br>• Inhalation of vapours<br>• Migration and accumulation of ground gas in enclosed spaces leading to inhalation or explosion |
| **Controlled Waters:**<br>• Groundwater (Secondary A Aquifers)<br>• Surface water (Rochdale Canal, Stanney Brook) | • Leaching of soil contaminants<br>• Vertical and lateral migration<br>• Surface run-off |
| **Ecology:**<br>• Flora and Fauna | • Lateral migration<br>• Uptake and accumulation |
| **Property:**<br>• Underground utilities<br>• Building structures | • Direct Contact<br>• Accumulation and explosion of gas |

**Table 4-3: Preliminary Conceptual Site Model**

| Source | Pathway | Receptor | Con | Prob | Risk |
|---|---|---|---|---|---|
| On-site sources as detailed in **Table 4.1**. | Dermal contact with, and incidental ingestion of soil and/or dust.<br>Inhalation of dust and/or fibres. | Future site users (commercial) | Md | Ul | L |
| | | Intrusive maintenance workers | Md | Lw | M/L |
| | Inhalation of vapours. | Future site users (commercial) | Md | Ul | L |
| | | Neighbouring public | Md | Ul | L |
| | | Intrusive maintenance workers | Md | Lw | M/L |
| | Migration and accumulation of ground gases in enclosed spaces leading to asphyxiation (carbon dioxide) or explosion (methane). | Future site users (commercial) | Md | Lw | M/L |
| | Leaching and permeation through soil profile. | Groundwater: Underlying Secondary Superficial & Bedrock Aquifers | Md | Ul | L |
| | Vertical and lateral migration of contaminants. | | Md | Ul | L |
| | Surface run-off. | Stanney Brook<br>Rochdale Canal | Md | Ul | L |
| | Direct contact. | Water utility pipes | Md | Lw | M/L |
| | | Buried structures/ foundations. | Mi | Lw | L |
| Off-site sources as detailed in **Table 4.1**. | Dermal contact with, and incidental ingestion of soil and/or dust. | Future site users (commercial) | Md | Ul | L |
| | | Future site users (commercial) | Md | Ul | L |
| | Leaching and permeation through soil profile. | Groundwater: Underlying Secondary Superficial & Bedrock Aquifers | Md | Ul | L |

| Source | Pathway | Receptor | Con | Prob | Risk |
|---|---|---|---|---|---|
| | Vertical and lateral migration of contaminants. | | Md | Ul | L |

VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low

KEY: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor, Hi = High, Li = Likely, Lw = Low Likelihood, Ul = Unlikely

# 5. PHASE II GEO-ENVIRONMENTAL AND GEOTECHNICAL GROUND INVESTIGATION

5.1 Additional intrusive ground investigation works for Plot R2 AVIC were undertaken by BWB between 3rd and 5th July 2023 and comprised the following works:

- Clearance of investigation locations by a specialist buried services' tracing company;
- Collection of coordinates and elevations of exploratory hole locations;
- The advancement of two cable percussive boreholes (BH01 (2023) and BH02 (2023)) to a maximum depth of 10.45m bgl with completion of SPTs and installations of gas and groundwater monitoring wells;
- The advancement of four machine excavated trial pits (TP01 to TP04 inclusive) to a maximum depth of 3.90m bgl;
- Collection of environmental soil and groundwater water samples for chemical analysis at a UKAS and MCERTS accredited laboratory;
- Collection of large and small disturbed soil samples for geotechnical testing at a UKAS accredited laboratory.
- Four proposed post investigation ground gas and groundwater level monitoring visits (3 currently completed); and
- An additional sampling visit to delineate any extent of asbestos (31st August 2023).

5.2 An exploratory hole location plan is presented in **Drawings;** this includes the exploratory holes formed within the Plot R2 AVIC site during the 2022 ground investigation. BWB exploratory hole records are presented as **Appendix 2**, the SPT calibration certificate is presented in **Appendix 3**, and the post-investigation gas and groundwater monitoring data is presented as **Appendix 4**.

5.3 The site investigation works were carried out in general accordance with BS5930:2015 'Code of Practice for Site Investigations' and BS10175:2011 'Investigation of Potentially Contaminated Sites'.

### Chemical Sampling Strategy

5.4 There was a non-targeted sampling strategy, considering the anticipated site wide Made Ground (of limited thickness) and the natural shallow soils including areas of natural organic material.

5.5 Samples of Made Ground and natural soils were taken and subjected to testing to inform preliminary assessments of the potential for re-use of soils for fill and/or landscaping.

5.6 Cable percussive boreholes included single groundwater and gas installations to monitor and characterise the underlying groundwater regime within the Hummocky Glacial Deposits. Installations in the two cable percussive boreholes undertaken during the Plot P investigation are also included below.

**Table 5-1: Response Zones**

| Location | Response zone | Stratum |
|---|---|---|
| Borehole BH01 (2023) | Between 3.0m and 10.0m | Hummocky Glacial Deposits (Sand) |
| Borehole BH02 (2023) | Between 3.0m and 10.0m | Hummocky Glacial Deposits (Sand) |
| Borehole BH01 (2022) | Between 2.0m and 5.0m | Hummocky Glacial Deposits (Sand) |
| Borehole BH02 (2022) | Between 3.0m and 12.0m | Hummocky Glacial Deposits (Sand) |

## Chemical Analytical Strategy

### Soil Strategy

5.7 Selected soil samples collected from exploratory hole locations were sent to i2 Analytical Ltd Services (UKAS and MCERTS accredited) for chemical analysis. The following chemical analytical testing was undertaken during the recent investigation:

- 8 no. soil samples were tested for a soil suite (BWB Standard Suite) comprising arsenic, barium, beryllium, water soluble boron, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, vanadium, zinc, water soluble sulphate (2:1 extract), total phenols, total cyanide, free cyanide, complex cyanide, fraction of organic carbon, pH, Polycyclic Aromatic Hydrocarbons (PAHs) (United States Environment Protection Agency priority 16 compounds) and Total Petroleum Hydrocarbons (TPH) C6-C40;
- 15 no. soil samples underwent asbestos screening (6 during investigation, and 10 post main investigation); and
- 2 no. soil samples tested for TPH speciated to the UK Criteria Working Group (TPHCWG) aliphatic and aromatic compounds.

5.8 Soil testing undertaken in the relevant holes on The Plot R2 AVIC site during the 2022 'Plot P' investigation included:

- Two no. soil samples were tested for a soil suite (BWB Standard Suite) comprising arsenic, barium, beryllium, water soluble boron, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, vanadium, zinc, water soluble sulphate (2:1 extract), total phenols, total cyanide, free cyanide, complex cyanide, fraction of organic carbon, pH, Polycyclic Aromatic Hydrocarbons (PAHs) (United States Environment Protection Agency priority 16 compounds) and Total Petroleum Hydrocarbons (TPH) C6-C40;
- One soil sample underwent asbestos screening; and
- One soil sample were tested for a suite of common leachable contaminants, namely arsenic, barium, beryllium, water soluble boron, cadmium, chromium, copper, lead, mercury, nickel, selenium, vanadium, zinc, water soluble sulphate (2:1 extract), sulphate, total cyanide and pH.

5.9 The results of the soil chemical testing are presented as **Appendix 5**.

### Groundwater Strategy

5.10 Groundwater was not sampled during the 2023 investigation as there was insufficient water available in the monitoring wells to obtain representative samples for testing. This is likely due to the very dry weather and associated low seasonal groundwater levels.

5.11 Groundwater samples undertaken in the relevant Plot P 2022 investigation included:

- 1no. water sample was tested for arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, vanadium, zinc, conductivity, soluble sulphate, ammoniacal nitrogen, total phenols, total cyanide, pH, total organic carbon, PAHs (US EPA priority 16 compounds).

5.12 The results of the water chemical testing are presented as **Appendix 6**.

### Geotechnical Strategy

5.13 The cable percussive borehole locations were positioned around the site, in consideration of the proposed building footprint, to assess underlying ground conditions for geotechnical assessment purposes. The trial pits were positioned to assess ground conditions, strength properties and characteristics across the full site.

5.14 In situ soil strength testing comprising SPTs were undertaken at regular depth intervals within the cable percussive boreholes. SPT 'N' values are included on the exploratory hole logs in **Appendix 2**.

5.15 Selected large and small disturbed and undisturbed samples were collected from the investigation locations and sent to the geotechnical project laboratory (i2 Analytical Ltd Services), which is UKAS accredited. The following geotechnical testing was undertaken;

- 11 samples tested for moisture content;
- 4 samples tested for Atterberg (liquid and plastic) limits;
- 7 samples tested for particle size distribution by sieve and pipette;
- 2 samples tested for particle size distribution by sedimentation;
- 10 samples tested for BRE Suite comprising aqueous sulphate and pH;
- 3 samples underwent (2.5kg rammer) compaction testing; and
- 2 samples underwent (4.5kg rammer) compaction testing.

5.16 The results of the geotechnical testing are included as **Appendix 7**.

5.17 Geotechnical Testing undertaken in the relevant Plot P 2022 investigation included:

- 1 sample tested for moisture content;
- 1 sample tested for Atterberg (liquid and plastic) limits;
- 2 samples tested for BRE Suite comprising aqueous sulphate and pH;
- 1 CBR test was undertaken on a recompacted sample (2.5kg rammer);

- 4 particle density tests;
- 3 samples underwent (2.5kg rammer) compaction testing; and
- 1 sample underwent (4.5kg rammer) compaction testing.

# 6. GROUND CONDITIONS ENCOUNTERED

## Geological Summary

6.1 The ground conditions recorded from both phases of investigation generally confirmed the published geology discussed in the Phase 1 report, i.e., the site is directly underlain by Hummocky Glacial Deposits, all underlain by Pennine Lower Coal Measures bedrock.

6.2 The recorded ground conditions are summarised in **Table 6.1** below. Uncorrected SPT results collected from the borehole locations are presented on the exploratory hole records presented in **Appendix 2**.

**Table 6-1: Summary of Ground Conditions**

| Stratum | Top Depth (m) | | Base Depth (m) | | Thickness (m) | | SPT N Value | |
|---|---|---|---|---|---|---|---|---|
| | Min | Max | Min | Max | Min | Max | Min | Max |
| Topsoil | Ground Level | | 0.1 | 0.40 | 0.10 | 0.40 | - | - |
| Made Ground | 0.00 | 0.20 | 0.20 | 2.30 | 0.20 | 2.20 | 4 | 6 |
| Hummocky Glacial Deposits (upper clay layer) | 0.20 | 2.50 | 0.80 | 3.00 | 0.00 | 1.70 | 10 | 11 |
| Hummocky Glacial Deposits (Sand and Gravels) | 0.80 | 3.00 | Not proven* (base of deepest hole 15.45m) | | Not proven (base of deepest hole 15.45m) | | 12 | 37 |
| * Note: Hummocky Glacial deposits in BH01 (2022) comprise stiff clay between 11.80m depth and end of hole at 15.45m. | | | | | | | | |

## Geological Descriptions

### Topsoil

6.3 Topsoil was encountered in BH01 (2023) and TP02 during the Plot R2 AVIC (2023) investigation. It was recorded with thicknesses of between 0.1m and 0.2m, and up to 1.0m thick in BH01 (2022) during the Plot P investigation. Topsoil composition was variable, typically comprising dark brown slightly gravelly silty fine to medium sand with varying rootlet content and with medium to coarse siltstone, brick, and glass gravel content. The topsoil is topped by grass across much of the site.

6.4 The depths of topsoil over the site may vary from those encountered at the locations investigated within the scope of this investigation, which should be considered when making estimates of topsoil quantities on the site.

### Made Ground

6.5 Made Ground was encountered in all exploratory holes in the 2023 investigation and within TP101 and TP105 within the 2022 investigation. It was recorded with thicknesses of between 0.2m and 2.3m.

6.6 The Made Ground encountered was variable in composition. It typically comprised a dark brown gravelly sand. Gravel comprised various natural and artificial inclusions (glass, siltstone, concrete and metal fragments).

6.7 SPT $N_{60}$ values ranged from 4 and 6 within this stratum.

Hummocky Glacial Deposits

6.8 Soils inferred to be Hummocky Glacial Deposits were encountered in all exploratory holes below Topsoil or Made Ground. All exploratory holes terminated within the Hummocky Glacial Deposits, with full thicknesses not proven (extending to at least 15.45m bgl). These deposits typically comprised an upper clayey layer over the deeper predominantly sand horizon:

- The upper clay layer, where present, was encountered to between 0.8m and 3.0m depth. It is present in all holes except BH01, TP101 and TP102 from the Plot P investigation. The material typically comprises a firm light grey mottled orangish brown sandy, silty, slightly gravelly clay. Gravel is subangular to subrounded, fine to medium coal, siltstone and sandstone. Recorded descriptions vary from soft to stiff, but typically recorded as firm. SPT $N_{60}$ values in this stratum ranged between 10 and 11, equivalent to an undrained shear strength around 50kPa for low to medium plasticity clay.
- The underlying sands (depth to base not proven) comprised light brown to brown gravelly sand. Gravel content comprises coal, siltstone and quartz. SPT N60 values within the sand dominated Hummocky Glacial Deposits were recorded ranging from 12 to 37.

6.9 An SPT $N_{60}$ versus depth plot is presented as **Figure 6.1**. While $N_{60}$ values generally increased with depth, the data is broadly scattered.

**Figure 6.1: SPT '$N_{60}$' Values vs. Depth.**

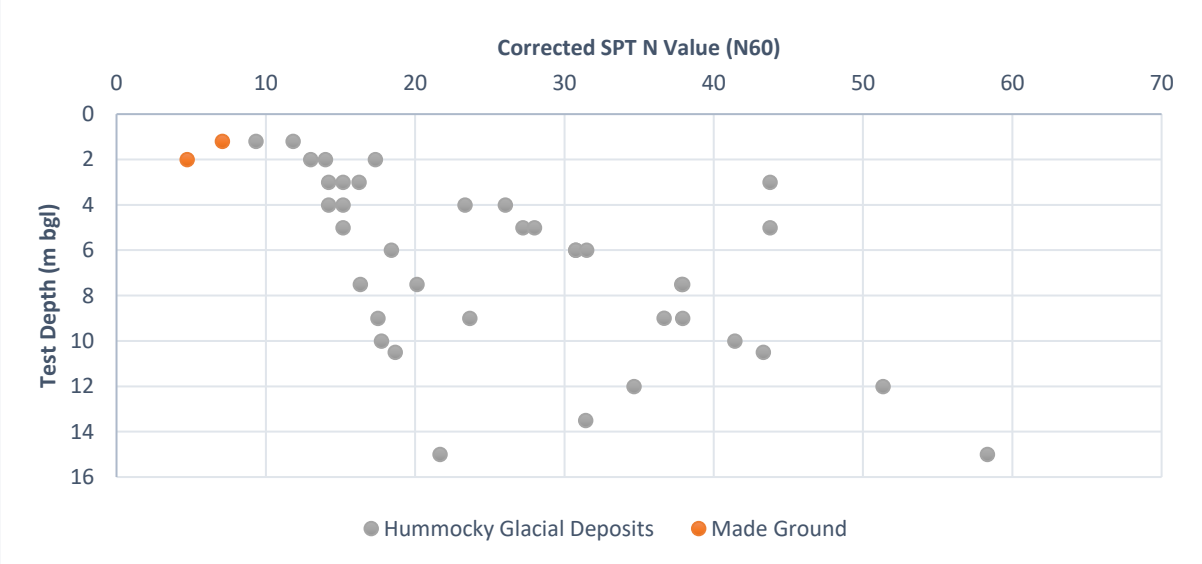
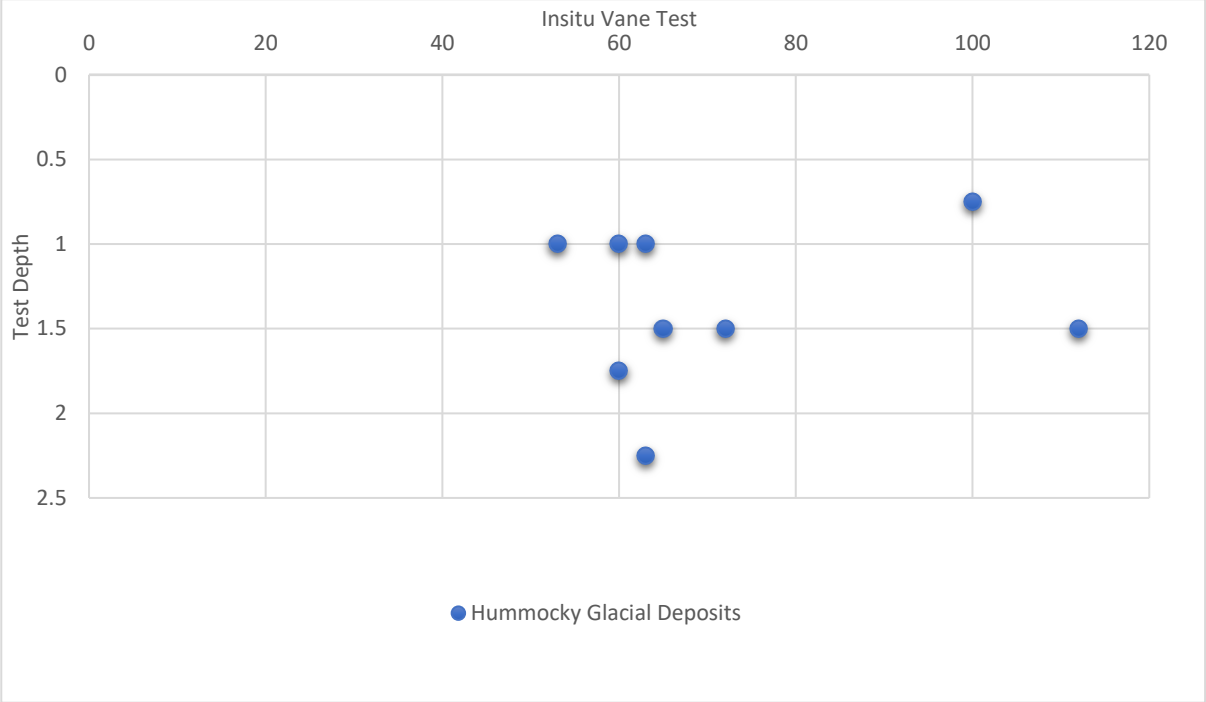


**Figure 6.2: Hand Shear Vane (HSV) vs. Depth (m bgl).**




6.10 5 no. samples from within the Hummocky Glacial Deposits were tested for Atterberg Limits and indicate a range of low to intermediate plasticity clays. Plasticity Index (PI) results range from 16% to 27%.

6.11 Particle size distribution test results for these strata are summarised below.

**Table 6-2: PSD Results Summary (Hummocky Glacial Deposits).**

| Location | Depth (m) | Cobble Content (%) | Gravel Content (%) | Sand Content (%) | Clay/ Silt Content (%) | Earthworks Classification |
|---|---|---|---|---|---|---|
| TP01 (2023) | 3.00-3.50 | 0 | 8 | 85 | 7 | 1A |
| TP02 (2023) | 1.00-1.50 | 0 | 2 | 38 | 61 | 2A/2B |
| TP03 (2023) | 0.50-1.00 | 0 | 20 | 55 | 25 | 2A/2B |
| TP04 (2023) | 0.70-1.10 | 0 | 7 | 44 | 49 | 2A/2B |
| BH01 (2023) | 0.50-1.00 | 0 | 13 | 35 | 52 | 2A/2B |
| BH02 (2023) | 2.50-3.00 | 0 | 5 | 22 | 73 | 2A/2B |
| BH02 (2023) | 5.50-6.00 | 0 | 10 | 86 | 4 | 1A |
| TP105 (2022) | 2.50 | 0 | 0 | 93 | 7 | 1A |

6.12 Three 2.5kg hammer and two 4.5kg hammer "compaction" tests were undertaken; the maximum dry density (MDD) ranged from 1.34 to 1.99 Mg/m$^3$ and the optimum moisture content (omc) from 11% to 28% for the 2.5kg tests, with the MDD ranging from 1.93 to 1.99Mg/m$^3$, and the omc ranging from 12% to 13% respectively for the 4.5kg tests.

### Hydrogeology

6.13 No groundwater was encountered during hole formation in any exploratory holes during the Plot R2 AVIC investigation. Groundwater monitoring is ongoing.

6.14 Groundwater monitoring during the Plot R2 AVIC (2023) investigation recorded levels between 10.4 and 11.2m below ground level.

6.15 Groundwater monitoring during the Plot R2 AVIC (2022) investigation recorded levels between 2.04m and 3.13m below ground level.

### Hydrology

6.16 No surface water features were observed within the site boundary.

6.17 No contamination observations were noted during the groundwater sampling visit (2022) or subsequent gas and groundwater monitoring period (2022 and 2023).

# 7. GEOTECHNICAL ASSESSMENT

## Introduction

7.1 The proposed development for Plot R2 AVIC is indicated to be a single research & development building including office, laboratory & production space, function space & café, new access, car parking, servicing, boundary treatments, hard and soft landscaping and other associated works. The building is likely to be a steel portal framed structure.

7.2 The generalised ground conditions across the development plot consist of Topsoil/ Made Ground up to 2.3m thick, overlying Hummocky Glacial Deposits comprising a layer of firm clay up to 3.0m thick, over medium dense sands which become denser with depth.

## Ground Model

7.3 For the purpose of geotechnical appraisal, groundwater is considered to be at depths of between 2m and 3m bgl (reduced levels of about 146 – 147m AOD). This is based on levels recorded within the Hummocky Glacial Deposits during the groundwater monitoring at Plot P (2022). BWB's experience of the local area indicates that groundwater varies seasonally and may be recorded at significantly shallower depths after periods of extended rainfall, and dry periods can result in deeper groundwater (around 10m to 11m below ground level during 2023 monitoring).

7.4 A geotechnical ground model has been developed and engineering parameter values selected, based on the ground conditions discussed in **Section 6**. This model provides the basis for geotechnical analysis informing this report.

7.5 For the purpose of the following appraisal the following 'worst case' model has been adopted:

- Made Ground , maximum 2.3m depth;
- Firm clay (Hummocky Glacial Deposits), maximum base at 3.0m depth; over
- Medium dense to dense sands (Hummocky Glacial Deposits) to depths greater than 15m.

7.6 Due to the limited strength and potential compressibility of the Made Ground and Hummocky Glacial clays, it is recommended that load-bearing structures are founded in the underlying Hummocky Glacial sands, up to 3m below current ground level.

## Foundation Solutions

<u>Simple Foundations Strip or Pads</u>

7.7 Anticipated loadings for the development of this nature are up to 150kPa on foundations and 50kPa on floor slabs.

7.8 Shallow strip or pad foundations within the upper 3m are not likely be suitable for this development without ground improvement, given the potential for Made Ground up to 2.3m deep, and the potential compressibility of the underlying Hummocky Glacial Clays.

7.9 Shallow bearing capacity calculations based on in situ hand shear vanes, laboratory triaxial testing and an empirical correlation between SPT $N_{60}$ values and undrained shear strength (Stroud 1976, reference in CIRIA143), were undertaken assuming pad/strip foundations were founded within the Hummocky Glacial Clays. Results suggest a safe bearing capacity of around 100kPa, but with potential for settlements in excess of the typical 25mm limit for common structures. Shallow spread foundations transferring loads onto the (untreated) underlying Hummocky Glacial Clays are therefore unlikely to be suitable for the building, as there would be a risk of excessive and unpredictable total and differential settlements.

7.10 Bearing capacity and settlement in the sands is unlikely to be a limiting factor, subject to site-specific assessment when proposed loads are available. Pad or strip foundations could be founded in the underlying Hummocky Glacial Sands, typically present below 3m depth, if trench fill or replacement of the overlying Made Ground and natural clays is preferred, but it may be that ground improvement is a more practical and viable option.

### Ground Improvement Techniques

7.11 Potential ground improvement techniques at this site include vibro-stone columns (VSC) and rigid inclusions (unreinforced concrete columns). Techniques such as vibrating dynamic compaction or falling dynamic compaction are likely to be unsuitable, as the shallow materials to be treated are clays, and therefore low in permeability.

7.12 Vibro-stone columns (VSC) could be adopted to support shallow (pad) spread foundations and a ground bearing ground floor slab. Alternatively, the option of ground improvement techniques comprising the installation of rigid inclusions (RIs), with a load transfer platform is also considered feasible, although likely to be more costly.

7.13 Assuming vibro stone columns or rigid inclusions are adopted, settlement under the slab and foundations is expected to be limited to 25mm under typically expected loads. This will need to be subject to detailed assessment by the foundation and ground improvement designers when loads are confirmed.

7.14 Designs may need to allow for mitigation of differential settlement between the main structure and external areas; this may need to include for articulation of threshold elements/structures and or dock levellers.

7.15 A specialist ground improvement contractor should be consulted in order to confirm the viability of ground improvement and to advise which technique would be best/most cost effective for this site.

### Ground Floor Slabs

7.16 Loading requirements of the ground floor slab are expected to be lower than beneath pad or strip foundations, approximately 50kPa. Nevertheless, in order to mitigate risks of excessive total/differential settlement, in situ ground improvement as described above, should also be undertaken beneath the ground floor slab.

### Piled Foundations

7.17 A piled foundation solution could be adopted for the support of the proposed building but this is likely not a cost-effective solution. A specialist piling contractor should be consulted to further assess the most economical and suitable piling solution if this option is preferred.

### Roads and Pavements

7.18 Plasticity Index testing undertaken on near-surface cohesive soil samples (upper 1-2m below ground level) are in the range of 16% to 27% (mean value 19%). CBR values of about 3% are indicated based on these PI values with reference to Table C1 of TRRL 1132 (Structural Design of Bituminous Roads) according to guidance in National Highways document CD225, Design for New Pavement Foundations). However, the variability in composition and thickness of Made Ground means this is not necessarily a reliable indication of the surface conditions across the whole site.

7.19 Minimum design CBR values for pavement foundations is typically 3% and if pavements are required on the natural soils at the site, local modification of these formation soils (e.g. by lime or cement) will likely be required to achieve the minimum design CBR value. An improved CBR of minimum 5% would likely be possible in modified formation soils.

7.20 The design of chemical modification to provide a suitable thickness of subgrade should take account the potentially high organic matter content and high-water contents in the underlying soils. Ground improvement techniques and thickness of improved in situ ground should be designed to limit settlement under pavements to 25mm after the accommodation of the sub-base, base and surface courses. This should be subject to detailed design.

7.21 It is recommended that in situ CBR tests at formation level should be carried out during earthworks to confirm the strength of sub grade and finalise the required pavement construction thickness.

### Drainage

7.22 No soakaway drainage tests have been undertaken at the site. Additional soil infiltration tests would be required to inform whether traditional soakaways would be suitable, if required. However, based on the ground conditions encountered together with the variable and shallow groundwater issues in the area, soakaway drainage is not likely to be a viable solution.

### Ease of Excavation

7.23 Conventional plant equipment is expected to be suitable for excavations at the site.

7.24 Surface conditions are likely to vary seasonally and with rainfall; it is likely that tracked equipment and management of surface water is key to successful earthworks at this site.

### Stability of Excavation

7.25 Excavations displayed generally poor stability across the site, with all trial pits terminating due to instability. In addition to this, following periods of wet weather, groundwater levels and running sands could present an issue within excavations and the use of temporary shoring may need to be considered. The potential for stability issues will be reduced if works are undertaken in the drier summer months, but the sandy soils will likely need temporary stabilisation regardless.

7.26 Excavations may become unstable if left open for any significant periods. Where personnel entry is required for inspection; excavations should be sufficiently enlarged, and an assessment of safe temporary angles should be made. Alternatively, temporary shoring should be provided.

### Legislation on Personnel Entry to Excavations

7.27 It is recommended that no excavations should be entered without appropriate support and a full risk assessment should be completed prior to entry. Mitigation measures to protect from accumulating ground gases should be implemented.

### Groundwater

7.28 Groundwater is likely to vary greatly seasonally at the site. The ground investigation, undertaken in early July (after a particularly dry late spring/summer) will have likely captured a lowered groundwater situation at the site, with various areas of the site displaying evidence of historical waterlogging (e.g. reeds).

7.29 If, as anticipated, groundwater levels rise following extended periods of wet weather, groundwater control may be required during construction ground works, and standard pumping equipment is likely to be suitable. The local water authority should be consulted to assess whether a temporary drainage consent is required, for discharging to the local drainage network.

### Chemical Attack on Buried Concrete

7.30 At the site, water soluble sulphate concentrations in soils ranged from 0.0017 g/l to 0.017 g/l with soil pH values ranging from 7.3 to 8.6. Total sulphur concentrations ranged from <0.005% to 0.087%. One result from the 2022 investigation recorded a value of 0.149%.

7.31 In accordance with the recommendations of BRE Special Digest 1, 'Concrete in Aggressive Ground' 2005, the conditions of soils at the site would therefore be classed

as Design Sulphate Class DS-1 and ACEC Class AC-1 for soils, when considering the most appropriate type of concrete to be used at the site in order to resist chemical attack from sulphate. One classification of DS2 in the 2022 investigation is not representative of the whole site and therefore can be dismissed.

### Earthworks

7.32 Small scale earthworks will be required to create a suitable, level development platform across the plot. Based on the results obtained, near-surface soil materials are likely to conform to Highway Works Class 2C general fill.

7.33 Based on experience of earthworks on other plots at this site, and compaction tests reported above, site won materials are likely to be wet of optimum moisture content.

7.34 The results of the compaction testing (from the 2023 investigation) indicate Optimum Moisture Contents generally in the range of 12 – 13% (4.5kg rammer) and 11 – 16% (2.5 kg/rammer) with one exception of 28% (2.5kg rammer) that appears to be an outlier (the sample in question from TP03 at 0.5m depth was of Made Ground and included fragmented glass). This correlates with Maximum Dry Density values of 1.34 – 1.99 Mg/m3 (2.5 kg rammer) and 1.93 – 1.99 Mg/m3 (4.5 kg rammer). Natural moisture content values were found to range from 8% to 21%.

7.35 If, as anticipated/indicated, the near-surface soils likely to be re-used in earthworks are significantly wet of their Optimum Moisture Contents, soils will require drying out (probably via chemical modification) to achieve adequate compaction as engineered fill.

7.36 The suitability of earthworks materials has been assessed on the basis of the testing carried out as part of this investigation. The materials encountered on site may vary from those analysed; furthermore, inclement weather, winter working or seasonal variations in groundwater may result in materials being unsuitable for incorporation within the works without modification by lime, cement or other methods. In particular, cohesive soils are very susceptible to 'wet weather working' and BWB strongly recommends that consideration should be given to lime and/or cement stabilisation of these materials if the earthworks are undertaken during inclement weather or the winter period.

7.37 Stockpiled materials often deteriorate due to water infiltration, and they may become unsuitable for incorporation in the works; further testing and re-assessment should be made prior to the finalisation and implementation of the earthworks design.

# 8. GROUND GAS ASSESSMENT

## Introduction

8.1 Ground gas assessment has been undertaken to assess the risks associated with ground gases and volatile vapours to the proposed new building and occupants. The results obtained have been assessed in line with relevant guidance (notably CIRIA C665).

8.2 Based on the desk study and the ground investigation undertaken, the following potential sources of hazardous ground gas have been identified:

- Made Ground across the site; and
- Underlying locally organic soils in adjacent Plot P.

8.3 Based on the potential sources identified, CIRIA C665 guidance indicates that for a site with low/moderate gas generation potential and a low sensitivity development (the proposed commercial land use), a typical monitoring programme may comprise four visits over a period of 2-3 months.

8.4 BWB have undertaken three visits (to date) over a period of two months and therefore this assessment is considered to be preliminary in advance of the final monitoring round. An additional monitoring visit is yet to be undertaken. Relevant 2022 results have also been considered.

## Methodology

8.5 The assessment of potential ground gas generation is based on the observation of trends and changes in gas evolution by the direct measurement of ground gases from gas wells. The works included measurement of methane, carbon dioxide, oxygen, hydrogen sulphide, carbon monoxide, gas flows and barometric pressure. A PID survey was undertaken to measure volatile organic compounds within the borehole response zones.

## Results

8.6 The minimum and maximum steady state concentrations recorded for borehole flow, oxygen, carbon dioxide and methane are summarised below in **Table 8.1**. Monitoring in boreholes BH01 and BH02 from the 2022 ground investigation were undertaken between August and October 2022. Monitoring in boreholes from the recent 2023 investigation is ongoing. The full set of ground gas monitoring results are presented in **Appendix 4**.

**Table 8-1: Summary of Recorded Ground Gas Results**

| Borehole ID | Targeted Geology | Steady Flow (l/hr) | | Carbon Dioxide (%v/v) | | Methane (%v/v) | |
|---|---|---|---|---|---|---|---|
| | | min. | max. | min. | max. | min. | max. |
| BH01 (2022) | GF | <0.1 | <0.1 | <0.1 | 0.1 | <0.1 | <0.1 |
| BH02 (2022) | GF | <0.1 | <0.1 | <0.1 | 0.7 | <0.1 | <0.1 |

| Borehole ID | Targeted Geology | Steady Flow (l/hr) | | Carbon Dioxide (%v/v) | | Methane (%v/v) | |
|---|---|---|---|---|---|---|---|
| | | min. | max. | min. | max. | min. | max. |
| BH01 (2023) | GF | <0.1 | <0.1 | 4.9 | 5.3 | <0.1 | 1.8 |
| BH02 (2023) | GF | <0.1 | <0.1 | 0.9 | 1.4 | <0.1 | <0.1 |

8.7 The atmospheric pressures were recorded as follows (2023 Investigation):

- Round 1 – 1007mB during the site visit falling from 1012mB over the preceding 12 hours.
- Round 2 – 1001mB during the site visit falling from 1003mB over the preceding 12 hours.
- Round 3 - 1007mB during the site visit falling from 1019 over the preceding 12 hours.
- Round 4 - 1017mB during the site visit rising from 1021 over the preceding 12 hours.

8.8 The atmospheric pressures were recorded as follows (2022 Investigation):

- Round 1 – 1017mB during the site visit falling from 1019mB over the preceding 12 hours;
- Round 2 – 1015mB during the site visit falling from 1018mB over the preceding 12 hours;
- Round 3 - 991mB during the site visit falling from 1001 over the preceding 12 hours;
- Round 4 - 1015mB during the site visit falling from 1017 over the preceding 12 hours

8.9 On this basis, the monitoring events are considered unlikely to have captured the worst-case gassing scenario at the site as generally, ground gas emissions tend to increase when atmospheric pressure falls rapidly.

8.10 Hydrogen sulphide and carbon monoxide concentrations were generally not recorded above the limit of detection of the equipment during the monitoring visits in the 2023 investigation. This was similarly the case with the 2022 investigation with the exception of carbon monoxide in BH01 (Round 3) at 2.2ppm.

8.11 PID concentrations were recorded above <0.1ppm (the limit of detection of the equipment) with values ranging from 3.2-3.4pm during the 2023 investigation. No PID concentrations were recorded above <0.1ppm (the limit of detection) in the 2022 investigation.

## Risk Assessment

8.12 CIRIA Report 665 "Assessing Risks Posed by Hazardous Ground Gases to Buildings" presents current best practice on the assessment of ground gases for commercial and residential buildings (with the exception of low-rise traditional housing). The report presents a risk-based approach based on gas screening levels which depend on both the concentration and emission rate of gas from the ground. Gas screening levels are calculated as follows:

$$Gas\ screening\ value\ (l/hr)\ = \frac{gas\ concentration\ (\%)\ X\ measured\ borehole\ flow\ rate\ (l/h)}{100}$$

8.13 Gas screening values should be calculated on a borehole basis in the first instance. Consideration of worst case i.e., highest flow and highest concentrations should only be considered if the CSM warrants it.

8.14 Maximum gas screening levels of 0.005 were recorded giving a classification of 1. Gas protection measures would not be required. Carbon dioxide concentrations above 5% have been recorded in BH01 2023 on two occasions (Round 1 5.3% and Round 2 5.1%) and so consideration should be given to raising the gas classification to 2 (BS8485:2015 (+A1 2019)).

8.15 Total Organic Carbon (TOC) content of the Made Ground was recorded at 1.9% (BH01 0.2m-0.3m), 2.3% (TP101 0.3m) and at 2.6% in organic rich Glaciofluvial Deposits (BH02 2.3-2.4m).

8.16 CL:AIRE RB17 (November 2012) and Table D.1 included within BS8485:2015 (+A1 2019) recommends a Characteristic Situation 2, for TOC (%) between ≤1.0 and ≤1.5% and Characteristic Situation 3, for TOC (%) between ≤1.5 and ≤4.0% recorded in Made Ground with thicknesses of less than 3.0m that has been in place for less than 20 years.

### Recommendations

8.17 Given the recorded $CO_2$ concentration and TOC of Made Ground and natural soils, gas protection measures should be installed in accordance with BS848: 2015. Based on a Type D development and CS2 classification a gas protection score of 1.5 will need to be achieved. Type C uses within the larger building (offices etc) would require a gas protection score of 2.5 to be achieved. **Table 8.2** provides suggested combinations of floor slab, ventilation and membrane that can achieve a suitable level of protection.

**Table 8-2: Gas Protection Matrix**

| Building Type | Points score Required | Structural Slab | Ventilation | Membrane |
|---|---|---|---|---|
| C | 2.5 | 1.0-1.5 | 1.5-2.5 | 2 |
| D | 1.5 | 1.0-1.5 | 1.5-2.5 | 2 |

# 9. CONTAMINANT DISTRIBUTION

## Soils

9.1 Contamination data have been compared to generic site assessment criteria (GSAC) for a commercial end use. The soil chemical laboratory results are presented as **Appendix 5** and details of the derivation of the GSACs are presented in **Appendix 8**. The criteria include reference to the LQM/CIEH S4ULs for Human Health Risk Assessment Copyright Land Quality Management Limited reproduced with permission; publication number S4UL3271.

9.2 A summary of the soil chemical laboratory results across both investigations is presented in **Table 9:1** below.

**Table 9-1: Summary of Soil Chemical Testing Results**

| Contaminant | No of Samples | Range of Concentrations | Generic Screening level (mg/kg) | No of Exceedances |
|---|---|---|---|---|
| Asbestos | 7 | - | - | 2 |

9.3 Asbestos fibres were recorded in two samples from exploratory holes. These are from TP01(2023) (0.10-0.20m – Chrysolite and Crocidolite - Loose Fibres and Loose Fibrous Debris), and TP03 (2023) (0.10-0.20m- Chrysolite and Crocidolite - Loose Fibrous Debris).

9.4 Quantification results for TP01 (2023) was recorded as <0.001% and for TP03 (2023) as 0.359%.

9.5 No visual or olfactory observations of contamination were noted during the ground investigation.

9.6 Testing undertaken in the relevant Plot P 2022 investigation exploratory holes recorded no exceedances.

9.7 To delineate the extent of the asbestos recorded within the main 2023 investigation, another sampling visit was undertaken on 31/08/23. Ten samples were recovered from the surrounding area of both positive identifications. No positive identification of asbestos fibres were recorded.

## Surface Water

9.8 No surface water samples were recovered or tested as part of either investigation.

# 10. HUMAN HEALTH RISK ASSESSMENT

10.1 Soil contaminant data have been compared against Generic Site Assessment Criteria (GSAC) developed by BWB using the CLEA model 1.06 and the updated CLEA framework (2009) for assessing risk from soil contamination to human health. The results of the soil chemical laboratory analysis are provided within **Appendix 5**. Details of the derivation of the GSACs and a table summarising the results presented are presented in **Appendix 8**.

10.2 The GSACs have been developed with the following assumptions which have been changed from the CLEA default parameter set. Soil type is a sandy loam with an organic matter content of 1% for the natural strata and 2.5% for the Made Ground. This is considered to be more representative of natural strata and shallow Made Ground found on site than the CLEA default of 6% organic matter (excluding areas of Peat and visible high organic matter). The building type for a commercial development is assumed to be a post 1970s office which is representative of new commercial buildings.

## Pathways

10.3 Contamination data have been compared to generic site assessment criteria (GSAC) for a 'commercial' end use (i.e. using all pathways for that end use) based on an organic matter content of 1% and 2.5%. Details of the derivation of the GSACs are presented in **Appendix 8**. It is noted that 'commercial' assessment criteria also cover the Business and Service proposed end use of the development in question.

10.4 The site is to be developed for commercial end use and therefore the key receptor is considered to be an adult female worker and GSACs for a commercial industrial end use have been adopted.

10.5 Exposure pathways considered in this assessment are presented in **Table 10.1**.

**Table 10-1: Commercial Exposure Pathways**

| Source | Shallow Soils | | Deep Soils |
|---|---|---|---|
| Pathway | Commercial / Industrial with managed landscaped areas | Commercial / Industrial with Hard standing areas | Commercial / Industrial |
| Ingestion of Soil | ✓ | × | × |
| Ingestion of site derived household dust | ✓ | × | × |
| Ingestion of contaminated vegetables | × | × | × |
| Ingestion of soil attached to vegetables | × | × | × |
| Dermal contact with Soil | ✓ | × | × |
| Dermal contact with site derived household dust | ✓ | × | × |
| Inhalation of fugitive soil dust | ✓ | × | × |
| Inhalation of fugitive site derived household dust | ✓ | × | × |

| Source | Shallow Soils | | Deep Soils |
|---|---|---|---|
| Inhalation of vapours outside | ✓ | ✓ | ✓ |
| Inhalation of vapours inside | ✓ | ✓ | ✓ |

10.6 CLAIRE report "Guidance on Comparing Soil Contamination Data with a Critical Concentration" sets out a structured approach for the statistical assessment of contaminant data with respect to risks to human health. A flow chart showing the approach is presented as **Appendix 8.** The CLEA assessment is made in four stages:

- Stage 1 – The site is split into what are known as Averaging Areas, these are those sections of the site as determined by the assessor as being of a similar nature, this can be defined by strata, contaminant impact, location, development zones, etc.
- Stage 2 – The dataset is reviewed using graphical, visual and statistical tools whereby all the samples (per contaminant) are combined to establish whether or not the highest values recorded are representative or not of the Averaging Area as a whole. This is known as the Outlier Test. A sample that is considered as representative of the whole is referred to as an '*inlier*' and one which is considered unrepresentative as an '*outlier*'.
- Stage 3 – The samples are assessed using graphical, visual and statistical tools to determine whether the dataset is normally distributed. A statistical calculation is then used to determine the upper confidence level (UCL) of the mean to determine whether or not the Averaging Area, as a whole meets the critical concentration. The UCL value is considered against the appropriate generic or site-specific screening value as to whether or not a risk exists.
- Stage 4 – The outliers in Stage 2 are compared directly against the critical concentration. Thus, indicating whether those removed samples represent an Anomalous Zone (or hotspot).

### Sources

10.7 Asbestos fibres recorded in the Made Ground of TP01and TP03 are considered isolated areas of contamination.

10.8 No further significant sources of soil contamination have been identified on site.

# 11. CONTROLLED WATERS RISK ASSESSMENT

11.1 Soil leachability has been undertaken for a number of metals on samples from the Made Ground. The soil leachability results are presented within **Appendix 5**.

- The controlled waters assessment considers the potential impact of on-site contamination to pertinent controlled waters receptors identified at the site including:
- Secondary A Aquifer beneath the site within the Hummocky Glacial superficial deposits;
- Secondary A Aquifer in the surrounding area within the Pennine Lower Coal Measures bedrock;
- Surface water (Rochdale Canal, Stanney Brook).

## Pathways

11.2 Controlled water risk assessment has been undertaken through assessment of leachable concentrations of contaminants in soil referring to exposure pathways considered and referencing **Table 16**.

**Table 11-1: Controlled Water Exposure Pathways**

| Controlled Waters Exposure Pathway | Receptor |
|---|---|
| Leaching of soil contamination into recharge infiltration | ✓ |
| Vertical migration of impacted pore water through unsaturated zone into underlying aquifer | ✓ |
| Horizontal migration of groundwater through aquifer to offsite receptors | ✓ |

## Soil Leachability

11.3 All soil leachate testing undertaken was in the Plot P 2022 investigation.

11.4 The soil leachate concentrations have been compared to the UK Drinking Water Standards (UK DWS) to assess the risk to the underlying aquifers. None of the samples screened exceeded the UK DWS.

11.5 In addition, the leachate results were also screened against the Environmental Quality Standards (EQS) for freshwater to assess the risk to surface waters. A summary of the results is presented in **Table 11:2** below.

**Table 11-2: Summary of Leachate Exceedances – EQS**

| Leachable Contaminant | Exceedance Concentration Range (µg/l) | Location (& Depth (m bgl)) | EQS (µg/l) |
|---|---|---|---|
| Copper | 6.3-16 | TP104 0.3m, TP101 0.3m | 1 |
| Lead | 3.0-5.2 | TP104 0.3m, TP101 0.3m | 1.2 |
| Nickel | 7.3 | TP101 0.3m | 4 |
| Zinc | 17 | TP101 0.3m | 10.9 |

11.6 BWB consider these exceedances to not be significant given they are within an order of magnitude of the screening criteria and the considering the distances from the site to sensitive surface water receptors. Leachate summary worksheets are presented as **Appendix 9**.

## Groundwater Assessment

11.7 The following groundwater testing undertaken was undertaken during the Plot P 2022 investigation. The groundwater results have been compared to the EQS freshwater criteria to assess the risk to surface water features and UK DWS for the underlying aquifers. The exceedances following a direct comparison to the screening criteria are detailed in **Table 11.3** and **Table 11.4**. Groundwater summary worksheets are presented as **Appendix 10.**

11.8 No groundwater testing was undertaken in the 2023 Investigation with insufficient groundwater to obtain a representative sample.

**Table 11-3: Summary of Water Sample Exceedances - EQS**

| Contaminant | Exceedance Concentration Range (µg/l) | Location | EQS (µg/l) |
|---|---|---|---|
| Cadmium | 0.23 | BH02 | 0.08 |
| Copper | 1.7 | BH02 | 1 |
| Nickel | 4.4 | BH02 | 4 |
| Zinc | 42 | BH02 | 10.9 |
| Ammonia | 0.07 | BH02 | 0.015 |

**Table 11-4: Summary of Water Sample Exceedances - DWS**

| Contaminant | Exceedance Concentration Range (µg/l) | Location | DWS (µg/l) |
|---|---|---|---|
| Ammonia | 0.07 | BH02 | 0.015 |

## Risk Assessment

11.9 Total TPH and PAH were not recorded above the laboratories lowest level of detection, in all (soil, leachate and groundwater) samples tested.

11.10 Low concentrations of metals and inorganics have been recorded in the groundwater and leachate samples, with a symmetry between the two sets of results. BWB consider it possible that the shallow soils on site could be impacting upon the site groundwater quality. However, the levels of exceedances are not considered significant to the recorded concentrations of contaminants in samples.

11.11 As the proposed development on the site will comprise extensive areas of hardstanding and buildings which will limit further infiltration and leaching, BWB do not consider that the closest nearby controlled water (Stanley Brook 150m to the south) will be exposed to an unacceptable risk as a result of the proposed development.

# 12. ENVIRONMENTAL RISK ASSESSMENT

## Introduction

12.1 An updated assessment of pollutant linkages has been undertaken following completion of a ground investigation at the Site. The preliminary risk assessment presented in **Section 4** has been updated in light of the findings of the ground investigation and the revised conceptual site model developed, as presented in **Table 12:1**.

## Sources

- Asbestos fibres recorded in the Made Ground of TP01and TP03 are considered isolated areas of contamination.
- Total Organic Carbon (TOC) content of the Made Ground and Glaciofluvial Deposits (2023 investigation) was recorded between 1.9% and 2.6% respectively;
- Marginally elevated leachable heavy metals have been recorded in the shallow Made Ground above EQS assessment criteria.

## Pathways

- Inhalation of fibres and particle dust;
- Dermal contact;
- Vertical migration of contaminants in the soil leachate;
- Lateral migration of contaminants within the groundwater; and
- Accumulation of gas leading to explosion and asphyxiation within the new developments.

## Receptors

- Future site users;
- Construction and groundworkers;
- Underlying Secondary Undifferentiated Aquifer & Secondary A Aquifers;
- Stanley Brook 150m to the south and west of the site.

**Table 12-1: Preliminary Conceptual Site Model**

| Source | Pathway | Receptor | Con | Prob | Risk | Potential Mitigation/Investigation Requirements |
|---|---|---|---|---|---|---|
| **MADE GROUND**<br>Contamination associated with **AGRICULTURAL** activities<br>Gas accumulation in **Made Ground** and **organic soils**<br>**Asbestos** within TP01 and TP03 | Direct contact, incidental ingestion and inhalation of particulates. | Construction/services personnel | Md | Lw | M/L | As part of the Proposed Development, it is anticipated that hardstanding will be created across large areas of the site. This will limit the potential for direct contact with and minimise dust generation from potentially contaminated soils at the site post construction. A clean soil cover system will be required in areas of landscaping.<br>The exposure to construction workers/services personnel can be mitigated by utilising appropriate PPE and maintaining good hygiene levels. |
| | | Future site users (commercial) | Md | Lw | M/L | |
| | Migration and accumulation of ground gases in enclosed spaces leading to asphyxiation (carbon dioxide) or explosion (methane). | Future site users (commercial)<br>Construction and groundworkers | Sv | Lw | M | Made Ground is present across most of the site.<br>Elevated $CO_2$ concentrations and high TOC indicates a potential risk from ground gases.<br>Given the elevated TOC of organic soils on site and the organic nature of soil adjacent to the east, it is considered appropriate to adopt a CS2 classification for the development area.<br>Migration of hazardous ground is not considered to be occurring given the low concentrations being recorded on site. Installing protection measures as described above is considered sufficient to protection end site users from any previously unidentified hazardous gas migration. |
| | Leaching and permeation through soil profile. | Groundwater: Underlying Secondary Superficial & Bedrock Aquifers | Md | Ul | L | The leachate and groundwater concentrations are considered low. Given that the site is principally underlain by low permeability soils, it is considered unlikely that the low leachate and groundwater concentrations would migrate towards the aquifer or nearby surface water bodies at elevated concentrations. The development will be predominantly covered by buildings and hard standing surface cover, therefore limiting any potential for mobilisation of contaminants within the Made Ground. Therefore, BWB considers that leachable contaminants and contaminants within groundwater do not represent a plausible risk to controlled waters.<br>The recommendations of DEFRA and EA guidance document '*Pollution prevention for businesses*' should be considered during construction. |
| | Vertical and lateral migration of contaminants in groundwater. | | Md | Ul | L | |
| | Surface run-off. | Stanney Brook<br>Rochdale Canal | Md | Ul | L | |
| | Vertical and lateral migration of contaminants in groundwater. | | Md | Ul | L | |

VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low

KEY: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor, Hi = High, Li = Likely, Lw = Low Likelihood, Ul = Unlikely

| Source | Pathway | Receptor | Con | Prob | Risk | Potential Mitigation/Investigation Requirements |
|---|---|---|---|---|---|---|

**Pollutant Linkage Assessment Summary**

When considered in the context of the conceptual site model and the historical activities that have taken place, the proposed development is considered to pose a **MODERATE** risk to human health. It is considered that the main driver for the risk rating for human health is Migration and accumulation of ground gases related to potential Made Ground and organic rich soils on the site.

The risk posed to controlled waters is predominantly considered to be **LOW** due to the limited contaminative sources identified on site.

