



EARTH ENVIRONMENTAL
& GEOTECHNICAL

Phase 1 GeoEnvironmental Desk Study

Penzance Street

Manchester

October 2021

On behalf of

One Manchester

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

Tel : 01619756088

Email
headoffice@earthenvironmental.co.uk

www.earthenvironmental.co.uk



**PENZANCE STREET
MANCHESTER
PHASE I GEOENVIRONMENTAL DESK STUDY
FOR
ONE MANCHESTER**

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

www.earthenvironmental.co.uk

Tel: 0161 975 6088

Report No. A4353/21

OCTOBER 2021

Report Title:	Penzance Street, Manchester Phase I GeoEnvironmental Desk Study
Report Reference:	A4353/21
Client:	One Manchester
Issue Date:	4th October 2021
Drafted By:	B Garratty
Reviewed By:	A Czarnecki
Authorised By:	A Czarnecki

This document has been prepared for the titled project (or named part thereof) and should not be relied upon or used for any other project without an independent check being carried out as to its suitability and prior written authorisation being obtained from Earth Environmental & Geotechnical. Earth Environmental & Geotechnical accepts no responsibility or liability for the consequences of the use of this document, wholly or in part, for any other purpose than that for which it was commissioned. Any persons so using or relying upon this document for such other purpose do so at their own risk.

This report was prepared for the sole use of the Client and shall not be relied upon or transferred to any other party without the express written authorisation of Earth Environmental & Geotechnical. It may contain material subject to copyright or obtained subject to license; unauthorised copying of this report will be in breach of copyright/license.

The findings and opinions provided in this document are given in good faith and are subject to the limitations imposed by employing site assessment methods and techniques, appropriate to the time of investigation and within the limitations and constraints defined within this document. The findings and opinions are relevant to the dates when the assessment was undertaken, but should not necessarily be relied upon to represent conditions at a substantially later date.

The findings and opinions conveyed in this report are based on information obtained from a variety of sources as detailed and which Earth Environmental & Geotechnical assumes to be reliable, but have not been independently confirmed. Therefore, Earth Environmental & Geotechnical cannot and does not guarantee the authenticity or reliability of third party information it has relied upon.

Where opinions expressed in this report are based on current available guidelines and legislation, no liability can be accepted by Earth Environmental & Geotechnical for the effects of any future changes to such guidelines and legislation.

The limitations of liability of Earth Environmental & Geotechnical for the contents of this document have been agreed with the Client, as set out in the terms and conditions of offer and related contract documentation.

CONTENTS

1.0	INTRODUCTION.....	1
	Appointment.....	1
	Objective	1
	Scope	2
2.0	SITE LOCATION AND DESCRIPTION	3
	Site Utility Services	4
3.0	ENVIRONMENTAL SETTING	5
	Geology.....	5
	Ground Workings	5
	Mining and Other Underground Workings.....	6
	Radon Potential.....	6
	Hydrogeology and Hydrology.....	6
	Landfill & Waste Management Activity	7
	Industrial Land Use Information	7
	Environmental Permits, Incidents and Registers.....	9
	Environmentally Sensitive Sites	10
	Ecology	10
	Archaeology	10
	Potential Flood Risks	10
	Previous Site Investigations	11
4.0	SITE HISTORY	12
5.0	WALKOVER SURVEY	20
6.0	PRELIMINARY CONTAMINATION RISK ASSESSMENT	22
	Introduction	22
	Potential Sources.....	23
	Potential Receptors.....	23
	Potential Pathways.....	23
7.0	GEOTECHNICAL HAZARDS ASSOCIATED WITH THE DEVELOPMENT	26
8.0	CONCLUSIONS & RECOMMENDATIONS.....	28
	Conclusions.....	28
	Recommendations	28

FIGURES

Figure 1	Proposed Development Plan
Figure 2	Site Location Plan
Figure 3	Site Photograph
Figure 4	OS Map Extract: 1848
Figure 5	OS Map Extract: 1922
Figure 6	OS Map Extract: 1949
Figure 7	OS Map Extract: 1966-1968
Figure 8	Aerial Photograph 2021
Figure 9	Site Features Plan
Figure 10	Site Walkover Photo Locations

TABLES

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

APPENDICES

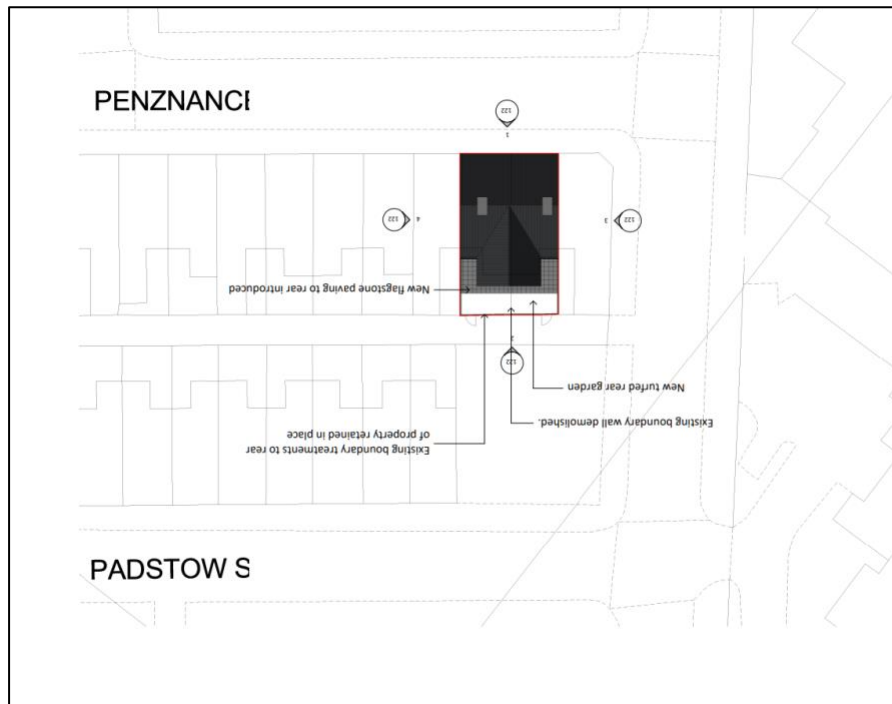
Appendix 1	GroundSure Reports
Appendix 2	Site Photographs
Appendix 3	Site Walkover Notes
Appendix 4	Report Limitations

1.0 INTRODUCTION

Appointment

- 1.1 Earth Environmental & Geotechnical Ltd has been commissioned by BTP Architects Ltd on behalf of One Manchester (the Client) to undertake a Phase I GeoEnvironmental Desk Study for the proposed development on the land at Penzance Street, Manchester.
- 1.2 It is understood that the Client wishes to convert 26 and 28 Penzance Street into a single property with associated flagstone paving and soft landscaping. The existing boundary wall between the properties will be demolished. The building has been used as an office for several years.
- 1.3 Vehicle access will be gained from Penzance Street to the north of the site.
- 1.4 A proposed development plan for the site is shown in Figure 1 below.

