



**EARTH ENVIRONMENTAL
& GEOTECHNICAL**
A Technics Group Company

Phase 1 GeoEnvironmental Desk Study

Parr Hill

Whitefield

November 2025

On behalf of

Fisk & Associates



Earth Environmental & Geotechnical Ltd
Houldsworth Mill Business Centre
Houldsworth Street
Stockport
SK5 6DA

Tel : 01619756088

Email
headoffice@earthenvironmental.co.uk

www.earthenvironmental.co.uk



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LAND AT PARR HILL

WHITEFIELD

FOR

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Earth Environmental & Geotechnical Ltd
Houldsworth Mill Business & Arts Centre
Houldsworth Street
Stockport
SK5 6DA

www.earthenvironmental.co.uk

Tel: 0161 975 6088

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Drafted By:	R. Sarnoe
Reviewed By:	A Czarnecki
Authorised By:	A Czarnecki

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CONTENTS

1.0	INTRODUCTION	1
	Appointment	1
	Objective	1
	Scope	1
2.0	SITE LOCATION AND DESCRIPTION	3
	Site Utility Services	4
3.0	ENVIRONMENTAL SETTING	5
	Geology	5
	Hydrogeology and Hydrology	5
	Ground Workings, Mining and Other Underground Workings	6
	Mining and Other Underground Workings	7
	Radon Potential	7
	Landfill & Waste Management Activity	7
	Industrial Land Use Information	8
	Environmental Permits, Incidents, and Registers	8
	Environmentally Sensitive Sites	9
	Ecology	10
	Archaeology	10
	Potential Flood Risks	10
	Unexploded Ordnance	11
4.0	SITE HISTORY	12
5.0	WALKOVER SURVEY	17
6.0	PRELIMINARY CONTAMINATION RISK ASSESSMENT	19
	Introduction	19
	Potential Receptors	20
	Potential Pathways	20
7.0	GEOTECHNICAL HAZARDS ASSOCIATED WITH THE DEVELOPMENT	23
8.0	CONCLUSIONS AND RECOMMENDATIONS	25
	Conclusions	25
	Recommendations	25



FIGURES

Figure 1	Proposed Development Plan
Figure 2	Site Location Plan
Figure 3	Site Photograph
Figure 4	Ordnance Survey Map Extract 1893
Figure 5	Ordnance Survey Map Extract 1932
Figure 6	Ordnance Survey Map Extract 2003
Figure 7	Aerial Photograph 2023
Figure 8	Site Features Plan
Figure 9	Site Walkover Photograph Locations

TABLES

Table 1	Environmental Permits, Incidents, and Registers within 500m of the Site
Table 2	Summary of Site History
Table 3	Summary of Site History from Aerial Photographs
Table 4	Consequence, Probability, and Risk
Table 5	Estimation of the Level of Risk by Comparison of Consequence and Probability
Table 6	Preliminary Conceptual Model
Table 7	Summary of Geotechnical Hazards
Table 8	Summary of Geotechnical Considerations

APPENDICES

Appendix 1	Groundsure Reports
Appendix 2	Site Photographs
Appendix 3	Site Walkover Notes
Appendix 4	Report Limitations

1.0 INTRODUCTION

Appointment

- 1.1 Fisk & Associates has commissioned Earth Environmental & Geotechnical Ltd to undertake a Phase I Environmental Desk Study for a new development at Land adjacent to Parr Hill, Whitefield.
- 1.2 It is understood that the Client is proposing to develop the site with a residential dwelling with an associated garden area.
- 1.3 A proposed development plan is presented in Figure 1, overleaf.

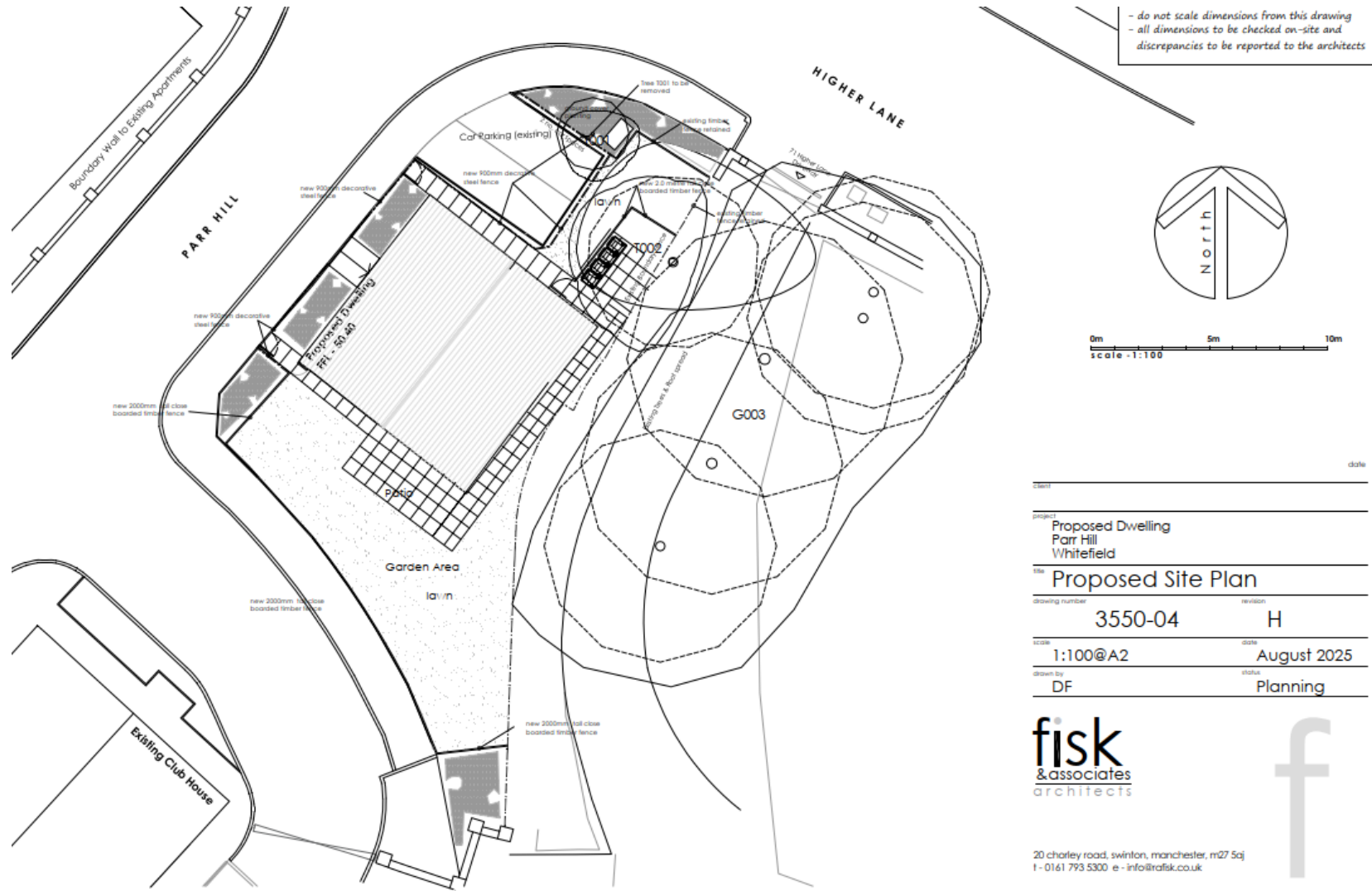
Objective

- 1.4 The purpose of the Desk Study is to collate available geological and environmental data for the site (and its environment) and provide a preliminary geotechnical and geo-environmental appraisal, with a site-specific conceptual model. This enables an initial assessment of geo-environmental risks to be undertaken and, if necessary, provides information for the design of a Phase 2 Ground Investigation.