# 13. ENVIRONMENT LIABILITY ASSESSMENT AND DEVELOPMENT IMPLICATIONS

## Statutory Liability

13.1 Based on the information available regarding the site, the potential for Statutory Authority action based on "*pollution of controlled water*" or "*significant harm*" as defined by Part IIA of the Environmental Protection Act 1990 is considered to be **LOW** based on to lack of significant contaminant sources on site.

## Third Party Liability

13.2 Based on the information contained in this report, it is the opinion of BWB that the potential for legal action by surrounding landowners, based on the potential for contamination to migrate off-site, is considered to be **LOW** when considering the nature of the surrounding land use.

## Public Relations

13.3 The likelihood of public relations being tarnished due to contamination issues at the site is considered to be **LOW.**

## Development Implications

13.4 Further consideration of drainage design would be required as soakaway testing was not completed as part of this assessment. However, in consideration of site ground and groundwater conditions, soakaways are unlikely to be viable for the development.

# 14. WASTE MANAGEMENT

## Waste Classification

14.1 Soil samples have been characterised against hazardous waste criteria using Hazwasteonline for both investigations. The results of the waste classification are presented in **Appendix 11**. The assessment indicates that most of the soils analysed are likely to be classified as non-hazardous. The waste classification assessment only applies to those soils that have been tested. If other soils are to be disposed of off-site then further analysis may be required.

14.2 Asbestos fibres were recorded in two locations (TP01and TP03). Quantification results recorded <0.001% and 0.359% respectively. Concentrations of asbestos within the soils in TP03 would be classified as hazardous waste.

14.3 To delineate the extent of the asbestos recorded within the main investigation, another sampling visit was undertaken on 30/08/23. Ten samples were recovered from the surrounding area of both positive identifications and no further instances of asbestos fibres were recorded.

14.4 The presence of any visible asbestos containing materials in waste or at concentrations exceeding 0.1% by weight will classify the waste as mixed and require disposal as hazardous waste irrespective of the chemical properties of the waste.

14.5 Should any soils require disposal off site an assessment of waste classification of the soils for disposal should be made by a competent person. Further chemical analysis may be required to fully characterise waste soils for disposal to landfill or re-use off site. WAC analysis may be required for disposal of soils as inert or hazardous.

## Waste Acceptance Criteria

14.6 WAC testing was not completed. Should disposal of soils off-site be required, further classification and WAC testing of waste soils should be undertaken in discussion with the proposed landfill destination.

# 15. CONCLUSIONS AND RECOMMENDATIONS

## Conclusions

15.1 The proposed development for Plot R2 AVIC is indicated to be a research & development building (Use Class E) including office, laboratory & production space, function space & café, new access, car parking, servicing, boundary treatments, hard and soft landscaping and other associated works. This is likely to be a steel portal framed structure.

15.2 The generalised ground conditions across the development plot consist of Topsoil/ Made Ground overlying Hummocky Glacial Deposits comprising upper clays over sands which become denser with depth. Generally, Made Ground was present close to Michael Faraday Avenue, and in other localised zones at the site.

## Environmental

15.3 No exceedances were recorded when screened against the respective LQM/CIEH S4UL, for a commercial end use, screening criteria for risks to human health. Asbestos was recorded in two of the six Made Ground samples tested. To further delineate the extent of the asbestos recorded, another sampling visit was undertaken. Ten samples were recovered from the shallow Made Ground across the site and surrounding the area of both positive identifications and further instances of asbestos fibres were recorded. It is considerate that the asbestos fibres identified in the Made Ground in TP01 and TP03 are isolated areas of contamination.

15.4 Low concentrations of metals and inorganics have been recorded in leachate and samples of the groundwater above UK DWS and EQS screening criteria in the 2022 investigation. BWB consider it possible that the shallow soils on site could be impacting upon the groundwater quality. However, the levels of exceedances are not considered significant to the recorded levels of contaminants in samples. No groundwater testing was undertaken during the 2023 investigation as there was insufficient groundwater available to sample.

15.5 As the proposed development on the site will comprise large areas with hardstanding and buildings which will limit further infiltration and leaching, BWB does not consider that controlled waters will be exposed to an unacceptable risk as a result of the proposed development.

## Geotechnical

15.6 Shallow spread foundations transferring loads onto the (untreated) underlying Hummocky Glacial Deposits are unlikely to be suitable for the building, as there would be a risk of excessive and unpredictable total and differential settlements.

15.7 Ground improvement will be required. Vibro-stone columns (VSC) to support shallow (pad) spread foundations and a ground bearing floor slab would be feasible. Alternatively, ground improvement comprising installation of rigid inclusions (RIs), with a load transfer platform is considered feasible but likely less cost-effective, as are piled foundations.

15.8 Grading and Atterberg Limit tests for the near-surface Hummocky Glacial Deposits indicated that excavated site-won materials would generally classify as either Class 1A/1B and Class 2A/2B or 2C in accordance with 'Table 6/2 of the SHW, Series 600'. Compaction testing indicates soils are generally wet of optimum at natural moisture contents and would require dewatering (via chemical modification) for adequate compaction as engineered fill.

15.9 The design sulphate and ACEC class for below ground concrete at the site is DS-1 and AC-1.

15.10 Laboratory testing indicates a range of CBR values for the design of new pavements (2022 investigation), with most results giving values of less than 3.0% and often less than 1%. Minimum design CBR values for pavement foundations is typically 3%; for pavements on the natural soils at the site, modification of the formation soils (e.g. by lime or cement) will be required to achieve the required design CBR value.

15.11 Based on the ground conditions encountered together with the variable and shallow groundwater issues in the area, soakaway drainage is unlikely to be a viable solution.

15.12 Groundwater is likely to vary greatly seasonally at the site. The ground investigation, undertaken in July (after a particularly dry spring/summer), will have likely captured a lowered groundwater situation at the site, with some areas of the site displaying evidence of historical waterlogging (reeds, peat build up).

15.13 If groundwater levels rise following extended periods of wet weather, groundwater pumping may be required during construction ground works.

**Recommendations**

Environmental

15.14 A Remediation Strategy should be completed for the site prior to development to provide remediation and mitigation requirements, identify those soils on site likely to require disposal, set remediation targets if required and provide verification requirements of any gas protection measures required.

## Geotechnical

15.15 Earthworks will need to be undertaken in accordance with a suitable specification document, which will need to be prepared to describe the materials and their requirements including placement and acceptability limits.

15.16 Ground improvement will need to be undertaken in accordance with a suitable specification.

15.17 Allowance should be made for temporary shoring of excavations due to likely stability issues associated with running sands.

15.18 Contingency for groundwater control should be considered especially if development is undertaken during the winter months.

# 16. REFERENCES

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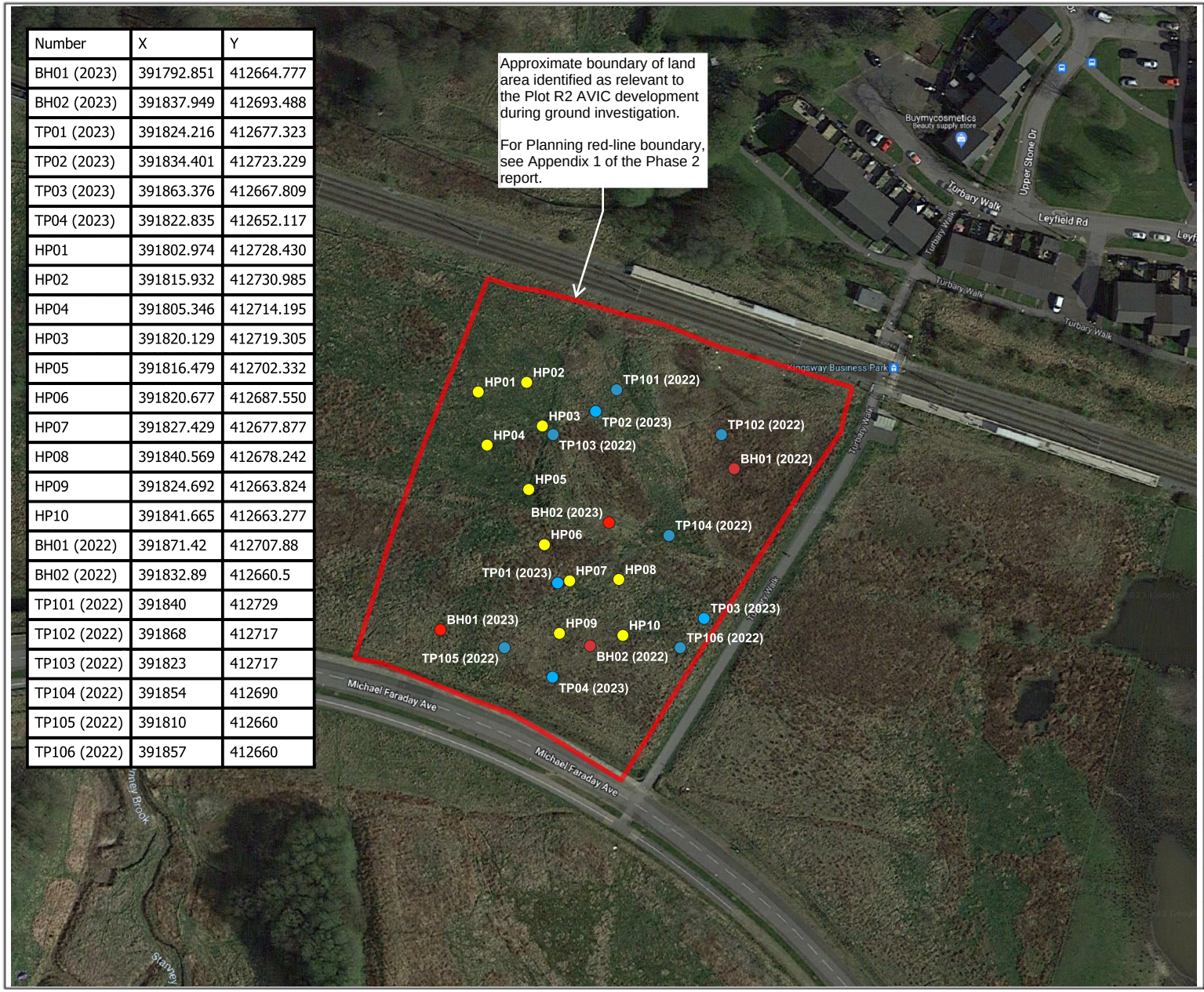
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# *DRAWINGS*

**Drawing 1: Site Layout**

| Number | X | Y |
|---|---|---|
| BH01 (2023) | 391792.851 | 412664.777 |
| BH02 (2023) | 391837.949 | 412693.488 |
| TP01 (2023) | 391824.216 | 412677.323 |
| TP02 (2023) | 391834.401 | 412723.229 |
| TP03 (2023) | 391863.376 | 412667.809 |
| TP04 (2023) | 391822.835 | 412652.117 |
| HP01 | 391802.974 | 412728.430 |
| HP02 | 391815.932 | 412730.985 |
| HP04 | 391805.346 | 412714.195 |
| HP03 | 391820.129 | 412719.305 |
| HP05 | 391816.479 | 412702.332 |
| HP06 | 391820.677 | 412687.550 |
| HP07 | 391827.429 | 412677.877 |
| HP08 | 391840.569 | 412678.242 |
| HP09 | 391824.692 | 412663.824 |
| HP10 | 391841.665 | 412663.277 |
| BH01 (2022) | 391871.42 | 412707.88 |
| BH02 (2022) | 391832.89 | 412660.5 |
| TP101 (2022) | 391840 | 412729 |
| TP102 (2022) | 391868 | 412717 |
| TP103 (2022) | 391823 | 412717 |
| TP104 (2022) | 391854 | 412690 |
| TP105 (2022) | 391810 | 412660 |
| TP106 (2022) | 391857 | 412660 |




## NOTES

1. DO NOT SCALE THIS DRAWING. ALL DIMENSIONS MUCT BE CHECKED/ VERIFIED ON SITE. IF IN DOUBT ASK.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALISTS DRAWINGS AND SPECIFICATIONS.
3. ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE. ALL LEVELS IN METERES UNLESS NOTED OTHERWISE.
4. ANY DISCREPANCIES NOTED ON SITE ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY.

## LEGEND

- Borehole (2023)
- Trial Pit (2023)
- Hand Pit (2023)
- Borehole (2022)
- Trial Pit (2022)

BWB
A CAF GROUP COMPANY


5th Floor, Waterfront House, Station Street,
Nottingham, NG2 3DQ
T 0115 924 1100 F 0115 950 3966 W bwbconsulting.com


Client:
Wilson Bowden Developments Ltd
& Rochdale Borough Council

Project Title:
Plot R2 AVIC, Kingsway Business Park, Rochdale

Drawing Title:
Site EHLP

| Scale: | Date: | Drawn: | Authorised: |
|---|---|---|---|
| Not to Scale | Aug-23 | PM | AFB |

Drawing Status:
FINAL

| Drawing No: | Revision: |
|---|---|
| 001 | R1 |

# *APPENDICES*

# Appendix 1: Masterplan

Note: This is a colour drawing, in order to ensure any subsequent reproduction is viewed correctly it is to be re-printed in full colour

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DO NOT SCALE, REFER TO FIGURED DIMENSIONS ONLY

REVISIONS

| | | |
|---|---|---|
| P01 | FIRST ISSUE | 15/04/24 PSL |
| P02 | Application boundary revised to accommodate off site earthworks. Updated in line with Client comments | 03/05/24 PSL |

LEYFIELD ROAD

Turbary Walk

Metrolink Tram Stop

AVIC Red Line Application Boundary = 1.50 hectares / 3.71 Acres

AVIC Building

Total GIA (2 Storey) 3,913 m2
Total NIA 2,709 m2

Parking Schedule

86 Total Car Parking Bays (1 per 32m2 NIA)
Includes :
- 7 Accessible bays (≈ 8%)
- 18 EVCP bays (≈ 20%)

Sheltered Cycle Parking = 10 Spaces (5 Sheffield type stands)

M/Cycle Parking = 4 Spaces

Soft landscape and tree arrangement shown indicatively
Refer to DLA drawing AVIC-DLA-XX-00-DR-A-99100 for details

Secure Fencing to yard
Gate
Asphalt Access Road
Covered Waste Area
Concrete Service Yard
Plant
Workshop Level Access
Gate
10 No EVCP
8 No EVCP
86 Parking Spaces
(including 7 Accessible Spaces and 18 EVCP Spaces)
AVIC Building FFL 148.50
Cycle Shelter
Main Entrance
7 Accessible Bays
Motor Cycles
Undeveloped Plot R1
New Retaining Structure to Sub Station
New Substation with Parking
Michael Faraday Avenue
New Fire Hydrant
New Vehicular Site Entrance
New pedestrian footpath
Existing Asphalt path to Metrolink Tram Stop cross hatched red to be closed and diverted
New Diverted Asphalt path to Metrolink Tram Stop shaded green
Undeveloped Plot P1
Island For Future Rising Arm Barrier Access Controls
New Pedestrian Crossing shaded yellow to LPA Highways approval
Existing Pedestrian Crossing shaded brown to be stopped and removed and foot / cycleway to be made good
Application Boundary to End of current public highway

0 5 10 20 50 m

NORTH

Wilson Bowden Developments

dla ARCHITECTURE
6 East Parade | Leeds | LS1 2AD
0113 887 3100
www.dla-architecture.co.uk

PROJECT
KINGSWAY BUSINESS PARK
PLOT R2

TITLE
**GA Site Plan**

SCALE 1 : 500 @ A1
DATE 12/04/24

DLA REF 2022-040
DRAWN PSL
REVIEWED BLG

DOCUMENT NUMBER
AVIC-DLA-XX-00-DR-A- **99003**

DOCUMENT PURPOSE PLANNING
REVISION **P02**

# Appendix 2: Exploratory Hole Logs

# BOREHOLE LOG

Scale 1:50 Sheet 1 of 2

| LOCATION ID | | | | |
|---|---|---|---|---|
| **BH01** | **Project Name:** Plot R Kingsway Business Park | | **Ground Level (m AOD):** | 147.94 |
| | **Project Number:** 232081 | | **Eastings:** | 391792.85 |
| | **Client:** Wilson Bowden Devleopments Ltd | | **Northings:** | 412664.78 |
| **Hole Type:** BH | **Rig:** Dando 2000 | **Start & End Date:** 03/07/2023 - 04/07/2023 | **Engineer:** PM | **Checker:** AB |

| Boring | | Strata | | | Samples | | | In-Situ Tests | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Strike | Well | Level (m AOD) & [Thickness (m)] | Description | Legend | Depth (m bgl) | Type (Ublows) | From (m) | To (m) | Type | Depth (m) | Result | Casing Depth & (Water Level) |
| | | [0.10] 147.84 [0.40] | Grass over dark brown slightly gravelly silty fine to medium SAND with occasional rootlets. Gravel is angular to subrounded medium to coarse siltstone, brick and glass. (Topsoil) | | 0.10 | B | 0.10 | 0.50 | | | | |
| | | | | | | ES1 | 0.20 | 0.30 | | | | |
| | | 147.44 [2.00] | Dark brown gravelly fine to medium SAND. Gravel is angular to subrounded fine to coarse concrete, brick, glass, mudstone and siltstone. (Made Ground) | | 0.50 | B | 0.50 | 1.00 | | | | |
| | | | | | | ES2 | 0.60 | 0.70 | | | | |
| | | | | | | D | 0.80 | | | | | |
| | | | | | | | | | SPT | 1.20 | N=10 (3,3/2,3,3,2) | 10.00m (NR) |
| | | | Firm brown and light grey mottled slightly gravelly slightly sandy silty CLAY. Gravel is angular to subrounded fine to medium coal and siltstone. (Hummocky Glacial Deposits) | | | | | | SPT | 2.00 | N=11 (1,1/2,2,3,4) | 10.00m (NR) |
| | | 145.44 [3.00] | Light brown gravelly fine to medium SAND. Gravel is subangular to subrounded fine to coarse siltstone, sandstone, quartz and coal. (Hummocky Glacial Deposits) | | 2.50 | B | 2.50 | 3.00 | | | | |
| | | | | | | | | | SPT | 3.00 | N=12 (3,3/2,3,4,3) | 10.00m (NR) |
| | | | | | | | | | SPT | 4.00 | N=12 (2,3/3,4,2,3) | 10.00m (NR) |
| | | | | | | | | | SPT | 5.00 | N=37 (4,4/7,5,9,16) | 10.00m (NR) |
| | | 142.44 [4.95] | Brown slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded siltstone and quartz. (Hummocky Glacial Deposits) | | 5.50 | B | 5.50 | 6.00 | | | | |
| | | | | | | D | 6.00 | | SPT | 6.00 | N=26 (4,4/5,6,7,8) | 10.00m (NR) |
| | | | | | | | | | SPT | 7.50 | N=17 (4,4/4,4,4,5) | 10.00m (NR) |
| | | | *8.00-10.45: Becomes gravelly* | | | | | | | | | |
| | | | | | | B | 9.00 | 9.50 | SPT | 9.00 | N=20 (4,5/5,5,5,5) | 10.00m (NR) |

| Chiseling | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Time (hh:mm) |
| | | |

| Water Added | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Volume (l) |
| | | |

## Remarks

**Reason for Termination:**
Designation depth reached.

**Groundwater Remarks:**
No groundwater encountered.

**Other Remarks:**
Location cleared of buried services. Hand pit dug to 1.20m bgl.

# BOREHOLE LOG



| LOCATION ID | | | | | |
|---|---|---|---|---|---|
| **BH01** | **Project Name:** Plot R Kingsway Business Park | | | **Ground Level (m AOD):** | 147.94 |
| | **Project Number:** 232081 | | | **Eastings:** | 391792.85 |
| | **Client:** Wilson Bowden Devleopments Ltd | | | **Northings:** | 412664.78 |
| **Hole Type:** BH | **Rig:** Dando 2000 | **Start & End Date:** | 03/07/2023 - 04/07/2023 | **Engineer:** PM | **Checker:** AB |

| Boring | | Strata | | | | Samples | | | In-Situ Tests | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strike | Well | Level (m AOD) & [Thickness (m)] | Description | Legend | Depth (m bgl) | Type (Ublows) | From (m) | To (m) | Type | Depth (m) | Result | Casing Depth & (Water Level) |
| | | 137.49 | Brown slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded siltstone and quartz. (Hummocky Glacial Deposits) | | | | | | SPT | 10.00 | N=15 (4,4/4,4,4,3) | 10.00m (NR) |
| | | | Hole Terminated at 10.45m bgl. | | 10.45 | | | | | | | |

| Chiseling | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Time (hh:mm) |
| | | |

| Water Added | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Volume (l) |
| | | |

## Remarks

**Reason for Termination:**

Designation depth reached.

**Groundwater Remarks:**

No groundwater encountered.

**Other Remarks:**

Location cleared of buried services. Hand pit dug to 1.20m bgl.

# BOREHOLE LOG

Scale 1:50 Sheet 1 of 2

| LOCATION ID | | | | | |
|---|---|---|---|---|---|
| **BH02** | **Project Name:** Plot R Kingsway Business Park | | | **Ground Level (m AOD):** 150.39 | |
| | **Project Number:** 232081 | | | **Eastings:** 391837.95 | |
| | **Client:** Wilson Bowden Devleopments Ltd | | | **Northings:** 412693.49 | |
| **Hole Type:** BH | **Rig:** Dando 2000 | **Start & End Date:** 04/07/2023 - 05/07/2023 | | **Engineer:** PM | **Checker:** AB |

| Boring | | Strata | | | Samples | | | In-Situ Tests | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Strike | Well | Level (m AOD) & [Thickness (m)] | Description | Legend | Depth (m bgl) | Type (Ublows) | From (m) | To (m) | Type | Depth (m) | Result | Casing Depth & (Water Level) |
| | | [2.30] | Firm dark brown slightly gravelly slightly sandy silty CLAY. Gravel is angular to subrounded fine to coarse brick, concrete, siltstone, sandstone and metal. (Made Ground) | | | ES1 | 0.10 | 0.20 | | | | |
| | | | | | | | | | SPT | 1.00 | N=6 (1,1/1,1,2,2) | 10.00m (NR) |
| | | | | | | | | | SPT | 2.00 | N=4 (1,1/1,1,1,1) | 10.00m (NR) |
| | | 148.09 [0.20] | Soft dark grey silty CLAY with frequent rootlets (slight natural organic odour). (Hummocky Glacial Deposits) | | 2.30 | ES2 | 2.30 | 2.40 | | | | |
| | | 147.89 [0.50] | | | 2.50 | B | 2.50 | 2.60 | | | | |
| | | | | | | ES3 | 2.50 | 3.00 | | | | |
| | | 147.39 [2.10] | Firm locally stiff friable brown and light grey mottled slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to medium siltstone. (Hummocky Glacial Deposits) | | 3.00 | B | 3.00 | 3.50 | SPT | 3.00 | N=37 (4,7/8,9,10,10) | 10.00m (NR) |
| | | | Light brown gravelly fine to medium SAND. Gravel is subangular to subrounded fine to medium quartz, siltstone and coal. (Hummocky Glacial Deposits) | | | D | 3.50 | | | | | |
| | | | | | | | | | SPT | 4.00 | N=22 (3,3/4,5,6,7) | 10.00m (NR) |
| | | 145.29 [5.35] | Brown slightly gravelly fine to coarse SAND. Gravel is angular to subrounded quartz, siltstone and quartz. (Hummocky Glacial Deposits) | | 5.10 | | | | SPT | 5.00 | N=23 (3,5/5,5,6,7) | 10.00m (NR) |
| | | | | | | B | 5.50 | 6.00 | | | | |
| | | | | | | | | | SPT | 6.00 | N=26 (3,5/7,5,7,7) | 10.00m (NR) |
| | | | | | | D | 6.50 | | | | | |
| | | | *7.5 - 10.45: Becomes gravelly with frequent horizons of coal-rich gravel* | | | | | | SPT | 7.50 | N=32 (3,5/8,8,8,8) | 10.00m (NR) |
| | | | | | | B | 8.50 | 9.00 | | | | |
| | | | | | | D | 9.00 | | SPT | 9.00 | N=31 (5,5/5,8,8,10) | 10.00m (NR) |

| Chiseling | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Time (hh:mm) |
| | | |

| Water Added | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Volume (l) |
| | | |

## Remarks

**Reason for Termination:**

Designation depth reached.

**Groundwater Remarks:**

No groundwater encountered.

**Other Remarks:**

Location cleared of buried services. Hand pit dug to 1.20m bgl.

# BOREHOLE LOG

Scale 1:50 Sheet 2 of 2

| LOCATION ID | | | | | |
|---|---|---|---|---|---|
| **BH02** | **Project Name:** Plot R Kingsway Business Park | | | **Ground Level (m AOD):** | 150.39 |
| | **Project Number:** 232081 | | | **Eastings:** | 391837.95 |
| | **Client:** Wilson Bowden Devleopments Ltd | | | **Northings:** | 412693.49 |
| **Hole Type:** BH | **Rig:** Dando 2000 | **Start & End Date:** | 04/07/2023 - 05/07/2023 | **Engineer:** PM | **Checker:** AB |

| Boring | | Strata | | | | Samples | | | In-Situ Tests | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strike | Well | Level (m AOD) & (Thickness (m)) | Description | Legend | Depth (m bgl) | Type (Ublows) | From (m) | To (m) | Type | Depth (m) | Result | Casing Depth & (Water Level) |
| | | 139.94 | Brown slightly gravelly fine to coarse SAND. Gravel is angular to subrounded quartz, siltstone and quartz. (Hummocky Glacial Deposits) | | | | | | SPT | 10.00 | N=35 (4,8/7,7,9,12) | 10.00m (NR) |
| | | | Hole Terminated at 10.45m bgl. | | 10.45 | | | | | | | |

| Chiseling | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Time (hh:mm) |
| | | |

| Water Added | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Volume (l) |
| | | |

## Remarks

**Reason for Termination:**

Designation depth reached.

**Groundwater Remarks:**

No groundwater encountered.

**Other Remarks:**

Location cleared of buried services. Hand pit dug to 1.20m bgl.

# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot R Kingsway Business Park | | 1.80 |
| **TP01** | **Project Number:** 232081 | | 0.80 Pit Dimensions (m) Degrees |
| | **Client:** Wilson Bowden Devleopments Ltd | | |
| | **Plant:** 8 Tonne Excavator | **Start & End Date:** 03/07/2023 | Stability: Unstable |
| **Ground Level (m AOD):** 148.47 | **Eastings & Northings:** 391824E 412677N | | Engineer: PM / Checker: AB |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | | Grass over dark brown gravelly fine to medium SAND with occasional concrete cobble content. Gravel is angular to subrounded fine to coarse brick, siltstone, glass and concrete. (Made Ground) | | | ES | 0.10 | 0.20 | | | |
| | | 1.00m | | | | | | | | | |
| | | 147.47 | | | 1.00 | ES | 1.00 | 1.10 | | | |
| | | 0.20m | Brown slightly gravelly fine to medium SAND. Gravel is subangular to subrounded fine to coarse siltstone. (Hummocky Glacial Deposits) | | | | | | | | |
| | | 147.27 | | | 1.20 | | | | | | |
| | | | Firm locally stiff friable brown and light grey mottled slightly gravelly slightly sandy silty CLAY. Gravel is angular to subrounded fine to coarse mudstone and coal. (Hummocky Glacial Deposits) | | | D | 1.50 | | | | |
| | | 1.30m | | | | | | | | | |
| | | 145.97 | | | 2.50 | | | | | | |
| | | | Light brown slightly gravelly fine to medium SAND. Gravel is angular fine coal. (Hummocky Glacial Deposits) | | | B | 3.00 | 3.50 | | | |
| | | 1.40m | | | | | | | | | |
| | | 144.57 | Hole Terminated at 3.90m bgl. | | 3.90 | | | | | | |

## Remarks

**Reason for Termination:**

Pit becoming unstable.

**Groundwater Notes:**

No groundwater encountered.

**Other Remarks:**

Location cleared of buried services. Backfilled with arisings.

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot R Kingsway Business Park | | 1.80 |
| **TP02** | **Project Number:** 232081 | | 0.80 Pit Dimensions (m) Degrees |
| | **Client:** Wilson Bowden Devleopments Ltd | | |
| | **Plant:** 8 Tonne Excavator | **Start & End Date:** 03/07/2023 | Stability: Stable |
| **Ground Level (m AOD):** 148.88 | **Eastings & Northings:** 391834E 412723N | | Engineer: PM Checker: AB |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.20m<br>148.68 | Grass over dark brown slightly gravelly silty fine to medium SAND with occasional rootlets. Gravel is angular to subrounded medium to coarse siltstone, brick and glass. | | | D<br>ES | 0.10<br>0.10 | 0.20 | | | |
| | | 0.40m<br>148.28 | (Topsoil) | | 0.20 | ES | 0.30 | 0.40 | | | |
| | | | Brown slightly gravelly fine to medium SAND. Gravel is subangular to subrounded medium to coarse siltstone. (Hummocky Glacial Deposits) | | 0.60 | B | 1.00 | 1.50 | | | |
| | | 1.30m | Firm locally stiff friable brown and light grey mottled slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse mudstone and coal. (Hummocky Glacial Deposits) | | | | | | | | |
| | | 146.98 | Light brown slightly gravelly fine to medium SAND. Gravel is angular fine coal. (Hummocky Glacial Deposits) | | 1.90 | | | | | | |
| | | 1.40m | | | | D | 3.00 | | | | |
| | | 145.58 | Hole Terminated at 3.30m bgl. | | 3.30 | | | | | | |

## Remarks

**Reason for Termination:**

Maximum depth reached.

**Groundwater Notes:**

No groundwater encountered.

**Other Remarks:**

Location cleared of buried services. Backfilled with arisings.

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot R Kingsway Business Park | | | 1.80 |
| **TP03** | **Project Number:** 232081 | | | 0.80 Pit Dimensions (m) Degrees |
| | **Client:** Wilson Bowden Devleopments Ltd | | | |
| | **Plant:** 8 Tonne Excavator | **Start & End Date:** 03/07/2023 | | Stability: Unstable |
| **Ground Level (m AOD):** 149.20 | | **Eastings & Northings:** 391863E 412668N | Engineer: PM | Checker: AB |

| Strata | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend / Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.90m | Grass over dark brown gravelly fine to medium SAND with occasional concrete cobble content. Gravel is angular to subrounded fine to coarse glass, siltstone, brick and concrete. (Made Ground) | | ES | 0.20 | 0.30 | | | |
| | | | | | B | 0.50 | 1.00 | | | |
| | | 148.30 | | 0.90 | | | | | | |
| | | 0.90m | Firm locally stiff friable brown and light grey mottled slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to coarse mudstone and coal. (Hummocky Glacial Deposits) | | ES | 1.00 | 1.10 | | | |
| | | 147.40 | | 1.80 | | | | | | |
| | | 1.40m | Light brown slightly gravelly fine to medium SAND. Gravel is angular to subrounded fine coal and siltstone. (Hummocky Glacial Deposits) | | B | 2.00 | 2.50 | | | |
| | | | | | D | 3.00 | | | | |
| | | 146.00 | Hole Terminated at 3.20m bgl. | 3.20 | | | | | | |

## Remarks

**Reason for Termination:**

Pit becoming unstable.

**Groundwater Notes:**

No groundwater encountered.

**Other Remarks:**

Location cleared of buried services. Backfilled with arisings.

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AGS REGISTERED USER 2023

# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot R Kingsway Business Park | | 1.80 |
| **TP04** | **Project Number:** 232081 | | 0.80 Pit Dimensions (m) Degrees |
| | **Client:** Wilson Bowden Devleopments Ltd | | |
| | **Plant:** 8 Tonne Excavator | **Start & End Date:** 03/07/2023 | Stability: Stable |
| **Ground Level (m AOD):** 148.64 | **Eastings & Northings:** 391823E 412652N | | Engineer: PM Checker: AB |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.55m<br>148.09 | Grass over dark brown slightly gravelly fine to medium SAND with occasional concrete cobble content and with occasional rootlets. Gravel is angular to subrounded fine to coarse siltstone, brick and glass. (Made Ground) | | 0.55 | ES | 0.10 | 0.20 | | | |
| | | 1.35m | Firm locally stiff friable brown and light grey mottled slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse mudstone and coal. (Hummocky Glacial Deposits) | | | ES<br>B<br>D | 0.60<br>0.70<br>1.00 | 0.70<br>1.10 | | | |
| | | 146.74<br>1.40m | Light brown slightly gravelly fine to medium SAND. Gravel is fine angular coal. (Hummocky Glacial Deposits) | | 1.90 | B<br>D | 2.00<br>2.50 | 2.40 | | | |
| | | 145.34 | Hole Terminated at 3.30m bgl. | | 3.30 | | | | | | |

## Remarks

**Reason for Termination:**

Maximum depth reached.

**Groundwater Notes:**

No groundwater encountered.

**Other Remarks:**

Location cleared of buried services. Backfilled with arisings.

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# BOREHOLE LOG

Scale 1:50 Sheet 1 of 2

| LOCATION ID | | | | |
|---|---|---|---|---|
| **BH01** | **Project Name:** Plot P, Kingsway Business Park | | **Ground Level (m AOD):** | 147.28 |
| | **Project Number:** 210939 | | **Eastings:** | 391871.42 |
| | **Client:** Wilson Bowden Developments Ltd | | **Northings:** | 412707.88 |
| **Hole Type:** CP | **Rig:** Dando 2000 | **Start & End Date:** 02/08/2022 | **Engineer:** TF | **Checker:** MH |

| Boring | | Strata | | | Samples | | | In-Situ Tests | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Strike | Well | Level (m AOD) & (Thickness (m)) | Description | Legend / Depth (m bgl) | Type (Ublows) | From (m) | To (m) | Type | Depth (m) | Result | Casing Depth & (Water Level) |
| | | [1.00] | Grass over dark brown slightly clayey fine SAND with high rootlet content. (Topsoil) | | B1 | 0.20 | 1.00 | | | | |
| | | 146.28 [0.80] | Loose brown very clayey SAND.() | 1.00 | B2 | 1.20 | 1.65 | SPT | 1.20 | N=8 (1,1/2,2,2,2) | |
| | | | | | D1 | 1.20 | | | | | |
| | | 145.48 [10.00] | Medium dense reddish brown clayey SAND.() | 1.80 | B3 | 2.00 | 2.45 | SPT | 2.00 | N=12 (1,2/3,3,3,3) | |
| | | | | | D2 | 2.00 | | | | | |
| | | | | | B4 | 3.00 | 3.45 | SPT | 3.00 | N=13 (2,2/3,3,3,4) | |
| | | | | | D3 | 3.00 | | | | | |
| | | | | | B5 | 4.00 | 4.45 | SPT | 4.00 | N=20 (4,4/4,5,5,6) | |
| | | | | | D4 | 4.00 | | | | | |
| | | | | | B6 | 5.00 | 5.45 | SPT | 5.00 | N=24 (4,5/6,6,6,6) | |
| | | | | | D5 | 5.00 | | | | | |
| | | | | | B7 | 6.00 | 6.45 | SPT | 6.00 | N=27 (4,5/6,7,7,7) | |
| | | | | | D6 | 6.00 | | | | | |
| | | | | | D7 | 7.00 | 7.00 | | | | |
| | | | | | B8 | 7.50 | 7.95 | SPT | 7.50 | N=14 (2,3/3,3,4,4) | |
| | | | | | D8 | 7.50 | | | | | |
| | | | | | B9 | 9.00 | 9.45 | SPT | 9.00 | N=15 (2,3/3,4,4,4) | |
| | | | | | D9 | 9.00 | | | | | |

| Chiseling | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Time (hh:mm) |
| | | |

| Water Added | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Volume (l) |
| | | |

## Remarks

**Reason for Termination:**

Designated depth reached

**Groundwater Remarks:**

No groundwater encountered.

**Other Remarks:**

Cleared of buried services. Handpit dug to 1.20mbgl. Installed with monitoring standpipe upon completion.

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# BOREHOLE LOG

Scale 1:50 Sheet 2 of 2

| LOCATION ID | | | | |
|---|---|---|---|---|
| **BH01** | **Project Name:** Plot P, Kingsway Business Park | | **Ground Level (m AOD):** | 147.28 |
| | **Project Number:** 210939 | | **Eastings:** | 391871.42 |
| | **Client:** Wilson Bowden Developments Ltd | | **Northings:** | 412707.88 |
| **Hole Type:** CP | **Rig:** Dando 2000 | **Start & End Date:** 02/08/2022 | **Engineer:** TF | **Checker:** MH |

| Boring | | Strata | | | | Samples | | | In-Situ Tests | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strike | Well | Level (m AOD) & [Thickness (m)] | Description | Legend | Depth (m bgl) | Type (Ublows) | From (m) | To (m) | Type | Depth (m) | Result | Casing Depth & (Water Level) |
| | | | Medium dense reddish brown clayey SAND.() | | | D10 | 10.00 | 10.00 | | | | |
| | | | | | | D11 | 10.50 | 10.95 | SPT | 10.50 | N=16 (2,3/4,3,4,5) | |
| | | 135.48 [3.20] | Very stiff grey slightly gravelly sandy CLAY. Gravel is subangular to subrounded, fine to coarse of sandstone.() | | 11.80 | D12 | 11.80 | 11.80 | | | | |
| | | | | | | B10 D13 | 12.00 12.00 | 12.45 | SPT | 12.00 | N=44 (4,8/8,10,12,14) | |
| | | | | | | D14 | 13.00 | 13.45 | | | | |
| | | | | | | U1 (120) | 13.50 | 13.95 | | | | |
| | | | | | | D15 | 14.00 | 14.00 | | | | |
| | | 132.28 [0.16] 132.12 | Very stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded, fine to coarse of sandstone.() | | 15.00 15.16 | D16 | 15.00 | 15.00 | SPT | 15.00 | 50 (25 for 105mm/50 for 50mm) | |
| | | | Hole Terminated at 15.16m bgl. | | | | | | | | | |

| Chiseling | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Time (hh:mm) |
| | | |

| Water Added | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Volume (l) |
| | | |

## Remarks

**Reason for Termination:**

Designated depth reached

**Groundwater Remarks:**

No groundwater encountered.

**Other Remarks:**

Cleared of buried services. Handpit dug to 1.20mbgl. Installed with monitoring standpipe upon completion.

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# BOREHOLE LOG

Scale 1:50 Sheet 1 of 2

| LOCATION ID | | | | | |
|---|---|---|---|---|---|
| **BH02** | **Project Name:** Plot P, Kingsway Business Park | | | **Ground Level (m AOD):** | 149.09 |
| | **Project Number:** 210939 | | | **Eastings:** | 391832.89 |
| | **Client:** Wilson Bowden Developments Ltd | | | **Northings:** | 412660.50 |
| **Hole Type:** CP | **Rig:** Dando 2000 | **Start & End Date:** | 04/08/2022 - 05/08/2022 | **Engineer:** TF | **Checker:** MH |

| Boring | | Strata | | | Samples | | | In-Situ Tests | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Strike | Well | Level (m AOD) & [Thickness (m)] | Description | Legend / Depth (m bgl) | Type (Ublows) | From (m) | To (m) | Type | Depth (m) | Result | Casing Depth & (Water Level) |
| | | [1.00] | Grass over dark brown slightly clayey fine SAND with high rootlet content. (Topsoil) | | B1 | 0.10 | 1.00 | | | | |
| | | 148.09 [0.90] | Firm orange mottled grey sandy CLAY.() | 1.00 | D1 | 1.00 | 1.00 | | | | |
| | | | | | U1 (55) | 1.20 | 1.65 | | | | |
| | | | | | D2 | 1.70 | 1.70 | | | | |
| | | 147.19 [3.50] | Medium dense orange slightly clayey SAND() | 1.90 | B2 | 2.00 | 2.45 | SPT | 2.00 | N=16 (3,3/3,4,4,5) | |
| | | | | | | | | SPT | 3.00 | N=15 (2,2/3,4,4,4) | |
| | | | | | D3 | 3.70 | 3.70 | | | | |
| | | | | | B3 | 4.00 | 4.45 | SPT | 4.00 | N=14 (2,3/3,3,4,4) | |
| | | | | | D4 | 5.00 | 5.45 | SPT | 5.00 | N=14 (2,2/3,3,4,4) | |
| | | 143.69 [9.60] [10.05] | Reddish brown slightly clayey slightly gravelly SAND. Gravel is subangular, fine to medium of sandstone and mudstone() | 5.40 | | | | | | | |
| | | | Medium dense becoming dense reddish brown slightly clayey slightly gravelly SAND. Gravel is subangular, fine to medium of sandstone and mudstone() | | B4 | 6.00 | 6.45 | SPT | 6.00 | N=17 (2,3/4,4,4,5) | |
| | | | | | D5 | 7.00 | 7.00 | | | | |
| | | | | | B5 | 7.50 | 7.95 | SPT | 7.50 | N=35 (5,7/7,9,9,10) | |
| | | | | | | | | SPT | 9.00 | N=35 (4,7/8,8,9,10) | |

| Chiseling | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Time (hh:mm) |
| | | |

| Water Added | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Volume (l) |
| | | |

## Remarks

**Reason for Termination:**

Designated depth reached

**Groundwater Remarks:**

No groundwater encountered.

**Other Remarks:**

Cleared of buried services. Handpit dug to 1.20mbgl. Installed with monitoring standpipe upon completion.

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# BOREHOLE LOG

Scale 1:50 Sheet 2 of 2

| LOCATION ID | | | | | |
|---|---|---|---|---|---|
| **BH02** | **Project Name:** Plot P, Kingsway Business Park | | | **Ground Level (m AOD):** | 149.09 |
| | **Project Number:** 210939 | | | **Eastings:** | 391832.89 |
| | **Client:** Wilson Bowden Developments Ltd | | | **Northings:** | 412660.50 |
| **Hole Type:** CP | **Rig:** Dando 2000 | **Start & End Date:** | 04/08/2022 - 05/08/2022 | **Engineer:** TF | **Checker:** MH |

| Boring | | Strata | | | Samples | | | In-Situ Tests | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Strike | Well | Level (m AOD) & (Thickness (m)) | Description | Legend / Depth (m bgl) | Type (Ublows) | From (m) | To (m) | Type | Depth (m) | Result | Casing Depth & (Water Level) |
| | | | Medium dense becoming dense reddish brown slightly clayey slightly gravelly SAND. Gravel is subangular, fine to medium of sandstone and mudstone() | | D6 | 10.00 | 10.00 | | | | |
| | | | | | B6 | 10.50 | 10.95 | SPT | 10.50 | N=40 (6,8/9,10,10,11) | |
| | | | | | D7 | 11.50 | 11.50 | | | | |
| | | | | | B7 | 12.00 | 12.45 | SPT | 12.00 | N=32 (3,5/7,8,9,8) | |
| | | | | | | | | SPT | 13.50 | N=29 (3,5/6,7,8,8) | |
| | | | | | D8 | 13.80 | 13.80 | | | | |
| | | | | | D9 | 14.50 | 14.50 | | | | |
| | | 134.09 | | 15.00 | | | | SPT | 15.00 | N=20 (2,3/4,4,5,7) | |
| | | 133.64 | Hole Terminated at 15.45m bgl. | 15.45 | | | | | | | |

| Chiseling | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Time (hh:mm) |
| | | |

| Water Added | | |
|---|---|---|
| From (m bgl) | To (m bgl) | Volume (l) |
| | | |

## Remarks

**Reason for Termination:**

Designated depth reached

**Groundwater Remarks:**

No groundwater encountered.

**Other Remarks:**

Cleared of buried services. Handpit dug to 1.20mbgl. Installed with monitoring standpipe upon completion.

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.50 |
| **TP101** | **Project Number:** 210939 | | 1.00 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** JCB 3CX | **Start & End Date:** 01/08/2022 | Stability: Unstable below 1.80mbgl |
| **Ground Level (m AOD):** 148.94 | **Eastings & Northings:** 391840E 412729N | | Engineer: TF Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | | Grass over black gravelly SAND with low cobble content. Gravel is subangular to subrounded, fine to coarse of clinker, brick, sandstone and wood. Cobbles are subangular of slag. (Made Ground) | | | ES1 | 0.30 | 0.30 | | | |
| | | 1.80m | | | | B1 | 1.00 | 1.00 | | | |
| | | | | | | ES2 | 1.50 | 1.50 | | | |
| | | 147.14 | Light brown slightly clayey SAND.() | | 1.80 | D1 | 2.00 | 2.00 | | | |
| | | 1.70m | | | | B2 | 3.00 | 3.00 | | | |
| | | 145.44 | Hole Terminated at 3.50m bgl. | | 3.50 | D2 | 3.50 | 3.50 | | | |

## Remarks

**Reason for Termination:**

Sides Collapsing

**Groundwater Notes:**

No groundwater encountered.

