Groundsure
LOCATION INTELLIGENCE

Capita Property and Infrastructure

ACCOUNTS PAYABLE, PO Box 202, Faverdale Industrial Estate,
DARLINGTON, DL1 9HB

Groundsure Reference:	GS-5545541
Your Reference:	4500355959
Report Date	19 Oct 2018
Report Delivery Method:	Email - pdf

Geo Insight

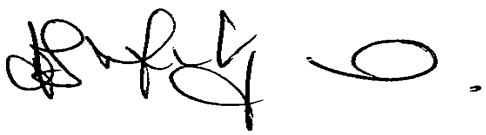
Address: Land North of Irlam Station,

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Geo Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,



Managing Director
Groundsure Limited

Enc.
Groundsure Geo Insight

Geo Insight

Address:	**Land North of Irlam Station,**
Date:	**19 Oct 2018**
Reference:	**GS-5545541**
Client:	**Capita Property and Infrastructure**

NW N NE

W E

SW S SE

Aerial Photograph Capture date:	11-Jun-2015
Grid Reference:	371062,393637
Site Size:	66.65ha

Groundsure
LOCATION INTELLIGENCE

Contents Page

Contents Page ... 3
Overview of Findings ... 5
1:10,000 Scale Availability ... 8
Availability of 1:10,000 Scale Geology Mapping ... 9
1 Geology (1:10,000 scale) ... 10
1.1 Artificial Ground map (1:10,000 scale) ... 10
1. Geology 1:10,000 scale ... 11
1.1 Artificial Ground ... 11
1.2 Superficial Deposits and Landslips map (1:10,000 scale) ... 12
1.2 Superficial Deposits and Landslips ... 13
1.2.1 Superficial Deposits/ Drift Geology ... 13
1.2.2 Landslip ... 13
1.3 Bedrock and linear features map (1:10,000 scale) ... 14
1.3 Bedrock and linear features ... 15
1.3.1 Bedrock/ Solid Geology ... 15
1.3.2 Linear features ... 15
2 Geology 1:50,000 Scale ... 16
2.1 Artificial Ground map ... 16
2. Geology 1:50,000 scale ... 17
2.1 Artificial Ground ... 17
2.1.1 Artificial/ Made Ground ... 17
2.1.2 Permeability of Artificial Ground ... 17
2.2 Superficial Deposits and Landslips map (1:50,000 scale) ... 18
2.2 Superficial Deposits and Landslips ... 19
2.2.1 Superficial Deposits/ Drift Geology ... 19
2.2.2 Permeability of Superficial Ground ... 19
2.2.3 Landslip ... 20
2.2.4 Landslip Permeability ... 20
2.3 Bedrock and linear features map (1:50,000 scale) ... 21
2.3 Bedrock, Solid Geology & linear features ... 22
2.3.1 Bedrock/Solid Geology ... 22
2.3.2 Permeability of Bedrock Ground ... 22
2.3.3 Linear features ... 22
3 Radon Data ... 23
3.1 Radon Affected Areas ... 23
3.2 Radon Protection ... 23
4 Ground Workings map ... 24
4 Ground Workings ... 25
4.1 Historical Surface Ground Working Features derived from Historical Mapping ... 25
4.2 Historical Underground Working Features derived from Historical Mapping ... 28
4.3 Current Ground Workings ... 28
5 Mining, Extraction & Natural Cavities ... 30
5.1 Historical Mining ... 30
5.2 Coal Mining ... 30
5.3 Johnson Poole and Bloomer ... 30
5.4 Non-Coal Mining ... 30
5.5 Non-Coal Mining Cavities ... 31
5.6 Natural Cavities ... 31
5.7 Brine Extraction ... 31
5.8 Gypsum Extraction ... 31
5.9 Tin Mining ... 31
5.10 Clay Mining ... 32
6 Natural Ground Subsidence ... 33
6.1 Shrink-Swell Clay map ... 33
6.2 Landslides map ... 34
6.3 Ground Dissolution of Soluble Rocks map ... 35
6.4 Compressible Deposits map ... 36
6.5 Collapsible Deposits map ... 37
6.6 Running Sand map ... 38

6 Natural Ground Subsidence..... 39
6.1 Shrink-Swell Clays..... 39
6.2 Landslides..... 39
6.3 Ground Dissolution of Soluble Rocks..... 40
6.4 Compressible Deposits..... 40
6.5 Collapsible Deposits..... 40
6.6 Running Sands..... 41
7 Borehole Records..... 43
8 Estimated Background Soil Chemistry..... 46
9 Railways and Tunnels map..... 47
9 Railways and Tunnels..... 48
9.1 Tunnels..... 48
9.2 Historical Railway and Tunnel Features..... 48
9.3 Historical Railways..... 52
9.4 Active Railways..... 52
9.5 Railway Projects..... 53

Overview of Findings

The Groundsure Geo Insight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 and 1:10,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Non-coal mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and Groundsure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Geology 1:10,000 Scale		
1.1 Artificial Ground	1.1 Is there any Artificial Ground/ Made Ground present beneath the study site at 1:10,000 scale?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site at 1:10,000 scale?*	Yes
	1.2.2 Are there any records of landslip within 500m of the study site boundary at 1:10,000 scale?	No
1.3 Bedrock, Solid Geology and linear features	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale?	Yes

Section 2: Geology 1:50,000 Scale		
2.1 Artificial Ground	2.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	2.1.2 Are there any records relating to permeability of artificial ground within the study site*boundary?	No
2.2 Superficial Geology and Landslips	2.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?*	Yes
	2.2.2 Are there any records of permeability of superficial ground within 500m of the study site?	Yes
	2.2.3 Are there any records of landslip within 500m of the study site boundary?	No
	2.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No

Section 2: Geology 1:50,000 Scale

2.3 Bedrock, Solid Geology and linear features	2.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	2.3.2 Are there any records relating to permeability of bedrock ground within the study site boundary?	Yes
	2.3.3 Are there any records of linear features within 500m of the study site boundary?	Yes

Section 3: Radon

3. Radon	3.1Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.
	3.2Radon Protection	No radon protective measures are necessary.

Section 4: Ground Workings	On-site	0-50m	51-250	251-500	501-1000
4.1 Historical Surface Ground Working Features from Small Scale Mapping	23	12	41	Not Searched	Not Searched
4.2 Historical Underground Workings from Small Scale Mapping	0	0	0	0	0
4.3 Current Ground Workings	0	0	1	0	3

Section 5: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
5.1 Historical Mining	0	0	0	0	0
5.2 Coal Mining	1	0	0	0	0
5.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
5.4 Non-Coal Mining*	0	0	0	0	0
5.5 Non–Coal Mining Cavities	0	0	0	0	0
5.5 Natural Cavities	0	0	0	0	0

Section 5: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
5.6 Brine Extraction	0	0	0	0	0
5.7 Gypsum Extraction	0	0	0	0	0
5.8 Tin Mining	0	0	0	0	0
5.9 Clay Mining	0	0	0	0	0

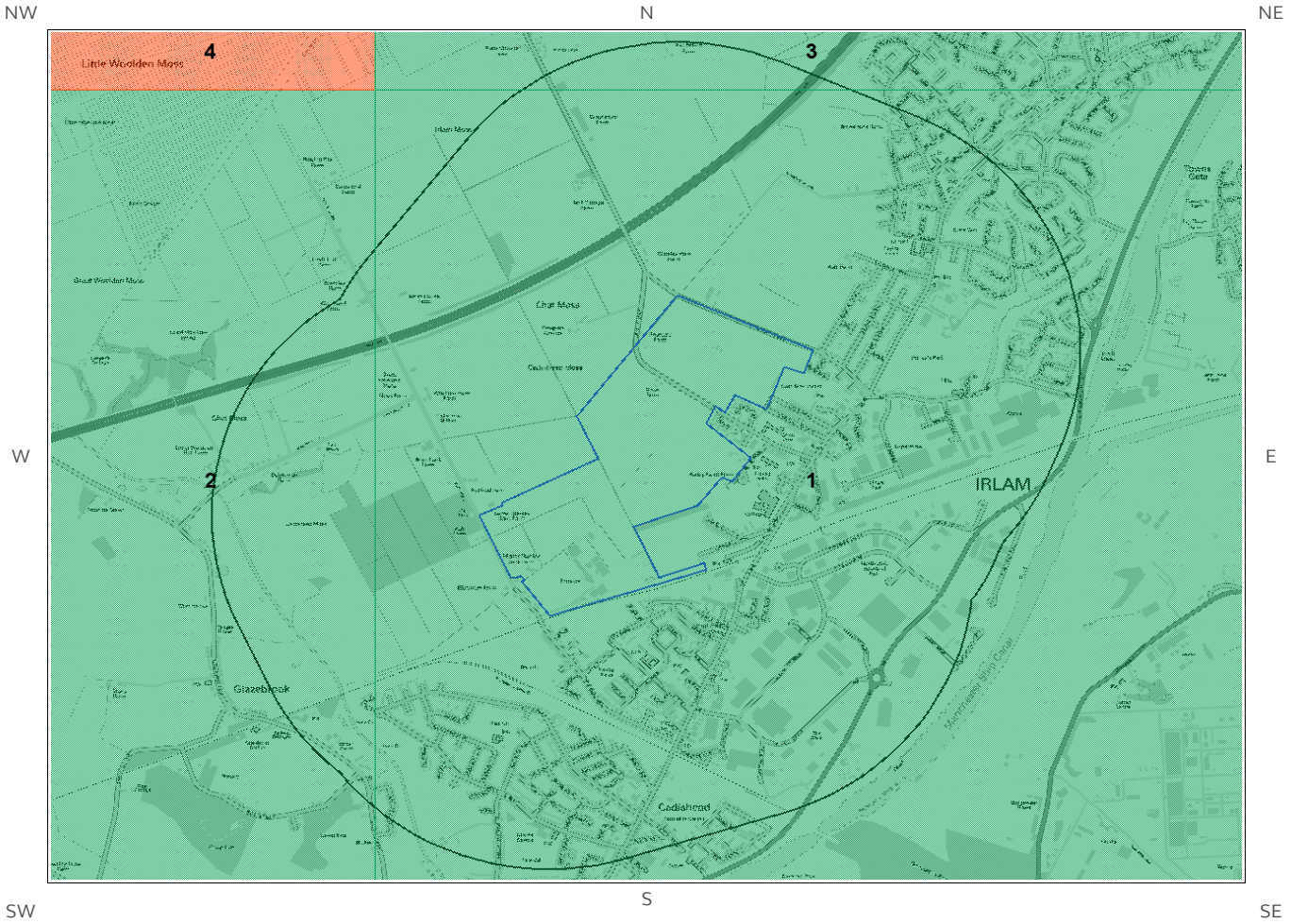
Section 6: Natural Ground Subsidence	On-site
6.1 Shrink-Swell Clay	Very Low
6.2 Landslides	Very Low
6.3 Ground Dissolution of Soluble Rocks	Negligible
6.4 Compressible Deposits	High
6.5 Collapsible Deposits	Very Low
6.5 Running Sand	Very Low

Section 7: Borehole Records	On-site	0-50m	51-250
7 BGS Recorded Boreholes	3	4	26

Section 8: Estimated Background Soil Chemistry	On-site	0-50m	51-250
8 Records of Background Soil Chemistry	15	9	0

Section 9: Railways and Tunnels	On-site	0-50m	51-250	250-500
9.1 Tunnels	0	0	0	Not Searched
9.2 Historical Railway and Tunnel Features	39	20	29	Not Searched
9.3 Historical Railways	0	0	1	Not Searched
9.4 Active Railways	4	4	10	Not Searched
9.5 Railway Projects	0	0	0	0

1:10,000 Scale Availability



1_10,000 Availability Legend

Site Outline

Full Coverage

Partial Coverage

No Coverage

50
250
Search Buffers (m)

Availability of 1:10,000 Scale Geology Mapping

The following information represents the availability of the key components of the 1:10,000 scale geological data.