Figure 1 Proposed Development Plan



Objective

- 1.5 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 a preliminary assessment of geo-environmental risks to be undertaken and, if necessary, provides information for the design of a Phase 2 Ground Investigation.

Scope

1.6 The Phase I Environmental Desk Study comprises of a site reconnaissance visit and a review of the following information sources, some of which was 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 presented in the site specific GroundSure Reports (Appendix 1).
- Coal Authority Interactive Viewer.
- Manchester City Council Planning Portal.

2.0 SITE LOCATION AND DESCRIPTION

- 2.1 The site is in Miles Platting, Manchester approximately 2.7km from Manchester City Centre. The approximate National Grid Reference for the centre of the site is SD 86447 99327 (X: 386447, Y: 399327) with the closest postcode being M40 7BD.
- 2.2 The site is a rectangular shaped parcel of land with current access via Highfield Park to the south of the site. The maximum dimensions of the proposed site are 8.8m north to south and 14.5m west to east. The site occupies an area of approximately 0.01 hectares.
- 2.3 The site is currently occupied by terraced houses with site access via Penzance Street.
- 2.4 The general surrounding area comprises predominantly of residential dwellings, with Sycamore Court retirement housing located to the southeast of the site.
- 2.5 A location plan is shown below as Figure 2, together with a recent site photograph as Figure 3 (overleaf).

Figure 2 Site Location Plan

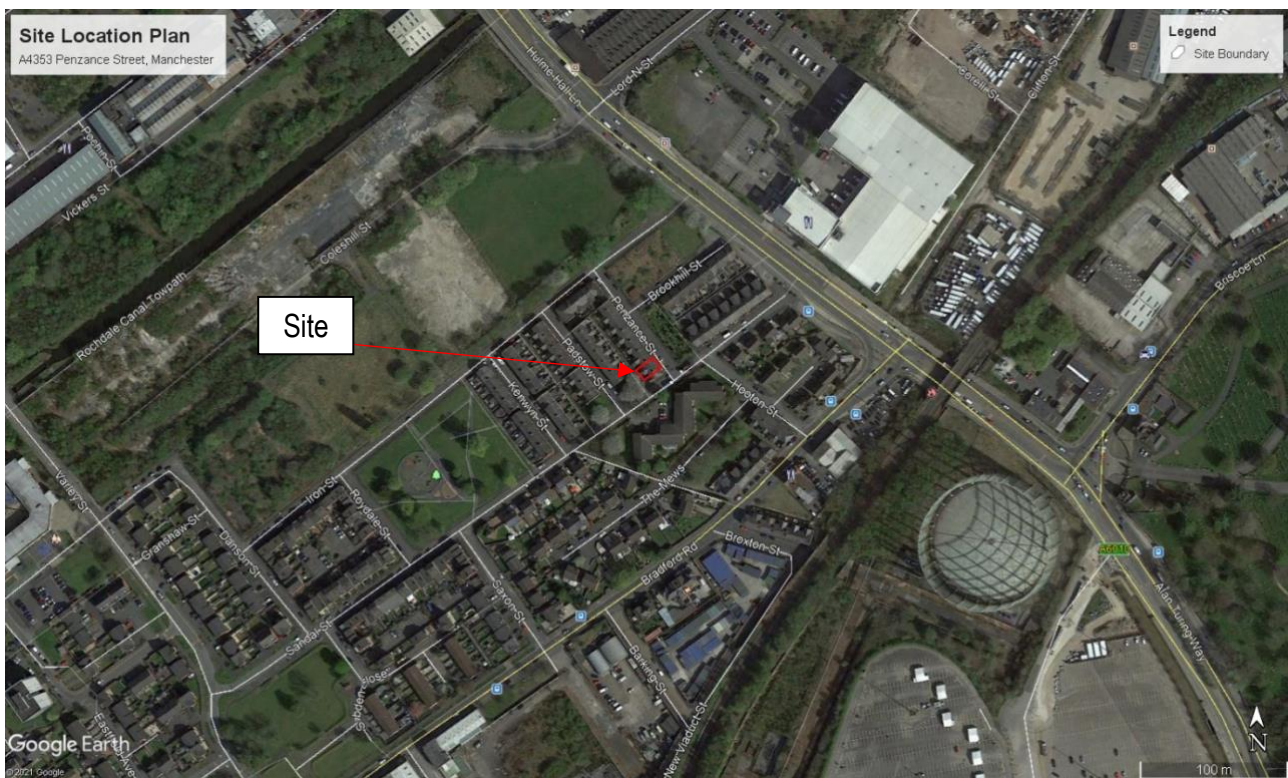


Figure 3 Site Photograph



Site Utility Services

- 2.6 Site service plans have not been obtained for the site on behalf of the client. The status of all services should be checked prior to any development (including site investigation) commencing.

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 Environment Agency (EA) and British Geological Survey (BGS) online data, and the site specific GroundSure Enviro+Geo Insight report (Appendix 1).

Geology

- 3.3 The BGS states that the site is not underlain by artificial deposits.
- 3.4 The site is predominantly underlain by superficial deposits of till, comprising Devensian diamicton.
- 3.5 The solid geology beneath the site is shown to be the Pennine Upper Coal Measures Formation, comprising mudstone, siltstone and sandstone.
- 3.6 There are 7 records of linear features within 500m of the site boundary. The onsite record refers to an inferred coal seam. The closest offsite record refers to an inferred coal seam located 77m southwest of the site.
- 3.7 There are no records of landslips within 500m of the site.
- 3.8 There are 58 borehole records identified within 250m of the site. The closest, non-confidential record is located 114m east of the site (BGS Reference; SDSJ89NE2346) and records:
- Topsoil to 0.1m
 - Made Ground comprising house bricks within dark brown slightly clayey, sandy, angular to sub-rounded, fine to coarse gravel to 2.8m
 - Made Ground comprising firm dark brown slightly sandy peaty clay to 3.1m
- 3.9 The site is in an area where the hazard rating is very low regarding shrink swell clays, running sands, collapsible deposits, and landslides. The hazard rating is negligible with regard to compressible deposits and the dissolution of soluble rocks.

Ground Workings

- 3.10 There are 21 records of historical surface ground working features identified within 250m of the site boundary. The closest record off site refers to coal pits located 92m south of the site, dated 1851. Other records in the vicinity refer to further coal pits, ponds, brick works, disused canals, canals, an unspecified pit and unspecified heaps.
- 3.11 According to the BGS, there are 2 records of a British Pit within 500m of the site. The closest record refers to Miles Platting Brick Works, a ceased surface mineral working located 170m northeast of the site.