**Other Remarks:**

Cleared of services, backfilled with arisings

# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.40 |
| **TP102** | **Project Number:** 210939 | | 1.00 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** JCB 3CX | **Start & End Date:** 03/08/2022 | Stability: Unstable at groundwater contact |
| **Ground Level (m AOD):** 147.22 | **Eastings & Northings:** 391868E 412717N | | Engineer: OS Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.30m<br>146.92 | Dark brown sightly clayey fine to medium SAND with rootlet content. (Topsoil) | | | ES | 0.20 | | | | |
| | | 0.70m<br>146.22 | Blackish brown slightly gravelly slightly clayey fine to medium SAND with high cobble content. Gravel is subangular, coarse of sandstone. Cobbles are subangular to subrounded of sandstone.() | | 0.30 | ES | 0.60 | | | | |
| | | 0.60m<br>145.62 | Orangey light grey slightly silty fine to medium SAND.() | | 1.00 | B<br>ES | 1.30<br>1.30 | | | | |
| | | 0.90m<br>144.72 | Orange silty fine to medium SAND.() | | 1.60 | | | | | | |
| ▼ | | 0.70m<br>144.02 | Orange slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded, fine to medium of coal and sandstone.() | | 2.50 | B<br>D | 2.80<br>2.80 | | | | |
| | | | Hole Terminated at 3.20m bgl. | | 3.20 | | | | | | |

## Remarks

**Reason for Termination:**

Sides Collapsing

**Groundwater Notes:**

Seepage at 2.70mbgl

**Other Remarks:**

Cleared of services, black plastic sheet at 0.10mmgl, backfilled with arisings

# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.40 |
| **TP103** | **Project Number:** 210939 | | 1.20 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** JCB 3CX | **Start & End Date:** 01/08/2022 | Stability: Unstable below 2.00mbgl |
| **Ground Level (m AOD):** 149.08 | **Eastings & Northings:** 391823E 412714N | | Engineer: TF Checker: MH |

| Strata | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend / Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.40m | Grass over dark brown clayey SAND with high rootlet content (Topsoil) | | ES1 | 0.30 | 0.30 | | | |
| | | 148.68 | | 0.40 | D1 | 0.50 | 0.50 | | | |
| | | 0.50m | Black and brown clayey gravelly SAND with low boulder content. Gravel is subangular to subrounded, fine to coarse of sandstone. Boulders are subangular of sandstone.() | | ES2 | 0.50 | 0.50 | | | |
| | | 148.18 | | 0.90 | B1 | 0.80 | 0.80 | | | |
| | | | Firm light grey mottled orangish brown sandy slightly gravelly CLAY. Gravel is subangular to subrounded, fine to medium of coal and sandstone.() | | D2 | 1.00 | 1.00 | HSV | 1.00 | (58, 75, 56)kPa |
| | | 1.10m | | | B2 | 1.80 | 1.80 | | | |
| | | 147.08 | Light orangish brown slightly clayey slightly gravelly SAND. Gravel is subrounded, medium to coarse of sandstone.() | 2.00 | | | | | | |
| ▼ | | 2.00m | | | D3 | 2.50 | 2.50 | | | |
| | | 145.08 | Hole Terminated at 4.00m bgl. | 4.00 | B3 | 4.00 | 4.00 | | | |

## Remarks

**Reason for Termination:**

Sides Collapsing

**Groundwater Notes:**

No Groundwater Encountered

**Other Remarks:**

Cleared of services, backfilled with arisings

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.30 |
| **TP104** | **Project Number:** 210939 | | 1.10 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** JCB 3CX | **Start & End Date:** 01/08/2022 | Stability: Unstable below 0.80mbgl |
| **Ground Level (m AOD):** 149.01 | **Eastings & Northings:** 391854E 412690N | | Engineer: TF Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.20m 148.81 | Grass over dark brown clayey SAND with high rootlet content (Topsoil) | | 0.20 | ES1 | 0.10 | 0.10 | | | |
| | | 0.60m | Stiff orangish brown mottled light grey sandy gravelly CLAY with high rootlet content.() | | | ES2 | 0.30 | 0.30 | | | |
| | | 148.21 | Orange clayey slightly gravelly SAND Gravel is subangular to subrounded, fine to coarse of sandstone.() | | 0.80 | B1 | 0.50 | 0.50 | | | |
| | | | | | | D1 | 0.70 | 0.70 | | | |
| | | | | | | B2 | 1.00 | 1.00 | | | |
| | | | | | | D2 | 1.50 | 1.50 | | | |
| ▼ | | 3.00m | | | | B3 | 2.80 | 2.80 | | | |
| | | | | | | D3 | 3.50 | 3.50 | | | |
| | | 145.21 | Hole Terminated at 3.80m bgl. | | 3.80 | | | | | | |

## Remarks

**Reason for Termination:**

Sides Collapsing

**Groundwater Notes:**

No Groundwater Encountered

**Other Remarks:**

Cleared of services, backfilled with arisings

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | |
|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.50 |
| **TP105** | **Project Number:** 210939 | | 1.20 Pit Dimensions (m) 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | |
| | **Plant:** JCB 3CX | **Start & End Date:** 02/08/2022 | Stability: Stable |
| **Ground Level (m AOD):** 148.54 | **Eastings & Northings:** 391810E 412660N | | Engineer: TF Checker: MH |

| Strata | | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend | Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.80m | Grass over brown clayey gravely SAND, with low cobble content. Gravel is subangular to subrounded, fine to coarse of sandstone and brick. Cobbles are subangular to subrounded of sandstone. (Made Ground) | | | ES1 | 0.20 | 0.20 | | | |
| | | 147.74 | | | 0.80 | | | | | | |
| | | | Firm light grey mottled orange silty sandy gravelly CLAY with medium cobble content. Gravel is subangular to subrounded, fine to coarse of sandstone. Cobbles are subrounded of sandstone.() | | | D1 | 1.00 | 1.00 | HSV | 1.00 | (58, 47, 54)kPa |
| | | | | | | ES2 | 1.00 | 1.00 | | | |
| | | 1.40m | | | | B1 | 1.50 | 1.50 | | | |
| | | | | | | D2 | 2.00 | 2.00 | | | |
| | | 146.34 | | | 2.20 | | | | | | |
| ▼ | | | Light grayish brown slightly clayey slightly gravelly SAND. Gravel is subrounded, fine to coarse of sandstone.() | | | B2 | 2.50 | 2.50 | | | |
| | | 2.30m | | | | D3 | 3.50 | 3.50 | | | |
| | | 144.04 | Hole Terminated at 4.50m bgl. | | 4.50 | B3 | 4.50 | 4.50 | | | |

## Remarks

**Reason for Termination:**

Undercutting below machine

**Groundwater Notes:**

No Groundwater Encountered

**Other Remarks:**

Cleared of services, backfilled with arisings

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# TRIAL PIT LOG

Scale: 1:50 Sheet 1 of 1

| | | | | |
|---|---|---|---|---|
| **LOCATION ID:** | **Project Name:** Plot P, Kingsway Business Park | | 2.10 | |
| **TP106** | **Project Number:** 210939 | | 1.20 Pit Dimensions (m) | 0 Degrees |
| | **Client:** Wilson Bowden Developments Ltd | | Stability: Unstable below 1.70mbgl | |
| | **Plant:** JCB 3CX | **Start & End Date:** 02/08/2022 | | |
| **Ground Level (m AOD):** 149.37 | | **Eastings & Northings:** 391857E 412660N | Engineer: TF | Checker: MH |

| Strata | | | | | Samples | | | In-Situ Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater Strike | Backfill | Level (m AOD) | Description | Legend / Depth (m bgl) | Type | From (m) | To (m) | Type | Depth (m) | Result |
| | | 0.50m | Grass over dark brown slightly clayey gravelly SAND. Gravel is subangular to subrounded, fine to coarse of sandstone and brick. (Made Ground) | | ES1 | 0.20 | 0.20 | | | |
| | | 148.87 | Stiff grey mottled brown sandy CLAY.() | 0.50 | ES2 | 0.60 | 0.60 | | | |
| | | 1.20m | | | D1 | 1.00 | 1.00 | | | |
| | | | | | B1 | 1.50 | 1.50 | HSV | 1.50 | (70, 100, 40)kPa |
| | | 147.67 | Light brownish orange SAND.() | 1.70 | | | | | | |
| | | | | | D2 | 2.00 | 2.00 | | | |
| ▼ | | 2.30m | | | | | | | | |
| | | | | | B2 | 3.00 | 3.00 | | | |
| | | 145.37 | Hole Terminated at 4.00m bgl. | 4.00 | D3 | 4.00 | 4.00 | | | |

## Remarks

**Reason for Termination:**

Sides Collapsing

**Groundwater Notes:**

No Groundwater Encountered

**Other Remarks:**

Cleared of services, backfilled with arisings

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## Appendix 3: SPT Calibration Certificate



# Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

| | |
|---|---|
| Hammer Ref: | PBD5 |
| Test Date: | 05/01/2022 |
| Report Date: | |
| File Name: | PBD5.spt |
| Test Operator: | B HUNTER |

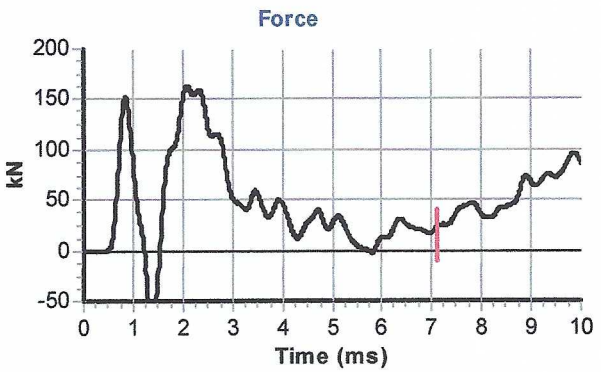
**Instrumented Rod Data**

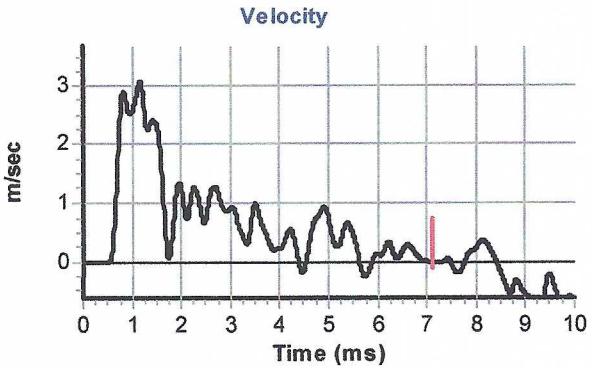
| | |
|---|---|
| Diameter $d_r$ (mm): | 54 |
| Wall Thickness $t_r$ (mm): | 6.0 |
| Assumed Modulus $E_a$ (GPa): | 208 |
| Accelerometer No.1: | 62901 |
| Accelerometer No.2: | 62902 |

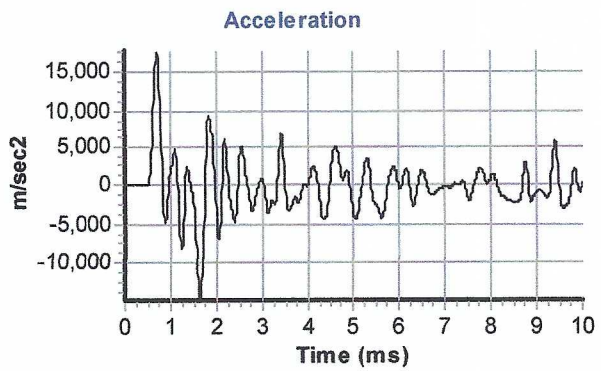
**Hammer Information**

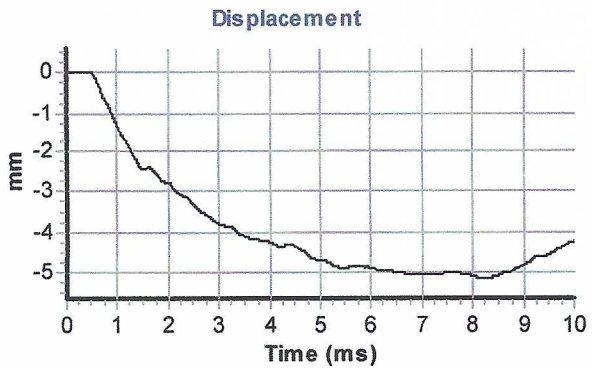
| | |
|---|---|
| Hammer Mass m (kg): | 63.5 |
| Falling Height h (mm): | 760 |
| String Length L (m): | 10.0 |

**Comments / Location**




**Calculations**

| | |
|---|---|
| Area of Rod A (mm2): | 905 |
| Theoretical Energy $E_{theor}$ (J): | 473 |
| Measured Energy $E_{meas}$ (J): | 309 |

**Energy Ratio $E_r$ (%):** **65**

Signed:

Title: Operations Manager

The recommended calibration interval is 12 months

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# SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

**ARCHWAY ENGINEERING UK LTD**
**AINLEYS INDUSTRIAL ESTATE**
**ELLAND**
**WEST YORKSHIRE**
**HX5 9JP**

| | |
|---|---|
| SPT Hammer Ref: | PBD02 |
| Test Date: | 17/02/2022 |
| Report Date: | 17/02/2022 |
| File Name: | PBD02.spt |
| Test Operator: | CM |

## Instrumented Rod Data

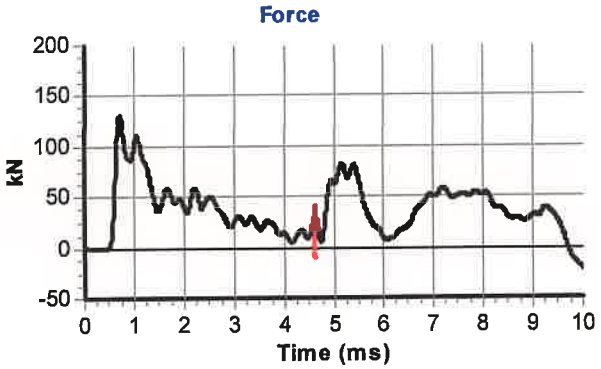
| | |
|---|---|
| Diameter $d_r$ (mm): | 54 |
| Wall Thickness $t_r$ (mm): | 6.0 |
| Assumed Modulus $E_a$ (GPa): | 200 |
| Accelerometer No.1: | 7080 |
| Accelerometer No.2: | 11609 |

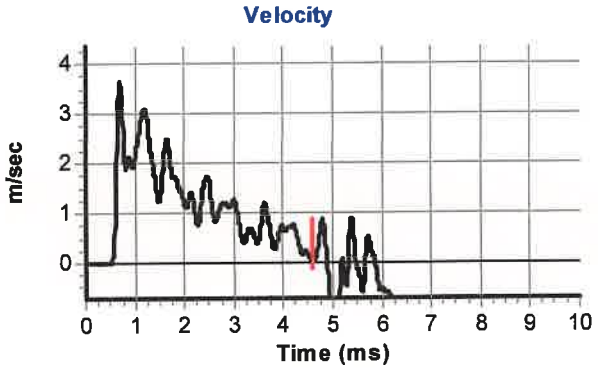
## SPT Hammer Information

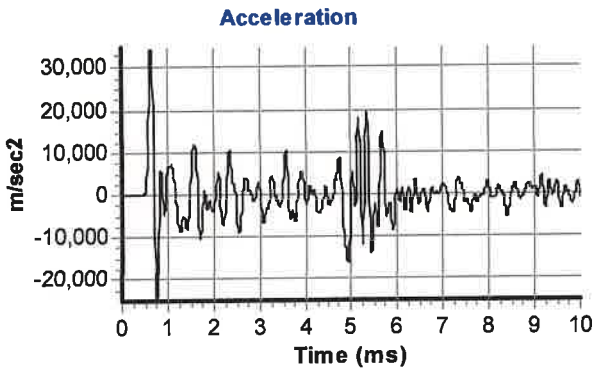
| | |
|---|---|
| Hammer Mass m (kg): | 63.5 |
| Falling Height h (mm): | 760 |
| SPT String Length L (m): | 10.0 |

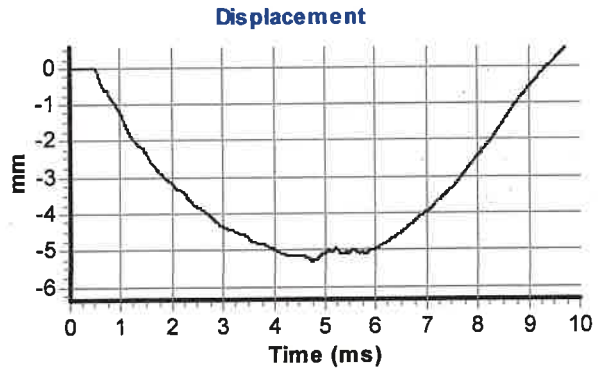
## Comments / Location

PB DRILLING LTD/79197




## Calculations

| | |
|---|---|
| Area of Rod A (mm2): | 905 |
| Theoretical Energy $E_{theor}$ (J): | 473 |
| Measured Energy $E_{meas}$ (J): | 331 |

**Energy Ratio $E_r$ (%):** **70**

The recommended calibration interval is 12 months

Signed: C.McCLUSKEY

Title: FITTER

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# SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

**Geo Site Surveys Ltd**
**32 Mersey Road**
**Sale, Cheshire**
**M33 6HN**
**0161 282 8583**

| | |
|---|---|
| SPT Hammer Ref: | AR342 SPT1 |
| Test Date: | 11/05/2023 |
| Report Date: | 11/05/2023 |
| File Name: | AR342 SPT1.spt |
| Test Operator: | LUKE KERSHAW |

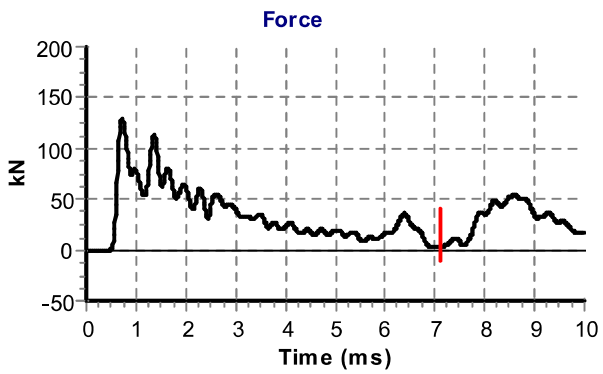
### Instrumented Rod Data

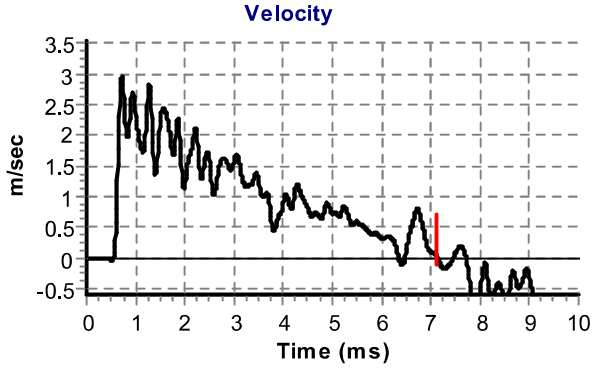
| | |
|---|---|
| Diameter $d_r$ (mm): | 54 |
| Wall Thickness $t_r$ (mm): | 6.5 |
| Assumed Modulus $E_a$ (GPa): | 208 |
| Accelerometer No.1: | 8965 |
| Accelerometer No.2: | 6457 |

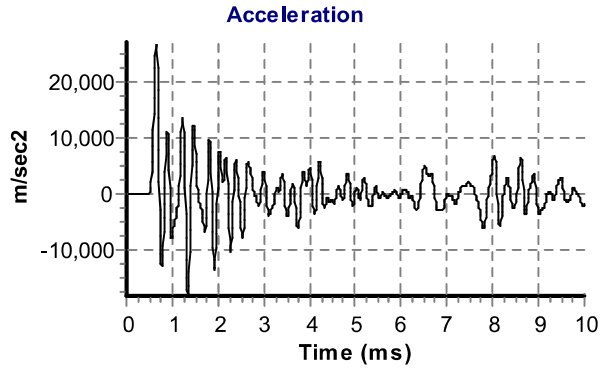
### SPT Hammer Information

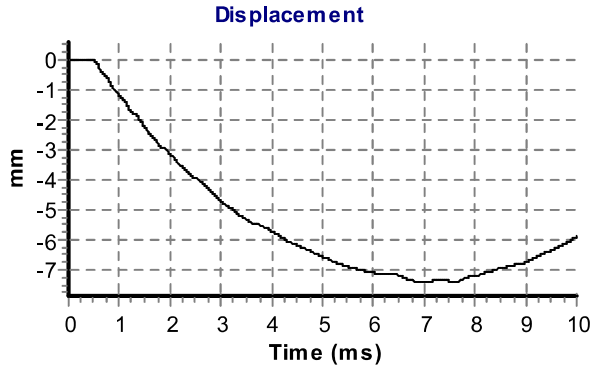
| | |
|---|---|
| Hammer Mass m (kg): | 63.5 |
| Falling Height h (mm): | 760 |
| SPT String Length L (m): | 13.5 |

### Comments / Location




### Calculations

| | |
|---|---|
| Area of Rod A (mm2): | 970 |
| Theoretical Energy $E_{theor}$ (J): | 473 |
| Measured Energy $E_{meas}$ (J): | 374 |

**Energy Ratio $E_r$ (%):** **79**

Signed: Luke Kershaw

Title: Snr Eng / Supervisor

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# Appendix 4: Gas and Groundwater Monitoring Data

**BWB GAS AND GROUNDWATER MONITORING**

| | | |
|---|---|---|
| Site: | | Plot R, Kingsway Business Park |
| Client: | | Wilson Bowden Developments Ltd |
| Job No.: | | 232081 |
| Date: | | 14/07/2023 |
| Start / End Time: | | 10:30 - 11:00 |
| Engineer: | | OS |
| Monitoring Equipment: | Gas Meter ID | **74235** |
| | PID ID | **592-908237** |
| | Dip Tape | **BWB00962** |
| | Other | |

NR = Not Recorded
Dry = No Groundwater

BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

| Weather Conditions | Start | End |
|---|---|---|
| (Dry / Raining) | Raining | Raining |
| Wind Strength (m/s) | | |
| Wind Direction (from) | | |
| Temperature (°C) | 15.0 | 15.0 |
| Barometric Pressure (h Pa / mB) | 1007.0 | 1007.0 |
| App 12 Hour Pressure (h Pa / mB) | 1012.0 | |
| 12 Hour Pressure Trend | Falling | |
| PID - Air | | |
| PID - Calibration Gas | | |

| Location Reference | Relative Pressure (Pa) | Flow (l/hr) | | Methane (%v/v) | | Carbon Dioxide (%v/v) | | Oxygen (%v/v) | | Hydrogen Sulphide (ppm) | Carbon Monoxide (ppm) | PID (ppm) | Depth to water (m) | Base of Response Zone (m) | Free-Phase Product Level Top (m) | Groundwater Elevation (m AOD) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak | Steady | Peak | Steady | Peak | Steady | Min | Steady | | | | | | | | |
| Ambient Air Start (Calibration) | | | | | | | | | | | | | | | | | |
| Ambient Air Finish (Calibration) | | | | | | | | | | | | | | | | | |
| **BH01 2023** | | <0.1 | <0.1 | <0.1 | <0.1 | 5.3 | 5.3 | 16.0 | 16.0 | <0.1 | <0.1 | 3.3 | 10.40 | 10.50 | | -10.40 | |
| **BH02 2023** | | <0.1 | <0.1 | <0.1 | <0.1 | 1.4 | 1.4 | 19,8 | 19.8 | <0.1 | <0.1 | 3.4 | Dry | 10.20 | | | |
| **BH01 2022** | | | | | | | | | | | | | Dry | 2.00 | | | Borehole vandalised |
| **BH02 2022** | | | | | | | | | | | | | 11.20 | 11.20 | | -11.20 | Borehole vandalised |

**BWB GAS AND GROUNDWATER MONITORING**

| | | |
|---|---|---|
| **Site:** | | Plot R, Kingsway Business Park |
| **Client:** | | Wilson Bowden Developments Ltd |
| **Job No.:** | | 232081 |
| **Date:** | | 28/07/2023 |
| **Start / End Time:** | | 15:30 - 16:00 |
| **Engineer:** | | OS |
| **Monitoring Equipment:** | **Gas Meter ID** | **74235** |
| | **PID ID** | **592-908237** |
| | **Dip Tape** | **BWB00962** |
| | **Other** | |

NR = Not Recorded
Dry = No Groundwater

BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

| Weather Conditions | Start | End |
|---|---|---|
| (Dry / Raining) | Overcast, Dry | Overcast, Dry |
| Wind Strength (m/s) | | |
| Wind Direction (from) | | |
| Temperature (°C) | 21.0 | 21.0 |
| Barometric Pressure (h Pa / mB) | 1001.0 | 1001.0 |
| App 12 Hour Pressure (h Pa / mB) | 1003.0 | |
| 12 Hour Pressure Trend | Falling | |
| PID - Air | | |
| PID - Calibration Gas | | |

| Location Reference | Relative Pressure (Pa) | Flow (l/hr) | | Methane (%v/v) | | Carbon Dioxide (%v/v) | | Oxygen (%v/v) | | Hydrogen Sulphide (ppm) | Carbon Monoxide (ppm) | PID (ppm) | Depth to water (m) | Base of Response Zone (m) | Free-Phase Product Level Top (m) | Groundwater Elevation (m AOD) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak | Steady | Peak | Steady | Peak | Steady | Min | Steady | | | | | | | | |
| **Ambient Air Start (Calibration)** | | | | | | | | | | | | | | | | | |
| **Ambient Air Finish (Calibration)** | | | | | | | | | | | | | | | | | |
| **BH01 2023** | | <0.1 | <0.1 | <0.1 | <0.1 | 5.1 | 5.0 | 16.4 | 16.4 | <0.1 | <0.1 | 3.2 | 10.50 | 10.50 | | -10.50 | |
| **BH02 2023** | | <0.1 | <0.1 | <0.1 | <0.1 | 1.3 | 1.3 | 19.6 | 19.6 | <0.1 | <0.1 | 3.4 | Dry | 10.20 | | | |
| **BH01 2022** | | | | | | | | | | | | | Dry | 2.00 | | | Borehole vandalised |
| **BH02 2022** | | | | | | | | | | | | | 11.20 | 11.20 | | -11.20 | Borehole vandalised |

**BWB GAS AND GROUNDWATER MONITORING**

| | | |
|---|---|---|
| Site: | | Plot R, Kingsway Business Park |
| Client: | | Wilson Bowden Developments Ltd |
| Job No.: | | 232081 |
| Date: | | 16/08/2023 |
| Start / End Time: | | 13:30 - 14:00 |
| Engineer: | | OS |
| Monitoring Equipment: | Gas Meter ID | **74235** |
| | PID ID | **592-908237** |
| | Dip Tape | **BWB00962** |
| | Other | |

NR = Not Recorded

Dry = No Groundwater

CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

| Weather Conditions | Start | End |
|---|---|---|
| (Dry / Raining) | Overcast, Dry | Overcast, Dry |
| Wind Strength (m/s) | | |
| Wind Direction (from) | | |
| Temperature (°C) | 21.0 | 21.0 |
| Barometric Pressure (h Pa / mB) | 1007.0 | 1007.0 |
| App 12 Hour Pressure (h Pa / mB) | 1019.0 | |
| 12 Hour Pressure Trend | Falling | |
| PID - Air | | |
| PID - Calibration Gas | | |

| Location Reference | Relative Pressure (Pa) | Flow (l/hr) | | Methane (%v/v) | | Carbon Dioxide (%v/v) | | Oxygen (%v/v) | | Hydrogen Sulphide (ppm) | Carbon Monoxide (ppm) | PID (ppm) | Depth to water (m) | Base of Response Zone (m) | Free-Phase Product Level Top (m) | Groundwater Elevation (m AOD) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak | Steady | Peak | Steady | Peak | Steady | Min | Steady | | | | | | | | |
| **Ambient Air Start (Calibration)** | | | | | | | | | | | | | | | | | |
| **Ambient Air Finish (Calibration)** | | | | | | | | | | | | | | | | | |
| **BH01 2023** | | <0.1 | <0.1 | <0.1 | <0.1 | 4.9 | 4.9 | 16.2 | 16.2 | <0.1 | <0.1 | 3.2 | 10.40 | 10.50 | | -10.40 | |
| **BH02 2023** | | <0.1 | <0.1 | <0.1 | <0.1 | 1.0 | 0.9 | 19.9 | 19.9 | <0.1 | <0.1 | 3.4 | Dry | 10.20 | | | |
| **BH01 2022** | | | | | | | | | | | | | Dry | 2.00 | | | Borehole vandalised |
| **BH02 2022** | | | | | | | | | | | | | 11.00 | 11.20 | | -11.00 | Borehole vandalised |

**BWB GAS AND GROUNDWATER MONITORING**

| | | |
|---|---|---|
| **Site:** | | Plot R, Kingsway Business Park |
| **Client:** | | Wilson Bowden Developments Ltd |
| **Job No.:** | | 232081 |
| **Date:** | | 14/09/2023 |
| **Start / End Time:** | | 10:30 - 11:00 |
| **Engineer:** | | OS |
| **Monitoring Equipment:** | **Gas Meter ID** | **74235** |
| | **PID ID** | **592-908237** |
| | **Dip Tape** | **BWB00962** |
| | **Other** | |

NR = Not Recorded
Dry = No Groundwater

BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

| Weather Conditions | Start | End |
|---|---|---|
| (Dry / Raining) | Cloudy, Dry | Cloudy, Dry |
| Wind Strength (m/s) | | |
| Wind Direction (from) | | |
| Temperature (°C) | 4.0 | 14.0 |
| Barometric Pressure (h Pa / mB) | 1017.0 | 1017.0 |
| App 12 Hour Pressure (h Pa / mB) | 1021.0 | |
| 12 Hour Pressure Trend | Falling | |
| PID - Air | | |
| PID - Calibration Gas | | |

| Location Reference | Relative Pressure (Pa) | Flow (l/hr) | | Methane (%v/v) | | Carbon Dioxide (%v/v) | | Oxygen (%v/v) | | Hydrogen Sulphide (ppm) | Carbon Monoxide (ppm) | PID (ppm) | Depth to water (m) | Base of Response Zone (m) | Free-Phase Product Level Top (m) | Groundwater Elevation (m AOD) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak | Steady | Peak | Steady | Peak | Steady | Min | Steady | | | | | | | | |
| **Ambient Air Start (Calibration)** | | | | | | | | | | | | | | | | | |
| **Ambient Air Finish (Calibration)** | | | | | | | | | | | | | | | | | |
| **BH01 2023** | | <0.1 | <0.1 | <0.1 | <0.1 | 4.8 | 4.6 | 16.8 | 16.8 | <0.1 | <0.1 | 3.0 | 10.30 | 10.50 | | -10.30 | |
| **BH02 2023** | | <0.1 | <0.1 | <0.1 | <0.1 | 1.2 | 1.2 | 19.8 | 19.8 | <0.1 | <0.1 | 3.3 | Dry | 10.20 | | | |
| **BH01 2022** | | | | | | | | | | | | | Dry | 2.00 | | | Borehole Vandalised |
| **BH02 2022** | | | | | | | | | | | | | 10.90 | 11.00 | | -10.90 | Borehole Vandalised |

**BWB GAS AND GROUNDWATER MONITORING**

| | | |
|---|---|---|
| **Site:** | | Plot P Kingsway Business Park |
| **Client:** | | Wilson Bowden Developments |
| **Job No.:** | | 210939 |
| **Date:** | | 26 August 2022 |
| **Start / End Time:** | | 10:45 - 12:00 |
| **Engineer:** | | OS |
| **Monitoring Equipment:** | **Gas Meter ID** | |
| | **PID ID** | |
| | **Dip Tape** | |
| | **Other** | |

NR = Not Recorded
Dry = No Groundwater

BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

| **Weather Conditions** | **Start** | **End** |
|---|---|---|
| **(Dry / Raining)** | Dry | Dry |
| **Wind Strength (m/s)** | | |
| **Wind Direction (from)** | | |
| **Temperature (°C)** | 14.0 | 14.0 |
| **Barometric Pressure (h Pa / mB)** | 1017.0 | 1017.0 |
| **App 12 Hour Pressure (h Pa / mB)** | 1019.0 | |
| **12 Hour Pressure Trend** | | |
| **PID - Air** | <0.1 | <0.1 |
| **PID - Calibration Gas** | | |

| **Location Reference** | **Relative Pressure (Pa)** | **Flow (l/hr)** | | **Methane (%v/v)** | | **Carbon Dioxide (%v/v)** | | **Oxygen (%v/v)** | | **Hydrogen Sulphide (ppm)** | **Carbon Monoxide (ppm)** | **PID (ppm)** | **Depth to water (m)** | **Base of Response Zone (m)** | **Free-Phase Product Level Top (m)** | **Groundwater Elevation (m AOD)** | **Notes** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Peak** | **Steady** | **Peak** | **Steady** | **Peak** | **Steady** | **Min** | **Steady** | | | | | | | | |
| **Ambient Air Start (Calibration)** | | | | | | | | | | | | | | | | | |
| **Ambient Air Finish (Calibration)** | | | | | | | | | | | | | | | | | |
| **BH01** | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 20.8 | 20.8 | <0.1 | <0.1 | <0.1 | 3.13 | 3.61 | | 144.15 | |
| **BH02** | | <0.1 | <0.1 | <0.1 | <0.1 | 0.6 | 0.5 | 20.2 | 20.4 | <0.1 | <0.1 | <0.1 | 11.34 | 14.74 | | 137.75 | |
| **BH03** | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 21.1 | 21.6 | <0.1 | <0.1 | <0.1 | 2.42 | 3.27 | | 147.05 | |
| **BH04** | | <0.1 | <0.1 | <0.1 | <0.1 | 0.1 | 0.1 | 21.1 | 20.6 | <0.1 | <0.1 | <0.1 | 9.56 | 14.23 | | 139.21 | |
| **BH05** | | <0.1 | <0.1 | <0.1 | <0.1 | 0.9 | 0.9 | 19.9 | 19.9 | <0.1 | <0.1 | <0.1 | 2.04 | 3.70 | | 146.73 | |

**BWB GAS AND GROUNDWATER MONITORING**

| | | |
|---|---|---|
| Site: | | Plot P Kingsway Business Park |
| Client: | | Wilson Bowden Developments |
| Job No.: | | 210939 |
| Date: | | 06/09/2022 |
| Start / End Time: | | 10:30 - 11:30 |
| Engineer: | | OS |
| Monitoring Equipment: | Gas Meter ID | |
| | PID ID | |
| | Dip Tape | |
| | Other | |

NR = Not Recorded
Dry = No Groundwater

BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

| Weather Conditions | Start | End |
|---|---|---|
| (Dry / Raining) | Dry | Light rain |
| Wind Strength (m/s) | | |
| Wind Direction (from) | | |
| Temperature (°C) | 10.0 | 10.0 |
| Barometric Pressure (h Pa / mB) | 1015.0 | 1015.0 |
| App 12 Hour Pressure (h Pa / mB) | 1018.0 | |
| 12 Hour Pressure Trend | | |
| PID - Air | <0.1 | <0.1 |
| PID - Calibration Gas | | |

| Location Reference | Relative Pressure (Pa) | Flow (l/hr) | | Methane (%v/v) | | Carbon Dioxide (%v/v) | | Oxygen (%v/v) | | Hydrogen Sulphide (ppm) | Carbon Monoxide (ppm) | PID (ppm) | Depth to water (m) | Base of Response Zone (m) | Free-Phase Product Level Top (m) | Groundwater Elevation (m AOD) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak | Steady | Peak | Steady | Peak | Steady | Min | Steady | | | | | | | | |
| **Ambient Air Start (Calibration)** | | | | | | | | | | | | | | | | | |
| **Ambient Air Finish (Calibration)** | | | | | | | | | | | | | | | | | |
| **BH01** | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 20.5 | 20.6 | <0.1 | <0.1 | <0.1 | 3.10 | 3.61 | | 144.18 | |
| **BH02** | | <0.1 | <0.1 | <0.1 | <0.1 | 0.7 | 0.4 | 20.3 | 20.3 | <0.1 | <0.1 | <0.1 | 11.32 | 14.70 | | 137.77 | |
| **BH03** | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 21.2 | 21.6 | <0.1 | <0.1 | <0.1 | 2.38 | 3.25 | | 147.09 | |
| **BH04** | | <0.1 | <0.1 | <0.1 | <0.1 | 0.1 | 0.1 | 20.1 | 20.6 | <0.1 | <0.1 | <0.1 | 9.55 | 14.20 | | 139.22 | |
| **BH05** | | <0.1 | <0.1 | <0.1 | <0.1 | 0.7 | 0.7 | 19.9 | 19.9 | <0.1 | <0.1 | <0.1 | 2.03 | 3.70 | | 146.74 | |

**BWB GAS AND GROUNDWATER MONITORING**

| | | |
|---|---|---|
| Site: | | Plot P Kingsway Business Park |
| Client: | | Wilson Bowden Developments |
| Job No.: | | 210939 |
| Date: | | 29/09/2022 |
| Start / End Time: | | |
| Engineer: | | OS |
| Monitoring Equipment: | Gas Meter ID | |
| | PID ID | |
| | Dip Tape | |
| | Other | |

NR = Not Recorded
Dry = No Groundwater

BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

| Weather Conditions | Start | End |
|---|---|---|
| (Dry / Raining) | Dry | Dry |
| Wind Strength (m/s) | | |
| Wind Direction (from) | | |
| Temperature (°C) | 15.0 | 14.0 |
| Barometric Pressure (h Pa / mB) | 991.0 | 991.0 |
| App 12 Hour Pressure (h Pa / mB) | 1001.0 | |
| 12 Hour Pressure Trend | | |
| PID - Air | <0.1 | <0.1 |
| PID - Calibration Gas | | |

| Location Reference | Relative Pressure (Pa) | Flow (l/hr) | | Methane (%v/v) | | Carbon Dioxide (%v/v) | | Oxygen (%v/v) | | Hydrogen Sulphide (ppm) | Carbon Monoxide (ppm) | PID (ppm) | Depth to water (m) | Base of Response Zone (m) | Free-Phase Product Level Top (m) | Groundwater Elevation (m AOD) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak | Steady | Peak | Steady | Peak | Steady | Min | Steady | | | | | | | | |
| **Ambient Air Start (Calibration)** | | | | | | | | | | | | | | | | | |
| **Ambient Air Finish (Calibration)** | | | | | | | | | | | | | | | | | |
| **BH01** | | <0.1 | <0.1 | <0.1 | <0.1 | 0.1 | 0.1 | 21.4 | 21.4 | 0 | 2.2 | <0.1 | Dry | 3.55 | | | Lock removed, sandy sediment at base of hole. |
| **BH02** | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 21.6 | 21.9 | 0 | 0 | <0.1 | 11.40 | 14.62 | | 137.69 | Lock removed, tap clearly removed prior to monitoring |
| **BH03** | | <0.1 | <0.1 | 1.8 | 1.8 | 3.4 | 3.4 | 2.6 | 2.6 | 0 | 0 | <0.1 | 2.45 | 3.30 | | 147.02 | Lock removed |
| **BH04** | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 22.3 | 22.5 | 0 | 0 | <0.1 | 10.76 | 14.00 | | 138.01 | Lock removed, tap clearly removed prior to monitoring, bailer lost |
| **BH05** | | <0.1 | <0.1 | <0.1 | <0.1 | 1.0 | 1.0 | 10.4 | 10.4 | 0 | 0 | <0.1 | 2.10 | 3.70 | | 146.67 | Lock removed, tap clearly removed prior to monitoring |

**BWB GAS AND GROUNDWATER MONITORING**

| | | |
|---|---|---|
| **Site:** | | Plot P Kingsway Business Park |
| **Client:** | | Wilson Bowden Developments |
| **Job No.:** | | 210939 |
| **Date:** | | 13/10/2022 |
| **Start / End Time:** | | |
| **Engineer:** | | OS |
| **Monitoring Equipment:** | **Gas Meter ID** | |
| | **PID ID** | |
| | **Dip Tape** | |
| | **Other** | |

NR = Not Recorded
Dry = No Groundwater

BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

| Weather Conditions | Start | End |
|---|---|---|
| (Dry / Raining) | Dry | Dry |
| Wind Strength (m/s) | | |
| Wind Direction (from) | | |
| Temperature (°C) | 15.0 | 15.0 |
| Barometric Pressure (h Pa / mB) | 1015.0 | 1015.0 |
| App 12 Hour Pressure (h Pa / mB) | 1017.0 | |
| 12 Hour Pressure Trend | | |
| PID - Air | | |
| PID - Calibration Gas | | |

| Location Reference | Relative Pressure (Pa) | Flow (l/hr) | | Methane (%v/v) | | Carbon Dioxide (%v/v) | | Oxygen (%v/v) | | Hydrogen Sulphide (ppm) | Carbon Monoxide (ppm) | PID (ppm) | Depth to water (m) | Base of Response Zone (m) | Free-Phase Product Level Top (m) | Groundwater Elevation (m AOD) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak | Steady | Peak | Steady | Peak | Steady | Min | Steady | | | | | | | | |
| **Ambient Air Start (Calibration)** | | | | | | | | | | | | | | | | | |
| **Ambient Air Finish (Calibration)** | | | | | | | | | | | | | | | | | |
| **BH01** | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 20.9 | 21.0 | <0.1 | <0.1 | <0.1 | 3.40 | 3.48 | | 143.88 | |
| **BH02** | | <0.1 | <0.1 | <0.1 | <0.1 | 0.8 | 0.7 | 20.5 | 20.8 | <0.1 | <0.1 | <0.1 | 12.10 | 14.60 | | 136.99 | |
| **BH03** | | <0.1 | <0.1 | 0.5 | 0.5 | 0.3 | 0.2 | 19.3 | 19.6 | <0.1 | <0.1 | <0.1 | 2.95 | 3.28 | | 146.52 | |
| **BH04** | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 21.2 | 21.5 | <0.1 | <0.1 | <0.1 | 11.32 | 13.97 | | 137.45 | |
| **BH05** | | <0.1 | <0.1 | <0.1 | <0.1 | 0.7 | 0.7 | 20.2 | 20.4 | <0.1 | <0.1 | <0.1 | 2.78 | 3.70 | | 145.99 | |

# Appendix 5: Soil Chemical Analysis Results

**Mike Harper**
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# Analytical Report Number : 23-54402

Replaces Analytical Report Number: 23-54402, issue no. 1
Client references/information amended.
Sample depths amended as per client's request.

| | | | |
|---|---|---|---|
| **Project / Site name:** | Plot R Kingsway Business Park | **Samples received on:** | 01/09/2023 |
| **Your job number:** | 232081 | **Samples instructed on/ Analysis started on:** | 01/09/2023 |
| **Your order number:** | 5912 | **Analysis completed by:** | 12/09/2023 |
| **Report Issue Number:** | 2 | **Report issued on:** | 13/09/2023 |
| **Samples Analysed:** | 10 soil samples | | |

**Signed:** JSzwagrak

Joanna Szwagrzak
Junior Reporting Specialist
**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.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

4041

**Analytical Report Number: 23-54402**
**Project / Site name: Plot R Kingsway Business Park**
**Your Order No: 5912**

| **Lab Sample Number** | | | | 2799582 | 2799583 | 2799584 | 2799585 | 2799586 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | HP01 | HP02 | HP03 | HP04 | HP05 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.10-0.30 | 0.10-0.30 | 0.10-0.30 | 0.10-0.30 | 0.10-0.30 |
| **Date Sampled** | | | | 31/08/2023 | 31/08/2023 | 31/08/2023 | 31/08/2023 | 31/08/2023 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| Asbestos in Soil | Type | N/A | ISO 17025 | Not-detected | Not-detected | Not-detected | Not-detected | Not-detected |
| Asbestos Analyst ID | N/A | N/A | N/A | EWS | EWS | EWS | EWS | EWS |

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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

4041

**Analytical Report Number: 23-54402**
**Project / Site name: Plot R Kingsway Business Park**
**Your Order No: 5912**

| **Lab Sample Number** | | | | 2799587 | 2799588 | 2799589 | 2799590 | 2799591 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | HP06 | HP07 | HP08 | HP09 | HP10 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.10-0.30 | 0.10-0.30 | 0.10-0.30 | 0.10-0.30 | 0.10-0.30 |
| **Date Sampled** | | | | 31/08/2023 | 31/08/2023 | 31/08/2023 | 31/08/2023 | 31/08/2023 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| Asbestos in Soil | Type | N/A | ISO 17025 | Not-detected | Not-detected | Not-detected | Not-detected | Not-detected |
| Asbestos Analyst ID | N/A | N/A | N/A | EWS | EWS | EWS | EWS | EWS |

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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**Analytical Report Number : 23-54402**
**Project / Site name: Plot R Kingsway Business Park**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| Asbestos identification in soil | Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques. | In house method based on HSG 248 | A001-PL | D | ISO 17025 |

**For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).**
**For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).**
**For method numbers ending in 'PL or B' 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.**

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**e:** reception@i2analytical.com

# Analytical Report Number : 23-43728

Replaces Analytical Report Number: 23-43728, issue no. 1
Additional analysis undertaken.
Asbestos Quantification Added to Positive Samples at Clients Request

| | | | |
|---|---|---|---|
| **Project / Site name:** | Plot R - Kingsway Business Park | **Samples received on:** | 05/07/2023 |
| **Your job number:** | 232081 | **Samples instructed on/ Analysis started on:** | 07/07/2023 |
| **Your order number:** | 5320 | **Analysis completed by:** | 24/07/2023 |
| **Report Issue Number:** | 2 | **Report issued on:** | 28/07/2023 |
| **Samples Analysed:** | 8 soil samples | | |

Izabela Wójcik
**Signed:**

Izabela Wójcik
Reporting Specialist
**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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The results included within the report relate only to the sample(s) submitted for testing.

**Analytical Report Number: 23-43728**
**Project / Site name: Plot R - Kingsway Business Park**
**Your Order No: 5320**

| Lab Sample Number | | | | 2740096 | 2740097 | 2740098 | 2740099 | 2740100 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP01 | TP02 | TP03 | TP04 | BH01 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.10-0.20 | 0.10-0.20 | 0.10-0.20 | 0.10-0.20 | 0.20-0.30 |
| **Date Sampled** | | | | 03/07/2023 | 03/07/2023 | 03/07/2023 | 03/07/2023 | 03/07/2023 |
| **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 | 18 | 17 | 14 | 14 | 12 |
| Total mass of sample received | kg | 0.001 | NONE | 1.3 | 1.3 | 0.8 | 0.8 | 1.3 |
| Asbestos in Soil Screen / Identification Name | Type | N/A | ISO 17025 | Chrysotile & Crocidolite | - | Chrysotile & Crocidolite | - | - |
| Asbestos in Soil | Type | N/A | ISO 17025 | Detected | Not-detected | Detected | Not-detected | Not-detected |
| Asbestos Quantification (Stage 2) | % | 0.001 | ISO 17025 | < 0.001 | - | 0.359 | - | - |
| Asbestos Quantification Total | % | 0.001 | ISO 17025 | < 0.001 | - | 0.359 | - | - |
| Asbestos Analyst ID | N/A | N/A | N/A | WEM | WEM | WEM | WEM | WEM |
| **General Inorganics** | | | | | | | | |
| pH - Automated | pH Units | N/A | MCERTS | 6.6 | 4.9 | 7.8 | 7.3 | 8.5 |
| Total Cyanide | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Complex 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 |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | 0.018 | 0.0039 | 0.025 | 0.0092 | 0.25 |
| Total Sulphur | mg/kg | 50 | MCERTS | 1200 | 450 | 1100 | 460 | 550 |
| Fraction Organic Carbon (FOC) Automated | N/A | 0.001 | MCERTS | 0.03 | 0.032 | 0.03 | 0.034 | 0.019 |
| **Total Phenols** | | | | | | | | |
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | 1.7 | < 1.0 | < 1.0 | < 1.0 |
| **Speciated PAHs** | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | 0.15 | < 0.05 | 0.4 | < 0.05 | 1.3 |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.09 | < 0.05 | < 0.05 |
| Acenaphthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.32 | < 0.05 | 0.64 |
| Fluorene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.23 | < 0.05 | 0.49 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | 0.39 | 0.15 | 3.6 | 0.45 | 4 |
| Anthracene | mg/kg | 0.05 | MCERTS | 0.07 | < 0.05 | 0.55 | 0.09 | 0.95 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | 0.51 | 0.21 | 5 | 0.72 | 4.2 |
| Pyrene | mg/kg | 0.05 | MCERTS | 0.44 | 0.22 | 4.5 | 0.7 | 4 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | 0.3 | 0.11 | 2.1 | 0.35 | 1.6 |
| Chrysene | mg/kg | 0.05 | MCERTS | 0.34 | 0.14 | 2.2 | 0.43 | 1.9 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | ISO 17025 | 0.38 | 0.18 | 2.3 | 0.48 | 2 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | ISO 17025 | 0.16 | 0.06 | 1.1 | 0.17 | 0.65 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | 0.24 | 0.12 | 1.9 | 0.36 | 1.7 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | 0.17 | 0.06 | 1.2 | 0.17 | 0.91 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.23 | < 0.05 | 0.18 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | 0.19 | 0.09 | 1.3 | 0.24 | 1 |
| **Total PAH** | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | ISO 17025 | 3.34 | 1.34 | 26.9 | 4.16 | 25.4 |

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**Analytical Report Number: 23-43728**
**Project / Site name: Plot R - Kingsway Business Park**
**Your Order No: 5320**

| Lab Sample Number | | | | 2740096 | 2740097 | 2740098 | 2740099 | 2740100 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP01 | TP02 | TP03 | TP04 | BH01 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.10-0.20 | 0.10-0.20 | 0.10-0.20 | 0.10-0.20 | 0.20-0.30 |
| **Date Sampled** | | | | 03/07/2023 | 03/07/2023 | 03/07/2023 | 03/07/2023 | 03/07/2023 |
| **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 | 130 | 17 | 120 | 15 | 11 |
| Barium (aqua regia extractable) | mg/kg | 1 | MCERTS | 2000 | 87 | 2200 | 94 | 100 |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | 9 | 0.91 | 7.8 | 0.79 | 0.66 |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | 0.4 | 0.7 | 0.8 | 0.7 | 0.4 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Chromium (hexavalent) | mg/kg | 1.8 | MCERTS | < 1.8 | 1.8 | < 1.8 | < 1.8 | < 1.8 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 41 | 18 | 40 | 18 | 15 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 260 | 41 | 270 | 39 | 31 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 220 | 70 | 360 | 70 | 57 |
| 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 | 100 | 16 | 100 | 16 | 14 |
| 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 | 260 | 33 | 230 | 29 | 25 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 230 | 68 | 270 | 74 | 61 |
| **Monoaromatics & Oxygenates** | | | | | | | | |
| Benzene | µg/kg | 5 | MCERTS | < 5.0 | - | - | - | - |
| Toluene | µg/kg | 5 | MCERTS | < 5.0 | - | - | - | - |
| Ethylbenzene | µg/kg | 5 | MCERTS | < 5.0 | - | - | - | - |
| p & m-xylene | µg/kg | 5 | MCERTS | < 5.0 | - | - | - | - |
| o-xylene | µg/kg | 5 | MCERTS | < 5.0 | - | - | - | - |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 5 | NONE | < 5.0 | - | - | - | - |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$ | mg/kg | 10 | MCERTS | 27 | 14 | 75 | 14 | 72 |
| TPH2 (C6 - C10) $_{HS\_1D\_TOTAL}$ | mg/kg | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$ | mg/kg | 0.1 | NONE | < 0.1 | - | - | - | - |
| TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$ | mg/kg | 0.1 | NONE | < 0.1 | - | - | - | - |
| TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$ | mg/kg | 0.1 | NONE | < 0.1 | - | - | - | - |
| TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$ | mg/kg | 1 | MCERTS | < 1.0 | - | - | - | - |
| TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$ | mg/kg | 2 | MCERTS | < 2.0 | - | - | - | - |
| TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | < 8.0 | - | - | - | - |
| TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | 19 | - | - | - | - |
| TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$ | mg/kg | 10 | NONE | 21 | - | - | - | - |
| TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$ | mg/kg | 0.1 | NONE | < 0.1 | - | - | - | - |
| TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$ | mg/kg | 0.1 | NONE | < 0.1 | - | - | - | - |
| TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$ | mg/kg | 0.1 | NONE | < 0.1 | - | - | - | - |
| TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$ | mg/kg | 1 | MCERTS | < 1.0 | - | - | - | - |
| TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$ | mg/kg | 2 | MCERTS | < 2.0 | - | - | - | - |
| TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | < 10 | - | - | - | - |
| TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | < 10 | - | - | - | - |
| TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$ | mg/kg | 10 | NONE | < 10 | - | - | - | - |

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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

**Analytical Report Number: 23-43728**
**Project / Site name: Plot R - Kingsway Business Park**
**Your Order No: 5320**

| Lab Sample Number | | | | 2740101 | 2740102 | 2740103 |
|---|---|---|---|---|---|---|
| **Sample Reference** | | | | BH02 | BH02 | BH02 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.10-0.20 | 2.30-2.40 | 2.50-2.60 |
| **Date Sampled** | | | | 04/07/2023 | 04/07/2023 | 04/07/2023 |
| **Time Taken** | | | | 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 | 17 | 21 | 15 |
| Total mass of sample received | kg | 0.001 | NONE | 1.3 | 1.3 | 1.3 |
| Asbestos in Soil Screen / Identification Name | Type | N/A | ISO 17025 | - | - | - |
| Asbestos in Soil | Type | N/A | ISO 17025 | Not-detected | - | - |
| Asbestos Quantification (Stage 2) | % | 0.001 | ISO 17025 | - | - | - |
| Asbestos Quantification Total | % | 0.001 | ISO 17025 | - | - | - |
| Asbestos Analyst ID | N/A | N/A | N/A | WEM | N/A | N/A |
| **General Inorganics** | | | | | | |
| pH - Automated | pH Units | N/A | MCERTS | 7.5 | 7 | 4.7 |
| Total Cyanide | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 |
| Complex Cyanide | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 |
| Free Cyanide | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | 0.055 | 0.049 | 0.028 |
| Total Sulphur | mg/kg | 50 | MCERTS | 350 | 400 | 220 |
| Fraction Organic Carbon (FOC) Automated | N/A | 0.001 | MCERTS | 0.022 | 0.026 | 0.0053 |
| **Total Phenols** | | | | | | |
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 |
| **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 | < 0.05 | < 0.05 | < 0.05 |
| Fluorene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | 0.17 | 0.22 | < 0.05 |
| Anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | 0.2 | 0.45 | < 0.05 |
| Pyrene | mg/kg | 0.05 | MCERTS | 0.2 | 0.4 | < 0.05 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | 0.07 | 0.22 | < 0.05 |
| Chrysene | mg/kg | 0.05 | MCERTS | 0.11 | 0.27 | < 0.05 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | ISO 17025 | 0.09 | 0.37 | < 0.05 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | ISO 17025 | < 0.05 | 0.08 | < 0.05 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | 0.05 | 0.23 | < 0.05 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.15 | < 0.05 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.17 | < 0.05 |
| **Total PAH** | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | ISO 17025 | 0.89 | 2.56 | < 0.80 |

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

**Analytical Report Number: 23-43728**
**Project / Site name: Plot R - Kingsway Business Park**
**Your Order No: 5320**

| Lab Sample Number | | | | 2740101 | 2740102 | 2740103 |
|---|---|---|---|---|---|---|
| Sample Reference | | | | BH02 | BH02 | BH02 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 0.10-0.20 | 2.30-2.40 | 2.50-2.60 |
| Date Sampled | | | | 04/07/2023 | 04/07/2023 | 04/07/2023 |
| Time Taken | | | | 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 | 8.6 | 11 | 6.7 |
| Barium (aqua regia extractable) | mg/kg | 1 | MCERTS | 120 | 110 | 190 |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | 0.95 | 0.93 | 0.98 |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | 0.3 | 0.4 | < 0.2 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 |
| Chromium (hexavalent) | mg/kg | 1.8 | MCERTS | < 1.8 | < 1.8 | < 1.8 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 21 | 21 | 25 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 29 | 30 | 27 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 25 | 39 | 14 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 26 | 22 | 18 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | 26 | 28 | 29 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 66 | 62 | 37 |
| **Monoaromatics & Oxygenates** | | | | | | |
| Benzene | µg/kg | 5 | MCERTS | < 5.0 | - | - |
| Toluene | µg/kg | 5 | MCERTS | < 5.0 | - | - |
| Ethylbenzene | µg/kg | 5 | MCERTS | < 5.0 | - | - |
| p & m-xylene | µg/kg | 5 | MCERTS | < 5.0 | - | - |
| o-xylene | µg/kg | 5 | MCERTS | < 5.0 | - | - |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 5 | NONE | < 5.0 | - | - |
| **Petroleum Hydrocarbons** | | | | | | |
| TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$ | mg/kg | 10 | MCERTS | 20 | < 10 | < 10 |
| TPH2 (C6 - C10) $_{HS\_1D\_TOTAL}$ | mg/kg | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$ | mg/kg | 0.1 | NONE | < 0.1 | - | - |
| TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$ | mg/kg | 0.1 | NONE | < 0.1 | - | - |
| TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$ | mg/kg | 0.1 | NONE | < 0.1 | - | - |
| TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$ | mg/kg | 1 | MCERTS | < 1.0 | - | - |
| TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$ | mg/kg | 2 | MCERTS | < 2.0 | - | - |
| TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | < 8.0 | - | - |
| TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$ | mg/kg | 8 | MCERTS | < 8.0 | - | - |
| TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$ | mg/kg | 10 | NONE | < 10 | - | - |
| TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$ | mg/kg | 0.1 | NONE | < 0.1 | - | - |
| TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$ | mg/kg | 0.1 | NONE | < 0.1 | - | - |
| TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$ | mg/kg | 0.1 | NONE | < 0.1 | - | - |
| TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$ | mg/kg | 1 | MCERTS | < 1.0 | - | - |
| TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$ | mg/kg | 2 | MCERTS | < 2.0 | - | - |
| TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | < 10 | - | - |
| TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$ | mg/kg | 10 | MCERTS | < 10 | - | - |
| TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$ | mg/kg | 10 | NONE | < 10 | - | - |

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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

**Analytical Report Number:** 23-43728
**Project / Site name:** Plot R - Kingsway Business Park
**Your Order No:** 5320

# 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 |
|---|---|---|---|---|---|---|---|
| **2740096** | TP01 | 0.10-0.20 | 190 | Loose Fibres & Loose Fibrous Debris | **Chrysotile & Crocidolite** | < 0.001 | **< 0.001** |
| **2740098** | TP03 | 0.10-0.20 | 121 | Loose Fibrous Debris | **Chrysotile & Crocidolite** | 0.359 | **0.359** |

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

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**Analytical Report Number : 23-43728**
**Project / Site name: Plot R - Kingsway Business Park**

* 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 * |
|---|---|---|---|---|
| 2740096 | TP01 | None Supplied | 0.10-0.20 | Brown loam and sand with gravel and vegetation. |
| 2740097 | TP02 | None Supplied | 0.10-0.20 | Brown loam and clay with gravel and vegetation. |
| 2740098 | TP03 | None Supplied | 0.10-0.20 | Brown loam and sand with gravel and vegetation. |
| 2740099 | TP04 | None Supplied | 0.10-0.20 | Brown loam and sand with gravel and vegetation. |
| 2740100 | BH01 | None Supplied | 0.20-0.30 | Brown loam and clay with gravel and vegetation. |
| 2740101 | BH02 | None Supplied | 0.10-0.20 | Brown clay and loam with gravel and vegetation. |
| 2740102 | BH02 | None Supplied | 2.30-2.40 | Brown clay and loam with gravel and vegetation. |
| 2740103 | BH02 | None Supplied | 2.50-2.60 | Brown clay. |

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**Analytical Report Number : 23-43728**
**Project / Site name: Plot R - Kingsway Business Park**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| 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 dispersion 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 |
| Complex Cyanide in soil | Determination of complex cyanide by calculation. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar) | 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 |
| Moisture Content | Moisture content, determined gravimetrically. (30 oC) | In house method. | L019-UK/PL | W | NONE |
| Monohydric phenols in soil | Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar) | L080-PL | W | MCERTS |
| 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 |
| 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 |
| Total Sulphur in soil | Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES. | In house method. | L038-PL | D | MCERTS |
| TPH2 (Soil) | Determination of hydrocarbons C6-C10 by headspace GC-MS. | In-house method based on USEPA8260 | L088-PL | W | NONE |
| 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 |
| BTEX and MTBE in soil (Monoaromatics) | Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited | In-house method based on USEPA8260 | L073B-PL | W | MCERTS |
| TPHCWG (Soil) | Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID. | In-house method with silica gel split/clean up. | L088/76-PL | W | 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 | D | MCERTS |

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**Analytical Report Number : 23-43728**
**Project / Site name: Plot R - Kingsway Business Park**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| 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 |
| Fraction Organic Carbon FOC Automated | Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate. | In house method | L009 | D | MCERTS |
| Hexavalent chromium in soil | Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry. | In-house method | L080-PL | W | MCERTS |

**For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).**
**For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).**
**For method numbers ending in 'PL or B' 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.**

## Information in Support of Analytical Results

### List of HWOL Acronyms and Operators

| Acronym | Descriptions |
|---|---|
| HS | Headspace Analysis |
| MS | Mass spectrometry |
| FID | Flame Ionisation Detector |
| GC | Gas Chromatography |
| EH | Extractable Hydrocarbons (i.e. everything extracted by the solvent(s)) |
| CU | Clean-up - e.g. by Florisil®, silica gel |
| 1D | GC - Single coil/column gas chromatography |
| 2D | GC-GC - Double coil/column gas chromatography |
| Total | Aliphatics & Aromatics |
| AL | Aliphatics |
| AR | Aromatics |
| #1 | EH_2D_Total but with humics mathematically subtracted |
| #2 | EH_2D_Total but with fatty acids mathematically subtracted |
| _ | Operator - understore to separate acronyms (exception for +) |
| + | Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total |

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# Appendix 6: Groundwater Analysis Results

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# Analytical Report Number : 22-87539

Replaces Analytical Report Number: 22-87539, issue no. 1
Additional analysis undertaken.

| | | | |
|---|---|---|---|
| **Project / Site name:** | Plot P, Kingsway Business park | **Samples received on:** | 30/09/2022 |
| **Your job number:** | 210939 | **Samples instructed on/ Analysis started on:** | 30/09/2022 |
| **Your order number:** | PO 2881 | **Analysis completed by:** | 11/10/2022 |
| **Report Issue Number:** | 2 | **Report issued on:** | 17/10/2022 |
| **Samples Analysed:** | 4 water samples | | |

**Signed:**

Adam Fenwick
Technical Reviewer
**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.