ID	Distance	Artificial Coverage	Superficial Coverage	Bedrock Coverage	Mass Movement Coverage
1	0.0	Some deposits are mapped	Full	Full	No coverage
2	389.0	Some deposits are mapped	Full	Full	No coverage
3	814.0	Some deposits are mapped	Full	Full	No coverage
4	1394.0	Some deposits are mapped	Partial	Full	No coverage

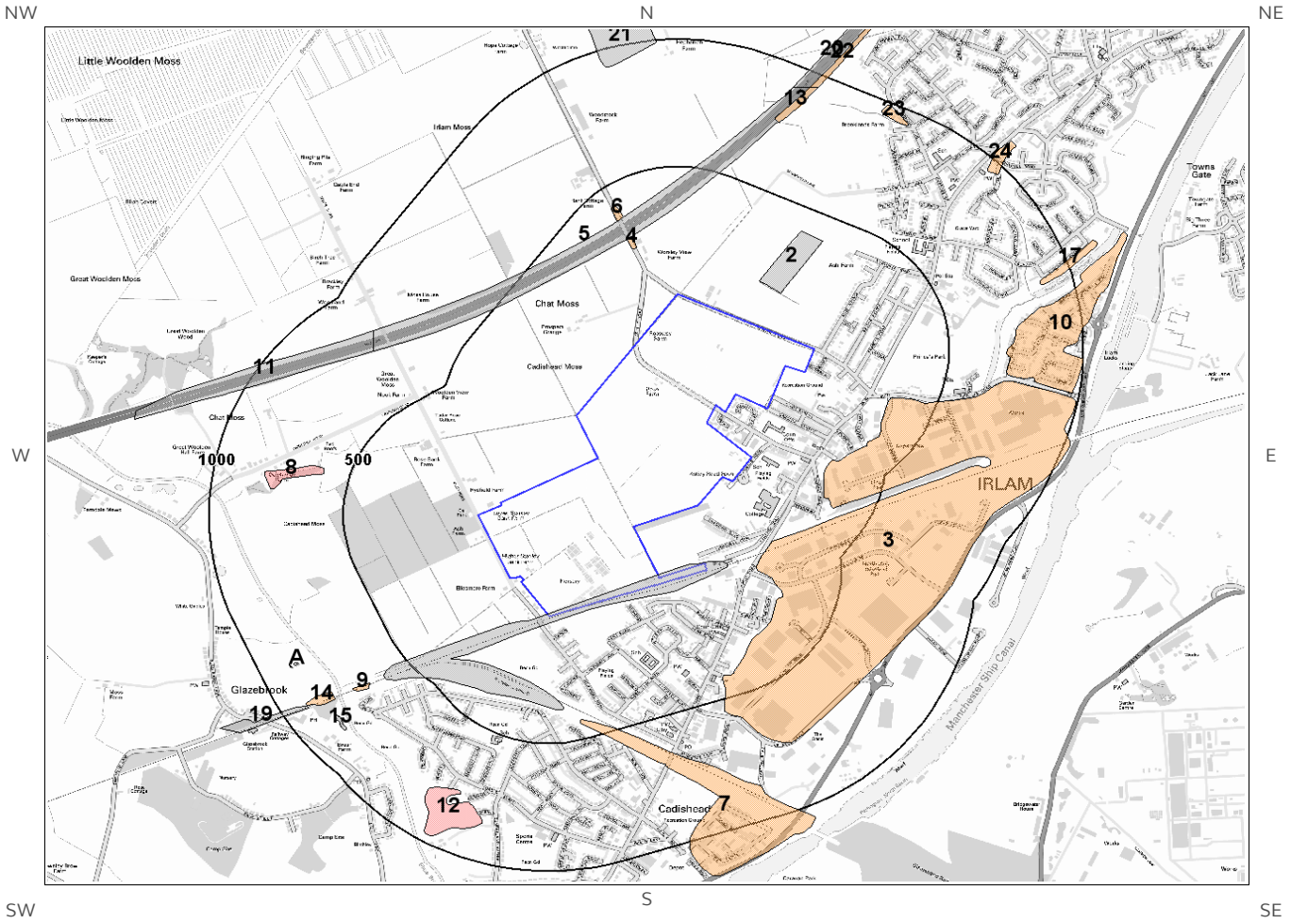
Guidance: The 1:10,000 scale geological interpretation is the most detailed generally available from BGS and is the scale at which most geological surveying is carried out in the field. The database is presented as four types of geology (artificial, mass movement, superficial and bedrock), although not all themes are mapped or available on every map sheet. Therefore a coverage layer showing the availability of the four themes is presented above.

The definitions of coverage are as follows:

Geology	Full Coverage	Partial Coverage	No Coverage
Bedrock	The whole tile has been mapped	Some but not all the tile has been mapped	No coverage
Superficial	The whole tile has been mapped	Some but not all of the tile has been mapped	No coverage
Artificial	Some deposits are mapped on this tile	-	No deposits are mapped
Mass Movement	Some deposits are mapped on this tile	-	No coverage

1 Geology (1:10,000 scale).

1.1 Artificial Ground map (1:10,000 scale)



Artificial Ground Legend

Site Outline

500
1000
Search Buffers (m)

Made Ground (undivided)

Worked Ground (undivided)

Infilled Ground

Disturbed Ground (undivided)

Landscaped Ground (undivided)

Reclaimed Ground

1. Geology 1:10,000 scale

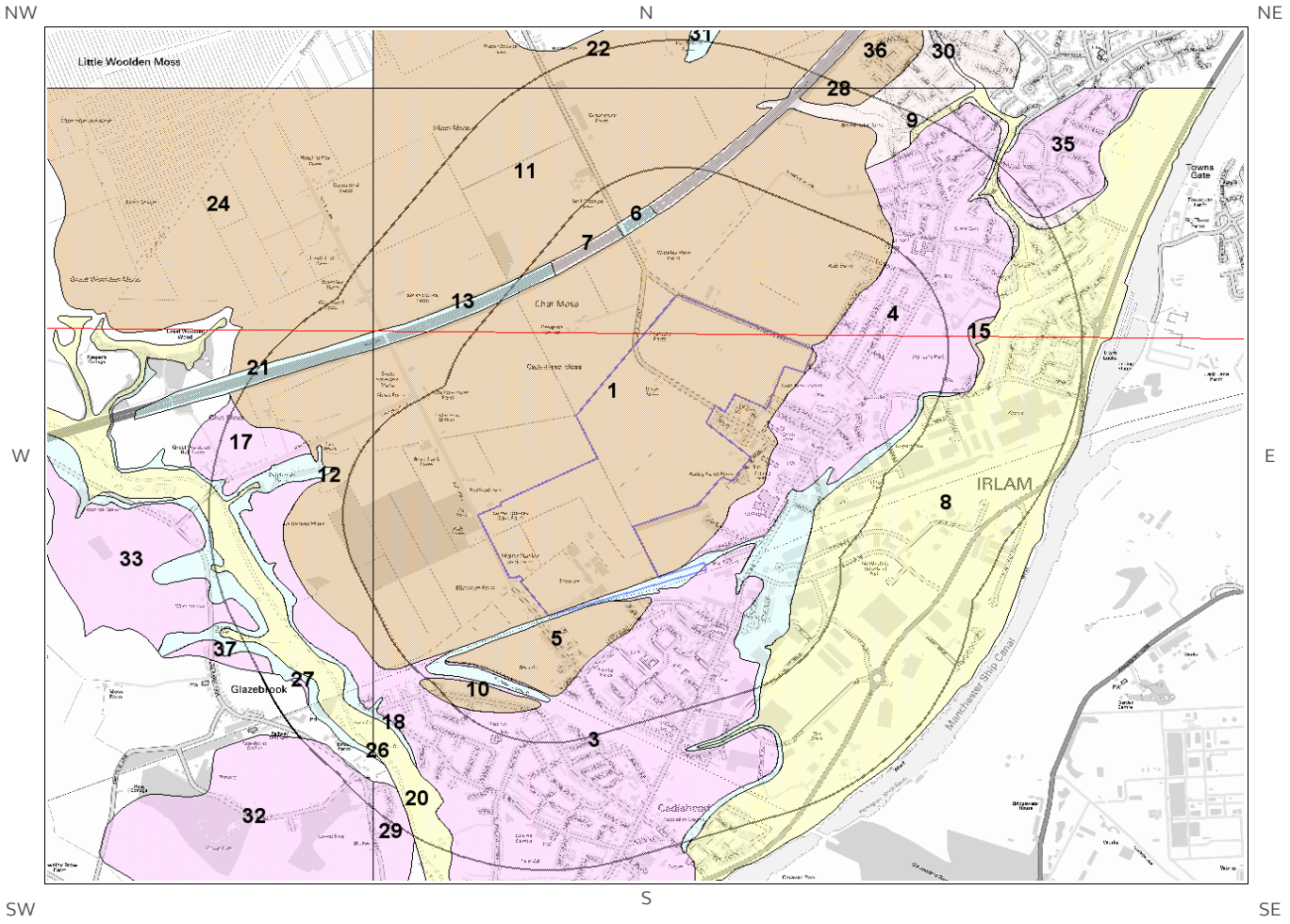
1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

Are there any records of Artificial/ Made Ground within 500m of the study site boundary at 1:10,000 scale? Yes

ID	Distance	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	WGR-VOID	Worked Ground (Undivided)	Void
2	152.0	NE	WGR-VOID	Worked Ground (Undivided)	Void
3	184.0	E	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
4	240.0	NW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
5	285.0	NW	WGR-VOID	Worked Ground (Undivided)	Void
6	365.0	NW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
7	424.0	S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

1.2 Superficial Deposits and Landslips map (1:10,000 scale)



Artificial Ground Legend

Site Outline

500
1000
Search Buffers (m)

1.2 Superficial Deposits and Landslips

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary at 1:10,000 scale? Yes

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	PEAT-P	Peat - Peat	Peat
2	0.0	On Site	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton
3	0.0	On Site	GFSDD-XSV	Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel	Sand And Gravel
4	0.0	On Site	GFSDD-XSV	Glaciofluvial Sheet Deposits, Devensian - Sand And Gravel	Sand And Gravel
5	5.0	S	PEAT-P	Peat - Peat	Peat
6	300.0	NW	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton
7	303.0	NW	GLLDD-C	Glaciolacustrine Deposits, Devensian - Clay	Clay
8	307.0	SE	ALV-XCZSV	Alluvium - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel
9	323.0	N	GLLDD-C	Glaciolacustrine Deposits, Devensian - Clay	Clay
10	332.0	S	PEAT-P	Peat - Peat	Peat
11	356.0	NW	PEAT-P	Peat - Peat	Peat
12	389.0	W	PEAT-P	Peat - Peat	Peat
13	403.0	NW	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton

1.2.2 Landslip

Are there any records of Landslip within 500m of the study site boundary at 1:10,000 scale?

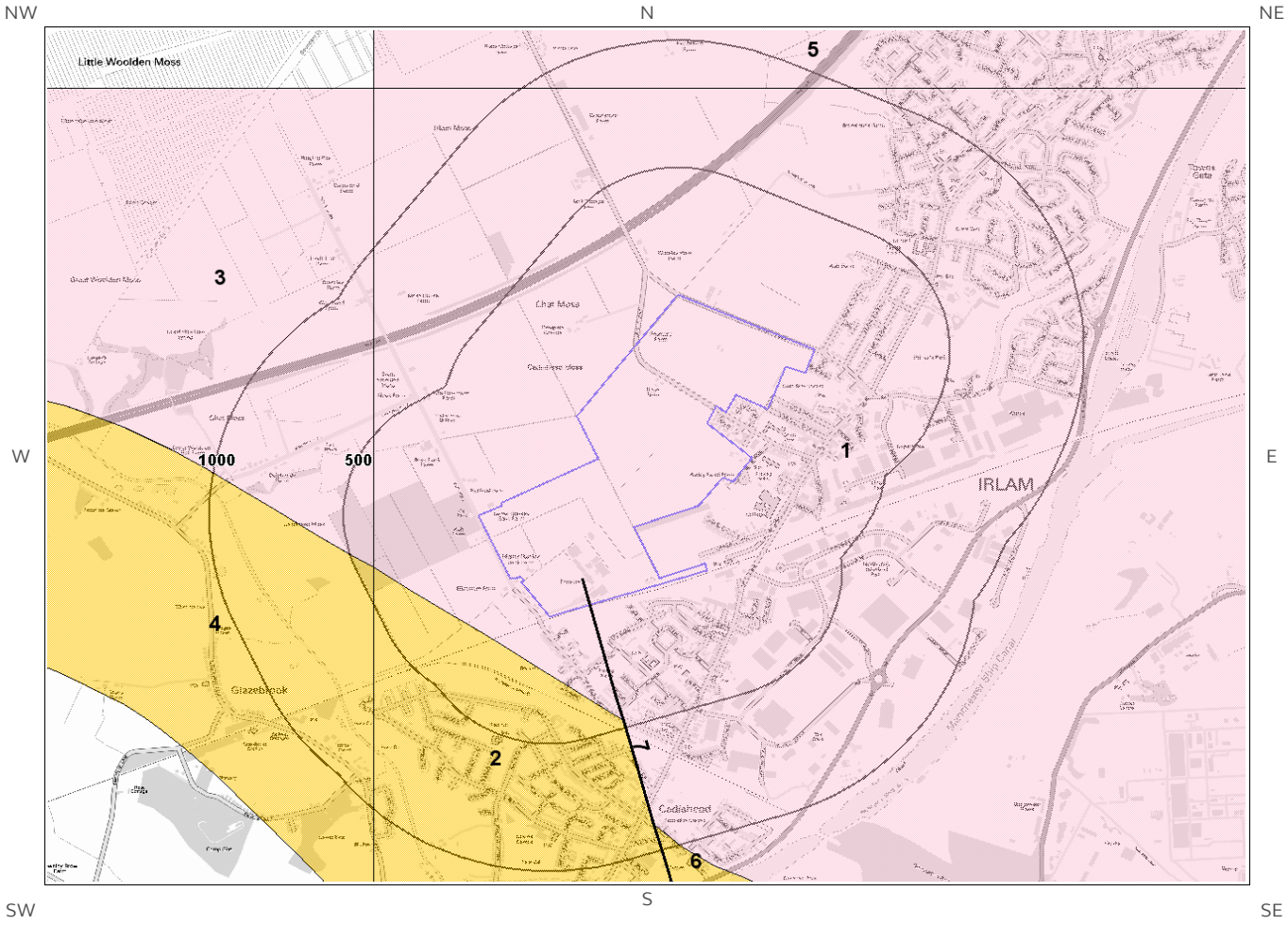
No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:10,000 scale

This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.3 Bedrock and linear features map (1:10,000 scale)



Bedrock and linear features Legend

Site Outline

500
1000
Search Buffers (m)

1.3 Bedrock and linear features

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

1.3.1 Bedrock/ Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary at 1:10,000 scale.

ID	Distance (m)	Direction	LEX Code	Description	Rock Age
1	0.0	On Site	WLSF-SDST	Wilmslow Sandstone Formation - Sandstone	Early Triassic Epoch
2	190.0	SW	HEY-SDST	Helsby Sandstone Formation - Sandstone	Anisian Age - Early Triassic Epoch
3	389.0	W	WLSF-SDST	Wilmslow Sandstone Formation - Sandstone	Early Triassic Epoch
4	438.0	SW	HEY-SDST	Helsby Sandstone Formation - Sandstone	Anisian Age - Early Triassic Epoch

