

APPENDIX II

APPENDIX II – DESK STUDY INFORMATION

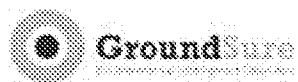
GroundSure Environmental and Geological Databases

Enquiries were made to the GroundSure Environmental and Geological Databases regarding the site and surrounding area. This database includes collated and continuously updated information from a variety of sources and includes entries that cover Environment Agency licences, waste sites, hazardous substances, geological data, industrial landuse, groundwater vulnerability, source protection zones and floodplains.

Two reports (EnviroInsight and GeoInsight) are included in this Appendix for a search radius of 1 km around the site and includes a summary table of the search results. Detailed information contained in these reports have been included only if it is relevant to the geotechnical and environmental assessment. All other pages have been omitted. A full copy of the GroundSure Reports can be provided on request.

British Geological Survey

Records of Wells and Exploratory Holes close to the site, held by the British Geological Survey National Geological Records Centre, are presented in this Appendix. The locations of these holes are identified within the results of the GeoInsight Report. The records are reproduced under the Open Government Licence, available for viewing at <http://www.nationalarchives.gov.uk/doc/open-government-licence>.



GroundSure EnvirolInsight

Address: CCL02593,Bradbury Hotel,Station Road, Eat Preston,BN16 3AJ,
Date: 13 Oct 2014
Reference: EMS-271584_366261
Client: EmapSite

NW

N

NE

W

E



SW

S

SE

Aerial Photograph Capture date: 13-Sep-2012
Grid Reference: 506503,102639
Site Size: 0.23ha

Overview of Findings

For further details on each dataset, please refer to each individual section in the main 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: Environmental Permits, Incidents and Registers		On-site	0-50m	51-250	251-500		
1.1 Industrial Sites Holding Environmental Permits and/or Authorisations							
1.1.1	Records of historic IPC Authorisations	0	0	0	0		
1.1.2	Records of Part A(1) and IPPC Authorised Activities	0	0	0	0		
1.1.3	Records of Water Industry Referrals (potentially harmful discharges to the public sewer)	0	0	0	0		
1.1.4	Records of Red List Discharge Consents (potentially harmful discharges to controlled waters)	0	0	0	0		
1.1.5	Records of List 1 Dangerous Substances Inventory sites	0	0	0	0		
1.1.6	Records of List 2 Dangerous Substances Inventory sites	0	0	0	0		
1.1.7	Records of Part A(2) and Part B Activities and Enforcements	0	0	1	2		
1.1.8	Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0		
1.1.9	Records of Licensed Discharge Consents	0	0	1	5		
1.1.10	Records of Planning Hazardous Substance Consents and Enforcements	0	0	0	0		
1.2	Records of COMAH and NIHHS sites	0	0	0	0		
1.3 Environment Agency Recorded Pollution Incidents							
1.3.1	National Incidents Recording System, List 2	0	0	1	3		
1.3.2	National Incidents Recording System, List 1	0	0	0	0		
1.4	Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0		
Section 2: Landfill and Other Waste Sites		On-site	0-50m	51-250	251-500	501-1000	1000-5000
2.1 Landfill Sites							
2.1.1	Environment Agency Registered Landfill Sites	0	0	0	0	0	Not searched
2.1.2	Environment Agency Historic Landfill Sites	0	0	0	0	0	0
2.1.3	BGS/DoE Landfill Site Survey	0	0	0	0	0	0
2.1.4	GroundSure Local Authority Landfill Sites Data	0	0	0	0	0	0
2.2 Landfill and Other Waste Sites Findings							
2.2.1	Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	Not searched	Not searched
2.2.2	Environment Agency Licensed Waste Sites	0	0	0	2	0	0

Section 3: Current Land Use	On-site	0-50m	51-250	251-500
3.1 Current Industrial Sites Data	0	0	3	Not searched
3.2 Records of Petrol and Fuel Sites	0	0	0	1
3.3 Underground High Pressure Oil and Gas Pipelines	0	0	0	0

Section 4: Geology	
4.1 Are there any records of Artificial Ground and Made Ground present beneath the study site?	No
4.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site?	Yes
4.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 5: Hydrogeology and Hydrology	0-500m					
5.1 Are there any records of Strata Classification in the Superficial Geology within 500m of the study site?	Yes					
5.2 Are there any records of Strata Classification in the Bedrock Geology within 500m of the study site?	Yes					
	On-site	0-50m	51-250	251-500	501-1000	1000-2000
5.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	0	2	4
5.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	2	0
5.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	1	0
5.6 Source Protection Zones (within 500m of the study site)	0	0	0	1	Not searched	Not searched
5.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
5.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	1	0	0	0	Not searched	Not searched
	On-site	0-50m	51-250	251-500	501-1000	1000-1500
5.9 Is there any Environment Agency information on river quality within 1500m of the study site?	No	No	No	No	No	No
5.10 Detailed River Network entries within 500m of the site	0	0	0	0	Not searched	Not searched
5.11 Surface water features within 250m of the study site	No	No	No	Not searched	Not searched	Not searched

Section 6: Flooding

6.1 Are there any Environment Agency Zone 2 floodplains within 250m of the study site?	No
6.2 Are there any Environment Agency Zone 3 floodplains within 250m of the study site?	No
6.3 Are there any Flood Defences within 250m of the study site?	No
6.4 Are there any areas benefiting from Flood Defences within 250m of the study site?	No
6.5 Are there any areas used for Flood Storage within 250m of the study site?	No
6.6 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	Potential below Surface
6.7 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	High

Section 7: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
7.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	0	0
7.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
7.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
7.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
7.5 Records of Ramsar sites	0	0	0	0	0	0
7.6 Records of Ancient Woodlands	0	0	0	0	0	0
7.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	0
7.8 Records of World Heritage Sites	0	0	0	0	0	0
7.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0
7.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0
7.11 Records of National Parks	0	0	0	0	0	1
7.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
7.13 Records of Nitrate Vulnerable Zones	0	0	0	0	1	1

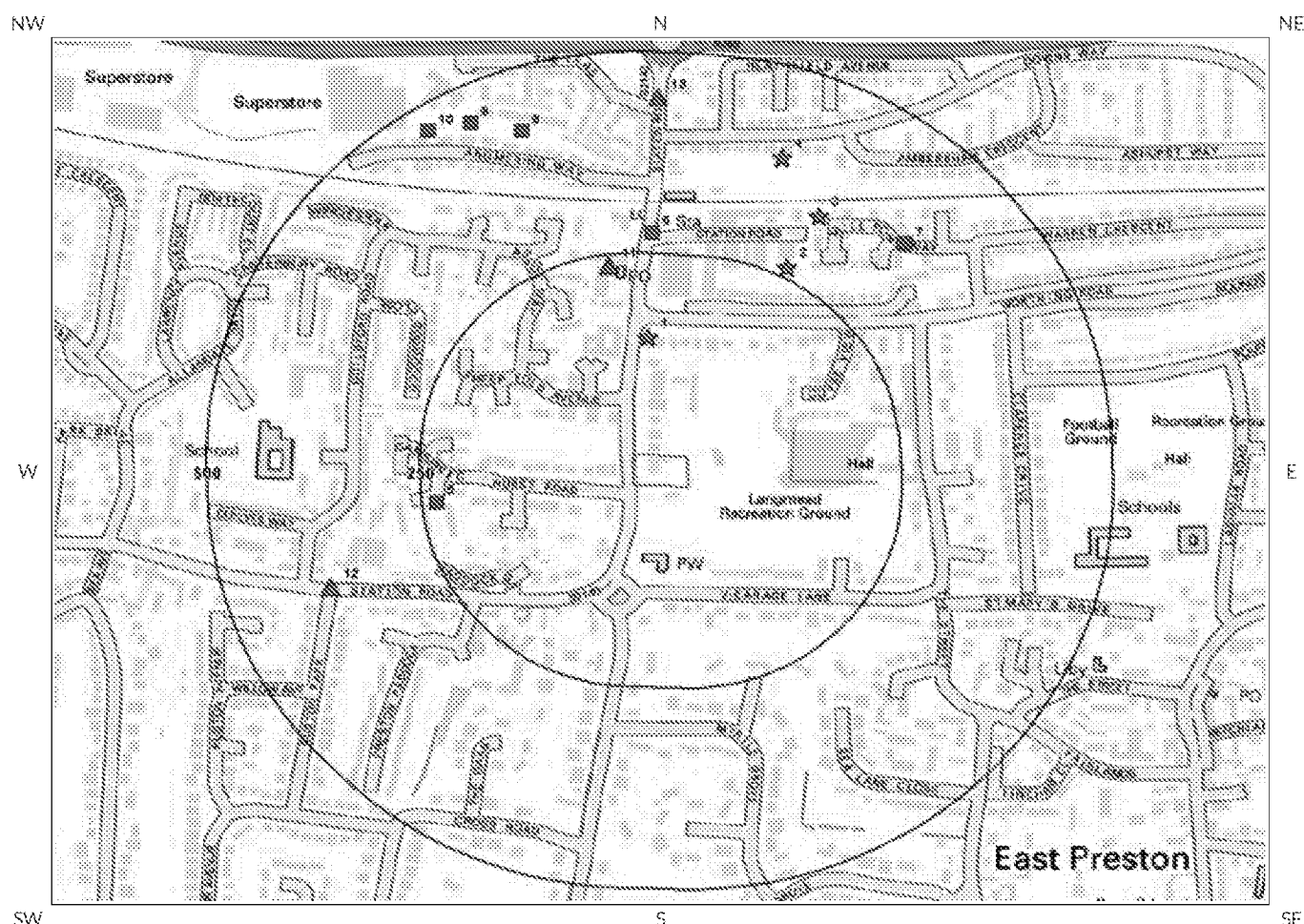
Section 8: Natural Hazards

8.1 What is the maximum risk of natural ground subsidence?	Low
8.1.1 What is the maximum Shrink-Swell hazard rating identified on the study site?	Low
8.1.2 What is the maximum Landslides hazard rating identified on the study site?	Very Low
8.1.3 What is the maximum Soluble Rocks hazard rating identified on the study site?	Very Low
8.1.4 What is the maximum Compressible Ground hazard rating identified on the study site?	Negligible
8.1.5 What is the maximum Collapsible Rocks hazard rating identified on the study site?	Low
8.1.6 What is the maximum Running Sand hazard rating identified on the study site?	Low

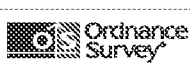
Section 9: Mining

9.1 Are there any coal mining areas within 75m of the study site?	No
9.2 What is the risk of subsidence relating to shallow mining within 150m of the study site?	Low
9.3 Are there any brine affected areas within 75m of the study site?	No

1. Environmental Permits, Incidents and Registers Map



Environmental Permits,
Incidents and Registers Legend



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- | | | |
|--|---------------------------------|--|
|  Site Outline | ★ Recorded Pollution Incident | ▼ RAS 3 & 4 Authorisations |
|  Search Buffers (m) | ◆ Dangerous Substances (List 1) | ▲ Part A(1) Authorised Processes and Historic IPC Authorisations |
| | ◇ Dangerous Substances (List 2) | ▲ Part A(2) and Part B Authorised Processes |
| | ■ Water Industry Referrals | ⬢ COMAH / NIIHS Sites |
| | ■ Licensed Discharge Consents | ⬢ Sites Determined as Contaminated Land |
| | □ Red List Discharge Consents | ● Hazardous Substance Consents and Enforcements |

Report Reference: EMS-271584_366261
Client Reference: EMS_271584_366261

1.1.6 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:

0

Database searched and no data found.

1.1.7 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site:

3

The following Part A(2) and Part B Activities are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance	Direction	NGR	Details
11	234.0	N	506442 102891	Address: Kingfisher Cleaners, Shop 3 Station Parade, Station Road, East Preston, BN16 3AE Process: Dry Cleaning Status: Current Permit Permit Type: Part B Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified
12	379.0	W	506116 102493	Address: Texaco Ltd, Star Service Station, Station Road, Littlehampton, BN16 2RB Process: Service Station Status: Historical Permit Permit Type: Part B Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified
13	441.0	N	506500 103100	Address: Star Serv Stn, Station Rd, BN16 2RB Process: Petrol Vapour Recovery Process Status: Historical Permit Permit Type: Part B Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified

1.1.8 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

1.1.9 Records of Licensed Discharge Consents within 500m of the study site:

6

The following Licensed Discharge Consents records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance	Direction	NGR	Details
5	233.0	W	506240 102600	Address: Oakhurst Gardens, Oakhurst Gardens, Rustington, Littlehampton, West Sussex Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: P01797 Permit Version: 1 Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 1/8/1988 Effective Date: 1/8/1988 Revocation Date: -

1.3 Environment Agency Recorded Pollution Incidents

1.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:

4

The following NIRS List 2 records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance	Direction	NGR	Details
1	145.0	N	506488 102804	Incident Date: 04/12/2002 Incident Identification: 124589 Pollutant: Oils and Fuel Pollutant Description: Gas and Fuel Oils Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)
2	262.0	NE	506650 102891	Incident Date: 02/10/2001 Incident Identification: 34254 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Smoke Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
3	335.0	NE	506688 102954	Incident Date: 08/02/2002 Incident Identification: 57303 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Smoke Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)
4	386.0	N	506645 103026	Incident Date: 04/07/2001 Incident Identification: 13530 Pollutant: Inert Materials and Wastes Pollutant Description: Construction and Demolition Materials and Wastes Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)

1.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:

0

Database searched and no data found.

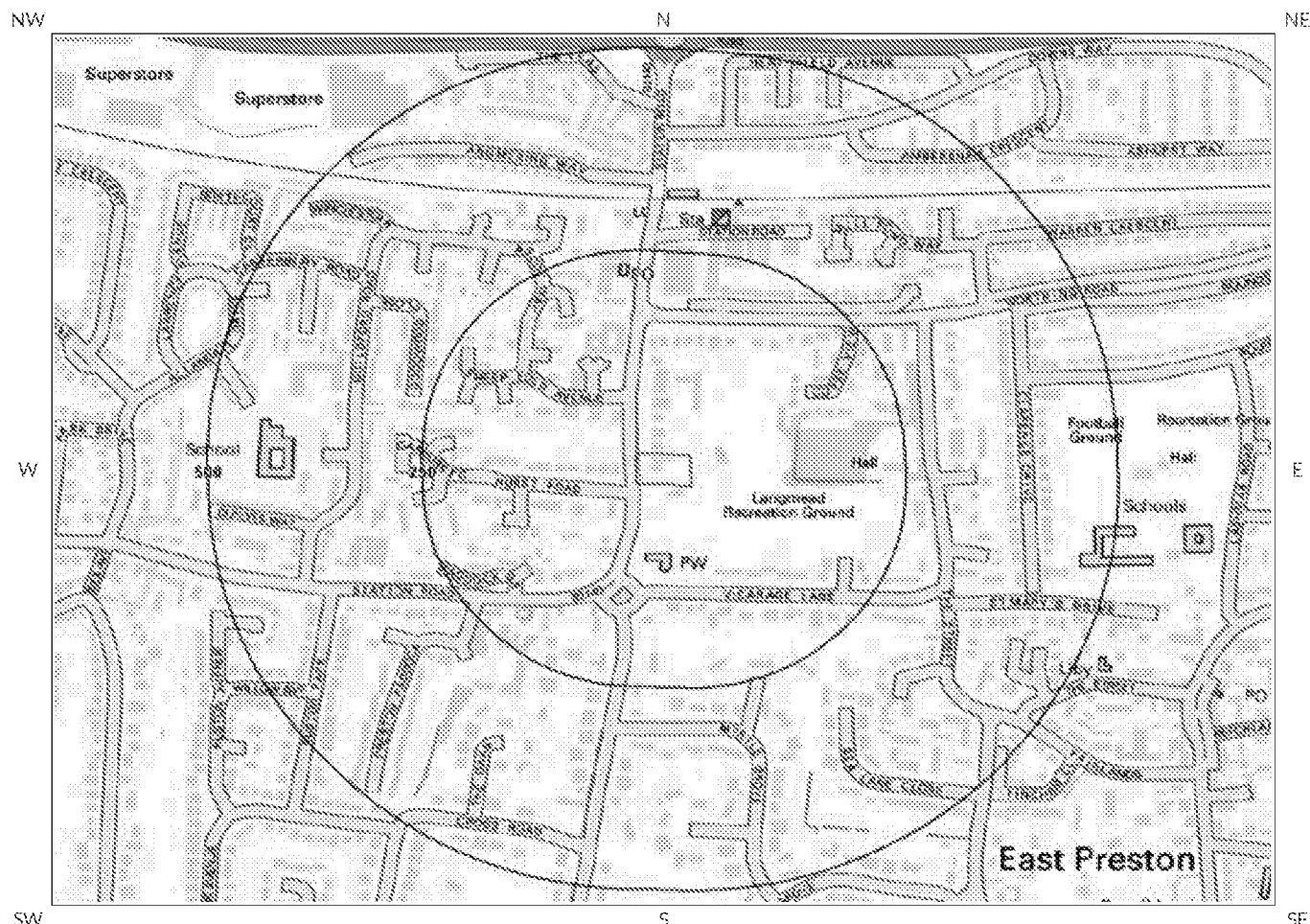
1.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site?