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

**Analytical Report Number: 22-87539**
**Project / Site name: Plot P, Kingsway Business park**

**Your Order No: PO 2881**

| **Lab Sample Number** | | | | 2445272 | 2445273 | 2445274 | 2445275 |
|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | BH02 | BH03 | BH04 | BH05 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Date Sampled** | | | | 29/09/2022 | 29/09/2022 | 29/09/2022 | 29/09/2022 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Water Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | |
| **General Inorganics** | | | | | | | |
| pH | pH Units | N/A | ISO 17025 | 6.3 | 6.4 | 7.2 | 7.1 |
| Electrical Conductivity at 20 °C | µS/cm | 10 | ISO 17025 | 320 | 580 | 670 | 430 |
| Total Cyanide | µg/l | 10 | ISO 17025 | < 10 | < 10 | < 10 | < 10 |
| Sulphate as SO4 | µg/l | 45 | ISO 17025 | 93200 | 65600 | 31600 | 10400 |
| Sulphate as SO4 | mg/l | 0.045 | ISO 17025 | 93.2 | 65.6 | 31.6 | 10.4 |
| Ammoniacal Nitrogen as N | µg/l | 15 | ISO 17025 | 72 | 28 | 25 | 41 |
| Dissolved Organic Carbon (DOC) | mg/l | 0.1 | ISO 17025 | 2.28 | 13.3 | 5.4 | 18.9 |
| Hardness - Total | mgCaCO3/l | 1 | ISO 17025 | 478 | 374 | 443 | 290 |
| **Total Phenols** | | | | | | | |
| Total Phenols (monohydric) | µg/l | 10 | ISO 17025 | < 10 | < 10 | < 10 | < 10 |
| **Speciated PAHs** | | | | | | | |
| Naphthalene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Acenaphthylene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Acenaphthene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Fluorene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Phenanthrene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Anthracene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Fluoranthene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Pyrene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Benzo(a)anthracene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Chrysene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Benzo(b)fluoranthene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Benzo(k)fluoranthene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Benzo(a)pyrene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Indeno(1,2,3-cd)pyrene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Dibenz(a,h)anthracene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Benzo(ghi)perylene | µg/l | 0.01 | ISO 17025 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| **Total PAH** | | | | | | | |
| Total EPA-16 PAHs | µg/l | 0.16 | ISO 17025 | < 0.16 | < 0.16 | < 0.16 | < 0.16 |

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**Analytical Report Number: 22-87539**
**Project / Site name: Plot P, Kingsway Business park**

**Your Order No: PO 2881**

| **Lab Sample Number** | | | | 2445272 | 2445273 | 2445274 | 2445275 |
|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | BH02 | BH03 | BH04 | BH05 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Date Sampled** | | | | 29/09/2022 | 29/09/2022 | 29/09/2022 | 29/09/2022 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Water Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | |
| **Heavy Metals / Metalloids** | | | | | | | |
| Boron (dissolved) | µg/l | 10 | ISO 17025 | 83 | 29 | 96 | 20 |
| Calcium (dissolved) | mg/l | 0.012 | ISO 17025 | 170 | 140 | 120 | 110 |
| Chromium (hexavalent) | µg/l | 5 | ISO 17025 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Magnesium (dissolved) | mg/l | 0.005 | ISO 17025 | 12 | 3.9 | 34 | 3.6 |
| Arsenic (dissolved) | µg/l | 0.15 | ISO 17025 | 0.16 | 3.05 | 0.31 | 1.34 |
| Barium (dissolved) | µg/l | 0.06 | ISO 17025 | 55 | 190 | 220 | 180 |
| Beryllium (dissolved) | µg/l | 0.1 | ISO 17025 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Cadmium (dissolved) | µg/l | 0.02 | ISO 17025 | 0.23 | 0.04 | 0.05 | 0.15 |
| Chromium (dissolved) | µg/l | 0.2 | ISO 17025 | < 0.2 | 1.2 | < 0.2 | 1.4 |
| Copper (dissolved) | µg/l | 0.5 | ISO 17025 | 1.7 | 3 | 8.6 | 12 |
| Lead (dissolved) | µg/l | 0.2 | ISO 17025 | < 0.2 | 0.2 | < 0.2 | 0.5 |
| Mercury (dissolved) | µg/l | 0.05 | ISO 17025 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Nickel (dissolved) | µg/l | 0.5 | ISO 17025 | 4.4 | 5.8 | 4.8 | 8.6 |
| Selenium (dissolved) | µg/l | 0.6 | ISO 17025 | 1.5 | 1.5 | < 0.6 | 1 |
| Vanadium (dissolved) | µg/l | 0.2 | ISO 17025 | < 0.2 | 2.3 | 0.3 | 3.8 |
| Zinc (dissolved) | µg/l | 0.5 | ISO 17025 | 42 | 9.6 | 6.5 | 4.7 |
| **Petroleum Hydrocarbons** | | | | | | | |
| TPH1 (C10 - C40) EH_1D_TOTAL_MS | µg/l | 10 | ISO 17025 | < 10 | < 10 | < 10 | < 10 |
| TPH2 (C6 - C10) HS_1D_TOTAL | µg/l | 10 | ISO 17025 | < 10 | < 10 | < 10 | < 10 |

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.

4041

**Analytical Report Number : 22-87539**
**Project / Site name: Plot P, Kingsway Business park**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| Metals in water by ICP-OES (dissolved) | Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn). | In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil. | L039-PL | W | ISO 17025 |
| Metals in water by ICP-MS (dissolved) | Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW. | In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS. | L012-PL | W | ISO 17025 |
| Boron in water | Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW | In-house method based on MEWAM | L039-PL | W | ISO 17025 |
| Hexavalent chromium in water | Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry. | In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW. | L080-PL | W | ISO 17025 |
| Electrical conductivity at 20oC of water | Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW | In-house method | L031-PL | W | ISO 17025 |
| Total Hardness of water | Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L045-PL | W | ISO 17025 |
| Monohydric phenols in water | Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar) | L080-PL | W | ISO 17025 |
| Speciated EPA-16 PAHs in water | Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW | In-house method based on USEPA 8270 | L102B-PL | W | ISO 17025 |
| Sulphate in water | Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW. | In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil. | L039-PL | W | ISO 17025 |
| TPH2 (Waters) | Determination of hydrocarbons C6-C10 by headspace GC-MS. Accredited Matrices SW, PW. GW. | In-house method based on USEPA8260 | L088-PL | W | ISO 17025 |
| Total cyanide in water | Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar) | L080-PL | W | ISO 17025 |
| Dissolved Organic Carbon in water | Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L037-PL | W | ISO 17025 |
| Ammoniacal Nitrogen as N in water | Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method. Accredited matrices SW, GW, PW. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L082-PL | W | ISO 17025 |

4041

**Analytical Report Number : 22-87539**
**Project / Site name: Plot P, Kingsway Business park**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| pH at 20oC in water (automated) | Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW | In house method. | L099-PL | W | ISO 17025 |
| TPH1 (Waters) | Determination of dichloromethane extractable hydrocarbons in water by GC-MS. | In-house method | L070-PL | W | ISO 17025 |

**For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).**
**For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).**
**For method numbers ending in 'PL or B' 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.**

## Information in Support of Analytical Results

### List of HWOL Acronyms and Operators

| Acronym | Descriptions |
|---|---|
| HS | Headspace Analysis |
| MS | Mass spectrometry |
| FID | Flame Ionisation Detector |
| GC | Gas Chromatography |
| EH | Extractable Hydrocarbons (i.e. everything extracted by the solvent(s)) |
| CU | Clean-up - e.g. by Florisil®, silica gel |
| 1D | GC - Single coil/column gas chromatography |
| 2D | GC-GC - Double coil/column gas chromatography |
| Total | Aliphatics & Aromatics |
| AL | Aliphatics |
| AR | Aromatics |
| #1 | EH_2D_Total but with humics mathematically subtracted |
| #2 | EH_2D_Total but with fatty acids mathematically subtracted |
| _ | Operator - understore to separate acronyms (exception for +) |
| + | Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total |

# Sample Deviation Report

**Analytical Report Number : 22-87539**
**Project / Site name: Plot P, Kingsway Business park**

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

| Sample ID | Other ID | Sample Type | Lab Sample Number | Sample Deviation | Test Name | Test Ref | Test Deviation |
|---|---|---|---|---|---|---|---|
| BH02 | None Supplied | W | 2445272 | c | Ammoniacal Nitrogen as N in water | L082-PL | c |
| BH02 | None Supplied | W | 2445272 | c | Electrical conductivity at 20oC of water | L031-PL | c |
| BH02 | None Supplied | W | 2445272 | c | pH at 20oC in water (automated) | L099-PL | c |
| BH03 | None Supplied | W | 2445273 | c | Ammoniacal Nitrogen as N in water | L082-PL | c |
| BH03 | None Supplied | W | 2445273 | c | Electrical conductivity at 20oC of water | L031-PL | c |
| BH03 | None Supplied | W | 2445273 | c | pH at 20oC in water (automated) | L099-PL | c |
| BH04 | None Supplied | W | 2445274 | c | Ammoniacal Nitrogen as N in water | L082-PL | c |
| BH04 | None Supplied | W | 2445274 | c | Electrical conductivity at 20oC of water | L031-PL | c |
| BH04 | None Supplied | W | 2445274 | c | pH at 20oC in water (automated) | L099-PL | c |
| BH05 | None Supplied | W | 2445275 | c | Ammoniacal Nitrogen as N in water | L082-PL | c |
| BH05 | None Supplied | W | 2445275 | c | Electrical conductivity at 20oC of water | L031-PL | c |
| BH05 | None Supplied | W | 2445275 | c | pH at 20oC in water (automated) | L099-PL | c |

# Appendix 7: Geotechnical Analysis Results

**Analytical Report Number: 23-43846**
**Project / Site name: Plot R, Kingsway Business Park, Rochdale**
**Your Order No: PO5321**

| **Lab Sample Number** | | | | 2740800 | 2740801 | 2740802 | 2740803 | 2740804 | 2740805 | 2740806 | 2740807 | 2740808 | 2740809 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | TP01 | TP03 | TP03 | TP04 | BH01 | BH01 | BH01 | BH02 | BH02 | BH02 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 1.50 | 0.50-1.00 | 3.00 | 2.50 | 0.10-0.50 | 0.80 | 6.00 | 3.50 | 6.50 | 9.00 |
| **Date Sampled** | | | | Deviating | Deviating | Deviating | Deviating | Deviating | Deviating | Deviating | Deviating | Deviating | Deviating |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied | 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 | 44 | < 0.1 | < 0.1 | 19 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Moisture Content | % | 0.01 | NONE | 17 | 13 | 7.3 | 4.6 | 8.8 | 15 | 18 | 3.9 | 16 | 18 |
| Total mass of sample received | kg | 0.001 | NONE | 0.3 | 0.3 | 0.7 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.7 | 0.7 |
| **General Inorganics** | | | | | | | | | | | | | |
| pH - Automated | pH Units | N/A | MCERTS | 7.8 | 7.8 | 8.2 | 7.8 | 7.8 | 7.5 | 8.8 | 8 | 8.6 | 7.3 |
| Total Sulphate as SO4 | % | 0.005 | MCERTS | 0.014 | 0.087 | 0.012 | 0.007 | 0.01 | 0.015 | 0.006 | < 0.005 | 0.007 | 0.005 |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | 0.0084 | 0.03 | 0.0067 | 0.0033 | 0.01 | 0.017 | 0.0017 | 0.0019 | 0.0035 | 0.0025 |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | mg/l | 1.25 | MCERTS | 8.4 | 30.3 | 6.7 | 3.3 | 10.1 | 16.8 | 1.7 | 1.9 | 3.5 | 2.5 |
| Water Soluble Chloride (2:1) (leachate equivalent) | mg/l | 0.5 | MCERTS | 1.7 | 1.2 | 0.5 | < 0.5 | 1.1 | 1.8 | 2.6 | < 0.5 | 3.2 | 4.5 |
| Total Sulphur | % | 0.005 | MCERTS | 0.009 | 0.105 | 0.009 | < 0.005 | 0.007 | 0.011 | < 0.005 | < 0.005 | < 0.005 | 0.006 |
| Water Soluble Nitrate (2:1) as N (leachate equivalent) | mg/l | 2 | NONE | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| **Heavy Metals / Metalloids** | | | | | | | | | | | | | |
| Magnesium (water soluble) | mg/kg | 5 | NONE | < 5.0 | 7.1 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Magnesium (leachate equivalent) | mg/l | 2.5 | NONE | < 2.5 | 3.5 | < 2.5 | < 2.5 | < 2.5 | < 2.5 | < 2.5 | < 2.5 | < 2.5 | < 2.5 |

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

# TEST CERTIFICATE

**DETERMINATION OF LIQUID AND PLASTIC LIMITS**

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

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

4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 232081 |
| Client Address: | 11 Borough High Street, London, SE1 9SE | Job Number: | 23-43844-1 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/07/2023 |
| Contact: | Paolo Moniz | Date Tested: | 17/07/2023 |
| Site Address: | Plol R, Kingsway Business Park, Rochdale | Sampled By: | Not Given |

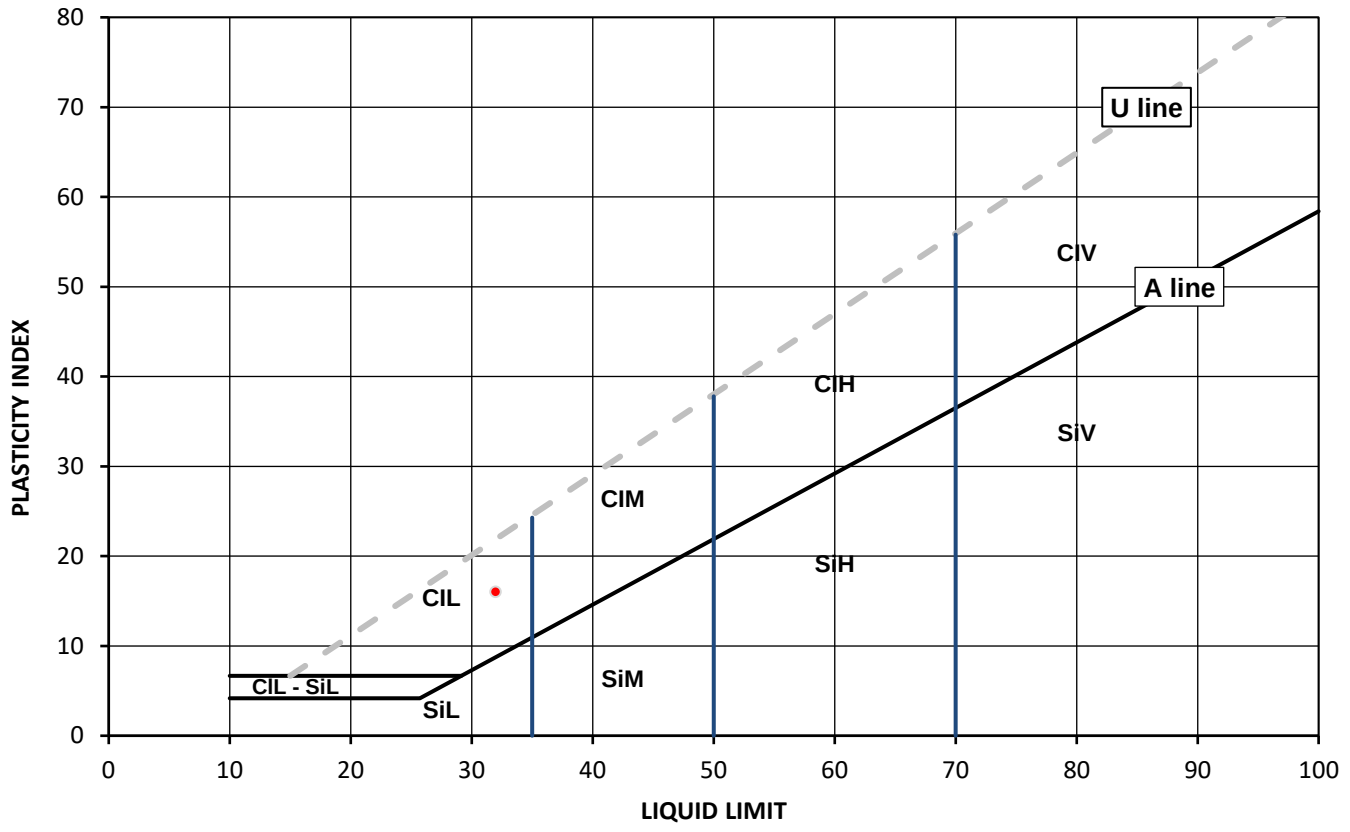
*Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland*

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2740788 | Depth Top [m]: | 1.00 |
| Hole No.: | TP02 | Depth Base [m]: | 1.50 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brown sandy CLAY | | |

Sample Preparation: Tested after washing to remove >425um

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 21 | 32 | 16 | 16 | 92 |




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: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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.

**Signed:** Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 21/08/2023

**GF 236.13**

# TEST CERTIFICATE

**DETERMINATION OF LIQUID AND PLASTIC LIMITS**

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

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

4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 232081 |
| Client Address: | 11 Borough High Street, London, SE1 9SE | Job Number: | 23-43844-1 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/07/2023 |
| Contact: | Paolo Moniz | Date Tested: | 17/07/2023 |
| Site Address: | Plol R, Kingsway Business Park, Rochdale | Sampled By: | Not Given |

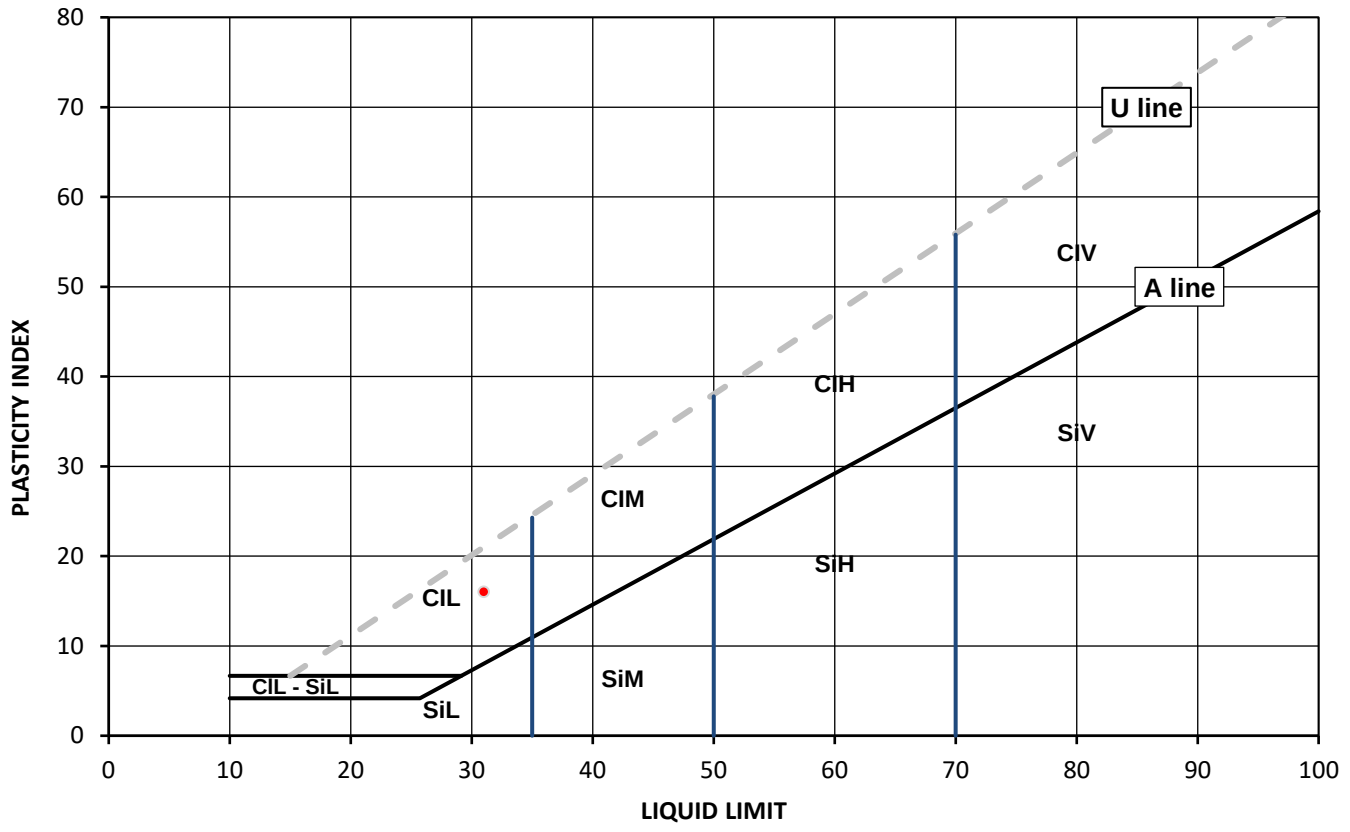
*Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland*

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2740790 | Depth Top [m]: | 0.70 |
| Hole No.: | TP04 | Depth Base [m]: | 1.10 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brown sandy CLAY | | |

Sample Preparation: Tested after washing to remove >425um

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 15 | 31 | 15 | 16 | 90 |




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: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Katarzyna Koziel
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 21/08/2023

**GF 236.13**

# TEST CERTIFICATE

**DETERMINATION OF LIQUID AND PLASTIC LIMITS**
Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

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

4041

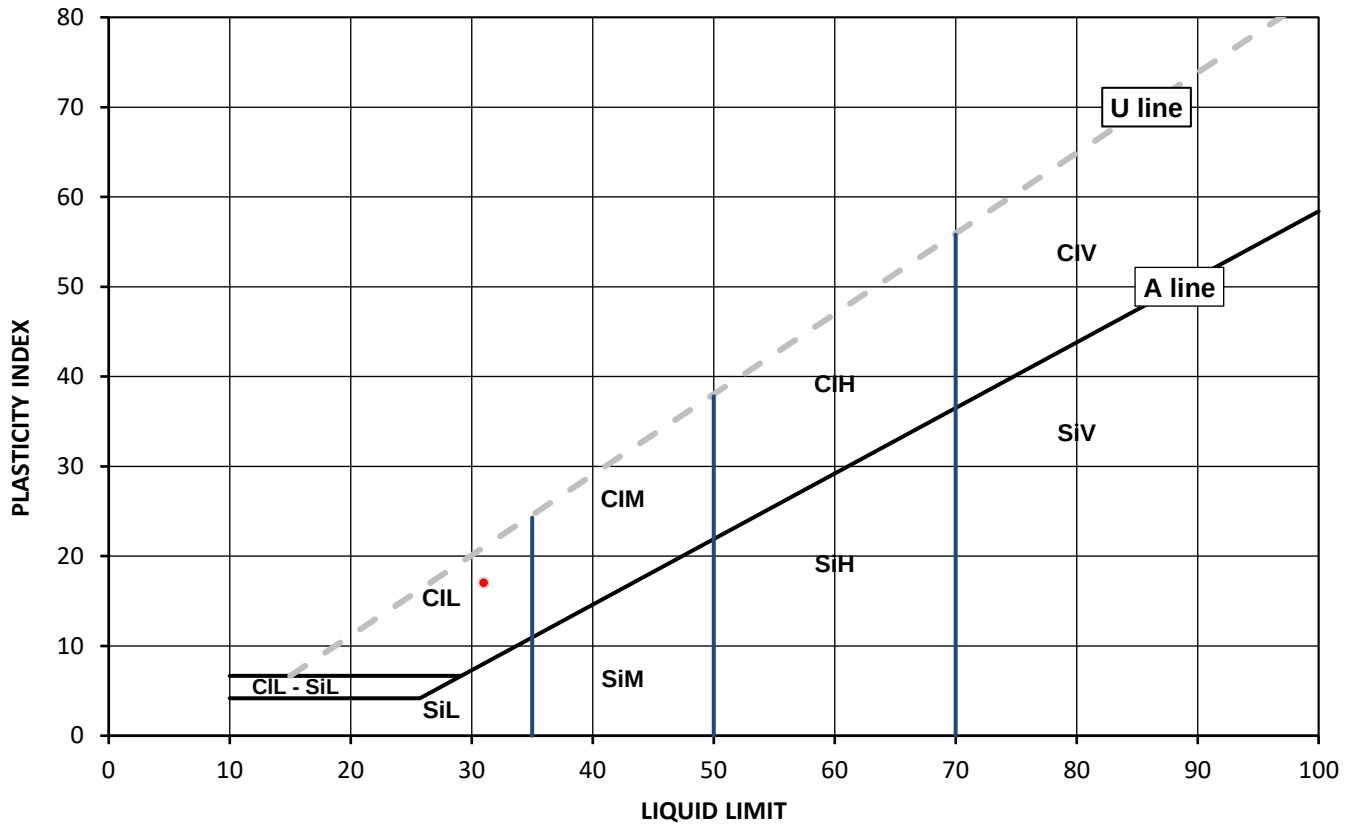
| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 232081 |
| Client Address: | 11 Borough High Street, London, SE1 9SE | Job Number: | 23-43844-1 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/07/2023 |
| Contact: | Paolo Moniz | Date Tested: | 18/07/2023 |
| Site Address: | Plol R, Kingsway Business Park, Rochdale | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2740794 | Depth Top [m]: | 0.80 |
| Hole No.: | BH01 | Depth Base [m]: | Not Given |
| Sample Reference: | Not Given | Sample Type: | D |
| Sample Description: | Brown slightly gravelly very sandy CLAY | | |
| Sample Preparation: | Tested after >425um removed by hand | | |

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 17 | 31 | 14 | 17 | 98 |




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: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Katarzyna Koziel
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**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 21/08/2023

**GF 236.13**

# TEST CERTIFICATE

**DETERMINATION OF LIQUID AND PLASTIC LIMITS**

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

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

4041

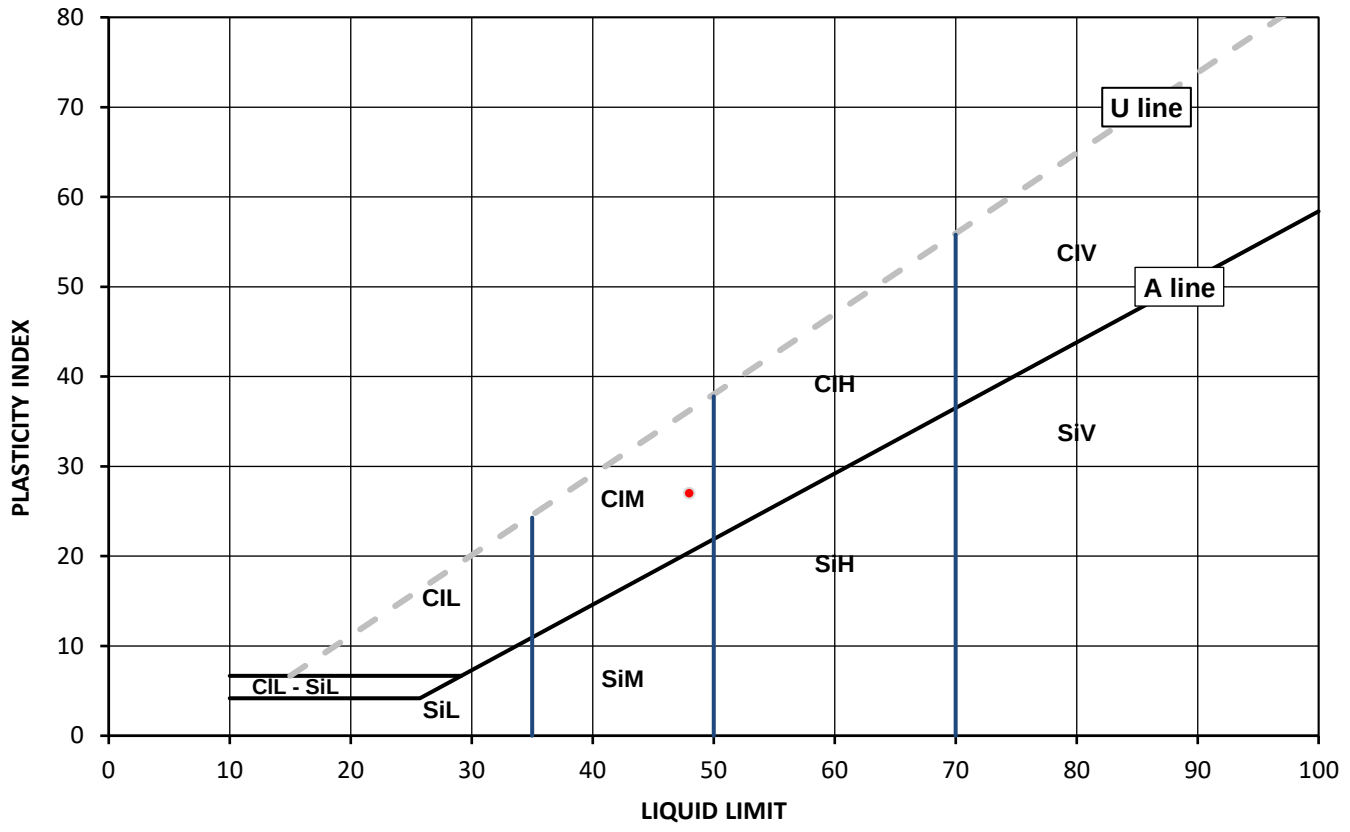
| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 232081 |
| Client Address: | 11 Borough High Street, London, SE1 9SE | Job Number: | 23-43844-1 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/07/2023 |
| Contact: | Paolo Moniz | Date Tested: | 17/07/2023 |
| Site Address: | Plol R, Kingsway Business Park, Rochdale | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2740796 | Depth Top [m]: | 2.50 |
| Hole No.: | BH02 | Depth Base [m]: | 3.00 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brownish grey sandy CLAY | | |
| Sample Preparation: | Tested after washing to remove >425um | | |

| As Received Water Content [ W ] % | Liquid Limit [ WL ] % | Plastic Limit [ Wp ] % | Plasticity Index [ Ip ] % | % Passing 425µm BS Test Sieve |
|---|---|---|---|---|
| 21 | 48 | 21 | 27 | 94 |




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: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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.

**Signed:** Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 21/08/2023

**GF 236.13**

# SUMMARY REPORT

## SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

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

4041

Client: BWB Consulting Limited

Client Address: 11 Borough High Street, London, SE1 9SE

Contact: Paolo Moniz

Site Address: Plol R, Kingsway Business Park, Rochdale

Water Content by BS 1377-2:1990: Clause 3.2Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5

Client Reference: 232081
Job Number: 23-43844-1
Date Sampled: Not Given
Date Received: 05/07/2023
Date Tested: 17/07 - 18/07/2023
Sampled By: Not Given

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

### Test results

| Laboratory Reference | Hole No. | Sample | | | | Description | Remarks | Water Content BS 1377-2 [ W ] | Water Content BS EN ISO 17892-2 [ W ] | Atterberg | | | | Density | | | Total Porosity# | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Reference | Depth Top | Depth Base | Type | | | | | % Passing 425um | WL | Wp | Ip | bulk | dry | PD | | | |
| | | | m | m | | | | % | % | % | % | % | % | Mg/m3 | Mg/m3 | Mg/m3 | % | | |
| 2740787 | TP01 | Not Given | 1.50 | Not Given | D | Brown CLAY | | 23 | | | | | | | | | | | |
| 2740788 | TP02 | Not Given | 1.00 | 1.50 | B | Brown sandy CLAY | Atterberg 4 Point | 21 | | 92 | 32 | 16 | 16 | | | | | | |
| 2740789 | TP03 | Not Given | 0.50 | 1.00 | B | Black gravelly clayey SAND with fragments of glass | | 21 | | | | | | | | | | | |
| 2740790 | TP04 | Not Given | 0.70 | 1.10 | B | Brown sandy CLAY | Atterberg 4 Point | 15 | | 90 | 31 | 15 | 16 | | | | | | |
| 2740791 | TP04 | Not Given | 2.00 | 2.40 | B | Brown clayey SAND | | 8.0 | | | | | | | | | | | |
| 2740792 | BH01 | Not Given | 0.10 | 0.50 | B | Brown gravelly SAND | | 11 | | | | | | | | | | | |
| 2740793 | BH01 | Not Given | 0.50 | 1.00 | B | Brown sandy CLAY with fragments of bricks | | 16 | | | | | | | | | | | |
| 2740794 | BH01 | Not Given | 0.80 | Not Given | D | Brown slightly gravelly very sandy CLAY | Atterberg 4 Point | 17 | | 98 | 31 | 14 | 17 | | | | | | |
| 2740795 | BH01 | Not Given | 6.00 | Not Given | D | Brown slightly gravelly SAND | | 17 | | | | | | | | | | | |
| 2740796 | BH02 | Not Given | 2.50 | 3.00 | B | Brownish grey sandy CLAY | Atterberg 4 Point | 21 | | 94 | 48 | 21 | 27 | | | | | | |

Note: # Non accredited; NP - Non plastic

Comments:

**Signed:**

Katarzyna Koziel
Reporting Specialist
**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:** 21/08/2023

**GF 238.16**

# SUMMARY REPORT

## SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

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

4041

Client: BWB Consulting Limited

Client Address: 11 Borough High Street, London, SE1 9SE

Contact: Paolo Moniz

Site Address: Plol R, Kingsway Business Park, Rochdale

Water Content by BS 1377-2:1990: Clause 3.2Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5

Client Reference: 232081
Job Number: 23-43844-1
Date Sampled: Not Given
Date Received: 05/07/2023
Date Tested: 17/07 - 18/07/2023
Sampled By: Not Given

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

**Test results**

| Laboratory Reference | Hole No. | Sample | | | | Description | Remarks | Water Content BS 1377-2 [ W ] | Water Content BS EN ISO 17892-2 [ W ] | Atterberg | | | | Density | | | Total Porosity# | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Reference | Depth Top | Depth Base | Type | | | | | % Passing 425um | WL | Wp | Ip | bulk | dry | PD | | | |
| | | | m | m | | | | % | % | % | % | % | % | Mg/m3 | Mg/m3 | Mg/m3 | % | | |
| 2740797 | BH02 | Not Given | 3.50 | Not Given | D | Brown SAND | | 4.3 | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
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Note: # Non accredited; NP - Non plastic

Comments:

**Signed:**

Katarzyna Koziel
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**

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**Date Reported:** 21/08/2023

**GF 238.16**

# SUMMARY REPORT

## DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

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

4041

Client: BWB Consulting Limited

Client Address: 11 Borough High Street, London, SE1 9SE

Contact: Paolo Moniz

Site Address: Plol R, Kingsway Business Park, Rochdale

Client Reference: 232081
Job Number: 23-43844-1
Date Sampled: Not Given
Date Received: 05/07/2023
Date Tested: 17/07 - 18/07/2023
Sampled By: Not Given

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

### Test results

| Laboratory Reference | Hole No. | Sample | | | | Description | Remarks | WC | Sample preparation / Oven temperature at the time of testing | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Reference | Depth Top m | Depth Base m | Type | | | % | | | | |
| 2740787 | TP01 | Not Given | 1.50 | Not Given | D | Brown CLAY | | 23 | Sample was quartered, oven dried at 108.3 °C | | | |
| 2740788 | TP02 | Not Given | 1.00 | 1.50 | B | Brown sandy CLAY | | 21 | Sample was quartered, oven dried at 109 °C | | | |
| 2740789 | TP03 | Not Given | 0.50 | 1.00 | B | Black gravelly clayey SAND with fragments of glass | | 21 | Sample was quartered, oven dried at 109 °C | | | |
| 2740790 | TP04 | Not Given | 0.70 | 1.10 | B | Brown sandy CLAY | | 15 | Sample was quartered, oven dried at 109 °C | | | |
| 2740791 | TP04 | Not Given | 2.00 | 2.40 | B | Brown clayey SAND | | 8.0 | Sample was quartered, oven dried at 106 °C | | | |
| 2740792 | BH01 | Not Given | 0.10 | 0.50 | B | Brown gravelly SAND | | 11 | Sample was quartered, oven dried at 106 °C | | | |
| 2740793 | BH01 | Not Given | 0.50 | 1.00 | B | Brown sandy CLAY with fragments of bricks | | 16 | Sample was quartered, oven dried at 106 °C | | | |
| 2740794 | BH01 | Not Given | 0.80 | Not Given | D | Brown slightly gravelly very sandy CLAY | | 17 | Sample was quartered, oven dried at 108.3 °C | | | |
| 2740795 | BH01 | Not Given | 6.00 | Not Given | D | Brown slightly gravelly SAND | | 17 | Sample was quartered, oven dried at 108.3 °C | | | |
| 2740796 | BH02 | Not Given | 2.50 | 3.00 | B | Brownish grey sandy CLAY | | 21 | Sample was quartered, oven dried at 109 °C | | | |

Comments:

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**Signed:** Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 21/08/2023

# SUMMARY REPORT

**DETERMINATION OF WATER CONTENT**

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

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

4041

Client: BWB Consulting Limited

Client Address: 11 Borough High Street, London,
SE1 9SE

Contact: Paolo Moniz

Site Address: Plol R, Kingsway Business Park, Rochdale

Client Reference: 232081
Job Number: 23-43844-1
Date Sampled: Not Given
Date Received: 05/07/2023
Date Tested: 18/07/2023
Sampled By: Not Given

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

## Test results

| Laboratory Reference | Hole No. | Sample | | | | Description | Remarks | WC | Sample preparation / Oven temperature at the time of testing | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Reference | Depth Top m | Depth Base m | Type | | | % | | | | |
| 2740797 | BH02 | Not Given | 3.50 | Not Given | D | Brown SAND | | 4.3 | Sample was quartered, oven dried at 108.3 °C | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
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Comments:

**Signed:** Katarzyna Koziel
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**

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**Date Reported:** 21/08/2023

**GF 099.17**

# TEST CERTIFICATE

**DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Tested in Accordance with: BS 1377-2: 1990

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

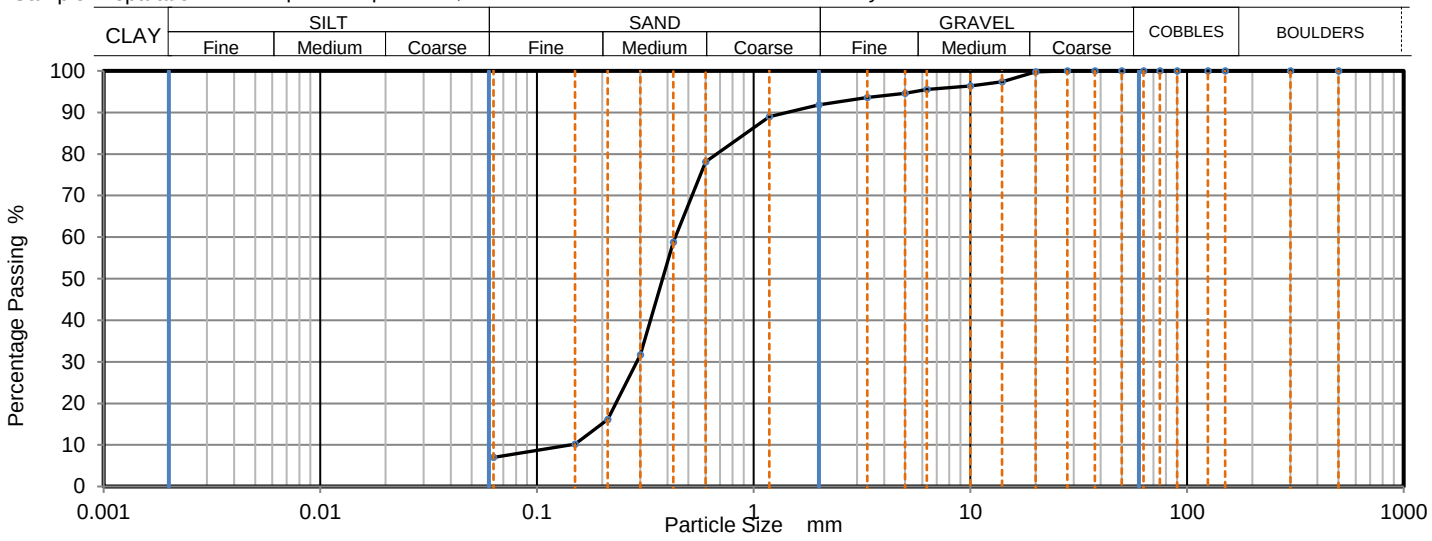
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 232081 |
| Client Address: | 11 Borough High Street, London, SE1 9SE | Job Number: | 23-43844-1 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/07/2023 |
| Contact: | Paolo Moniz | Date Tested: | 17/07/2023 |
| Site Address: | Plol R, Kingsway Business Park, Rochdale | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2740786 | Depth Top [m]: | 3.00 |
| Hole No.: | TP01 | Depth Base [m]: | 3.50 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Light brown SAND with fragments of shells | | |
| Sample Preparation: | Sample was quartered, oven dried at 109.0 °C and broken down by hand. | | |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | 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 | 97 | | |
| 10 | 96 | | |
| 6.3 | 96 | | |
| 5 | 95 | | |
| 3.35 | 94 | | |
| 2 | 92 | | |
| 1.18 | 89 | | |
| 0.6 | 78 | | |
| 0.425 | 59 | | |
| 0.3 | 32 | | |
| 0.212 | 16 | | |
| 0.15 | 10 | | |
| 0.063 | 7 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 8 |
| Sand | 85 |
| | |
| Fines <0.063mm | 7 |

| Grading Analysis | | |
|---|---|---|
| D100 | mm | 28 |
| D60 | mm | 0.435 |
| D30 | mm | 0.289 |
| D10 | mm | 0.14 |
| Uniformity Coefficient | | 3.1 |
| Curvature Coefficient | | 1.4 |

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

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

Remarks:

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**Signed:** Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 21/08/2023

**GF 100.23**

# TEST CERTIFICATE

**DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Tested in Accordance with: BS 1377-2: 1990

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

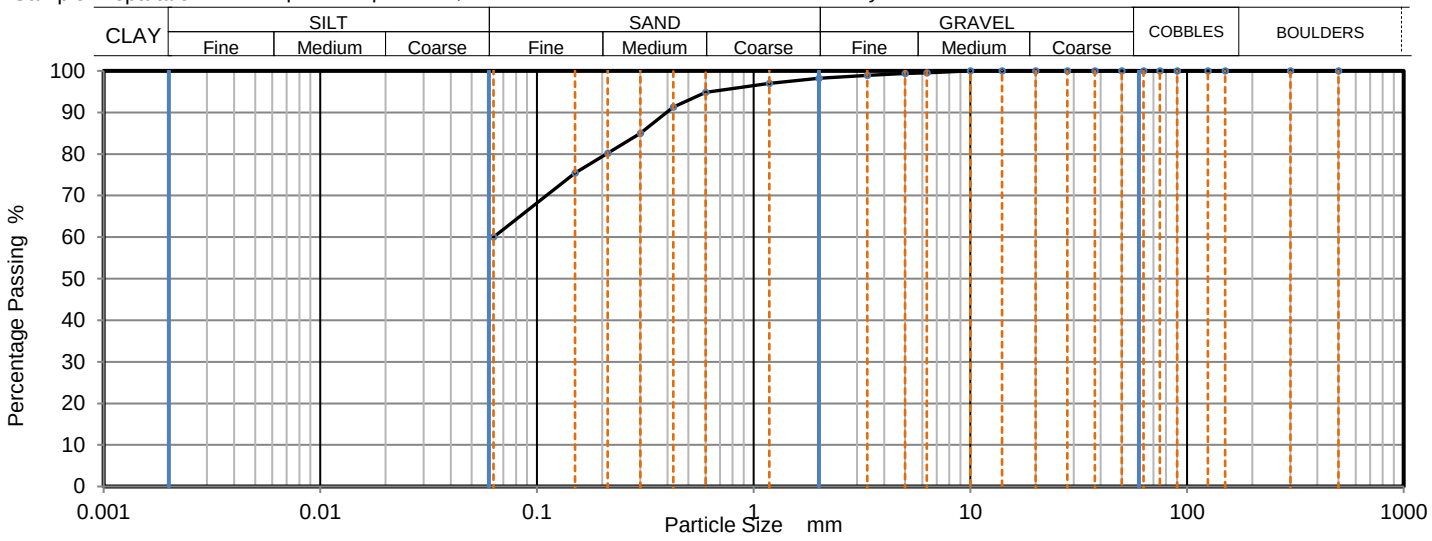
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 232081 |
| Client Address: | 11 Borough High Street, London, SE1 9SE | Job Number: | 23-43844-1 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/07/2023 |
| Contact: | Paolo Moniz | Date Tested: | 17/07/2023 |
| Site Address: | Plol R, Kingsway Business Park, Rochdale | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2740788 | Depth Top [m]: | 1.00 |
| Hole No.: | TP02 | Depth Base [m]: | 1.50 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brown sandy CLAY | | |
| Sample Preparation: | Sample was quartered, oven dried at 109.0 °C and broken down by hand. | | |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | 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 | 99 | | |
| 3.35 | 99 | | |
| 2 | 98 | | |
| 1.18 | 97 | | |
| 0.6 | 95 | | |
| 0.425 | 91 | | |
| 0.3 | 85 | | |
| 0.212 | 80 | | |
| 0.15 | 75 | | |
| 0.063 | 61 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 2 |
| Sand | 38 |
| | |
| Fines <0.063mm | 61 |

| Grading Analysis | | |
|---|---|---|
| D100 | mm | 10 |
| D60 | mm | |
| D30 | mm | |
| D10 | mm | |
| Uniformity Coefficient | | N/A |
| Curvature Coefficient | | |

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

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

Remarks:

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**Signed:** Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 21/08/2023