1.3.2 Linear features

Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale? Yes

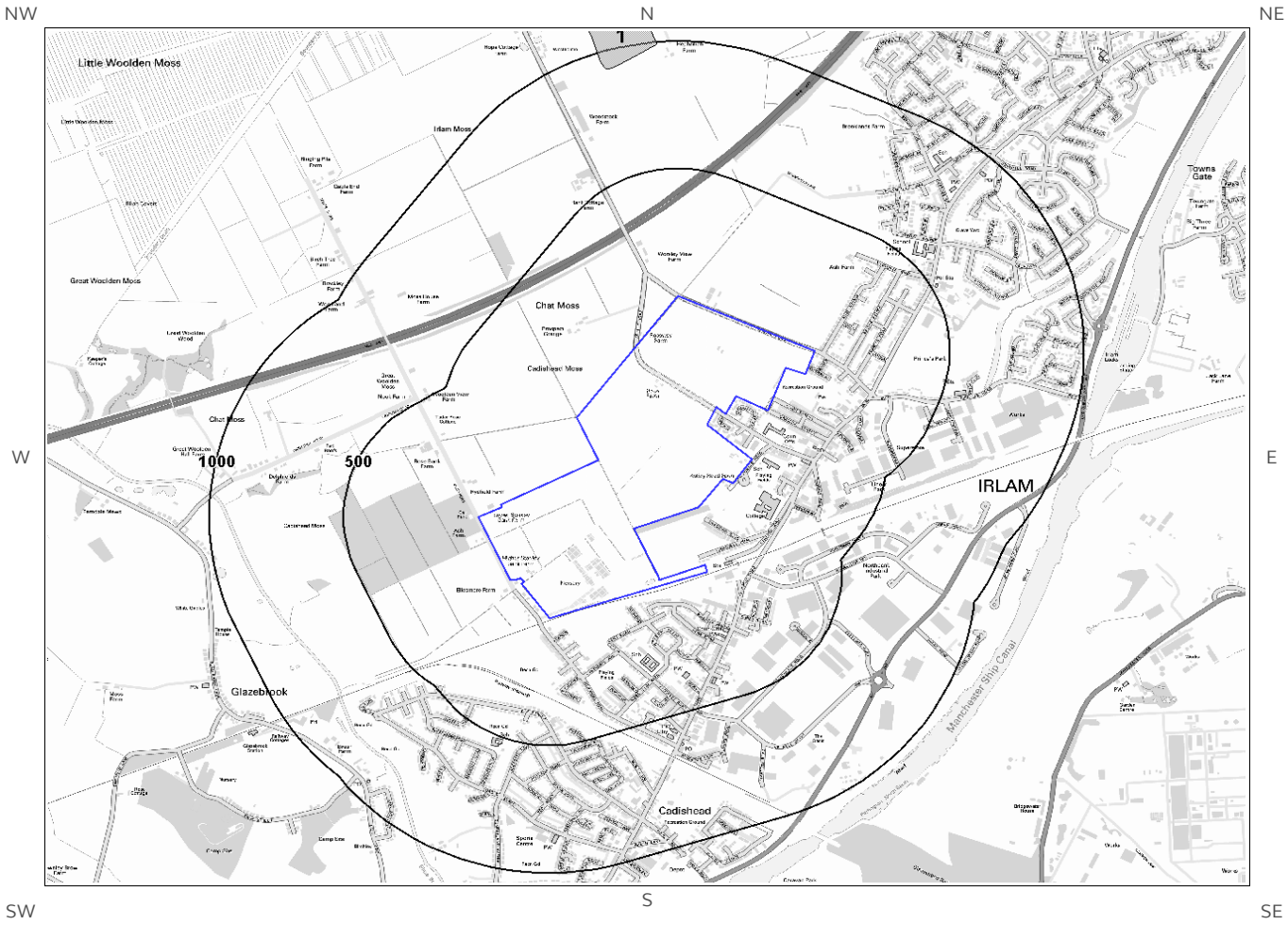
ID	Distance (m)	Direction	Category Description	Feature Description
7	0.0	On Site	FAULT	Normal fault, inferred; crossmarks on downthrow side

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of great Britain at 1:10,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2 Geology 1:50,000 Scale

2.1 Artificial Ground map



Site Outline

500
1000
Search Buffers (m)

Made Ground (undivided)

Disturbed Ground (undivided)

Worked Ground (undivided)

Landscaped Ground (undivided)

Infilled Ground

Reclaimed Ground

2. Geology 1:50,000 scale

2.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 098

2.1.1 Artificial/ Made Ground

Are there any records of Artificial/ Made Ground within 500m of the study site boundary? No

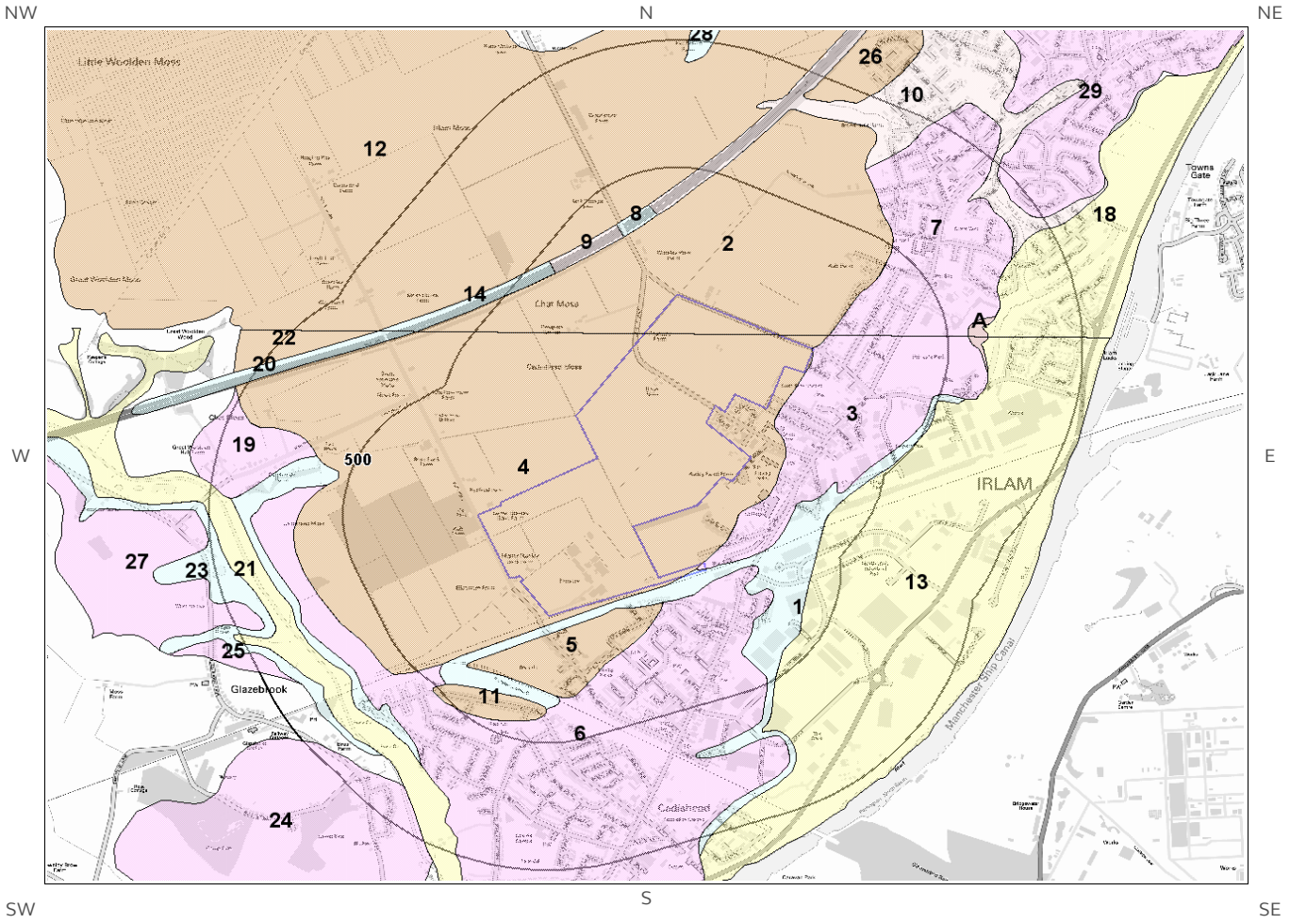
Database searched and no data found.

2.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site boundary? No

Database searched and no data found.

2.2 Superficial Deposits and Landslips map (1:50,000 scale)



Site Outline

500
1000
Search Buffers (m)

2.2 Superficial Deposits and Landslips

2.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? Yes

ID	Distance	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
2	0.0	On Site	PEAT-P	PEAT	PEAT
3	0.0	On Site	GFSDD-XSV	GLACIOFLUVIAL SHEET DEPOSITS, DEVENSIAN	SAND AND GRAVEL
4	0.0	On Site	PEAT-P	PEAT	PEAT
5	43.0	S	PEAT-P	PEAT	PEAT
6	46.0	SE	GFSDD-XSV	GLACIOFLUVIAL SHEET DEPOSITS, DEVENSIAN	SAND AND GRAVEL
7	79.0	NE	GFSDD-XSV	GLACIOFLUVIAL SHEET DEPOSITS, DEVENSIAN	SAND AND GRAVEL
8	300.0	NW	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
9	303.0	NW	GLLDD-XCZ	GLACIOLACUSTRINE DEPOSITS, DEVENSIAN	CLAY AND SILT
10	322.0	N	GLLDD-XCZ	GLACIOLACUSTRINE DEPOSITS, DEVENSIAN	CLAY AND SILT
11	338.0	S	PEAT-P	PEAT	PEAT
12	356.0	NW	PEAT-P	PEAT	PEAT
13	366.0	SE	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
14	409.0	NW	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON

2.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Mixed	Low	Very Low
0.0	On Site	Intergranular	Very High	High
0.0	On Site	Mixed	High	Low
43.0	S	Mixed	Low	Very Low
46.0	SE	Intergranular	Very High	High

2.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

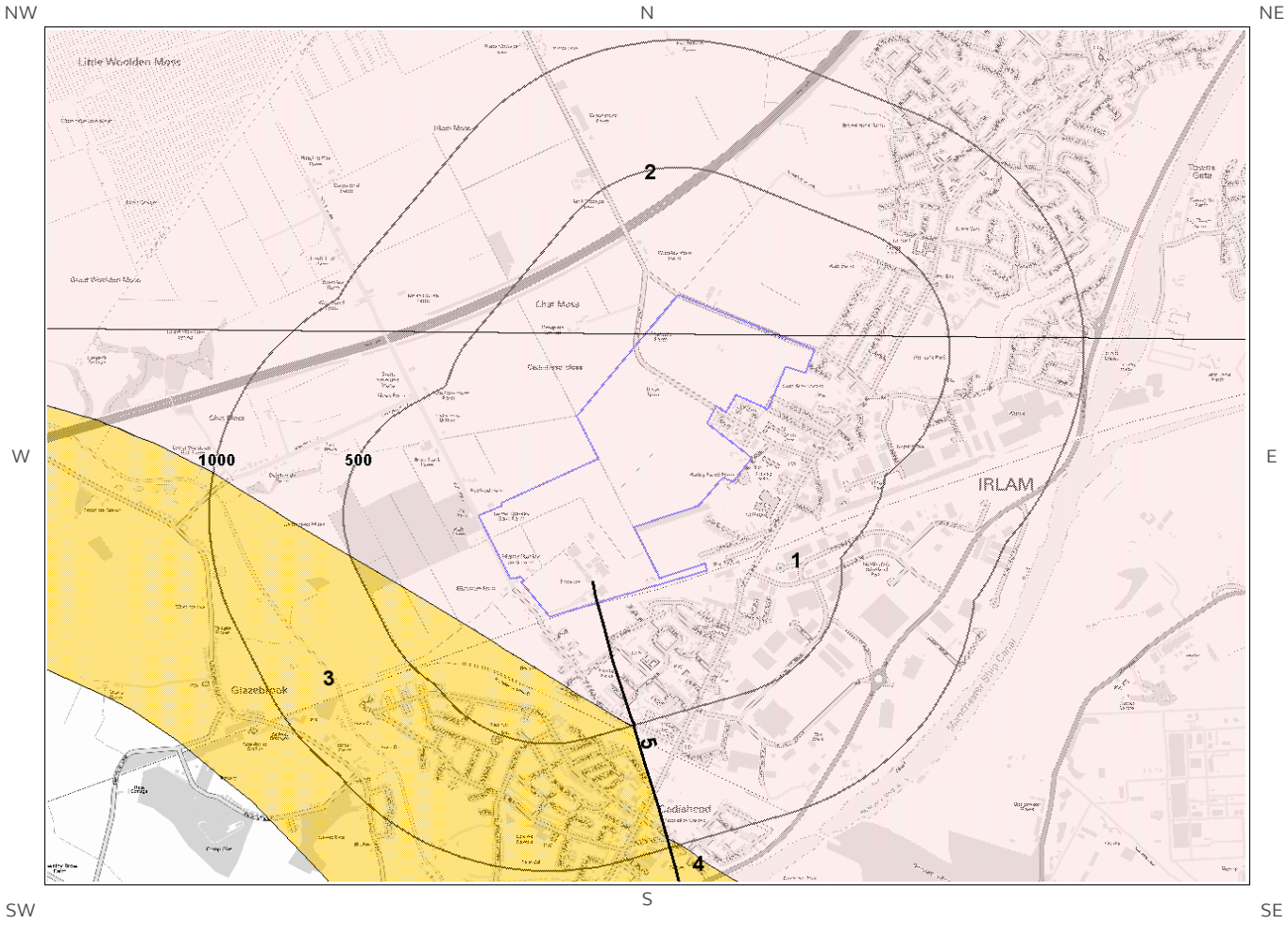
This Geology shows the main components as discrete layers, there are: Artificial/ Made Ground, Superficial/ Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site boundary? No

Database searched and no data found.