0

Database searched and no data found.

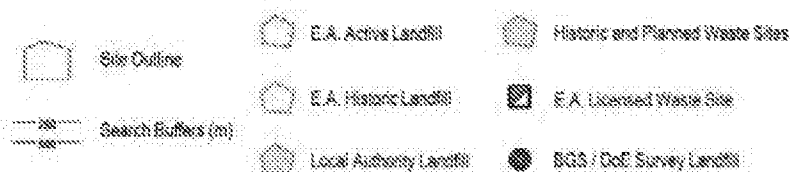
2. Landfill and Other Waste Sites Map



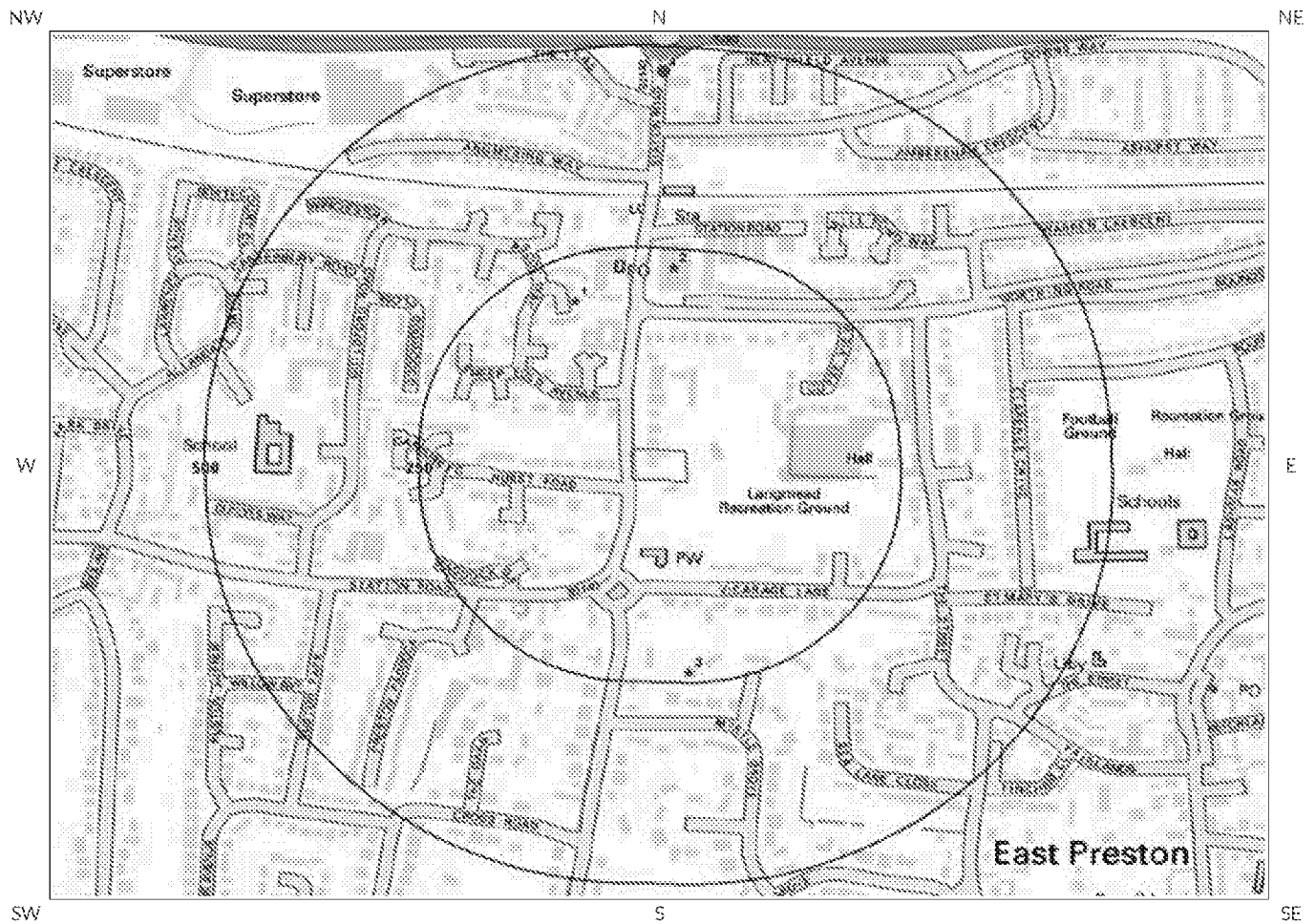
Landfill and Other Waste Sites Legend



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3. Current Land Use Map



Current Land Use Legend



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Site Outline



Search Buffers (m)



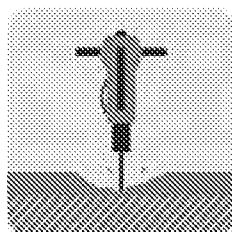
Current Industrial Sites



Petrol & Fuel Sites



Underground High Pressure Oil & Fuel Pipelines



3. Current Land Uses

3.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site:

3

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	195.0	N	Electricity Sub Station	506405 102842	BN16	Electrical Features	Infrastructure and Facilities
2	227.0	N	Gerrard House Business Centre	506520 102884	BN16	Business Parks and Industrial Estates	Industrial Features
3	237.0	S	Electricity Sub Station	506538 102382	BN16	Electrical Features	Infrastructure and Facilities

3.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site:

1

The following petrol or fuel site records provided by Catalist are represented as points on the Current Land Use map:

ID	Distance (m)	Direction	NGR	Company	Address	LPG	Status
4	469.0	N	506508 103127	Texaco	Star Angmering, Station Road, Station Road, B2140, Angmering, Littlehampton, West Sussex, BN16 4HH	Not Applicable	Obsolete

3.3 Underground High Pressure Oil and Gas Pipelines

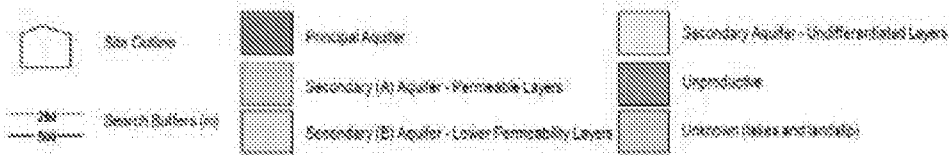
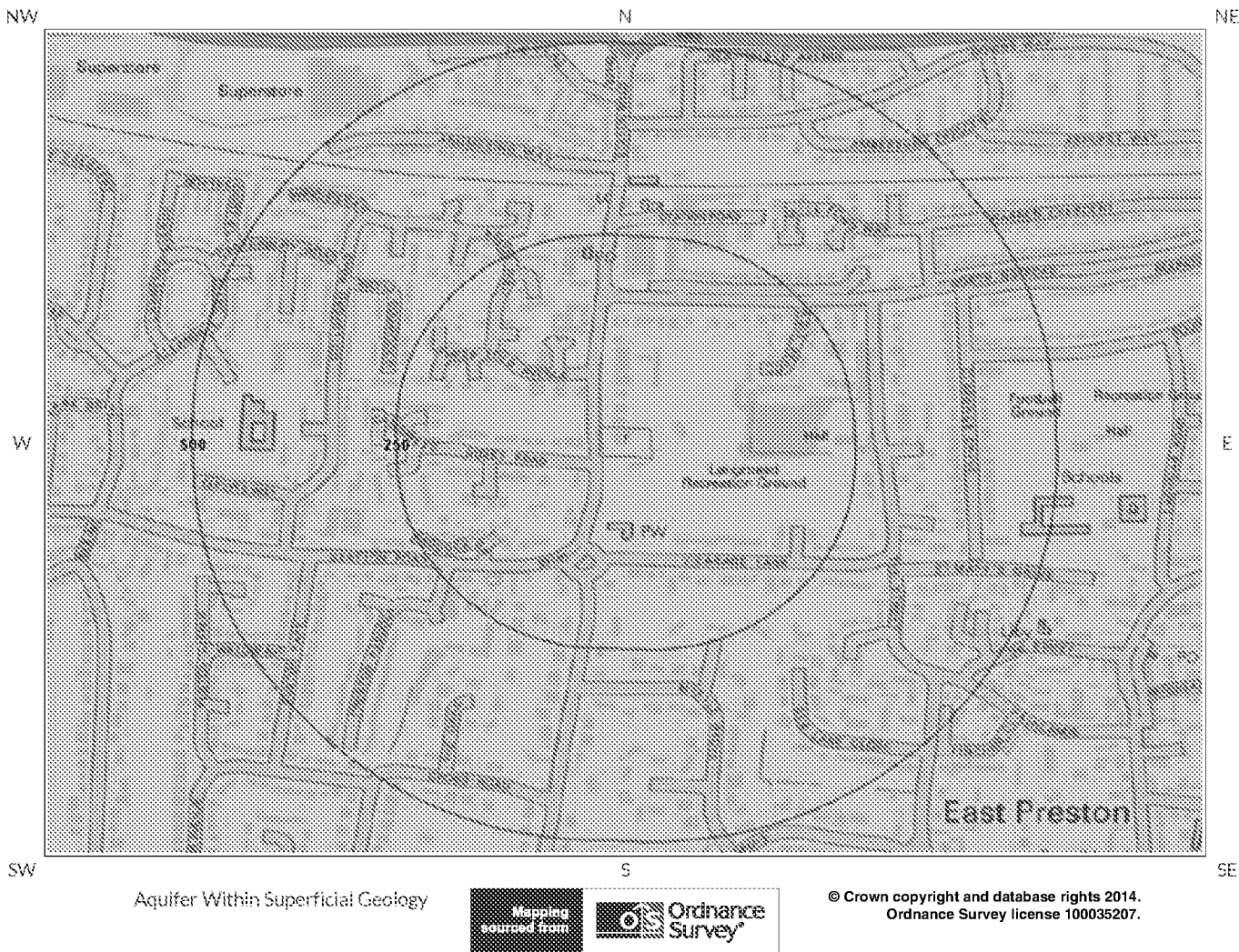
Records of high pressure underground pipelines within 500m of the study site:

0

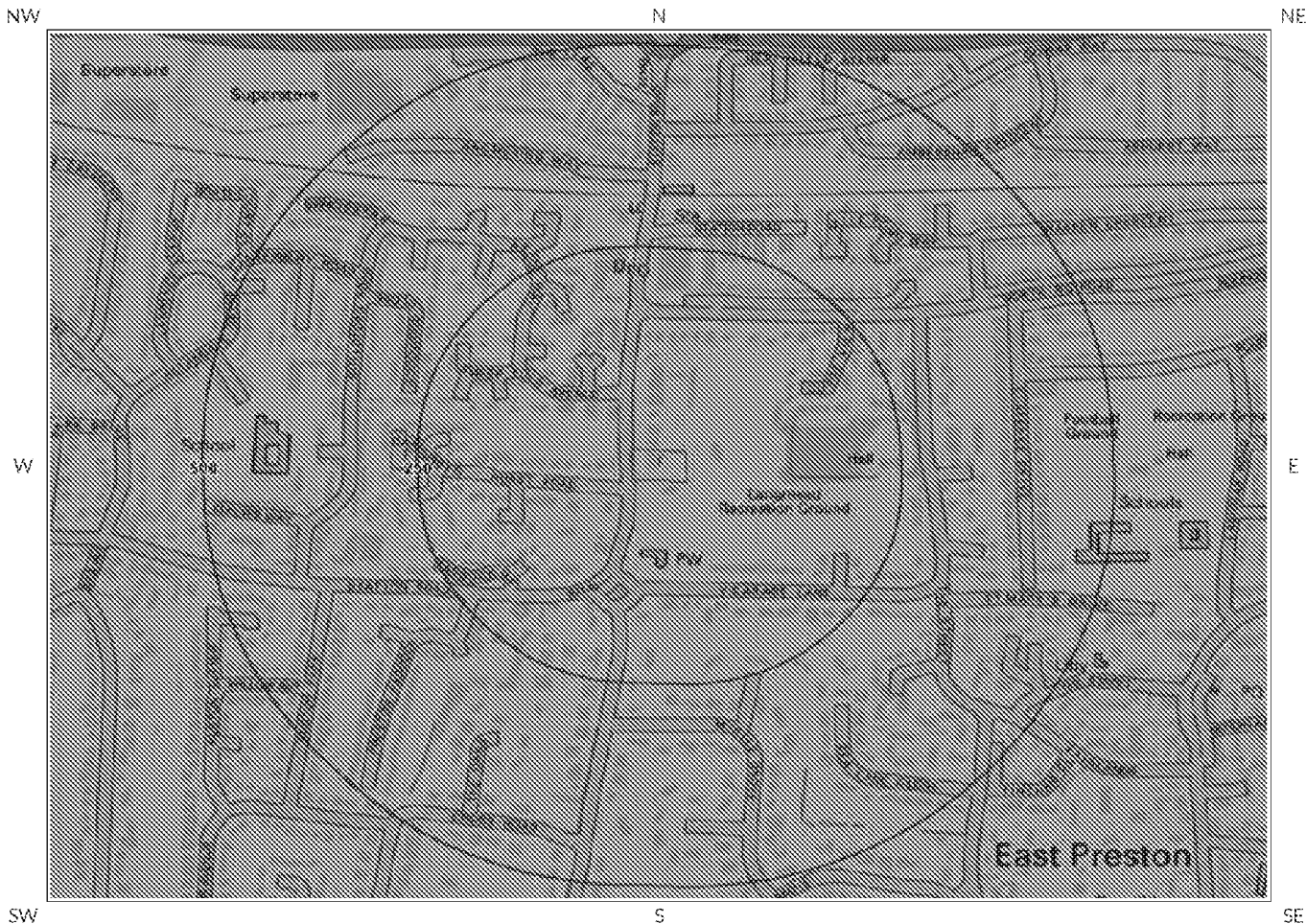
Database searched and no data found.

5. Hydrogeology and Hydrology

5a. Aquifer Within Superficial Geology



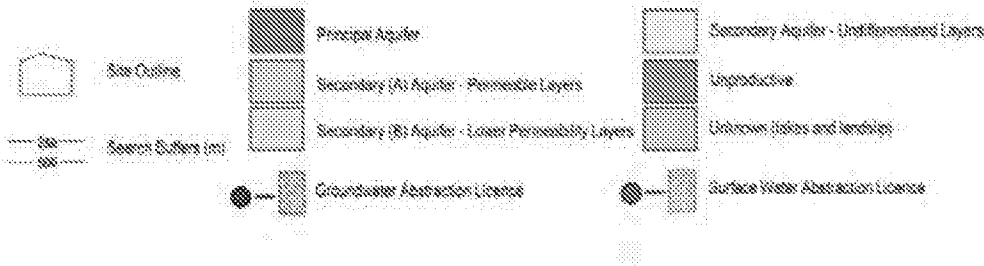
5b. Aquifer Within Bedrock Geology and Abstraction Licenses



