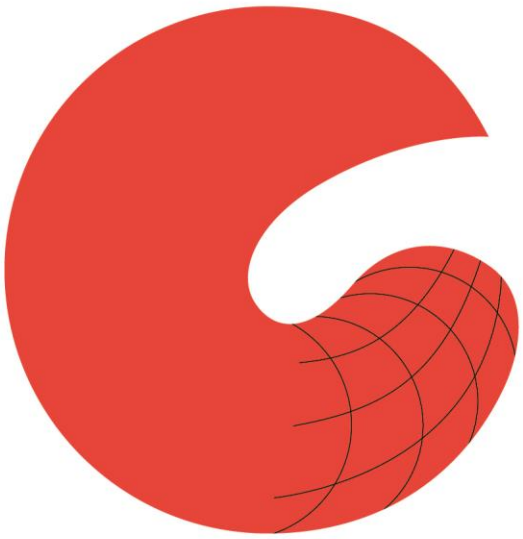

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Basement Impact Assessment – Volume 2 of 4

3 Radon Data

3.1 Radon Affected Areas

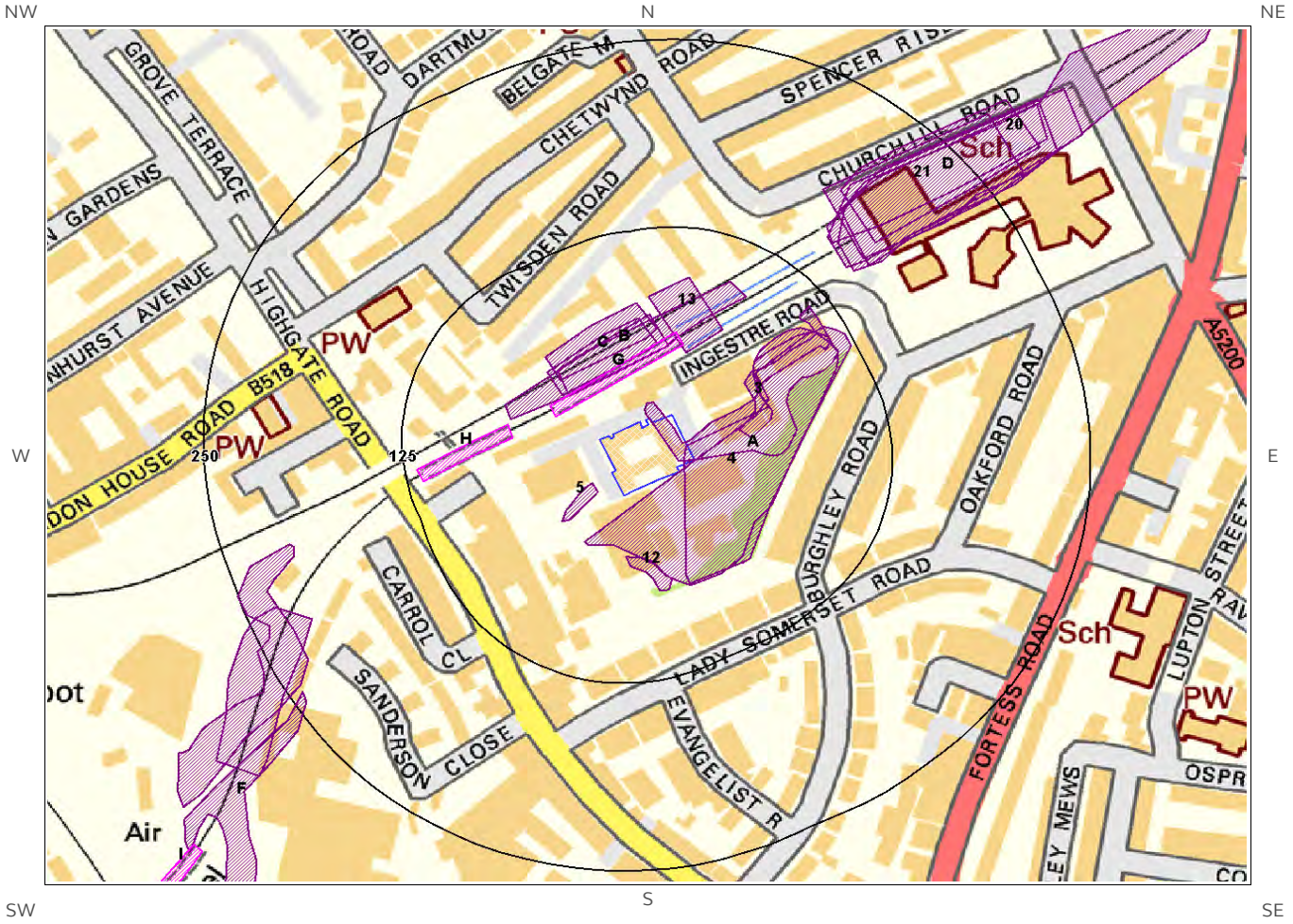
Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