2.3 Bedrock and linear features map (1:50,000 scale)



Site Outline

500
1000
Search Buffers (m)

2.3 Bedrock, Solid Geology & linear features

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 098

2.3.1 Bedrock/Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary:

ID	Distance	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	WLSF-SDST	WILMSLOW SANDSTONE FORMATION - SANDSTONE	-
2	0.0	On Site	WLSF-SDST	WILMSLOW SANDSTONE FORMATION - SANDSTONE	-
3	197.0	SW	HEY-PESST	HELSBY SANDSTONE FORMATION - SANDSTONE, PEBBLY (GRAVELLY)	ANISIAN

2.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site boundary? Yes

Distance	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Intergranular	High	High

2.3.3 Linear features

Are there any records of linear features within 500m of the study site boundary? Yes

ID	Distance	Direction	Category Description	Feature Description
5	0.0	On Site	FAULT	Fault, inferred

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nation wide coverage.

3 Radon Data

3.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

3.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

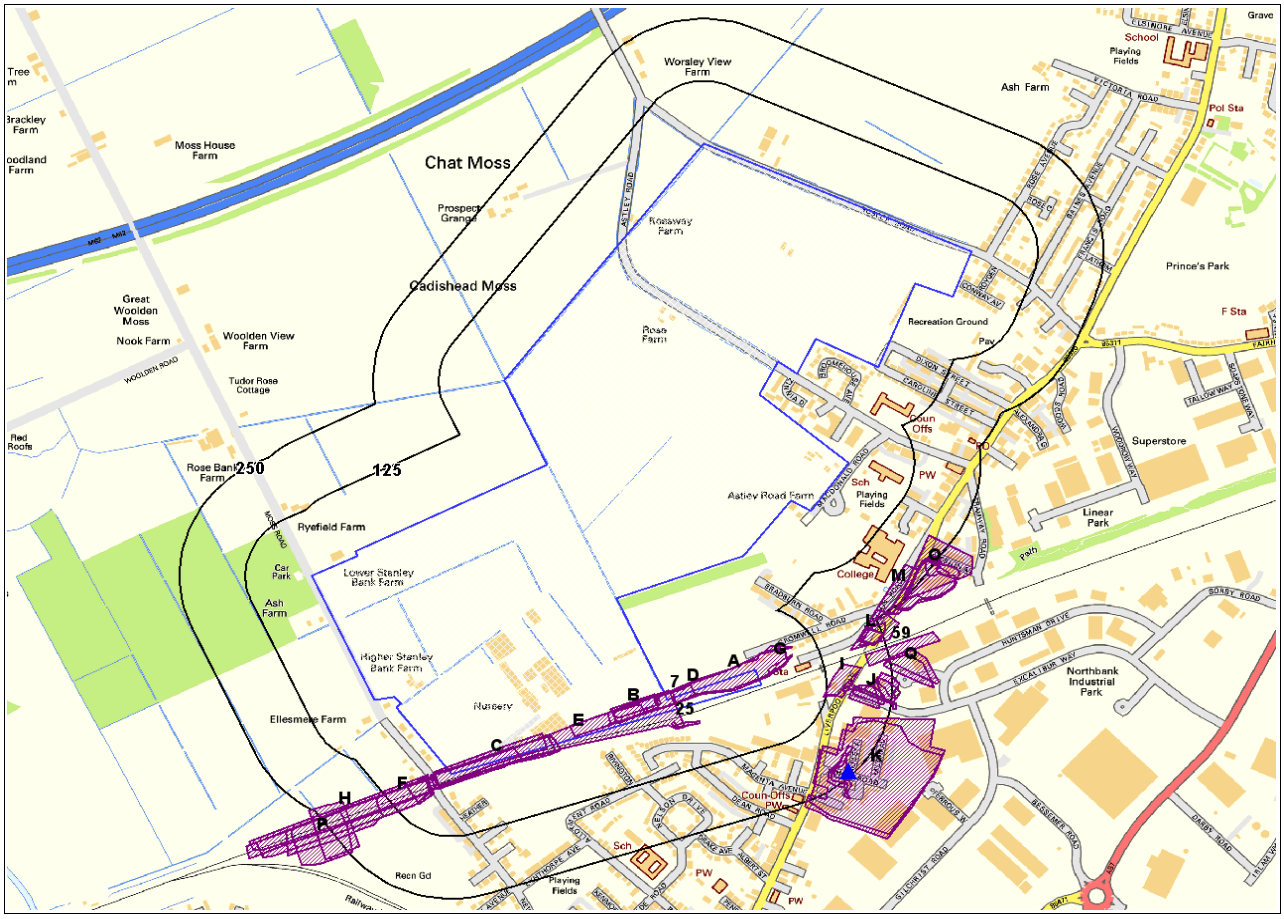
---

4 Ground Workings map

NW N NE

W E

SW S SE



Ground Workings Legend

Site Outline

125
250
Search Buffers (m)

Historic Surface Ground Workings

Historic Underground Workings

Current Ground Workings

4 Ground Workings

4.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on Groundsure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Use	Date
1A	0.0	On Site	371182 393117	Cuttings	1894
2A	0.0	On Site	371182 393117	Cuttings	1904
3D	0.0	On Site	371086 393084	Cuttings	1926
4E	0.0	On Site	370714 392939	Cuttings	1894
5B	0.0	On Site	370999 393051	Cuttings	1904
6C	0.0	On Site	370735 392948	Cuttings	1904
7	0.0	On Site	371078 393076	Cuttings	1949
8B	0.0	On Site	370988 393043	Cuttings	1949
9C	0.0	On Site	370738 392945	Cuttings	1949
10C	0.0	On Site	370735 392948	Cuttings	1926
11C	0.0	On Site	370729 392951	Cuttings	1908
12C	0.0	On Site	370729 392951	Cuttings	1949
13B	0.0	On Site	371005 393059	Cuttings	1949
14D	0.0	On Site	371086 393084	Cuttings	1938
15A	0.0	On Site	371182 393117	Cuttings	1894
16E	0.0	On Site	370714 392939	Cuttings	1894
17F	0.0	On Site	370596 392880	Cuttings	1938
18F	0.0	On Site	370535 392866	Cuttings	1949
19C	0.0	On Site	370738 392945	Cuttings	1949
20B	0.0	On Site	370988 393043	Cuttings	1949
21D	0.0	On Site	371078 393076	Cuttings	1949

ID	Distance (m)	Direction	NGR	Use	Date
22F	0.0	On Site	370596 392880	Cuttings	1938
23D	0.0	On Site	371086 393084	Cuttings	1938
24G	22.0	E	371279 393144	Unspecified Ground Workings	1949
25	23.0	S	371099 393022	Unspecified Ground Workings	1949
26G	34.0	N	371261 393171	Unspecified Ground Workings	1949
27H	35.0	SW	370444 392845	Cuttings	1908
28H	42.0	SW	370440 392835	Cuttings	1894
29H	42.0	SW	370440 392835	Cuttings	1904
30H	42.0	SW	370440 392835	Cuttings	1894
31F	42.0	SW	370595 392887	Cuttings	1995
32F	42.0	SW	370595 392887	Cuttings	1979
33H	46.0	SW	370477 392834	Cuttings	1926
34F	46.0	SW	370562 392874	Cuttings	1949
35F	46.0	SW	370562 392874	Cuttings	1949
36I	122.0	E	371397 393110	Cuttings	1904
37I	124.0	E	371397 393110	Cuttings	1894
38I	124.0	E	371397 393110	Cuttings	1894
39J	157.0	E	371465 393076	Unspecified Ground Workings	1949
40J	157.0	E	371465 393076	Unspecified Ground Workings	1949
41J	169.0	E	371438 393076	Unspecified Pit	1904
42K	170.0	SE	371462 392918	Brick Works	1908
43K	172.0	SE	371455 392916	Brick Works	1904
44J	176.0	E	371447 393085	Unspecified Pit	1904
45L	183.0	E	371446 393198	Cuttings	1904
46H	196.0	SW	370432 392809	Cuttings	1995
47H	196.0	SW	370432 392809	Cuttings	1979
48L	202.0	E	371467 393217	Cuttings	1995
49L	202.0	E	371467 393217	Cuttings	1979
50L	204.0	E	371451 393197	Cuttings	1926

ID	Distance (m)	Direction	NGR	Use	Date
51L	204.0	E	371451 393197	Cuttings	1938
52L	204.0	E	371451 393197	Cuttings	1938
53L	205.0	E	371446 393198	Cuttings	1894
54L	205.0	E	371446 393198	Cuttings	1894
55N	208.0	SE	371380 392926	Unspecified Ground Workings	1908
56M	208.0	SE	371495 393284	Cuttings	1894
57M	208.0	SE	371495 393284	Cuttings	1894
58M	208.0	SE	371495 393284	Cuttings	1904
59	208.0	E	371512 393173	Unspecified Pit	1904
60N	209.0	SE	371387 392930	Unspecified Pit	1904
61O	210.0	SE	371563 393321	Brick Field	1894
62O	210.0	SE	371563 393321	Brick Field	1894
63P	211.0	SW	370409 392794	Cuttings	1949
64P	211.0	SW	370409 392794	Cuttings	1949
65J	215.0	E	371478 393090	Pond	1904
66J	222.0	E	371485 393099	Pond	1904
67O	229.0	SE	371555 393297	Unspecified Pit	1926
68O	229.0	SE	371555 393297	Unspecified Pit	1938
69O	229.0	SE	371555 393297	Unspecified Pit	1938
70O	231.0	SE	371556 393304	Unspecified Pit	1949
71O	232.0	SE	371538 393317	Unspecified Ground Workings	1949
72O	232.0	SE	371538 393317	Unspecified Ground Workings	1949
73O	233.0	SE	371555 393303	Gravel Pit	1949
74O	235.0	SE	371577 393334	Unspecified Pit	1904
75Q	236.0	E	371523 393128	Unspecified Pit	1904
76Q	245.0	E	371531 393136	Unspecified Pit	1904

4.2 Historical Underground Working Features derived from Historical Mapping

This data is derived from the Groundsure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? No

Database searched and no data found.

4.3 Current Ground Workings

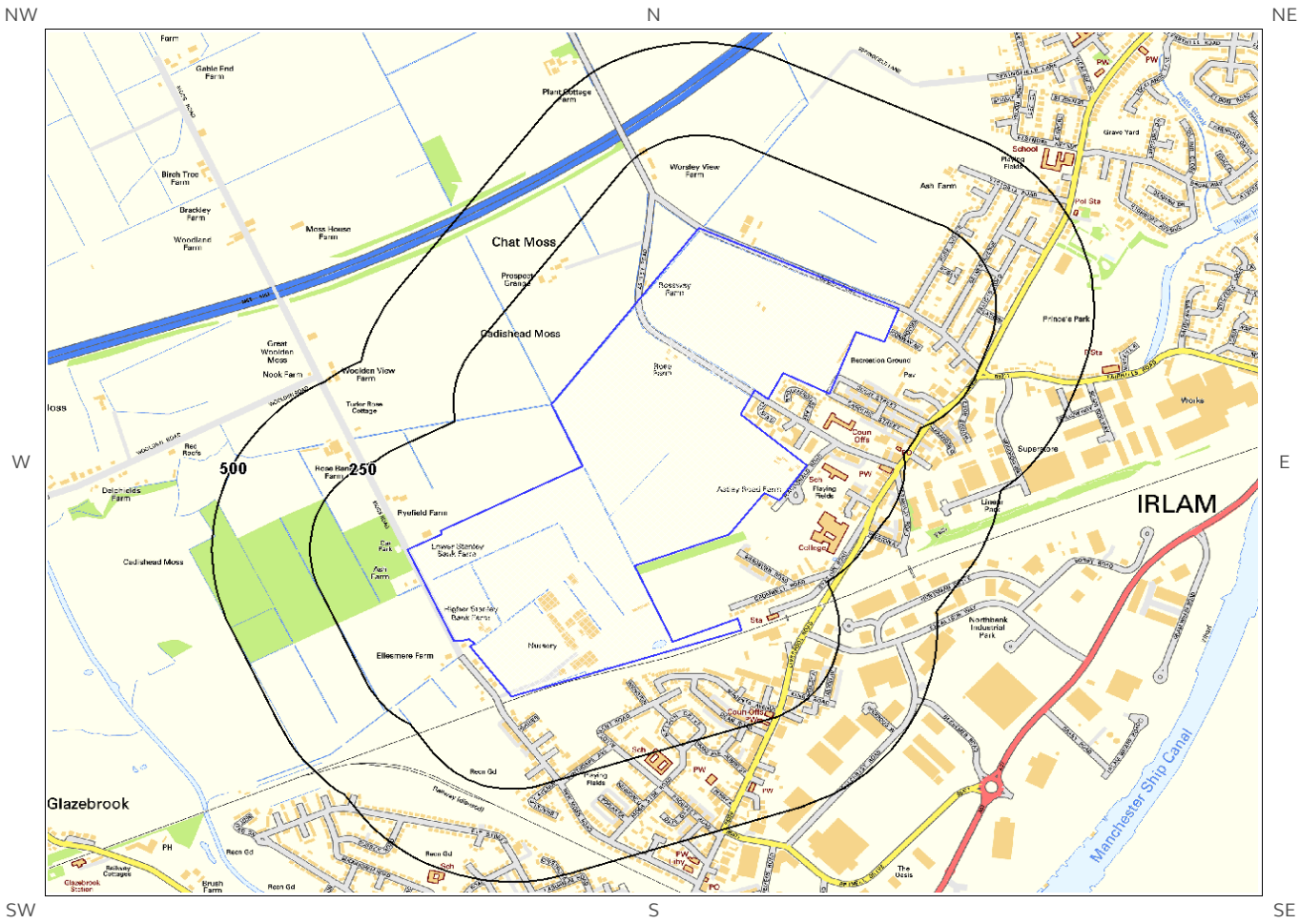
This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Are there any BGS Current Ground Workings within 1000m of the study site boundary? Yes

