



Earth Environmental
& Geotechnical

Coal Mining Risk Assessment

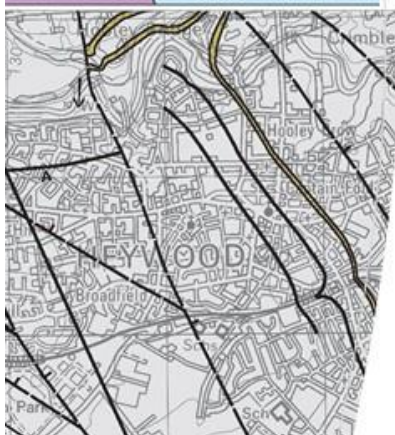
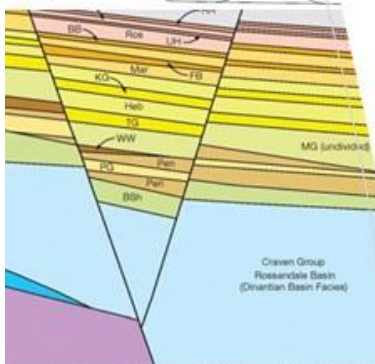
Earl Street

Heywood

March 2021

On behalf of

Tang and Associates Architecture
Ltd



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

Tel : 0161 975 6088

Email info@earthenvironmental.co.uk
www.earthenvironmental.co.uk



COAL MINING RISK ASSESSMENT
EARL STREET
HEYWOOD
FOR
TANG AND ASSOCIATES ARCHITECTURE LTD

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

www.earthenvironmental.co.uk

Tel 0161 9756088

Report No. A2504/18/V2

MARCH 2021

Report Title:	Earl Street, Heywood Coal Mining Risk Assessment	
Report Reference:	A2504/18/V2	
Client:	Tang and Associates Architecture Ltd	
Issue Date:	16th March 2021	
Drafted By:	J Sheridan and A Ellams	
Reviewed By:	A Czarnecki BSc (Hons) CGeol FGS	<i>A Czarnecki</i>
Authorised By:	A Czarnecki BSc (Hons) CGeol FGS	<i>A Czarnecki</i>

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	2
	Sources of Information	2
2.0	SITE LOCATION AND DESCRIPTION	3
3.0	ASSESSMENT OF DATA	5
	Geological Information	5
	Coal Authority Records	6
	Historical Records	7
4.0	COAL MINING RISK ASSESSMENT	8
	Scope of Coal Mining Risk Assessment.....	8
	Data Limitations	8
	Coal Mining Risks	8
	Proposed Mitigation Strategy	9

FIGURES

Figure 1	Proposed Development Plan
Figure 2	Site Location Plan
Figure 3	Site Photograph
Figure 4	Extract From Geological Map
Figure 5	Extract From Coal Authority Interactive Viewer

APPENDICES

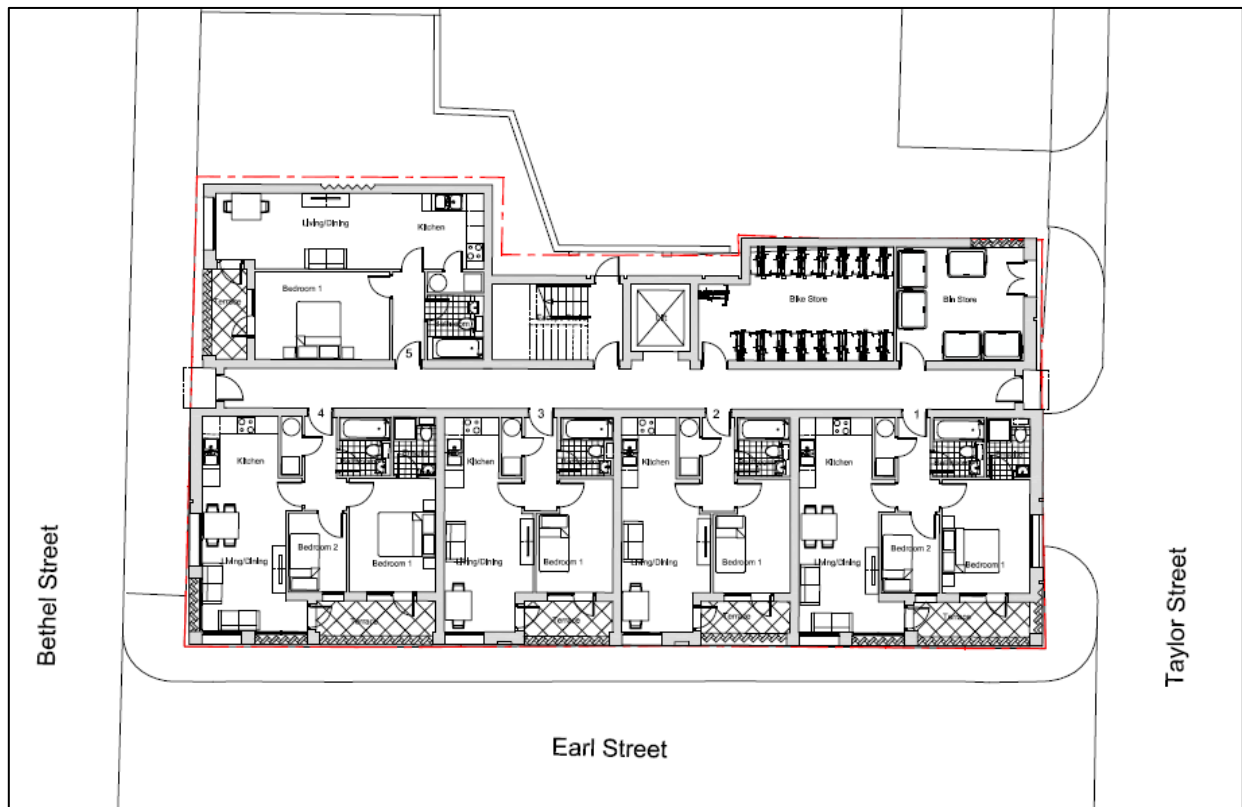
Appendix 1	Coal Authority Mining Report
Appendix 2	Report Limitations