Mining and Other Underground Workings

- 3.12 The site is located within an identified coal mining area. Reference to the Coal Authority Interactive viewer shows the site is also located within a Development High Risk Area.
- 3.13 There is 1 record of non-coal mining areas located within 1km of the site. This record refers to an onsite vein mineral (class A) located 623m southwest of the site.
- 3.14 There are no areas of brine extraction, gypsum extraction, tin mining or clay mining on the site.
- 3.15 There are no records of natural cavities within 500m of the site.
- 3.16 There are no records for non-coal cavities identified within 1km of the site.
- 3.17 There are 3 records for historical underground working features identified within 1km of the site. The closest record refers to a colliery, located 965m northwest, dated 1923.

Radon Potential

- 3.18 The site is not located in a Radon Affected Area, as between less than 1% of the properties are above the Action Level, therefore no Radon Protection Measures are required.

Hydrogeology and Hydrology

- 3.19 The superficial deposits are classified by the Environment Agency (EA) as a Secondary Undifferentiated Aquifer. The Till Deposits of Devensian diamicton have a mixed flow type and a high to low permeability. The BGS states the following:

Secondary Undifferentiated Aquifer *'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.'*

- 3.20 The Pennine Upper Coal Measures Formation is classified by the Environment Agency (EA) as a Secondary A Aquifer. The Pennine Upper Coal Measures Formation has a fracture flow type and a high to moderate permeability. The BGS states the following:

Secondary A Aquifer *'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.'*

- 3.21 The groundwater vulnerability and soil leaching potential of the site has been classified as a low vulnerability. The BGS states:

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'*

- 3.22 There are 25 ground water abstraction licence records within 2km of the site. The closest record refers to a historical ground water source at Norton Street, Miles Platting and is located 473 m north of the site.
- 3.23 There are 6 surface water abstraction licence records within 2km of the site. The closest record refers to a historical surface, non-tidal source at Ashton canal, located 1.47km southeast of the site.
- 3.24 There are no potable water abstraction licence records within 2km of the site.
- 3.25 The site is not located within 500m of a Source Protection Zone or Source Protection Zone within a confined aquifer.
- 3.26 There are no water network entries within 250m of the site.
- 3.27 There is 1 surface water feature identified within 250m of the site. This record refers to a canal located 250m northwest of the site.
- 3.28 There are 2 records of a Water Framework Directive (WDF) surface water body located on site. The closest record refers to Rochdale Canal, western section located 250m northwest of the site. The water body was a good chemical rating and moderate ecological rating in 2016.
- 3.29 There is 1 record of a Water Framework Directive (WDF) groundwater body located on-site. The record refers to Manchester and East Cheshire Permo-Triassic Aquifers which were a poor chemical rating in 2015.

Landfill & Waste Management Activity

- 3.30 There are no records for current Environment Agency/Natural Resource Wales landfill records within 500m of the site.
- 3.31 There are 3 records of historic Environment Agency/Natural Resource Wales landfill sites within 500m of the site. The closest record refers to Bradford Road Works, with a waste type of inert, industrial and special, located 186m southeast of the site.
- 3.32 There are no records of BGS/DoE non-operational landfill sites within 500m of the site.
- 3.33 There are no records of a historical landfill from the Local Authority and Historical Mapping records within 500m of the site.
- 3.34 There are 28 records of a waste treatment, transfer, or disposal site within 500m of the site. The closest record refers to a storing waste exemption site, non-agricultural waste only, located 140 m south of the site. The record is described as storage of waste in a secure place.
- 3.35 There are 14 records of historical waste sites within 500m of the site. The closest record refers to a waste and mills site located 181m northwest of the site, dated 1908.
- 3.36 There are no records of current Environment Agency/Natural Resources Wales licensed waste sites within 500m of the site.

Industrial Land Use Information

- 3.37 There are 200 records of potentially contaminative historical land uses identified within 500m of the site. The closest record off site refers to a coal pit located 61m southeast of the site dated 1851. Other records in the vicinity refer to other coal pits, railway sidings, coal yards, brick works, unspecified heaps, gas works, canal works, gasometers, unspecified pits etc.
- 3.38 There are 10 records of current potentially contaminative land uses identified within 250m of the site. The closest record refers to recycling, reclamation and disposal at J B S Balers, located 31m northeast of the site. The other records in the vicinity refers to second hand vehicles, electrical features, vehicle repair testing and servicing, catering, tanks etc.
- 3.39 There are 454 records of historical tanks identified within 500m of the site. The closest record refers to gas works located 162m south of the site, dated 1949.
- 3.40 There are 49 records of historical energy features identified within 500m of the site. The closest record refers to gas works, located 162m south of the site, dated 1949.
- 3.41 There are no records for current petrol or fuel sites within 500m of the site.
- 3.42 There are no records of historical petrol or fuel sites within 500m of the site.
- 3.43 There are 6 historical garage and motor vehicle repair site records identified within 500m of the site. The closest record refers to a garage located 257m east of the site, dated 1984.
- 3.44 There are no National Grid high voltage underground electricity transmission cables within 500m of the site.
- 3.45 There are no National Grid high-pressure gas transmission pipelines within 500m of the site.
- 3.46 There are 33 historical railway and tunnel features identified within 250m of the site. The closest record refers to railway sidings located 117m southeast of the site, dated 1938.
- 3.47 There are no historical railway lines identified within 250m of the site.
- 3.48 There are 12 current active railway line records identified within 250m of the site. The closest refers to a rail line located 161m southeast of the site.
- 3.49 There are no underground railway lines or tunnels identified within 250m of the site.
- 3.50 The site is not within 500m of the route of the High Speed 2 rail project.
- 3.51 The site is not within 500m of the route of the Crossrail 1 rail project.

Environmental Permits, Incidents and Registers

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

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

Permit/Incident/Register	Number
Historical Licensed Industrial Activities (IPC)	2
Part A (1) and IPPC Authorised Activities	2
Pollutant Release to Surface Waters (Red List)	0
List 1 Dangerous Substances Inventory Sites	1
List 2 Dangerous Substances Inventory Sites	1
Part A (2) and Part B Activities and Enforcements	7
Category 3 or 4 Radioactive Substance Authorisations	0
Licensed Discharge Consents	9
Planning Hazardous Substance Consents and Enforcements	4
Dangerous or Hazardous (COMAH and NIHHS) Sites	2
Sites Determined as Contaminated Land under Part 2A EPA 1990	0
Regulated Explosive Sites	0
Pollutant Release to Public Sewer	0
Substantiated Pollution Incidents (Category 1 and 2)	0
Pollution Inventory Substances, Wastes and Radioactive Wastes	1

- 3.53 There are 2 records of Historical Licensed Industrial Activity within 500m of the site. The closest record refers to Degussa Ltd, located 240m west of the site with a process inorganic chemical processes.
- 3.54 There are 2 records of Part A (1) activities within 500m of the site. The closest record refers to Princes Ltd located 453m northeast of the site with a process animal, vegetable and food treating.
- 3.55 There is 1 record of List 1 Dangerous Substance Inventory Sites within 500m of the site. This record refers to the Manchester Ship Canal with an authorised substance of mercury located 454m northeast of the site.
- 3.56 There is 1 record of List 2 Dangerous Substance Inventory Sites within 500m of the site. This record refers to Degussa Ltd with an authorised substance of cyanide, located 253m west of the site.
- 3.57 There are 7 records of Part (2) and Part B Activities and Enforcements within 500m of the site. The closest record refers to a current Part B Permit for printing located 335m northwest of the site.