The following Current Ground Workings information is provided by British Geological Survey:

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
77N	241.0	SE	371408 392927	Clay & Shale	Irlam Brick Works	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	774.0	SW	370309 392229	Sand	Glaze Brook Sand Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	819.0	S	370365 392156	Sand	Glaze Brook Sand Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	882.0	W	369507 393352	Sand	Great Woolden Hall Sand Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

5 Mining, Extraction & Natural Cavities map



Mining, Extraction and Natural Cavities Legend

- Site Outline
- Search Buffers (m) — 250 — 500
- Historical Mining
- Non-Coal Mining Cavities
- Natural Cavities (point data)
- Natural Cavities (polygon data)

Non-Coal Mining
- Highly likely
- Likely
- Unlikely
- Highly unlikely
- Rare

5 Mining, Extraction & Natural Cavities

5.1 Historical Mining

This dataset is derived from Groundsure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? Yes

The following Coal Mining information provided by the Coal Authority is not represented on Mapping:

Distance (m)	Direction	Details
0.0	On Site	The study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

5.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? No

The following information provided by JPB is not represented on mapping: Database searched and no data found.

5.4 Non-Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.5 Non-Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled "Review of mining instability in Great Britain, 1990" PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? No

Database searched and no data found.

5.6 Natural Cavities

This dataset provides information based on the Peter Brett Associates natural cavities database. The dataset is made up of points and polygons. Where polygons are used these represent an area in which it is expected the cavities could be found. It does not indicate that cavities are present everywhere within the polygon, and caution should be used in the interpretation of this data.

Are there any Natural Cavities within 1000m of the study site boundary? No

Database searched and no data found.

5.7 Brine Extraction

This data provides information from the Coal Authority issued on behalf of the Cheshire Brine Subsidence Compensation Board.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level..

Are there any Tin Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.10 Clay Mining

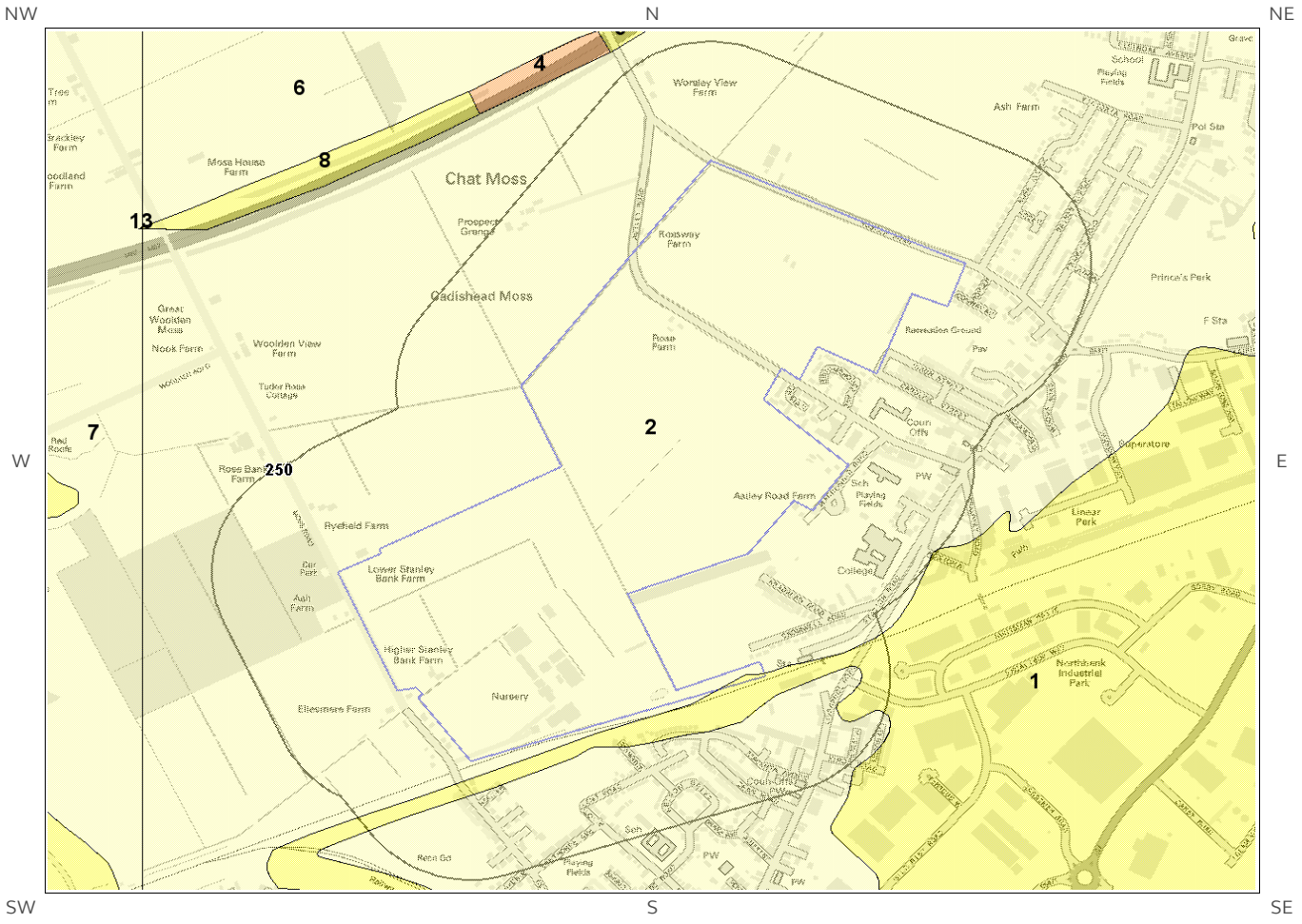
This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