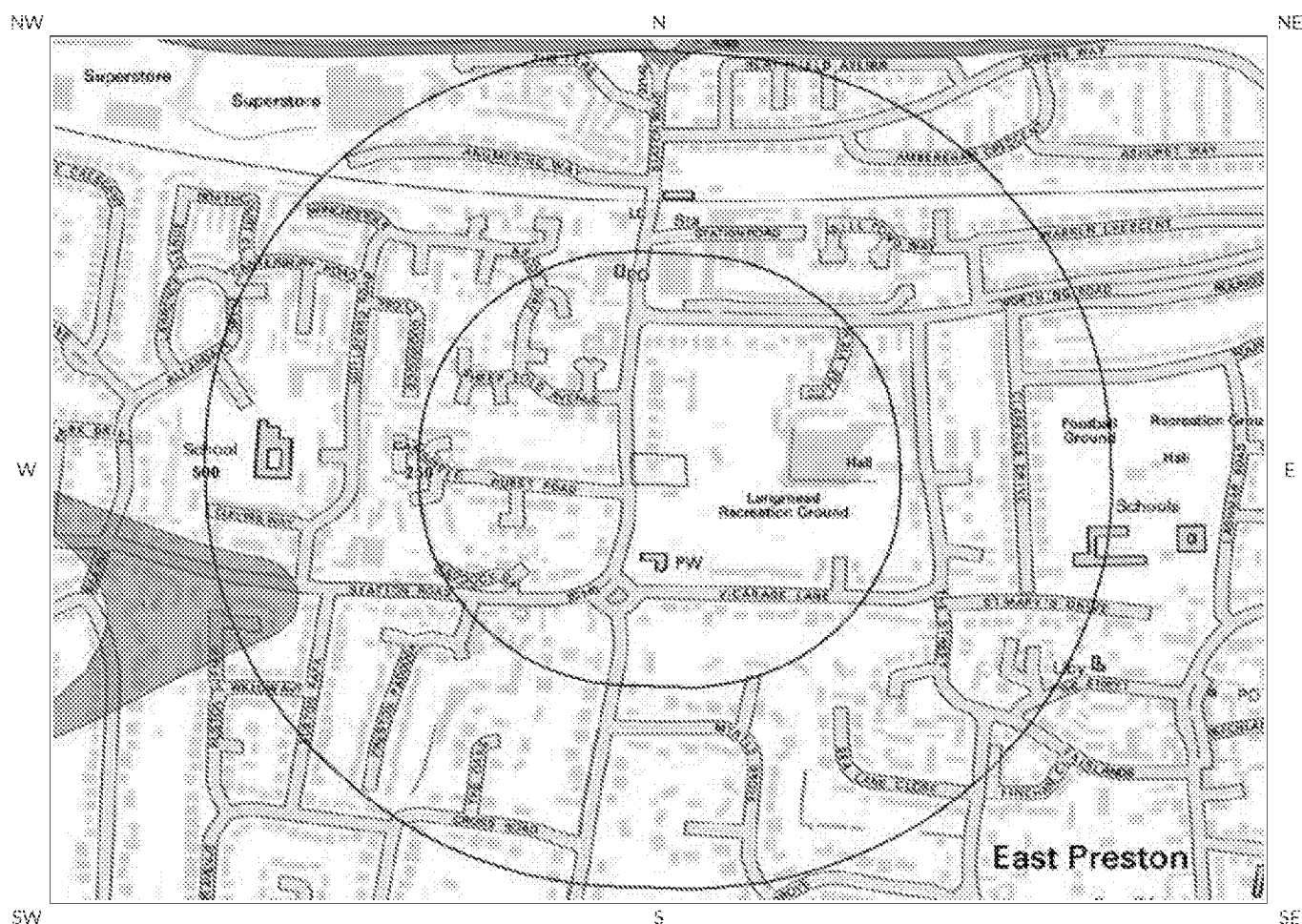
Aquifer Within Bedrock Geology and
Abstraction Licenses



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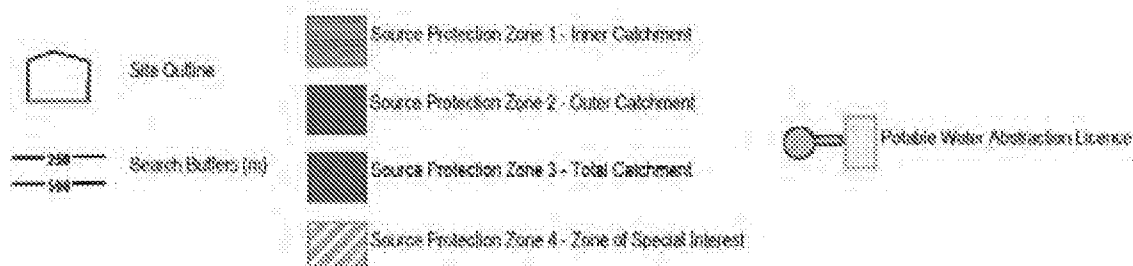
5c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses



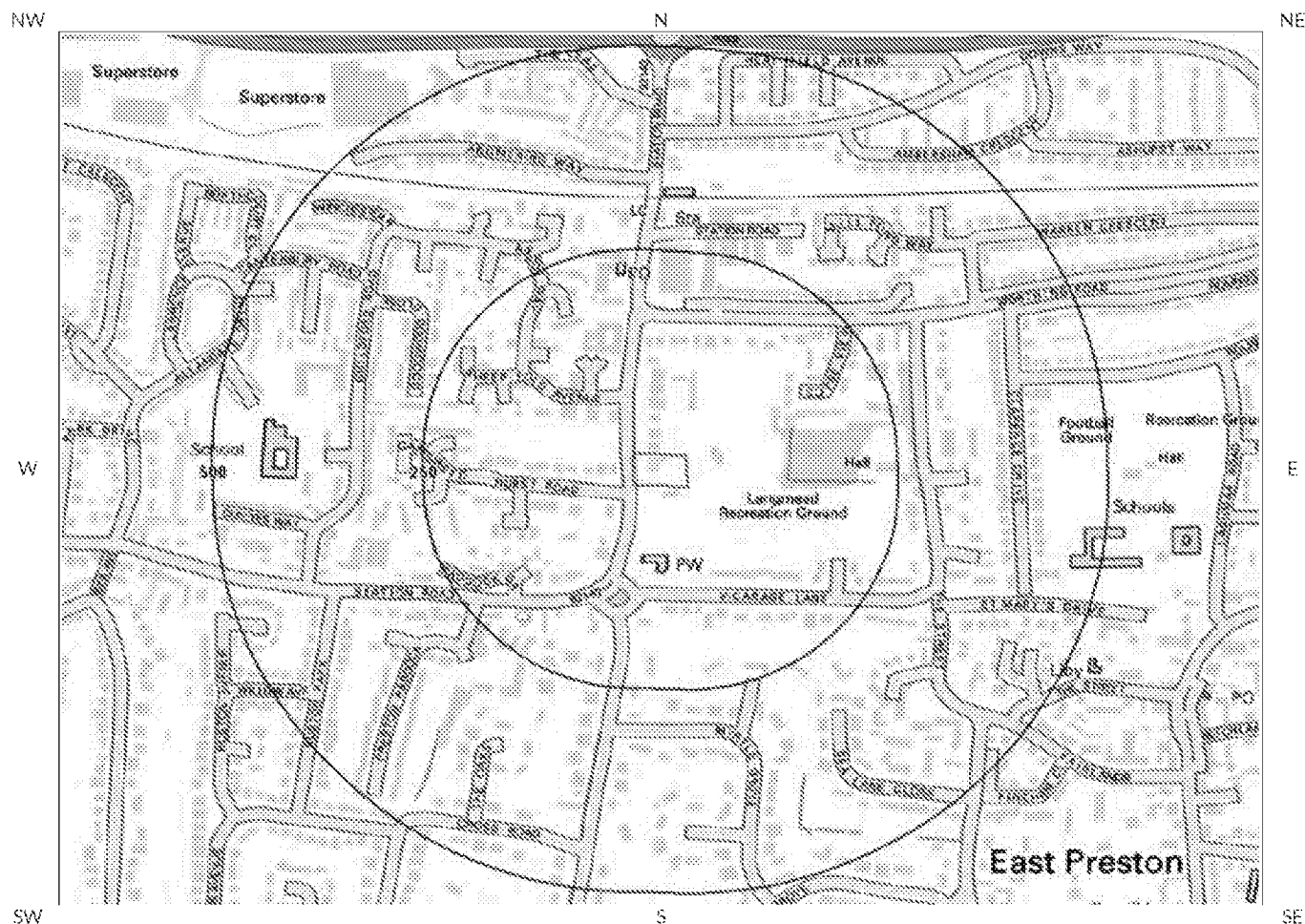
Map Legend Source Protection Zones and Potable Water Abstraction Licenses



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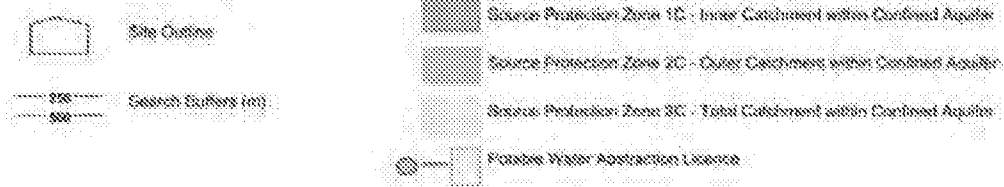
5d. Hydrology Source Protection Zones within confined aquifer



Hydrology Source Protection Zones

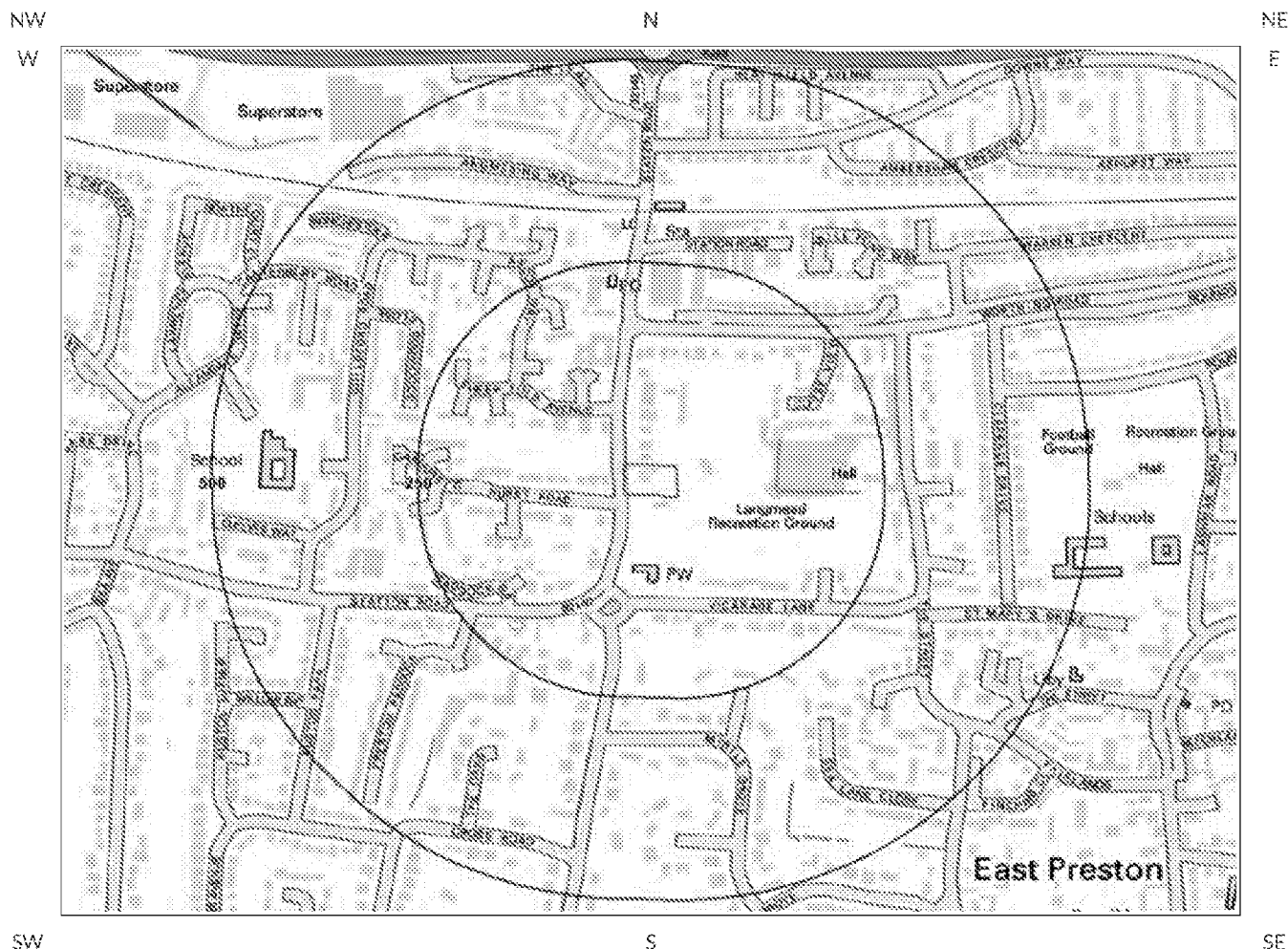


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Report Reference: EMS-271584_366261
Client Reference: EMS_271584_366261

5 e. Hydrology – Detailed River Network and River Quality



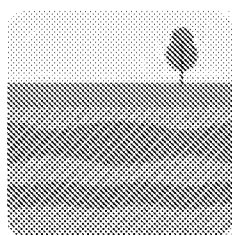
Hydrology - Detailed River Network and River Quality



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Report Reference: EMS-271584_366261
Client Reference: EMS_271584_366261



5. Hydrogeology and Hydrology

5.1 Aquifer within Superficial Deposits

Are there records of strata classification within the superficial geology at or in proximity to the property? **Yes**

From 1 April 2010, the Environment Agency's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the GroundSure Enviroinsight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (5a):

ID	Distance (m)	Direction	Designation	Description
1	0.0	On Site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

5.2 Aquifer within Bedrock Deposits

Are there records of strata classification within the bedrock geology at or in proximity to the property? **Yes**

From 1 April 2010, the Environment Agency's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the GroundSure Enviroinsight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (5b):

ID	Distance (m)	Direction	Designation	Description
1	0.0	On Site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers

5.6 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site?

Yes

The following Source Protection Zones records are represented on the SPZ and Potable Water Abstraction Map (5c):

ID	Distance (m)	Direction	Type	Description
1	415.0	W	3	Total Catchment

5.7 Source Protection Zones within Confined Aquifer

Are there any Source Protection Zones within the Confined Aquifer within 500m of the study site?

No

Historically, Source Protection Zone maps have been focused on regulation of activities which occur at or near the ground surface, such as prevention of point source pollution and bacterial contamination of water supplies. Sources in confined aquifers were often considered to be protected from these surface pressures due to the presence of a low permeability confining layer (e.g. glacial till, clay). The increased interest in subsurface activities such as onshore oil and gas exploration, ground source heating and cooling requires protection zones for confined sources to be marked on SPZ maps where this has not already been done.

Database searched and no data found.

5.8 Groundwater Vulnerability and Soil Leaching Potential

Is there any Environment Agency information on groundwater vulnerability and soil leaching potential within 500m of the study site?

Yes

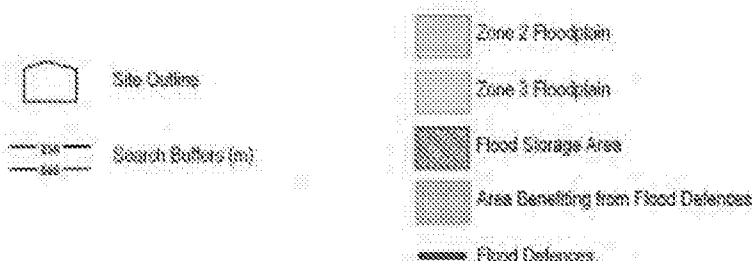
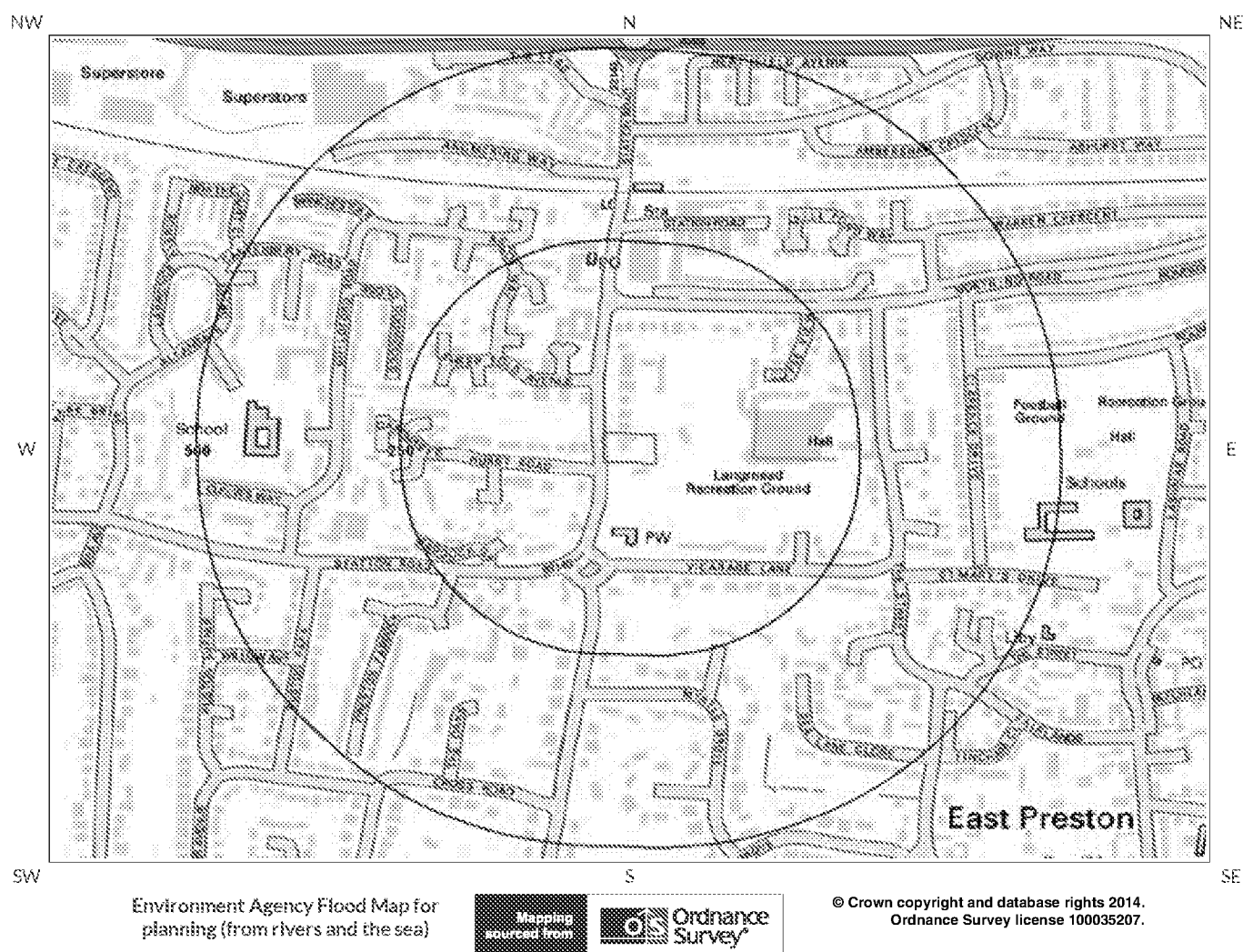
Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Major Aquifer/High Leaching Potential	HU	Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information.