- 3.58 There are 5 records of Licensed Discharge Consents within 500m of the site. The closest record refers to sewage storm overflow discharges at Hulme Hall Lane, located 115m northeast of the site.
- 3.59 There are 4 records of Planning Hazardous Substance Consents and Enforcements within 500m of the site. The closest record refers to the continuation of hazardous substances consent for storage of gas, located 216m southeast of the site.
- 3.60 There are 2 records of Dangerous or Hazardous (COMAH and NIHHS) Sites within 500m of the site. The closest record refers to a historical COMAH site at British Gas, located 110m southeast of the site.
- 3.61 There is 1 record of Pollution Inventory Substances, Wastes and Radioactive Wastes within 500m of the site. This record refers to a waste transfer at Princes Ltd located 454m northeast of the site for the treatment and processing of vegetable raw materials.
- 3.62 There are no other records of Environmental Permits, Incident or Registers within 500m of the site.

Environmentally Sensitive Sites

- 3.63 There are no records of Sites of Special Scientific Interest (SSSI) within 2km of the site.
- 3.64 There is record of Greenbelt land within 2km of the site. The closest record refers to Merseyside and Greater Manchester green belt located 1.2km east of the site.

Ecology

- 3.65 An ecological assessment of the site falls outside the brief of this report. Where considered necessary, advice should be sought from an ecological specialist in this respect.
- 3.66 However, the site is classified as Urban Land. See Appendix 1 for details.

Archaeology

- 3.67 An archaeological assessment falls outside the brief of this report. Where considered necessary, advice should be sought from an archaeological specialist in this respect.
- 3.68 There are no records of World Heritage Sites or Scheduled Ancient Monuments within 250m of the site.

Potential Flood Risks

- 3.69 Detailed assessment of flood risks is outside the scope of this report. However, the site does not lie within 50m of an Environment Agency Zone 2 or Zone 3 floodplain.
- 3.70 There is no risk of flooding from rivers and sea (RoFRaS) within 50m of the site.
- 3.71 There are no records of flood defences located within 250m of the site.
- 3.72 There are no records of areas benefitting from flood defences within 250m of the site.

- 3.73 There are no records of areas used for flood storage within 250m of the site.
- 3.74 The highest risk of surface water flooding occurring on-site is **negligible**.
- 3.75 The highest risk of groundwater flooding occurring on-site is **low**.

Previous Site Investigations

- 3.76 A planning application (reference: 087308/VO/2008/N1) was submitted to Manchester City Council in October 2008 for the continued use of property as part of Eco Homes demonstration programme. The application was approved in December 2008.

4.0 SITE HISTORY

- 4.1 The historical development of the site has been determined by reference historical plans and Google Earth imagery. The reviewed historical plans comprise only readily available records and may be limited; however, the information available to date indicates that additional searches are unlikely to add to our understanding of the site. The earliest available historical mapping covering the site dates back to 1848.
- 4.2 The site history is summarised in Table 2, below, followed by selected extracts from maps and aerial photographs.

Table 2: Summary of Site History

Date	On-Site History	Surrounding Land Use History
1848 1:10,560	The site is comprised of vacant fields.	Shooters Brook runs along the eastern boundary of the site. A coal pit is located 100m southeast of the site. A coal pit is located 150m northwest of the site. A coal pit is located 150m southwest of the site. Hulme Hall Lane is located 150m east of the site. A railway line with associated tram bond runs southwest to northeast located 200m south of the site. Manchester steel works is located 350m north of the site. Hulme Hall is located 450m northwest of the site. A tannery is located 450m west of the site. Shooters Brook is culverted runs 500m north of the site. A chemical works is located 500m west of the site. A brick field is located 500m south of the site. Fustian Mill is located 650m south of the site. A pottery is located 700m south of the site. Holt Town Reservoir is located 750m south of the site. Residential dwellings are located 700m northwest of the site. Manchester and Salford Water Works reservoir is located 780m south of the site.

1890-1891 1:10,560 1893 1:2,500	No significant change.	Residential dwellings are constructed 100m northeast of the site. A brick works is constructed located 200m south of the site. A brick works is constructed located 225m northeast of the site. Residential dwellings are constructed located approximately 250m southwest of the site. A chemical work is constructed located 250m west of the site. The railway line running 200m east of the site is expanded. A coal yard is developed located 250m northeast of the site. Duchie Mills is constructed 300m north of the site. A providence works is constructed located 400m north of the site. Bradford Road Gas Work is constructed located 400m south of the site. A sanitary works is constructed 500m south of the site. Reservoir mill is constructed located 550m south of the site. Phillips Park with associated cemetery is developed located approximately 600m east of the site. Wild's Farm is built located 600m northeast of the site. A gas plant works is constructed 600m north of the site. A significant railway junction is constructed 600m northeast of the site. A dye works is constructed located 650m northeast of the site. Gratrix's mill is constructed located 600m southeast of the site. A cotton works is constructed located 750m south of the site.
1905-1906 1:10,560 1908 1:2,500	No significant change.	Further residential developments to the southeast and northeast of the site located approximately 80m away. Streets are established to the east and west of the site. A school is constructed located 250m southwest of the site. The gas works located south of the site is expanded. Duchie Mills is converted into a waste centre. A soap, colour and chemical works is constructed 250m north of the site. An iron works is constructed located 400m north of the site. A clay pit is established 500m northeast of the site.

		A cotton works is constructed located 750m south of the site
1923 1:10,560 1922 1:2,500	Terrace house dwellings are constructed on Penzance Street on site.	Further residential dwellings are erected around all boundaries of the site. A church is constructed located 80m east of the site. The clay pit located 500m northeast of the site is now disused. A recreational ground with associated band stand and lavatories is developed 100m west of the site. A gasometer located 250 southeast of the site is constructed. Oil tanks are constructed located 300m southeast of the site. A church is constructed located 450m southwest of the site. An iron works is developed located 500m north of the site. Residential buildings are demolished and a mill is constructed located 550m south of the site. A woollen mill is developed located 600m southwest of the site.
1933-1934 1:10,560 1931 1:2,500	No significant change.	A recreational bowling green is developed located 150m southwest of the site. Tanks are constructed from the gas works, located 250m southeast of the site. Gasometer associated with the gas works are demolished leaving ground with embankments. Tenoid works (asbestos brake lining) is established located 250m north of the site. A tramway is constructed located 750m east of the site. The railway line is extended around the north and west of the site located 750m from the site with associated sidings.
1949 1:2,500	No significant change.	Terraced residential dwellings located 50m south of the site are demolished and a nursing home is constructed in its place.
1956 1:10,560 1953 1:2,500	No significant change.	A church is constructed located 80m south of the site.
1966-1968 1:10,560 1970 1:2,500	No significant change.	A fire station is constructed 250m east of the site. A garage is constructed located 500m northeast of the site. A sports ground is developed located 750m north of the site.
1980-1981 1:10,000	No significant change.	Flats built 50m south of the site are demolished.