Are there any Clay Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

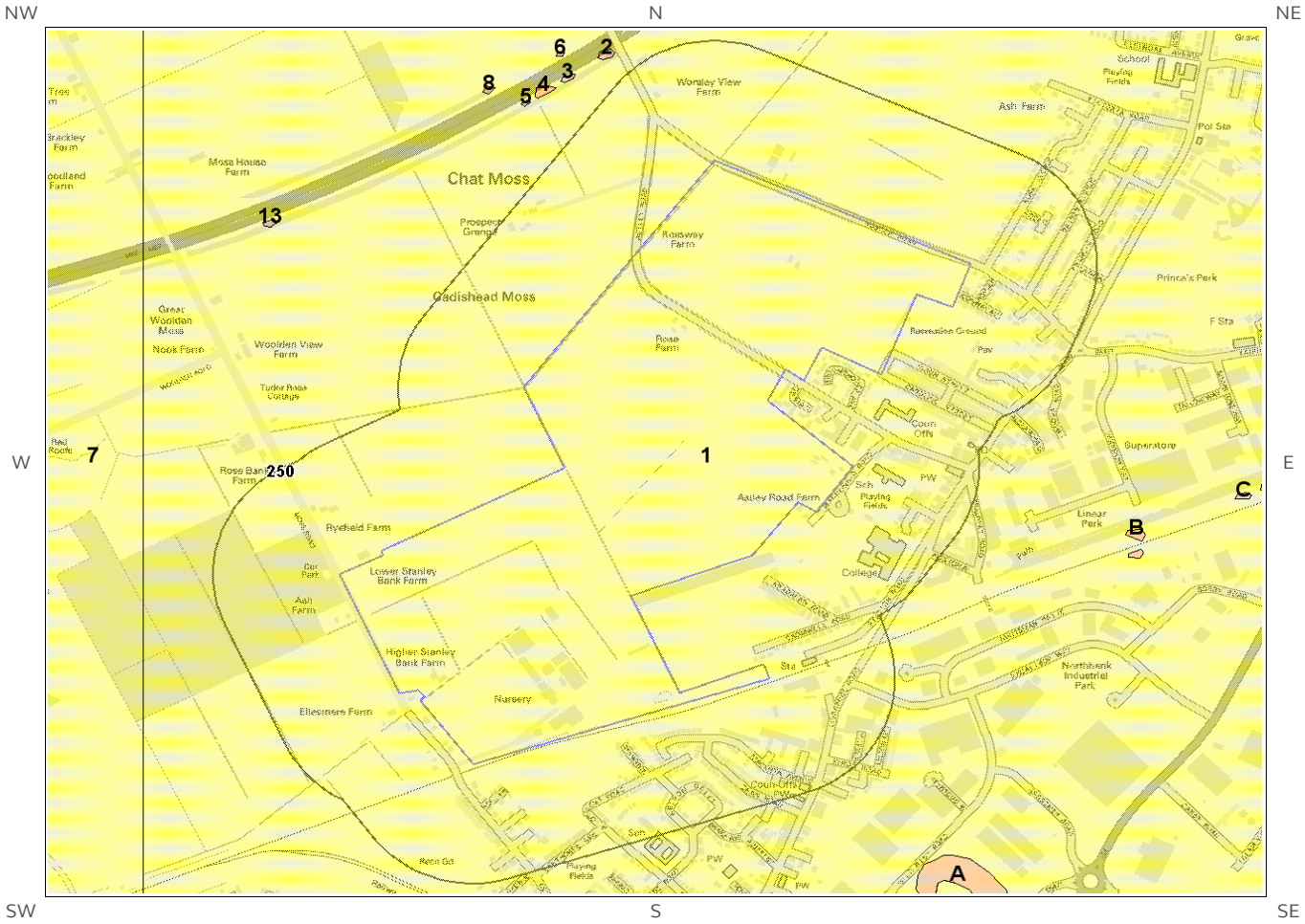
6 Natural Ground Subsidence

6.1 Shrink-Swell Clay map



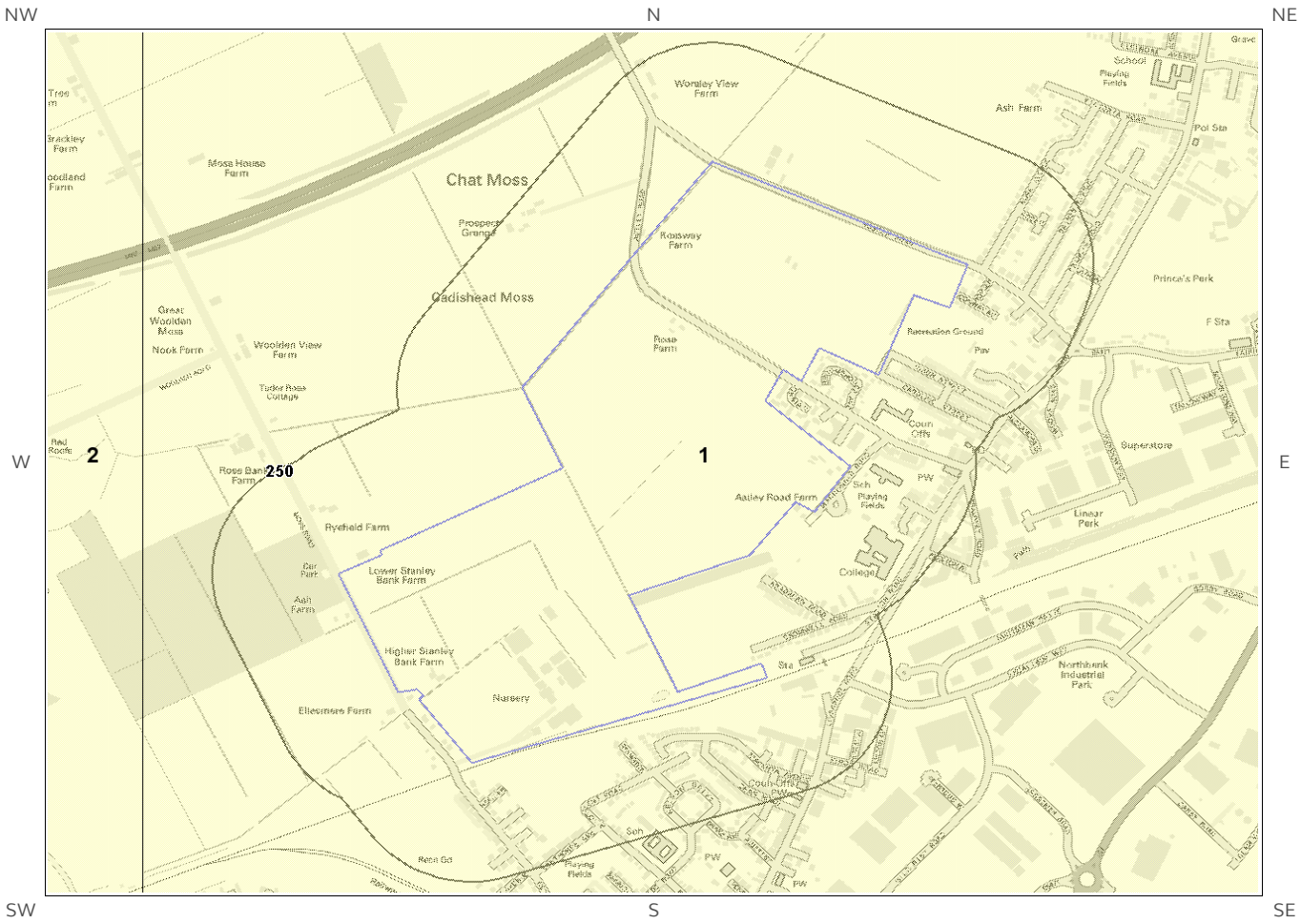
Shrink Swell Clay Legend

6.2 Landslides map



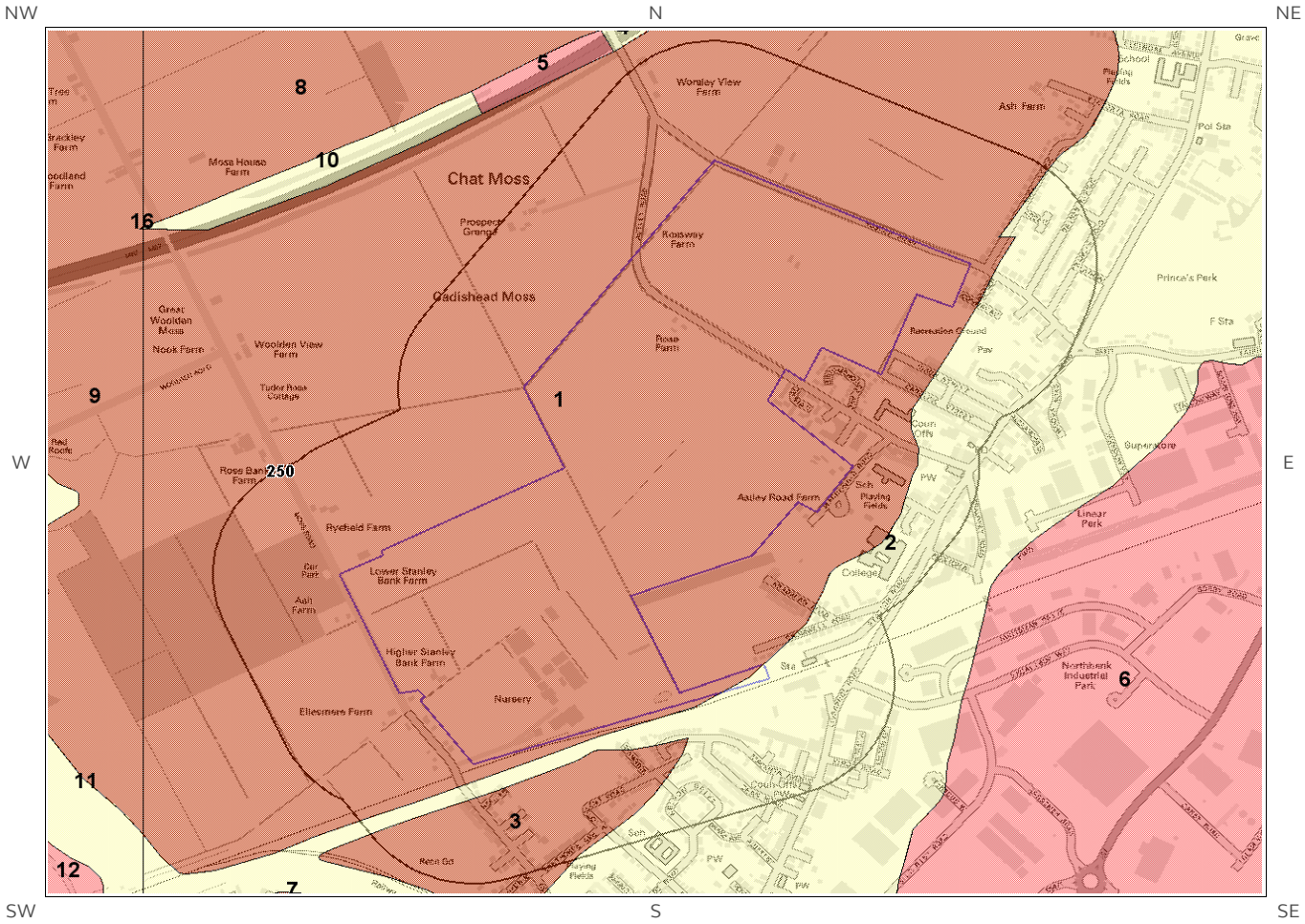
Landslides Legend

6.3 Ground Dissolution of Soluble Rocks map



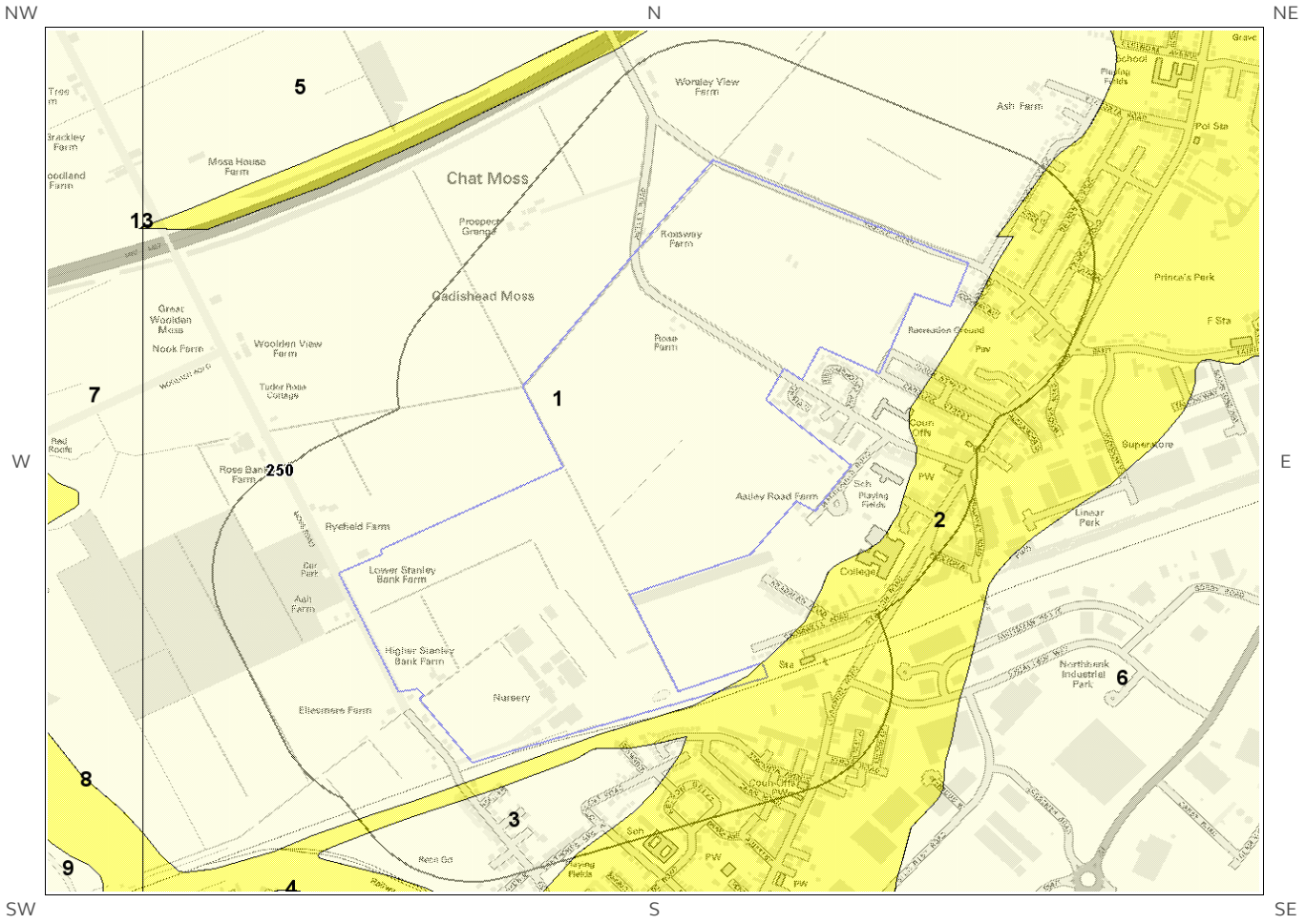
Ground Dissolution Soluble Rocks Legend

6.4 Compressible Deposits map



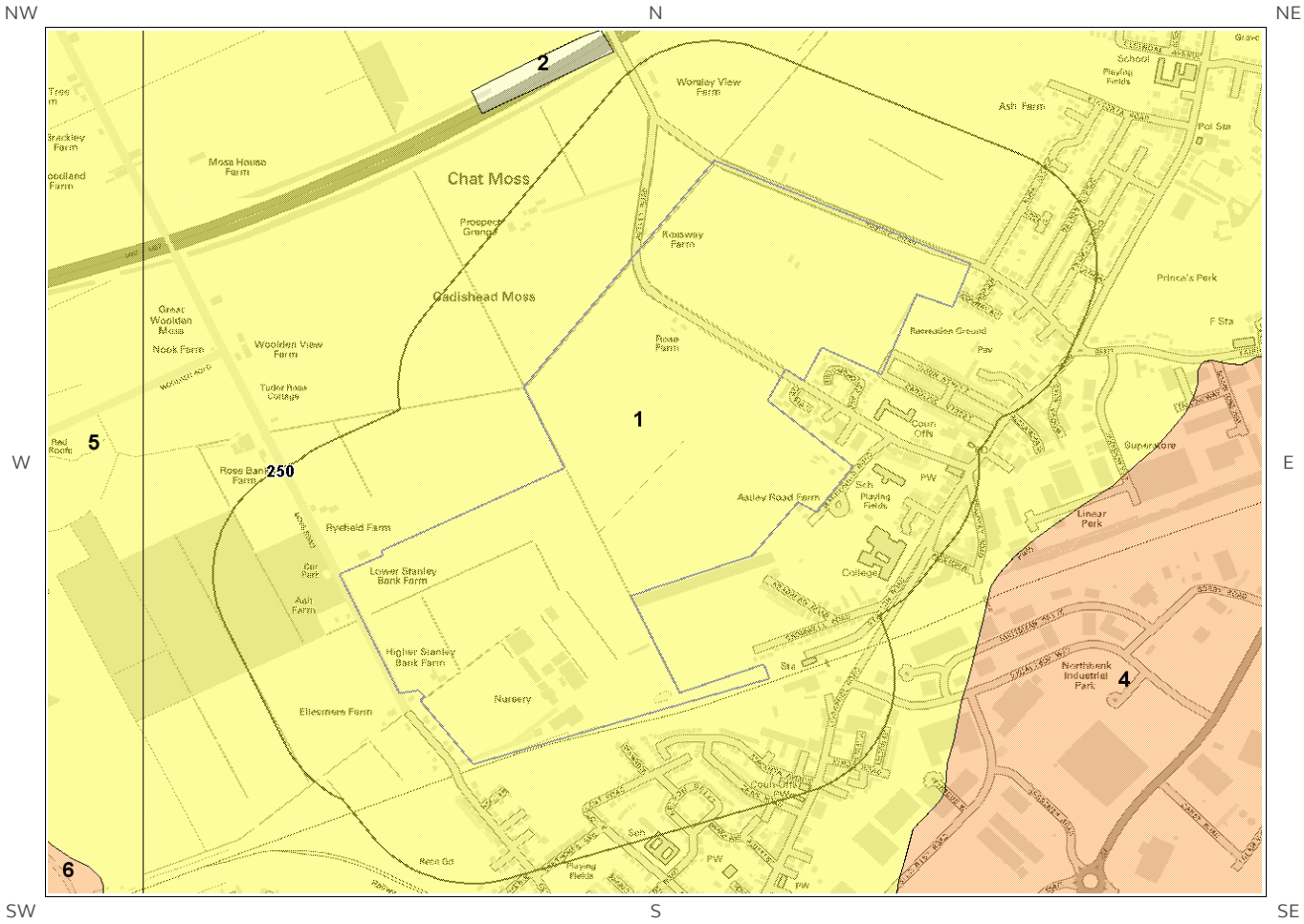
Compressible Deposits Legend

6.5 Collapsible Deposits map



Collapsible Deposits Legend

6.6 Running Sand map



Running Sand Legend

6 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site*[*] boundary? High

6.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.
2	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.

6.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

* This includes an automatically generated 50m buffer zone around the site

6.3 Ground Dissolution of Soluble Rocks

The following Ground Dissolution information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

6.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	High	Very significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build - consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Construction may not be possible at economic cost. For existing property - probable increase in insurance risk from compressibility especially if water conditions or loading of the ground change significantly.
2	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.
3	43.0	S	High	Very significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build - consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Construction may not be possible at economic cost. For existing property - probable increase in insurance risk from compressibility especially if water conditions or loading of the ground change significantly.