1.0 INTRODUCTION

Appointment

- 1.1 Earth Environmental & Geotechnical Ltd was commissioned by Tang & Associates Architecture Ltd (the Client) to undertake a Coal Mining Risk Assessment for a new four-storey residential apartment block on Earl Street, Heywood.
- 1.2 A proposed development layout plan has been provided and an extract is shown below as Figure 1.
- 1.3 A Coal Mining Risk Assessment is required to support a planning application to Rochdale Borough Council.

Figure 1 Proposed Development Plan



Objective

- 1.4 The purpose of the Coal Mining Risk Assessment is to collate available geological, mining and historical data in order to assess the potential for the site to be affected by underground mining. This report has been drafted in accordance with the Coal Authority Coal Mining Risk Assessment Template, January 2011.

Sources of Information

- 1.5 The Coal Mining Risk Assessment comprises of a review of the following information sources:
- Online British Geological Survey maps and data.
 - Geological Survey of England & Wales, Sheet 85 Manchester, 1:50,000 scale, Bedrock edition of 2010.
 - Geological Survey of England & Wales, Sheet 85 Manchester, 1:50,000 scale, Bedrock and Superficial edition of 2011.
 - Coal Authority Consultants Mining Report, dated 18th May 2018.
 - Coal Authority Interactive Map Viewer.
 - British Geological Survey online borehole records.
 - Google Earth imagery.
 - Online Historical Ordnance Survey maps.
 - Rochdale Borough Council planning portal.
 - Site Investigations in Areas of Mining Subsidence, FG Bell, 1975.
 - The threat of abandoned mines on the stability of urban areas, Barry Clarke, IAEG2006 Paper Number 379, The Geological Society of London, 2006.
 - The collapse of shallow coal mine workings, Durham theses, Durham University, Garrard, 1981.

2.0 SITE LOCATION AND DESCRIPTION

- 2.1 The site is located within a mixed residential and commercial area approximately 4.5km southeast of Rochdale town centre. The site lies at an approximate elevation of 120mAOD.
- 2.2 The National Grid Reference for the centre of the site is SD 85472 10779 (X: 385472, Y: 410779) with the nearest postcode.
- 2.3 A location plan is shown below as Figure 2, with a photograph of the site shown overleaf as Figure 3.