Scope

- 1.5 The Phase I Environmental Desk Study comprises a site reconnaissance visit and a review of the following information sources, some of which were provided by the client.
 - British Geological Survey online maps.
 - Google Earth imagery.
 - Environment Agency online mapping data.
 - Historical Ordnance Survey maps.
 - The site and surrounding areas' environmental, geological, and mining data are presented in the site-specific GroundSure Reports (Appendix 1).
 - Coal Authority Interactive Viewer.
 - Manchester City Council planning portal.

Figure 1: Proposed Development Plan



2.0 SITE LOCATION AND DESCRIPTION

- 2.1 The site (0.06 hectares) is a parcel of land off the A665 Road located within 5m of Whitefield golf club.
- 2.2 The approximate National Grid Reference for the centre of the site is SD 800523 05315(X: 380523, Y: 405351) and postcode M45 7EZ.
- 2.3 Access to the site is gained via a Heras fence to the southern end of the site off the A665 Road and Parr Hill Road.
- 2.4 The site is relatively flat and is mainly covered in hardstanding due to the old car park; however, a small area of the site is a grassland at the northeastern point of the site.
- 2.5 A Heras fence and a wooden fence along the eastern boundary of the site bound the site.
- 2.6 The site is surrounded by residential buildings to the north and west, commercial buildings to the south and a large parcel along with a used building to the east.
- 2.7 A location plan is shown below as Figure 2, together with a recent site photograph as Figure 3 (overleaf).

Figure 2: Site Location Plan

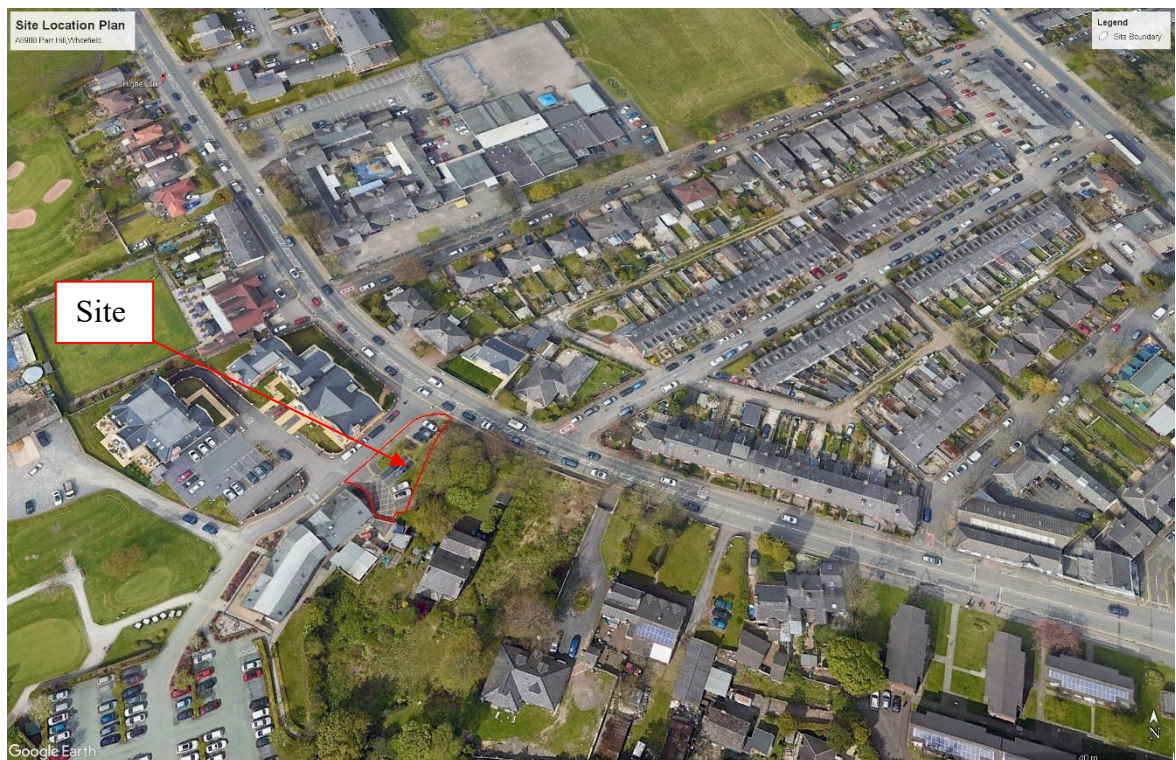


Figure 3: Site Photograph



Site Utility Services

- 2.8 Site service plans have been obtained for the site on behalf of the client. The status of all services should be checked before any development (including site investigation) commences.

3.0 ENVIRONMENTAL SETTING

- 3.1 The geology of the site is covered by British Geological Survey (BGS) online data and the site-specific GroundSure Enviro+Geo Insight report (Appendix 1).
- 3.2 Environmental conditions are covered by the Environment Agency (EA) and British Geological Survey (BGS) online data, and the site-specific GroundSure Enviro+Geo Insight report (Appendix

Geology

- 3.3 The BGS states the site is not underlain by artificial deposits or made ground.
- 3.4 The site is recorded to be underlain by superficial deposits of Devensian till, comprising Diamicton and more commonly known as Boulder Clay.
- 3.5 The site is recorded to be underlain by bedrock of the Pennine Middle Coal Measures Formation- mudstone, siltstone and sandstone, which BGS Lexicon describes 'Interbedded grey mudstone, siltstone, pale grey sandstone and commonly coal seams, with a bed of mudstone containing marine fossils at the base, and several such marine fossil-bearing mudstones in the upper half of the unit' is 200 m thick in northwest England.
- 3.6 There are 5no. records of linear features within 500m of the site boundary. The nearest one is 6m north-east of the site, which is the marine band that falls under the fossil horizon category.
- 3.7 There are no records of landslips within 500m of the site boundary.
- 3.8 There are 15no. borehole records identified within 250m of the site. The closest BGS borehole 380520 405370, located 5m to the northwest of the site, is confidential. The nearest available borehole is SD80NW/241, located 94m to the west of the site, which indicates glacial till to a depth of 70.50m overlying topsoil, and a middle coal measure to a depth of 112.0m, interbedded with mudstone and sandstone.
- 3.9 The following hazard ratings apply to the site and land within 50m are presented in the Enviro + Geo Insight Report
- | | |
|--|------------|
| • Shrink / swell clays: | Very Low |
| • Running sands: | Very Low |
| • Compressible deposits: | Negligible |
| • Collapsible deposits: | Very Low |
| • Landslides: | Very Low |
| • Ground dissolution of soluble rocks: | Negligible |

Hydrogeology and Hydrology

- 3.10 The superficial deposits of Devensian Till comprising Diamicton are classified by the Environment Agency (EA) as a "Secondary Undifferentiated Aquifer," described as "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." The aquifer is of mixed flow type and has a high-to-low permeability gradient.