5.9 River Quality

Is there any Environment Agency information on river quality within 1500m of the study site?

No

6. Environment Agency Flood Map for planning (from rivers and the sea)



6.6 Groundwater Flooding Susceptibility Areas

6.6.1 Are there any British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site?

Yes

Does this relate to Clearwater Flooding or Superficial Deposits Flooding?

Clearwater Flooding

Notes: Groundwater flooding may either be associated with shallow unconsolidated sedimentary aquifers which overlie unproductive aquifers (Superficial Deposits Flooding), or with unconfined aquifers (Clearwater Flooding).

6.6.2 What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?

Potential below Surface

Where potential for groundwater flooding of property situated below ground level is indicated, this means that given the geological conditions there may be a groundwater flooding hazard to basements and other below surface infrastructure. Unless other relevant information, e.g. records of previous flooding, suggests groundwater flooding has occurred before in this area you need take no further action in relation to groundwater flooding hazard. If there are records of previous incidences of groundwater flooding, then is recommended that other information e.g. rainfall history, property type, and land drainage information in addition to previous records of flooding be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

6.7 Groundwater Flooding Confidence Areas

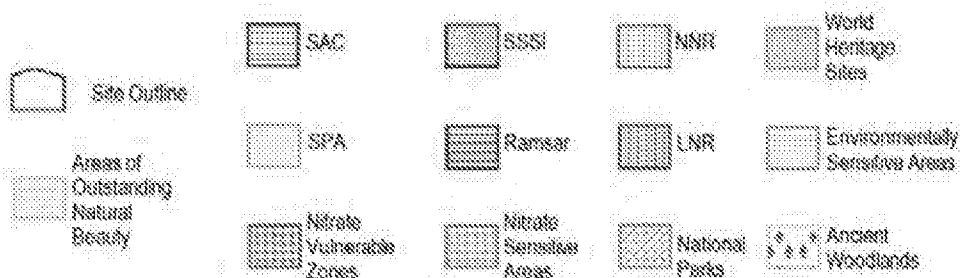
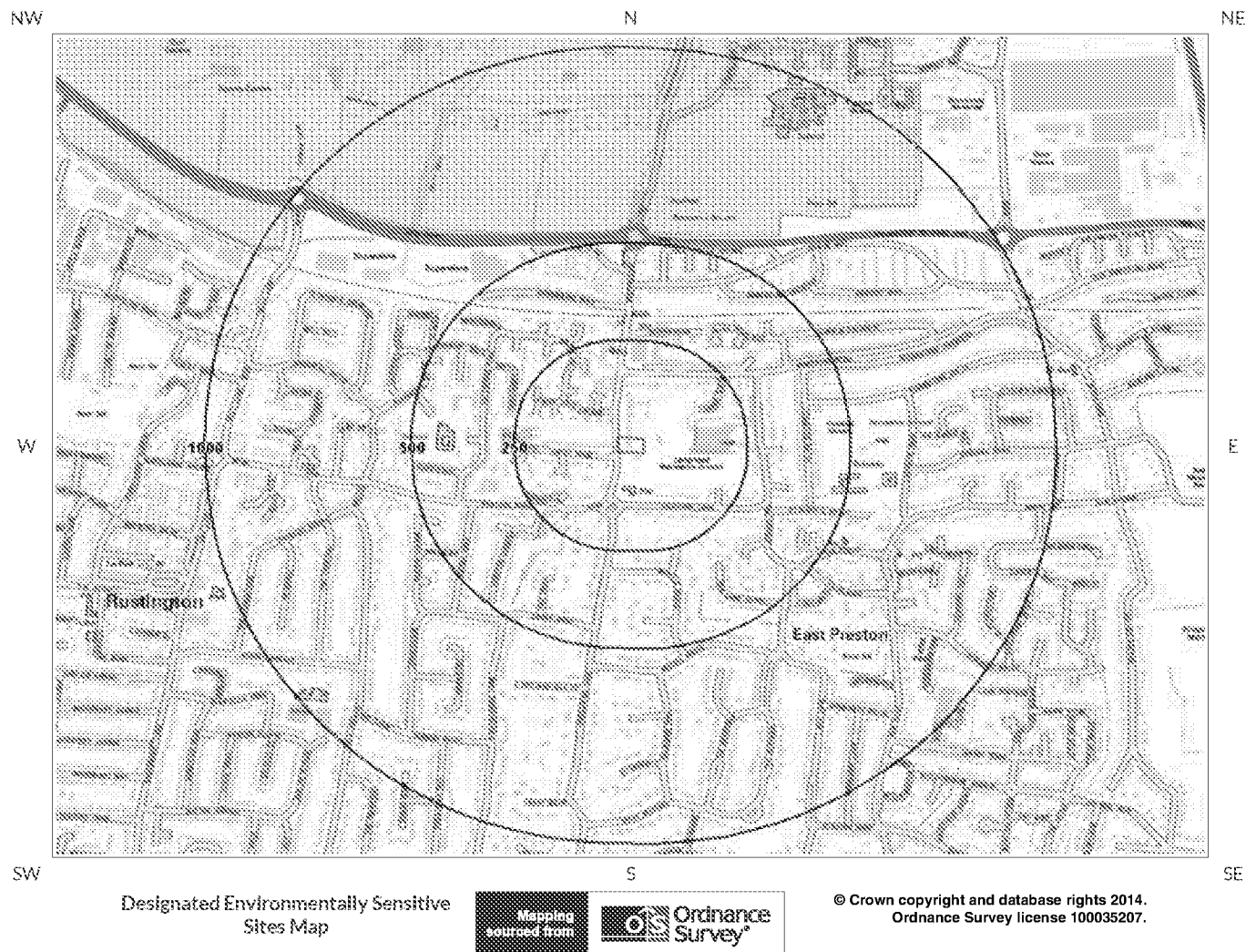
What is the British Geological Survey confidence rating in this result?

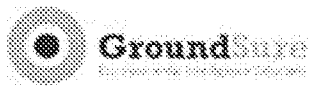
High

Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The confidence rating is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

7. Designated Environmentally Sensitive Sites Map





GroundSure GeoInsight

Address: ,
Date: 21 Oct 2014
Reference: EMS-272712_367719
Client: EmapSite



Aerial Photograph Capture date: 13-Sep-2012
Grid Reference: 506503,102639
Site Size: 0.23ha

Overview of Findings

The GroundSure GeoInsight 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 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Shallow 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

1.1 Artificial Ground	1.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?	Yes
	1.2.2 Are there any records relating to permeability of superficial geology within the study site boundary?	Yes
	1.2.3 Are there any records of landslip within 500m of the study site boundary?	No
	1.2.4 Are there any records relating to permeability of landslips within the study site boundary?	No
1.3 Bedrock, Solid Geology & Faults	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 relating to permeability of bedrock within the study site boundary?	Yes
	1.3.3 Are there any records of faults within 500m of the study site boundary?	Yes
1.4 Radon data	1.4.1 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 in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level
	1.4.2 Is the property in an area where Radon Protection Measures 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

Section 2: Ground Workings	On-site	0-50m	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	0	0	2	Not Searched	Not Searched
2.2 Historical Underground Workings from Small Scale Mapping	0	0	0	0	0
2.3 Current Ground Workings	0	0	0	0	0
Section 3: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
3.1 Historical Mining	0	0	0	0	0

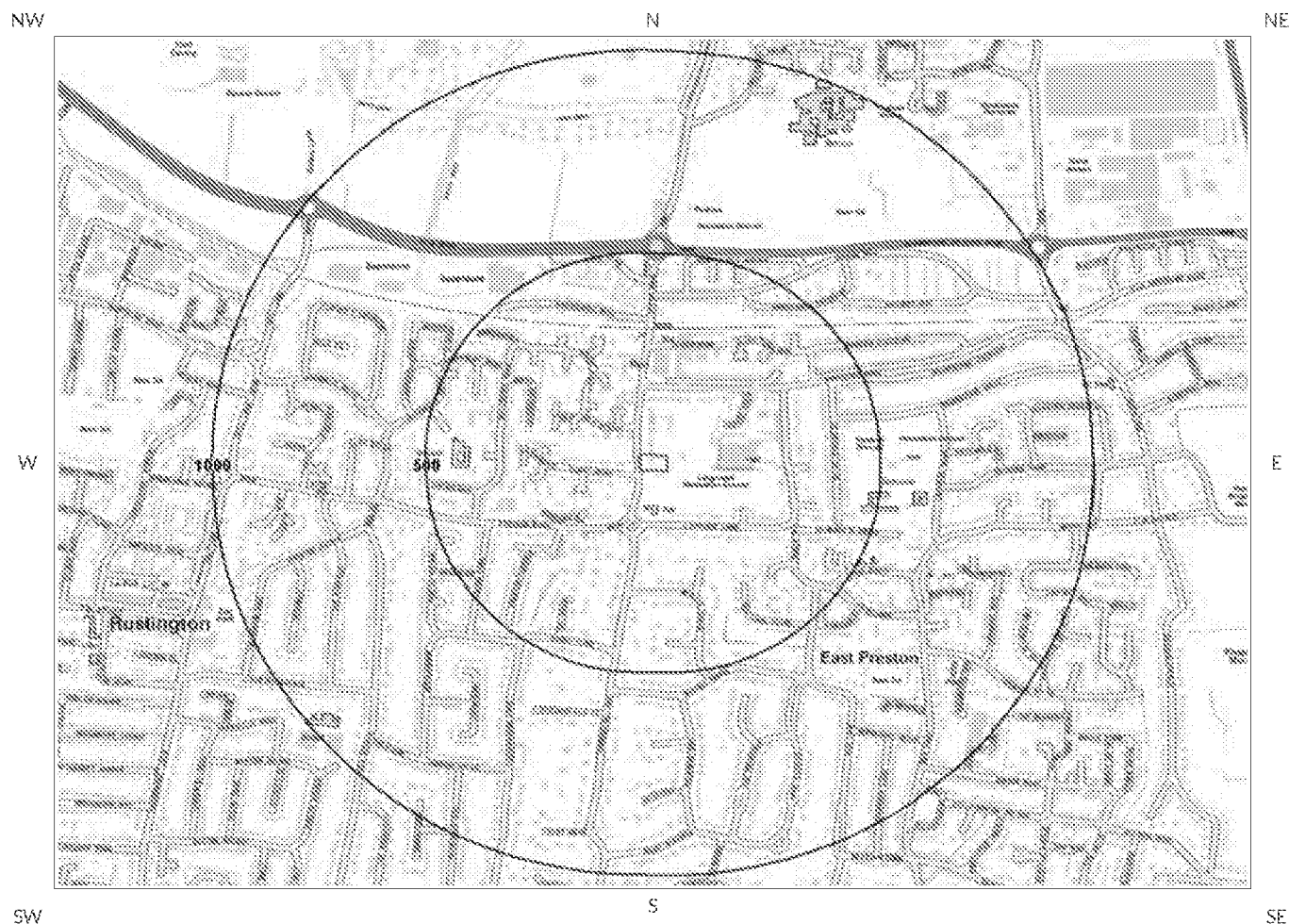
Section 3 Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
3.2 Coal Mining	0	0	0	0	0
3.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
3.4 Non-Coal Mining	1	0	0	0	0
3.5 Non-Coal Mining Cavities	0	0	0	0	0
3.6 Natural Cavities	0	0	0	0	0
3.7 Brine Extraction	0	0	0	0	0
3.8 Gypsum Extraction	0	0	0	0	0
3.9 Tin Mining	0	0	0	0	0
3.10 Clay Mining	0	0	0	0	0
Section 4 Natural Ground Subsidence	On-site				
4.1 Shrink Swell Clay	Low				
4.2 Landslides	Very Low				
4.3 Ground Dissolution of Soluble Rocks	Very Low				
4.4 Compressible Deposits	Negligible				
4.5 Collapsible Deposits	Low				
4.6 Running Sand	Low				
Section 5 Borehole Records	On-site	0-50m	51-250		
5 BGS Recorded Boreholes	0	1	1		
Section 6 Estimated Background Soil Chemistry	On-site	0-50m	51-250		
6 Records of Background Soil Chemistry	1	0	0		
Section 7 Railways and Tunnels	On-site	0-50m	51-250	251-500	
7.1 Tunnels	0	0	0	Not Searched	
7.2 Historical Railway and Tunnel Features	0	0	0	Not Searched	
7.3 Historical Railways	0	0	0	Not Searched	
7.4 Active Railways	0	0	0	Not Searched	

Report Reference: EMS-272712_367719
Client Reference: EMS_272712_367719

Section 7: Railways and Tunnels	On-site	0-50m	51-250	251-500
7.5 Railway Projects	0	0	0	0

1 Geology

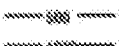
1.1 Artificial Ground Map



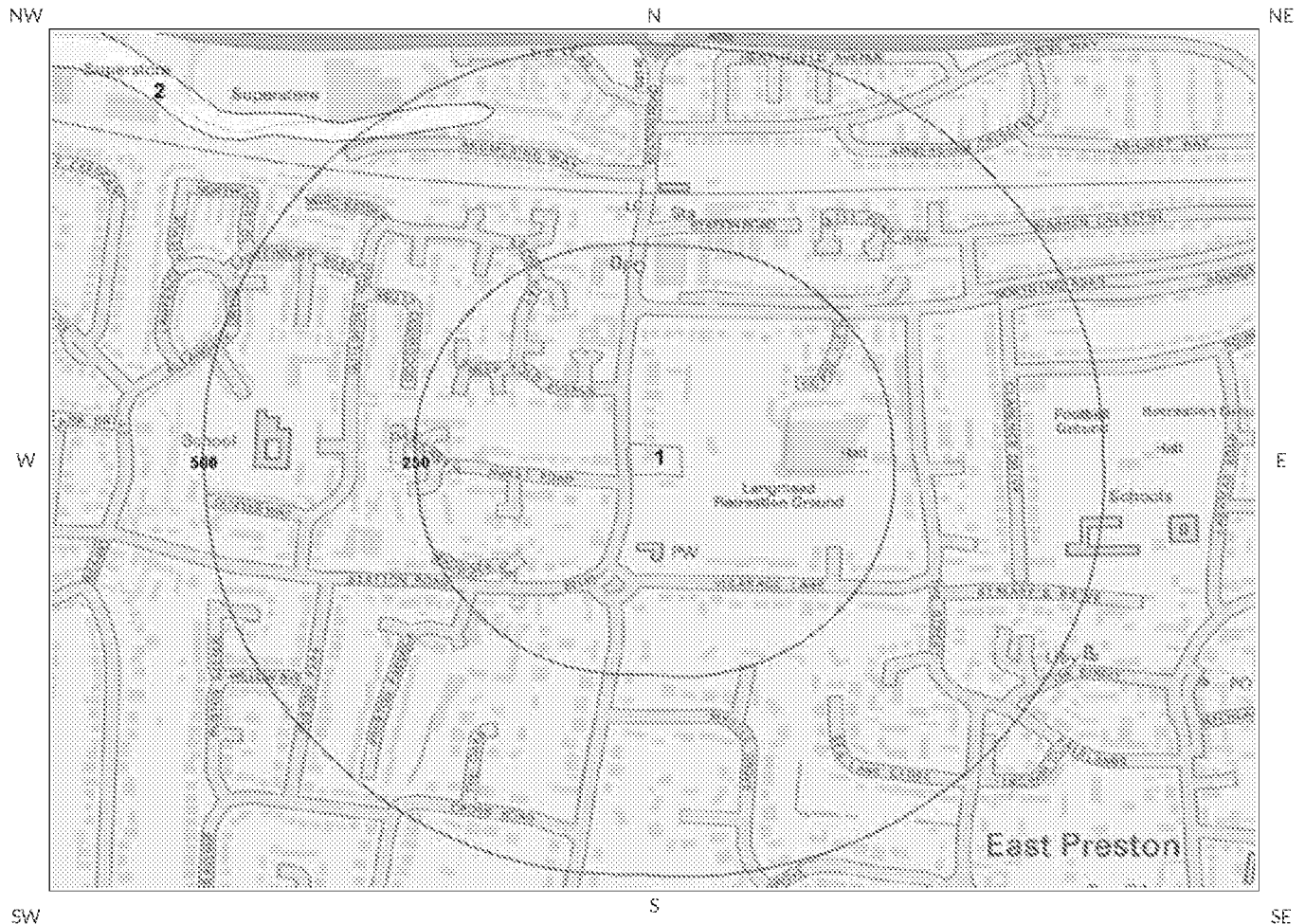
Artificial Ground Legend



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	Site Outline		Made Ground (undivided)		Disturbed Ground (undivided)
	Search Buffers (m)		Worked Ground (undivided)		Landscaped Ground (undivided)
			Infilled Ground		Reclaimed Ground

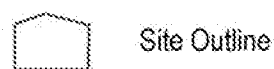
1.2 Superficial Deposits and Landslips Map



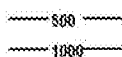
Superficial Deposits and Landslips
Legend



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Site Outline



Search Buffers (m)

1.2 Superficial Deposits and Landslips

1.2.1 Superficial Deposits/ Drift Geology

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

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	RTDU-SSCL	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND, SILT AND CLAY
2	438.0	NW	ALV-CSSG	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL

1.2.2 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	Intergranular	High	Low

1.2.3 Landslip

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

Database searched and no data found.