**GF 100.23**

# TEST CERTIFICATE

**DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Tested in Accordance with: BS 1377-2: 1990

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

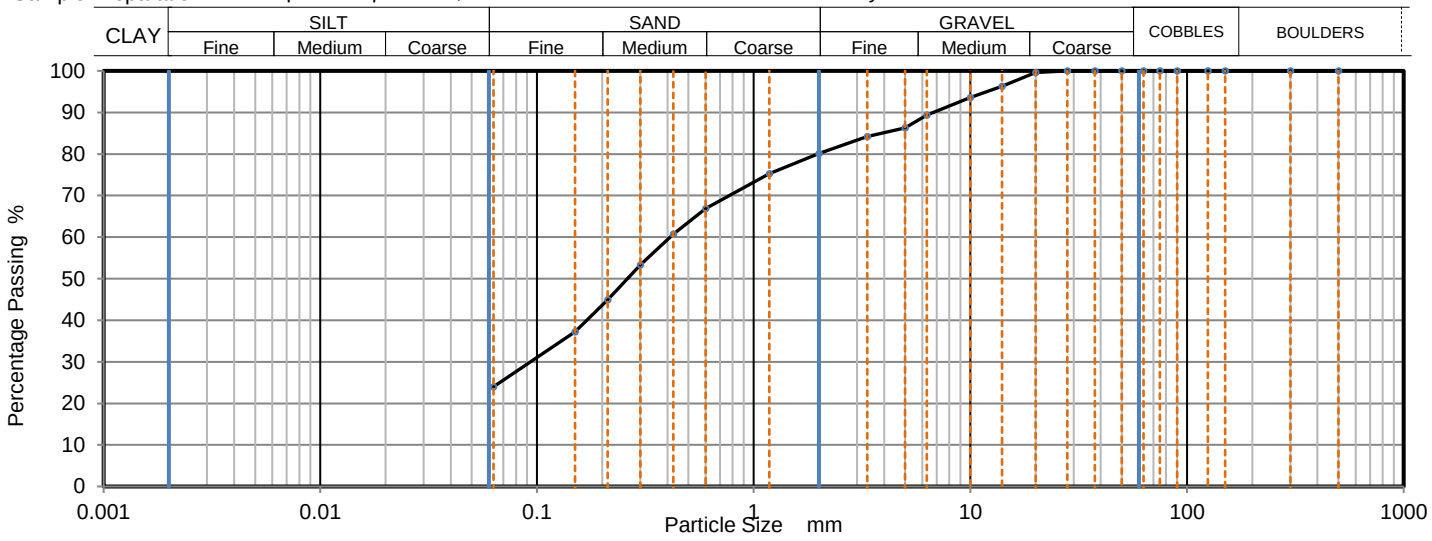
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 232081 |
| Client Address: | 11 Borough High Street, London, SE1 9SE | Job Number: | 23-43844-1 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/07/2023 |
| Contact: | Paolo Moniz | Date Tested: | 17/07/2023 |
| Site Address: | Plol R, Kingsway Business Park, Rochdale | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2740789 | Depth Top [m]: | 0.50 |
| Hole No.: | TP03 | Depth Base [m]: | 1.00 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Black gravelly clayey SAND with fragments of glass | | |
| Sample Preparation: | Sample was quartered, oven dried at 109.0 °C and broken down by hand. | | |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | 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 | 96 | | |
| 10 | 94 | | |
| 6.3 | 89 | | |
| 5 | 86 | | |
| 3.35 | 84 | | |
| 2 | 80 | | |
| 1.18 | 75 | | |
| 0.6 | 67 | | |
| 0.425 | 61 | | |
| 0.3 | 53 | | |
| 0.212 | 45 | | |
| 0.15 | 37 | | |
| 0.063 | 25 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 20 |
| Sand | 55 |
| | |
| Fines <0.063mm | 25 |

| Grading Analysis | | |
|---|---|---|
| D100 | mm | 28 |
| D60 | mm | 0.411 |
| D30 | mm | 0.0909 |
| D10 | mm | |
| Uniformity Coefficient | | > 6.5 |
| Curvature Coefficient | | |

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

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

Remarks:

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**Signed:** Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 21/08/2023

**GF 100.23**

# TEST CERTIFICATE

**DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Tested in Accordance with: BS 1377-2: 1990

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

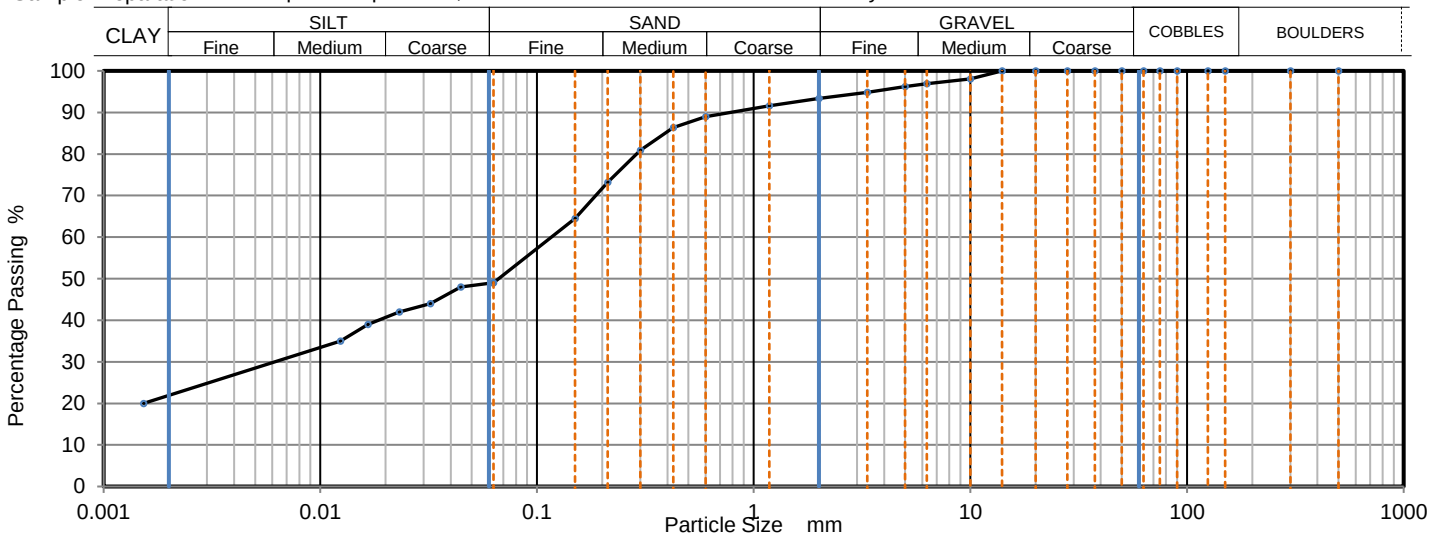
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 232081 |
| Client Address: | 11 Borough High Street, London, SE1 9SE | Job Number: | 23-43844-1 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/07/2023 |
| Contact: | Paolo Moniz | Date Tested: | 17/07/2023 |
| Site Address: | Plol R, Kingsway Business Park, Rochdale | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2740790 | Depth Top [m]: | 0.70 |
| Hole No.: | TP04 | Depth Base [m]: | 1.10 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brown sandy CLAY | | |
| Sample Preparation: | Sample was quartered, oven dried at 109.0 °C and broken down by hand. | | |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 500 | 100 | 0.0625 | 49 |
| 300 | 100 | 0.0445 | 48 |
| 150 | 100 | 0.0322 | 44 |
| 125 | 100 | 0.0231 | 42 |
| 90 | 100 | 0.0166 | 39 |
| 75 | 100 | 0.0124 | 35 |
| 63 | 100 | 0.0015 | 20 |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 98 | | |
| 6.3 | 97 | | |
| 5 | 96 | | |
| 3.35 | 95 | Particle density | (assumed) |
| 2 | 93 | 2.65 | Mg/m3 |
| 1.18 | 92 | | |
| 0.6 | 89 | | |
| 0.425 | 86 | | |
| 0.3 | 81 | | |
| 0.212 | 73 | | |
| 0.15 | 65 | | |
| 0.063 | 49 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 7 |
| Sand | 44 |
| Silt | 27 |
| Clay | 22 |

| Grading Analysis | | |
|---|---|---|
| D100 | mm | 14 |
| D60 | mm | 0.116 |
| D30 | mm | 0.00599 |
| D10 | mm | |
| Uniformity Coefficient | | > 76 |
| Curvature Coefficient | | |

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

**Signed:** Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**

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**Date Reported:** 21/08/2023

**GF 100.23**

# TEST CERTIFICATE

**DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Tested in Accordance with: BS 1377-2: 1990

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

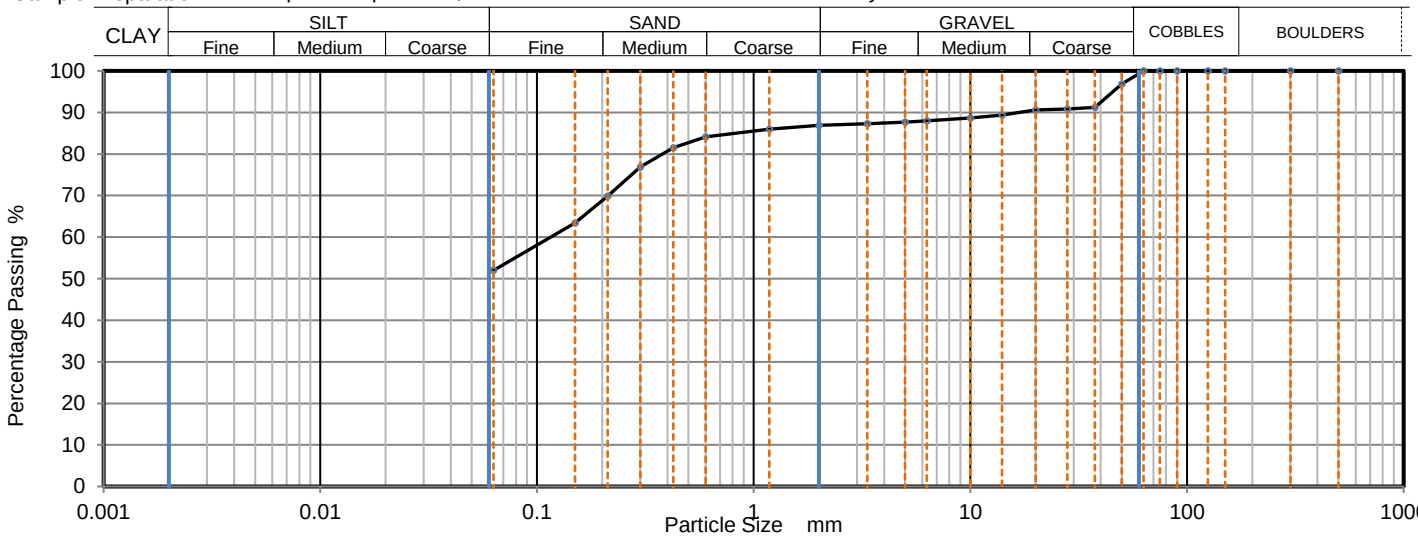
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 232081 |
| Client Address: | 11 Borough High Street, London, SE1 9SE | Job Number: | 23-43844-1 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/07/2023 |
| Contact: | Paolo Moniz | Date Tested: | 17/07/2023 |
| Site Address: | Plol R, Kingsway Business Park, Rochdale | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2740793 | Depth Top [m]: | 0.50 |
| Hole No.: | BH01 | Depth Base [m]: | 1.00 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brown sandy CLAY with fragments of bricks | | |
| Sample Preparation: | Sample was quartered, oven dried at 106.0 °C and broken down by hand. | | |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 500 | 100 | | |
| 300 | 100 | | |
| 150 | 100 | | |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 97 | | |
| 37.5 | 91 | | |
| 28 | 91 | | |
| 20 | 91 | | |
| 14 | 89 | | |
| 10 | 89 | | |
| 6.3 | 88 | | |
| 5 | 88 | | |
| 3.35 | 87 | | |
| 2 | 87 | | |
| 1.18 | 86 | | |
| 0.6 | 84 | | |
| 0.425 | 82 | | |
| 0.3 | 77 | | |
| 0.212 | 70 | | |
| 0.15 | 63 | | |
| 0.063 | 52 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 13 |
| Sand | 35 |
| | |
| Fines <0.063mm | 52 |

| Grading Analysis | | |
|---|---|---|
| D100 | mm | 63 |
| D60 | mm | 0.116 |
| D30 | mm | |
| D10 | mm | |
| Uniformity Coefficient | | > 1.8 |
| Curvature Coefficient | | |

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

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

Remarks:

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**Signed:** Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 21/08/2023

**GF 100.23**

# TEST CERTIFICATE

**DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Tested in Accordance with: BS 1377-2: 1990

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

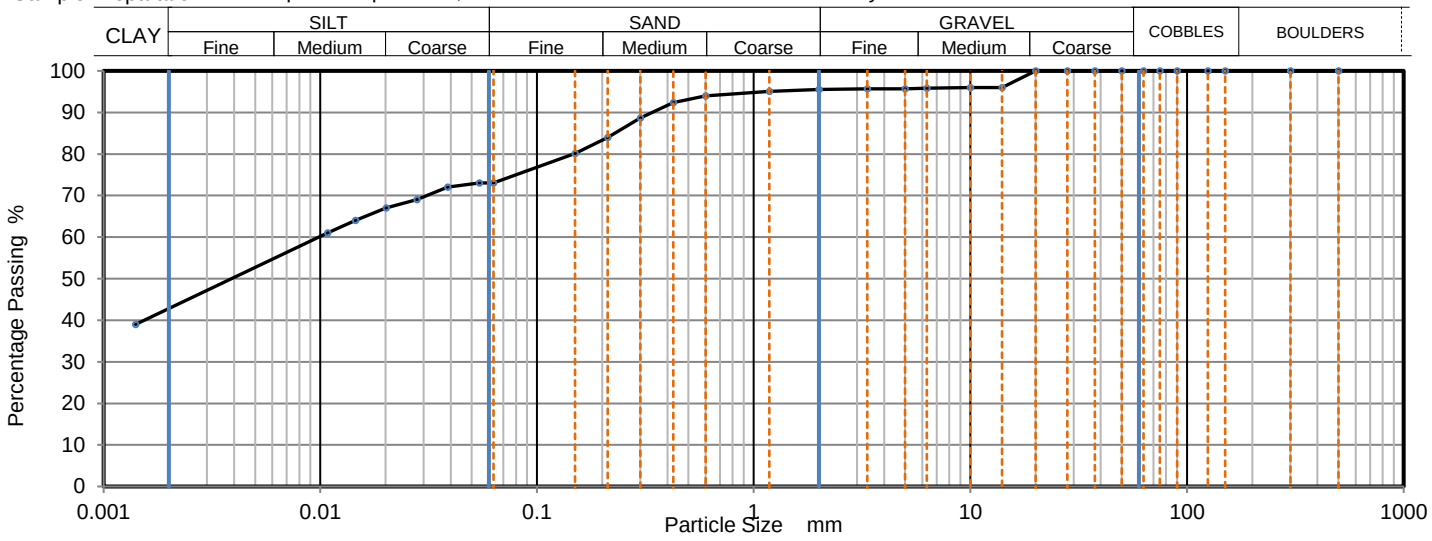
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 232081 |
| Client Address: | 11 Borough High Street, London, SE1 9SE | Job Number: | 23-43844-1 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/07/2023 |
| Contact: | Paolo Moniz | Date Tested: | 17/07/2023 |
| Site Address: | Plol R, Kingsway Business Park, Rochdale | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2740796 | Depth Top [m]: | 2.50 |
| Hole No.: | BH02 | Depth Base [m]: | 3.00 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brownish grey sandy CLAY | | |
| Sample Preparation: | Sample was quartered, oven dried at 109.0 °C and broken down by hand. | | |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 500 | 100 | 0.0541 | 73 |
| 300 | 100 | 0.0387 | 72 |
| 150 | 100 | 0.0279 | 69 |
| 125 | 100 | 0.0201 | 67 |
| 90 | 100 | 0.0145 | 64 |
| 75 | 100 | 0.0108 | 61 |
| 63 | 100 | 0.0014 | 39 |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 96 | | |
| 10 | 96 | | |
| 6.3 | 96 | | |
| 5 | 96 | | |
| 3.35 | 96 | Particle density | (assumed) |
| 2 | 96 | 2.65 | Mg/m3 |
| 1.18 | 95 | | |
| 0.6 | 94 | | |
| 0.425 | 92 | | |
| 0.3 | 89 | | |
| 0.212 | 84 | | |
| 0.15 | 80 | | |
| 0.063 | 73 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 5 |
| Sand | 22 |
| Silt | 30 |
| Clay | 43 |

| Grading Analysis | | |
|---|---|---|
| D100 | mm | 20 |
| D60 | mm | 0.00969 |
| D30 | mm | |
| D10 | mm | |
| Uniformity Coefficient | | > 6.9 |
| Curvature Coefficient | | |

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

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**Signed:** Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 21/08/2023

**GF 100.23**

# TEST CERTIFICATE

**DETERMINATION OF PARTICLE SIZE DISTRIBUTION**

Tested in Accordance with: BS 1377-2: 1990

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

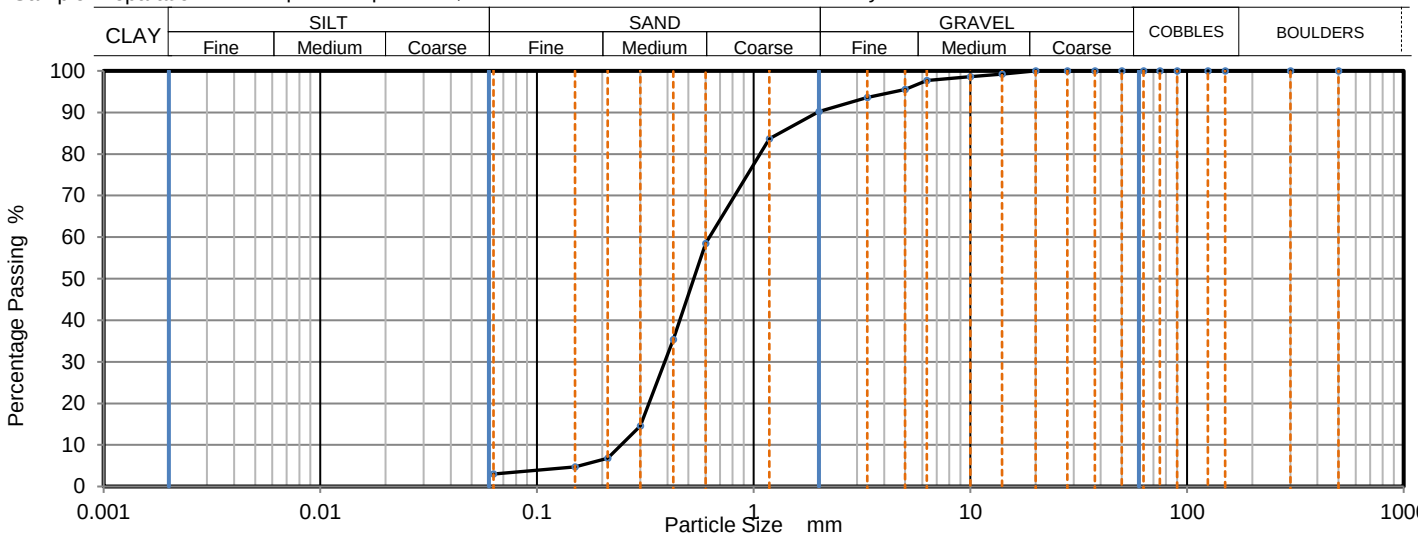
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 232081 |
| Client Address: | 11 Borough High Street, London, SE1 9SE | Job Number: | 23-43844-1 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/07/2023 |
| Contact: | Paolo Moniz | Date Tested: | 17/07/2023 |
| Site Address: | Plol R, Kingsway Business Park, Rochdale | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2740798 | Depth Top [m]: | 5.50 |
| Hole No.: | BH02 | Depth Base [m]: | 6.00 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brown SAND | | |
| Sample Preparation: | Sample was quartered, oven dried at 109.0 °C and broken down by hand. | | |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | 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 | 96 | | |
| 3.35 | 94 | | |
| 2 | 90 | | |
| 1.18 | 84 | | |
| 0.6 | 59 | | |
| 0.425 | 35 | | |
| 0.3 | 15 | | |
| 0.212 | 7 | | |
| 0.15 | 5 | | |
| 0.063 | 4 | | |

| Sample Proportions | % dry mass |
|---|---|
| Very coarse | 0 |
| Gravel | 10 |
| Sand | 86 |
| | |
| Fines <0.063mm | 4 |

| Grading Analysis | | |
|---|---|---|
| D100 | mm | 20 |
| D60 | mm | 0.625 |
| D30 | mm | 0.388 |
| D10 | mm | 0.244 |
| Uniformity Coefficient | | 2.6 |
| Curvature Coefficient | | 0.99 |

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

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

Remarks:

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**Signed:** Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 21/08/2023

**GF 100.23**

4041

# TEST CERTIFICATE

**DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP METHOD USING 2.5 KG RAMMER**

Tested in Accordance with: BS 1377-4: 1990

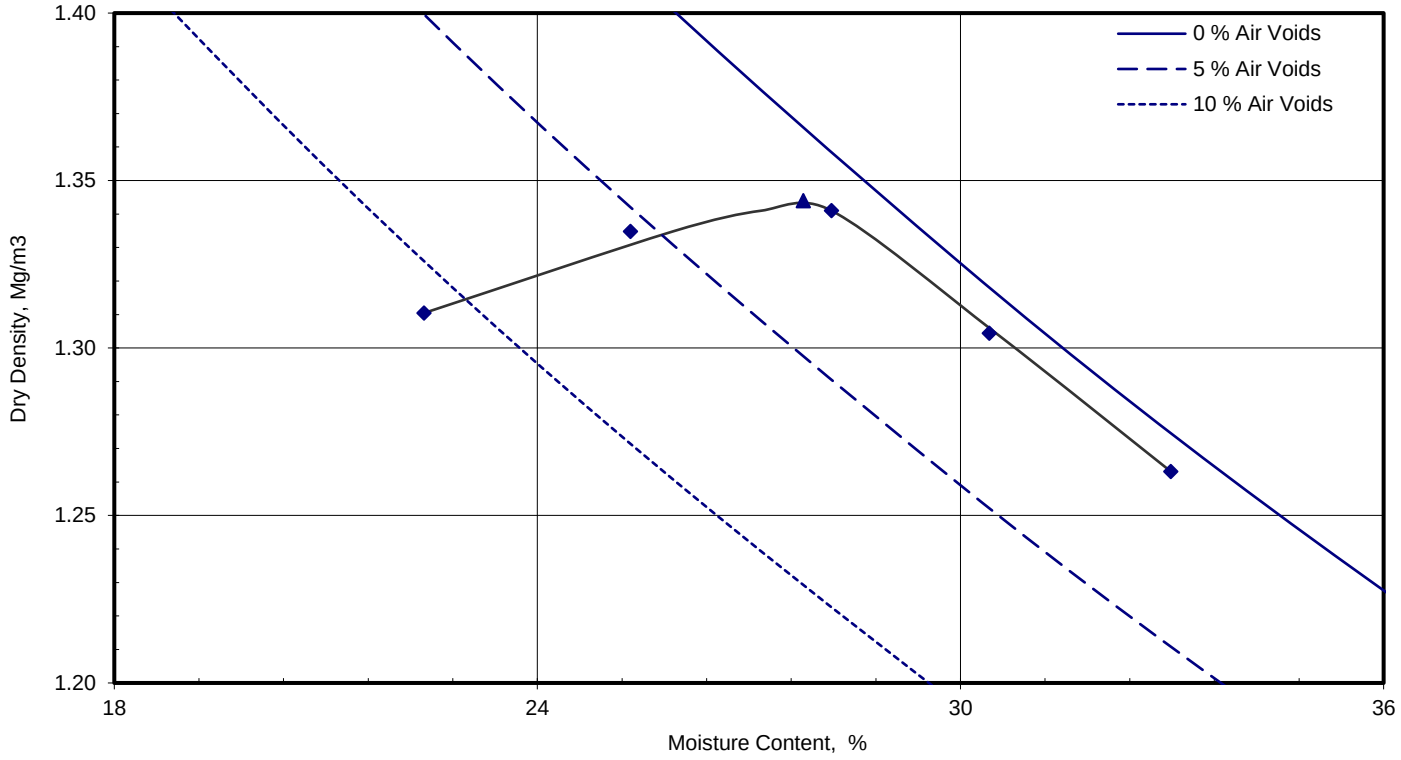
i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 232081 |
| Client Address: | 11 Borough High Street, London, SE1 9SE | Job Number: | 23-43844-1 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/07/2023 |
| Contact: | Paolo Moniz | Date Tested: | 18/08/2023 |
| Site Address: | Plol R, Kingsway Business Park, Rochdale | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2740789 | Depth Top [m]: | 0.50 |
| Hole No.: | TP03 | Depth Base [m]: | 1.00 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Black gravelly clayey SAND with fragments of glass | | |
| Sample Preparation: | Sample was quartered and broken down by hand. Material used was natural. | | |




| Compaction Point No. | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Moisture Content | % | 22 | 25 | 28 | 30 | 33 |
| Dry Density | Mg/m³ | 1.31 | 1.33 | 1.34 | 1.30 | 1.26 |

| | | |
|---|---|---|
| Mould Type | | CBR |
| Samples Used | | Single sample tested |
| Dry Mass Retained on 37.5 mm Sieve | % | 0 |
| Dry Mass Retained on 20.0 mm Sieve | % | 1 |
| Particle Density - Assumed | Mg/m³ | 2.20 |
| As received Moisture Content | % | 21 |
| **Maximum Dry Density** | Mg/m³ | **1.34** |

| | | |
|---|---|---|
| **Optimum Moisture Content** | % | **28** |

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.4 using 2.5kg [light] Rammer

Remarks:

**Signed:** Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**

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**Date Reported:** 21/08/2023

**GF 109.24**

# TEST CERTIFICATE

**DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP METHOD USING 2.5 KG RAMMER**

Tested in Accordance with: BS 1377-4: 1990

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

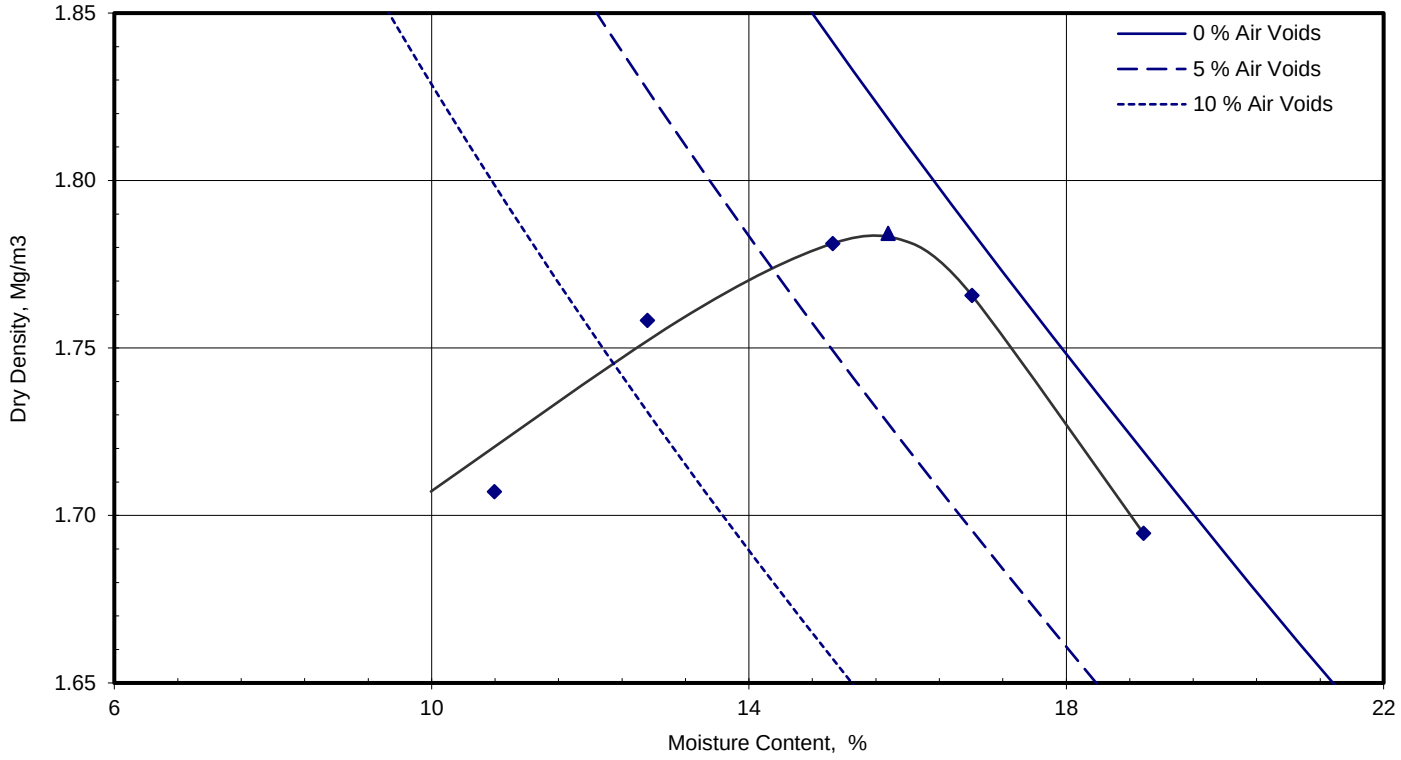
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 232081 |
| Client Address: | 11 Borough High Street, London, SE1 9SE | Job Number: | 23-43844-1 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/07/2023 |
| Contact: | Paolo Moniz | Date Tested: | 18/08/2023 |
| Site Address: | Plol R, Kingsway Business Park, Rochdale | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2740791 | Depth Top [m]: | 2.00 |
| Hole No.: | TP04 | Depth Base [m]: | 2.40 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brown clayey SAND | | |
| Sample Preparation: | Sample was quartered and broken down by hand. Material used was natural. | | |




| Compaction Point No. | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Moisture Content | % | 11 | 13 | 15 | 17 | 19 |
| Dry Density | Mg/m³ | 1.71 | 1.76 | 1.78 | 1.77 | 1.69 |

| | | |
|---|---|---|
| Mould Type | | 1 Litre |
| Samples Used | | Single sample tested |
| Dry Mass Retained on 37.5 mm Sieve | % | 0 |
| Dry Mass Retained on 20.0 mm Sieve | % | 0 |
| Particle Density - Assumed | Mg/m³ | 2.55 |
| As received Moisture Content | % | 8.0 |
| **Maximum Dry Density** | Mg/m³ | **1.78** |

| | | |
|---|---|---|
| **Optimum Moisture Content** | % | **16** |

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks:

**Signed:** Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**

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**Date Reported:** 21/08/2023

**GF 109.24**

# TEST CERTIFICATE

**DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP METHOD USING 2.5 KG RAMMER**

Tested in Accordance with: BS 1377-4: 1990

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

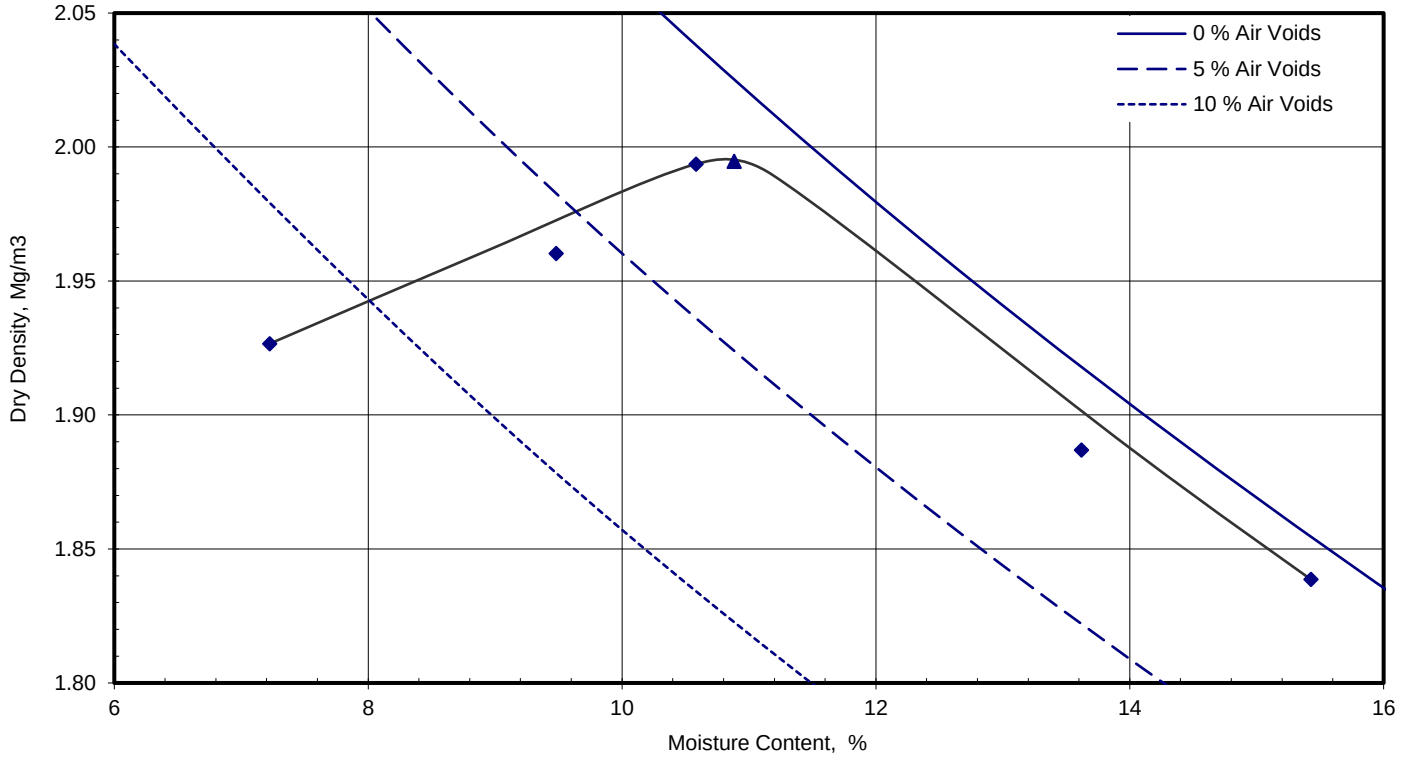
4041

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 232081 |
| Client Address: | 11 Borough High Street, London, SE1 9SE | Job Number: | 23-43844-1 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/07/2023 |
| Contact: | Paolo Moniz | Date Tested: | 18/08/2023 |
| Site Address: | Plol R, Kingsway Business Park, Rochdale | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2740792 | Depth Top [m]: | 0.10 |
| Hole No.: | BH01 | Depth Base [m]: | 0.50 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brown gravelly SAND | | |
| Sample Preparation: | Sample was quartered and broken down by hand. Material used was natural. | | |




| Compaction Point No. | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Moisture Content | % | 7.2 | 9.5 | 11 | 14 | 15 |
| Dry Density | Mg/m³ | 1.93 | 1.96 | 1.99 | 1.89 | 1.84 |

| | | |
|---|---|---|
| Mould Type | | CBR |
| Samples Used | | Single sample tested |
| Dry Mass Retained on 37.5 mm Sieve | % | 10 |
| Dry Mass Retained on 20.0 mm Sieve | % | 13 |
| Particle Density - Assumed | Mg/m³ | 2.60 |
| As received Moisture Content | % | 14 |
| **Maximum Dry Density** | Mg/m³ | **1.99** |

| | | |
|---|---|---|
| **Optimum Moisture Content** | % | **11** |

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.4 using 2.5kg [light] Rammer

Remarks:

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**Signed:** Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 21/08/2023

**GF 109.24**

4041

# TEST CERTIFICATE

**DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP METHOD USING 4.5 KG RAMMER**

Tested in Accordance with: BS 1377-4: 1990

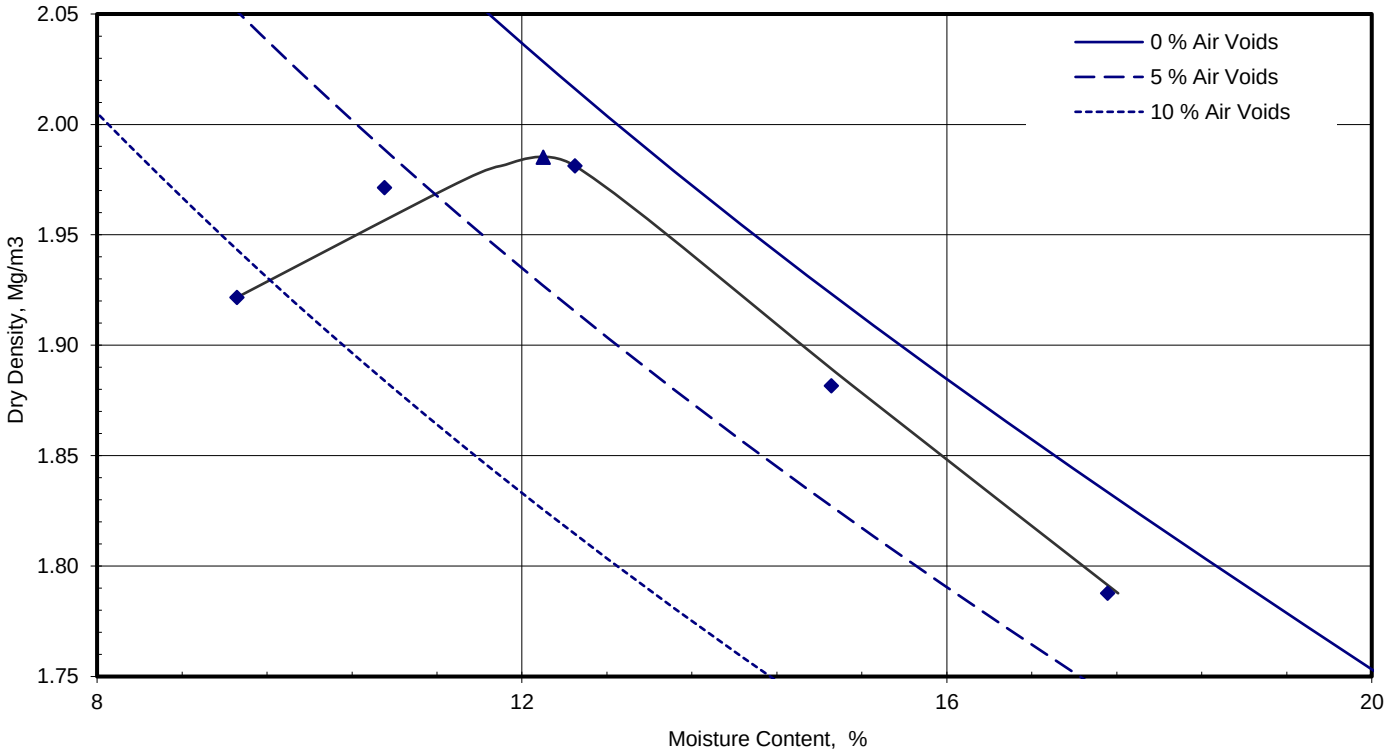
i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 232081 |
| Client Address: | 11 Borough High Street, London, SE1 9SE | Job Number: | 23-43844-1 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/07/2023 |
| Contact: | Paolo Moniz | Date Tested: | 19/08/2023 |
| Site Address: | Plol R, Kingsway Business Park, Rochdale | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2740788 | Depth Top [m]: | 1.00 |
| Hole No.: | TP02 | Depth Base [m]: | 1.50 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brown sandy CLAY | | |
| Sample Preparation: | Sample was quartered and broken down by hand. Material used was natural. | | |




| Compaction Point No. | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Moisture Content | % | 9.3 | 11 | 13 | 15 | 18 |
| Dry Density | Mg/m³ | 1.92 | 1.97 | 1.98 | 1.88 | 1.79 |

| | | |
|---|---|---|
| Mould Type | | 1 Litre |
| Samples Used | | Single sample tested |
| Dry Mass Retained on 37.5 mm Sieve | % | 0 |
| Dry Mass Retained on 20.0 mm Sieve | % | 0 |
| Particle Density - Assumed | Mg/m³ | 2.70 |
| As received Moisture Content | % | 20 |
| **Maximum Dry Density** | Mg/m³ | **1.99** |

| | | |
|---|---|---|
| **Optimum Moisture Content** | % | **12** |

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks:

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**Signed:** Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 21/08/2023

**GF 110.24**

4041

# TEST CERTIFICATE

**DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP METHOD USING 4.5 KG RAMMER**

Tested in Accordance with: BS 1377-4: 1990

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

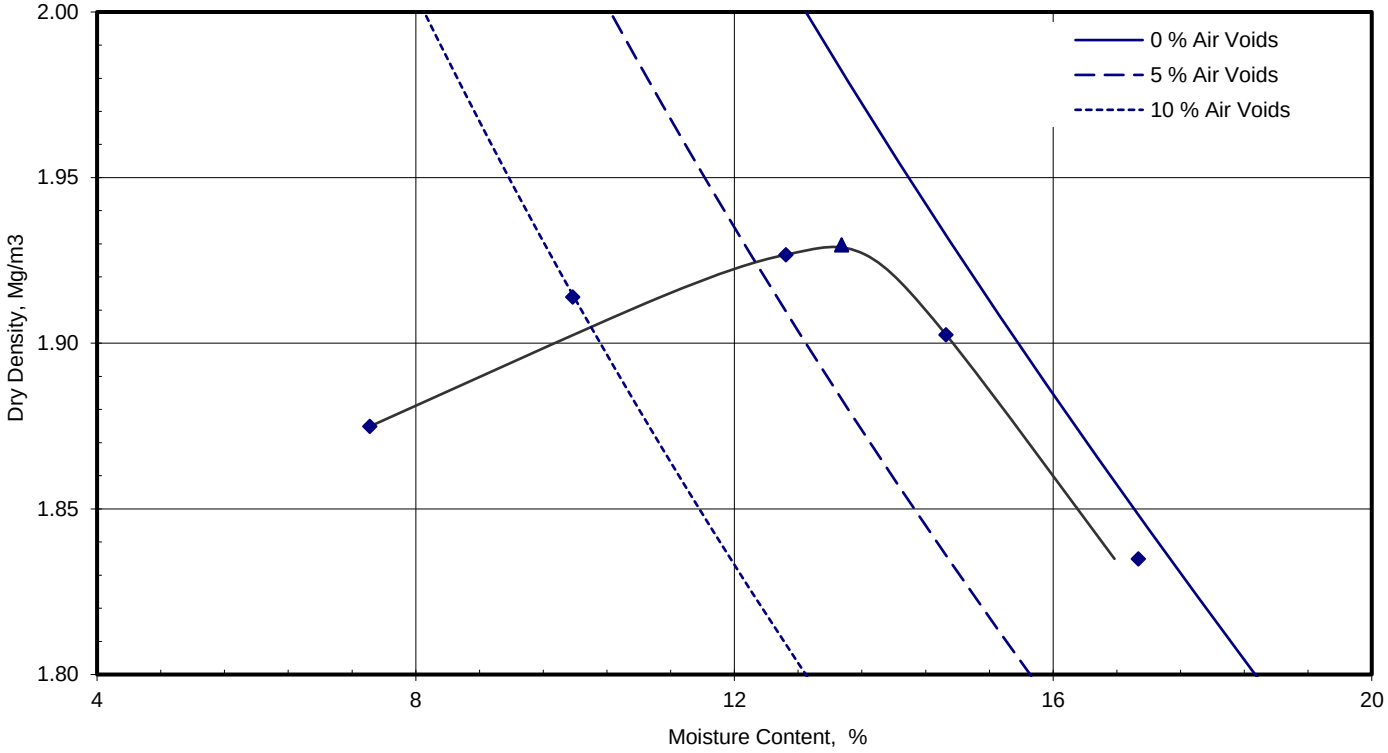
Environmental Science

| | | | |
|---|---|---|---|
| Client: | BWB Consulting Limited | Client Reference: | 232081 |
| Client Address: | 11 Borough High Street, London, SE1 9SE | Job Number: | 23-43844-1 |
| | | Date Sampled: | Not Given |
| | | Date Received: | 05/07/2023 |
| Contact: | Paolo Moniz | Date Tested: | 19/08/2023 |
| Site Address: | Plol R, Kingsway Business Park, Rochdale | Sampled By: | Not Given |

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

**Test Results:**

| | | | |
|---|---|---|---|
| Laboratory Reference: | 2740796 | Depth Top [m]: | 2.50 |
| Hole No.: | BH02 | Depth Base [m]: | 3.00 |
| Sample Reference: | Not Given | Sample Type: | B |
| Sample Description: | Brownish grey sandy CLAY | | |
| Sample Preparation: | Sample was quartered and broken down by hand. Material used was natural. | | |




| Compaction Point No. | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Moisture Content | % | 7.4 | 10.0 | 13 | 15 | 17 |
| Dry Density | Mg/m³ | 1.87 | 1.91 | 1.93 | 1.90 | 1.83 |

| | | |
|---|---|---|
| Mould Type | | 1 Litre |
| Samples Used | | Single sample tested |
| Dry Mass Retained on 37.5 mm Sieve | % | 0 |
| Dry Mass Retained on 20.0 mm Sieve | % | 2 |
| Particle Density - Assumed | Mg/m³ | 2.70 |
| As received Moisture Content | % | 21 |
| **Maximum Dry Density** | Mg/m³ | **1.93** |

| | | |
|---|---|---|
| **Optimum Moisture Content** | % | **13** |

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.6 using 4.5kg [heavy] Rammer

Remarks:

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**Signed:** Katarzyna Koziel

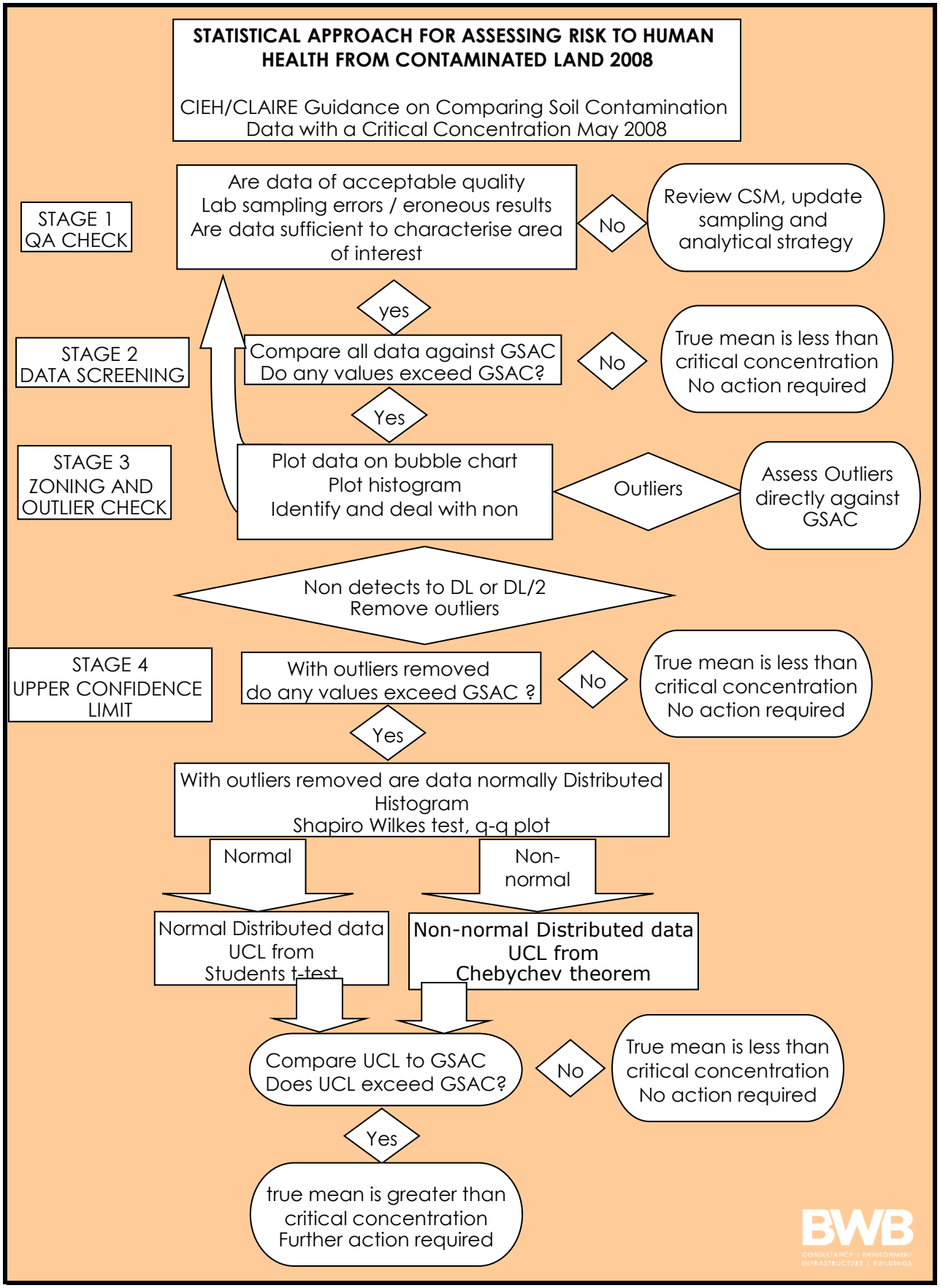
Katarzyna Koziel
Reporting Specialist
**for and on behalf of i2 Analytical Ltd**



**Date Reported:** 21/08/2023

**GF 110.24**

# Appendix 8: CLEA Assessment Worksheets


STATISTICAL APPROACH FOR ASSESSING RISK TO HUMAN HEALTH FROM CONTAMINATED LAND 2008
CIEH/CLAIRE Guidance on Comparing Soil Contamination Data with a Critical Concentration May 2008
STAGE 1 QA CHECK
Are data of acceptable quality
Lab sampling errors / eroneous results
Are data sufficient to characterise area of interest
No
Review CSM, update sampling and analytical strategy
yes
STAGE 2 DATA SCREENING
Compare all data against GSAC
Do any values exceed GSAC?
No
True mean is less than critical concentration
No action required
Yes
STAGE 3 ZONING AND OUTLIER CHECK
Plot data on bubble chart
Plot histogram
Identify and deal with non
Outliers
Assess Outliers directly against GSAC
Non detects to DL or DL/2
Remove outliers
STAGE 4 UPPER CONFIDENCE LIMIT
With outliers removed
do any values exceed GSAC ?
No
True mean is less than critical concentration
No action required
Yes
With outliers removed are data normally Distributed
Histogram
Shapiro Wilkes test, q-q plot
Normal
Non-normal
Normal Distributed data
UCL from
Students t-test
Non-normal Distributed data
UCL from
Chebychev theorem
Compare UCL to GSAC
Does UCL exceed GSAC?
No
True mean is less than critical concentration
No action required
Yes
true mean is greater than critical concentration
Further action required
BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

# Human Health Generic QRA Worksheet

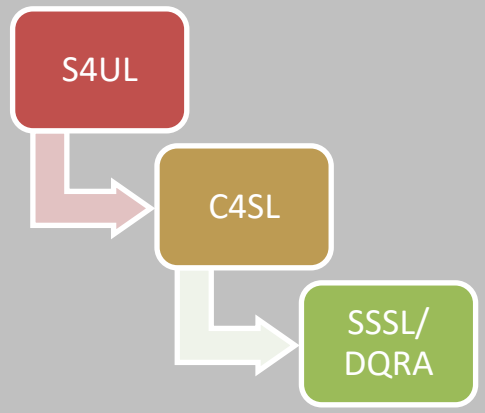
| Kingsway Plot R | 232081 |
|---|---|
| description | |

Define CSM – Is site represented by a standard land use?