- 3.11 The bedrock geology of the Pennine Middle Coal Measures Formation Mudstone, Siltstone, and Sandstone is classified by the EA as a “Secondary A Aquifer,” described as “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.” The aquifer has a well-connected fractured flow type of moderate to low permeability.
- 3.12 The groundwater vulnerability and soil leaching potential of the site have been classified as medium vulnerability. The BGS describes medium vulnerability areas as ‘Intermediate between high and low vulnerability.’ A low-permeability area is defined as “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.” And a high permeability area is described as ‘Areas able to transmit pollution to groundwater easily. They are likely to be characterised by high leaching soils and the absence of low-permeability superficial deposits.’
- 3.13 There are 14no. groundwater abstraction licence records within 2km of the site. The closest record refers to an active licence located 94m to the west of the site.
- 3.14 There are 3no. surface water abstraction licence records within 2km of the site. The closest record refers to a historical licence located 1312m north-east of the site.
- 3.15 There are 3no. potable abstraction license records within 2km of the site. The closest record refers to a historical licence located 1015m north of the site.
- 3.16 The site is not located within a groundwater Source Protection Zone.
- 3.17 The site is not located within a Source Protection Zone with a confined aquifer.
- 3.18 There are no water network entries within 250m of the site.
- 3.19 There are no surface water features within 250m of the site.
- 3.20 There are 2no. record of a Water Framework Directive (WFD) surface water body catchment located on the site. The record refers to the Croal Irwell River (Irwell-Croal to Irk) catchment and the Rock Irk Medlock River (Roch-Spodden to Irwell) catchment.
- 3.21 There are 2no. records of a WFD surface water body located within 500m of the site. The record refers to the Croal Irwell River (Irwell-Croal to Irk) catchment and the Rock Irk Medlock River (Roch-Spodden to Irwell) catchment, with a failed chemical rating and a moderate ecological rating.
- 3.22 There is 1no. record of a WFD groundwater body located on the site. The record refers to the Northern Manchester Carboniferous Aquifers. The river received a poor chemical rating in 2019.

Ground Workings, Mining and Other Underground Workings

- 3.23 There are 2no. records of BritPits within 500m of the site. The status of the BritPits is considered closed by the operator. The BritPits were both surface mineral workings within 489m southwest and 493m northwest of the site.

- 3.24 There is 1no. record of historical surface ground working features identified within 250m of the site boundary. The record refers to the refuse heap within 207m east of the site, which was mapped in 1965.

Mining and Other Underground Workings

- 3.25 Reference to the Coal Authority shows that the site is located within an identified coal mining area but not in a Development High Risk Area.
- 3.26 There are 10no. records for historical underground working features identified within 1km of the site. The closest is a tunnel located 739m north of the site.
- 3.27 There are no records for non-coal mining areas located within 1km of the site.
- 3.28 There are no areas of gypsum extraction, brine extraction, tin mining, or clay mining within 1km of the site.
- 3.29 There are no records for mining cavities identified within 1km of the site.
- 3.30 There are no records of natural cavities identified within 1km of the site.
- 3.31 There are no records of historical or reported incidents within 500m of the site.

Radon Potential

- 3.32 The structure is within an area where less than 1% of properties are above the Action Level.
- 3.33 Therefore, radon protection measures are not necessary.

Landfill & Waste Management Activity

- 3.34 There are no records for the current Environment Agency/Natural Resource Wales landfill records within 500m of the site.
- 3.35 There are no records of BGS/DoE non-operational landfill sites within 500m of the site.
- 3.36 There is 1no. record of historical landfill sites from the Local Authority and Historical Mapping Records within 500m of the site. The record refers to a refuse tip within 448m east of the site, which was mapped in 1969.
- 3.37 There are no records of a historic Environment Agency/Natural Resource Wales landfill site within 500m of the site.
- 3.38 There are no records of historical waste sites from the Local Authority and Historical Mapping Records within 500m of the site.
- 3.39 There are no records of current Environment Agency/Natural Resources Wales licensed waste sites within 500m of the site.
- 3.40 There are 5no. records of waste treatment, transfer, or disposal sites within 500m of the site. The closest record is located 401m to the north of the site and refers to sorting and denaturing of controlled drugs for disposal.

Industrial Land Use Information

- 3.41 There are 46no. records of historical industrial land uses identified within 500m of the site. The closest record refers to a Brewery located 169m to the east of the site, dating to 1891.
- 3.42 There are 8no. records of current potentially contaminative land uses identified within 500m of the site. The closest record refers to an electricity substation located 153m northwest of the site.
- 3.43 There are 9no. records of historical tanks identified within 500m of the site. The nearest is an unspecified tank located 291m east of the site, dated 1909.
- 3.44 There are 5no. records of current tanks identified within 250m of the site. The records refer to a roofed storage tank located 101m west of the site first identified in 2016.
- 3.45 There are 14no. records of historical energy features identified within 500m of the site. The closest record refers to an electrical substation located 188m to the east of the site.
- 3.46 There are no records for current petrol or fuel sites within 500m of the site.
- 3.47 There are no records of historical petrol or fuel sites within 500m of the site.
- 3.48 There are 9no. historical garage and motor vehicle repair site records identified within 500m of the site. The closest record refers to a garage located 136m east of the site in 1973.
- 3.49 There are no records of historical military land within 500m of the site.
- 3.50 There are no National Grid high voltage underground electricity transmission cables within 500m of the site.
- 3.51 There are no National Grid high-pressure gas transmission pipelines within 500m of the site.
- 3.52 There are no records of historical railway and tunnel features identified within 250m of the site.
- 3.53 There are no historical railway lines identified within 250m of the site.
- 3.54 There are no. records of the current active railway line records identified within 250m of the site.
- 3.55 There are no underground railway lines or tunnels identified within 250m of the site.
- 3.56 The site is not within 500m of the route of the Crossrail 2 rail project.

Environmental Permits, Incidents, and Registers

- 3.57 The Groundsure Report includes records of environmental permits, incidents, and registers within 500m of the site, which are summarised in Table 1.

Table 1: Environmental Permits, Incidents, and Registers within 500m of the Site

Permit/Incident/Register	Number
Sites Determined as Contaminated Land under Part 2a EPA 1990	0
Dangerous or Hazardous (COMAH and NIHHS) Sites	0
Regulated Explosive Sites	0
Historical Licensed Industrial Activities (IPC)	0
Part A (1) and IPPC Authorised Activities	0
Part A (2) and Part B Activities and Enforcements	0
Pollutant Release to Surface Waters (Red List)	0
List 1 Dangerous Substances Inventory Sites	0
List 2 Dangerous Substances Inventory Sites	0
Category 3 or 4 Radioactive Substance Authorisations	0
Licensed Discharge Consents	3
Planning Hazardous Substance Consents and Enforcements	0
Pollutant Release to Public Sewer	0
Substantiated Pollution Incidents	0
Pollution Inventory Substances, Wastes, and Radioactive Wastes	0

- 3.58 There are 3no. records for Licensed Discharge Consents located within 500m of the site. The nearest record refers to sewage discharges from a sewer storm overflow to surface water, located 482m to the south of the site.

Environmentally Sensitive Sites

- 3.59 There are no records of Sites of Special Scientific Interest (SSSI) within 2km of the site.
- 3.60 There are no records of RAMSAR sites, special areas of conservation, special protection areas, nature reserves, biosphere reserves, and marine conservation zones on the site.
- 3.61 There are 6no. of Local Nature Reserves within 2km of the site. The nearest record refers to Philip's Park, located 776m south of the site.
- 3.62 There are 6no. of Designated Ancient Woodland within 2km of the site. The nearest record refers to the Mere Clough Woodland located 820m south of the site.
- 3.63 There are 4no. of the Green Belt within 2km of the site. The nearest record refers to the Merseyside and Greater Manchester Green Belt located 20m southwest of the site.
- 3.64 There are 2no. records for Nitrate Vulnerable Zones within 2 km of the site. The nearest record refers to the Irwell / Man. Ship Canal (Kearsley to Irlam Locks) NVZ surface water located on site. The status of the water is existing.

- 3.65 There are no further records of environmentally sensitive areas.

Ecology

- 3.66 An ecological assessment of the NVZ surface outside the scope of this report. Where considered necessary, advice should be sought from an ecological specialist in this respect.
- 3.67 The site is classified as Urban land.
- 3.68 There is 1no. records for tree felling licenses within 250m of the site. The record refers to the selective fell/thin (conditional) licence, dated 2009, located 27m southwest of the site.
- 3.69 There are no records for open access land, environmental stewardship schemes, country stewardship schemes or priority habitat inventory within 250m of the site.
- 3.70 There are no records for habitat networks, open mosaic habitats, or limestone pavement orders located within 250m of the site.