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.

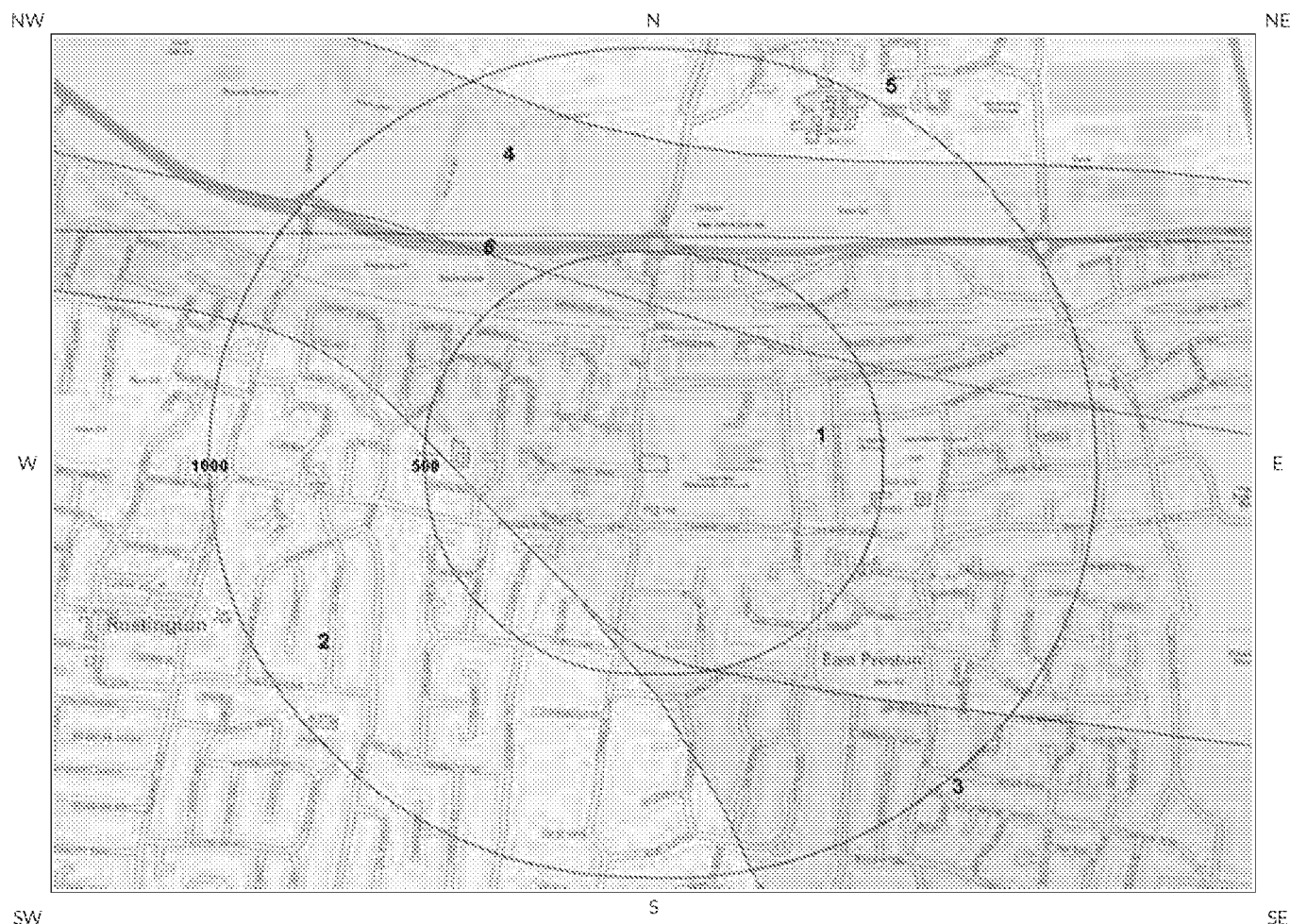
1.2.4 Landslip Permeability

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

Database searched and no data found.

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

1.3 Bedrock and Faults Map



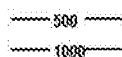
Bedrock and Faults Legend



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Site Outline



Search Buffers (m)

1.3 Bedrock, Solid Geology & Faults

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:332

1.3.1 Bedrock/ Solid Geology

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

ID	Distance (m)	Direction	LEX Code	Description	Rock Age
1	0.0	On Site	NPCH-CHLK	New Pit Chalk Formation - Chalk	Turonian
2	320.0	SW	LPCK-CHLK	Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation And Portsdown C.	Campanian / Turonian
3	350.0	SW	LECH-CHLK	Lewes Nodular Chalk Formation - Chalk	Coniacian / Turonian

1.3.2 Permeability of Bedrock Ground

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

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	Very High	Very High

1.3.3 Faults

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

ID	Distance (m)	Direction	Category Description	Feature Description
6	343.0	N	FOLD_AXIS	Axial plane trace of major anticline

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 nationwide coverage.

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

1.4 Radon Data

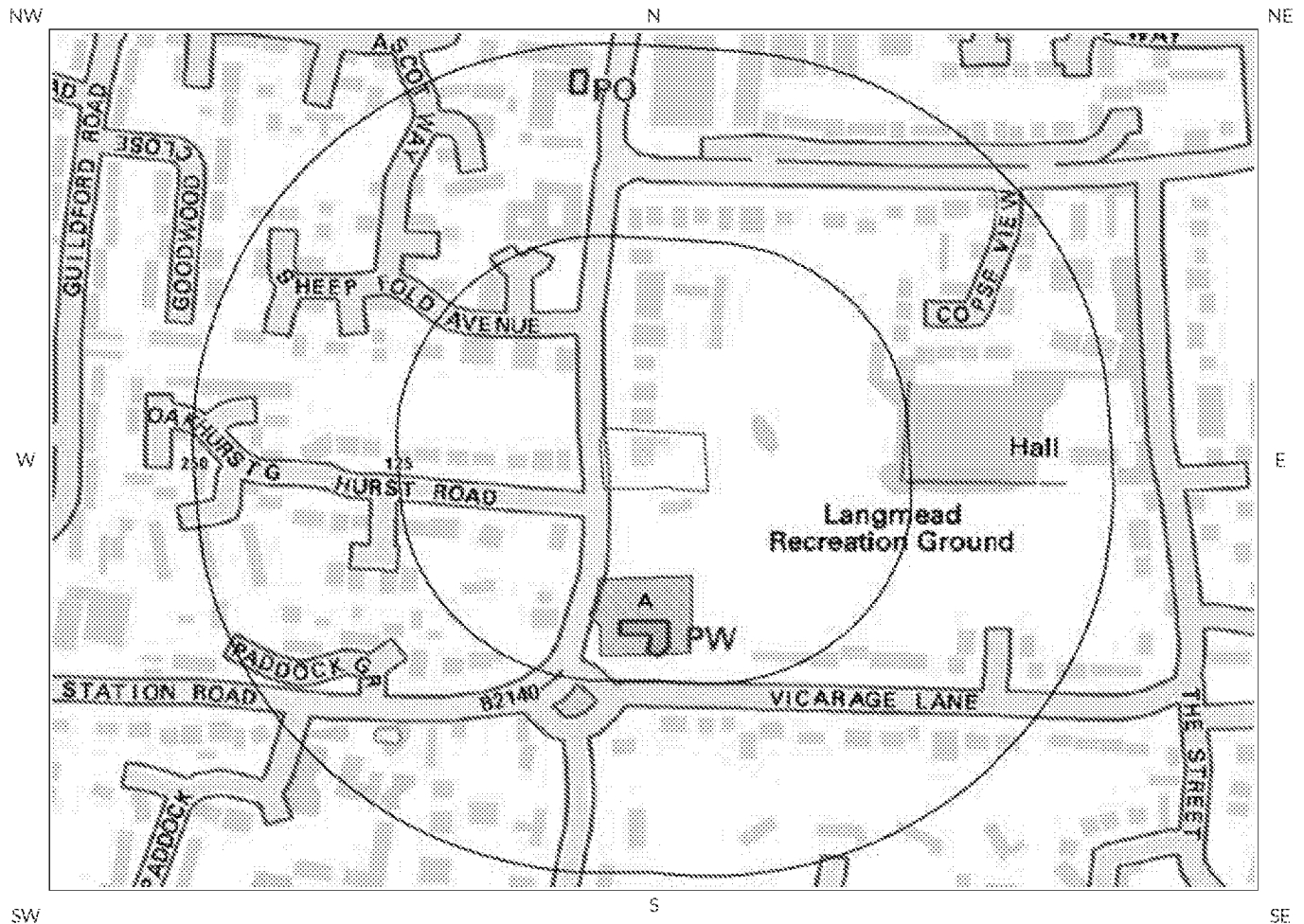
1.4.1 Radon Affected Areas

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 in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level

1.4.2 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

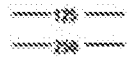
2 Ground Workings Map

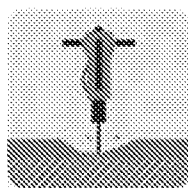


Ground Workings Legend



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-  Site Outline
-  Search Buffers (m)
-  Historic Surface Ground Workings
-  Historic Underground Workings
-  Current Ground Workings



2 Ground Workings

2.1 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

The following Historical Surface Ground Working Features are provided by GroundSure:

ID	Distance (m)	Direction	NGR	Use	Date
1A	56.0	S	506495 102538	Grave Yard	1876
2A	56.0	S	506495 102538	Grave Yard	1876

2.2 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.

2.3 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.

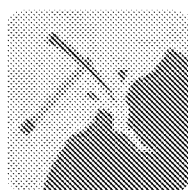
Mapping
sourced from

 Ordnance
Survey®

Figure 1 is a legend for the map. It includes the following items:

- Site Outline:** Represented by a dashed line.
- Search Buffers (m):** Two concentric dashed circles representing 250m and 500m buffers.
- Historical Mining:** Represented by a stippled pattern.
- Non-Coal Mining Cavities:** Represented by a cross-hatched pattern.
- Natural Cavities:** Represented by a solid black diamond.
- Non-Coal Mining Probability Scale:** A vertical bar divided into five segments with the following labels from top to bottom:
 - Highly likely (darkest stippling)
 - Likely (medium-dark stippling)
 - Unlikely (medium-light stippling)
 - Highly unlikely (light stippling)
 - Rare (white/unfilled)

ARUN DISTRICT COUNCIL EP/88/17/DOC



3 Mining, Extraction & Natural Cavities

3.1 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.

3.2 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.

3.3 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.

3.4 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.

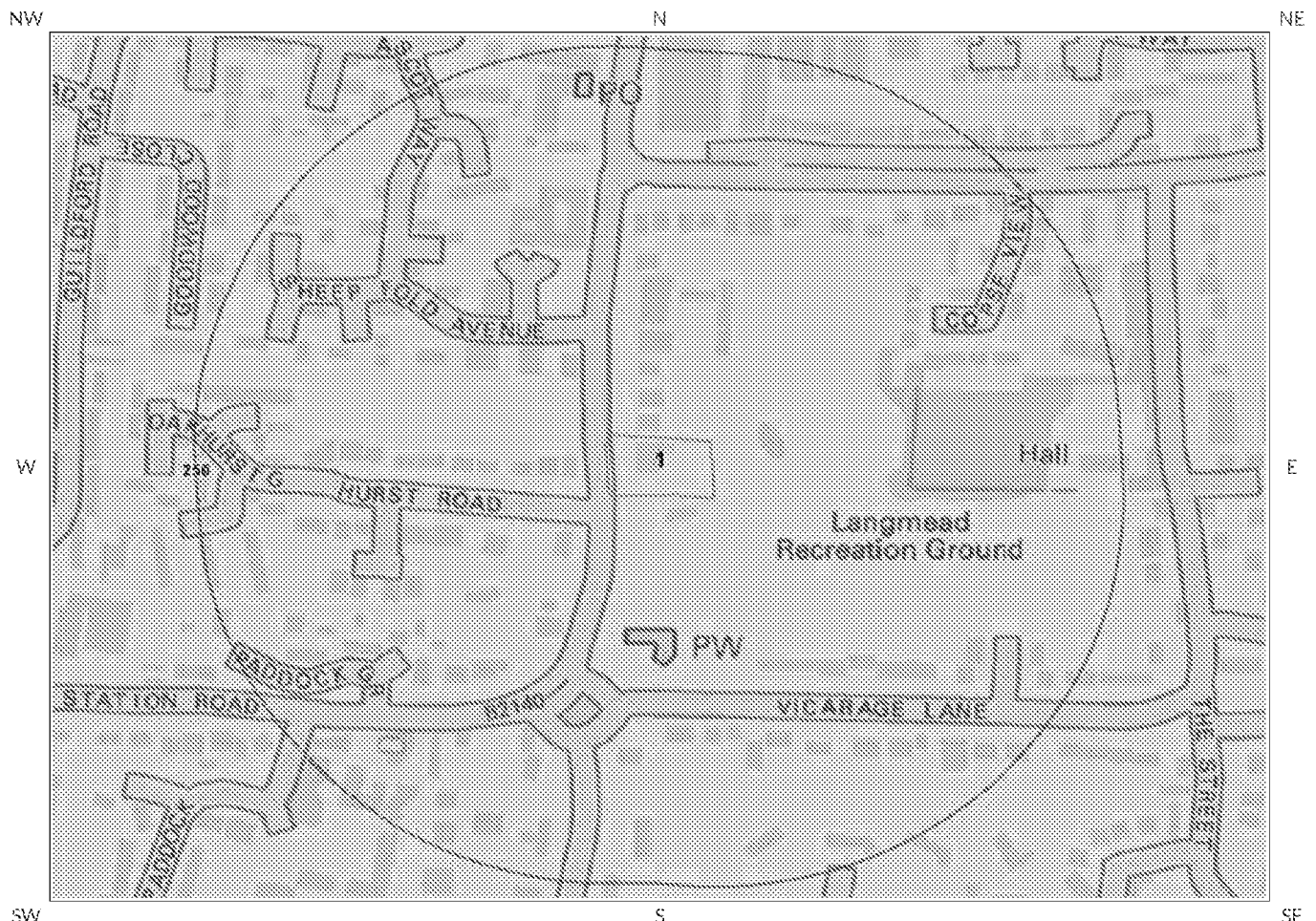
Are there any Non-Coal Mining areas within 1000m of the study site boundary? Yes

The following non-coal mining information is provided by the BGS:

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
1	0.0	On Site	Not available	Chalk	Occasional minor mining may have occurred but of restricted extent.