Figure 2 Site Location Plan

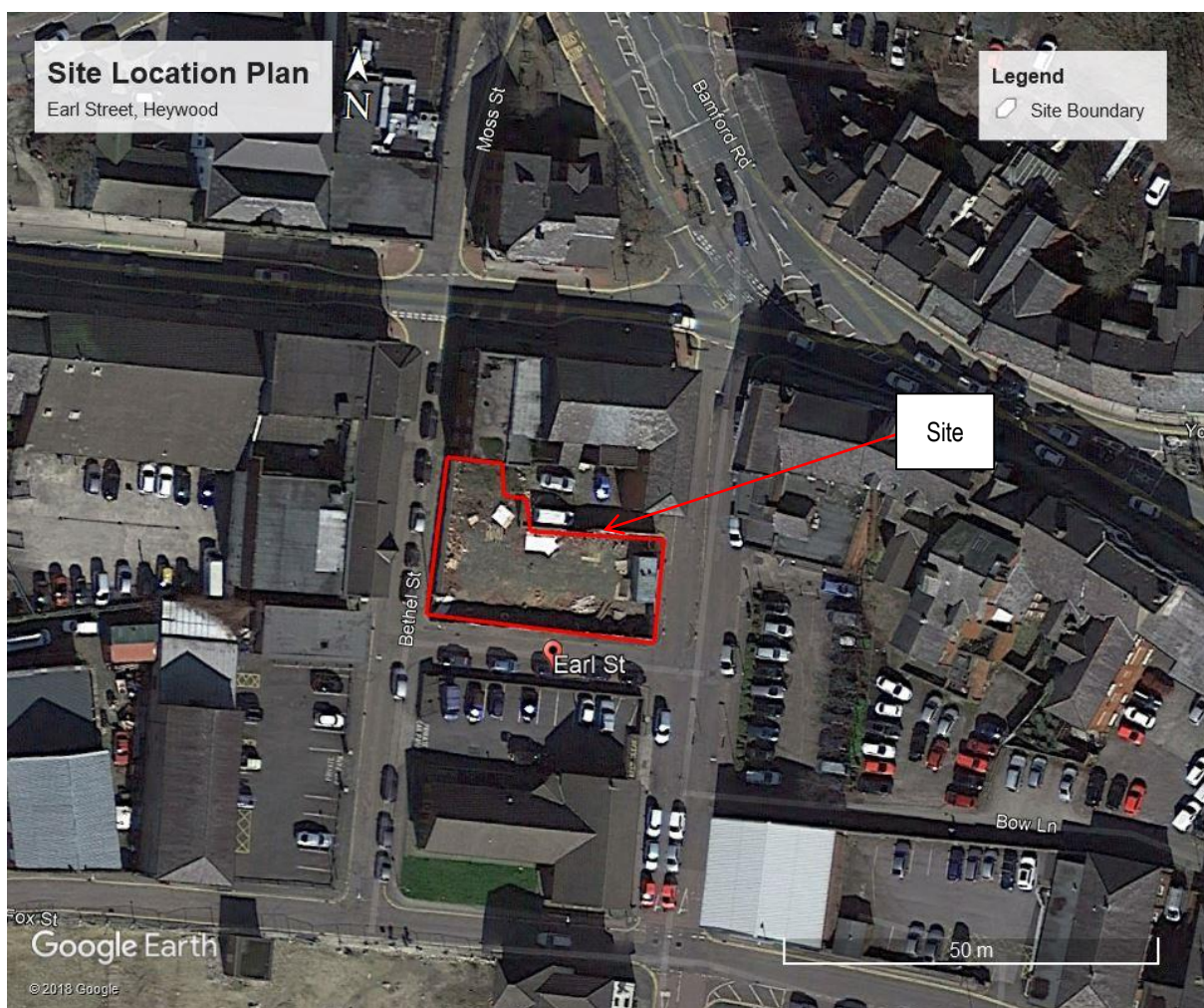


Figure 3 Site Photograph (looking northeast from Bethel St)