Archaeology

- 3.71 An archaeological assessment falls outside the brief of this report. Where considered necessary, advice should be sought from an archaeological specialist in this respect.
- 3.72 However, there are no records of World Heritage Sites, Areas of Outstanding Natural Beauty, National Parks, Scheduled Ancient Monuments, or Registered Parks and Gardens within 250m of the site.
- 3.73 There is 1no. of Listed Building within 250m of the site. The record refers to the Broxups building located 15m southeast of the site.
- 3.74 There is 1no. of Conservation Area within 250m of the site. The record refers to the All Saints, Whitefield building located 222m northeast of the site.

Potential Flood Risks

- 3.75 Detailed assessment of flood risk is outside the scope of this report. However, reference to Environment Agency records indicates that the site does not lie within a Zone 2 or Zone 3 Flood Zone.
- 3.76 There is no risk of flooding from rivers and sea (RoFRaS) on site or within 50m of the site.
- 3.77 There are no records of historical flood events within 250m of the site.
- 3.78 There are no records of flood defences located within 250m of the site.
- 3.79 There are no records of areas benefiting from flood defences within 250m of the site.
- 3.80 There are no records of areas used for flood storage within 250m of the site.
- 3.81 The highest risk of surface water flooding occurring on-site is negligible.
- 3.82 The highest risk of groundwater flooding occurring on-site is low.

Unexploded Ordnance

3.83 The online Zetica UXO map shows the site within a low-risk zone.

4.0 SITE HISTORY

- 4.1 Reference historical plans and Google Earth imagery have determined the historical development of the site. The information in the historical mapping study has been predominantly limited to the site or within 100m of the site, focusing on the most directly relevant information. Beyond this radius, only information deemed appropriate will be referenced. Each map or photograph represents a snapshot of the site and its environment at the date of the survey. Any changes that occur at other times may not have been recorded on the maps and could represent an unidentified hazard to the site.
- 4.2 Only selected maps with a clear view of the site and surrounding area have been used; the information reported might not represent all pertinent information that could be obtained. The interpretation of the maps and/or other data commented on in this report is subjective.
- 4.3 The earliest available historical mapping covering the site dates to 1848. The site history is summarised in Tables 2 and 3 below, followed by selected extracts from maps and aerial photographs in Figures 4-7.

Table 2: Summary of Site History

Date	Scale	On-Site History	Surrounding Land Use History
1848-1850	1:10,560	The site is an open field.	The site has buildings on the east and west, approximately 100m from the site. The rest of the surrounding area is an open field. A road is at the northern boundary of the site.
1891	1:10,560	No change compared to the previous map.	There are ponds approximately 50m southwest and 100m west and east of the site.
1893	1:2,500	A structure is on the site, probably a shed. Trees are at the northern end of the site.	Buildings are at the southern boundary of the site. Trees are at the eastern boundary of the site.
1907-1908	1:10,560	No change compared to the previous map.	The pond has been refilled.
1909	1:2,500	The trees are not seen on the map.	No change compared to the previous map.
1915	1:10,560	No change compared to the previous map.	A school is approximately 100m to the north of the site.
1922	1:2,500	The structure has been extended on the site.	No change compared to the previous map.
1923-1927	1:10,560	No change compared to the previous map.	No change compared to the previous map.
1932-1937	1:10,560	No change compared to the previous map.	A row of residential buildings is located approximately 5m northeast of the site.
1938	1:10,560	No change compared to the previous map.	No change compared to the previous map.
1955	1:1,250	No structure is on the site. Part of the building at the southern boundary of the site is on the site.	Beech House is located on the southeast boundary of the site, and a clubhouse is situated on the northwest, approximately 50m away.

Date	Scale	On-Site History	Surrounding Land Use History
1970	1:2,500	No change compared to the previous map.	No change compared to the previous map.
1969-1973	1:1,250	No part of the building on the site. Open field.	No change compared to the previous map.
1973-1977	1:10,000	No change compared to the previous map.	No change compared to the previous map.
1978	1:1,250	No change compared to the previous map.	No change compared to the previous map.
1979-1984	1:1,250	No change compared to the previous map.	No change compared to the previous map.
1989-1992	1:1,250	No change compared to the previous map.	No change compared to the previous map.
2001	1:10,000	No change compared to the previous map.	No change compared to the previous map.
2003	1:1,250	No change compared to the previous map.	No change compared to the previous map.
2010	1:10,000	No change compared to the previous map.	A path is at the western and eastern boundaries of the site.
2025	1:10,000	No change compared to the previous map.	No change compared to the previous map.

Table 3: Summary of Site History from Aerial Photographs

Date	On-Site History	Surrounding Land Use History
2000	The site is part of a car park.	A road is to the north of the site. Grassland surrounds the site to the east. A car park is on the western boundary of the site. A residential building is approximately 5m north and east. The golf club building is approximately 10 metres northwest of the site. A Tennis courts are located approximately 10m to the southwest of the site.
2011	The site is a car park with grassland at its eastern end.	A new road has been constructed to the western boundary, and new buildings have been built at the southwestern boundary of the site. A car park has also been constructed approximately 10m to the south side of the site. The former golf club building has been demolished, and the grassland has been removed.
2015	There is no significant change compared to the previous photograph.	There is no significant change compared to the previous picture.
2019	There is no significant change compared to the previous photograph.	Two new buildings for the golf club have been constructed on the land adjacent to the golf club building, located approximately 5 metres to the northwest of the site.
2023	There is no significant change compared to the previous photograph	There is no significant change compared to the previous photograph

4.4 The earliest map, dating from 1848-1850, indicates the site was an open field.

4.5 A structure, probably a shed, was seen on the site from 1893.

4.6 A pond was seen in 1891; however, it was filled by 1907.

- 4.7 There was no significant change to the site from 1893 to 1955, but surrounding the site, a school was built in 1915, approximately 100m north of the site.
- 4.8 Part of a building was on the site at the southern boundary of the site, as indicated on the 1955 map, but the site was once again an open field from 1969 to 2000.
- 4.9 The 2000 map shows the site as part of a car park with vegetation at the eastern end of the site.
- 4.10 At present, the site is a car park that is not in use.
- 4.11 The majority of the site is covered in hardstanding, with the rest of the site being covered in vegetation at the eastern end.