1979-1984 1:2,500		Buildings associated with the gas works located 500m southeast of the site have been demolished. A factory is constructed 600m north of the site. An abattoir is developed located 775m west of the site.
1988-1991 1: 10,000 1991-1995 1:1,250	No significant change.	No significant change.
2001 1:10,000 2003 1:1,250	No significant change.	A playground is constructed located 150m southwest of the site. The national cycling centre is constructed located 800m southeast of the site.
2021 1;10,000 2021 Aerial	No significant change.	Etihad Stadium with associated sports complex is constructed located 850m southeast of the site.

Figure 4 OS Map Extract 1848



Figure 5 OS Map Extract 1922

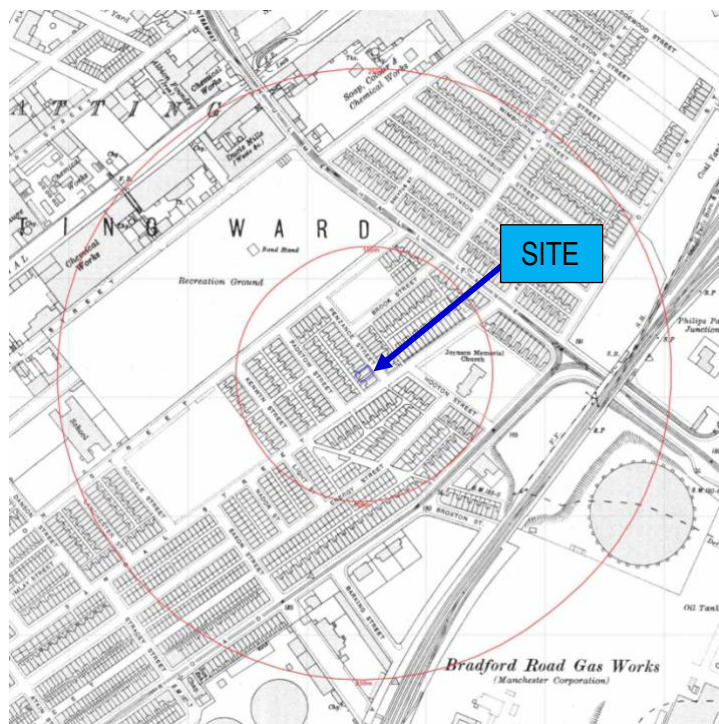


Figure 6 OS Map Extract 1949

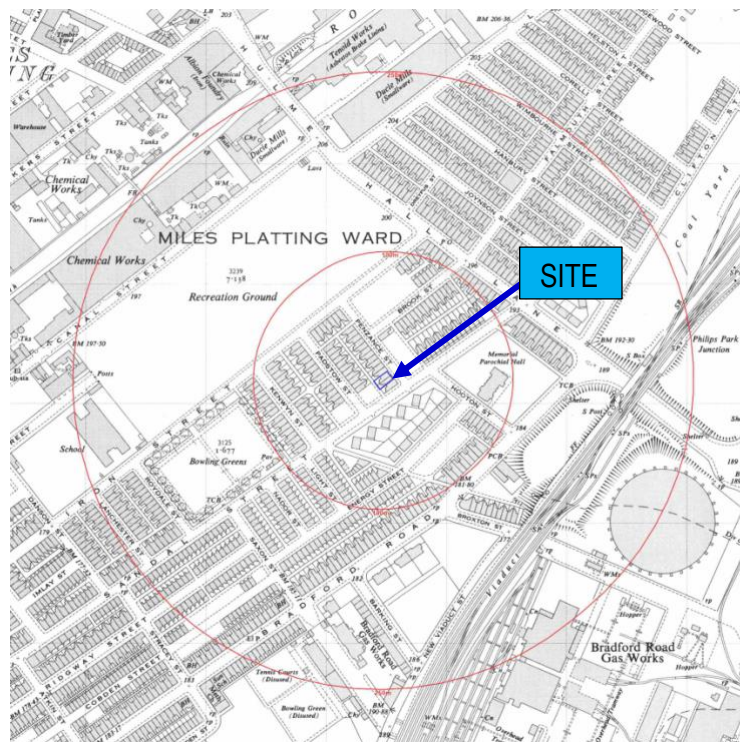