6.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

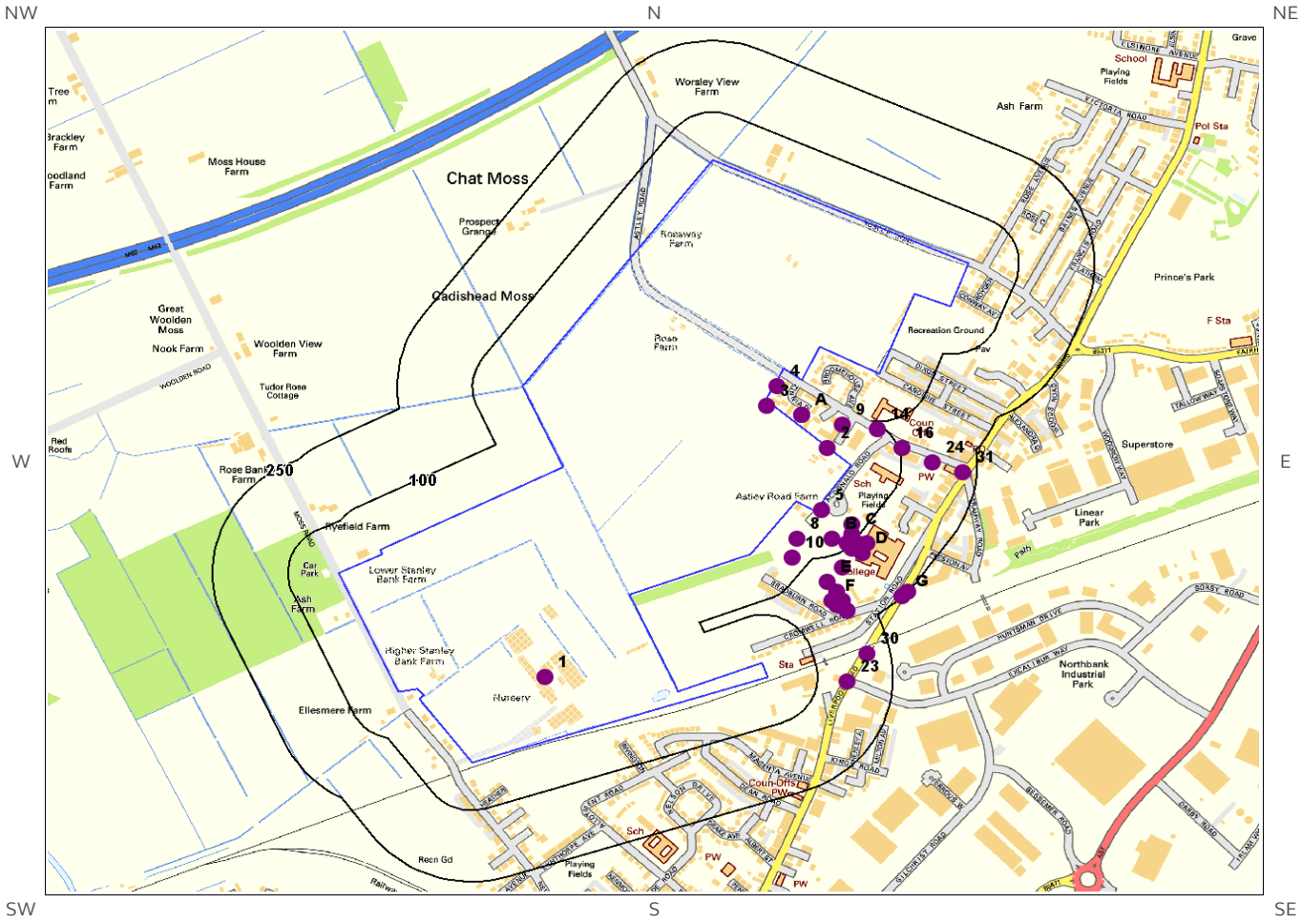
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for collapsible deposits identified. No actions required to avoid problems due to collapsible deposits. No special ground investigation required, or increased construction costs or increased financial risk due to potential problems with collapsible deposits.
2	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.
3	43.0	S	Negligible	No indicators for collapsible deposits identified. No actions required to avoid problems due to collapsible deposits. No special ground investigation required, or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

6.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

7 Borehole Records map



Borehole Records Legend

Site Outline

Borehole Locations

125
250
Search Buffers (m)

7 Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary: 33

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	0.0	On Site	370800 393100	SJ79SW374	91.44	BRENTWOOD MOSS NURSERIES
2	0.0	On Site	371360 393580	SJ79SW292	6.25	ASTLEY ROAD IRLAM 4
3	0.0	On Site	371240 393670	SJ79SW290	6.55	ASTLEY ROAD IRLAM 2
4	5.0	SE	371260 393710	SJ79SW291	6.25	ASTLEY ROAD IRLAM 3
5	10.0	SE	371350 393450	SJ79SW319	12.8	PROPOSED ALFRED TURNER COUNTY SECONDARY SCHOOL 4
6A	18.0	NE	371310 393650	SJ79SW289	6.25	ASTLEY ROAD IRLAM 1A
7A	18.0	NE	371310 393650	SJ79SW288	1.37	ASTLEY ROAD IRLAM 1
8	51.0	SE	371300 393390	SJ79SW318	6.55	PROPOSED ALFRED TURNER COUNTY SECONDARY SCHOOL 3
9	53.0	NE	371390 393630	SJ79SW293	6.1	ASTLEY ROAD IRLAM 5
10	68.0	SE	371290 393350	SJ79SW317	6.4	PROPOSED ALFRED TURNER COUNTY SECONDARY SCHOOL 2
11B	69.0	SE	371370 393390	SJ79SW323	6.7	PROPOSED ALFRED TURNER COUNTY SECONDARY SCHOOL 8
12B	76.0	SE	371410 393420	SJ79SW320	12.37	PROPOSED ALFRED TURNER COUNTY SECONDARY SCHOOL 5
13C	88.0	SE	371410 393400	SJ79SW325	10.0	IRLAM HIGH SCHOOL MACDONALD ROAD IRLAM 2
14	89.0	NE	371460 393620	SJ79SW312	-1.0	PROPOSED OFF SITE SEWERS ASTLEY ROAD IRLAM 1
15B	94.0	SE	371400 393380	SJ79SW324	10.0	IRLAM HIGH SCHOOL MACDONALD ROAD IRLAM 1
16	106.0	E	371510 393580	SJ79SW313	-1.0	PROPOSED OFF SITE SEWERS ASTLEY ROAD IRLAM 2
17C	108.0	SE	371410 393370	SJ79SW321	12.11	PROPOSED ALFRED TURNER COUNTY SECONDARY SCHOOL 6

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
18C	108.0	SE	371420 393380	SJ79SW326	10.0	IRLAM HIGH SCHOOL MACDONALD ROAD IRLAM 3
19C	124.0	SE	371440 393380	SJ79SW328	10.0	IRLAM HIGH SCHOOL MACDONALD ROAD IRLAM 5
20D	129.0	SE	371430 393360	SJ79SW327	10.0	IRLAM HIGH SCHOOL MACDONALD ROAD IRLAM 4
21D	131.0	SE	371390 393330	SJ79SW322	7.19	PROPOSED ALFRED TURNER COUNTY SECONDARY SCHOOL 7
22E	152.0	S	371360 393300	SJ79SW316	12.19	PROPOSED ALFRED TURNER COUNTY SECONDARY SCHOOL 1
23	158.0	E	371400 393090	SJ79SW391	-1.0	PROPOSED SURFACE WATER SEWER LIVERPOOL ROAD IRLAM 1
24	161.0	E	371570 393550	SJ79SW314	-1.0	PROPOSED OFF SITE SEWERS ASTLEY ROAD IRLAM 3
25E	176.0	S	371380 393280	SJ79SW389	3.0	CROMWELL ROAD IRLAM TP4
26F	187.0	SE	371370 393260	SJ79SW388	3.0	CROMWELL ROAD IRLAM TP3
27F	189.0	NE	371380 393250	SJ79SW387	3.0	CROMWELL ROAD IRLAM TP2
28F	198.0	S	371390 393260	SJ79SW390	3.0	CROMWELL ROAD IRLAM TP5
29F	199.0	NE	371400 393240	SJ79SW386	3.0	CROMWELL ROAD IRLAM TP1
30	204.0	E	371440 393150	SJ79SW392	-1.0	PROPOSED SURFACE WATER SEWER LIVERPOOL ROAD IRLAM 2
31	222.0	E	371630 393530	SJ79SW315	-1.0	PROPOSED OFF SITE SEWERS ASTLEY ROAD IRLAM 4
32G	250.0	SE	371510 393270	SJ79SW394	-1.0	PROPOSED SURFACE WATER SEWER LIVERPOOL ROAD IRLAM 4
33G	250.0	SE	371520 393280	SJ79SW395	-1.0	PROPOSED SURFACE WATER SEWER LIVERPOOL ROAD IRLAM 4A

The borehole records are available using the hyperlinks below: Please note that if the donor of the borehole record has requested the information be held as commercial-in-confidence, the additional data will be held separately by the BGS and a formal request must be made for its release.

#1: scans.bgs.ac.uk/sobi_scans/boreholes/803047
#2: scans.bgs.ac.uk/sobi_scans/boreholes/802965
#3: scans.bgs.ac.uk/sobi_scans/boreholes/802963
#4: scans.bgs.ac.uk/sobi_scans/boreholes/802964
#5: scans.bgs.ac.uk/sobi_scans/boreholes/802992
#6A: scans.bgs.ac.uk/sobi_scans/boreholes/802962
#7A: scans.bgs.ac.uk/sobi_scans/boreholes/802961
#8: scans.bgs.ac.uk/sobi_scans/boreholes/802991
#9: scans.bgs.ac.uk/sobi_scans/boreholes/802966
#10: scans.bgs.ac.uk/sobi_scans/boreholes/802990
#11B: scans.bgs.ac.uk/sobi_scans/boreholes/802996
#12B: scans.bgs.ac.uk/sobi_scans/boreholes/802993
#13C: scans.bgs.ac.uk/sobi_scans/boreholes/802998
#15B: scans.bgs.ac.uk/sobi_scans/boreholes/802997
#17C: scans.bgs.ac.uk/sobi_scans/boreholes/802994
#18C: scans.bgs.ac.uk/sobi_scans/boreholes/802999
#19C: scans.bgs.ac.uk/sobi_scans/boreholes/803001
#20D: scans.bgs.ac.uk/sobi_scans/boreholes/803000
#21D: scans.bgs.ac.uk/sobi_scans/boreholes/802995
#22E: scans.bgs.ac.uk/sobi_scans/boreholes/802989
#25E: scans.bgs.ac.uk/sobi_scans/boreholes/803062
#26F: scans.bgs.ac.uk/sobi_scans/boreholes/803061
#27F: scans.bgs.ac.uk/sobi_scans/boreholes/803060
#28F: scans.bgs.ac.uk/sobi_scans/boreholes/803063
#29F: scans.bgs.ac.uk/sobi_scans/boreholes/803059

8 Estimated Background Soil Chemistry

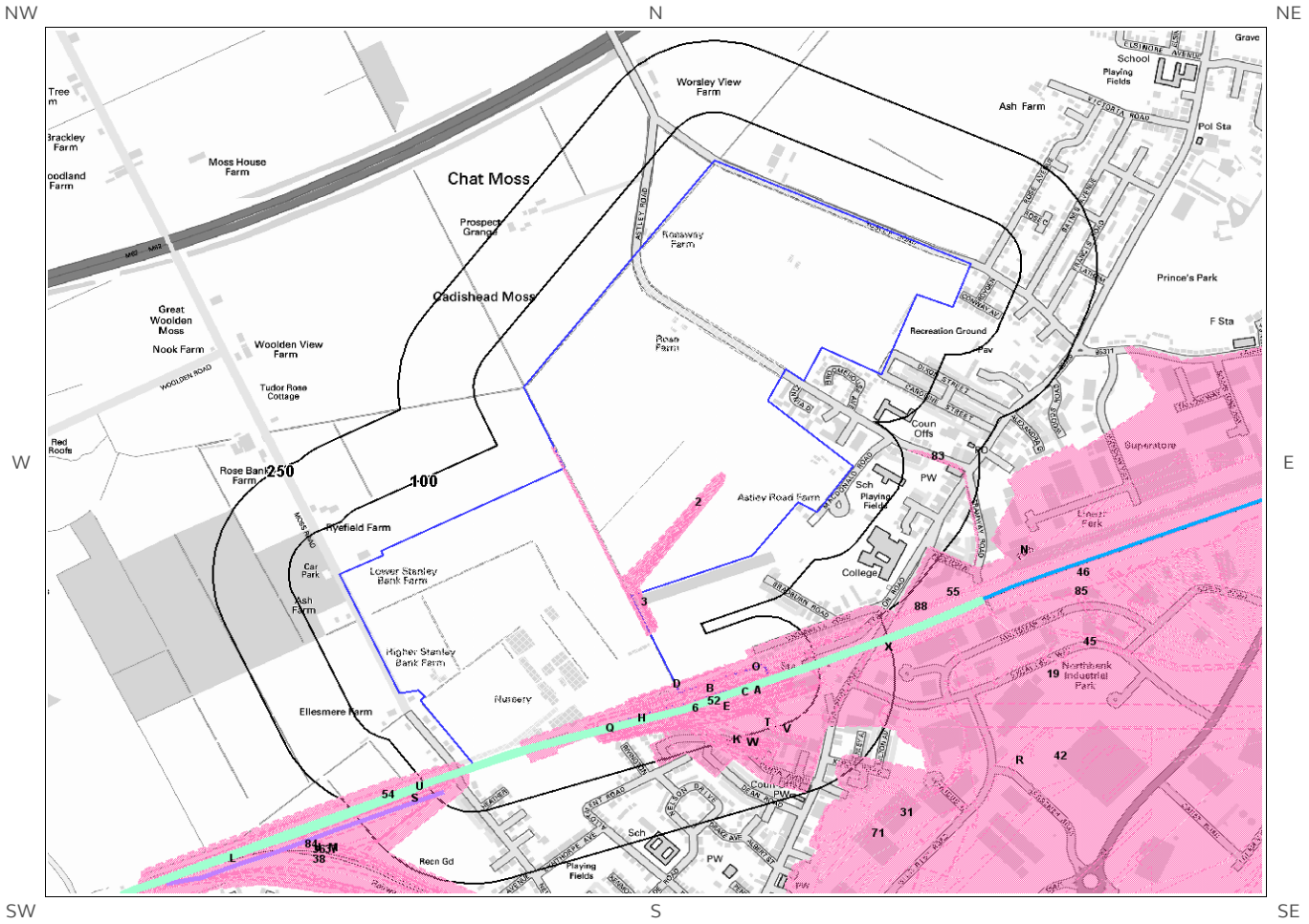
Records of background estimated soil chemistry within 250m of the study site boundary: 24

For further information on how this data is calculated and limitations upon its use, please see the Groundsure Geo Insight User Guide, available on request.