Figure 4: Ordnance Survey Map Extract 1893

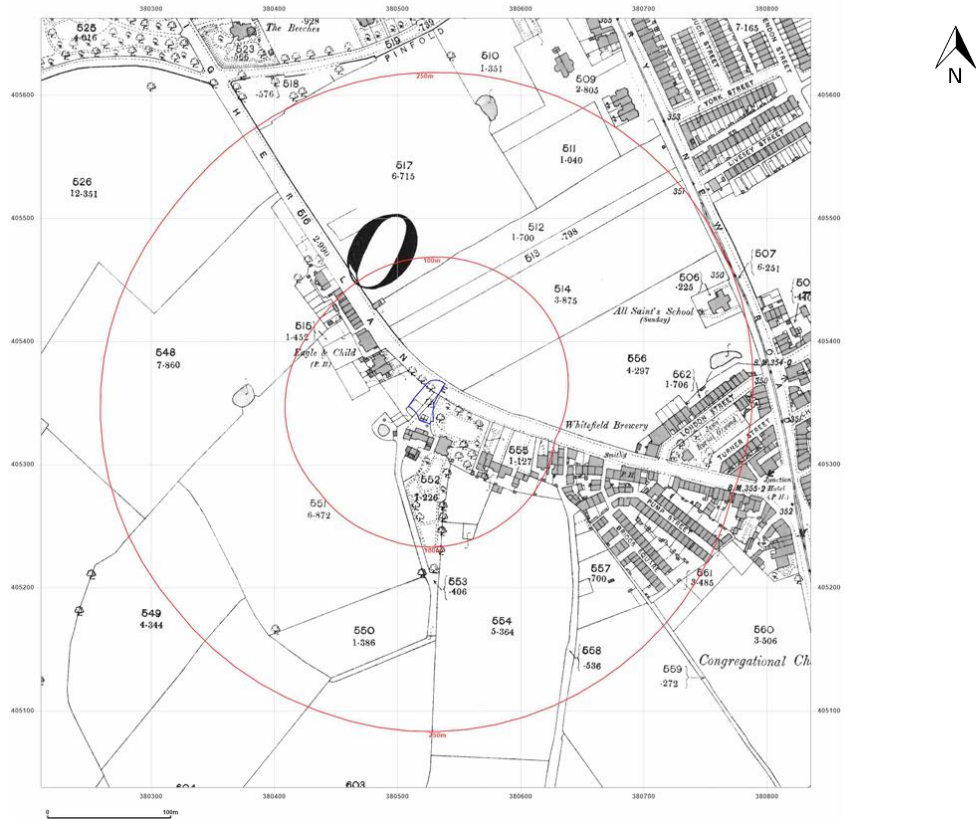


Figure 5: Ordnance Survey Map Extract 1932

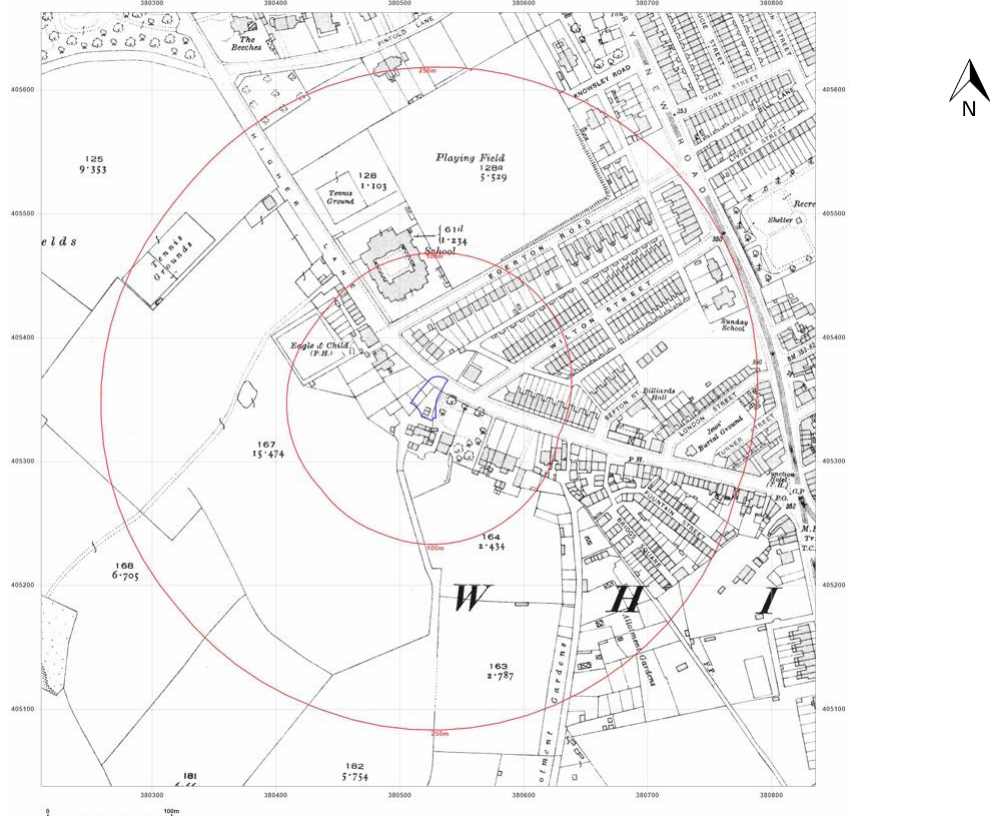


Figure 6: Ordnance Survey Map Extract 2003



Figure 7: Aerial Photograph 2023



5.0 WALKOVER SURVEY

- 5.1 A walkover survey was completed on 7th August 2025. The photographs and notes from this survey are appended to this report as Appendix 2 and Appendix 3, respectively.
- 5.2 Access to the site is gained via a Heras fence to the southern end of the site off the A665 Road and Parr Hill Road.
- 5.3 The site is relatively flat and is mainly covered in hardstanding due to the old car park; however, a small area of the site is a grassland at the northeastern point of the site.
- 5.4 A Heras fence and a wooden fence along the eastern boundary of the site bound the site.
- 5.5 The site is surrounded by residential buildings to the north and west, commercial buildings to the south and a large parcel along with a used building to the east.

Figure 8 Site Features Plan



6.0 PRELIMINARY CONTAMINATION RISK ASSESSMENT

Introduction

- 6.1 The following paragraphs outline a Preliminary Risk Assessment (PRA) for the site based on the above desk study information as defined by the Land Contamination Risk Management Environment Agency, July 2023.
- 6.2 Table 6 provides a Preliminary Conceptual Model (PCM) which considers the source-pathway-receptor linkages present alongside the likelihood, severity, and risk level as defined within Table 4 and Table 5 below. The assessment of probability, a modified risk table, and specific consequence definitions are based on CIRIA C552 and the Land Contamination Risk Management Environment Agency's guidelines, July 2023.
- 6.3 Table 6 considers whether a pollution linkage is potentially present and provides a preliminary qualitative assessment of risk based on the information currently available. Where a possible linkage is identified, it does not necessarily indicate a significant risk; instead, it suggests that further information is required through appropriate site investigation to substantiate the conceptual model.
- 6.4 The PCM/PRA is based on a residential land use.

Table 4: Consequence, Probability, and Risk

Probability	Consequence,	Risk
High Likelihood- There is a pollution linkage, and an event either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution	Very High – acute risk to human health, likely to result in significant harm. Risk of severe or irreversible effects on ground/surface water quality. Catastrophic damage to buildings/property.	Very High – There is a high potential that the source-pathway-receptor scenarios may lead to harm to human health or the environment, and remedial action is likely to be required.
Likely – there is a pollution linkage, and all the elements are present, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but it is possible in the short term and likely to happen over the long term.	High – Severe or irreversible effect on human health. Temporary severe or irreversible effect on ground/surface water quality. Reduction of water quality rendering groundwater or surface water unfit to drink and/or a substantial adverse impact on groundwater-dependent environmental receptors.	High – it is likely that the source-pathway-receptor scenarios may affect human health or the environment, requiring remediation and/or control measures to mitigate risks.
Low likelihood – there is a pollutant linkage, and circumstances are possible for the event to occur. However, it is by no means certain that such an event would occur over a more extended period, and it is even less likely in the short term.	Moderate – Long-term or short-term moderate effect on human health. Moderate impact on ground/surface water quality, reversible with time. Reduced reliability of a supply at a groundwater or surface water abstraction source	Moderate – it is possible that the source-pathway-receptor scenarios may have an impact on human health or the environment; however, it is either relatively unlikely that such an impact would be severe, or, if any harm were to occur, it is more likely to be mild.
Unlikely – there is a pollution linkage, but circumstances are such that it is doubtful that an event would occur even in the very long term.	Low – Non-permanent health effects to human health (easily prevented by means such as personal protective clothing, etc.) Slight impact on ground/surface water quality, reversible with time. Marginal reduced reliability of a supply at a groundwater or surface water abstraction source.	Low – it is possible that harm could arise at the source; however, this is likely to be mild at worst.
		Very Low – It is unlikely that the source-pathway-receptor scenarios will have an impact on human health or the environment.