4 Natural Ground Subsidence

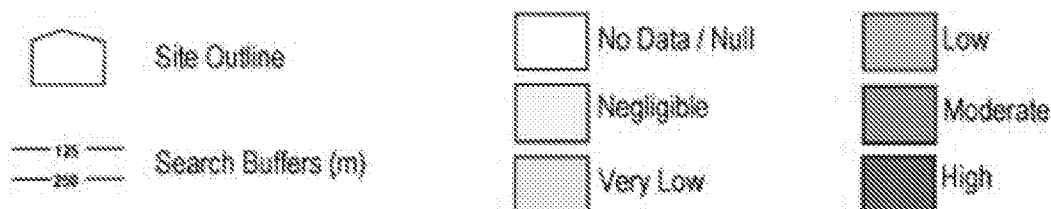
4.1 Shrink-Swell Clay Map



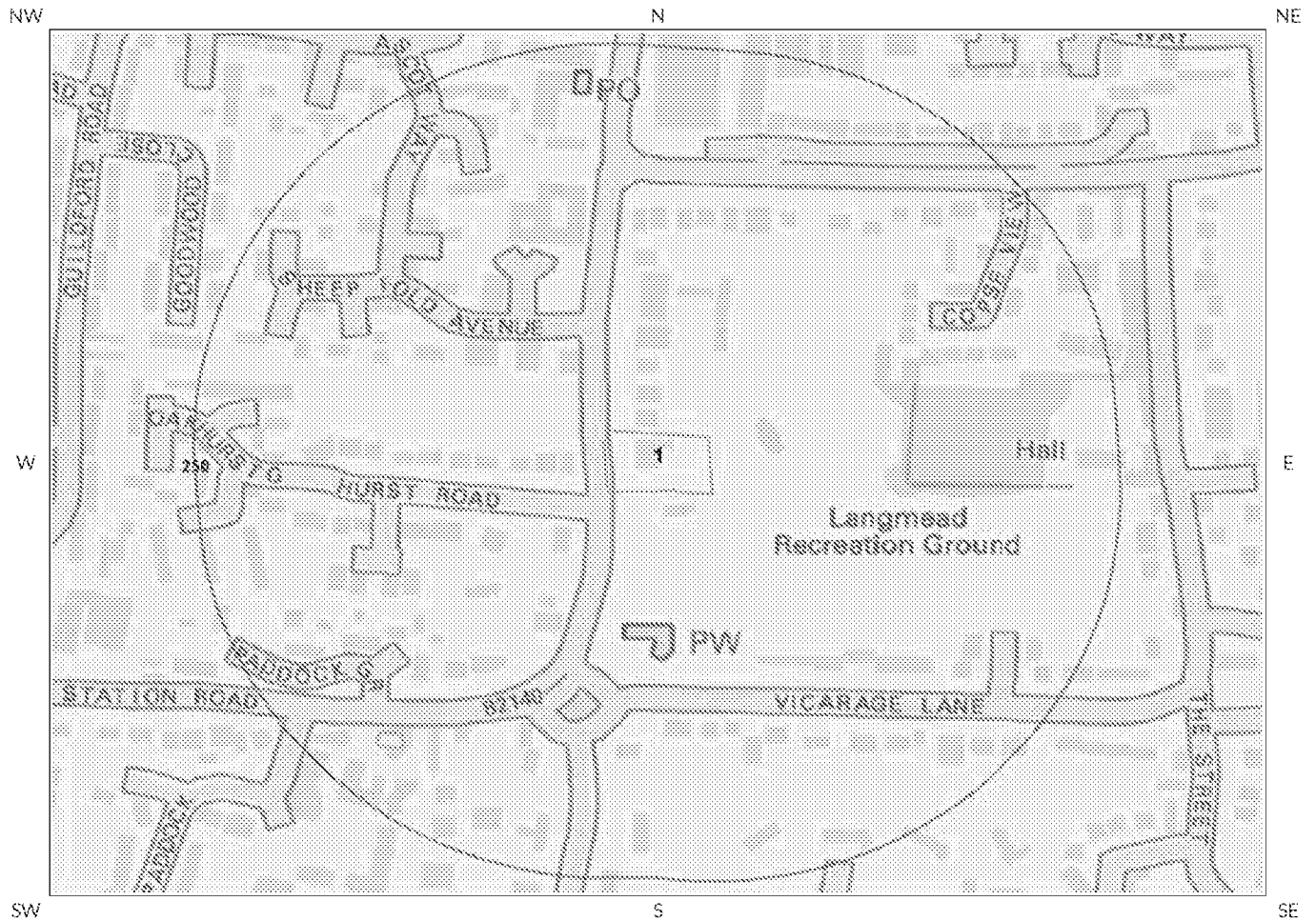
Shrink Swell Clay Legend



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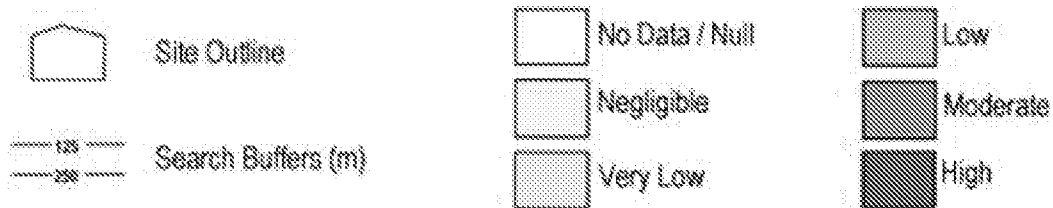
4.2 Landslides Map



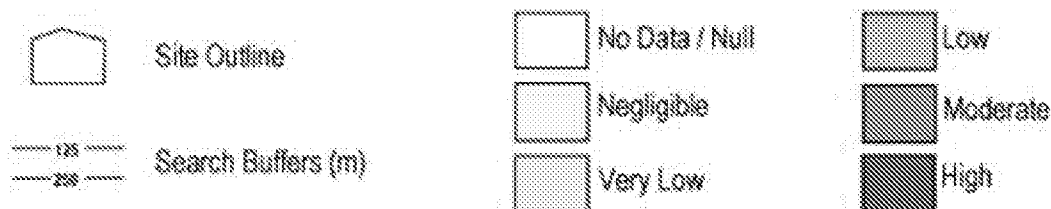
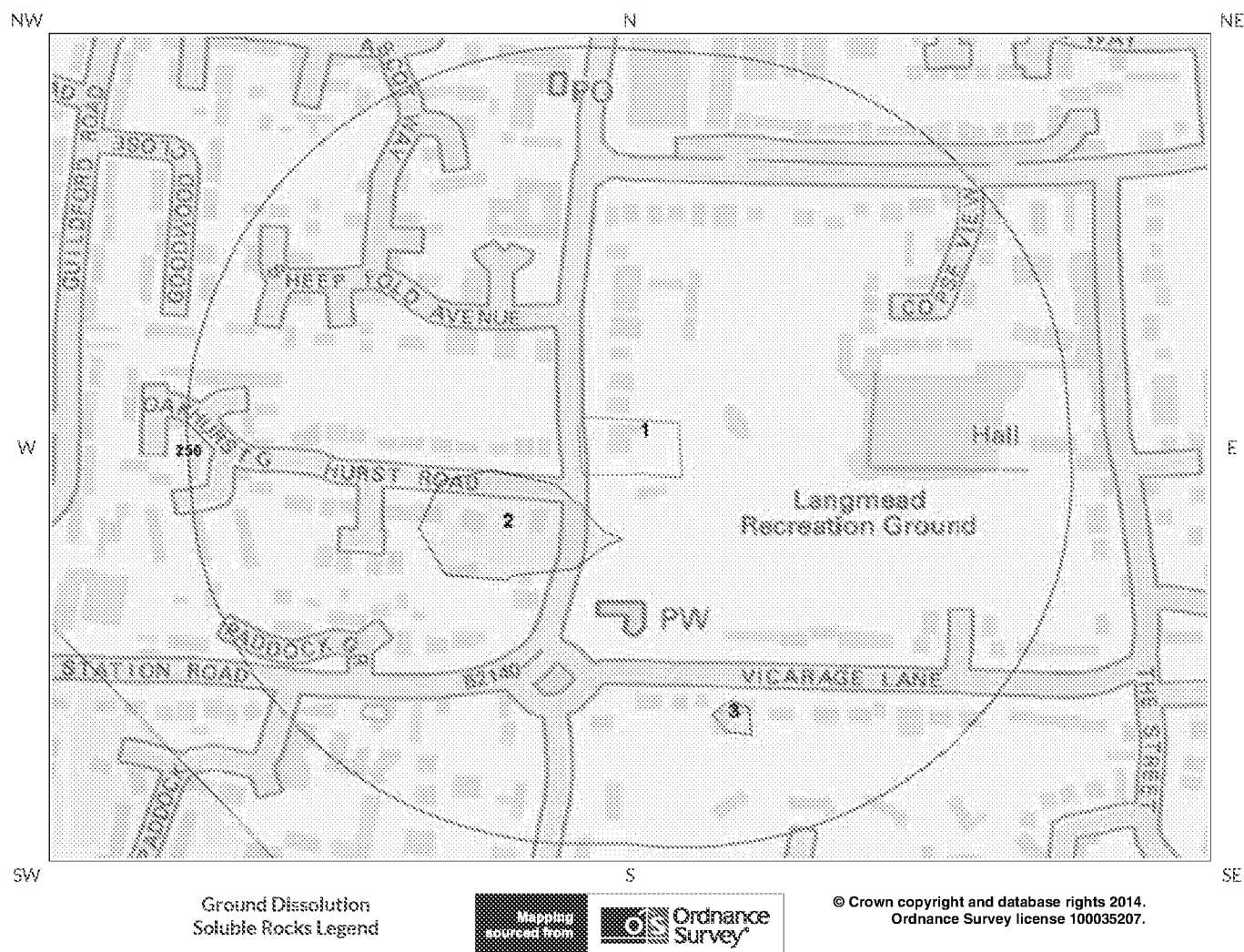
Landslides Legend



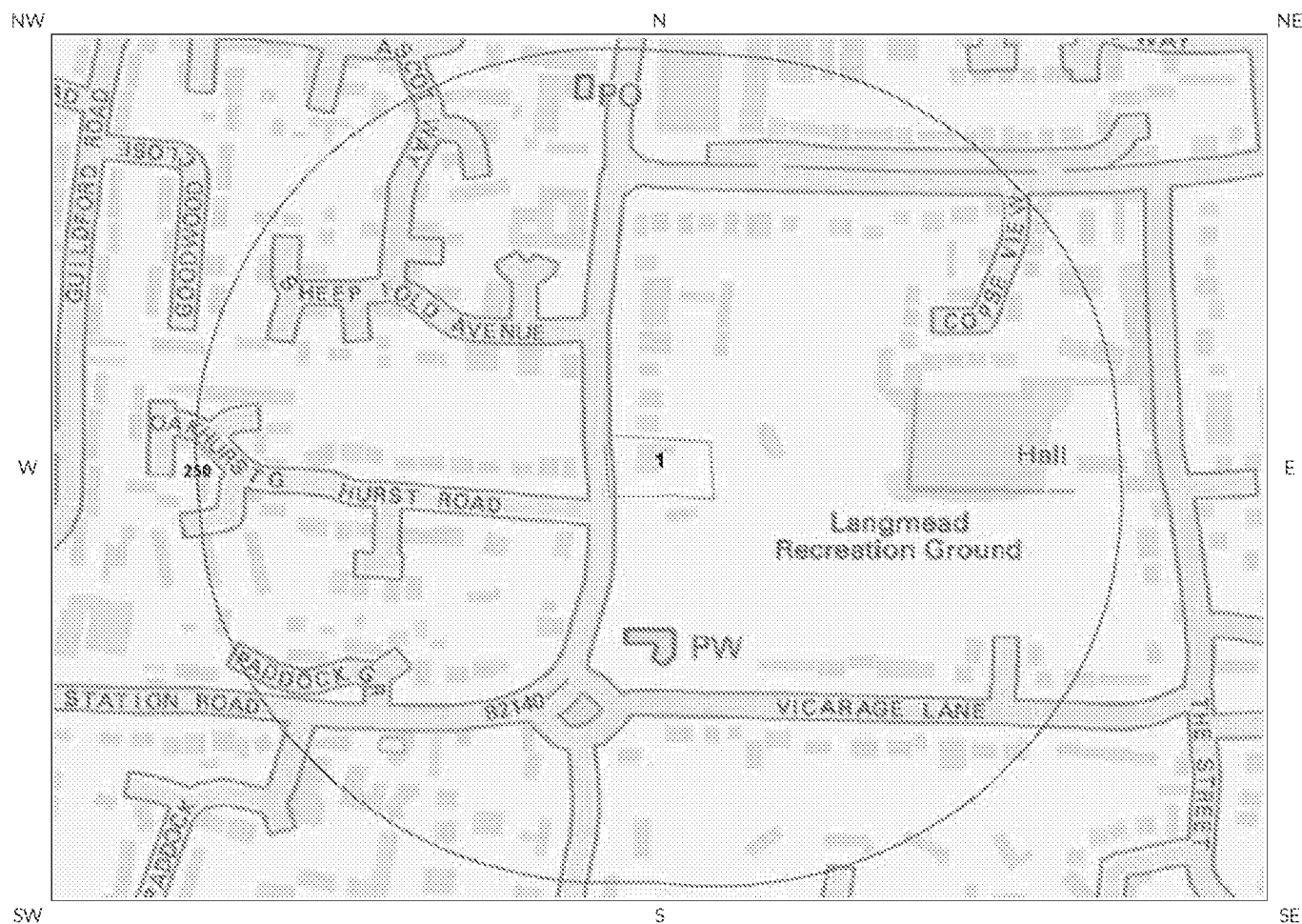
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4.3 Ground Dissolution Soluble Rocks Map



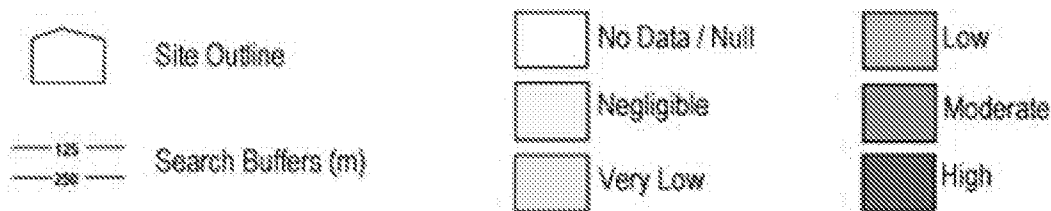
4.4 Compressible Deposits Map



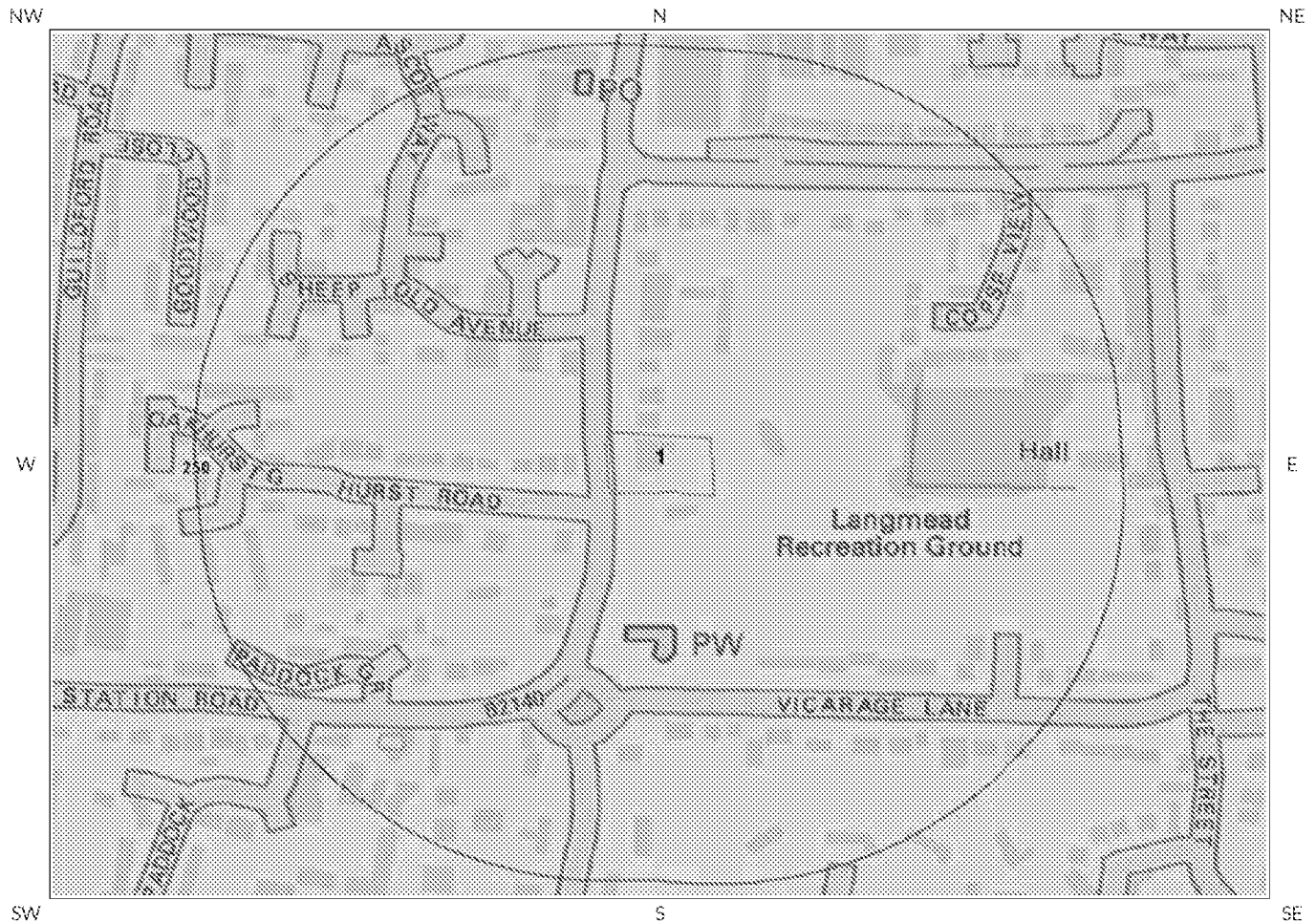
Compressible Deposits Legend



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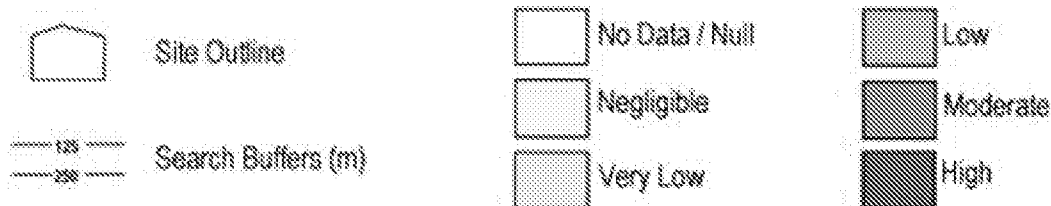
4.5 Collapsible Deposits Map