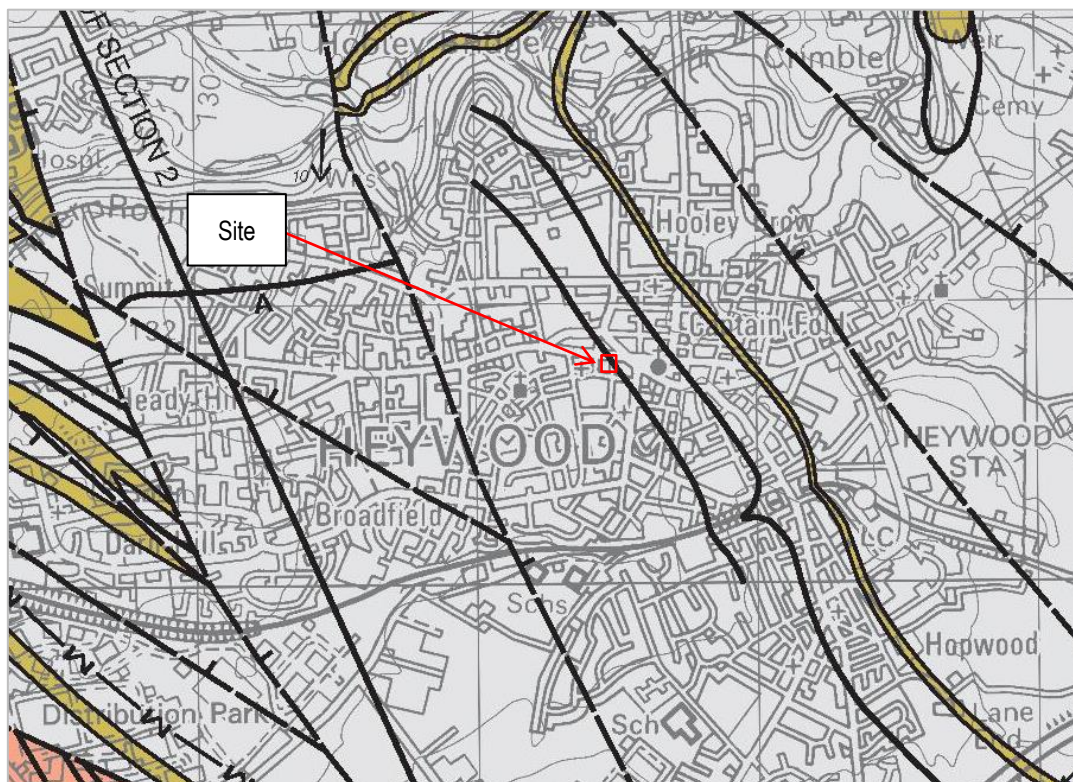


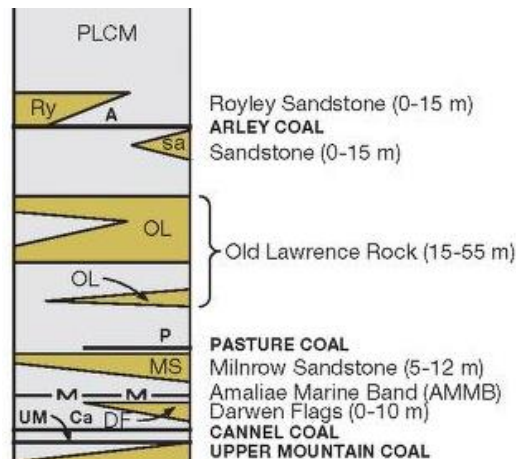
3.0 ASSESSMENT OF DATA

Geological Information

- 3.1 The geology of the site has been determined from acquisition of geological maps for the area and examination of Coal Authority records. The British Geological Survey (BGS) map and online maps shows superficial deposits consisting of glaciofluvial deposits to be present.
- 3.2 The superficial deposits are underlain by the Pennine Lower Coal Measures Formation consisting of mudstone, siltstone and sandstone.
- 3.3 Figure 4 (below) shows an extract from the 1:50,000 scale geological map, Sheet 85.