Table 5: Estimation of the Level of Risk by Comparison of Consequence and Probability

		Consequence			
		High	Moderate	Low	Very low
Probability	High Likelihood	Very High	High risk	Moderate risk	Moderate to low risk
	Likely	High risk	Moderate risk	Moderate to low risk	Low risk
	Low Likelihood	Moderate risk	Moderate to low risk	Low risk	Very low risk
	Unlikely	Moderate to low risk	Low risk	Very low risk	Very low risk

6.5 To summarise, there is limited potential for the presence of contamination on the site or in the local area.

Potential Receptors

6.6 The following receptors have been considered for the construction and operational stages of the proposed redevelopment.

- Current site users;
- Adjacent land users;
- Future land users;
- Construction workers during site development works;

Potential Pathways

6.7 The following pathways have been considered for the construction and operational stages of the proposed redevelopment.

- Dermal contact, ingestion, and inhalation pathways of potentially contaminated soils.
- Downward vertical migration of leachate to shallow groundwater.
- Vertical or lateral migration of ground gas

Table 6: Preliminary Conceptual Model

Source	Pathway	Receptor	Probability	Consequence	Risk	Comment
Made Ground (Heavy Metals, PAH, TPH, BTEX)	Dermal contact, ingestion, and inhalation of soil dust	Current Site Users	Unlikely	Low	Very Low	The site is currently vacant. The risk is therefore considered to be VERY LOW .
		Adjacent land users	Low Likelihood	Low	Low	The golf club is located west of the site, approximately 5m away, and residential buildings are situated to the north and east of the site. The risk to off-site land users is considered to be LOW . Usual dust control measures should be implemented as part of good site working practices during construction to reduce dust generation.
		Future land users	Low Likelihood	Low	Low	Given future site use, there is a potential for direct contact between contaminated soils and receptors; however, the likelihood of such contact is low. The risk to future site users from direct exposure is considered LOW .
		Construction Workers	Low Likelihood	Low	Low	Construction workers may be exposed to potentially contaminated materials during construction; however, exposure duration is typically short-term. Assuming appropriate health and safety measures are adopted (in line with CDM and other relevant health and safety guidance), a LOW risk to construction workers is anticipated.
	Downward vertical migration of leachate to shallow groundwater	Groundwater within the Underlying Aquifer	Unlikely	Moderate	Low	A limited on-site source of mobile contaminants has been identified. The cohesive soils beneath the site will limit downward migration, and the groundwater vulnerability is medium. The risk to groundwater is therefore considered LOW .
	Lateral migration in surface waters	Nearby Surface water features	Unlikely	Moderate	Low	There are no nearby surface water features, and the site has limited potential for contaminants; cohesive superficial deposits will limit lateral migration. Therefore, the risk to surface waters is considered LOW .
	Vertical or lateral migration of ground gas	Current Site Users	Unlikely	Moderate	Low	There are no significant sources within 250m of the site. The risk from ground gas is therefore considered LOW .
		Adjacent land users	Unlikely	Moderate	Low	There are no significant onsite sources of ground gas. Therefore, the risk to adjacent site users from ground gas is considered LOW .
		Future land users	Unlikely	Moderate	Low	There are no significant sources within 250m of the site. Therefore, the risk to future site users from radon and ground gas is considered LOW .
		Construction Workers	Unlikely	Moderate	Low	There are no significant onsite sources of ground gas. Construction workers may be exposed to ground gas/depleted oxygen conditions in excavations; however, the exposure will be short-term. The risk to

Source	Pathway	Receptor	Probability	Consequence	Risk	Comment
						construction workers from ground gas is considered LOW .
Asbestos Containing Material (ACM)		Current Site Users	Unlikely	Moderate	Low	The site is currently unused; therefore, disturbance of the potential for asbestos in the soil is unlikely. Thus, the risk to current site users from asbestos is considered to be low.
		Adjacent land users	Low Likelihood	Moderate	Low	Residential properties are located near the site boundary. Disturbance of soil during the construction phase may allow fibres to become airborne. The risk is considered to be LOW .
		Future land users	Low Likelihood	Moderate	Low	Given the future site use (residential), there is potential for direct contact between contaminated soils and receptors; however, there is limited potential for ACM in the soil. Therefore, the risk to future land users is considered to be LOW .
		Construction Workers	Low Likelihood	Moderate	Low	Construction workers may be exposed to asbestos in soil during construction. The risk is considered LOW .

7.0 GEOTECHNICAL HAZARDS ASSOCIATED WITH THE DEVELOPMENT

- 7.1 In addition to the environmental hazards, there are also geotechnical hazards associated with the stability of the ground, including load-bearing capacity, slope stability, and effects of ground mining activities. Local Authorities follow the NPPF (2021), which requires that a site be suitable for its new use, taking into account ground conditions and land instability, including from natural hazards and former activities such as mining.
- 7.2 A summary of the geotechnical hazards and geotechnical considerations is provided below Tables 7 and 8, respectively.

Table 7: Summary of Geotechnical Hazards

Geohazards:	
Highly Compressible Ground	Negligible
Collapsible Soils	Very Low
Swelling Clay	Very Low
Running Sand	Very Low
Ground Dissolution	Negligible
Landslip	Very low
Mining & Quarrying	The site is located within an identified coal mining area. The site does not lie within a Coal Authority Development High Risk Area.

Table 8: Summary of Geotechnical Considerations

Geotechnical Design Considerations	
Site Clearance	Vegetational clearance is needed at the site.
Trees	There are no trees at the eastern boundary of the site.
Existing Buildings/Obstructions	There are no existing buildings on the site.
Foundations	The depth and type of proposed foundations would depend on the site's ground conditions. There are no artificial deposit records underlying the proposed development area. The superficial deposits consist of Devensian Till.
Floor Slabs	A ground-bearing floor slab is anticipated to be suitable on the prepared formation level. However, verification of the ground would be required.

Geotechnical Design Considerations	
Groundwater	Groundwater conditions are not yet known. For a more detailed understanding of the groundwater regime, an intrusive geotechnical investigation would be necessary. However, the site is underlain by [Secondary Undifferentiated aquifer]. The highest risk of groundwater flooding on the site is recorded as low.
Soakaways	Soakaways are unlikely to be feasible on the site.
Earthworks	It is unlikely that any major earthworks will be required on the site.
Slopes	The site is relatively flat.
Retaining Walls	It is unlikely that retaining walls will be required due to the site's gentle slope.
Chemically aggressive ground conditions	Chemically aggressive ground conditions are not expected at this site due to the previous SI. However, an intrusive geotechnical investigation would be necessary to confirm this at the specified development location.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- 8.1 The site is recorded to be underlain by superficial deposits of Devensian Till (Secondary Undifferentiated Aquifer) according to the BGS.
- 8.2 The bedrock geology beneath the site is shown to be of the Pennine Middle Coal Measures Formation Mudstone, Siltstone, and Sandstone is classified by the EA as a "Secondary A Aquifer," described as "Interbedded grey mudstone, siltstone, pale grey sandstone and commonly coal seams, with a bed of mudstone containing marine fossils at the base, and several such marine fossil-bearing mudstones in the upper half of the unit" is 200 m thick in northwest England.
- 8.3 The overall risk from soil contamination to residential end users and construction workers is concluded to be **LOW**.
- 8.4 The risk to controlled waters is concluded to be **LOW** based on the limited source potential and absence of nearby surface water features.
- 8.5 The risk from ground gas to end users is considered to be **LOW**.
- 8.6 The site does not lie within a radon-affected area and therefore no radon protection measures are required for any new structures.
- 8.7 The site does not lie within a flood plain.
- 8.8 The site lies within an area of low risk of UXOs.
- 8.9 A shallow foundation may be suitable; however, further assessment will be required.
- 8.10 Ground bearing slabs may be feasible and will need to be examined further.
- 8.11 Soakaways are unlikely to be feasible on the site.