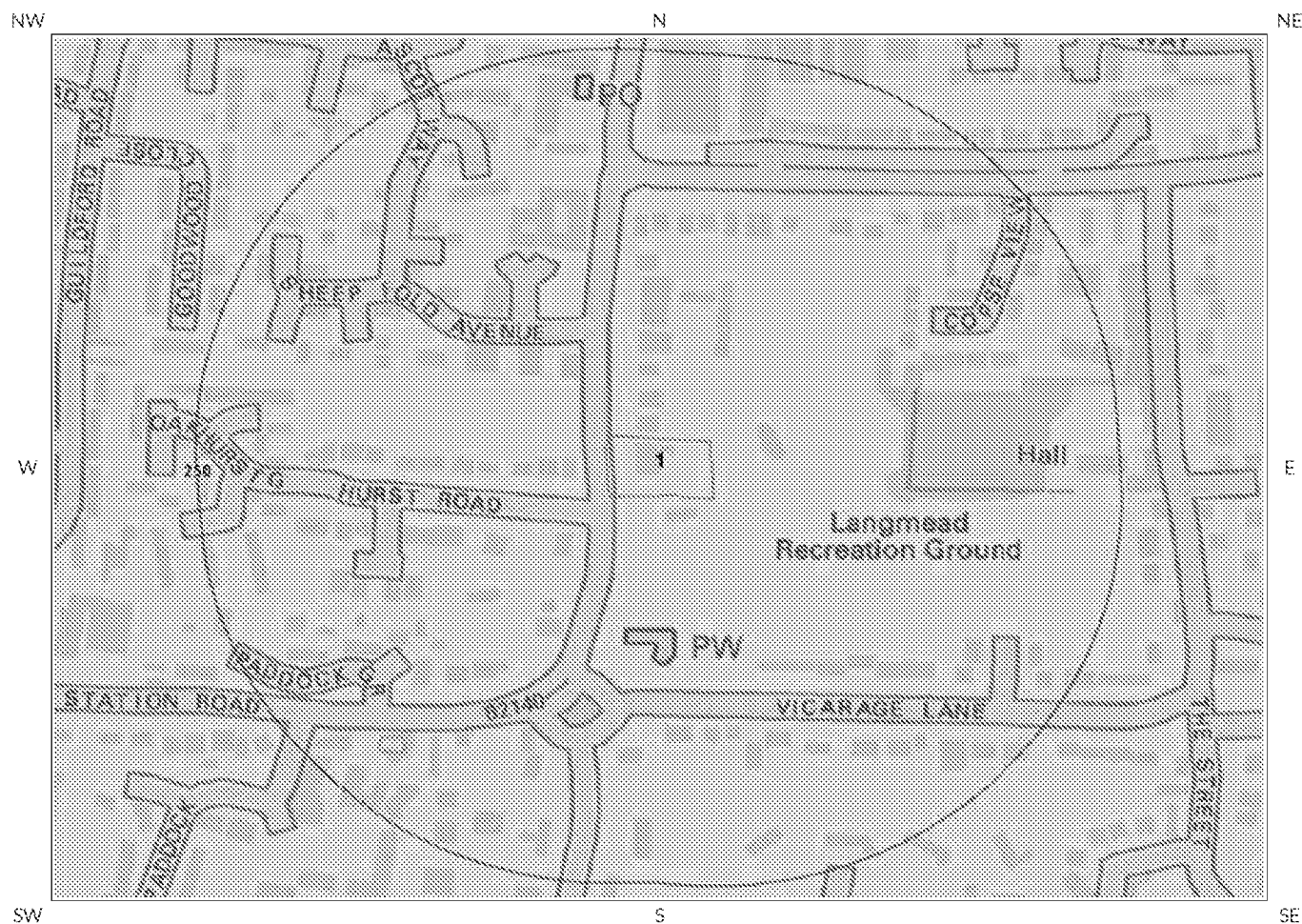
Collapsible Deposits Legend



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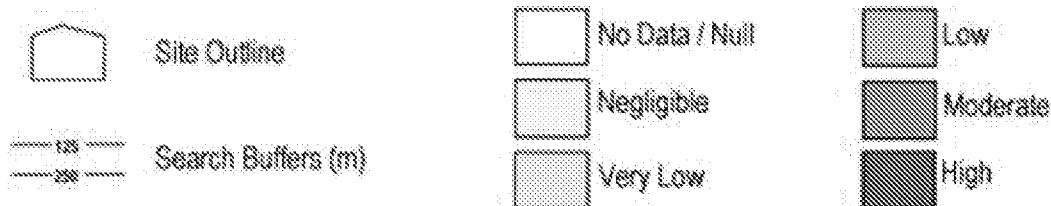
4.6 Running Sand Map



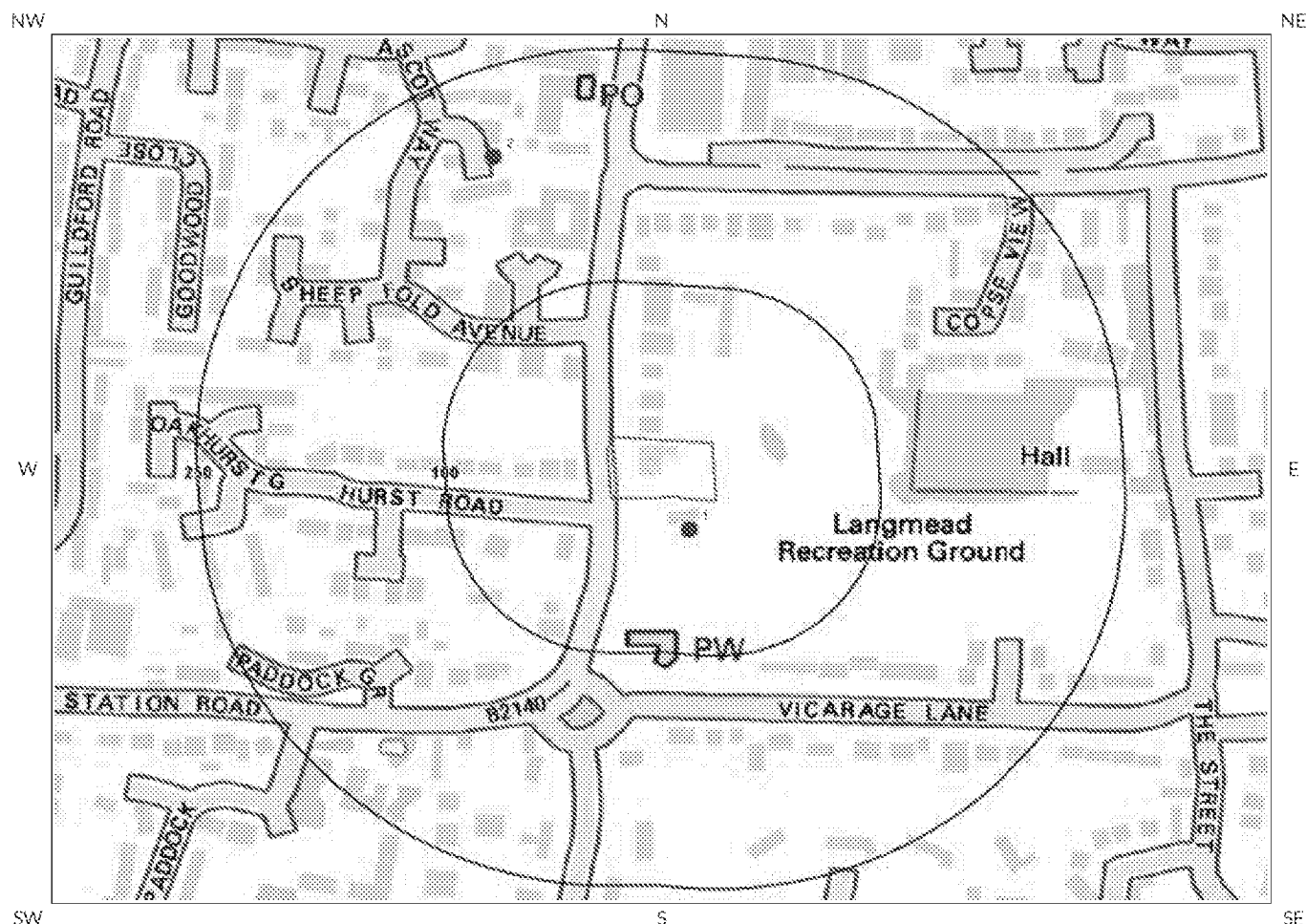
Running Sand Legend



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5 Borehole Records Map

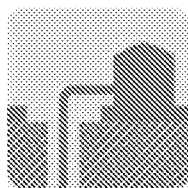


Borehole Records Legend



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-  Site Outline
-  Borehole Locations
-  Search Buffers (m)



5 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:

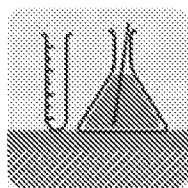
2

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	20.0	S	506520 102600	TQ00SE26	19.81	EAST PRESTON
2	194.0	N	506400 102840	TQ00SE22	36.57	STANFORD NURSERIES

Additional online information is available for the following boreholes listed above:

#1: scans.bgs.ac.uk/sobi_scans/boreholes/569977

#2: scans.bgs.ac.uk/sobi_scans/boreholes/569973



6 Estimated Background Soil Chemistry

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

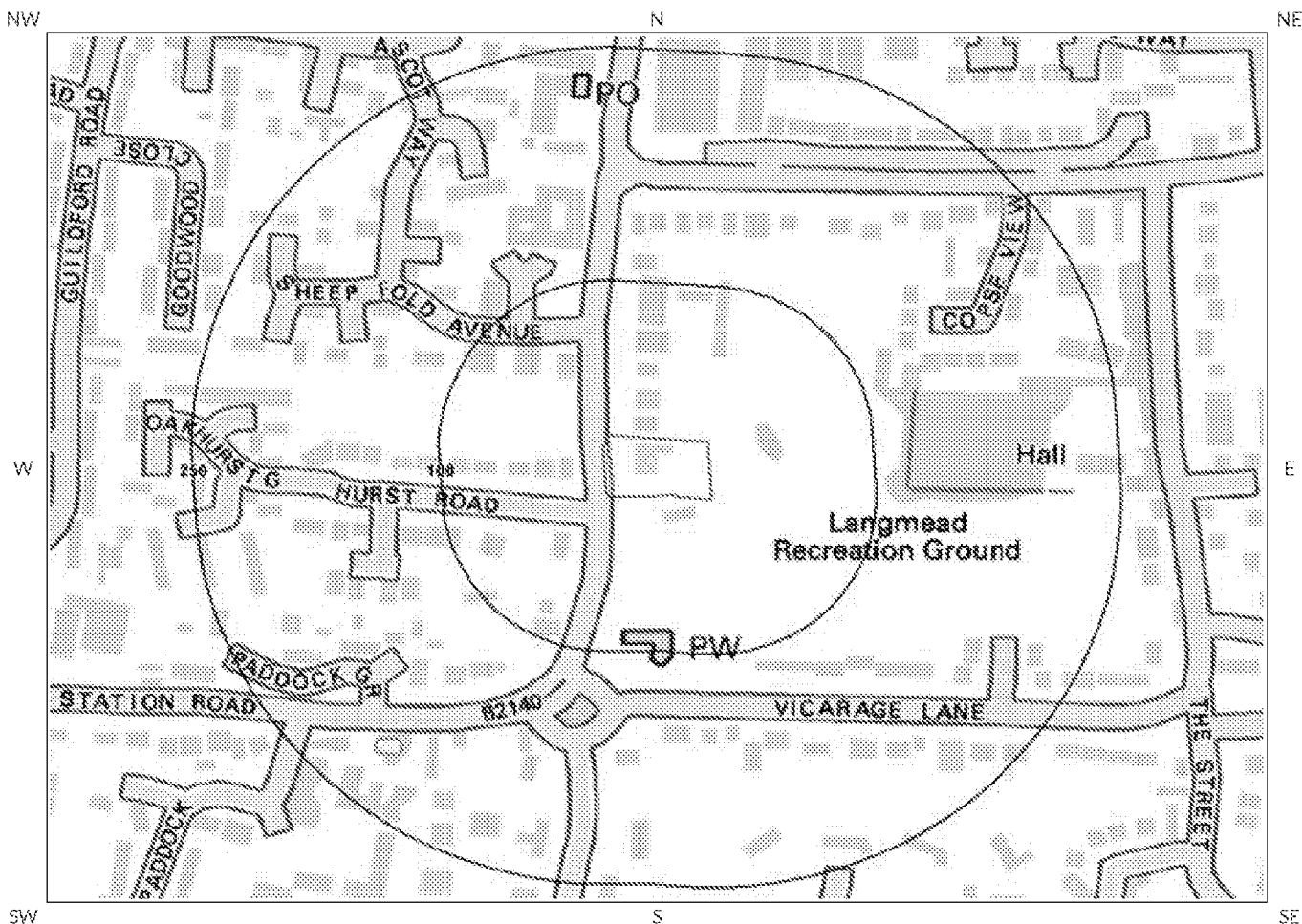
1.

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

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 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.

7 Railways and Tunnels Map



Railways and Tunnels Legend



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© OpenStreetMapContributors

	Underground or Partially Underground Railway / Subway System		Railway Track (OpenStreetMap)
	Railway Tunnel (OS Mapping)		High Speed 2
	Abandoned or Dismantled Railway (OpenStreetMap)		Crossrail
	Railway Track (OS Mapping)		Railway and/or Tunnel Feature from Historical Mapping
	Site Outline		
	Search Buffers (m)		

[illegible]

<http://scans.bes.ac.uk/sci/scans/holes/369977/images/14935734.html>

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May 2016

Crossfield
Consulting

APPENDIX III

APPENDIX III – GROUND INVESTIGATION

Introduction

This Appendix, together with Sections 2 to 4 of the report, forms the Ground Investigation Report for the development described in the report, in compliance with the requirements of BS5930:1999+A2:2010, BSEN1997-1:2004(2007) and BSEN1997-2:2007(2007).

The site operations were carried out between on Thursday 23 October 2014 under the supervision of a geo-environmental engineer from Crossfield Consulting Limited. The scope and rationale for the design of the investigation is presented in Table III-1.

The ground investigation was designed and supervised by qualified and experienced geo-environmental specialists from Crossfield Consulting Limited. Where appropriate, and as outlined below, specialist drilling/sampling equipment was procured together with trained and experienced operators. Unless otherwise indicated, sampling and logging remained the responsibility of trained staff from Crossfield Consulting Limited and field records were prepared on site, during or immediately following drilling/sampling or in situ measurements/tests. The results of in situ tests are presented on the relevant record sheets in this Appendix and the data are summarised on Figure III-1. Details of any correction factors used in processing the test results are presented in the summary figures.

An exploratory hole location plan is presented as Figure III-2.

Windowless Sampling

Two windowless sampling boreholes, denoted as WS1 and WS6, were sunk by Dynamic Sampling UK Limited, to between 3 m and 4 m depth. Dynamic/driven open-tube soil sampling/boring was undertaken using a Premier Compact rig. Using a 1.0 m long thick-walled open-tube sampler (with plastic liner), Category A and B samples were recovered (sample disturbance being influenced by the specific soils encountered). Where appropriate, small disturbed sub-samples were recovered from the materials recovered in the open-tube sampler.