Residential with / without homegrown produce
Commercial / Industrial
Public Open Space - Residential (S4UL/C4SL only)
Public Open Space - Park (S4UL/C4SL only)

| | |
|---|---|
| **GSAC Type (BWB, LQM S4UL, C4SL, Bespoke)** | **LQM_CIEH_S4UL** |
| **Key Receptor/CSM (Residential/Commercial/POS)** | **S4UL Commercial** |
| **Organic Matter % (If unknown use 1%)** | **2.5** |

GSAC Hierarcy




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Publication Number S4UL3271

| Generic Assessment Criteria<br>Kingsway Plot R<br>232081 | S4UL Commercial<br>mg/kg | Source |
|---|---|---|
| Arsenic | 6.40E+02 | LQM_CIEH_S4UL |
| Barium | 2.21E+04 | LQM_CIEH_S4UL |
| Beryllium | 1.20E+01 | LQM_CIEH_S4UL |
| Boron | 2.40E+05 | LQM_CIEH_S4UL |
| Cadmium | 1.90E+02 | LQM_CIEH_S4UL |
| Chromium VI | 3.30E+01 | LQM_CIEH_S4UL |
| Chromium III | 8.60E+03 | LQM_CIEH_S4UL |
| Copper | 6.80E+04 | LQM_CIEH_S4UL |
| Lead* | 2.33E+03 | DEFRA_C4SL |
| Inorganic Mercury | 1.10E+03 | LQM_CIEH_S4UL |
| Nickel | 9.80E+02 | LQM_CIEH_S4UL |
| Selenium | 1.20E+04 | LQM_CIEH_S4UL |
| Vanadium | 9.00E+03 | LQM_CIEH_S4UL |
| Zinc | 7.30E+05 | LQM_CIEH_S4UL |
| Cyanide (Free) | 4.30E+01 | BWB |
| Cyanide (Complex) | 2.13E+02 | BWB |
| Phenols (Total) | 6.90E+02 | LQM_CIEH_S4UL |
| Benzene | 4.70E+01 | LQM_CIEH_S4UL |
| Toluene | 1.10E+05 | LQM_CIEH_S4UL |
| Ethyl benzene | 1.30E+04 | LQM_CIEH_S4UL |
| Total Xylene | 1.40E+04 | LQM_CIEH_S4UL |
| TPH (EC5-6) aliphatic | 5.90E+03 | LQM_CIEH_S4UL |
| TPH (>EC6-8) aliphatic | 1.70E+04 | LQM_CIEH_S4UL |
| TPH (>EC8-10) aliphatic | 4.80E+03 | LQM_CIEH_S4UL |
| TPH (>EC10-12) aliphatic | 2.30E+04 | LQM_CIEH_S4UL |
| TPH (>EC12-16) aliphatic | 8.20E+04 | LQM_CIEH_S4UL |
| TPH (>EC16-21) aliphatic | 1.70E+06 | LQM_CIEH_S4UL |
| TPH (>EC21-35) aliphatic | 1.70E+06 | LQM_CIEH_S4UL |
| TPH (>EC35-44) aliphatic | 1.70E+06 | LQM_CIEH_S4UL |
| TPH (>EC6-7) aromatic (benzene) | 4.60E+04 | LQM_CIEH_S4UL |
| TPH (>EC7-8) aromatic (toluene) | 1.10E+05 | LQM_CIEH_S4UL |
| TPH (>EC8-10) aromatic | 8.10E+03 | LQM_CIEH_S4UL |
| TPH (>EC10-12) aromatic | 2.80E+04 | LQM_CIEH_S4UL |
| TPH (>EC12-16) aromatic | 3.70E+04 | LQM_CIEH_S4UL |
| TPH (>EC16-21) aromatic | 2.80E+04 | LQM_CIEH_S4UL |
| TPH (>EC21-35) aromatic | 2.80E+04 | LQM_CIEH_S4UL |
| TPH (>EC35-44) aromatic | 2.80E+04 | LQM_CIEH_S4UL |
| Total TPH | 5.00E+02 | LQM_CIEH_S4UL |
| Naphthalene | 4.60E+02 | LQM_CIEH_S4UL |
| Acenaphthylene | 9.70E+04 | LQM_CIEH_S4UL |
| Acenaphthene | 9.70E+04 | LQM_CIEH_S4UL |
| Fluorene | 6.80E+04 | LQM_CIEH_S4UL |
| Phenanthrene | 2.20E+04 | LQM_CIEH_S4UL |
| Anthracene | 5.40E+05 | LQM_CIEH_S4UL |
| Fluoranthene | 2.30E+04 | LQM_CIEH_S4UL |
| Pyrene | 5.40E+04 | LQM_CIEH_S4UL |
| Benzo(a)anthracene | 1.70E+02 | LQM_CIEH_S4UL |
| Chrysene | 3.50E+02 | LQM_CIEH_S4UL |
| Benzo(b)fluoranthene | 4.40E+01 | LQM_CIEH_S4UL |
| Benzo(k)fluoranthene | 1.20E+03 | LQM_CIEH_S4UL |
| Benzo(a)pyrene | 3.50E+01 | LQM_CIEH_S4UL |

| Generic Assessment Criteria<br>Kingsway Plot R 232081 | S4UL Commercial mg/kg | Source |
|---|---|---|
| Indeno(1,2,3-c,d)pyrene | 5.10E+02 | LQM_CIEH_S4UL |
| Dibenzo(a,h)anthracene | 3.60E+00 | LQM_CIEH_S4UL |
| Benzo(g,hi)perylene | 4.00E+03 | LQM_CIEH_S4UL |
| Coal Tar (B(a)P as surrogate marker | 1.50E+01 | LQM_CIEH_S4UL |
| Tetrachloroethene (PCE) | 4.20E+01 | LQM_CIEH_S4UL |
| Trichloroethene (TCE) | 2.60E+00 | LQM_CIEH_S4UL |
| *cis* -1,2-Dichloroethene | 2.40E+01 | LQM_CIEH_S4UL |
| Vinyl Chloride (VC) | 7.70E-02 | LQM_CIEH_S4UL |
| 1,1,2,2-Tetrachloroethane (PCA) | 5.50E+02 | LQM_CIEH_S4UL |
| 1,1,1-Trichloroethane (TCA) | 1.30E+03 | LQM_CIEH_S4UL |
| 1,2-Dichloroethane | 9.70E-01 | LQM_CIEH_S4UL |
| Carbon Tetrachloride | 6.30E+00 | LQM_CIEH_S4UL |
| Carbon disulphide | 2.20E+01 | LQM_CIEH_S4UL |

| Location | Sample depth | Easting | Northing | Strata Type | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium VI | Chromium III | Copper | Lead | Inorganic Mercury | Nickel | Selenium | Vanadium | Zinc | Cyanide (Free) | Cyanide (Complex) | Phenols (Total) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Detection Limit** | | | | | | | | | | | | | | | | | | | | | |
| **GSAC** | | | | | 6.40E+02 | 2.21E+04 | 1.20E+01 | 2.40E+05 | 1.90E+02 | 3.30E+01 | 8.60E+03 | 6.80E+04 | 2.33E+03 | 1.10E+03 | 9.80E+02 | 1.20E+04 | 9.00E+03 | 7.30E+05 | 4.30E+01 | 2.13E+02 | 6.90E+02 |
| TP01 | 0.10-0.20 | | | | 130 | 2000 | 9 | 0.4 | 0.2 | 1.8 | 41 | 260 | 220 | 0.3 | 100 | 1 | 260 | 230 | 1 | 1 | 1 |
| TP02 | 0.10-0.20 | | | | 17 | 87 | 0.91 | 0.7 | 0.2 | 1.8 | 18 | 41 | 70 | 0.3 | 16 | 1 | 33 | 68 | 1 | 1 | 1.7 |
| TP03 | 0.10-0.20 | | | | 120 | 2200 | 7.8 | 0.8 | 0.2 | 1.8 | 40 | 270 | 360 | 0.3 | 100 | 1 | 230 | 270 | 1 | 1 | 1 |
| TP04 | 0.10-0.20 | | | | 15 | 94 | 0.79 | 0.7 | 0.2 | 1.8 | 18 | 39 | 70 | 0.3 | 16 | 1 | 29 | 74 | 1 | 1 | 1 |
| BH01 | 0.20-0.30 | | | | 11 | 100 | 0.66 | 0.4 | 0.2 | 1.8 | 15 | 31 | 57 | 0.3 | 14 | 1 | 25 | 61 | 1 | 1 | 1 |
| BH02 | 0.10-0.20 | | | | 8.6 | 120 | 0.95 | 0.3 | 0.2 | 1.8 | 21 | 29 | 25 | 0.3 | 26 | 1 | 26 | 66 | 1 | 1 | 1 |
| BH02 | 2.30-2.40 | | | | 11 | 110 | 0.93 | 0.4 | 0.2 | 1.8 | 21 | 30 | 39 | 0.3 | 22 | 1 | 28 | 62 | 1 | 1 | 1 |
| BH02 | 2.50-2.60 | | | | 6.7 | 190 | 0.98 | 0.2 | 0.2 | 1.8 | 25 | 27 | 14 | 0.3 | 18 | 1 | 29 | 37 | 1 | 1 | 1 |

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INFRASTRUCTURE | BUILDINGS

| Location | Sample depth | Benzene | Toluene | Ethyl benzene | Total Xylene | TPH (EC5-6) aliphatic | TPH (>EC6-8) aliphatic | TPH (>EC8-10) aliphatic | TPH (>EC10-12) aliphatic | TPH (>EC12-16) aliphatic | TPH (>EC16-21) aliphatic | TPH (>EC21-35) aliphatic | TPH (>EC6-7) aromatic (benzene) | TPH (>EC7-8) aromatic (toluene) | TPH (>EC8-10) aromatic | TPH (>EC10-12) aromatic | TPH (>EC12-16) aromatic | TPH (>EC16-21) aromatic | TPH (>EC21-35) aromatic |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Detection Limit** | | | | | | | | | | | | | | | | | | | |
| **GSAC** | | 4.70E+01 | 1.10E+05 | 1.30E+04 | 1.40E+04 | 5.90E+03 | 1.70E+04 | 4.80E+03 | 2.30E+04 | 8.20E+04 | 1.70E+06 | 1.70E+06 | 4.60E+04 | 1.10E+05 | 8.10E+03 | 2.80E+04 | 3.70E+04 | 2.80E+04 | 2.80E+04 |
| TP01 | 0.10-0.20 | 0.005 | 0.005 | 0.005 | 0.01 | | | 0.1 | | | | 19 | | 0.1 | 0.1 | | 2 | | 10 |
| TP02 | 0.10-0.20 | | | | | | | | | | | | | | | | | | |
| TP03 | 0.10-0.20 | | | | | | | | | | | | | | | | | | |
| TP04 | 0.10-0.20 | | | | | | | | | | | | | | | | | | |
| BH01 | 0.20-0.30 | | | | | | | | | | | | | | | | | | |
| BH02 | 0.10-0.20 | 0.005 | 0.005 | 0.005 | 0.01 | | | 0.1 | | | | 8 | | 0.1 | 0.1 | | 2 | | 10 |
| BH02 | 2.30-2.40 | | | | | | | | | | | | | | | | | | |
| BH02 | 2.50-2.60 | | | | | | | | | | | | | | | | | | |

BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

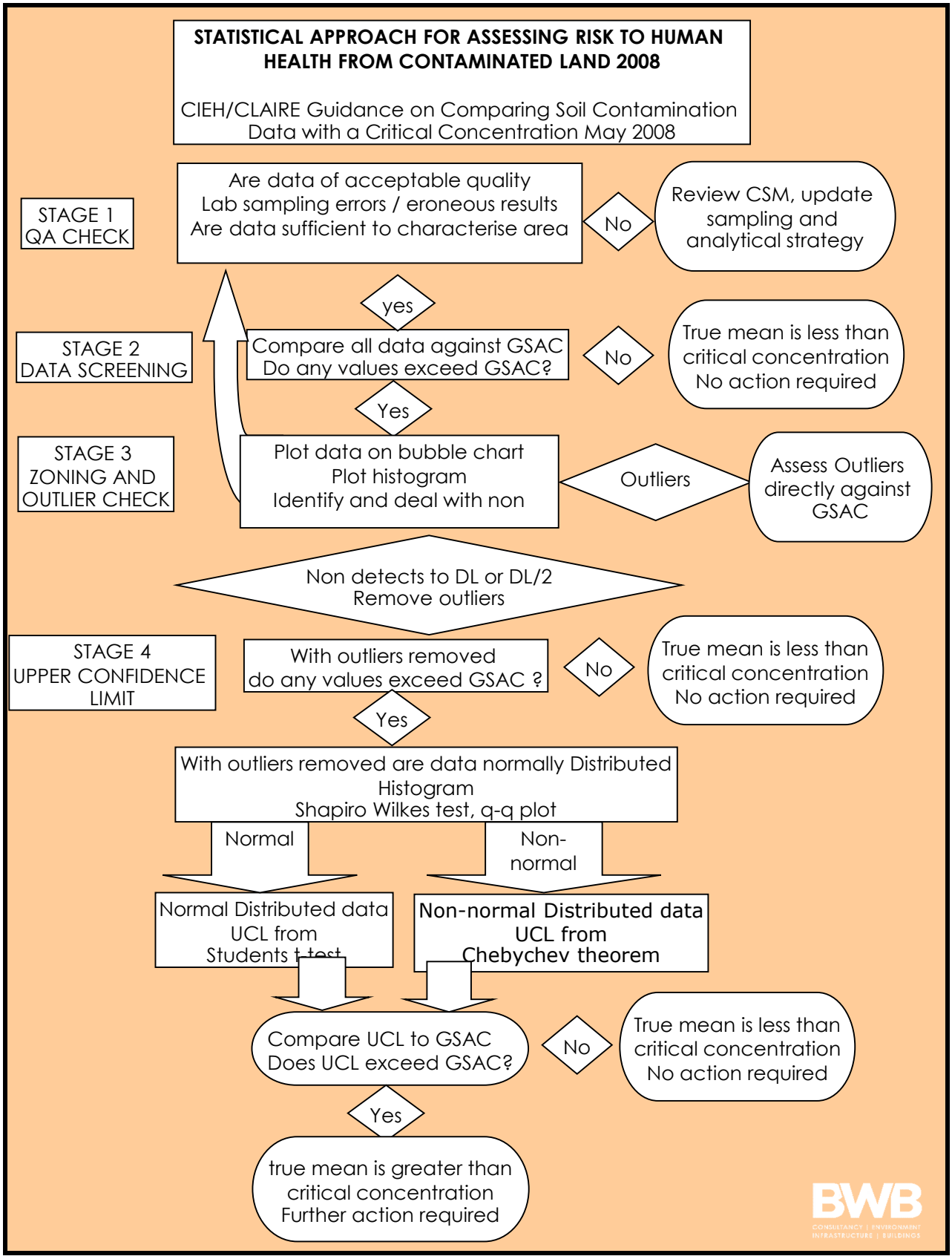
| Location | Sample depth | TPH (>EC35-44) aromatic | Total TPH | Naphthalene | Acenaphthylene | Acenaphthene | Fluorene | Phenanthrene | Anthracene | Fluoranthene | Pyrene | Benzo(a)anthracene | Chrysene | Benzo(b)fluoranthene | Benzo(k)fluoranthene | Benzo(a)pyrene | Indeno(1,2,3-c,d)pyrene | Dibenzo(a,h)anthracene | Benzo(g,hi)perylene | Benzo(a)pyrene (as surrogate marker) | Tetrachloroethene (PCE) | *Trichloroethene (TCE)* | cis-1,2-Dichloroethene | Vinyl Chloride (VC) | 1,1,2,2-Tetrachloroethane (PCA) | 1,1,1-Trichloroethane (TCA) | 1,2-Dichloroethane |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Detection Limit** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **GSAC** | | 2.80E+04 | 5.00E+02 | 4.60E+02 | 9.70E+04 | 9.70E+04 | 6.80E+04 | 2.20E+04 | 5.40E+05 | 2.30E+04 | 5.40E+04 | 1.70E+02 | 3.50E+02 | 4.40E+01 | 1.20E+03 | 3.50E+01 | 5.10E+02 | 3.60E+00 | 4.00E+03 | 1.50E+01 | 4.20E+01 | 2.60E+00 | 2.40E+01 | 7.70E-02 | 5.50E+02 | 1.30E+03 | 9.70E-01 |
| TP01 | 0.10-0.20 | | 27 | 0.15 | 0.05 | 0.05 | 0.05 | 0.39 | 0.07 | 0.51 | 0.44 | 0.3 | 0.34 | 0.38 | 0.16 | 0.24 | 0.17 | 0.05 | 0.19 | 0.24 | | | | | | | |
| TP02 | 0.10-0.20 | | 14 | 0.05 | 0.05 | 0.05 | 0.05 | 0.15 | 0.05 | 0.21 | 0.22 | 0.11 | 0.14 | 0.18 | 0.06 | 0.12 | 0.06 | 0.05 | 0.09 | 0.12 | | | | | | | |
| TP03 | 0.10-0.20 | | 75 | 0.4 | 0.09 | 0.32 | 0.23 | 3.6 | 0.55 | 5 | 4.5 | 2.1 | 2.2 | 2.3 | 1.1 | 1.9 | 1.2 | 0.23 | 1.3 | 1.9 | | | | | | | |
| TP04 | 0.10-0.20 | | 14 | 0.05 | 0.05 | 0.05 | 0.05 | 0.45 | 0.09 | 0.72 | 0.7 | 0.35 | 0.43 | 0.48 | 0.17 | 0.36 | 0.17 | 0.05 | 0.24 | 0.36 | | | | | | | |
| BH01 | 0.20-0.30 | | 72 | 1.3 | 0.05 | 0.64 | 0.49 | 4 | 0.95 | 4.2 | 4 | 1.6 | 1.9 | 2 | 0.65 | 1.7 | 0.91 | 0.18 | 1 | 1.7 | | | | | | | |
| BH02 | 0.10-0.20 | | 20 | 0.05 | 0.05 | 0.05 | 0.05 | 0.17 | 0.05 | 0.2 | 0.2 | 0.07 | 0.11 | 0.09 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | | |
| BH02 | 2.30-2.40 | | 10 | 0.05 | 0.05 | 0.05 | 0.05 | 0.22 | 0.05 | 0.45 | 0.4 | 0.22 | 0.27 | 0.37 | 0.08 | 0.23 | 0.15 | 0.05 | 0.17 | 0.23 | | | | | | | |
| BH02 | 2.50-2.60 | | 10 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | | |

BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

| Location | Sample depth | Carbon Tetrachloride |
|---|---|---|
| **Detection Limit** | | |
| **GSAC** | | 6.30E+00 |
| TP01 | 0.10-0.20 | |
| TP02 | 0.10-0.20 | |
| TP03 | 0.10-0.20 | |
| TP04 | 0.10-0.20 | |
| BH01 | 0.20-0.30 | |
| BH02 | 0.10-0.20 | |
| BH02 | 2.30-2.40 | |
| BH02 | 2.50-2.60 | |

BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

| Determinand | Number of tests | Range (mg/kg) | S4UL Commercial GSAC (m | Detection Limit (mg/kg) | Min | Max | No. of Exceedances | No. Non detects | < or not |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 8 | <6.7 to 130 | 6.40E+02 | 0 | 6.7 | 130 | 0 | 192 | < |
| Barium | 8 | <87 to 2200 | 2.21E+04 | 0 | 87 | 2200 | 0 | 192 | < |
| Beryllium | 8 | <0.66 to 9 | 1.20E+01 | 0 | 0.66 | 9 | 0 | 192 | < |
| Boron | 8 | <0.2 to 0.8 | 2.40E+05 | 0 | 0.2 | 0.8 | 0 | 192 | < |
| Cadmium | 8 | <0.2 to 0.2 | 1.90E+02 | 0 | 0.2 | 0.2 | 0 | 192 | < |
| Chromium VI | 8 | <1.8 to 1.8 | 3.30E+01 | 0 | 1.8 | 1.8 | 0 | 192 | < |
| Chromium III | 8 | <15 to 41 | 8.60E+03 | 0 | 15 | 41 | 0 | 192 | < |
| Copper | 8 | <27 to 270 | 6.80E+04 | 0 | 27 | 270 | 0 | 192 | < |
| Lead* | 8 | <14 to 360 | 2.33E+03 | 0 | 14 | 360 | 0 | 192 | < |
| Inorganic Mercury | 8 | <0.3 to 0.3 | 1.10E+03 | 0 | 0.3 | 0.3 | 0 | 192 | < |
| Nickel | 8 | <14 to 100 | 9.80E+02 | 0 | 14 | 100 | 0 | 192 | < |
| Selenium | 8 | <1 to 1 | 1.20E+04 | 0 | 1 | 1 | 0 | 192 | < |
| Vanadium | 8 | <25 to 260 | 9.00E+03 | 0 | 25 | 260 | 0 | 192 | < |
| Zinc | 8 | <37 to 270 | 7.30E+05 | 0 | 37 | 270 | 0 | 192 | < |
| Cyanide (Free) | 8 | <1 to 1 | 4.30E+01 | 0 | 1 | 1 | 0 | 192 | < |
| Cyanide (Complex) | 8 | <1 to 1 | 2.13E+02 | 0 | 1 | 1 | 0 | 192 | < |
| Phenols (Total) | 8 | <1 to 1.7 | 6.90E+02 | 0 | 1 | 1.7 | 0 | 192 | < |
| Benzene | 2 | <0.005 to 0.005 | 4.70E+01 | 0 | 0.005 | 0.005 | 0 | 198 | < |
| Toluene | 2 | <0.005 to 0.005 | 1.10E+05 | 0 | 0.005 | 0.005 | 0 | 198 | < |
| Ethyl benzene | 2 | <0.005 to 0.005 | 1.30E+04 | 0 | 0.005 | 0.005 | 0 | 198 | < |
| Total Xylene | 2 | <0.01 to 0.01 | 1.40E+04 | 0 | 0.01 | 0.01 | 0 | 198 | < |
| TPH (EC5-6) aliphatic | 0 | <0 to 0 | 5.90E+03 | 0 | 0 | 0 | 0 | 200 | < |
| TPH (>EC6-8) aliphatic | 0 | <0 to 0 | 1.70E+04 | 0 | 0 | 0 | 0 | 200 | < |
| TPH (>EC8-10) aliphatic | 1 | <0.1 to 0.1 | 4.80E+03 | 0 | 0.1 | 0.1 | 0 | 198 | < |
| TPH (>EC10-12) aliphatic | 0 | <0 to 0 | 2.30E+04 | 0 | 0 | 0 | 0 | 199 | < |
| TPH (>EC12-16) aliphatic | 0 | <0 to 0 | 8.20E+04 | 0 | 0 | 0 | 0 | 199 | < |
| TPH (>EC16-21) aliphatic | 0 | <0 to 0 | 1.70E+06 | 0 | 0 | 0 | 0 | 200 | < |
| TPH (>EC21-35) aliphatic | 2 | <8 to 19 | 1.70E+06 | 0 | 8 | 19 | 0 | 198 | < |
| TPH (>EC35-44) aliphatic | 0 | <0 to 0 | 1.70E+06 | 0 | 0 | 0 | 0 | 198 | < |
| TPH (>EC6-7) aromatic (benzene) | 0 | <0 to 0 | 4.60E+04 | 0 | 0 | 0 | 0 | 200 | < |
| TPH (>EC7-8) aromatic (toluene) | 2 | <0.1 to 0.1 | 1.10E+05 | 0 | 0.1 | 0.1 | 0 | 198 | < |
| TPH (>EC8-10) aromatic | 2 | <0.1 to 0.1 | 8.10E+03 | 0 | 0.1 | 0.1 | 0 | 198 | < |
| TPH (>EC10-12) aromatic | 0 | <0 to 0 | 2.80E+04 | 0 | 0 | 0 | 0 | 200 | < |
| TPH (>EC12-16) aromatic | 2 | <2 to 2 | 3.70E+04 | 0 | 2 | 2 | 0 | 198 | < |
| TPH (>EC16-21) aromatic | 0 | <0 to 0 | 2.80E+04 | 0 | 0 | 0 | 0 | 200 | < |
| TPH (>EC21-35) aromatic | 2 | <10 to 10 | 2.80E+04 | 0 | 10 | 10 | 0 | 198 | < |
| TPH (>EC35-44) aromatic | 0 | <0 to 0 | 2.80E+04 | 0 | 0 | 0 | 0 | 200 | < |
| Total TPH | 8 | <10 to 75 | 5.00E+02 | 0 | 10 | 75 | 0 | 192 | < |
| Naphthalene | 8 | <0.05 to 1.3 | 4.60E+02 | 0 | 0.05 | 1.3 | 0 | 192 | < |
| Acenaphthylene | 8 | <0.05 to 0.09 | 9.70E+04 | 0 | 0.05 | 0.09 | 0 | 192 | < |
| Acenaphthene | 8 | <0.05 to 0.64 | 9.70E+04 | 0 | 0.05 | 0.64 | 0 | 192 | < |
| Fluorene | 8 | <0.05 to 0.49 | 6.80E+04 | 0 | 0.05 | 0.49 | 0 | 192 | < |
| Phenanthrene | 8 | <0.05 to 4 | 2.20E+04 | 0 | 0.05 | 4 | 0 | 192 | < |
| Anthracene | 8 | <0.05 to 0.95 | 5.40E+05 | 0 | 0.05 | 0.95 | 0 | 192 | < |
| Fluoranthene | 8 | <0.05 to 5 | 2.30E+04 | 0 | 0.05 | 5 | 0 | 192 | < |
| Pyrene | 8 | <0.05 to 4.5 | 5.40E+04 | 0 | 0.05 | 4.5 | 0 | 192 | < |
| Benzo(a)anthracene | 8 | <0.05 to 2.1 | 1.70E+02 | 0 | 0.05 | 2.1 | 0 | 192 | < |
| Chrysene | 8 | <0.05 to 2.2 | 3.50E+02 | 0 | 0.05 | 2.2 | 0 | 192 | < |
| Benzo(b)fluoranthene | 8 | <0.05 to 2.3 | 4.40E+01 | 0 | 0.05 | 2.3 | 0 | 192 | < |
| Benzo(k)fluoranthene | 8 | <0.05 to 1.1 | 1.20E+03 | 0 | 0.05 | 1.1 | 0 | 192 | < |
| Benzo(a)pyrene | 8 | <0.05 to 1.9 | 3.50E+01 | 0 | 0.05 | 1.9 | 0 | 192 | < |
| Indeno(1,2,3-c,d)pyrene | 8 | <0.05 to 1.2 | 5.10E+02 | 0 | 0.05 | 1.2 | 0 | 192 | < |
| Dibenzo(a,h)anthracene | 8 | <0.05 to 0.23 | 3.60E+00 | 0 | 0.05 | 0.23 | 0 | 192 | < |
| Benzo(g,hi)perylene | 8 | <0.05 to 1.3 | 4.00E+03 | 0 | 0.05 | 1.3 | 0 | 192 | < |
| Coal Tar (B(a)P as surrogate mark | 8 | <0.05 to 1.9 | 1.50E+01 | 0 | 0.05 | 1.9 | 0 | 192 | < |
| Tetrachloroethene (PCE) | 0 | <0 to 0 | 4.20E+01 | 0 | 0 | 0 | 0 | 200 | < |
| Trichloroethene (TCE) | 0 | <0 to 0 | 2.60E+00 | 0 | 0 | 0 | 0 | 200 | < |
| cis-1,2-Dichloroethene | 0 | <0 to 0 | 2.40E+01 | 0 | 0 | 0 | 0 | 200 | < |
| Vinyl Chloride (VC) | 0 | <0 to 0 | 7.70E-02 | 0 | 0 | 0 | 0 | 200 | < |
| 1,1,2,2-Tetrachloroethane (PCA) | 0 | <0 to 0 | 5.50E+02 | 0 | 0 | 0 | 0 | 200 | < |


STATISTICAL APPROACH FOR ASSESSING RISK TO HUMAN HEALTH FROM CONTAMINATED LAND 2008
CIEH/CLAIRE Guidance on Comparing Soil Contamination Data with a Critical Concentration May 2008
STAGE 1 QA CHECK
Are data of acceptable quality
Lab sampling errors / eroneous results
Are data sufficient to characterise area
No
Review CSM, update sampling and analytical strategy
yes
STAGE 2 DATA SCREENING
Compare all data against GSAC
Do any values exceed GSAC?
No
True mean is less than critical concentration
No action required
Yes
STAGE 3 ZONING AND OUTLIER CHECK
Plot data on bubble chart
Plot histogram
Identify and deal with non
Outliers
Assess Outliers directly against GSAC
Non detects to DL or DL/2
Remove outliers
STAGE 4 UPPER CONFIDENCE LIMIT
With outliers removed
do any values exceed GSAC ?
No
True mean is less than critical concentration
No action required
Yes
With outliers removed are data normally Distributed
Histogram
Shapiro Wilkes test, q-q plot
Normal
Non-normal
Normal Distributed data
UCL from
Students t-test
Non-normal Distributed data
UCL from
Chebychev theorem
Compare UCL to GSAC
Does UCL exceed GSAC?
No
True mean is less than critical concentration
No action required
Yes
true mean is greater than critical concentration
Further action required
BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

# Human Health Generic QRA Worksheet

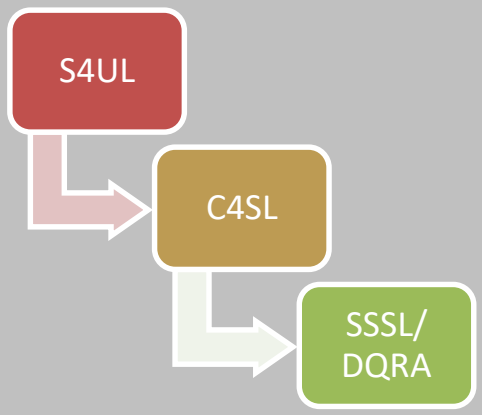
| Kingsway Plot R | 232081 |
|---|---|
| description | |

Define CSM – Is site represented by a standard land use?

Residential with / without homegrown produce
Commercial / Industrial
Public Open Space - Residential (S4UL/C4SL only)
Public Open Space - Park (S4UL/C4SL only)

| | |
|---|---|
| **GSAC Type (BWB, LQM S4UL, C4SL, Bespoke)** | **LQM_CIEH_S4UL** |
| **Key Receptor/CSM (Residential/Commercial/POS)** | **S4UL Commercial** |
| **Organic Matter % (If unknown use 1%)** | **1** |

GSAC Hierarcy




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Publication Number S4UL3271

| Generic Assessment Criteria<br><br>Kingsway Plot R<br>232081 | S4UL Commercial<br>mg/kg | BWB<br>A CAF GROUP COMPANY<br>Source |
|---|---|---|
| **Arsenic** | 6.40E+02 | LQM_CIEH_S4UL |
| **Barium** | 2.21E+04 | LQM_CIEH_S4UL |
| **Beryllium** | 1.20E+01 | LQM_CIEH_S4UL |
| **Boron** | 2.40E+05 | LQM_CIEH_S4UL |
| **Cadmium** | 1.90E+02 | LQM_CIEH_S4UL |
| **Chromium VI** | 3.30E+01 | LQM_CIEH_S4UL |
| **Chromium III** | 8.60E+03 | LQM_CIEH_S4UL |
| **Copper** | 6.80E+04 | LQM_CIEH_S4UL |
| **Lead*** | 2.33E+03 | DEFRA_C4SL |
| **Inorganic Mercury** | 1.10E+03 | LQM_CIEH_S4UL |
| **Nickel** | 9.80E+02 | LQM_CIEH_S4UL |
| **Selenium** | 1.20E+04 | LQM_CIEH_S4UL |
| **Vanadium** | 9.00E+03 | LQM_CIEH_S4UL |
| **Zinc** | 7.30E+05 | LQM_CIEH_S4UL |
| **Cyanide (Free)** | 4.30E+01 | BWB |
| **Cyanide (Complex)** | 2.13E+02 | BWB |
| **Phenols (Total)** | 4.40E+02 | LQM_CIEH_S4UL |
| **Benzene** | 2.70E+01 | LQM_CIEH_S4UL |
| **Toluene** | 5.60E+04 | LQM_CIEH_S4UL |
| **Ethyl benzene** | 5.70E+03 | LQM_CIEH_S4UL |
| **Total Xylene** | 5.90E+03 | LQM_CIEH_S4UL |
| **TPH (EC5-6) aliphatic** | 3.20E+03 | LQM_CIEH_S4UL |
| **TPH (>EC6-8) aliphatic** | 7.80E+03 | LQM_CIEH_S4UL |
| **TPH (>EC8-10) aliphatic** | 2.00E+03 | LQM_CIEH_S4UL |
| **TPH (>EC10-12) aliphatic** | 9.70E+03 | LQM_CIEH_S4UL |
| **TPH (>EC12-16) aliphatic** | 5.90E+04 | LQM_CIEH_S4UL |
| **TPH (>EC16-21) aliphatic** | 1.60E+06 | LQM_CIEH_S4UL |
| **TPH (>EC21-35) aliphatic** | 1.60E+06 | LQM_CIEH_S4UL |
| **TPH (>EC35-44) aliphatic** | 1.60E+06 | LQM_CIEH_S4UL |
| **TPH (>EC6-7) aromatic (benzene)** | 2.60E+04 | LQM_CIEH_S4UL |
| **TPH (>EC7-8) aromatic (toluene)** | 5.60E+04 | LQM_CIEH_S4UL |
| **TPH (>EC8-10) aromatic** | 3.50E+03 | LQM_CIEH_S4UL |
| **TPH (>EC10-12) aromatic** | 1.60E+04 | LQM_CIEH_S4UL |
| **TPH (>EC12-16) aromatic** | 3.60E+04 | LQM_CIEH_S4UL |
| **TPH (>EC16-21) aromatic** | 2.80E+04 | LQM_CIEH_S4UL |
| **TPH (>EC21-35) aromatic** | 2.80E+04 | LQM_CIEH_S4UL |
| **TPH (>EC35-44) aromatic** | 2.80E+04 | LQM_CIEH_S4UL |
| **Total TPH** | 5.00E+02 | LQM_CIEH_S4UL |
| **Naphthalene** | 1.90E+02 | LQM_CIEH_S4UL |
| **Acenaphthylene** | 8.30E+04 | LQM_CIEH_S4UL |
| **Acenaphthene** | 8.40E+04 | LQM_CIEH_S4UL |
| **Fluorene** | 6.30E+04 | LQM_CIEH_S4UL |
| **Phenanthrene** | 2.20E+04 | LQM_CIEH_S4UL |
| **Anthracene** | 5.20E+05 | LQM_CIEH_S4UL |
| **Fluoranthene** | 2.30E+04 | LQM_CIEH_S4UL |
| **Pyrene** | 5.40E+04 | LQM_CIEH_S4UL |
| **Benzo(a)anthracene** | 1.70E+02 | LQM_CIEH_S4UL |
| **Chrysene** | 3.50E+02 | LQM_CIEH_S4UL |
| **Benzo(b)fluoranthene** | 4.40E+01 | LQM_CIEH_S4UL |
| **Benzo(k)fluoranthene** | 1.20E+03 | LQM_CIEH_S4UL |
| **Benzo(a)pyrene** | 3.50E+01 | LQM_CIEH_S4UL |
| **Indeno(1,2,3-c,d)pyrene** | 5.00E+02 | LQM_CIEH_S4UL |

| Generic Assessment Criteria<br><br>Kingsway Plot R<br>232081 | S4UL Commercial<br>mg/kg | Source |
|---|---|---|
| **Dibenzo(a,h)anthracene** | 3.50E+00 | LQM_CIEH_S4UL |
| **Benzo(g,hi)perylene** | 3.90E+03 | LQM_CIEH_S4UL |
| **Coal Tar (B(a)P as surrogate marker** | 1.50E+01 | LQM_CIEH_S4UL |
| **Tetrachloroethene (PCE)** | 1.90E+01 | LQM_CIEH_S4UL |
| **Trichloroethene (TCE)** | 1.20E+00 | LQM_CIEH_S4UL |
| ***cis* -1,2-Dichloroethene** | 1.40E+01 | LQM_CIEH_S4UL |
| **Vinyl Chloride (VC)** | 5.90E-02 | LQM_CIEH_S4UL |
| **1,1,2,2-Tetrachloroethane (PCA)** | 2.70E+02 | LQM_CIEH_S4UL |
| **1,1,1-Trichloroethane (TCA)** | 6.60E+02 | LQM_CIEH_S4UL |
| **1,2-Dichloroethane** | 6.70E-01 | LQM_CIEH_S4UL |
| **Carbon Tetrachloride** | 2.90E+00 | LQM_CIEH_S4UL |
| **Carbon disulphide** | 1.10E+01 | LQM_CIEH_S4UL |

| Location | Sample depth | Easting | Northing | Strata Type | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium VI | Chromium III | Copper | Lead | Inorganic Mercury | Nickel | Selenium | Vanadium | Zinc | Cyanide (Free) | Cyanide (Complex) | Phenols (Total) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Detection Limit** | | | | | | | | | | | | | | | | | | | | | |
| **GSAC** | | | | | 6.40E+02 | 2.21E+04 | 1.20E+01 | 2.40E+05 | 1.90E+02 | 3.30E+01 | 8.60E+03 | 6.80E+04 | 2.33E+03 | 1.10E+03 | 9.80E+02 | 1.20E+04 | 9.00E+03 | 7.30E+05 | 4.30E+01 | 2.13E+02 | 4.40E+02 |
| TP01 | 0.10-0.20 | | | | 130 | 2000 | 9 | 0.4 | 0.2 | 1.8 | 41 | 260 | 220 | 0.3 | 100 | 1 | 260 | 230 | 1 | 1 | 1 |
| TP02 | 0.10-0.20 | | | | 17 | 87 | 0.91 | 0.7 | 0.2 | 1.8 | 18 | 41 | 70 | 0.3 | 16 | 1 | 33 | 68 | 1 | 1 | 1.7 |
| TP03 | 0.10-0.20 | | | | 120 | 2200 | 7.8 | 0.8 | 0.2 | 1.8 | 40 | 270 | 360 | 0.3 | 100 | 1 | 230 | 270 | 1 | 1 | 1 |
| TP04 | 0.10-0.20 | | | | 15 | 94 | 0.79 | 0.7 | 0.2 | 1.8 | 18 | 39 | 70 | 0.3 | 16 | 1 | 29 | 74 | 1 | 1 | 1 |
| BH01 | 0.20-0.30 | | | | 11 | 100 | 0.66 | 0.4 | 0.2 | 1.8 | 15 | 31 | 57 | 0.3 | 14 | 1 | 25 | 61 | 1 | 1 | 1 |
| BH02 | 0.10-0.20 | | | | 8.6 | 120 | 0.95 | 0.3 | 0.2 | 1.8 | 21 | 29 | 25 | 0.3 | 26 | 1 | 26 | 66 | 1 | 1 | 1 |
| BH02 | 2.30-2.40 | | | | 11 | 110 | 0.93 | 0.4 | 0.2 | 1.8 | 21 | 30 | 39 | 0.3 | 22 | 1 | 28 | 62 | 1 | 1 | 1 |
| BH02 | 2.50-2.60 | | | | 6.7 | 190 | 0.98 | 0.2 | 0.2 | 1.8 | 25 | 27 | 14 | 0.3 | 18 | 1 | 29 | 37 | 1 | 1 | 1 |

| Location | Sample depth | Benzene | Toluene | Ethyl benzene | Total Xylene | TPH (EC5-6) aliphatic | TPH (>EC6-8) aliphatic | TPH (>EC8-10) aliphatic | TPH (>EC10-12) aliphatic | TPH (>EC12-16) aliphatic | TPH (>EC16-21) aliphatic | TPH (>EC21-35) aliphatic | TPH (>EC6-7) aromatic (benzene) | TPH (>EC7-8) aromatic (toluene) | TPH (>EC8-10) aromatic | TPH (>EC10-12) aromatic | TPH (>EC12-16) aromatic | TPH (>EC16-21) aromatic | TPH (>EC21-35) aromatic |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Detection Limit** | | | | | | | | | | | | | | | | | | | |
| **GSAC** | | 2.70E+01 | 5.60E+04 | 5.70E+03 | 5.90E+03 | 3.20E+03 | 7.80E+03 | 2.00E+03 | 9.70E+03 | 5.90E+04 | 1.60E+06 | 1.60E+06 | 2.60E+04 | 5.60E+04 | 3.50E+03 | 1.60E+04 | 3.60E+04 | 2.80E+04 | 2.80E+04 |
| TP01 | 0.10-0.20 | 0.005 | 0.005 | 0.005 | 0.01 | | | 0.1 | | | | 19 | | 0.1 | 0.1 | | 2 | | 10 |
| TP02 | 0.10-0.20 | | | | | | | | | | | | | | | | | | |
| TP03 | 0.10-0.20 | | | | | | | | | | | | | | | | | | |
| TP04 | 0.10-0.20 | | | | | | | | | | | | | | | | | | |
| BH01 | 0.20-0.30 | | | | | | | | | | | | | | | | | | |
| BH02 | 0.10-0.20 | 0.005 | 0.005 | 0.005 | 0.01 | | | 0.1 | | | | 8 | | 0.1 | 0.1 | | 2 | | 10 |
| BH02 | 2.30-2.40 | | | | | | | | | | | | | | | | | | |
| BH02 | 2.50-2.60 | | | | | | | | | | | | | | | | | | |

| Location | Sample depth | TPH (>EC35-44) aromatic | Total TPH | Naphthalene | Acenaphthylene | Acenaphthene | Fluorene | Phenanthrene | Anthracene | Fluoranthene | Pyrene | Benzo(a)anthracene | Chrysene | Benzo(b)fluoranthene | Benzo(k)fluoranthene | Benzo(a)pyrene | Indeno(1,2,3-c,d)pyrene | Dibenzo(a,h)anthracene | Benzo(g,hi)perylene | Benzo(a)pyrene (as surrogate marker) | Tetrachloroethene (PCE) | *Trichloroethene (TCE)* | cis-1,2-Dichloroethene | Vinyl Chloride (VC) | 1,1,2,2-Tetrachloroethane (PCA) | 1,1,1-Trichloroethane (TCA) | 1,2-Dichloroethane |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Detection Limit** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **GSAC** | | 2.80E+04 | 5.00E+02 | 1.90E+02 | 8.30E+04 | 8.40E+04 | 6.30E+04 | 2.20E+04 | 5.20E+05 | 2.30E+04 | 5.40E+04 | 1.70E+02 | 3.50E+02 | 4.40E+01 | 1.20E+03 | 3.50E+01 | 5.00E+02 | 3.50E+00 | 3.90E+03 | 1.50E+01 | 1.90E+01 | 1.20E+00 | 1.40E+01 | 5.90E-02 | 2.70E+02 | 6.60E+02 | 6.70E-01 |
| TP01 | 0.10-0.20 | | 27 | 0.15 | 0.05 | 0.05 | 0.05 | 0.39 | 0.07 | 0.51 | 0.44 | 0.3 | 0.34 | 0.38 | 0.16 | 0.24 | 0.17 | 0.05 | 0.19 | 0.24 | | | | | | | |
| TP02 | 0.10-0.20 | | 14 | 0.05 | 0.05 | 0.05 | 0.05 | 0.15 | 0.05 | 0.21 | 0.22 | 0.11 | 0.14 | 0.18 | 0.06 | 0.12 | 0.06 | 0.05 | 0.09 | 0.12 | | | | | | | |
| TP03 | 0.10-0.20 | | 75 | 0.4 | 0.09 | 0.32 | 0.23 | 3.6 | 0.55 | 5 | 4.5 | 2.1 | 2.2 | 2.3 | 1.1 | 1.9 | 1.2 | 0.23 | 1.3 | 1.9 | | | | | | | |
| TP04 | 0.10-0.20 | | 14 | 0.05 | 0.05 | 0.05 | 0.05 | 0.45 | 0.09 | 0.72 | 0.7 | 0.35 | 0.43 | 0.48 | 0.17 | 0.36 | 0.17 | 0.05 | 0.24 | 0.36 | | | | | | | |
| BH01 | 0.20-0.30 | | 72 | 1.3 | 0.05 | 0.64 | 0.49 | 4 | 0.95 | 4.2 | 4 | 1.6 | 1.9 | 2 | 0.65 | 1.7 | 0.91 | 0.18 | 1 | 1.7 | | | | | | | |
| BH02 | 0.10-0.20 | | 20 | 0.05 | 0.05 | 0.05 | 0.05 | 0.17 | 0.05 | 0.2 | 0.2 | 0.07 | 0.11 | 0.09 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | | |
| BH02 | 2.30-2.40 | | 10 | 0.05 | 0.05 | 0.05 | 0.05 | 0.22 | 0.05 | 0.45 | 0.4 | 0.22 | 0.27 | 0.37 | 0.08 | 0.23 | 0.15 | 0.05 | 0.17 | 0.23 | | | | | | | |
| BH02 | 2.50-2.60 | | 10 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | | |

| Location | Sample depth | Carbon Tetrachloride |
|---|---|---|
| **Detection Limit** | | |
| **GSAC** | | 2.90E+00 |
| TP01 | 0.10-0.20 | |
| TP02 | 0.10-0.20 | |
| TP03 | 0.10-0.20 | |
| TP04 | 0.10-0.20 | |
| BH01 | 0.20-0.30 | |
| BH02 | 0.10-0.20 | |
| BH02 | 2.30-2.40 | |
| BH02 | 2.50-2.60 | |

| Determinand | Number of tests | Range (mg/kg) | S4UL Commercial GSAC (mg/kg) | Detection Limit (mg/kg) | Min | Max | No. of Exceedances | No. Non detects | < or not |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 8 | <6.7 to 130 | 6.40E+02 | 0 | 6.7 | 130 | 0 | 192 | < |
| Barium | 8 | <87 to 2200 | 2.21E+04 | 0 | 87 | 2200 | 0 | 192 | < |
| Beryllium | 8 | <0.66 to 9 | 1.20E+01 | 0 | 0.66 | 9 | 0 | 192 | < |
| Boron | 8 | <0.2 to 0.8 | 2.40E+05 | 0 | 0.2 | 0.8 | 0 | 192 | < |
| Cadmium | 8 | <0.2 to 0.2 | 1.90E+02 | 0 | 0.2 | 0.2 | 0 | 192 | < |
| Chromium VI | 8 | <1.8 to 1.8 | 3.30E+01 | 0 | 1.8 | 1.8 | 0 | 192 | < |
| Chromium III | 8 | <15 to 41 | 8.60E+03 | 0 | 15 | 41 | 0 | 192 | < |
| Copper | 8 | <27 to 270 | 6.80E+04 | 0 | 27 | 270 | 0 | 192 | < |
| Lead* | 8 | <14 to 360 | 2.33E+03 | 0 | 14 | 360 | 0 | 192 | < |
| Inorganic Mercury | 8 | <0.3 to 0.3 | 1.10E+03 | 0 | 0.3 | 0.3 | 0 | 192 | < |
| Nickel | 8 | <14 to 100 | 9.80E+02 | 0 | 14 | 100 | 0 | 192 | < |
| Selenium | 8 | <1 to 1 | 1.20E+04 | 0 | 1 | 1 | 0 | 192 | < |
| Vanadium | 8 | <25 to 260 | 9.00E+03 | 0 | 25 | 260 | 0 | 192 | < |
| Zinc | 8 | <37 to 270 | 7.30E+05 | 0 | 37 | 270 | 0 | 192 | < |
| Cyanide (Free) | 8 | <1 to 1 | 4.30E+01 | 0 | 1 | 1 | 0 | 192 | < |
| Cyanide (Complex) | 8 | <1 to 1 | 2.13E+02 | 0 | 1 | 1 | 0 | 192 | < |
| Phenols (Total) | 8 | <1 to 1.7 | 4.40E+02 | 0 | 1 | 1.7 | 0 | 192 | < |
| Benzene | 2 | <0.005 to 0.005 | 2.70E+01 | 0 | 0.005 | 0.005 | 0 | 198 | < |
| Toluene | 2 | <0.005 to 0.005 | 5.60E+04 | 0 | 0.005 | 0.005 | 0 | 198 | < |
| Ethyl benzene | 2 | <0.005 to 0.005 | 5.70E+03 | 0 | 0.005 | 0.005 | 0 | 198 | < |
| Total Xylene | 2 | <0.01 to 0.01 | 5.90E+03 | 0 | 0.01 | 0.01 | 0 | 198 | < |
| TPH (EC5-6) aliphatic | 0 | <0 to 0 | 3.20E+03 | 0 | 0 | 0 | 0 | 200 | < |
| TPH (>EC6-8) aliphatic | 0 | <0 to 0 | 7.80E+03 | 0 | 0 | 0 | 0 | 200 | < |
| TPH (>EC8-10) aliphatic | 1 | <0.1 to 0.1 | 2.00E+03 | 0 | 0.1 | 0.1 | 0 | 198 | < |
| TPH (>EC10-12) aliphatic | 0 | <0 to 0 | 9.70E+03 | 0 | 0 | 0 | 0 | 199 | < |
| TPH (>EC12-16) aliphatic | 0 | <0 to 0 | 5.90E+04 | 0 | 0 | 0 | 0 | 199 | < |
| TPH (>EC16-21) aliphatic | 0 | <0 to 0 | 1.60E+06 | 0 | 0 | 0 | 0 | 200 | < |
| TPH (>EC21-35) aliphatic | 2 | <8 to 19 | 1.60E+06 | 0 | 8 | 19 | 0 | 198 | < |
| TPH (>EC35-44) aliphatic | 0 | <0 to 0 | 1.60E+06 | 0 | 0 | 0 | 0 | 198 | < |
| TPH (>EC6-7) aromatic (benzene) | 0 | <0 to 0 | 2.60E+04 | 0 | 0 | 0 | 0 | 200 | < |
| TPH (>EC7-8) aromatic (toluene) | 2 | <0.1 to 0.1 | 5.60E+04 | 0 | 0.1 | 0.1 | 0 | 198 | < |
| TPH (>EC8-10) aromatic | 2 | <0.1 to 0.1 | 3.50E+03 | 0 | 0.1 | 0.1 | 0 | 198 | < |
| TPH (>EC10-12) aromatic | 0 | <0 to 0 | 1.60E+04 | 0 | 0 | 0 | 0 | 200 | < |
| TPH (>EC12-16) aromatic | 2 | <2 to 2 | 3.60E+04 | 0 | 2 | 2 | 0 | 198 | < |
| TPH (>EC16-21) aromatic | 0 | <0 to 0 | 2.80E+04 | 0 | 0 | 0 | 0 | 200 | < |
| TPH (>EC21-35) aromatic | 2 | <10 to 10 | 2.80E+04 | 0 | 10 | 10 | 0 | 198 | < |
| TPH (>EC35-44) aromatic | 0 | <0 to 0 | 2.80E+04 | 0 | 0 | 0 | 0 | 200 | < |
| Total TPH | 8 | <10 to 75 | 5.00E+02 | 0 | 10 | 75 | 0 | 192 | < |
| Naphthalene | 8 | <0.05 to 1.3 | 1.90E+02 | 0 | 0.05 | 1.3 | 0 | 192 | < |
| Acenaphthylene | 8 | <0.05 to 0.09 | 8.30E+04 | 0 | 0.05 | 0.09 | 0 | 192 | < |
| Acenaphthene | 8 | <0.05 to 0.64 | 8.40E+04 | 0 | 0.05 | 0.64 | 0 | 192 | < |
| Fluorene | 8 | <0.05 to 0.49 | 6.30E+04 | 0 | 0.05 | 0.49 | 0 | 192 | < |
| Phenanthrene | 8 | <0.05 to 4 | 2.20E+04 | 0 | 0.05 | 4 | 0 | 192 | < |
| Anthracene | 8 | <0.05 to 0.95 | 5.20E+05 | 0 | 0.05 | 0.95 | 0 | 192 | < |
| Fluoranthene | 8 | <0.05 to 5 | 2.30E+04 | 0 | 0.05 | 5 | 0 | 192 | < |
| Pyrene | 8 | <0.05 to 4.5 | 5.40E+04 | 0 | 0.05 | 4.5 | 0 | 192 | < |
| Benzo(a)anthracene | 8 | <0.05 to 2.1 | 1.70E+02 | 0 | 0.05 | 2.1 | 0 | 192 | < |
| Chrysene | 8 | <0.05 to 2.2 | 3.50E+02 | 0 | 0.05 | 2.2 | 0 | 192 | < |
| Benzo(b)fluoranthene | 8 | <0.05 to 2.3 | 4.40E+01 | 0 | 0.05 | 2.3 | 0 | 192 | < |
| Benzo(k)fluoranthene | 8 | <0.05 to 1.1 | 1.20E+03 | 0 | 0.05 | 1.1 | 0 | 192 | < |
| Benzo(a)pyrene | 8 | <0.05 to 1.9 | 3.50E+01 | 0 | 0.05 | 1.9 | 0 | 192 | < |
| Indeno(1,2,3-c,d)pyrene | 8 | <0.05 to 1.2 | 5.00E+02 | 0 | 0.05 | 1.2 | 0 | 192 | < |
| Dibenzo(a,h)anthracene | 8 | <0.05 to 0.23 | 3.50E+00 | 0 | 0.05 | 0.23 | 0 | 192 | < |
| Benzo(g,hi)perylene | 8 | <0.05 to 1.3 | 3.90E+03 | 0 | 0.05 | 1.3 | 0 | 192 | < |
| Coal Tar (B(a)P as surrogate mark | 8 | <0.05 to 1.9 | 1.50E+01 | 0 | 0.05 | 1.9 | 0 | 192 | < |
| Tetrachloroethene (PCE) | 0 | <0 to 0 | 1.90E+01 | 0 | 0 | 0 | 0 | 200 | < |
| Trichloroethene (TCE) | 0 | <0 to 0 | 1.20E+00 | 0 | 0 | 0 | 0 | 200 | < |
| cis-1,2-Dichloroethene | 0 | <0 to 0 | 1.40E+01 | 0 | 0 | 0 | 0 | 200 | < |
| Vinyl Chloride (VC) | 0 | <0 to 0 | 5.90E-02 | 0 | 0 | 0 | 0 | 200 | < |
| 1,1,2,2-Tetrachloroethane (PCA) | 0 | <0 to 0 | 2.70E+02 | 0 | 0 | 0 | 0 | 200 | < |