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



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	528878 185753	Unspecified Heap	1965
2A	0.0	On Site	528878 185753	Unspecified Heap	1958
3	0.0	On Site	528885 185795	Unspecified Heap	1940
4	0.0	SE	528850 185755	Unspecified Heap	1938
5	14.0	SW	528763 185723	Unspecified Ground Workings	1913
6	34.0	NE	528879 185809	Unspecified Ground Workings	1913
7B	35.0	NW	528792 185824	Cuttings	1869
8B	35.0	NW	528792 185824	Cuttings	1879
9B	35.0	NW	528792 185824	Cuttings	1879
10B	35.0	NW	528784 185821	Cuttings	1894
11C	37.0	NW	528777 185820	Cuttings	1913
12	41.0	S	528807 185675	Unspecified Ground Workings	1913
13	42.0	N	528830 185848	Cuttings	1940
14C	46.0	NW	528777 185830	Cuttings	1940
15D	147.0	NE	528984 185924	Cuttings	1938
16D	149.0	NE	528995 185934	Cuttings	1894
17D	153.0	NE	528989 185942	Cuttings	1869
18D	153.0	NE	528989 185942	Cuttings	1879
19D	153.0	NE	528989 185942	Cuttings	1879
20	159.0	NE	529049 185975	Cuttings	1913
21	160.0	NE	528985 185933	Cuttings	1958

ID	Distance (m)	Direction	NGR	Use	Date
22D	173.0	NE	528991 185944	Cuttings	1940
23E	206.0	W	528577 185607	Unspecified Pit	1879
24E	206.0	W	528577 185607	Unspecified Pit	1869
25E	206.0	W	528577 185607	Unspecified Pit	1879
26E	213.0	SW	528564 185597	Cuttings	1894
27F	241.0	SW	528552 185498	Unspecified Ground Workings	1879
28F	241.0	SW	528552 185498	Unspecified Ground Workings	1869
29F	241.0	SW	528552 185498	Unspecified Ground Workings	1879

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? Yes

The following Historical Underground Working Features are provided by Groundsure:

ID	Distance (m)	Direction	NGR	Use	Date
30G	28.0	NW	528750 185788	Tunnel	1965
31G	28.0	NW	528750 185788	Tunnel	1974
32G	28.0	NW	528750 185788	Tunnel	1958
33H	55.0	W	528691 185756	Tunnel	1974
34H	55.0	W	528691 185756	Tunnel	1965
35H	55.0	W	528691 185756	Tunnel	1958
36I	356.0	SW	528484 185446	Tunnel	1995
37I	356.0	SW	528484 185446	Tunnel	1965
38I	356.0	SW	528484 185446	Tunnel	1974
39I	356.0	SW	528484 185446	Tunnel	1958
Not shown	387.0	SW	528501 185465	Unspecified Shaft	1995
Not shown	387.0	SW	528501 185465	Unspecified Shaft	1974

ID	Distance (m)	Direction	NGR	Use	Date
Not shown	388.0	SW	528498 185464	Unspecified Shaft	1965
Not shown	435.0	SW	528502 185380	Tunnel	1965
Not shown	435.0	SW	528502 185380	Tunnel	1995
Not shown	435.0	SW	528502 185380	Tunnel	1974
Not shown	435.0	SW	528502 185380	Tunnel	1958
Not shown	445.0	SW	528516 185357	Tunnel	1974
Not shown	445.0	SW	528516 185357	Tunnel	1965
Not shown	445.0	SW	528516 185357	Tunnel	1995
Not shown	445.0	SW	528516 185357	Tunnel	1958
Not shown	795.0	SW	528025 185363	Tunnel	1965
Not shown	795.0	SW	528025 185363	Tunnel	1995
Not shown	795.0	SW	528025 185363	Tunnel	1974