Recommendations

- 8.12 No further assessment of the environmental status of the site is required.

APPENDIX 1

GROUNDSURE REPORTS

APPENDIX 2

SITE PHOTOGRAPHS

Earth Environmental & Geotechnical Ltd Tel: 0161 975 6088 Email: info@earthenvironmental.co.uk Web: www.earthenvironmental.co.uk	SITE PHOTOGRAPHS  EARTH ENVIRONMENTAL & GEOTECHNICAL A Technics Group Company
Job No.: A6988	Site: Parr Hill, Whitefield, Bury, M45 7EZ
Plate 1 View showing the entrance to the site	Plate 2 View showing the light pole in the middle of the site
	
Date: 7th August 2025	Date: 7th August 2025
Plate 3 View showing drainage at the northwestern boundary of the site	Plate 4 View showing the trees to the east
	
Date: 7th August 2025	Date: 7th August 2025

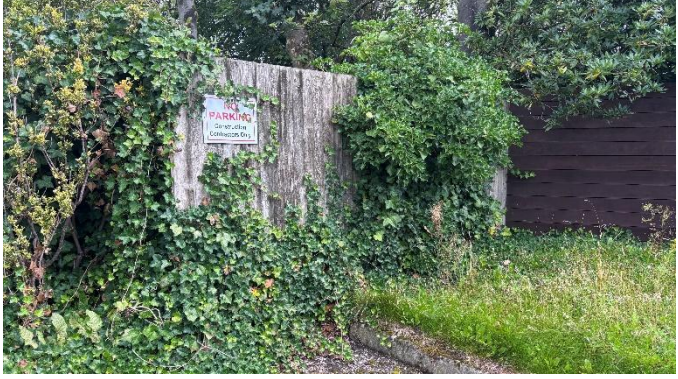
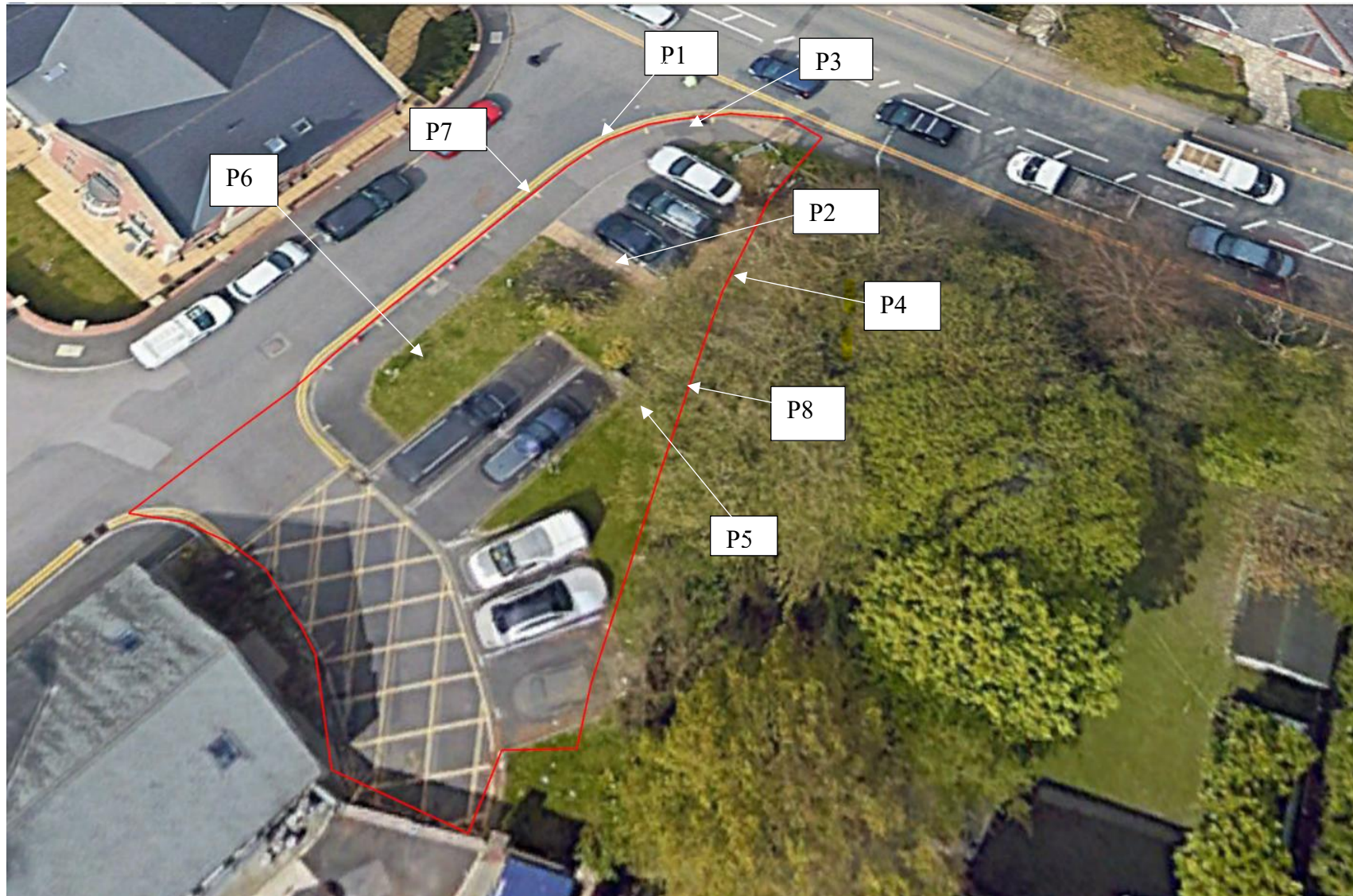
Earth Environmental & Geotechnical Ltd Tel: 0161 975 6088 Email: info@earthenvironmental.co.uk Web: www.earthenvironmental.co.uk	SITE PHOTOGRAPHS  EARTH ENVIRONMENTAL & GEOTECHNICAL A Technics Group Company
Job No.: A6988	Site: Parr Hill, Whitefield, Bury, M45 7EZ
Plate 5 View showing the grassland on the site	Plate 6 View showing the condition of the hardstanding
	
Date: 7th August 2025	Date: 7th August 2025
Plate 7 View showing Heras fencing	Plate 8 View showing the wooden fence to the east
	
Date: 7th August 2025	Date: 7th August 2025

Figure 9: Site Walkover Photograph Locations



APPENDIX 3

SITE WALKOVER NOTES

WALK OVER SURVEY REPORT

Site: Parr Hill, Whitefield, Bury, M45 7EZ

Date: 7th August 2025

Job No: A6988

Undertaken By: Rose Sarnoe

Purpose of Site Walkover:

- 1) Provide further information for the Desk Study Report;
- 2) Identify potential contamination sources, pathways, and receptors;
- 3) Identify geotechnical features and potential geohazards;
- 4) Determine locations for exploratory boreholes.