## Appendix 9: Leachate Screening Worksheets

*EQS Standard: Phenol and Benzene annual average of 300µg/l; Toluene 500µg/l for Freshwater, 400µg/l for Saltwater; 1,1,1-TCA 1,000µg/l.

| | |
|---|---|
| **Project Name:** | Plot P (Plot R) |
| **Project Number:** | 232081 |
| **Assessment for:** | Soil Leachate Assessment |
| **Laboratory:** | i2 |
| **Receptor:** | Drinking Water |
| **Receptor Water Hardness:** | >200 |

BWB A CAF GROUP COMPANY

100 = Assessment Criteria Exceedance)

50 = M-BAT Bioavailability Assessment Required

| | Contaminant | Units | Detection Limit | Guideline Concentration | Source | Number of Samples | Min | Max | No of Exceedences | TP104 | TP101 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 0.30 | 0.30 | | | | |
| Heavy Metals | Arsenic | µg/l | 1 | 10 | UK DWS | 1 | 2.70 | 2.70 | 0 | 2.70 | < 1.0 | | | | |
| | Barium | mg/l | 0.05 | 700 | UK DWS | 2 | 1.60 | 94.00 | 0 | 1.60 | 94.00 | | | | |
| | Beryllium | µg/l | 0.2 | None Available | | 2 | 0.30 | 0.30 | 0 | 0.30 | 0.30 | | | | |
| | Cadmium | µg/l | 0.08 | 3 | UK DWS | 0 | 0.00 | 0.00 | 0 | < 0.08 | < 0.08 | | | | |
| | Chromium III | µg/l | 0.4 | 4.7 | UK DWS | 2 | 0.60 | 1.10 | 0 | 0.60 | 1.10 | | | | |
| | Chromium VI | µg/l | | 3.4 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Copper | µg/l | 0.7 | 2000 | UK DWS | 2 | 6.30 | 16.00 | 0 | 6.30 | 16.00 | | | | |
| | Lead | µg/l | 1 | 10 | UK DWS | 2 | 3.00 | 5.20 | 0 | 3.00 | 5.20 | | | | |
| | Mercury | µg/l | 0.5 | 1 | UK DWS | 0 | 0.00 | 0.00 | 0 | < 0.5 | < 0.5 | | | | |
| | Nickel | µg/l | 0.3 | 20 | UK DWS | 2 | 3.50 | 7.30 | 0 | 3.50 | 7.30 | | | | |
| | Selenium | µg/l | 4 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | < 4.0 | < 4.0 | | | | |
| | Vanadium | µg/l | 1.7 | None Available | | 1 | 6.80 | 6.80 | 0 | < 1.7 | 6.80 | | | | |
| | Zinc | µg/l | 0.4 | 5000 | EQS Freshwater | 2 | 8.20 | 17.00 | 0 | 8.20 | 17.00 | | | | |
| | Sulphate | mg/l | 0.1 | 250 | EQS Freshwater | 2 | 1.40 | 14.40 | 0 | 1.40 | 14.40 | | | | |
| | Boron | µg/l | 10 | 300 | UK DWS | 2 | 13.00 | 18.00 | 0 | 13.00 | 18.00 | | | | |
| | pH | | | | | 0 | 0.00 | 0.00 | 0 | | | | | | |
| Inorganics | Cyanide (total) | µg/l | 10 | 70 | UK DWS | 0 | 0.00 | 0.00 | 0 | < 10 | < 10 | | | | |
| | Phenol* | µg/l | | 7.7 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Ammonia (NH3 as N) | mg/l | | 0.015 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |

*EQS Standard: Phenol and Benzene annual average of 300µg/l; Toluene 500µg/l for Freshwater, 400µg/l for Saltwater; 1,1,1-TCA 1,000µg/l.

| | |
|---|---|
| **Project Name:** | Plot P (Plot R) |
| **Project Number:** | 232081 |
| **Assessment for:** | Soil Leachate Assessment |
| **Laboratory:** | i2 |
| **Receptor:** | Freshwater |
| **Receptor Water Hardness:** | >200 |

BWB A CAF GROUP COMPANY

100 = Assessment Criteria Exceedance)

50 = M-BAT Bioavailability Assessment Required

| | Contaminant | Units | Detection Limit | Guideline Concentration | Source | Number of Samples | Min | Max | No of Exceedences | TP104 | TP101 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 0.30 | 0.30 | | | | |
| Heavy Metals | Arsenic | µg/l | 1 | 50 | EQS Freshwater | 1 | 2.70 | 2.70 | 0 | 2.70 | < 1.0 | | | | |
| | Barium | mg/l | 0.05 | 700 | UK DWS | 2 | 1.60 | 94.00 | 0 | 1.60 | 94.00 | | | | |
| | Beryllium | µg/l | 0.2 | None Available | | 2 | 0.30 | 0.30 | 0 | 0.30 | 0.30 | | | | |
| | Cadmium | µg/l | 0.08 | 0.25 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 0.08 | < 0.08 | | | | |
| | Chromium III | µg/l | 0.4 | 4.7 | EQS Freshwater | 2 | 0.60 | 1.10 | 0 | 0.60 | 1.10 | | | | |
| | Chromium VI | µg/l | | 3.4 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Copper | µg/l | 0.7 | 1 | EQS Freshwater | 2 | 6.30 | 16.00 | **2** | **6.30** | **16.00** | | | | |
| | Lead | µg/l | 1 | 1.2 | EQS Freshwater | 2 | 3.00 | 5.20 | 2 | **3.00** | **5.20** | | | | |
| | Mercury | µg/l | 0.5 | 0.07 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 0.5 | < 0.5 | | | | |
| | Nickel | µg/l | 0.3 | 4 | EQS Freshwater | 2 | 3.50 | 7.30 | **1** | 3.50 | **7.30** | | | | |
| | Selenium | µg/l | 4 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | < 4.0 | < 4.0 | | | | |
| | Vanadium | µg/l | 1.7 | None Available | | 1 | 6.80 | 6.80 | 0 | < 1.7 | 6.80 | | | | |
| | Zinc | µg/l | 0.4 | 10.9 | EQS Freshwater | 2 | 8.20 | 17.00 | **1** | 8.20 | **17.00** | | | | |
| | Sulphate | mg/l | 0.1 | 400 | EQS Freshwater | 2 | 1.40 | 14.40 | 0 | 1.40 | 14.40 | | | | |
| | Boron | µg/l | 10 | 2000 | EQS Freshwater | 2 | 13.00 | 18.00 | 0 | 13.00 | 18.00 | | | | |
| | pH | | | | | 0 | 0.00 | 0.00 | 0 | | | | | | |
| Inorganics | Cyanide (total) | µg/l | 10 | 1 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 10 | < 10 | | | | |
| | Phenol* | µg/l | | 7.7 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |
| | Ammonia (NH3 as N) | mg/l | | 0.015 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | | | | | | |

# Appendix 10: Groundwater Screening Worksheets

*EQS Standard: Phenol and Benzene annual average of 300µg/l; Toluene 500µg/l for Freshwater, 400µg/l for Saltwater; 1,1,1-TCA 1,000µg/l.

| | |
|---|---|
| **Project Name:** | Plot P Kingsway (Plot R) |
| **Project Number:** | 232081 |
| **Assessment for:** | Water Assessment |
| **Laboratory:** | i2 |
| **Receptor:** | Freshwater |
| **Receptor Water Hardness:** | <40 (No Data) |

BWB A CAF GROUP COMPANY

100 = Assessment Criteria Exceedance)

50 = M-BAT Bioavailability Assessment Required

| | Contaminant | Units | Detection Limit | Guideline Concentration | Source | Number of Samples | Min | Max | No of Exceedences | BH02 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Heavy Metals | Arsenic | µg/l | 0.15 | 50 | EQS Freshwater | 1 | 0.16 | 0.16 | 0 | 0.16 | | | | | |
| | Barium | mg/l | 0.06 | 700 | UK DWS | 1 | 55.00 | 55.00 | 0 | 55.00 | | | | | |
| | Beryllium | µg/l | 0.10 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.1 | | | | | |
| | Cadmium | µg/l | 0.02 | 0.08 | EQS Freshwater | 1 | 0.23 | 0.23 | 1 | **0.23** | | | | | |
| | Chromium III | µg/l | 0.20 | 4.7 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 0.2 | | | | | |
| | Copper | µg/l | 0.50 | 1 | EQS Freshwater | 1 | 1.70 | 1.70 | **1** | **1.70** | | | | | |
| | Lead | µg/l | 0.20 | 1.2 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 0.2 | | | | | |
| | Mercury | µg/l | 0.05 | 0.07 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 0.05 | | | | | |
| | Nickel | µg/l | 0.50 | 4 | EQS Freshwater | 1 | 4.40 | 4.40 | **1** | **4.40** | | | | | |
| | Selenium | µg/l | 0.60 | 10 | UK DWS | 1 | 1.50 | 1.50 | 0 | 1.50 | | | | | |
| | Vanadium | µg/l | 0.20 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.2 | | | | | |
| | Zinc | µg/l | 0.50 | 10.9 | EQS Freshwater | 1 | 42.00 | 42.00 | **1** | **42.00** | | | | | |
| | Sulphate | mg/l | 0.045 | 400 | EQS Freshwater | 1 | 93.20 | 93.20 | 0 | 93.20 | | | | | |
| | Boron | µg/l | 10.00 | 2000 | EQS Freshwater | 1 | 83.00 | 83.00 | 0 | 83.00 | | | | | |
| | pH | | | | | 1 | 6.30 | 6.30 | 0 | 6.30 | | | | | |
| Inorganics | Cyanide (total) | µg/l | 10 | 1 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 10 | | | | | |
| | Phenol* | µg/l | 10 | 7.7 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 10 | | | | | |
| | Ammonia (NH3 as N) | mg/l | | 0.015 | EQS Freshwater | 1 | 0.07 | 0.07 | 1 | **0.07** | | | | | |

*EQS Standard: Phenol and Benzene annual average of 300µg/l; Toluene 500µg/l for Freshwater, 400µg/l for Saltwater; 1,1,1-TCA 1,000µg/l.

| | |
|---|---|
| **Project Name:** | Plot P Kingsway (Plot R) |
| **Project Number:** | 232081 |
| **Assessment for:** | Water Assessment |
| **Laboratory:** | i2 |
| **Receptor:** | Drinking Water |
| **Receptor Water Hardness:** | <40 (No Data) |

A CAF GROUP COMPANY

100 = Assessment Criteria Exceedance)

50 = M-BAT Bioavailability Assessment Required

| | Contaminant | Units | Detection Limit | Guideline Concentration | Source | Number of Samples | Min | Max | No of Exceedences | BH02 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Heavy Metals | Arsenic | µg/l | 0.15 | 10 | UK DWS | 1 | 0.16 | 0.16 | 0 | 0.16 | | | | | |
| | Barium | mg/l | 0.06 | 700 | UK DWS | 1 | 55.00 | 55.00 | 0 | 55.00 | | | | | |
| | Beryllium | µg/l | 0.10 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.1 | | | | | |
| | Cadmium | µg/l | 0.02 | 3 | UK DWS | 1 | 0.23 | 0.23 | 0 | 0.23 | | | | | |
| | Chromium III | µg/l | 0.20 | 4.7 | UK DWS | 0 | 0.00 | 0.00 | 0 | < 0.2 | | | | | |
| | Copper | µg/l | 0.50 | 2000 | UK DWS | 1 | 1.70 | 1.70 | 0 | 1.70 | | | | | |
| | Lead | µg/l | 0.20 | 10 | UK DWS | 0 | 0.00 | 0.00 | 0 | < 0.2 | | | | | |
| | Mercury | µg/l | 0.05 | 1 | UK DWS | 0 | 0.00 | 0.00 | 0 | < 0.05 | | | | | |
| | Nickel | µg/l | 0.50 | 20 | UK DWS | 1 | 4.40 | 4.40 | 0 | 4.40 | | | | | |
| | Selenium | µg/l | 0.60 | 10 | UK DWS | 1 | 1.50 | 1.50 | 0 | 1.50 | | | | | |
| | Vanadium | µg/l | 0.20 | None Available | | 0 | 0.00 | 0.00 | 0 | < 0.2 | | | | | |
| | Zinc | µg/l | 0.50 | 5000 | UK DWS | 1 | 42.00 | 42.00 | 0 | 42.00 | | | | | |
| | Sulphate | mg/l | 0.045 | 250 | UK DWS | 1 | 93.20 | 93.20 | 0 | 93.20 | | | | | |
| | Boron | µg/l | 10.00 | 1000 | UK DWS | 1 | 83.00 | 83.00 | 0 | 83.00 | | | | | |
| | pH | | | | | 1 | 6.30 | 6.30 | 0 | 6.30 | | | | | |
| Inorganics | Cyanide (total) | µg/l | 10 | 70 | UK DWS | 0 | 0.00 | 0.00 | 0 | < 10 | | | | | |
| | Phenol* | µg/l | 10 | 7.7 | EQS Freshwater | 0 | 0.00 | 0.00 | 0 | < 10 | | | | | |
| | Ammonia (NH3 as N) | mg/l | | 0.015 | EQS Freshwater | 1 | 0.07 | 0.07 | 1 | **0.07** | | | | | |

# Appendix 11: Waste Classification

# Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

a) understand the origin of the waste
b) select the correct List of Waste code(s)
c) confirm that the list of determinands, results and sampling plan are fit for purpose
d) select and justify the chosen metal species (Appendix B)
e) correctly apply moisture correction and other available corrections
f) add the meta data for their user-defined substances (Appendix A)
g) check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

UHVAO-AOUGT-6N615

## Job name

232081 Plot R Kingsway

## Description/Comments

## Project

232081

## Site

Plot R Kingsway, Rochdale

## Classified by

Name:
**Timothy Hull**
Company:
**BWB Consulting Ltd**
Date:
**04 Aug 2023 13:26 GMT**
Telephone:
**0115 924 1100**

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

**HazWasteOnline™ Certification:** -

| Course | Date |
|---|---|
| Hazardous Waste Classification | - |

## Purpose of classification

2 - Material Characterisation

## Address of the waste

Plot R Kingsway Business Park, Rochadale **Post Code** N/A

## SIC for the process giving rise to the waste

41201 Construction of commercial buildings

## Description of industry/producer giving rise to the waste

Development of site for commercial buildings

## Description of the specific process, sub-process and/or activity that created the waste

Waste created during construction of foundations and drainage.

## Description of the waste

Made ground and natural soils

## Job summary

| # | Sample name | Depth [m] | Classification Result | Hazard properties | Page |
|---|---|---|---|---|---|
| 1 | TP01 | 0.10-0.20 | Non Hazardous | | 3 |
| 2 | TP02 | 0.10-0.20 | Non Hazardous | | 6 |
| 3 | TP03 | 0.10-0.20 | Non Hazardous | | 9 |
| 4 | TP04 | 0.10-0.20 | Non Hazardous | | 12 |
| 5 | BH01 | 0.20-0.30 | Non Hazardous | | 15 |
| 6 | BH02 | 0.10-0.20 | Non Hazardous | | 18 |
| 7 | BH02[2] | 2.30-2.40 | Non Hazardous | | 21 |
| 8 | BH02[3] | 2.50-2.60 | Non Hazardous | | 23 |

## Related documents

| # | Name | Description |
|---|---|---|
| 1 | BWB Contaminated Land Suite WM3 | waste stream template used to create this Job |

## Report

Created by: Timothy Hull

Created date: 04 Aug 2023 13:26 GMT


| Appendices | Page |
|---|---|
| Appendix A: Classifier defined and non GB MCL determinands | 25 |
| Appendix B: Rationale for selection of metal species | 26 |
| Appendix C: Version | 27 |

## Classification of sample: TP01

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**TP01**
Sample Depth:
**0.10-0.20 m**
Moisture content:
**18%**
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 18% No Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | confirm TPH has NOT arisen from diesel or petrol | | | | | ☑ | | | | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 130 mg/kg | 1.32 | 171.642 mg/kg | 0.0172 % | | |
| 3 | beryllium { beryllium oxide } | 004-003-00-8 | 215-133-1 | 1304-56-9 | | 9 mg/kg | 2.775 | 24.978 mg/kg | 0.0025 % | | |
| 4 | boron { boron tribromide/trichloride/trifluoride (combined) } | | | 10294-33-4, 10294-34-5, 7637-07-2 | | 0.4 mg/kg | 13.43 | 5.372 mg/kg | 0.000537 % | | |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 mg/kg | 1.285 | <0.257 mg/kg | <0.00002 % | | <**LOD** |
| 6 | chromium { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 41 mg/kg | 1.462 | 59.924 mg/kg | 0.00599 % | | |
| 7 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 260 mg/kg | 1.126 | 292.731 mg/kg | 0.0293 % | | |
| 8 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 220 mg/kg | | 220 mg/kg | 0.022 % | | |
| 9 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | <0.3 mg/kg | 1.353 | <0.406 mg/kg | <0.0000406 % | | <**LOD** |
| 10 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1] 234-348-1 [2] | 12054-48-7 [1] 11113-74-9 [2] | | 100 mg/kg | 1.579 | 157.95 mg/kg | 0.0158 % | | |
| 11 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | <1 mg/kg | 1.405 | <1.405 mg/kg | <0.000141 % | | <**LOD** |
| 12 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1] 231-793-3 [2] | 7446-19-7 [1] 7733-02-0 [2] | | 230 mg/kg | 2.469 | 567.938 mg/kg | 0.0568 % | | |
| 13 | pH | | | PH | | 6.6 pH | | 6.6 pH | 6.6 pH | | |

| # | | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | 006-007-00-5 | | | | <1 | mg/kg | 1.884 | <1.884 | mg/kg | <0.000188 % | | <**LOD** |
| 15 | | TPH (C6 to C40) petroleum group | | | TPH | | 27 | mg/kg | | 27 | mg/kg | 0.0027 % | | |
| 16 | | benzene | 601-020-00-8 | 200-753-7 | 71-43-2 | | <0.005 | mg/kg | | <0.005 | mg/kg | <0.0000005 % | | <**LOD** |
| 17 | | ethylbenzene | 601-023-00-4 | 202-849-4 | 100-41-4 | | <0.005 | mg/kg | | <0.005 | mg/kg | <0.0000005 % | | <**LOD** |
| 18 | | toluene | 601-021-00-3 | 203-625-9 | 108-88-3 | | <0.005 | mg/kg | | <0.005 | mg/kg | <0.0000005 % | | <**LOD** |
| 19 | | xylene | 601-022-00-9 | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4] | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4] | | <0.005 | mg/kg | | <0.005 | mg/kg | <0.0000005 % | | <**LOD** |
| 20 | | acenaphthene | | 201-469-6 | 83-32-9 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 21 | | acenaphthylene | | 205-917-1 | 208-96-8 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 22 | | anthracene | | 204-371-1 | 120-12-7 | | 0.07 | mg/kg | | 0.07 | mg/kg | 0.000007 % | | |
| 23 | | benzo[a]anthracene | 601-033-00-9 | 200-280-6 | 56-55-3 | | 0.3 | mg/kg | | 0.3 | mg/kg | 0.00003 % | | |
| 24 | | benzo[a]pyrene; benzo[def]chrysene | 601-032-00-3 | 200-028-5 | 50-32-8 | | 0.24 | mg/kg | | 0.24 | mg/kg | 0.000024 % | | |
| 25 | | benzo[b]fluoranthene | 601-034-00-4 | 205-911-9 | 205-99-2 | | 0.38 | mg/kg | | 0.38 | mg/kg | 0.000038 % | | |
| 26 | | benzo[ghi]perylene | | 205-883-8 | 191-24-2 | | 0.19 | mg/kg | | 0.19 | mg/kg | 0.000019 % | | |
| 27 | | benzo[k]fluoranthene | 601-036-00-5 | 205-916-6 | 207-08-9 | | 0.16 | mg/kg | | 0.16 | mg/kg | 0.000016 % | | |
| 28 | | chrysene | 601-048-00-0 | 205-923-4 | 218-01-9 | | 0.34 | mg/kg | | 0.34 | mg/kg | 0.000034 % | | |
| 29 | | dibenz[a,h]anthracene | 601-041-00-2 | 200-181-8 | 53-70-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 30 | | fluoranthene | | 205-912-4 | 206-44-0 | | 0.51 | mg/kg | | 0.51 | mg/kg | 0.000051 % | | |
| 31 | | fluorene | | 201-695-5 | 86-73-7 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 32 | | indeno[123-cd]pyrene | | 205-893-2 | 193-39-5 | | 0.17 | mg/kg | | 0.17 | mg/kg | 0.000017 % | | |
| 33 | | naphthalene | 601-052-00-2 | 202-049-5 | 91-20-3 | | 0.15 | mg/kg | | 0.15 | mg/kg | 0.000015 % | | |
| 34 | | phenanthrene | | 201-581-5 | 85-01-8 | | 0.39 | mg/kg | | 0.39 | mg/kg | 0.000039 % | | |
| 35 | | pyrene | | 204-927-3 | 129-00-0 | | 0.44 | mg/kg | | 0.44 | mg/kg | 0.000044 % | | |
| 36 | | phenol | 604-001-00-2 | 203-632-7 | 108-95-2 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| | | | | | | | | | | | Total: | 0.154 % | | |

| Key | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Trace levels of longer chain hydrocarbons. No volatility risk

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0027%)

## Classification of sample: TP02

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**TP02**
Sample Depth:
**0.10-0.20 m**
Moisture content:
**17%**
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 17% No Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | confirm TPH has NOT arisen from diesel or petrol | | | | | ☑ | | | | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 17 mg/kg | 1.32 | 22.446 mg/kg | 0.00224 % | | |
| 3 | beryllium { beryllium oxide } | 004-003-00-8 | 215-133-1 | 1304-56-9 | | 0.91 mg/kg | 2.775 | 2.526 mg/kg | 0.000253 % | | |
| 4 | boron { boron tribromide/trichloride/trifluoride (combined) } | | | 10294-33-4, 10294-34-5, 7637-07-2 | | 0.7 mg/kg | 13.43 | 9.401 mg/kg | 0.00094 % | | |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 mg/kg | 1.285 | <0.257 mg/kg | <0.00002 % | | <**LOD** |
| 6 | chromium { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 18 mg/kg | 1.462 | 26.308 mg/kg | 0.00263 % | | |
| 7 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 41 mg/kg | 1.126 | 46.161 mg/kg | 0.00462 % | | |
| 8 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 70 mg/kg | | 70 mg/kg | 0.007 % | | |
| 9 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | <0.3 mg/kg | 1.353 | <0.406 mg/kg | <0.0000406 % | | <**LOD** |
| 10 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1] 234-348-1 [2] | 12054-48-7 [1] 11113-74-9 [2] | | 16 mg/kg | 1.579 | 25.272 mg/kg | 0.00253 % | | |
| 11 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | <1 mg/kg | 1.405 | <1.405 mg/kg | <0.000141 % | | <**LOD** |
| 12 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1] 231-793-3 [2] | 7446-19-7 [1] 7733-02-0 [2] | | 68 mg/kg | 2.469 | 167.912 mg/kg | 0.0168 % | | |
| 13 | pH | | | PH | | 4.9 pH | | 4.9 pH | 4.9 pH | | |

| # | | Determinand | | | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EU CLP index number | EC Number | CAS Number | | | | | | | | | |
| 14 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | <1 | mg/kg | 1.884 | <1.884 | mg/kg | <0.000188 % | | <**LOD** |
| | | 006-007-00-5 | | | | | | | | | | | |
| 15 | | TPH (C6 to C40) petroleum group | | | | 14 | mg/kg | | 14 | mg/kg | 0.0014 % | | |
| | | | | TPH | | | | | | | | | |
| 16 | | acenaphthene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| | | | 201-469-6 | 83-32-9 | | | | | | | | | |
| 17 | | acenaphthylene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| | | | 205-917-1 | 208-96-8 | | | | | | | | | |
| 18 | | anthracene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| | | | 204-371-1 | 120-12-7 | | | | | | | | | |
| 19 | | benzo[a]anthracene | | | | 0.11 | mg/kg | | 0.11 | mg/kg | 0.000011 % | | |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | | | |
| 20 | | benzo[a]pyrene; benzo[def]chrysene | | | | 0.12 | mg/kg | | 0.12 | mg/kg | 0.000012 % | | |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | | | |
| 21 | | benzo[b]fluoranthene | | | | 0.18 | mg/kg | | 0.18 | mg/kg | 0.000018 % | | |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | | | |
| 22 | | benzo[ghi]perylene | | | | 0.09 | mg/kg | | 0.09 | mg/kg | 0.000009 % | | |
| | | | 205-883-8 | 191-24-2 | | | | | | | | | |
| 23 | | benzo[k]fluoranthene | | | | 0.06 | mg/kg | | 0.06 | mg/kg | 0.000006 % | | |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | | | |
| 24 | | chrysene | | | | 0.14 | mg/kg | | 0.14 | mg/kg | 0.000014 % | | |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | | | |
| 25 | | dibenz[a,h]anthracene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | | | |
| 26 | | fluoranthene | | | | 0.21 | mg/kg | | 0.21 | mg/kg | 0.000021 % | | |
| | | | 205-912-4 | 206-44-0 | | | | | | | | | |
| 27 | | fluorene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| | | | 201-695-5 | 86-73-7 | | | | | | | | | |
| 28 | | indeno[123-cd]pyrene | | | | 0.06 | mg/kg | | 0.06 | mg/kg | 0.000006 % | | |
| | | | 205-893-2 | 193-39-5 | | | | | | | | | |
| 29 | | naphthalene | | | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | | | |
| 30 | | phenanthrene | | | | 0.15 | mg/kg | | 0.15 | mg/kg | 0.000015 % | | |
| | | | 201-581-5 | 85-01-8 | | | | | | | | | |
| 31 | | pyrene | | | | 0.22 | mg/kg | | 0.22 | mg/kg | 0.000022 % | | |
| | | | 204-927-3 | 129-00-0 | | | | | | | | | |
| 32 | | phenol | | | | 1.7 | mg/kg | | 1.7 | mg/kg | 0.00017 % | | |
| | | 604-001-00-2 | 203-632-7 | 108-95-2 | | | | | | | | | |
| | | | | | | | | | | Total: | 0.0391 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Trace levels of longer chain hydrocarbons. No volatility risk

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0014%)

## Classification of sample: TP03

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**TP03**
Sample Depth:
**0.10-0.20 m**
Moisture content:
**14%**
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 14% No Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | confirm TPH has NOT arisen from diesel or petrol | | | | | ☑ | | | | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 120 mg/kg | 1.32 | 158.439 mg/kg | 0.0158 % | | |
| 3 | beryllium { beryllium oxide } | 004-003-00-8 | 215-133-1 | 1304-56-9 | | 7.8 mg/kg | 2.775 | 21.648 mg/kg | 0.00216 % | | |
| 4 | boron { boron tribromide/trichloride/trifluoride (combined) } | | | 10294-33-4, 10294-34-5, 7637-07-2 | | 0.8 mg/kg | 13.43 | 10.744 mg/kg | 0.00107 % | | |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 mg/kg | 1.285 | <0.257 mg/kg | <0.00002 % | | <**LOD** |
| 6 | chromium { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 40 mg/kg | 1.462 | 58.462 mg/kg | 0.00585 % | | |
| 7 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 270 mg/kg | 1.126 | 303.99 mg/kg | 0.0304 % | | |
| 8 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 360 mg/kg | | 360 mg/kg | 0.036 % | | |
| 9 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | <0.3 mg/kg | 1.353 | <0.406 mg/kg | <0.0000406 % | | <**LOD** |
| 10 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1]<br>234-348-1 [2] | 12054-48-7 [1]<br>11113-74-9 [2] | | 100 mg/kg | 1.579 | 157.95 mg/kg | 0.0158 % | | |
| 11 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | <1 mg/kg | 1.405 | <1.405 mg/kg | <0.000141 % | | <**LOD** |
| 12 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 270 mg/kg | 2.469 | 666.71 mg/kg | 0.0667 % | | |
| 13 | pH | | | PH | | 7.8 pH | | 7.8 pH | 7.8 pH | | |

| # | | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | 006-007-00-5 | | | | <1 | mg/kg | 1.884 | <1.884 | mg/kg | <0.000188 % | | <**LOD** |
| 15 | | TPH (C6 to C40) petroleum group | | | TPH | | 75 | mg/kg | | 75 | mg/kg | 0.0075 % | | |
| 16 | | acenaphthene | | 201-469-6 | 83-32-9 | | 0.32 | mg/kg | | 0.32 | mg/kg | 0.000032 % | | |
| 17 | | acenaphthylene | | 205-917-1 | 208-96-8 | | 0.09 | mg/kg | | 0.09 | mg/kg | 0.000009 % | | |
| 18 | | anthracene | | 204-371-1 | 120-12-7 | | 0.55 | mg/kg | | 0.55 | mg/kg | 0.000055 % | | |
| 19 | | benzo[a]anthracene | 601-033-00-9 | 200-280-6 | 56-55-3 | | 2.1 | mg/kg | | 2.1 | mg/kg | 0.00021 % | | |
| 20 | | benzo[a]pyrene; benzo[def]chrysene | 601-032-00-3 | 200-028-5 | 50-32-8 | | 1.9 | mg/kg | | 1.9 | mg/kg | 0.00019 % | | |
| 21 | | benzo[b]fluoranthene | 601-034-00-4 | 205-911-9 | 205-99-2 | | 2.3 | mg/kg | | 2.3 | mg/kg | 0.00023 % | | |
| 22 | | benzo[ghi]perylene | | 205-883-8 | 191-24-2 | | 1.3 | mg/kg | | 1.3 | mg/kg | 0.00013 % | | |
| 23 | | benzo[k]fluoranthene | 601-036-00-5 | 205-916-6 | 207-08-9 | | 1.1 | mg/kg | | 1.1 | mg/kg | 0.00011 % | | |
| 24 | | chrysene | 601-048-00-0 | 205-923-4 | 218-01-9 | | 2.2 | mg/kg | | 2.2 | mg/kg | 0.00022 % | | |
| 25 | | dibenz[a,h]anthracene | 601-041-00-2 | 200-181-8 | 53-70-3 | | 0.23 | mg/kg | | 0.23 | mg/kg | 0.000023 % | | |
| 26 | | fluoranthene | | 205-912-4 | 206-44-0 | | 5 | mg/kg | | 5 | mg/kg | 0.0005 % | | |
| 27 | | fluorene | | 201-695-5 | 86-73-7 | | 0.23 | mg/kg | | 0.23 | mg/kg | 0.000023 % | | |
| 28 | | indeno[123-cd]pyrene | | 205-893-2 | 193-39-5 | | 1.2 | mg/kg | | 1.2 | mg/kg | 0.00012 % | | |
| 29 | | naphthalene | 601-052-00-2 | 202-049-5 | 91-20-3 | | 0.4 | mg/kg | | 0.4 | mg/kg | 0.00004 % | | |
| 30 | | phenanthrene | | 201-581-5 | 85-01-8 | | 3.6 | mg/kg | | 3.6 | mg/kg | 0.00036 % | | |
| 31 | | pyrene | | 204-927-3 | 129-00-0 | | 4.5 | mg/kg | | 4.5 | mg/kg | 0.00045 % | | |
| 32 | | phenol | 604-001-00-2 | 203-632-7 | 108-95-2 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| | | | | | | | | | | | Total: | 0.184 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Trace levels of longer chain hydrocarbons. No volatility risk

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0075%)

## Classification of sample: TP04

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**TP04**
Sample Depth:
**0.10-0.20 m**
Moisture content:
**14%**
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 14% No Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | confirm TPH has NOT arisen from diesel or petrol | | | | | ☑ | | | | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 15 mg/kg | 1.32 | 19.805 mg/kg | 0.00198 % | | |
| 3 | beryllium { beryllium oxide } | 004-003-00-8 | 215-133-1 | 1304-56-9 | | 0.79 mg/kg | 2.775 | 2.193 mg/kg | 0.000219 % | | |
| 4 | boron { boron tribromide/trichloride/trifluoride (combined) } | | | 10294-33-4, 10294-34-5, 7637-07-2 | | 0.7 mg/kg | 13.43 | 9.401 mg/kg | 0.00094 % | | |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 mg/kg | 1.285 | <0.257 mg/kg | <0.00002 % | | <**LOD** |
| 6 | chromium { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 18 mg/kg | 1.462 | 26.308 mg/kg | 0.00263 % | | |
| 7 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 39 mg/kg | 1.126 | 43.91 mg/kg | 0.00439 % | | |
| 8 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 70 mg/kg | | 70 mg/kg | 0.007 % | | |
| 9 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | <0.3 mg/kg | 1.353 | <0.406 mg/kg | <0.0000406 % | | <**LOD** |
| 10 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1] 234-348-1 [2] | 12054-48-7 [1] 11113-74-9 [2] | | 16 mg/kg | 1.579 | 25.272 mg/kg | 0.00253 % | | |
| 11 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | <1 mg/kg | 1.405 | <1.405 mg/kg | <0.000141 % | | <**LOD** |
| 12 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1] 231-793-3 [2] | 7446-19-7 [1] 7733-02-0 [2] | | 74 mg/kg | 2.469 | 182.728 mg/kg | 0.0183 % | | |
| 13 | pH | | | PH | | 7.3 pH | | 7.3 pH | 7.3 pH | | |

| # | | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | 006-007-00-5 | | | | <1 mg/kg | 1.884 | <1.884 mg/kg | <0.000188 % | | <**LOD** |
| 15 | | TPH (C6 to C40) petroleum group | | | TPH | | 14 mg/kg | | 14 mg/kg | 0.0014 % | | |
| 16 | | acenaphthene | | 201-469-6 | 83-32-9 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <**LOD** |
| 17 | | acenaphthylene | | 205-917-1 | 208-96-8 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <**LOD** |
| 18 | | anthracene | | 204-371-1 | 120-12-7 | | 0.09 mg/kg | | 0.09 mg/kg | 0.000009 % | | |
| 19 | | benzo[a]anthracene | 601-033-00-9 | 200-280-6 | 56-55-3 | | 0.35 mg/kg | | 0.35 mg/kg | 0.000035 % | | |
| 20 | | benzo[a]pyrene; benzo[def]chrysene | 601-032-00-3 | 200-028-5 | 50-32-8 | | 0.36 mg/kg | | 0.36 mg/kg | 0.000036 % | | |
| 21 | | benzo[b]fluoranthene | 601-034-00-4 | 205-911-9 | 205-99-2 | | 0.48 mg/kg | | 0.48 mg/kg | 0.000048 % | | |
| 22 | | benzo[ghi]perylene | | 205-883-8 | 191-24-2 | | 0.24 mg/kg | | 0.24 mg/kg | 0.000024 % | | |
| 23 | | benzo[k]fluoranthene | 601-036-00-5 | 205-916-6 | 207-08-9 | | 0.17 mg/kg | | 0.17 mg/kg | 0.000017 % | | |
| 24 | | chrysene | 601-048-00-0 | 205-923-4 | 218-01-9 | | 0.43 mg/kg | | 0.43 mg/kg | 0.000043 % | | |
| 25 | | dibenz[a,h]anthracene | 601-041-00-2 | 200-181-8 | 53-70-3 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <**LOD** |
| 26 | | fluoranthene | | 205-912-4 | 206-44-0 | | 0.72 mg/kg | | 0.72 mg/kg | 0.000072 % | | |
| 27 | | fluorene | | 201-695-5 | 86-73-7 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <**LOD** |
| 28 | | indeno[123-cd]pyrene | | 205-893-2 | 193-39-5 | | 0.17 mg/kg | | 0.17 mg/kg | 0.000017 % | | |
| 29 | | naphthalene | 601-052-00-2 | 202-049-5 | 91-20-3 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <**LOD** |
| 30 | | phenanthrene | | 201-581-5 | 85-01-8 | | 0.45 mg/kg | | 0.45 mg/kg | 0.000045 % | | |
| 31 | | pyrene | | 204-927-3 | 129-00-0 | | 0.7 mg/kg | | 0.7 mg/kg | 0.00007 % | | |
| 32 | | phenol | 604-001-00-2 | 203-632-7 | 108-95-2 | | <1 mg/kg | | <1 mg/kg | <0.0001 % | | <**LOD** |
| | | | | | | | | | Total: | 0.0403 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Trace levels of longer chain hydrocarbons. No volatility risk

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0014%)

## Classification of sample: BH01

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**BH01**
Sample Depth:
**0.20-0.30 m**
Moisture content:
**12%**
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 12% No Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | confirm TPH has NOT arisen from diesel or petrol | | | | | ☑ | | | | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 11 mg/kg | 1.32 | 14.524 mg/kg | 0.00145 % | | |
| 3 | beryllium { beryllium oxide } | 004-003-00-8 | 215-133-1 | 1304-56-9 | | 0.66 mg/kg | 2.775 | 1.832 mg/kg | 0.000183 % | | |
| 4 | boron { boron tribromide/trichloride/trifluoride (combined) } | | | 10294-33-4, 10294-34-5, 7637-07-2 | | 0.4 mg/kg | 13.43 | 5.372 mg/kg | 0.000537 % | | |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 mg/kg | 1.285 | <0.257 mg/kg | <0.00002 % | | <**LOD** |
| 6 | chromium { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 15 mg/kg | 1.462 | 21.923 mg/kg | 0.00219 % | | |
| 7 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 31 mg/kg | 1.126 | 34.903 mg/kg | 0.00349 % | | |
| 8 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 57 mg/kg | | 57 mg/kg | 0.0057 % | | |
| 9 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | <0.3 mg/kg | 1.353 | <0.406 mg/kg | <0.0000406 % | | <**LOD** |
| 10 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1] 234-348-1 [2] | 12054-48-7 [1] 11113-74-9 [2] | | 14 mg/kg | 1.579 | 22.113 mg/kg | 0.00221 % | | |
| 11 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | <1 mg/kg | 1.405 | <1.405 mg/kg | <0.000141 % | | <**LOD** |
| 12 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1] 231-793-3 [2] | 7446-19-7 [1] 7733-02-0 [2] | | 61 mg/kg | 2.469 | 150.627 mg/kg | 0.0151 % | | |
| 13 | pH | | | PH | | 8.5 pH | | 8.5 pH | 8.5 pH | | |

| # | | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | 006-007-00-5 | | | | <1 | mg/kg | 1.884 | <1.884 | mg/kg | <0.000188 % | | <LOD |
| 15 | | TPH (C6 to C40) petroleum group | | | TPH | | 72 | mg/kg | | 72 | mg/kg | 0.0072 % | | |
| 16 | | acenaphthene | | 201-469-6 | 83-32-9 | | 0.64 | mg/kg | | 0.64 | mg/kg | 0.000064 % | | |
| 17 | | acenaphthylene | | 205-917-1 | 208-96-8 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <LOD |
| 18 | | anthracene | | 204-371-1 | 120-12-7 | | 0.95 | mg/kg | | 0.95 | mg/kg | 0.000095 % | | |
| 19 | | benzo[a]anthracene | 601-033-00-9 | 200-280-6 | 56-55-3 | | 1.6 | mg/kg | | 1.6 | mg/kg | 0.00016 % | | |
| 20 | | benzo[a]pyrene; benzo[def]chrysene | 601-032-00-3 | 200-028-5 | 50-32-8 | | 1.7 | mg/kg | | 1.7 | mg/kg | 0.00017 % | | |
| 21 | | benzo[b]fluoranthene | 601-034-00-4 | 205-911-9 | 205-99-2 | | 2 | mg/kg | | 2 | mg/kg | 0.0002 % | | |
| 22 | | benzo[ghi]perylene | | 205-883-8 | 191-24-2 | | 1 | mg/kg | | 1 | mg/kg | 0.0001 % | | |
| 23 | | benzo[k]fluoranthene | 601-036-00-5 | 205-916-6 | 207-08-9 | | 0.65 | mg/kg | | 0.65 | mg/kg | 0.000065 % | | |
| 24 | | chrysene | 601-048-00-0 | 205-923-4 | 218-01-9 | | 1.9 | mg/kg | | 1.9 | mg/kg | 0.00019 % | | |
| 25 | | dibenz[a,h]anthracene | 601-041-00-2 | 200-181-8 | 53-70-3 | | 0.18 | mg/kg | | 0.18 | mg/kg | 0.000018 % | | |
| 26 | | fluoranthene | | 205-912-4 | 206-44-0 | | 4.2 | mg/kg | | 4.2 | mg/kg | 0.00042 % | | |
| 27 | | fluorene | | 201-695-5 | 86-73-7 | | 0.49 | mg/kg | | 0.49 | mg/kg | 0.000049 % | | |
| 28 | | indeno[123-cd]pyrene | | 205-893-2 | 193-39-5 | | 0.91 | mg/kg | | 0.91 | mg/kg | 0.000091 % | | |
| 29 | | naphthalene | 601-052-00-2 | 202-049-5 | 91-20-3 | | 1.3 | mg/kg | | 1.3 | mg/kg | 0.00013 % | | |
| 30 | | phenanthrene | | 201-581-5 | 85-01-8 | | 4 | mg/kg | | 4 | mg/kg | 0.0004 % | | |
| 31 | | pyrene | | 204-927-3 | 129-00-0 | | 4 | mg/kg | | 4 | mg/kg | 0.0004 % | | |
| 32 | | phenol | 604-001-00-2 | 203-632-7 | 108-95-2 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <LOD |
| | | | | | | | | | | | Total: | 0.0411 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Trace levels of longer chain hydrocarbons. No volatility risk

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0072%)

## Classification of sample: BH02

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**BH02**
Sample Depth:
**0.10-0.20 m**
Moisture content:
**17%**
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 17% No Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | confirm TPH has NOT arisen from diesel or petrol | | | | | ☑ | | | | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 8.6 mg/kg | 1.32 | 11.355 mg/kg | 0.00114 % | | |
| 3 | beryllium { beryllium oxide } | 004-003-00-8 | 215-133-1 | 1304-56-9 | | 0.95 mg/kg | 2.775 | 2.637 mg/kg | 0.000264 % | | |
| 4 | boron { boron tribromide/trichloride/trifluoride (combined) } | | | 10294-33-4, 10294-34-5, 7637-07-2 | | 0.3 mg/kg | 13.43 | 4.029 mg/kg | 0.000403 % | | |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 mg/kg | 1.285 | <0.257 mg/kg | <0.00002 % | | <**LOD** |
| 6 | chromium { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 21 mg/kg | 1.462 | 30.693 mg/kg | 0.00307 % | | |
| 7 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 29 mg/kg | 1.126 | 32.651 mg/kg | 0.00327 % | | |
| 8 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 25 mg/kg | | 25 mg/kg | 0.0025 % | | |
| 9 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | <0.3 mg/kg | 1.353 | <0.406 mg/kg | <0.0000406 % | | <**LOD** |
| 10 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1] 234-348-1 [2] | 12054-48-7 [1] 11113-74-9 [2] | | 26 mg/kg | 1.579 | 41.067 mg/kg | 0.00411 % | | |
| 11 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | <1 mg/kg | 1.405 | <1.405 mg/kg | <0.000141 % | | <**LOD** |
| 12 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1] 231-793-3 [2] | 7446-19-7 [1] 7733-02-0 [2] | | 66 mg/kg | 2.469 | 162.974 mg/kg | 0.0163 % | | |
| 13 | pH | | | PH | | 7.5 pH | | 7.5 pH | 7.5 pH | | |

| # | | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | 006-007-00-5 | | | | <1 mg/kg | 1.884 | <1.884 mg/kg | <0.000188 % | | <**LOD** |
| 15 | | TPH (C6 to C40) petroleum group | | | TPH | | 20 mg/kg | | 20 mg/kg | 0.002 % | | |
| 16 | | benzene | 601-020-00-8 | 200-753-7 | 71-43-2 | | <0.005 mg/kg | | <0.005 mg/kg | <0.0000005 % | | <**LOD** |
| 17 | | ethylbenzene | 601-023-00-4 | 202-849-4 | 100-41-4 | | <0.005 mg/kg | | <0.005 mg/kg | <0.0000005 % | | <**LOD** |
| 18 | | toluene | 601-021-00-3 | 203-625-9 | 108-88-3 | | <0.005 mg/kg | | <0.005 mg/kg | <0.0000005 % | | <**LOD** |
| 19 | | xylene | 601-022-00-9 | 202-422-2 [1]<br>203-396-5 [2]<br>203-576-3 [3]<br>215-535-7 [4] | 95-47-6 [1]<br>106-42-3 [2]<br>108-38-3 [3]<br>1330-20-7 [4] | | <0.005 mg/kg | | <0.005 mg/kg | <0.0000005 % | | <**LOD** |
| 20 | | acenaphthene | | 201-469-6 | 83-32-9 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <**LOD** |
| 21 | | acenaphthylene | | 205-917-1 | 208-96-8 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <**LOD** |
| 22 | | anthracene | | 204-371-1 | 120-12-7 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <**LOD** |
| 23 | | benzo[a]anthracene | 601-033-00-9 | 200-280-6 | 56-55-3 | | 0.07 mg/kg | | 0.07 mg/kg | 0.000007 % | | |
| 24 | | benzo[a]pyrene; benzo[def]chrysene | 601-032-00-3 | 200-028-5 | 50-32-8 | | 0.05 mg/kg | | 0.05 mg/kg | 0.000005 % | | |
| 25 | | benzo[b]fluoranthene | 601-034-00-4 | 205-911-9 | 205-99-2 | | 0.09 mg/kg | | 0.09 mg/kg | 0.000009 % | | |
| 26 | | benzo[ghi]perylene | | 205-883-8 | 191-24-2 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <**LOD** |
| 27 | | benzo[k]fluoranthene | 601-036-00-5 | 205-916-6 | 207-08-9 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <**LOD** |
| 28 | | chrysene | 601-048-00-0 | 205-923-4 | 218-01-9 | | 0.11 mg/kg | | 0.11 mg/kg | 0.000011 % | | |
| 29 | | dibenz[a,h]anthracene | 601-041-00-2 | 200-181-8 | 53-70-3 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <**LOD** |
| 30 | | fluoranthene | | 205-912-4 | 206-44-0 | | 0.2 mg/kg | | 0.2 mg/kg | 0.00002 % | | |
| 31 | | fluorene | | 201-695-5 | 86-73-7 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <**LOD** |
| 32 | | indeno[123-cd]pyrene | | 205-893-2 | 193-39-5 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <**LOD** |
| 33 | | naphthalene | 601-052-00-2 | 202-049-5 | 91-20-3 | | <0.05 mg/kg | | <0.05 mg/kg | <0.000005 % | | <**LOD** |
| 34 | | phenanthrene | | 201-581-5 | 85-01-8 | | 0.17 mg/kg | | 0.17 mg/kg | 0.000017 % | | |
| 35 | | pyrene | | 204-927-3 | 129-00-0 | | 0.2 mg/kg | | 0.2 mg/kg | 0.00002 % | | |
| 36 | | phenol | 604-001-00-2 | 203-632-7 | 108-95-2 | | <1 mg/kg | | <1 mg/kg | <0.0001 % | | <**LOD** |
| | | | | | | | | | | Total: 0.0337 % | | |

| Key | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Trace levels of longer chain hydrocarbons. No volatility risk

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.002%)