Figure 7 OS Map Extract 1966-1968

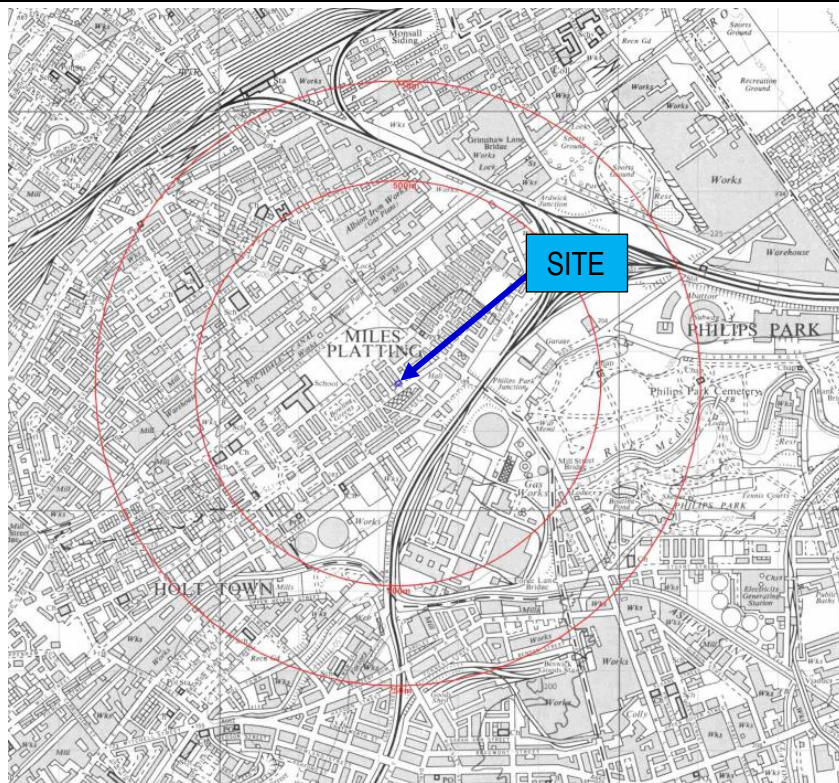
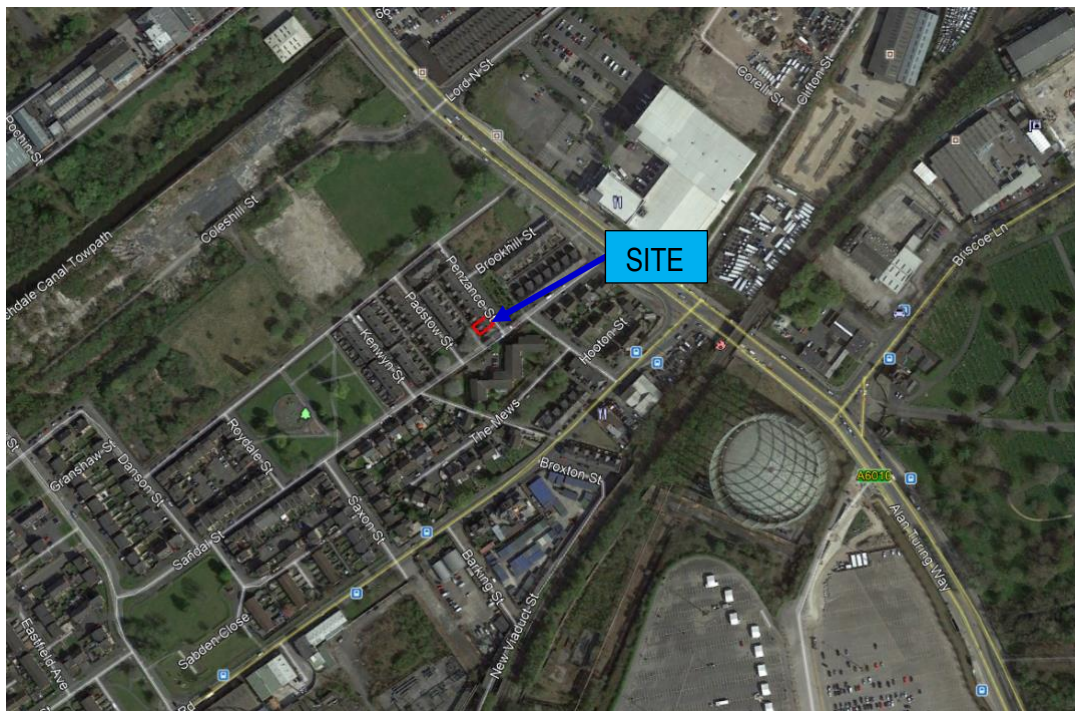


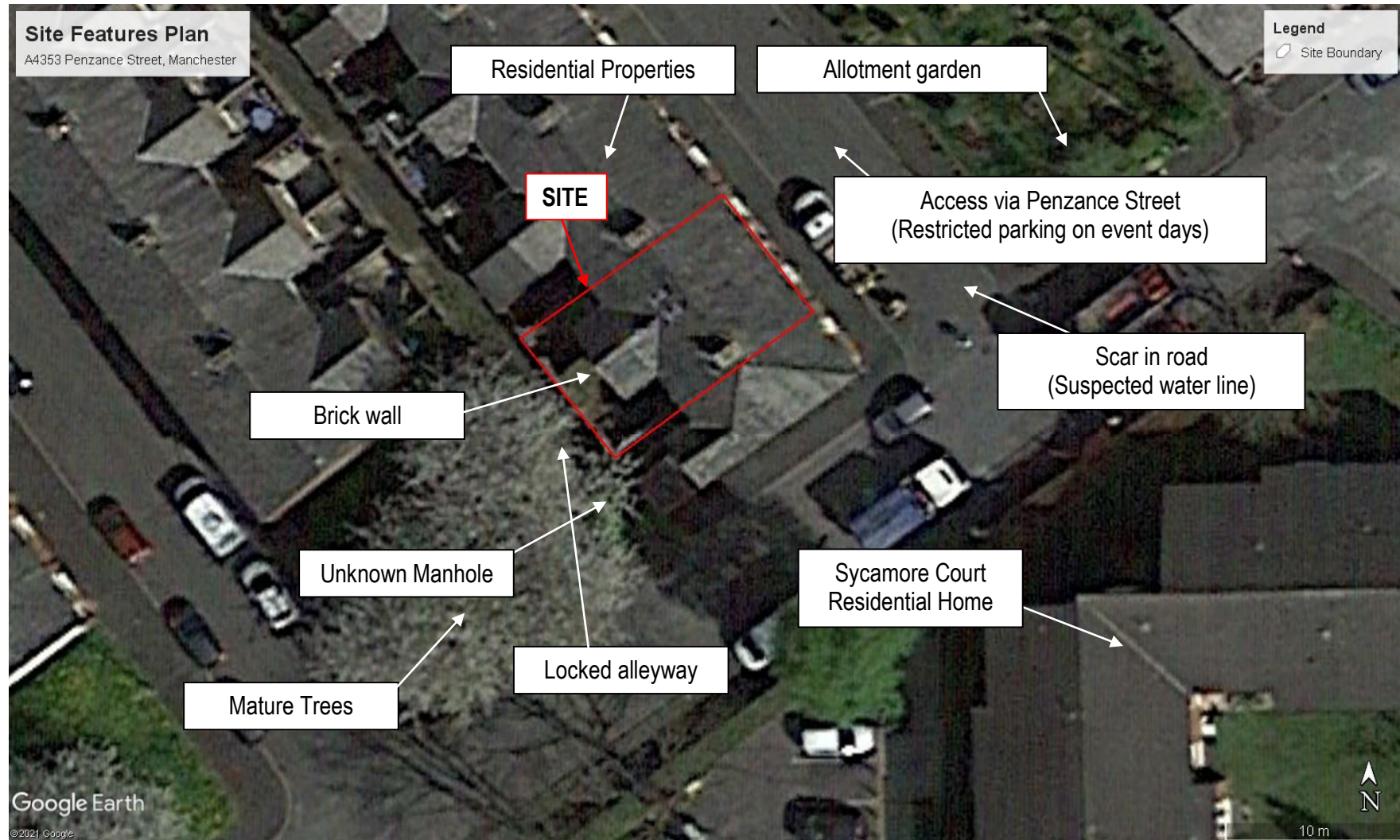
Figure 8 Aerial Photograph 2021



5.0 WALKOVER SURVEY

- 5.1 A walkover survey was completed on 1st October 2021 the details of which are contained within Appendix 2 and Appendix 3 respectively.
- 5.2 The site is currently accessed via Penzance Street to the northeast of the site.
- 5.3 The site is currently occupied by terraced residential dwellings and is surrounded by residential properties.
- 5.4 There site sits on an area of flat lying land with no significant slope.
- 5.5 There are overhead cables running from south of the site into the building.
- 5.6 A site features plan is presented as Figure 9 overleaf.