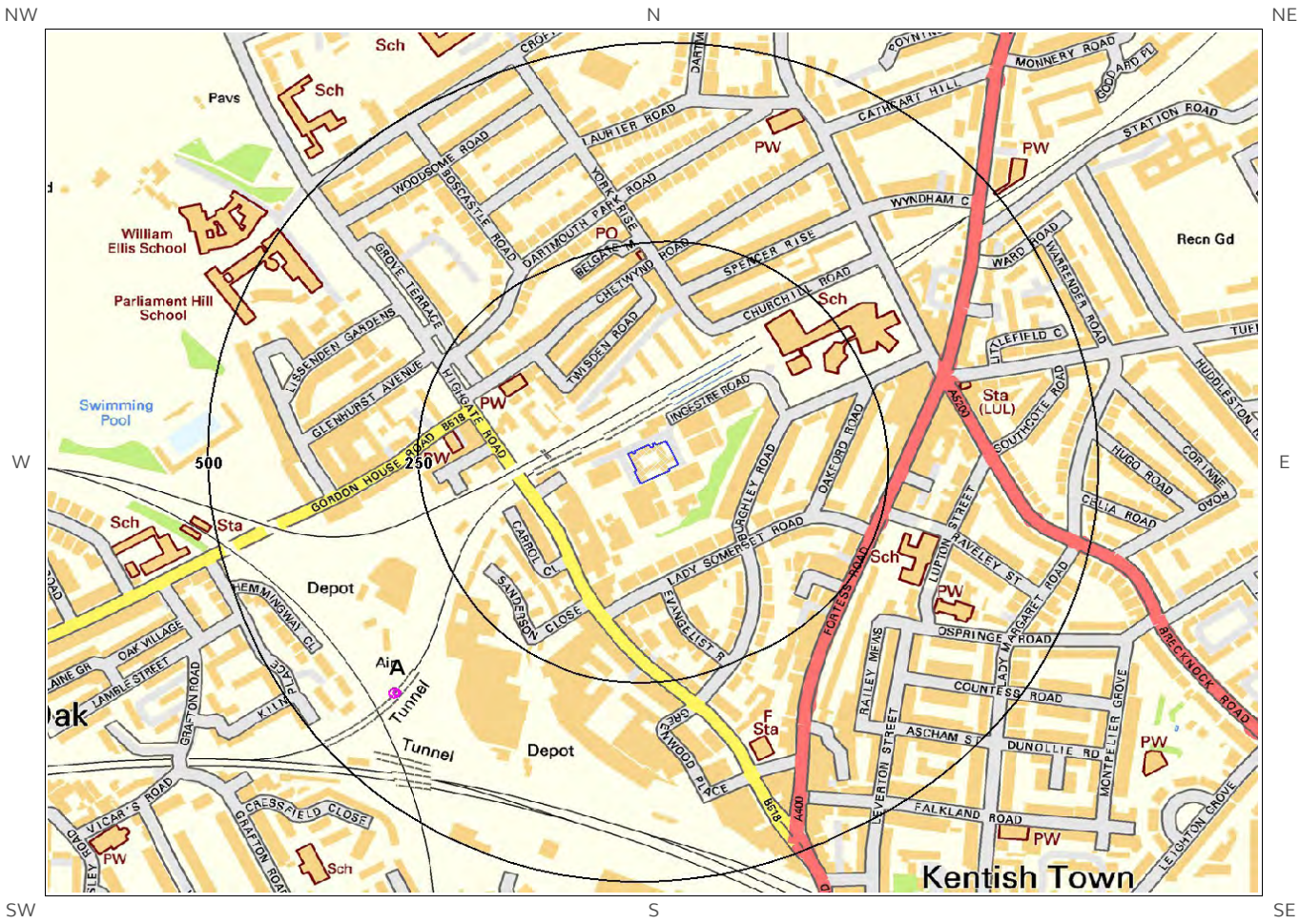
4.3 Current Ground Workings

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? No

Database searched and no data found.

5 Mining, Extraction & Natural Cavities Map



Mining, Extraction and Natural Cavities Legend

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? Yes

The following Historical Mining information is provided by Groundsure:

ID	Distance (m)	Direction	NGR	Details	Date
1A	387.0	SW	528501 185465	Unspecified Shaft	1995
2A	387.0	SW	528501 185465	Unspecified Shaft	1974
3A	388.0	SW	528498 185464	Unspecified Shaft	1965

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? No

Database searched and no data found.

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 Peter Brett Associates natural cavities database.

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.

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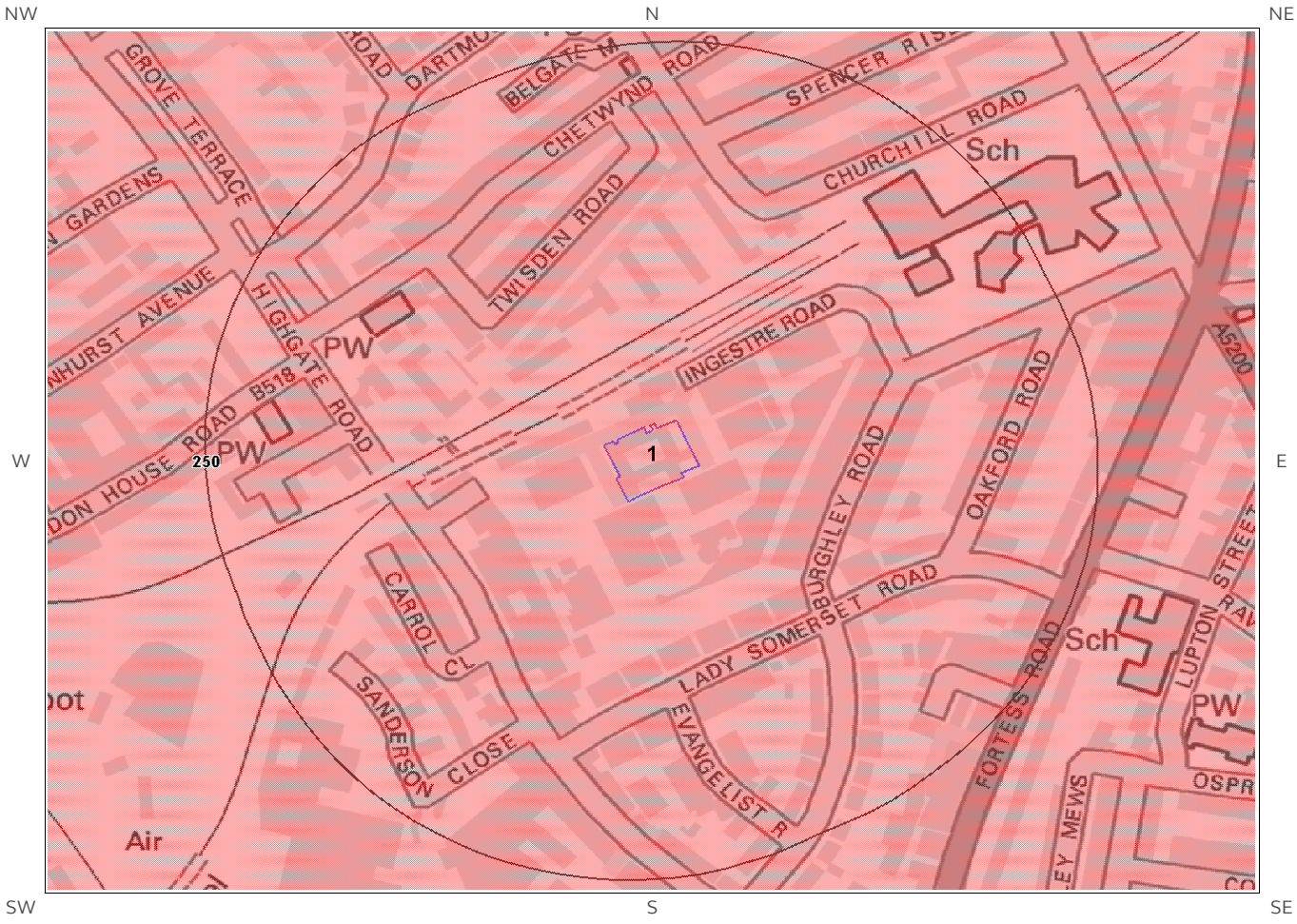
6 Natural Ground Subsidence