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	RuralSoil	25 - 35 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	80 - 100 mg/kg	600 - 1200 mg/kg
0.0	On Site	RuralSoil	25 - 35 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	80 - 100 mg/kg	300 - 600 mg/kg
0.0	On Site	RuralSoil	25 - 35 mg/kg	1.8 - 2.2 mg/kg	90 - 120 mg/kg	80 - 100 mg/kg	>1200 mg/kg
0.0	On Site	RuralSoil	25 - 35 mg/kg	1.8 - 2.2 mg/kg	90 - 120 mg/kg	80 - 100 mg/kg	>1200 mg/kg
0.0	On Site	RuralSoil	25 - 35 mg/kg	1.8 - 2.2 mg/kg	90 - 120 mg/kg	80 - 100 mg/kg	>1200 mg/kg
0.0	On Site	RuralSoil	<15 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	>1200 mg/kg
0.0	On Site	RuralSoil	25 - 35 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	80 - 100 mg/kg	600 - 1200 mg/kg
0.0	On Site	RuralSoil	25 - 35 mg/kg	2.2 - 3.0 mg/kg	90 - 120 mg/kg	80 - 100 mg/kg	>1200 mg/kg
0.0	On Site	RuralSoil	25 - 35 mg/kg	1.8 - 2.2 mg/kg	90 - 120 mg/kg	80 - 100 mg/kg	>1200 mg/kg
0.0	On Site	RuralSoil	25 - 35 mg/kg	1.8 - 2.2 mg/kg	90 - 120 mg/kg	80 - 100 mg/kg	>1200 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	>1200 mg/kg
0.0	On Site	RuralSoil	25 - 35 mg/kg	2.2 - 3.0 mg/kg	90 - 120 mg/kg	80 - 100 mg/kg	>1200 mg/kg
0.0	On Site	RuralSoil	25 - 35 mg/kg	1.8 - 2.2 mg/kg	90 - 120 mg/kg	80 - 100 mg/kg	>1200 mg/kg
0.0	On Site	RuralSoil	25 - 35 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	80 - 100 mg/kg	>1200 mg/kg
0.0	On Site	RuralSoil	25 - 35 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	80 - 100 mg/kg	600 - 1200 mg/kg
9.0	NW	RuralSoil	25 - 35 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	80 - 100 mg/kg	>1200 mg/kg
15.0	S	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	600 - 1200 mg/kg
16.0	S	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	600 - 1200 mg/kg
16.0	S	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	300 - 600 mg/kg
26.0	S	RuralSoil	15 - 25 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	>1200 mg/kg
26.0	S	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	600 - 1200 mg/kg
40.0	SE	RuralSoil	<15 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	>1200 mg/kg
43.0	S	RuralSoil	25 - 35 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	80 - 100 mg/kg	300 - 600 mg/kg
46.0	SE	RuralSoil	<15 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	>1200 mg/kg

*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

9 Railways and Tunnels map



Railways and Tunnels Legend

- Site Outline
- Search Buffers (m) — 250, 500
- Underground or Partially Underground Railway / Subway System
- Railway Tunnel (OS Mapping)
- Abandoned or Dismantled Railway (OpenStreetMap)
- Railway Track (OS Mapping)
- Railway Track (OpenStreetMap)
- High Speed 2
- High Speed 2 Revised Proposed Route
- Crossrail 1
- Railway and/or Tunnel Feature from Historical Mapping

9 Railways and Tunnels

9.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary? No

Have any underground railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary? No

Have any other railway tunnels been identified within 250m of the site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

9.2 Historical Railway and Tunnel Features

This data is derived from Groundsure's unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary? Yes

Have any historical railway or tunnel features been identified within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Details	Date
1A	0	On Site	371196 393079	Mineral Railway Sidings	1949
2	0	On Site	371133 393502	Tramway Sidings	1904
3	0	On Site	370994 393261	Tramway Sidings	1904
4D	0	On Site	371060 393084	Tramway Sidings	1904
5A	0	On Site	371196 393079	Railway Sidings	1904
6	0	On Site	371160 393036	Railway Sidings	1949

ID	Distance (m)	Direction	NGR	Details	Date
7E	0	On Site	371259 393106	Railway Sidings	1938
8B	0	On Site	371098 393088	Railway Sidings	1894
9B	0	On Site	371152 393076	Railway Sidings	1926
10H	0	On Site	370997 393008	Railway Sidings	1908
11B	0	On Site	371132 393077	Railway Sidings	1904
12B	0	On Site	371132 393077	Railway Sidings	1904
13C	0	On Site	371185 393071	Railway Sidings	1904
14C	0	On Site	371185 393071	Railway Sidings	1904
15D	0	On Site	371061 393072	Railway Sidings	1926
16K	0	On Site	371183 392946	Railway Sidings	1949
17E	0	On Site	371259 393106	Railway Sidings	1904
18E	0	On Site	371259 393106	Railway Sidings	1926
19	0	On Site	371364 393046	Railway Sidings	1965
20F	0	On Site	371028 393368	Tramways Sidings	1904
21F	0	On Site	371028 393368	Tramways Sidings	1904
22G	0	On Site	370992 393337	Tramway Sidings	1926
23G	0	On Site	370998 393345	Tramway Sidings	1926
24F	0	On Site	371020 393360	Tramway Sidings	1904
25G	0	On Site	370998 393345	Tramway Sidings	1938
47A	0	On Site	371234 393093	Railway Sidings	1971
48N	0	On Site	371646 393291	Mineral Railway Sidings	1928
49N	0	On Site	371676 393301	Mineral Railway Sidings	1937
50O	0	On Site	371238 393126	Railway Sidings	1890
51B	0	On Site	371159 393057	Railway Sidings	1965
52	0	On Site	371132 393051	Railway Sidings	1966
53C	0	On Site	n/a	Railways	1908
54	0	On Site	370595 392595	Railway Sidings	1908
55	0	On Site	371639 393288	Mineral Railway Sidings	1908
56N	0	On Site	371676 393301	Mineral Railway Sidings	1937

ID	Distance (m)	Direction	NGR	Details	Date
57O	0	On Site	371242 393126	Railway Sidings	1876
58P	0	On Site	370904 393398	Tramway Sidings	1937
59P	0	On Site	370908 393389	Tramway Sidings	1908
60P	0	On Site	370908 393389	Tramway Sidings	1928
26H	2	S	371008 393024	Railway Sidings	1908
27H	2	S	371008 393024	Railway Sidings	1908
61Q	6	S	370937 392989	Railway Sidings	1965
62E	7	S	371037 393016	Railway Sidings	1928
28E	9	S	371045 393020	Railway Sidings	1926
63E	9	S	371045 393020	Railway Sidings	1937
64E	9	S	371045 393020	Railway Sidings	1937
65Q	11	S	370935 392991	Railway Sidings	1965
29I	14	S	370926 392987	Railway Sidings	1908
30I	14	S	370926 392987	Railway Sidings	1908
31	16	SW	370760 392556	Railway Sidings	1949
32J	38	SW	370556 392650	Railway Sidings	1965
33J	38	SW	370549 392654	Railway Sidings	1979
34K	39	S	371177 392974	Railway Sidings	1908
35W	40	S	371183 392946	Railway Sidings	1949
36	42	SW	370473 392664	Railway Sidings	1904
37	45	SW	370560 392622	Railway Sidings	1938
38	46	SW	370902 392486	Railway Sidings	1908
39L	46	SW	370493 392663	Railway Sidings	1908
40L	46	SW	370493 392663	Railway Sidings	1908
66R	52	SW	370284 392717	Railway Sidings	1928
67R	52	SW	370285 392727	Railway Sidings	1937
68R	52	SW	370285 392727	Railway Sidings	1937
69K	54	S	371133 392980	Railway Sidings	1965
70K	54	S	371133 392980	Railway Sidings	1965

ID	Distance (m)	Direction	NGR	Details	Date
41M	55	SW	370555 392620	Railway Sidings	1894
71	55	SW	370816 392500	Railway Sidings	1965
72S	59	SW	370554 392843	Railway Sidings	1965
73S	59	SW	370554 392843	Railway Sidings	1976
42	69	SW	370349 392776	Railway Sidings	1926
43M	70	SW	370555 392620	Railway Sidings	1949
44K	73	S	371196 392956	Railway Sidings	1979
74U	86	SW	370549 392868	Railway Sidings	1992
75T	90	S	371241 393003	Railway Sidings	1965
76T	90	S	371244 393004	Railway Sidings	1966
77U	93	SW	370530 392880	Railway Sidings	1976
78U	93	SW	370530 392880	Railway Sidings	1965
79V	97	S	371279 392987	Railway Sidings	1965
80V	98	S	371279 392986	Railway Sidings	1965
81W	112	S	371203 392955	Railway Sidings	1910
82	113	E	371655 393380	Tramway Sidings	1876
83	115	E	371582 393558	Disused Tramway Sidings	1890
45	123	E	372002 393319	Mineral Railway Sidings	1949
84	149	SW	370250 392759	Railway Sidings	1965
46	205	E	372009 393367	Railway Sidings	1979
85	221	E	371703 393259	Railway Sidings	1966
86X	221	E	371478 393160	Railway Sidings	1965
87X	221	E	371478 393160	Railway Sidings	1971
88	223	E	371536 393244	Railway Sidings	1890

Any records that have been identified are represented on the Railways and Tunnels map.

9.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary? No

Have any historical railway lines been identified within 250m of the study site boundary? Yes

Distance (m)	Direction	Status
81	SW	Abandoned

Multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels map.

9.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary? Yes

Have any active railway lines been identified within 250m of the study site boundary? Yes

Distance (m)	Direction	Name	Type
0	On Site	Liverpool to Manchester Line	Rail
0	S	Not given	Multi Track
0	S	Not given	Multi Track
0	On Site	Liverpool to Manchester Line	Rail
4	S	Liverpool to Manchester Line	Rail
4	S	Liverpool to Manchester Line	Rail
46	SW	Not given	Multi Track
46	SW	Not given	Multi Track
92	SW	Not given	Rail
92	SW	Not given	Rail
198	E	Liverpool to Manchester line	Rail
198	E	Liverpool to Manchester Line	Rail
198	E	Liverpool to Manchester line	Rail
198	E	Liverpool to Manchester Line	Rail
236	E	Liverpool to Manchester line	Rail
236	E	Liverpool to Manchester line	Rail
237	E	Liverpool to Manchester Line	Rail
237	E	Liverpool to Manchester Line	Rail

Multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels map.

9.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail 1 .

Is the study site within 5km of the route of the High Speed 2 rail project?	Yes
Is the study site within 500m of the route of the Crossrail 1 rail project?	No

Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a ***Groundsure HS2 and Crossrail 1 Report****.*

The route data has been digitised from publicly available maps by Groundsure. The route as provided relates to the Crossrail 1 project only, and does not include any details of the Crossrail 2 project, as final details of the route for Crossrail 2 are still under consultation.

Please note that this assessment takes account of both the original Phase 2b proposed route and the amended route proposed in 2016. As the Phase 2b route is still under consultation, Groundsure are providing information on both options until the final route is formally confirmed. Practitioners should take account of this uncertainty when advising clients.

Contact Details

Groundsure Helpline

Telephone: 08444 159 000
info@groundsure.com

British Geological Survey Enquiries

Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email:**enquiries@bgs.ac.uk**
Web:**www.bgs.ac.uk**
BGS Geological Hazards Reports and general geological enquiries

British Gypsum

British Gypsum Ltd
East Leake
Loughborough
Leicestershire
LE12 6HX

The Coal Authority

200 Lichfield Lane
Mansfield
Notts NG18 4RG
Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk

Public Health England

Public information access office
Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
https://www.gov.uk/government/organisations/public-health-england
Email: **enquiries@phe.gov.uk**
Main switchboard: 020 7654 8000

Johnson Poole & Bloomer Limited

Harris and Pearson Building, Brettel Lane
Brierley Hill, West Midlands
DY5 3LH
Tel: +44 (0) 1384 262 000
Email:**enquiries.gs@jpb.co.uk**
Website: **www.jpb.co.uk**

Ordnance Survey

Adanac Drive, Southampton
SO16 0AS

Tel: 08456 050505
Website: http://www.ordnancesurvey.co.uk/

Getmapping PLC

Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444
Website:**http://www1.getmapping.com/**

Peter Brett Associates
Caversham Bridge House
Waterman Place
Reading
Berkshire RG1 8DN
Tel: +44 (0)118 950 0761 E-mail:**reading@pba.co.uk**
Website:**http://www.peterbrett.com/home**

Standard Terms and Conditions

Groundsure's Terms and Conditions can be viewed online at this link:
https://www.groundsure.com/terms-and-conditions-may25-2018