Desk Study features checked during site visit	Feature and Information required	Present	Description / Comments
Site Setting	Description required for: Town/Country/Suburb Setting Industrial/Residential/Retail Usage Current Site use (if undertaking security and access to the site)		25% of the site is grassland, and the rest of it is an old car park. The site is currently not in use.
Evidence of Past Activities	Are there: Any relevant street names in area? Features or relics which indicate past history?	Yes/No Yes/No	Indicate car park usage
Geographic Setting	Description required for: Low lying flood plain/dry valley/rolling hills etc.		Relatively flat.
Ground Conditions	Is there any evidence of: Mining, Mine entries Subsidence Landslip/slope erosion Former investigation works	Yes/No Yes/No Yes/No	

Desk Study features checked during site visit	Feature and Information required	Present	Description / Comments
Topography	Description required for: Are there apparent differences between site and surrounding area? (If yes describe the presence of retaining walls, and slopes). Is there evidence of Made Ground / Fill on site?	No No	
Site Boundaries and Neighbours	Description required for: Type of boundary demarcation (if any) on each side of site, usage of adjacent land and name of industrial/commercial occupiers. Note any adjacent features such as water course and other potentially environmentally sensitive uses (residential, school, infirmary, SSSI etc)		The site to the northern end is bounded by a heras fence on the west and a wooden wall.
Vegetation	Are there any vegetation/trees on or close to site (if yes describe locations, type, maturity, etc) Is there any evidence of poor health / distress?	Yes/No Yes/No	Part of the site is surrounded and covered in vegetation and trees. The trees are mature.
Ground Surface	Are there areas of hardstanding and estimate the split between hard and soft cover? (If yes describe locations, types, and conditions). Is there any evidence of any spillages or staining?	Yes/No Yes/No	75% of the site has hardstanding due to the car park.

Desk Study features checked during site visit	Feature and Information required	Present	Description / Comments
Site Drainage	Are there any drain covers / soakaways (if yes describe locations)	Yes/No	There are drain covers outside the barrier fence next to the private road entrance.
	Are there any outfalls/water courses on site (note the condition of water courses in open water courses. discolouration, odour, eutrophication, oily sheen, gas bubbling water, clear or cloudy)	Yes/No	
	Where a watercourse runs alongside or crosses a site are there any differences in visible water quality upstream and downstream of the site?	Yes/No	
Electrical Equipment	Are there any electricity sub stations on or adjacent to the site? Are there any electrical transformers, capacitors, pylons etc on site?	Yes/No	There is a light pole in the middle of the site.
Buildings	Is there any evidence of asbestos construction materials e.g. roofing, insulation materials.	Yes/No	
	Do any buildings have basements?	Yes/No	
	Do any buildings have a boiler room (if yes, describe fuel type and storage arrangements)?	Yes/No	

Desk Study features checked during site visit	Feature and Information required	Present	Description / Comments
Landfilling	Is there any evidence of gas protection measures (gas membrane, gravel-filled trenches, venting pipes, etc)?	Yes/No	
Process Air Emissions	Point Source: Are there any stacks / vents / cooling towers / abatement equipment? Fugitive Source: is there any stockpiled material / windblown dust / vapour process?	Yes/No Yes/No	
Storage of fuels & Chemicals	Are there any drums / containers (if yes, describe quantity, full /empty, stored on hard standing / soft landscaping, bunding)? Are there any above ground fuel tanks (if yes, describe locations, volumes, how many, bunding, used / disused, condition?) Is there any evidence of underground fuel tanks (fuel pumps, covers, vent pipes, how many and how large, fill point, used / disused, and condition)?	Yes/No Yes/No Yes/No	
Accidents	In the event of a large spillage would runoff affect any vulnerable watercourse/culverts? Are emergency procedures / equipment in place?	Yes/No Yes/No	

Desk Study features checked during site visit	Feature and Information required	Present	Description / Comments
Waste	Are there any waste skips present on site? Are waste storage facilities adequate? Is there any litter/fly tipped material?	Yes/No Yes/No Yes/No	N/A
Atmospheric	Are there any fumes, odours originating from site or affecting site from neighbouring sites?	Yes/No	
Access / Further Investigations	If a Phase 2 Investigation is likely to be required, describe any access problems including headroom where relevant, services, overhead cables, restricted access areas, confined spaces, trafficked areas, etc that are likely to affect investigation scope/techniques. Identify possible site office and storage locations. Identify possible water supply		Site clearance is required(vegetational). No water on site.
Site Environs	Are there any local features that could have a harmful influence e.g. landfill, industrial processes, railway land? Are there any sensitive water features/courses near to the site?	Yes/No Yes/No	
Local Knowledge / Anecdotal Evidence			
Site Dimensions	Describe the shape of the Site in plan and measure dimensions.		The site has an irregular shape and its area is 0.06 hectares.

APPENDIX 4

REPORT LIMITATIONS

LIMITATIONS

This contract was completed by Earth Environmental & Geotechnical Ltd on the basis of a defined programme and scope of works and terms and conditions agreed with the client. This report was compiled with all reasonable skill, and care, bearing in mind the project objectives, the agreed scope of works, the prevailing site conditions, the budget, and staff resources allocated to the project.

Other than that, expressly contained in the above paragraph, Earth Environmental & Geotechnical Ltd provides no other representation or warranty whether express or implied, is made in relation to the services. Unless otherwise agreed this report has been prepared exclusively for the use and reliance of the client in accordance with generally accepted consulting practices and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon, or transferred to, by any other party without the written agreement of a Director of Earth Environmental & Geotechnical Ltd.

If a third party relies on this report, it does so wholly at its own and sole risk and Earth Environmental & Geotechnical Ltd disclaims any liability to such parties.

It is Earth Environmental & Geotechnical Ltd understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was an important factor in determining the scope and level of the services. Should the purpose for which the report is used, or the proposed use of the site change, this report will no longer be valid and any further use of, or reliance upon the report in those circumstances by the client without Earth Environmental & Geotechnical Ltd review and advice shall be at the client's sole and own risk.

The report was written in 2025 and should be read in light of any subsequent changes in legislation, statutory requirements, and industry best practices. Ground conditions can also change over time and further investigations, or assessment should be made if there is any significant delay in acting on the findings of this report. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of Earth Environmental & Geotechnical Ltd. In the absence of such written advice of Earth Environmental & Geotechnical Ltd, reliance on the report in the future shall be at the client's own and sole risk. Should Earth Environmental & Geotechnical Ltd be requested to review the report in the future, Earth Environmental & Geotechnical Ltd shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between Earth Environmental & Geotechnical Ltd and the client.

The observations and conclusions described in this report are based solely upon the services that were provided pursuant to the agreement between the client and Earth Environmental & Geotechnical Ltd. Earth Environmental & Geotechnical Ltd has not performed any observations, investigations, studies or testing not specifically set out or mentioned within this report.

Earth Environmental & Geotechnical Ltd is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, Earth Environmental & Geotechnical Ltd did not seek to evaluate the presence on or off the site of electromagnetic fields, lead paint, radon gas or other radioactive materials.

The services are based upon Earth Environmental & Geotechnical Ltd observations of existing physical conditions at the site gained from a walkover survey of the site together with Earth Environmental & Geotechnical Ltd interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The findings and recommendations contained in this report are based in part upon information provided by third parties, and whilst Earth Environmental & Geotechnical Ltd have no reason to doubt the accuracy and that it has been provided in full from those it was requested from, the items relied on have not been verified.

No responsibility can be accepted for errors within third party items presented in this report. Further Earth Environmental & Geotechnical Ltd was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the services. Earth Environmental & Geotechnical Ltd is not liable for any inaccurate information, misrepresentation of data or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to Earth Environmental & Geotechnical Ltd and including the doing of any independent investigation of the information provided to Earth Environmental & Geotechnical Ltd save as otherwise provided in the terms of the contract between the client and Earth Environmental & Geotechnical Ltd.

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions can also be variable and as investigation excavations only allow examination of the ground at discrete locations. The potential exists for ground conditions to be encountered which are different to those considered in this report. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and Earth Environmental & Geotechnical Ltd] based on an understanding of the available operational and historical information, and it should not be inferred that other chemical species are not present.

The groundwater conditions entered on the exploratory hole records are those observed at the time of investigation. The normal speed of investigation usually does not permit the recording of an equilibrium water level for any one water strike. Moreover, groundwater levels are subject to seasonal variation or changes in local drainage conditions, and higher groundwater levels may occur at other times of the year than were recorded during this investigation.

Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on and surrounding, the site.