6.1 Shrink-Swell Clay Map



Shrink Swell Clay Legend

Site Outline

125
250
Search Buffers (m)

No Data / Null

Negligible

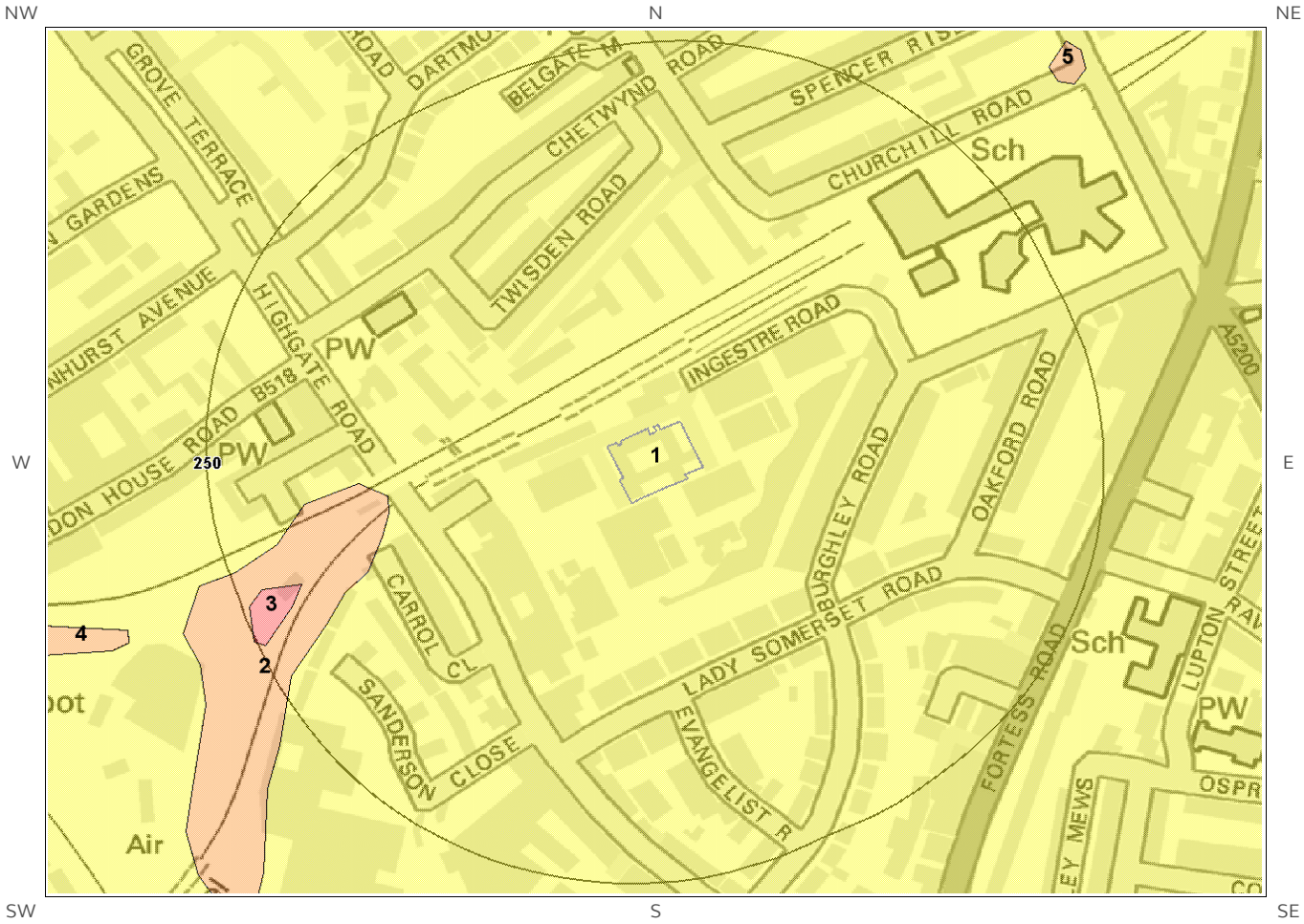
Very Low

Low

Moderate

High

6.2 Landslides Map



Landslides Legend

Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

6.3 Ground Dissolution of Soluble Rocks Map

Ground Dissolution Soluble Rocks Legend

Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

6.4 Compressible Deposits Map

Compressible Deposits Legend

Site Outline

125
250
Search Buffers (m)

No Data / Null

Negligible

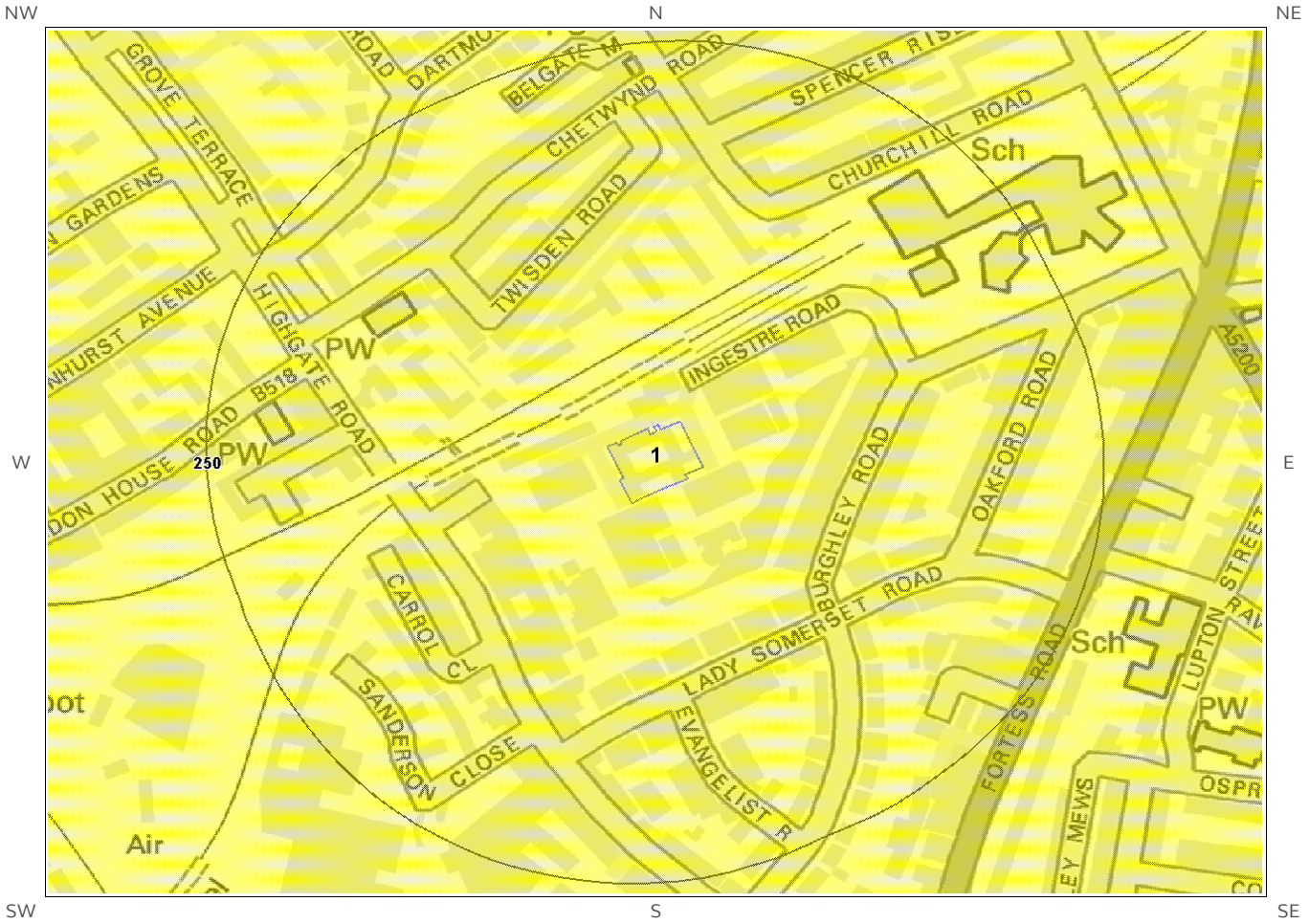
Very Low

Low

Moderate

High

6.5 Collapsible Deposits Map



Collapsible Deposits Legend

Site Outline

125
250
Search Buffers (m)

No Data / Null

Negligible

Very Low

Low

Moderate

High

6.6 Running Sand Map

Running Sand Legend

Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

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? Moderate

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	Moderate	Ground conditions predominantly high plasticity. Do not plant or remove trees or shrubs near to buildings without expert advice about their effect and management. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a probable increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a probable increase in insurance risk during droughts or where vegetation with high moisture demands is present.