Figure 4 Extract From Geological Map



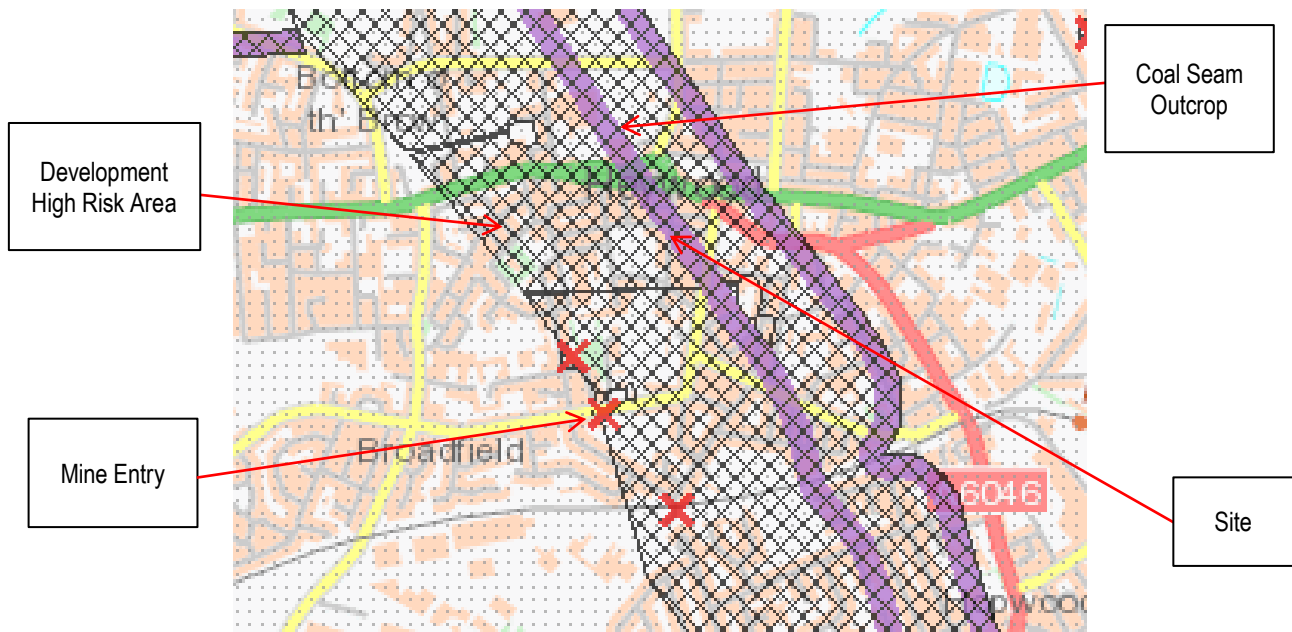


- 3.4 The surrounding geology is shown to be moderately faulted.
- 3.5 An unnamed coal seam appears to subcrop beneath the site. The dip direction of this seam is not shown, but is inferred to be to the south west.
- 3.6 Boreholes nearby indicate the shallow soils to comprise predominantly clay, sand and gravel.
- 3.7 There no deep boreholes in the nearby surrounding area that allow for further understanding of the coal mining regime or geology.

Coal Authority Records

- 3.8 A Coal Authority Mining Report has been acquired for the site and this reveals that there is no past underground mining recorded beneath the site.
- 3.9 However, unrecorded coal workings at shallow depth are stated as being probable.
- 3.10 The Coal Mining Report records an unnamed workable coal outcrop within the site boundary.
- 3.11 The Coal Authority Interactive Map Viewer (Figure 5) shows that the site lies within a Development High Risk Area due to shallow probable workings associated with the coal seam which outcrops on site.

Figure 5 Extract From Coal Authority Interactive Viewer



- 3.12 No damage notices, remediated sites, mine gas emissions, geological faults, or opencast sites are recorded.

Historical Records

- 3.13 Historical mapping dating from 1848 has been reviewed.
- 3.14 There is no evidence on any mining activity on any of the plans.

4.0 COAL MINING RISK ASSESSMENT

Scope of Coal Mining Risk Assessment

- 4.1 Objectives of the coal mining risk assessment are to provide a desk based assessment of available geological and mining information relating to the site (and wider area) and to use this information so as to identify risks present to the development from the legacy of mining.
- 4.2 As part of the risk assessment potential mitigation measures (if required) should be considered, including any necessary remedial works.
- 4.3 The outcome of the risk assessment should demonstrate to the Local Authority that the proposed development is, or can be made safe (and stable) to meet the requirements of the National Planning Policy Framework (NPPF).

Data Limitations

- 4.4 It should be appreciated that it did not become a legal requirement to deposit coal mining abandonment plans until the 1870's and that this requirement was not rigorously enforced for some time after. Many shallow coal seams were worked prior to the introduction of first edition Ordnance Survey Maps and information on these workings is often not available. Therefore, if coal seams were accessible then invariably they could have been worked by formal or informal means.
- 4.5 It is also possible that if unrecorded workings are present then unrecorded mine entries may be present.

Coal Mining Risks

- 4.6 The risks associated with coal mining are as follows:
- Collapse of relict workings beneath buildings causing damage to the building fabric and infrastructure.
 - Migration of mine gases from old mine works and mine entries resulting in build-up of flammable and asphyxiating gases in confined areas.
 - Consolidation of relict workings and overlying strata causing structural defects in building fabric and infrastructure.
 - Failure of mine entries causing loss of ground beneath building and external areas.
 - Spontaneous combustion of old mineworkings.

Summary of Risk

- 4.7 The site is located within a Development High Risk Area due to probable shallow mineworkings associated with a coal seam outcropping on the site.

Proposed Mitigation Strategy

- 4.8 It would be prudent to drill two boreholes within the proposed development area in order to determine whether there are any relict shallow mineworkings within influencing distance of the surface.
- 4.9 The drilling of the boreholes will require a permit from the Coal Authority, with the construction of a method statement and risk assessment.

APPENDIX 1

COAL AUTHORITY MINING REPORT

APPENDIX 2

REPORT LIMITATIONS

REPORT 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.