Figure 9 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 DEFRA and the EA Model Procedures for the Management of Land Contamination, CLR11⁽²⁰⁰⁴⁾.
- 6.2 Table 5 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 3 and Table 4 below. The assessment of probability, a modified risk table, and certain consequence definitions are based on CIRIA C552 and CLR11.
- 6.3 Table 5 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 mean that a significant risk exists, but indicates that further information is required through appropriate site investigation to substantiate the conceptual model.
- 6.4 The PCM/PRA is based on a continued residential end use.

Table 3: 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 the human health likely to result in significant harm. Risk of severe or irreversible effect on ground/surface water quality. Catastrophic damage to buildings / property.	Very High – there is a high potential that the source-pathway-receptor scenarios may give rise 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 an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.	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 substantial adverse impact on groundwater dependant environmental receptors.	High – it is likely that the source-pathway-receptor scenarios may give rise to an impact on human health or the environment, which may require remediation and/or control measures to mitigate risks
Low likelihood– there is a pollutant linkage and circumstances are possible for an event could occur. 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	Moderate – Long term or short term moderate effect on human health. Moderate effect 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 give rise to an impact on human health or the environment, however it is either relatively unlikely that such are would be severe, or if any harm were to occur it is more likely that harm would 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 effect 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 it is likely that this would at worst be mild.
		Very Low – it is unlikely that the source-pathway-receptor scenarios will give rise to an impact on human health or the environment.

Table 4: Estimation of 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

Potential Sources

- 6.5 Historically the site has comprised of vacant fields. By 1923 terrace house dwellings were constructed on site and have remained present since.
- 6.6 There is therefore limited potential for the presence of contamination on site.

Potential Receptors

- 6.7 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;
 - Surface water and Groundwater within the underlying aquifer

Potential Pathways

- 6.8 The following pathways have been considered for the construction and operational stages of the proposed redevelopment.
- Dermal contact, ingestion, inhalation pathways of potentially contaminated soils;
 - Downward vertical migration of leachate to surface waters and shallow groundwater;
 - Vertical or lateral migration of ground gas.

Table 5: Preliminary Conceptual Model

Source	Pathway	Receptor	Probability	Consequence	Risk	Comment
Potential soil contamination E.g. Heavy Metals, PAH, TPH, BTEX and ground gases.	Dermal contact, ingestion and inhalation of soils dust	Current Site Users	Low Likelihood	Moderate	Moderate to Low	The site is currently occupied by terrace dwellings. Usual dust control measures should be implemented as part of good site working practices during construction to reduce dust generation. The risk is therefore considered to be MODERATE TO LOW .
		Adjacent land users	Unlikely	Moderate	Low	Further residential dwellings surround the property including Sycamore Court nursing home located to the southeast. Usual dust control measures should be implemented as part of good site working practices during construction to reduce dust generation. Therefore, the risk is considered LOW .
		Future land users	Unlikely	Moderate	Low	The proposed development consists of demolishing an existing boundary wall and laying new pathing stones. Some of the site will be surfaced in hardstanding. The risk to future site users via direct exposure is considered to be LOW .
		Construction Workers	Low Likelihood	Moderate	Moderate to Low	Construction workers may be exposed to potentially contaminated soils during construction works, however exposure duration will be short-term only. The risk to construction workers is considered MODERATE to LOW . Appropriate health and safety measures (in line with CDM and other relevant health and safety guidance) will reduce the risk to LOW .
	Downward vertical migration of leachate to shallow groundwater	Groundwater within the Underlying Aquifer	Unlikely	Moderate	Low	The underlying superficial soils are anticipated to be diamicton till with a low permeability. There are 25 abstraction licences within 2km. The groundwater vulnerability is considered to be low. The risk to groundwater is therefore considered LOW .
	Lateral migration in surface waters	Surface water	Unlikely	Moderate	Low	There is 1 surface water feature (Rochdale Canal) located within 250m of the site. Therefore, the perceived risk to surface waters is considered to be LOW .
	Vertical or lateral migration of ground gas	Current Site Users	Low Likelihood	Moderate	Low	The site is currently occupied by terrace dwellings therefore large areas of made ground are present. There is no risk of radon affected area in the site, therefore no radon protection measures are required. This risk to current site users is therefore LOW .
		Adjacent land users	Unlikely	Moderate	Moderate to Low	Residential properties predominantly surround the site with Sycamore Court located to the southeast of the site. Areas of Made Ground are anticipated. There is low potential for radon gas and basic radon

Source	Pathway	Receptor	Probability	Consequence	Risk	Comment
						protection measures should be implemented. The risk to adjacent site users from ground gas is therefore considered LOW .
		Future land users	Unlikely	Moderate	Moderate to Low	The proposed development consists of constructing a new residential development. There is low potential for radon gas, therefore the risk is considered LOW .
		Construction Workers	Unlikely	Moderate	Moderate to Low	Construction workers may be exposed to ground gas/depleted oxygen conditions in confined spaces and excavations, however, the duration will be short term. The risk to construction workers from ground gas is considered LOW .
Asbestos Containing Material (ACM)		Current Site Users	Unlikely	Moderate	Low	The site is currently occupied by terraced dwellings. Asbestos may be present in small areas of the site, albeit unlikely. Asbestos is only harmful when disturbed. The risk to current site users is considered to be LOW .
		Adjacent land users	Unlikely	Moderate	Low	Residential properties predominantly surround the site with Sycamore Court nursing home located to the southeast of the site. Asbestos may be present in small areas of the site, albeit unlikely. Disturbance of soil during the construction phase may allow fibres to become airborne. Dust control measures (dampening down) should be implemented as part of good site working practices. Therefore, the risk is considered LOW .
		Future land users	Unlikely	Moderate	Low	The proposed development consists of demolishing a boundary wall and adding a pathed area. Some of the site will be surfaced in hardstanding. The risk is therefore considered LOW .
		Construction Workers	Unlikely	Moderate	Low	Construction workers may be exposed to potential asbestos in Made Ground soils. However, this potential area is small. 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 NPPF (2012) which requires that a site is suitable for its new use taking into account of ground conditions and land instability, including from natural hazards to former activities such as mining. A summary of the geotechnical considerations is provided below in Table 6.

Table 6: Summary of Geotechnical Hazards

Geohazards:	
Highly Compressible Ground	Negligible risk.
Collapseable Soils	Very low risk.
Swelling Clay	Very low risk.
Running Sand	Very low risk.
Ground Dissolution	Negligible risk.
Landslip	Very low risk.
Mining & Quarrying	No mining or quarrying is recorded as taking place on site. The site is located within a Coal Mining Reporting Area and a Development High Risk Area.
Geotechnical Design Considerations	
Site Clearance	Material will be necessary to remove following the demolishing of the existing boundary wall.
Trees	There is no onsite vegetation.
Existing Buildings/Obstructions	The site is accessible by Penzance Street, although terraced dwellings surround the site to the east and west.
Foundations	The depth and type of proposed foundations would depend on the ground conditions present on site. There are no artificial deposit records underlying the site and the underlying ground will be made up of superficial deposits of. There are various borehole records within the vicinity of the site, although none identify bedrock depth.