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	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.

6.5 Collapsible Deposits

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

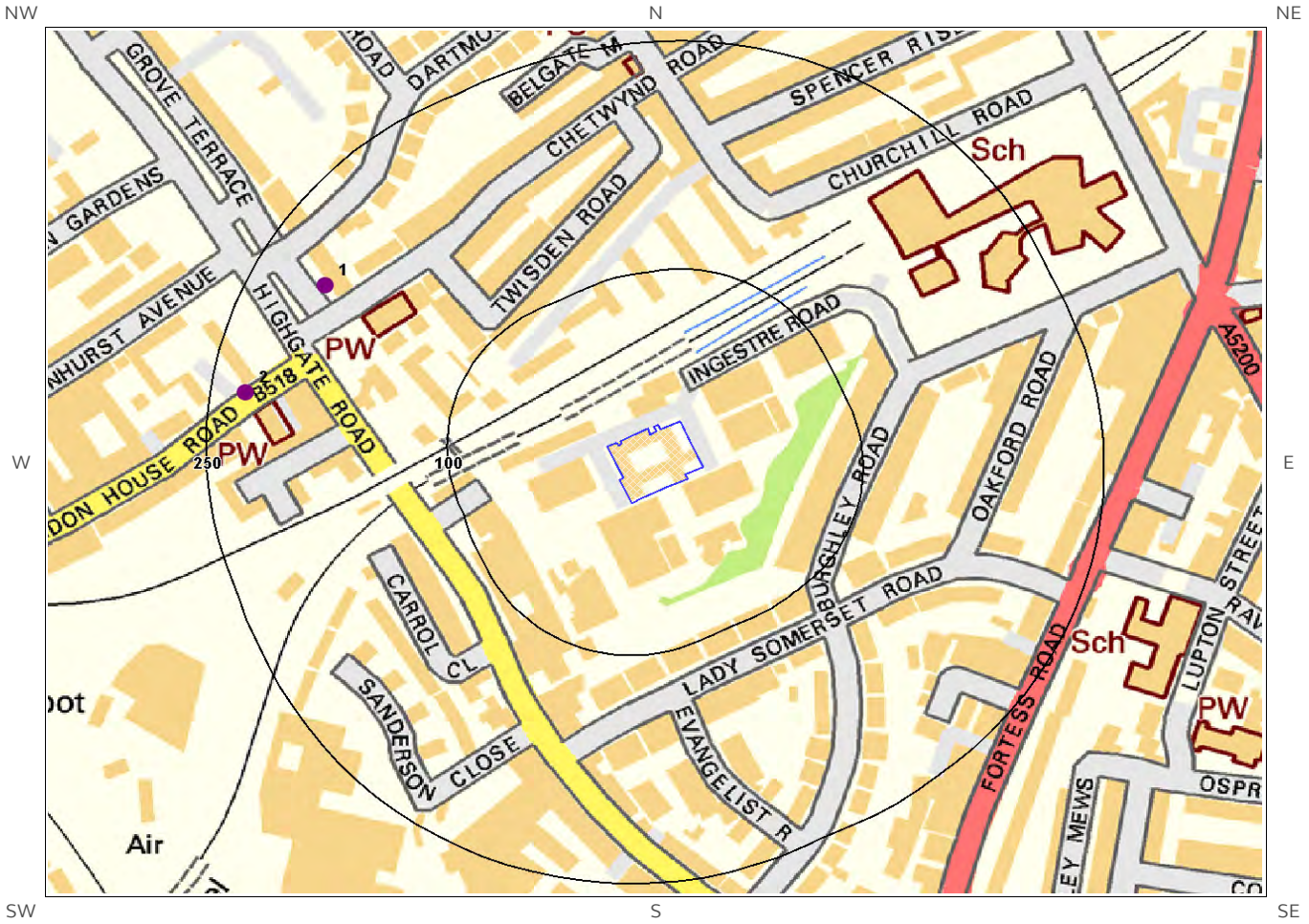
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible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

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	Negligible	No indicators for running sand identified. 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: 2

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	205.0	NW	528600 185870	TQ28NE22	9.14	JUNCTION CHETWYND RD KENTISH TOWN
2	229.0	W	528550 185800	TQ28NE23	21.33	GORDON HOUSE HIGHGATE RD KENTISH TOWN

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/590602
#2: scans.bgs.ac.uk/sobi_scans/boreholes/590603