## Classification of sample: BH02[2]

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**BH02[2]**
Sample Depth:
**2.30-2.40 m**
Moisture content:
**21%**
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 21% No Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | confirm TPH has NOT arisen from diesel or petrol | | | | | ☑ | | | | | | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 11 | mg/kg | 1.32 | 14.524 | mg/kg | 0.00145 % | | |
| 3 | beryllium { beryllium oxide } | 004-003-00-8 | 215-133-1 | 1304-56-9 | | 0.93 | mg/kg | 2.775 | 2.581 | mg/kg | 0.000258 % | | |
| 4 | boron { boron tribromide/trichloride/trifluoride (combined) } | | | 10294-33-4, 10294-34-5, 7637-07-2 | | 0.4 | mg/kg | 13.43 | 5.372 | mg/kg | 0.000537 % | | |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 | mg/kg | 1.285 | <0.257 | mg/kg | <0.00002 % | | <**LOD** |
| 6 | chromium { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 21 | mg/kg | 1.462 | 30.693 | mg/kg | 0.00307 % | | |
| 7 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 30 | mg/kg | 1.126 | 33.777 | mg/kg | 0.00338 % | | |
| 8 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 39 | mg/kg | | 39 | mg/kg | 0.0039 % | | |
| 9 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | <0.3 | mg/kg | 1.353 | <0.406 | mg/kg | <0.0000406 % | | <**LOD** |
| 10 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1] 234-348-1 [2] | 12054-48-7 [1] 11113-74-9 [2] | | 22 | mg/kg | 1.579 | 34.749 | mg/kg | 0.00347 % | | |
| 11 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | <1 | mg/kg | 1.405 | <1.405 | mg/kg | <0.000141 % | | <**LOD** |
| 12 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1] 231-793-3 [2] | 7446-19-7 [1] 7733-02-0 [2] | | 62 | mg/kg | 2.469 | 153.096 | mg/kg | 0.0153 % | | |
| 13 | pH | | | PH | | 7 | pH | | 7 | pH | 7pH | | |

| # | | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | 006-007-00-5 | | | | <1 | mg/kg | 1.884 | <1.884 | mg/kg | <0.000188 % | | <**LOD** |
| 15 | | TPH (C6 to C40) petroleum group | | | TPH | | <10 | mg/kg | | <10 | mg/kg | <0.001 % | | <**LOD** |
| 16 | | acenaphthene | | 201-469-6 | 83-32-9 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 17 | | acenaphthylene | | 205-917-1 | 208-96-8 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 18 | | anthracene | | 204-371-1 | 120-12-7 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 19 | | benzo[a]anthracene | 601-033-00-9 | 200-280-6 | 56-55-3 | | 0.22 | mg/kg | | 0.22 | mg/kg | 0.000022 % | | |
| 20 | | benzo[a]pyrene; benzo[def]chrysene | 601-032-00-3 | 200-028-5 | 50-32-8 | | 0.23 | mg/kg | | 0.23 | mg/kg | 0.000023 % | | |
| 21 | | benzo[b]fluoranthene | 601-034-00-4 | 205-911-9 | 205-99-2 | | 0.37 | mg/kg | | 0.37 | mg/kg | 0.000037 % | | |
| 22 | | benzo[ghi]perylene | | 205-883-8 | 191-24-2 | | 0.17 | mg/kg | | 0.17 | mg/kg | 0.000017 % | | |
| 23 | | benzo[k]fluoranthene | 601-036-00-5 | 205-916-6 | 207-08-9 | | 0.08 | mg/kg | | 0.08 | mg/kg | 0.000008 % | | |
| 24 | | chrysene | 601-048-00-0 | 205-923-4 | 218-01-9 | | 0.27 | mg/kg | | 0.27 | mg/kg | 0.000027 % | | |
| 25 | | dibenz[a,h]anthracene | 601-041-00-2 | 200-181-8 | 53-70-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 26 | | fluoranthene | | 205-912-4 | 206-44-0 | | 0.45 | mg/kg | | 0.45 | mg/kg | 0.000045 % | | |
| 27 | | fluorene | | 201-695-5 | 86-73-7 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 28 | | indeno[123-cd]pyrene | | 205-893-2 | 193-39-5 | | 0.15 | mg/kg | | 0.15 | mg/kg | 0.000015 % | | |
| 29 | | naphthalene | 601-052-00-2 | 202-049-5 | 91-20-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 30 | | phenanthrene | | 201-581-5 | 85-01-8 | | 0.22 | mg/kg | | 0.22 | mg/kg | 0.000022 % | | |
| 31 | | pyrene | | 204-927-3 | 129-00-0 | | 0.4 | mg/kg | | 0.4 | mg/kg | 0.00004 % | | |
| 32 | | phenol | 604-001-00-2 | 203-632-7 | 108-95-2 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| | | | | | | | | | | | Total: | 0.0332 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Classification of sample: BH02[3]

**Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

## Sample details

Sample name:
**BH02[3]**
Sample Depth:
**2.50-2.60 m**
Moisture content:
**15%**
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

## Hazard properties

None identified

## Determinands

Moisture content: 15% No Moisture Correction applied (MC)

| # | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | confirm TPH has NOT arisen from diesel or petrol | | | | | ☑ | | | | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 6.7 mg/kg | 1.32 | 8.846 mg/kg | 0.000885 % | | |
| 3 | beryllium { beryllium oxide } | 004-003-00-8 | 215-133-1 | 1304-56-9 | | 0.98 mg/kg | 2.775 | 2.72 mg/kg | 0.000272 % | | |
| 4 | boron { boron tribromide/trichloride/trifluoride (combined) } | | | 10294-33-4, 10294-34-5, 7637-07-2 | | <0.2 mg/kg | 13.43 | <2.686 mg/kg | <0.000269 % | | <**LOD** |
| 5 | cadmium { cadmium sulfide } | 048-010-00-4 | 215-147-8 | 1306-23-6 | 1 | <0.2 mg/kg | 1.285 | <0.257 mg/kg | <0.00002 % | | <**LOD** |
| 6 | chromium { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 25 mg/kg | 1.462 | 36.539 mg/kg | 0.00365 % | | |
| 7 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 27 mg/kg | 1.126 | 30.399 mg/kg | 0.00304 % | | |
| 8 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 14 mg/kg | | 14 mg/kg | 0.0014 % | | |
| 9 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | <0.3 mg/kg | 1.353 | <0.406 mg/kg | <0.0000406 % | | <**LOD** |
| 10 | nickel { nickel dihydroxide } | 028-008-00-X | 235-008-5 [1]<br>234-348-1 [2] | 12054-48-7 [1]<br>11113-74-9 [2] | | 18 mg/kg | 1.579 | 28.431 mg/kg | 0.00284 % | | |
| 11 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | <1 mg/kg | 1.405 | <1.405 mg/kg | <0.000141 % | | <**LOD** |
| 12 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 37 mg/kg | 2.469 | 91.364 mg/kg | 0.00914 % | | |
| 13 | pH | | | PH | | 4.7 pH | | 4.7 pH | 4.7 pH | | |

| # | | Determinand | EU CLP index number | EC Number | CAS Number | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | 006-007-00-5 | | | | <1 | mg/kg | 1.884 | <1.884 | mg/kg | <0.000188 % | | <**LOD** |
| 15 | | TPH (C6 to C40) petroleum group | | | TPH | | <10 | mg/kg | | <10 | mg/kg | <0.001 % | | <**LOD** |
| 16 | | acenaphthene | | 201-469-6 | 83-32-9 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 17 | | acenaphthylene | | 205-917-1 | 208-96-8 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 18 | | anthracene | | 204-371-1 | 120-12-7 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 19 | | benzo[a]anthracene | 601-033-00-9 | 200-280-6 | 56-55-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 20 | | benzo[a]pyrene; benzo[def]chrysene | 601-032-00-3 | 200-028-5 | 50-32-8 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 21 | | benzo[b]fluoranthene | 601-034-00-4 | 205-911-9 | 205-99-2 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 22 | | benzo[ghi]perylene | | 205-883-8 | 191-24-2 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 23 | | benzo[k]fluoranthene | 601-036-00-5 | 205-916-6 | 207-08-9 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 24 | | chrysene | 601-048-00-0 | 205-923-4 | 218-01-9 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 25 | | dibenz[a,h]anthracene | 601-041-00-2 | 200-181-8 | 53-70-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 26 | | fluoranthene | | 205-912-4 | 206-44-0 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 27 | | fluorene | | 201-695-5 | 86-73-7 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 28 | | indeno[123-cd]pyrene | | 205-893-2 | 193-39-5 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 29 | | naphthalene | 601-052-00-2 | 202-049-5 | 91-20-3 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 30 | | phenanthrene | | 201-581-5 | 85-01-8 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 31 | | pyrene | | 204-927-3 | 129-00-0 | | <0.05 | mg/kg | | <0.05 | mg/kg | <0.000005 % | | <**LOD** |
| 32 | | phenol | 604-001-00-2 | 203-632-7 | 108-95-2 | | <1 | mg/kg | | <1 | mg/kg | <0.0001 % | | <**LOD** |
| | | | | | | | | | | | Total: | 0.0231 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | Determinand values ignored for classification, see column 'Conc. Not Used' for reason |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |
| | Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration |
| **<LOD** | Below limit of detection |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Appendix A: Classifier defined and non GB MCL determinands

**confirm TPH has NOT arisen from diesel or petrol**

Description/Comments: Chapter 3, section 4b requires a positive confirmation for benzo[a]pyrene to be used as a marker in evaluating Carc. 1B; H350 (HP 7) and Muta. 1B; H340 (HP 11)
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

**boron tribromide/trichloride/trifluoride (combined)** (CAS Number: 10294-33-4, 10294-34-5, 7637-07-2)

Description/Comments: Combines the hazard statements and the average of the conversion factors for boron tribromide, boron trichloride and boron trifluoride
Data source: N/A
Data source date: 06 Aug 2015
Hazard Statements: EUH014 , Acute Tox. 2; H330 , Acute Tox. 2; H300 , Skin Corr. 1A; H314 , Skin Corr. 1B; H314

**chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

**lead compounds with the exception of those specified elsewhere in this Annex (worst case)**

GB MCL index number: 082-001-00-6
Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following MCL protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

**pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

**salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

GB MCL index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

**TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

**ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

**acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

- **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

- **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

- **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

- **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

## Appendix B: Rationale for selection of metal species

**arsenic {arsenic trioxide}**

Worst case species based on risk phrases

**beryllium {beryllium oxide}**

Worst case species based on risk phrases

**boron {boron tribromide/trichloride/trifluoride (combined)}**

Worst case species based on risk phrases

**cadmium {cadmium sulfide}**

Worst case species based on risk phrases

**chromium {chromium(III) oxide (worst case)}**

Chromium VI not detected

**copper {dicopper oxide; copper (I) oxide}**

Most likely common species

**lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}**

Chromium VI not detected

**mercury {mercury dichloride}**

Worst case species based on risk phrases

**nickel {nickel dihydroxide}**

Worst case species based on risk phrases

**selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}**

Worst case species based on risk phrases

**zinc {zinc sulphate}**

Chromium VI not detected

**cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}**

Worst case species

## Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2023.208.5698.10490 (27 Jul 2023)
HazWasteOnline Database: 2023.208.5698.10490 (27 Jul 2023)

This classification utilises the following guidance and legislation:
**WM3 v1.2.GB - Waste Classification** - 1st Edition v1.2.GB - Oct 2021
**CLP Regulation** - Regulation 1272/2008/EC of 16 December 2008
**1st ATP** - Regulation 790/2009/EC of 10 August 2009
**2nd ATP** - Regulation 286/2011/EC of 10 March 2011
**3rd ATP** - Regulation 618/2012/EU of 10 July 2012
**4th ATP** - Regulation 487/2013/EU of 8 May 2013
**Correction to 1st ATP** - Regulation 758/2013/EU of 7 August 2013
**5th ATP** - Regulation 944/2013/EU of 2 October 2013
**6th ATP** - Regulation 605/2014/EU of 5 June 2014
**WFD Annex III replacement** - Regulation 1357/2014/EU of 18 December 2014
**Revised List of Waste 2014** - Decision 2014/955/EU of 18 December 2014
**7th ATP** - Regulation 2015/1221/EU of 24 July 2015
**8th ATP** - Regulation (EU) 2016/918 of 19 May 2016
**9th ATP** - Regulation (EU) 2016/1179 of 19 July 2016
**10th ATP** - Regulation (EU) 2017/776 of 4 May 2017
**HP14 amendment** - Regulation (EU) 2017/997 of 8 June 2017
**13th ATP** - Regulation (EU) 2018/1480 of 4 October 2018
**14th ATP** - Regulation (EU) 2020/217 of 4 October 2019
**15th ATP** - Regulation (EU) 2020/1182 of 19 May 2020
**The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020** - UK: 2020 No. 1567 of 16th December 2020
**The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020** - UK: 2020 No. 1540 of 16th December 2020
**GB MCL List** - version 1.1 of 09 June 2021

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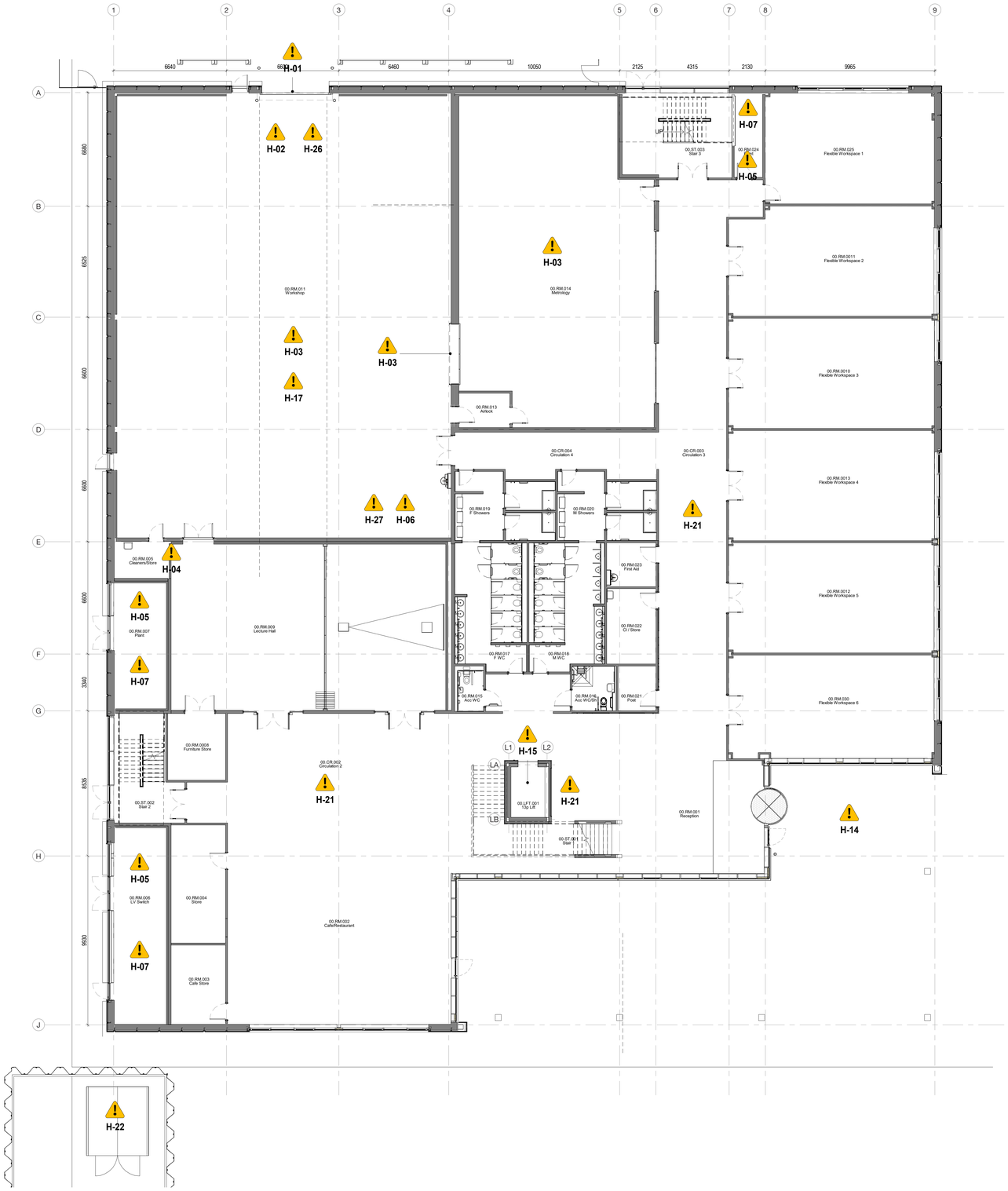
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REVISIONS

| | | |
|---|---|---|
| P01 | Issued for tender | 11/10/24 ES DTP |




1 / 69000 **PLAN 1**
1 : 100 **Hazards - Ground Floor**

| Hazard Schedule | | | |
|---|---|---|---|
| Hazard Number | Hazard Title | Hazard Description | Activity |
| H-01 | Loading door - Collision with delivery vehicles | Reversing vehicles - Collision with site operatives and/or crushing. Collision with other traffic. Injury to drivers and other personnel | OPERATION |
| H-02 | Manual handling at loading area | Manual handling - Lifting and manoeuvring quantities of materials | OPERATION |
| H-03 | Moving forklift | Conflict with internal foot traffic | OPERATION |
| H-04 | Battery charging - Fire hazard | Fire hazard at forklift battery charging points | MAINTENANCE |
| H-05 | Working with LV network | Risk shock from LV network installation and maintenance. | OPERATION |
| H-06 | Waste materials storage and handling | Bulky waste materials handling operations. Potential increased fire hazard risk of items stored | OPERATION |
| H-07 | Elevated noise levels from plant areas | Noise - Elevated levels of noise from plant area transferring to office & workstations area | OPERATION |
| H-09 | Elevated maintenance work to high level services and constructions | Cleaning louvres / feature high level cladding panels | MAINTENANCE |
| H-10 | Slips, trips and falls from roof | Trips and falls. Roof access/egress may be slippery | MAINTENANCE |
| H-11 | Working at height near voids/openings | Falls from height - Working at elevated levels for maintenance adjacent to openings, balustrades or voids. | MAINTENANCE / CONSTRUCTION |
| H-13 | Trip and fall hazards on roof level | Wind load effects - Large open area - Slips | MAINTENANCE |
| H-14 | Below ground level working | Operations that involve workers working below ground level | OPERATION |
| H-15 | Working at height near voids/openings | Open Service / Lift Pit | OPERATION |
| H-16 | Window cleaning - Working at height internally | Falls from height - Access to clean windows | MAINTENANCE |
| H-17 | MEP maintenance - Working at height internally | Falls from height - Access to MEP equipment | MAINTENANCE |
| H-18 | Working near roof openings | Falls from height - Through roof lights | MAINTENANCE / CONSTRUCTION |
| H-19 | Lightning strikes | Lightning strikes at external roof level | MAINTENANCE |
| H-21 | Access Equipment - Scissor Lifts | Various hazards notes as describe by Manufacturer associated with working at height and maintenance of roofights | MAINTENANCE / OPERATION |
| H-22 | Working with high voltage electricity | Electrtic shock associated injuries | MAINTENANCE |
| H-25 | Elevated maintenance work to stairwell roof | Risk of falling if maintenance personnel required to top of stairwell roof | MAINTENANCE |
| H-26 | Vehicle exhaust fumes inhalation | Vehicle exhaust fumes collecting within the loading bay area - Risk of inhalation of noxious & toxic fumes | OPERATION |
| H-27 | Hazard materials storage | Hazardous materials storage - Flammable/toxic gases and chemicals | OPERATION |

Wilson Bowden Developments

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PROJECT
KINGSWAY BUSINESS PARK
PLOT R2 - SMMC

TITLE
**HAZARD PLANS**
**GROUND FLOOR**

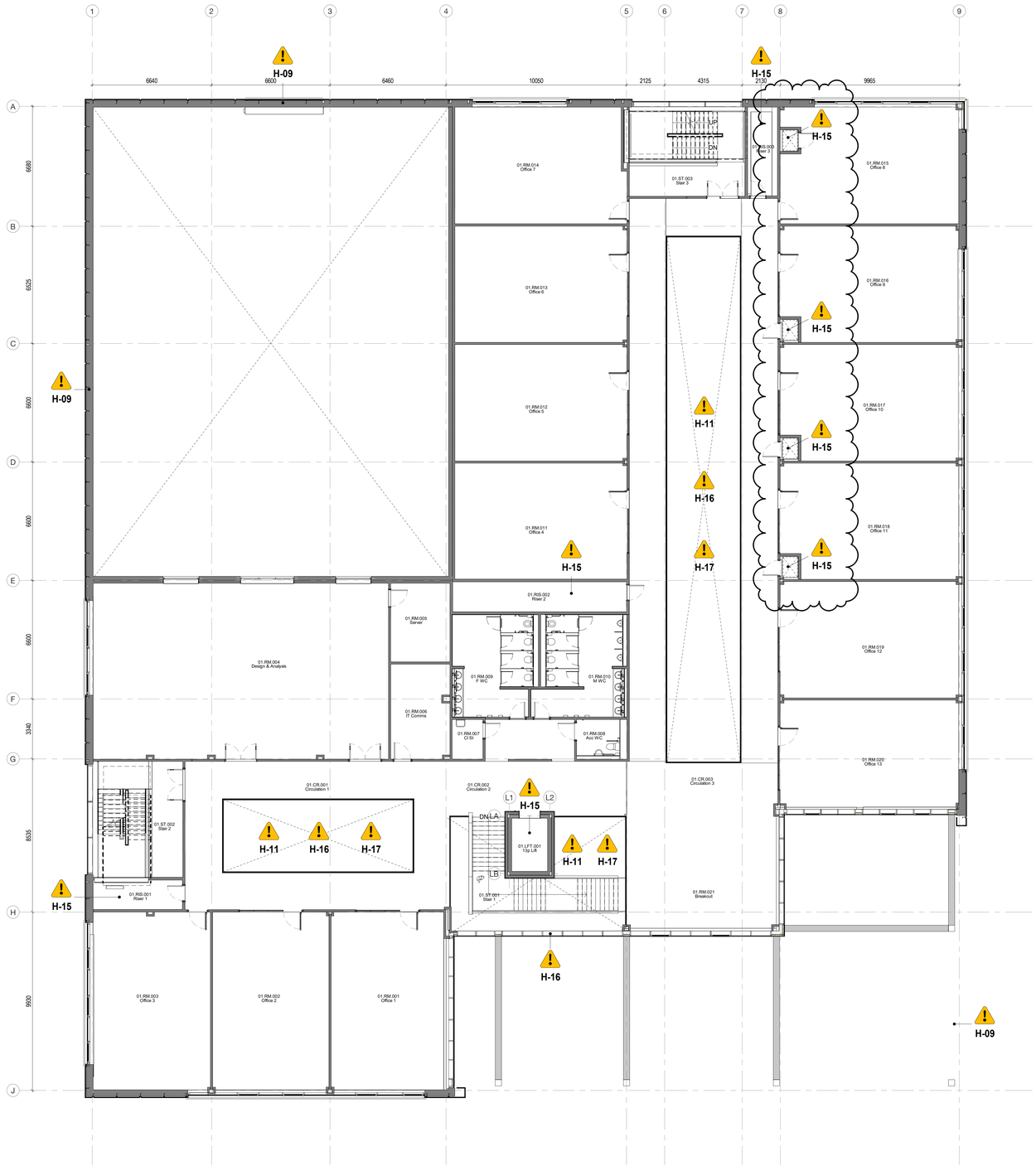
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DATE 11/10/24
DLA REF 2022-040
DRAWN DTP
REVIEWED ML
DOCUMENT NUMBER SMMC-DLA-ZZ-00-DR-A- **69000**
DOCUMENT PURPOSE STAGE 4 TENDER
REVISION **P01**

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REVISIONS

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|---|---|---|
| P01 | Issued for tender | 11/10/24 ES DTP |
| P02 | Risers added as per WB instruction 18/12/24 | 10/01/25 PGT DTP |




2 / 69001 **PLAN 2**

1 : 100 **Hazards - First Floor**

| Hazard Schedule | | | |
|---|---|---|---|
| Hazard Number | Hazard Title | Hazard Description | Activity |
| H-01 | Loading door - Collision with delivery vehicles | Reversing vehicles - Collision with site operatives and/or crushing. Collision with other traffic. Injury to drivers and other personnel | OPERATION |
| H-02 | Manual handling at loading area | Manual handling - Lifting and manoeuvring quantities of materials | OPERATION |
| H-03 | Moving forklift | Conflict with internal foot traffic | OPERATION |
| H-04 | Battery charging - Fire hazard | Fire hazard at forklift battery charging points | MAINTENANCE |
| H-05 | Working with LV network | Risk shock from LV network installation and maintenance. | OPERATION |
| H-06 | Waste materials storage and handling | Bulky waste materials handling operations. Potential increased fire hazard risk of items stored | OPERATION |
| H-07 | Elevated noise levels from plant areas | Noise - Elevated levels of noise from plant area transferring to office & workstations area | OPERATION |
| H-09 | Elevated maintenance work to high level services and constructions | Cleaning louvres / feature high level cladding panels | MAINTENANCE |
| H-10 | Slips, trips and falls from roof | Trips and falls. Roof access/egress may be slippery | MAINTENANCE |
| H-11 | Working at height near voids/openings | Falls from height - Working at elevated levels for maintenance adjacent to openings, balustrades or voids. | MAINTENANCE / CONSTRUCTION |
| H-13 | Trip and fall hazards on roof level | Wind load effects - Large open area - Slips | MAINTENANCE |
| H-14 | Below ground level working | Operations that involve workers working below ground level | OPERATION |
| H-15 | Working at height near voids/openings | Open Service / Lift Pit | OPERATION |
| H-16 | Window cleaning - Working at height internally | Falls from height - Access to clean windows | MAINTENANCE |
| H-17 | MEP maintenance - Working at height internally | Falls from height - Access to MEP equipment | MAINTENANCE |
| H-18 | Working near roof openings | Falls from height - Through roof lights | MAINTENANCE / CONSTRUCTION |
| H-19 | Lightning strikes | Lightning strikes at external roof level | MAINTENANCE |
| H-21 | Access Equipment - Scissor Lifts | Various hazards notes as describe by Manufacturer associated with working at height and maintenance of roofights | MAINTENANCE / OPERATION |
| H-22 | Working with high voltage electricity | Electrtic shock associated injuries | MAINTENANCE |
| H-25 | Elevated maintenance work to stairwell roof | Risk of falling if maintenance personnel required to top of stairwell roof | MAINTENANCE |
| H-26 | Vehicle exhaust fumes inhalation | Vehicle exhaust fumes collecting within the loading bay area - Risk of inhalation of noxious & toxic fumes | OPERATION |
| H-27 | Hazard materials storage | Hazardous materials storage - Flammable/toxic gases and chemicals | OPERATION |

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PROJECT
KINGSWAY BUSINESS PARK
PLOT R2 - SMMC

TITLE
**HAZARD PLANS**
**FIRST FLOOR**

SCALE 1 : 100 @ A0
DATE 11/10/24
DLA REF 2022-040
DRAWN DTP
REVIEWED ML
DOCUMENT NUMBER SMMC-DLA-ZZ-01-DR-A- **69001**
DOCUMENT PURPOSE STAGE 4 TENDER
REVISION **P02**

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REVISIONS

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|---|---|---|
| P01 | Issued for tender | 11/10/24 ES DTP |
| P02 | Risers added as per WB instruction 18/12/24 | 10/01/25 PDT DTP |




1 **PLAN 1**
69002 1 : 100 **Hazards - Roof Plan**

| Hazard Schedule | | | |
|---|---|---|---|
| Hazard Number | Hazard Title | Hazard Description | Activity |
| H-01 | Loading door - Collision with delivery vehicles | Reversing vehicles - Collision with site operatives and/or crushing. Collision with other traffic. Injury to drivers and other personnel | OPERATION |
| H-02 | Manual handling at loading area | Manual handling - Lifting and manoeuvring quantities of materials | OPERATION |
| H-03 | Moving forklift | Conflict with internal foot traffic | OPERATION |
| H-04 | Battery charging - Fire hazard | Fire hazard at forklift battery charging points | MAINTENANCE |
| H-05 | Working with LV network | Risk shock from LV network installation and maintenance. | OPERATION |
| H-06 | Waste materials storage and handling | Bulky waste materials handling operations. Potential increased fire hazard risk of items stored | OPERATION |
| H-07 | Elevated noise levels from plant areas | Noise - Elevated levels of noise from plant area transferring to office & workstations area | OPERATION |
| H-09 | Elevated maintenance work to high level services and constructions | Cleaning louvres / feature high level cladding panels | MAINTENANCE |
| H-10 | Slips, trips and falls from roof | Trips and falls. Roof access/egress may be slippery | MAINTENANCE |
| H-11 | Working at height near voids/openings | Falls from height - Working at elevated levels for maintenance adjacent to openings, balustrades or voids. | MAINTENANCE / CONSTRUCTION |
| H-13 | Trip and fall hazards on roof level | Wind load effects - Large open area - Slips | MAINTENANCE |
| H-14 | Below ground level working | Operations that involve workers working below ground level | OPERATION |
| H-15 | Working at height near voids/openings | Open Service / Lift Pit | OPERATION |
| H-16 | Window cleaning - Working at height internally | Falls from height - Access to clean windows | MAINTENANCE |
| H-17 | MEP maintenance - Working at height internally | Falls from height - Access to MEP equipment | MAINTENANCE |
| H-18 | Working near roof openings | Falls from height - Through roof lights | MAINTENANCE / CONSTRUCTION |
| H-19 | Lightning strikes | Lightning strikes at external roof level | MAINTENANCE |
| H-21 | Access Equipment - Scissor Lifts | Various hazards notes as describe by Manufacturer associated with working at height and maintenance of roofights | MAINTENANCE / OPERATION |
| H-22 | Working with high voltage electricity | Electrtic shock associated injuries | MAINTENANCE |
| H-25 | Elevated maintenance work to stairwell roof | Risk of falling if maintenance personnel required to top of stairwell roof | MAINTENANCE |
| H-26 | Vehicle exhaust fumes inhalation | Vehicle exhaust fumes collecting within the loading bay area - Risk of inhalation of noxious & toxic fumes | OPERATION |
| H-27 | Hazard materials storage | Hazardous materials storage - Flammable/toxic gases and chemicals | OPERATION |

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PROJECT
KINGSWAY BUSINESS PARK
PLOT R2 - SMMC

TITLE
**HAZARD PLANS ROOF PLAN**

SCALE 1 : 100 @ A0
DATE 11/10/24
DLA REF 2022-040
DRAWN DTP
REVIEWED ML
DOCUMENT NUMBER SMMC-DLA-ZZ-RF-DR-A- **69002**
DOCUMENT PURPOSE STAGE 4 TENDER
REVISION **P02**

# Designer's Risk Assessment

| | |
|---|---|
| **Revision** | P02 |
| **Project** | Kingsway, Plot R |
| **Job Number** | 232081 |

**This document compiles a list of potential design risks associated with the Structural and Civils design. This list is not inclusive of all risks and only considers specific, exceptional risks associated with a project and not generic construction risks. It is the duty of the project engineer to decide which risks are applicable and identify any other risks that are not included which might affect the project.**

| Ref | Discipline | Description of Hazard | Persons at risk | Project Phase | | | | Raw Risk Rating | | | Description of Control Measures | Final Risk Rating | | | FR Acceptable | Residual Risk Communicated via | Owner | CDM/CSM | Comments / Evidence | Close Out Action by |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Con | Main | Use | Demo | L | I | RR | | L | I | FR | | | | | | |
| 1 | All | **Ground gas release**<br>The site has been deemed to be CS2 according to the Phase 2 Site Investigation Report. | End users | | | x | | 5 | 5 | 25 | Relevant ground gas protection measures will be installed to suit CS2. | 1 | 1 | 1 | Yes | Report<br>Drawings | Designer | CDM | Contractor to be issued with site investigation reports. Note added to drawings. | PC |
| 2 | Structural | **Deep excavations for Structure installation**<br>Serious injury or death caused by collapse of deep excavations, water ingress | Construction staff | x | | | | 4 | 4 | 16 | Shallow strip footings are to be constructed on VSC, therefore no man entry required into excavations. | 1 | 4 | 4 | Yes | Drawings | Designer | CDM | Contractor to provide full detailed method statement. | PC |
| 3 | Structural | **Overloading of structure**<br>Future overloading of structure by the introduction of equipment into the building or change of use. | Maintenance staff, end users | | x | x | | 3 | 5 | 15 | Design floor loadings are noted on the structural drawings. | 1 | 5 | 5 | Yes | Drawings | Designer | CDM | Contractor to ensure that the drawings are included in the O&M Manuals for the building. End user to adhere to these loadings. | PC |
| 4 | Structural | **Retaining wall collapse**<br>Overloading of retaining walls by the placement of heavy loads at the top of the wall. | Construction staff, maintenance staff, end users | x | x | x | | 3 | 5 | 15 | Retaining walls are designed for a surcharge of 10kN/m². | 1 | 5 | 5 | Yes | Drawings | Designer | CDM | The surcharge is not to be exceeded. | N/A |
| 5 | Structural | **Temporary stability of steel frame**<br>Collapse of steel frame during erection due to temporary instability of structure or through the installation of the long spanning beams/ rafters | Construction staff | x | | | | 3 | 5 | 15 | Vertical bracing frames are distributed around the structure. | 2 | 5 | 10 | No | Drawings | PC | CDM | Where permanent bracing is deemed to not provide adequate stability during phased erection then the Subcontractor is to consider the requirements for any temporary bracing that may be required. | PC |
| 6 | Structural | **Modifications to structural elements - i.e. forming holes**<br>Risk of injury through damage to structural integrity of element. | Construction staff, maintenance staff, end users | x | x | x | | 3 | 5 | 15 | The post-forming of ANY holes through the completed structure should in ALL cases be referred to the designer. | 1 | 5 | 5 | Yes | | Client | CDM | Seek expert review of an appropriately qualified Structural Engineer. Ideally this should be the designer of the structure. | N/A |
| 7 | Civils | **Interaction between retaining wall, foundations & surface water drainage**<br>Risk of injury though ill considered phasing of construction works | Construction staff | x | | | x | 4 | 4 | 16 | Contractor to consider phasing of works to ensure that risks to construction staff are minimised.<br>Sufficient as-built information to be included in O&M's so any demolition work can be appropriately phased. | 2 | 4 | 8 | Yes | Drawings/As-builts | PC | CDM | Contractor to provide full detailed method statement. | PC |
| 8 | Civils | **Pedestrian Crossing**<br>Due to the current inclusion of white lining as shown in the DLA masterplan will have the right of way. Due to the distance between the crossing point and the give way markings this would mean the back half of any HGVs would stick out into Michael Faraday Avenue and there is a risk of shunts occurring when stopping unexpectedly to give way to pedestrians | End users | | | x | | 4 | 4 | 16 | Removal of any white lining/crossing that provide pedestrian priority. | 1 | 1 | 1 | Yes | | Designer | CDM | Technical approval of the junction proposals are required | Designer / Highway Authority |
| 9 | Civils | **Access Road Bend**<br>Risk of injury/property damage if vehicles speed around bend towards the service yard causing them to leave the access road carriageway and end up on the tram lines (the tram lines sit at the bottom of the slope outside the site boundary) | End users | x | | x | | 4 | 3 | 12 | Trief kerbs have been proposed to guide vehicles back within the carriageway. | 1 | 3 | 3 | Yes | | Designer | CDM | Requirement for fencing at top to slope as a visual aid of potential risk TBC by architect. Competent Contractor should be aware and can manage the risk during construction. | Designer |
| 10 | Civils | **Drainage**<br>Risk of injury related to excavation works during construction of drainage. (Trench collapse)<br>Risks related to confined entry for maintenance (asphyxiation) | Construction staff, maintenance staff | x | x | | x | 3 | 4 | 12 | Depth and amount of drainage has been minimised where possible and has been designed to minimise risk of blockage. Where possible ground level maintenance including rodding eyes has been provided | 2 | 4 | 8 | Yes | Drawings/O&M | PC | CDM | Competent Contractor should be aware and can manage the risk during construction with regards to the site specific ground conditions. Contractor provide as-built drainage information for inclusion with O&M's. An appropriate maintenance company with the relevant certification should be appointed for maintenance work. | PC/Client |
| 11 | Structural | **Retaining wall**<br>Fall from height | End users | | x | x | | 2 | 4 | 8 | Appropriate hand rails/fencing to be provided during construction and permanent scenarios | 1 | 4 | 4 | Yes | Drawings | Designer | CDM | Competent Contractor to provide temporary measure to protect site staff during construction works.<br>Architect to provide details of proposed hand rail/fencing. | Architect |

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| 12 | Civils | **Petrol Interceptor**<br>Potentially flammable / explosive atmospheres | Construction Staff, Maintenance staff | x | x | | | 2 | 3 | 6 | Proprietary petrol interceptors to be used, suitably vented to minimise the build-up of potentially flammable / explosive atmospheres | 1 | 3 | 3 | Yes | Drawings/As-builts | PC | CDM | Competent Contractor should include for managing the risks associated with the petrol interceptor once commissioned should this sit within the construction stage of the works. Contractor provide product literature information for inclusion with O&M's. | PC |
| 13 | Geotech | **Structure Stability**<br>Risk of collapse of structures due to organic materials within cohesive soils on site | Construction staff | x | | | | 5 | 2 | 10 | Ground improvement plan provided for management of organic material throughout earthworks | 2 | 2 | 4 | Yes | Drawings/GRR | PC | CDM | Contractor to provide ground improvement validation test data as per the ground improvement specification. | N/A |

| PROJECT RISK ASSESSMENT | | | | | |
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| **CONTRACT NAME AND NO:** | **G1245 SMMC Plot R** | | | **DATE:** | **1.8.25** |
| This Risk Assessment (RA) is to be developed by the project leader prior to commencement in line with the site-specific requirements. The RA is to be reviewed monthly by the project leader. The relevant SHE procedures should be referred to at all times. | | | | | |
| **DOCUMENT REVIEW** | | | | | |
| Review Completed By | J Baldwin | Details of the review | Full Review | Date | 1.8.25 |
| Review Completed By | S Schofield | Details of the review | Full Review | Date | 01.08.25 |

**High** - Work activity which has the potential to cause a fatal/major injury or health damage.
**Medium** - Work activity resulting in loss time injury or significant material or environmental damage
**Low -** Work activity resulting in minor injury but not lost time, or some material damage.

| Ref | Hazard | Risk | People at Risk | Initial Risk Rating | Control Measures | Residual Risk Rating | Additional Comments |
|---|---|---|---|---|---|---|---|
| 1 | Services | Shock Electrocution | Site Staff<br>Client Staff<br>Operatives | H | All services are to be presumed to be live.<br>If possible, obtain surveys of gas, water, electricity, drainage & all underground/overhead cables<br>GCL employees are not permitted to work on any services both overhead / underground.<br>Work is to be completed in line with agreed RAMS & Permit to Break Ground. Service records to be included in the above permit.<br>Inspection of excavations to be undertaken daily in accordance with Permit to Break Ground. | L | Supervisor to be CAT & Genny Trained & HSE HSG47 & GS6<br>Detailed plans to be issued by permit controller |
| 2 | Forming Trenches & Excavation | Ground Collapse<br>Fall from height | Site Staff<br>Client Staff<br>Operatives | M | Work is to be completed in line with agreed RAMS & Permit to Break Ground.<br>Inspection of excavations to be undertaken daily in accordance with Permit to Break Ground.<br>Any observation of excavation work to be from a safe distance. Trench supports approved under Temp Works to be in place.<br>No access into excavation is permitted.<br>Barriers to be located a min of 2m away from edge of excavation<br>Barriers to be closed to prevent access at the end of each shift<br>All trenches to have escape batter at one end. | L | |
| 3 | Site Deliveries | Struck by a moving vehicle<br>Damage to property | Public<br>Site Staff<br>Client Staff<br>Operatives | M | Trained banksman to be present during site deliveries.<br>No delivery vehicles to be approached unless parked up.<br>Hi-Vis to be worn at all times<br>Dedicated unloading point to be utilised<br>Traffic management plan to be adhered | L | Site delivery timings are to be adhered to |

PROJECT RISK ASSESSMENT

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| | | | | | Delivery drivers to be inducted using Delivery Drivers Induction | | |

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|---|---|---|---|---|---|---|---|
| 4 | Fire | Burns<br>Damage to Property | ALL | H | Emergency procedures to be followed as detailed in the site induction.<br>Monitor fire equipment & ensure escape routes & fire equip kept clear at all times, Inndex inspections required.<br>Fire RA is to be completed and reviewed monthly.<br>Permit for Hot Works to be completed<br>Accumulation of rubbish is not to be permitted | L | |
| 5 | Concrete & Mortar | Skin/ vision damage | Operatives | M | No GCL employees are to be directly involved with working with or in concrete.<br>PPE detailed in COSHH Assess & MSDS to be worn at all times.<br>Dedicated wash out point is to be in place and used for all wash out activities | L | |
| 6 | Electrical Equipment | Electrocution<br>Burns | Operatives | H | Operational control of electrical equipment & services to be formally transferred to competent electrical contractors for both temporary & permanent systems.<br>The competent electrical contractor shall nominate Electrical AP to manage safe system of work including permit to work, LOTO etc. No GCL staff shall act as Electrical AP under any circumstances.<br>All electrical hand tools are to be PAT every 3 months<br>All power tools are to be inspected weekly & recorded<br>Unauthorised power tools are not permitted on site. All hand power tools to be 110V<br>All defect tools & equipment must be segregated & tagged.<br>All cables must be in good condition & free from damage | M | Client specific requirements to be adhered to |
| 7 | Steel Erection | Hit by swinging / crushed by, falling objects<br>Falls from height | Site Staff<br>Client Staff<br>Operatives | H | Exclusion zone is to be established prior to any lifting / movement of steel<br>No entry to be permitted into exclusion zone. Under no circumstances is walking under beams / steel frame during erection<br>Dedicated unloading and storage areas to be established and agreed prior to commencement | L | Delivery timing to be agreed with PC |

| PROJECT RISK ASSESSMENT |
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| Ref | Hazard | Risk | People at Risk | Initial Risk Rating | Control Measures | Residual Risk Rating | Additional Comments |
|---|---|---|---|---|---|---|---|
| 8 | Scaffolding | Stability/ Collapse/ Falls from height/ Materials falling from height | Site Staff<br>Client Staff<br>Operatives | H | Safe access to be used when accessing scaffolding.<br>Access stairs are to be used whenever possible.<br>When ladder access is in use all ladders are to be correctly footed and secured using blue fibrous rope<br>Only trained scaffolders are to alter or amend scaffolding | L | Scaffold to be either compliant of Designed in accordance with TG20:21 |
| 9 | Ladders / Stepladders | Stability/ Collapse/ Falls from height/ Materials falling from height | Operatives | M | Ladders / Stepladders are not to be used unless under the control of Permit for Ladders & Step Ladders.<br>RAMS are to include the requirement / justification for the use of ladders / stepladders<br>Ladders are not to be used as a working platform<br>Ladders & stepladders must be footed at all times<br>All ladders / stepladders to be inspected and included in the Register of inspections | L | Podiums to be used as an alternative |
| 10 | Handling/ Installation of Metal Decking | Hit by swinging, crushed by falling objects. Personnel falling from height. | Operatives | M | No entry into the installation area is permitted unless under the guidance of the appointed contractor.<br>Exclusion zone is to be established below the working area<br>No handling of off-cuts by hand is to be permitted<br>All waste to be correctly disposed of immediately | L | |
| 11 | Installation of cladding panels | Hit / crushed by swinging by falling objects Persons falling from height Muscular-skeletal injury | Site Staff<br>Client Staff<br>Operatives | M | Exclusion zone to be established.<br>No entry into the installation area is permitted unless under the guidance of the appointed contractor.<br>RAMS to detail specific manual handling<br>Lifting Ops are to be suitably planned by a competent person<br>Weather / Wind conditions to be monitored | L | Work / lifting to be suspended if wind levels exceed 23mph |
| 12 | Work on Roof | Falls from height | Site Staff<br>Client Staff<br>Operatives | M | No access to any roof is permitted unless under control of the roof contractor in line with SAF034 Roof Access Permit.<br>Ensure protection, ladder fixings, guardrails, man-safe restraint anchors all to be checked regularly.<br>Netting to be installed prior to roof work commencing<br>Materials stored at high-level are to be stored safely.<br>End of shift inspections to be complete to ensure correct storage of all materials<br>Weather / Wind conditions to be monitored | L | Work / lifting to be suspended if wind levels exceed 23mph |

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**Low -** Work activity resulting in minor injury but not lost time, or some material damage.

| Ref | Hazard | Risk | People at Risk | Initial Risk Rating | Control Measures | Residual Risk Rating | Additional Comments |
|---|---|---|---|---|---|---|---|
| 13 | Working in vicinity of site vehicle/plant | Struck by a moving vehicle Impact Damage to property | Site Staff Client Staff Operatives | L | Dedicated pedestrian routes are to be used at all times in line with the current TM Plan.<br>Hi-Vis to be worn at all times<br>All pedestrian barriers to be correctly installed<br>Movement of plant is to be under the control of a banksman<br>Erect warning signs and invoke speed restrictions. | L | |
| 14 | Housekeeping | Slip Trip Fall / Spread of dust /debris casing fire, health hazard. | Site Staff Client Staff Operatives | L | Housekeeping to be monitored at all times.<br>Debris cleared from site on a regular basis, debris disposed of into skips, safe clear access to skips.<br>All debris cleared from site on a regular basis, debris disposed of into skips, safe clear access to skips.<br>No fires permitted on site.<br>Materials of unknown/ hazardous nature to be disposed of by specialists, in a legal manner. | L | |
| 15 | Incomplete blockwork/brickwork masonry | Masonry falling over & causing injury Chasing Blocks | Site Staff Client Staff Operatives | M | Ensure sequence of works avoids situations of temporary instability of structure where possible.<br>Use temporary supports where appropriate.<br>Use of PPE at all times.<br>If using mechanical hoist, ensure safe protected storage platform.<br>Ensure all current tests and certificates are valid, Safe access /protected platform/scaffolding<br>Exclusion zone to be established signage displayed | L | |
| 16 | Lifting operations | Hit by swinging, crushed by falling objects. | Site Staff Client Staff Operatives | H | All lifting operation to be planned by a competent person<br>Exclusion zone to be established with no entry permitted.<br>All crane bases are to be approved in Temp Works design<br>Appointed person to prepare lifting plan<br>All lifting to be controlled under Permit for Lifting | L | See 29 for controls relating to adjacent tramway. |

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|---|---|---|---|---|---|---|---|
| 17 | Unloading Lorries | Fall from height, hit by falling objects, Danger to personnel from lorries reversing, falling off load/part load due to uneven ground conditions, Falling off load/part load by poorly planned unleashing | Site Staff<br>Client Staff<br>Operatives | M | All delivery drivers to wear PPE in line with the site rules.<br>Ensure by visual inspection that all ground is level and compacted to suit vehicle tolerances in all manoeuvring and off-loading areas.<br>Use of cordoned area and use Banksman.<br>All chains/straps/ropes to be removed by a competent person only when load is in final position.<br>Breaking down packs of materials into component parts to reduce weight if possible.<br>Use of mechanical lifting aids to avoid the need for manual handling.<br>Team lifting where possible. | L | |
| 18 | LPG/HFL use and storage | Explosion, fire, Fire and explosion Gas is heavier that air and so any leaks will accumulate in low level drains, sums etc. | Site Staff<br>Client Staff<br>Operatives | H | LPG not to be used unless essential, then the size of cylinder to be kept as small as possible.<br>Cylinders to be kept to a minimum, stored in open air within a secure cage or similar and with appropriate warning signs posted.<br>Cylinders to be isolated except when actually in use.<br>If LPG appliances are used, annual inspection by a GAS-SAFE registered gas fitter to be available for the appliance. | L | |
| 19 | Reinforced Concrete Works | Skin contact, vision damage. | Site Staff<br>Client Staff<br>Operatives | M | Works to be carried out in line with approved RAMS.<br>Ensure that all temporary works have been designed, checked, approved and installed in accordance.<br>Ensure that all correct systems of work are in place at all times, i.e. correct PPE, Working at height, manual handling, CPCS, etc. | L | |

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| Ref | Hazard | Risk | People at Risk | Initial Risk Rating | Control Measures | Residual Risk Rating | Additional Comments |
|---|---|---|---|---|---|---|---|
| 20 | Use of Concrete Pump | Concrete in eyes, Concrete burns, Head injury from boom hoses, vehicle movement | Site Staff<br>Client Staff<br>Operatives | H | PPE detailed in COSHH Assess & MSDS to be worn at all times.<br>Use of ropes and good manual handling practices to be adopted.<br>All personnel are to remain clear of the delivery hose and placing boom.<br>Under no circumstances should any unauthorised personnel attempt to open the pipeline.<br>Trained banksman to be in place for concrete vehicles reversing | L | |
| 21 | Use of Shutters | Hit by swinging objects, falling objects. Persons falling from height Muscular-skeletal injury | Operatives | H | Ensure that all temporary works have been designed, checked, approved and installed in accordance.<br>Exclusion zone to be established<br>Signage to be displayed | L | |
| 22 | Dust and Airborne dust from construction activities | Lung Disease / Breathing problems / Spread of dust /debris causing fire, health hazard. | Site Staff<br>Client Staff<br>Operatives<br>Labourers | H | All construction activities are to be subjected to the use of wetting agents and on-tool extraction / vacuums<br>Debris cleared from site on a regular basis, debris disposed of into skips, safe clear access to skips.<br>All debris cleared from site on a regular basis, debris disposed of into skips, safe clear access to skips. No fires permitted on site.<br>Materials of unknown/ hazardous nature to be disposed of by specialists, in a legal manner.<br>RPE - minimum of FFP3 evidence of face fit testing completed<br>Ground conditions to be monitored and damping down with a water bowser is to be considered | L | |
| 23 | Manual Handling | Muscular-skeletal injury, slip trip and fall, bending, twisting, pulling, pushing | Operatives | M | Training to be provided<br>Proper manual handling techniques<br>If possible, avoid lone lifting,<br>Check the load and the area prior to any lift.<br>If possible, use of mechanised devices. | L | |

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| Ref | Hazard | Risk | People at Risk | Initial Risk Rating | Control Measures | Residual Risk Rating | Additional Comments |
|---|---|---|---|---|---|---|---|
| 24 | Noise and Vibration | Hearing Damage / HAVS / Physical ill health effects / Nuisance | Site Staff<br>Client Staff<br>Operatives | M | Use of manual tools to minimise noisy operations to ALARP.<br>Establish acoustic screens to contain noise nuisance.<br>Noise control communicated to ops prior to starting works and including the need to minimise the production of noise.<br>Noise/ vibration assessment where activities identified as producing significant noise or vibration.<br>Hazard warning signs indicating noise hazard.<br>Suitable PPE for operatives working with noise. | L | HAV records to be submitted to PC |
| 25 | Hot Works (welding, gas cutting, grinding) | Burns / Smoke Inhalation / Death / Damage to property | Site Staff<br>Client Staff<br>Operatives | H | Site specific Fire Action & Emergency Plan communicated to all<br>Permit for Hot Works to be completed for all Hot works<br>Task specific fire extinguishers to accompany Hot Works Permit.<br>Fire shields used when carrying out hot works to avoid fire spread to adjacent combustible materials.<br>Daily liaison with the Client key contact to advise of hot works. | L | |
| 26 | Storing of materials in working platform | Dropping objects, Muscular-skeletal injury. | Operatives | L | SWL to be confirmed prior to storage of equipment / materials.<br>The platform must be tested if required<br>Never store any excess material other than what is required.<br>Safe access must be provided with an exclusion zone in place<br>Housekeeping must be maintained of all working platforms | L | |
| 27 | Use of COSHH items | Irritant, respiratory problems asphyxiation | Operatives/staff | M | Provide good ventilation during application.<br>PPE detailed in COSHH Assess & MSDS to be worn at all times.<br>Storage of items is to be in an approved container as per MSDS | L | |
| 28 | Use of MEWP and Mast Climbers | Person & materials falling from height, Overturning of MEWP, Collision with other MEWP/ structure, Contact with overhead services or equipment | Staff/Operatives | H | Operatives to hold relevant IPAF card<br>Fall protection is to be in place as detailed in individual RA<br>Ground condition approved under Temp Works Design<br>No material must be stored in platform area except tools.<br>Platform is to be sighted on level and firm ground.<br>Thorough examination must be completed, and certificate issued to the PC prior to commencement<br>All MEWP must be equipped with reverse alarm.<br>Cherry Pickers must be fitted with anti-entrapment device<br>Emergency rescue procedures must be in place and communicated to the workforce | L | |
| 29 | Collision with adjacent Tramway | Collision Injury, damage to | Staff/Operatives | H | Hoarding to be in place with buffer zones & clear signage.<br>Information to be provided to Ops in on site briefings. | L | Lifting operations subject to approved lifting plans with |

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| | | property, reputation damage. | | | Crane oversail procedure (i.e. not permitted) and covered in SC supplied specific RAMS. Consider slew restrictors etc.<br>Works method to follow south to north sequence ensuring jib never faces north. | | specific ref to tramway.<br>LIP's to be submitted to TfGM.<br>Follow procedure as per Emergency plan. |
| 30 | Interface with Public | Various | Staff Ops | L | Glencar employed Gateperson to be in place.<br>Signage with contact details of site management provided.<br>Solid hoarding in place, (with approved TW design) and maintained throughout (Alongside footpath), hoarding inspections maintained.<br>Ops to be courteous and respectful at all times. | | |