Geotechnical Design Considerations

Floor Slabs	Again, an intrusive geotechnical investigation is recommended prior to any construction works to discover the most suitable floor slab design for the on-site ground conditions.
Groundwater	Exact groundwater conditions are not known at this stage. For more detailed knowledge of the groundwater regime, an intrusive geotechnical investigation would be needed. However, it is recorded that the site is underlain by Secondary A and Secondary Undifferentiated aquifers. The highest risk of groundwater flooding on site is recorded as low.
Earthworks	It is unlikely significant earthworks will be necessary at the site lies on a flat area.
Slopes	The site has very little to no gradients and can be considered flat lying.
Retaining Walls	There are currently no retaining walls due to the flat nature of the site. It is unlikely retaining walls will be required due to the flat lying topography.
Chemically aggressive ground conditions	Chemically aggressive ground conditions are not expected at this site. However, an intrusive geotechnical investigation would be necessary to confirm this.

8.0 CONCLUSIONS & RECOMMENDATIONS

Conclusions

- 8.1 The site was historically vacant land, and by 1923 terrace house dwellings were constructed on site and have remained present since.
- 8.2 The proposed development of the site is the demolition of an existing boundary wall between the two properties and the construction of a pathed area.
- 8.3 There is limited potential for on-site sources of contamination.
- 8.4 The site is underlain by Devensian Till, comprising diamicton (Secondary Undifferentiated Aquifer). The solid geology comprises the Pennine Upper Coal Measures Formation (Secondary A Aquifer.)
- 8.5 The site is not located in a Radon Affected Area, as less than 1% of the properties are above the Action Level.
- 8.6 Given the potential contaminative land uses, the overall risk from soil contamination to end users and construction workers is concluded to be **LOW**.
- 8.7 The risk to controlled waters is concluded to be **LOW** based on the low risk groundwater vulnerability.
- 8.8 The risk from ground gas to end users and construction workers is considered to be **LOW**.
- 8.9 The site is not located within a Zone 2 or Zone 3 floodplain. The risk of groundwater flooding is **LOW**.

Recommendations

- 8.10 No further recommendations are necessary with respect to the environmental status of the site.

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 
Job No.: A4353/21	Site: Penzance Street, Manchester
Plate 1 Viewing west, showing site access via Penzance Street. Note overhead cables and scar in the road (potential water supply.)	Plate 2 Viewing south showing front face of the site, comprised of two terraced houses.
	
Date: 1st October 2021	Date: 1st October 2021
Plate 3 Viewing west showing unknown manholes located in alleyway on the southern boundary of the property.	Plate 4 Viewing east, showing Sycamore Court care home located on the eastern boundary of the site.
	
Date: 1st October 2021	Date: 1st October 2021

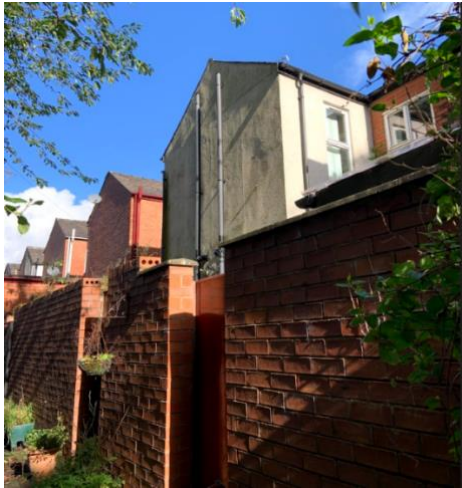
Earth Environmental & Geotechnical Ltd Tel: 0161 975 6088 Email: info@earthenvironmental.co.uk Web: www.earthenvironmental.co.uk	SITE PHOTOGRAPHS 
Job No.: A4353/21	Site: Penzance Street, Manchester
Plate 5 Viewing south, showing site access from Sandal Street, located east of the site. Note locked alleyway leading behind properties.	Plate 6 Viewing east, showing gasometer located within close proximity of the site.
	
Date: 1st October 2021	Date: 1st October 2021
Plate 7 Viewing west showing alleyway running behind site. Note the brick wall boundaries.	Plate 8 Viewing west, showing view down locked alleyway. Note overhead cables running into the properties.
	
Date: 1st October 2021	Date: 1st October 2021

Figure 10 Site Walkover Photo Locations



APPENDIX 3

SITE WALKOVER NOTES

WALK OVER SURVEY REPORT

Site: Penzance Street, Manchester

Date: 1st October 2021

Job No: A4353/21

Undertaken By: Bethany Garratty

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)		Urban town setting. Surrounding areas are predominantly residential. The site is currently occupied by terraced housing.
Evidence of Past Activities	Are there: Any relevant street names in area? Features or relics which indicate past history?	Yes/ No Yes /No	The site is located to the south of Penzance Street.
Geographic Setting	Description required for: Low lying flood plain/dry valley/rolling hills etc.		The site is located within flat lying land.
Ground Conditions	Is there any evidence of: Mining, Mine entries Subsidence Landslip/slope erosion Former investigation works	Yes /No 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?	Yes/No Yes/No	N/A Made ground is evident across the site.
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 is demarcated by a mixture of boundaries including stonewalls to the south of the site and terraced housing to the east and west of the site. The site is predominantly surrounded by residential properties.
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	Mature trees on southern boundary of the site.
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	100% of the site is covered in hardstanding. None visible on the site walkover.

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	Drain covers evident on Penzance Street, located north of the site.
	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	N/A
	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	N/A
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	None observed on site walkover.
Buildings	Is there any evidence of asbestos construction materials e.g. roofing, insulation materials.	Yes/ No	Asbestos may be present in building roofing, albeit unlikely.
	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	N/A
Process Air Emissions	Point Source: Are there any stacks / vents / cooling towers / abatement equipment?	Yes /No	N/A
	Fugitive Source: is there any stockpiled material / windblown dust / vapour process?	Yes /No	N/A
Storage of fuels & Chemicals	Are there any drums / containers (if yes, describe quantity, full /empty, stored on hard standing / soft landscaping, bunding)?	Yes /No	N/A
	Are there any above ground fuel tanks (if yes, describe locations, volumes, how many, bunding, used / disused, condition?)	Yes /No	N/A
	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	N/A
Accidents	In the event of a large spillage would runoff affect any vulnerable watercourse/culverts?	Yes /No	
	Are emergency procedures / equipment in place?	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	N/A
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		Tight residential access roads are not ideal to transport large, heavy machinery to the site. Many of the roads also follow a one-way system which may present transport issues. Overhead cables are also present running into the property at the south of the site. On made ground on the south of the site. Water supply from a suspected water pipe located on Penzance Street.
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	A gasometer is present within close proximity of the site.
Local Knowledge / Anecdotal Evidence			N/A
Site Dimensions	Describe shape of Site in plan and measure dimensions.		The maximum dimensions of the proposed site are 8.8m north to south and 14.5m west to east. The site occupies an area of approximately 0.01 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 2021 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.