8 Estimated Background Soil Chemistry

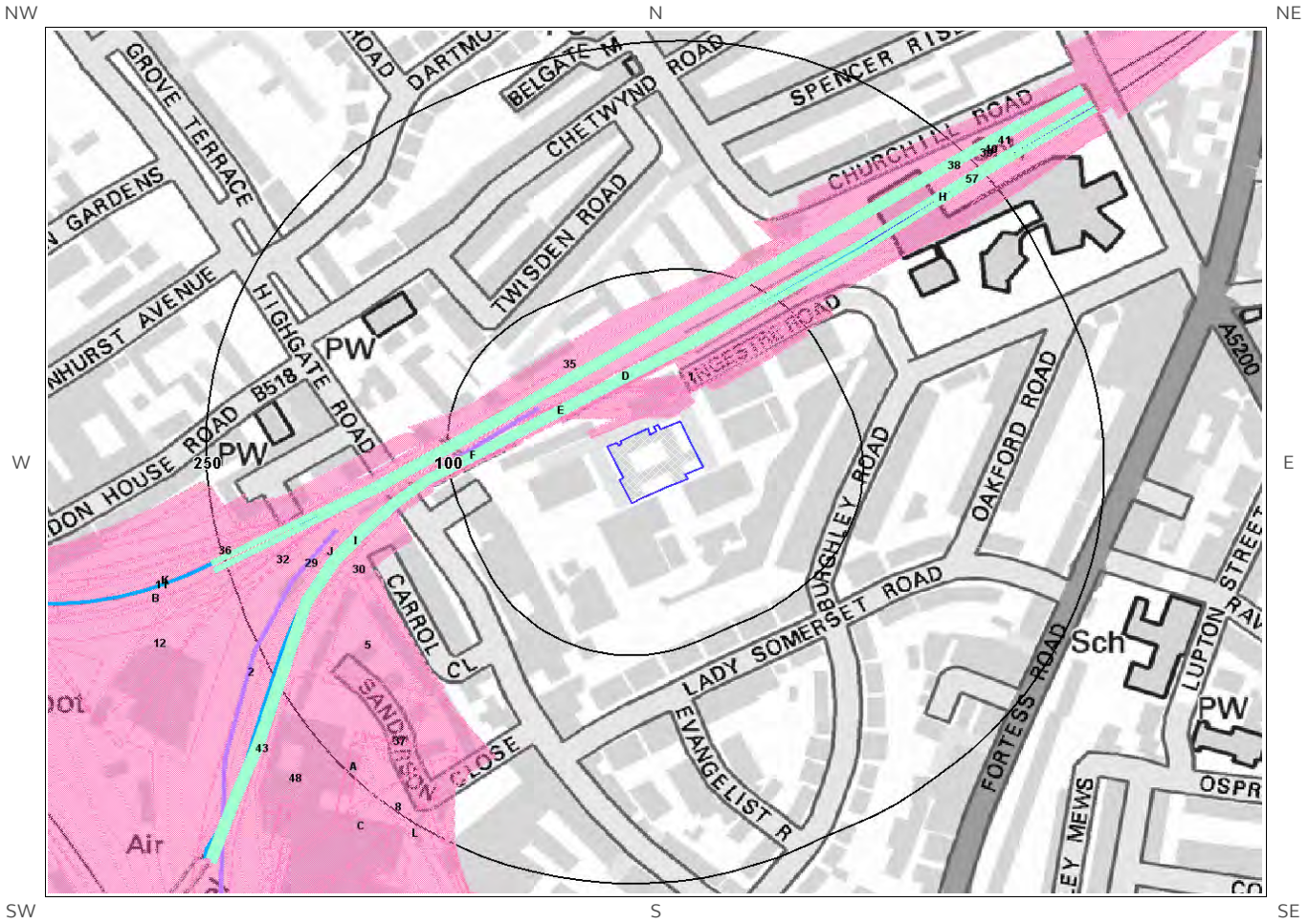
Records of background estimated soil chemistry within 250m of the study site boundary: 1

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	London	No data	No data	No data	No data	No data

*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? Yes

Distance (m)	Direction	Detail
34	NW	Railway Tunnel
124	W	Railway Tunnel
164	NE	Railway Tunnel
168	NE	Railway Tunnel

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? No

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

ID	Distance (m)	Direction	NGR	Details	Date
1	4	NW	528854 185817	Railway Sidings	1920
26G	7	N	528850 185817	Railway Sidings	1936

ID	Distance (m)	Direction	NGR	Details	Date
27G	8	NW	528845 185813	Railway Sidings	1952
28	9	NW	528469 185469	Railway Sidings	1952
29	10	N	n/a	Railway	1930
2	15	N	528631 185543	Railway Sidings	1938
30	19	N	n/a	Railway	1915
31	25	N	519194 185570	Railway Sidings	1915
14D	28	NW	528787 185809	Tunnel	1967
15D	28	NW	528787 185809	Tunnel	1952
61D	28	NW	528750 185788	Tunnel	1974
62D	28	NW	528750 185788	Tunnel	1958
63D	28	NW	528750 185788	Tunnel	1965
16E	29	NW	528746 185787	Tunnel	1973
17E	29	NW	528746 185787	Tunnel	1966
18E	29	NW	528746 185787	Tunnel	1952
19E	29	NW	528745 185787	Tunnel	1991
20E	29	NW	528745 185787	Tunnel	1981
21E	29	NW	528745 185787	Tunnel	1981
22D	30	NW	528787 185810	Tunnel	1995
32	31	N	n/a	Railway	1896
33H	44	N	528982 185927	Railway Sidings	1896
34H	46	N	528978 185927	Railway Sidings	1936
35	50	NW	n/a	Railway	1873
23F	54	W	528692 185757	Tunnel	1967
24F	54	W	528692 185757	Tunnel	1952
25F	55	W	528692 185758	Tunnel	1995
64F	55	W	528691 185756	Tunnel	1958
65F	55	W	528691 185756	Tunnel	1974
66F	55	W	528691 185756	Tunnel	1965
36	80	W	528232 185714	Railway Sidings	1967
37	112	W	528523 185497	Railway Sidings	1936
38	114	NE	n/a	Railway	1916
39	117	NE	n/a	Railway	1890

ID	Distance (m)	Direction	NGR	Details	Date
40	123	NE	n/a	Railway	1916
41	140	NE	n/a	Railway	1930
42	142	W	528557 185476	Railway Sidings	1896
43	146	W	528507 185469	Railway Sidings	1967
44I	162	W	528619 185700	Railway Sidings	1991
45I	162	W	528619 185700	Railway Sidings	1981
46I	162	W	528619 185700	Railway Sidings	1981
3A	166	SW	528641 185418	Railway Sidings	1965
4A	166	SW	528641 185418	Railway Sidings	1958
47	166	SW	518901 185210	Railway Sidings	1915
48	168	SW	528593 185558	Railway Sidings	1952
5	173	SW	528635 185640	Railway Sidings	1920
6B	176	W	528506 185657	Railway Sidings	1949
49J	177	W	528603 185693	Railway Sidings	1952
50J	177	W	528603 185693	Railway Sidings	1966
51J	177	W	528603 185693	Railway Sidings	1973
52J	179	W	528602 185689	Railway Sidings	1991
53J	179	W	528602 185689	Railway Sidings	1981
54J	179	W	528602 185689	Railway Sidings	1981
7B	189	W	528517 185662	Railway Sidings	1920
8	196	SW	528743 185342	Railway Sidings	1949
55K	197	W	528277 185694	Railway Sidings	1896
9C	199	SW	528689 185396	Railway Sidings	1869
10C	199	SW	528630 185396	Railway Sidings	1879
11	203	W	528498 185675	Railway Sidings	1894
12	203	W	528503 185635	Railway Sidings	1958
56K	203	W	518694 185422	Railway Sidings	1915
57	206	NE	n/a	Railway	1898
58K	211	W	528347 185671	Railway Sidings	1936
59L	212	SW	n/a	Railway	1873
13L	213	SW	528793 185273	Railway Sidings	1920

ID	Distance (m)	Direction	NGR	Details	Date
60	228	W	n/a	Railway	1866

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
49	NW	Abandoned
177	W	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? No

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

Distance (m)	Direction	Name	Type
33	NW	Not given	Rail
33	NW	Not given	Rail
37	NW	Not given	Rail
37	NW	Not given	Rail
48	NW	Gospel Oak to Barking Line	Rail
48	NW	Gospel Oak to Barking Line	Rail
50	NW	Not given	Multi Track
50	NW	Not given	Multi Track
51	N	Not given	Rail
51	N	Not given	Multi Track
51	N	Not given	Multi Track
51	N	Not given	Rail
52	NW	Gospel Oak to Barking Line	Rail
52	NW	Gospel Oak to Barking Line	Rail
54	N	Not given	Rail
54	N	Not given	Rail
112	W	Not given	Multi Track
112	W	Not given	Multi Track
114	W	Not given	Rail
114	W	Not given	Rail

Distance (m)	Direction	Name	Type
116	W	Not given	Rail
116	W	Not given	Rail
127	W	Gospel Oak to Barking Line	Rail
127	W	Gospel Oak to Barking Line	Rail
129	W	Gospel Oak to Barking Line	Rail
129	W	Gospel Oak to Barking Line	Rail
146	W	Gospel Oak to Barking Line	Rail
146	W	Gospel Oak to Barking Line	Rail
147	W	Gospel Oak to Barking Line	Rail
147	W	Gospel Oak to Barking Line	Rail
161	NE	Gospel Oak to Barking Line	Rail
161	NE	Gospel Oak to Barking Line	Rail
162	NE	Gospel Oak to Barking Line	Rail
162	NE	Gospel Oak to Barking Line	Rail
166	NE	Gospel Oak to Barking Line	Rail
166	NE	Gospel Oak to Barking Line	Rail
167	NE	Gospel Oak to Barking Line	Rail
167	NE	Gospel Oak to Barking 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

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Email:**enquiries@bgs.ac.uk**
Web:**www.bgs.ac.uk**
BGS Geological Hazards Reports and general geological enquiries

British Gypsum

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The Coal Authority

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Public Health England

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Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
https://www.gov.uk/government/organisations/public-health-england
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