Standard Penetration Tests (SPT) were carried out at regular intervals to provide data on the in situ density of granular strata and an indication of strength within cohesive strata. A summary of SPT/depth data is presented in this Appendix. The SPTs were carried out in accordance with BSEN ISO 22476-3:2005(2007).

Hand-dug Trial Pits

Four hand-dug trial pits (HP2 – HP5) were excavated by groundworkers from Dynamic Sampling UK Limited, to a maximum of 1.20 m depth in areas of soft landscaping areas. Hand-dug pits were excavated due to access issues to the south of the Hotel building. Small disturbed samples were obtained for subsequent geochemical analysis at an accredited laboratory.

The records from the investigation are presented in this Appendix. These records include the descriptions and depths of the strata encountered, together with sample depths, in situ test results (uncorrected values), groundwater observations, details of installations/backfill within exploratory holes and other pertinent comments.

Soil Samples

All samples for analytical testing were collected in appropriate containers, stored in cool boxes (where appropriate) and sent to the testing laboratory overnight. The sample containers, storage and handling procedures were all compatible with the relevant recommendations of the UKAS accredited testing laboratory for the specific testing proposed.

Samples designated for geotechnical testing were collected, stored and transported in accordance with the published requirements for the specific tests scheduled, such that moisture content and soil structure integrity was maintained, as necessary for the test requirements.

Analytical Laboratory Testing

The rationale for the analytical testing is set out in Table III-2.

Five selected samples of the soils encountered were submitted for screening analysis of the following determinands:

- | | |
|----------------------------|------------------------------|
| • Arsenic (Total) | • Cadmium (Total) |
| • Chromium (Total) | • Copper (Total) |
| • Lead (Total) | • Mercury (Total) |
| • Nickel (Total) | • Zinc (Total) |
| • Selenium (Total) | • Boron (Water soluble) |
| • Cyanide (Total) | • Sulphide (Total) |
| • Sulphate (Water soluble) | • Phenols (Total-monohydric) |
| • pH | • Total Organic Carbon |

Note: Total determinands are based on an aqua-regia extract.

- Total Petroleum Hydrocarbons – aromatic/aliphatic split and carbon number banding, using GC-FID techniques
- Polyaromatic Hydrocarbons – using GC-MS techniques

The analyses were carried out by i2 Analytical Limited, a UKAS accredited laboratory, and the results are presented in this Appendix. Soil testing was undertaken in accordance with the Environment Agency's Monitoring Certification Scheme (MCERTS).

Geotechnical Laboratory Testing

The rationale for the geotechnical laboratory testing is set out in the Table III-3.

Selected samples of the soils encountered were submitted for analysis for the following tests:

- pH value
- Water soluble sulphate
- Moisture content
- Atterberg Limits

The analyses were carried out by GEO Site & Testing Services and i2 Analytical Limited, both are UKAS accredited laboratories, and the results are presented in this Appendix.

TABLE III-1

RATIONALE FOR THE DESIGN OF THE GROUND INVESTIGATION

The scope of the ground investigation was designed with reference to the published geology and ground conditions indicated in the desk study information.

In compliance with the guidance published in BS EN 1997-2:2007, the ground investigation was designed to verify the preliminary ground model, established from the desk study information and to characterise the ground conditions within influencing distance of the proposed structures. In this regard, the exploratory holes were targeted within relevant areas of the site to provide information on the strata profile down to competent materials. With reference to the desk study information and the support requirements of the proposed development, it is evident that adequate support is provided by the strata that continue below the depths of the exploratory holes.

In compliance with the guidance published in BS10175:2011 and BS5930:1999+A2:2010, the layout of the exploratory holes and sampling regime also considers the Conceptual Site Model and potential pollutant linkages, such that the spatial arrangement of the investigation provides the necessary information to support a risk assessment of the identified potential pollutant linkages.

Exploratory Hole and Technique	Rationale for Hole Location	Depth (m)	Sampling/ In Situ Testing and Monitoring
WS1 and WS6	Windowless sample exploratory holes were located within accessible areas of the site, away from known or suspected services to investigate potential substances hazardous to human health, landscaping plants, buried structures and controlled waters in near surface soils associated with the site history and to provide data for a geotechnical assessment for the proposed structure	Up to 4.0 m	Soil samples were recovered from near surface soils and from potential founding strata. Standard Penetration Tests (SPT) were carried out at regular intervals to provide data on the in situ density of granular strata and an indication of strength within cohesive strata.
HP2 to HP5 (hand-dug)	All hand-dug trial pits were located within the soft landscaping areas to the south of the Hotel building, away from known or suspected services to investigate potential substances hazardous to human health, landscaping plants, buried structures and controlled waters in near surface soils associated with the site history and to provide data for a geotechnical assessment for the proposed structure	Up to 1.2 m	Soil samples were recovered from near surface soils and from potential founding strata.

Key

WS X	Windowless Sample Borehole
TP X	Hand-dig Trial Pit

TABLE III-2

RATIONALE FOR THE ANALYTICAL TESTING SUITE

Exploratory Hole and Samples	Selection Criteria	Analytical Tests
WS1 0.50 m HP2 0.60 m HP3 0.70 m HP4 0.40 m HP5 0.40 m	Samples were recovered from the near-surface soils to assess the presence of potential contaminants.	Metals and metalloids, cyanide (total), total organic carbon, pH, phenol, sulphate (water soluble & total), sulphide, polyaromatic hydrocarbons and total petroleum hydrocarbons

TABLE III-3

RATIONALE FOR THE GEOTECHNICAL TESTING SUITE

Exploratory Hole and Sample	Selection Criteria	Geotechnical Tests
WS1 0.50 m WS1 1.50 m HP2 0.60 m HP2 1.00 m HP3 0.70 m HP3 1.10 m HP4 0.40 m HP 1.00 m HP5 0.40 m WS6 1.80 m	Representative samples of founding strata recovered to aid foundation concrete design classification	pH Water soluble sulphate
WS1 1.50 m WS6 1.80 m HP2 1.00 m HP3 1.10 m HP4 1.00 m	Representative samples of the clayey horizons in foundation strata were recovered for classification purposes	Moisture content Atterberg Limits

WINDOWLESS SAMPLE RECORDS

KEY

Sampling

J	Disturbed Jar Sample
G	Jar Sample in Glass Container
g	Soil Sample in Glass Vial
W	Water Sample
IC	Nett sample recovery ratio (ratio of length of recovered sample to length of sample run)

In Situ Measurements

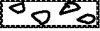
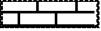
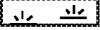
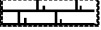
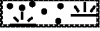
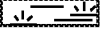
FVT	C_{lv}	Undrained Shear Strength (from hand vane shear vane test)
	C_{rv}	Undrained Remoulded Shear Strength (from hand vane shear vane test)
	C_{lv}^*	Hand Vane Shear Strength Test (on Category A: OS-TK/W soil sample recovered in window sampler)
	S	Standard Penetration Test (SPT: split spoon sampler)
	SPT(C)	SPT carried out with a 60° cone
	'N'	'N' Value from SPT test
	N_{10}	Dynamic Probe Test: Number of blows to drive 100 mm
DPH	N_{H10}	Dynamic Probe Test: Heavy (30 kg mass & 500 mm fall)
DPSH-A	N_{SHA10}	Dynamic Probe Test: Super-Heavy A (63.5 kg mass & 500 mm fall)
DPSH-B	N_{SHB10}	Dynamic Probe Test: Super-Heavy B (63.5 kg mass & 750 mm fall)
	$\frac{x}{y}$	x Blows per y Driving Distance (for non-standard SPT or DP driving distance)
	y mm	
	T	Torque (max) required to turn rods (unit: Nm, unless otherwise shown)

Notes:

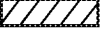
1. All measurement values on record sheets are uncorrected, unless otherwise indicated.
2. For corrected test values, refer to report.
3. Identification and classification of strata is based on the guidance published in the current edition of BS5930 together with BSEN ISO 14688-1:2002, BSEN ISO 14688-2:2004 and BSEN ISO 14689-1:2003
4. Consistency (soft, firm, stiff etc) relates to a manual test/inspection on site (in compliance with BSEN ISO 14688-1:2002 Section 5.14).
5. Undrained shear strength (low, medium, high etc) relates to in situ or laboratory test data and the associated assessed strength of a stratum (in compliance with BSEN ISO 14688-2:2004 Section 5.3 and Table 5).
6. The density of coarse-grained soils is based on SPT N values (or equivalent Dynamic Probe test or CPT data) as outlined in BS5930 and BSEN ISO 14688-2:2004.
7. Rock strength (weak, strong etc) is based on field identification (and/or strength test data), as outlined in BSEN ISO 14689-1:2003 Table 5.

BOREHOLE & DRILLHOLE RECORDS - LEGENDS KEY SHEET

Legend - Strata Encountered in Exploratory Hole

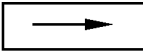
Soil	Rock		
	Sedimentary	Igneous	Metamorphic
 Made Ground	 Mudstone	 Fine-grained	 Fine-grained
 Clay	 Shale	 Medium-grained	 Medium-grained
 Silt	 Siltstone	 Coarse-grained	 Coarse-grained
 Sand	 Sandstone		
 Gravel	 Limestone		
 Peat/Topsoil	 Chalk		
 Organic Sand	 Coal		
 Organic Clay	 Conglomerate		

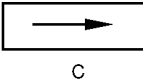
Legend - Backfill to Borehole and Standpipe Installations

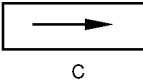
Backfill	Installations
 Soil arisings	 Concrete Cover Over Standpipe
 Bentonite	 Plain Standpipe - Bentonite Surround
 Cement-based Grout	 Perforated Standpipe - Geotextile and Granular Filter Surround
 Gravel	 Perforated Standpipe End Geotextile and Granular Filter Surround

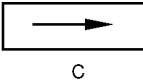
Notes:

1. A combination of the strata symbols are indicative of mixed soil types.
2. The response zone of a standpipe refers to the section of perforated pipe within a granular surround, where substances may freely enter the standpipe from the surrounding strata.

Crossfield CONSULTING GEOTECHNICAL ENVIRONMENTAL		Trial Pit Record Sheet				Hole Ref. HP2	
Project		Bradbury Hotel, Station Road, East Preston				Sheet 1 of 1	
Date		23/10/2014				Job No. CCL02593	
Bearing:		Shoring None used				Ground Level 9.30 m OD *	
Plant Hand-dug		Stability Hand-dug pit remained stable throughout excavation				Co-ordinates	
Trial Pit		Water No groundwater encountered				Logged by SC Logged on site during excavation	
Plan						Checked by	
A  B C							
Depth	Face A		Face B		Face C		Depth
0.10			1				0.10
			2				
1.20			Base of Pit				1.20
Sampling							
Sample/ Test	Type	Strength	Ref. No.	Strata	Description		
Depth		(kN/m ²)		Depth			
0.60	JGg		1	0.0-0.1	Grass over dark brown slightly sandy slightly gravelly silt with rootlets. Gravel is fine to medium and sub-rounded. (TOPSOIL)		
1.00	JJ		2	0.1-1.2	Firm consistency orangish brown slightly sandy slightly gravelly clay. Gravel is fine to medium and sub-angular to sub-rounded. Contains organic content and rare ashy deposits. (MADE GROUND)		
Remarks					Notes		
* Ground level estimated from topographic survey provided by Client.					1. All logging and sampling in accordance with BS 5930:1999+A2:2010 2. Symbols and abbreviations are explained on the accompanying key 3. All linear dimensions are in metres unless otherwise stated		

		Trial Pit Record Sheet			Hole Ref. HP3	
		Project Bradbury Hotel, Station Road, East Preston Date 23/10/2014			Sheet 1 of 1 Job No. CCL02593	
Bearing:		Shoring None used			Ground Level 9.30 m OD *	
Plant Hand-dug		Stability Hand-dug pit remained stable throughout excavation Water No groundwater encountered			Co-ordinates	
Trial Pit Plan 					Logged by SC Logged on site during excavation Checked by 	
Depth	Face A		Face B		Face C	
0.10			1			
			2			
0.70			3			
1.10			Base of Pit			
Sampling						
Sample/ Test Depth	Type	Strength (kN/m ²)	Ref. No.	Strata Depth	Description	
			1	0.0-0.1	Grass over dark brown slightly sandy slightly gravelly silt with rootlets. Gravel is fine and sub-angular to sub-rounded. (TOPSOIL)	
0.70	JGg		2	0.1-0.7	Firm consistency light brown slightly sandy gravelly clay. Gravel is fine to coarse and sub-angular to sub-rounded with occasional cobbles. Gravel consists of flint, brick and pottery fragments. (MADE GROUND)	
1.10	JJ		3	0.7-1.1	Firm consistency orangish brown slightly sandy CLAY. (RIVER TERRACE DEPOSITS)	
Remarks					Notes	
* Ground level estimated from topographic survey provided by the Client.					1. All logging and sampling in accordance with BS 5930:1999+A2:2010 2. Symbols and abbreviations are explained on the accompanying key 3. All linear dimensions are in metres unless otherwise stated	

		Trial Pit Record Sheet			Hole Ref. HP4	
		Project Bradbury Hotel, Station Road, East Preston Date 23/10/2014			Sheet 1 of 1 Job No. CCL02593	
Bearing:		Shoring None used			Ground Level 9.30 m OD *	
Plant Hand-dug		Stability Hand-dug pit remained stable throughout excavation Water No groundwater encountered			Co-ordinates	
Trial Pit Plan 					Logged by SC Logged on site during excavation Checked by 	
Depth	Face A		Face B		Face C	
0.10			1		0.10	
			2			
0.40			3		0.40	
			4			
0.70			Base of Pit		0.70	
1.10					1.10	
Sampling						
Sample/ Test Depth	Type	Strength (kN/m ²)	Ref. No.	Strata Depth	Description	
			1	0.0-0.1	Grass over dark brown slightly gravelly silt with rootlets. Gravel is fine and sub-angular to sub-rounded. (TOPSOIL)	
0.70	JGg		2	0.1-0.4	Dark brown slightly sandy gravelly silt with rootlets. Gravel is fine to medium and sub-angular to sub-rounded with brick fragments. (MADE GROUND)	
1.00	JJ		3	0.4-0.7	Firm consistency light brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium and sub-angular to sub-rounded with brick fragments. (MADE GROUND)	
			4	0.7-1.1	Firm consistency orangish brown CLAY. (RIVER TERRACE DEPOSITS)	
Remarks					Notes	
* Ground level estimated from topographical survey provided by the Client.					1. All logging and sampling in accordance with BS 5930:1999+A2:2010 2. Symbols and abbreviations are explained on the accompanying key 3. All linear dimensions are in metres unless otherwise stated	

		Trial Pit Record Sheet			Hole Ref. HP5	
		Project Bradbury Hotel, Station Road, East Preston Date 23/10/2014			Sheet 1 of 1 Job No. CCL02593	
Bearing:		Shoring None used			Ground Level 9.30 m OD *	
Plant Hand-dug		Stability Hand-dug pit remained stable throughout excavation Water No groundwater encountered			Co-ordinates	
Trial Pit Plan 					Logged by SC Logged on site during excavation Checked by 	
Depth	Face A		Face B		Face C	
0.10			1			
0.50			2			
1.10			3			
			Base of Pit			
Sampling						
Sample/ Test Depth	Type	Strength (kN/m ²)	Ref. No.	Strata Depth	Description	
0.40	JGg		1	0.0-0.1	Grass over dark brown slightly gravelly silt with rootlets. Gravel is fine to medium and sub-angular to sub-rounded. (TOPSOIL)	
			2	0.1-0.5	Light brown slightly sandy slightly gravelly silt with rootlets. Gravel is fine to medium and sub-angular to sub-rounded with rare brick and coal fragments. (MADE GROUND)	
1.00	B		3	0.5-1.1	Firm consistency orangish brown CLAY. (RIVER TERRACE DEPOSITS)	
Remarks					Notes	
* Ground level estimated from topographical survey provided by the Client.					1. All logging and sampling in accordance with BS 5930:1999+A2:2010 2. Symbols and abbreviations are explained on the accompanying key 3. All linear dimensions are in metres unless otherwise stated	

					Windowless Sample Record Sheet					Hole Ref. WS1	
Project: Bradbury Hotel, Station Road, East Preston					Sheet 1 of 1					Job No. CCL02593	
Date: 23/10/2014					Ground Level. 9.20 m OD *					Co-ordinates	
Contractor Dynamic Sampling Ltd					Equipment Premier Compact 110					Logged by: SC Logged on site during drilling operations	
Method 0.0 m to 4.0 m windowless sampling					Checked by:						
Boring Diameter 100 mm											
Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.		
0.50	JGg				Tarmacadam surfacing over light brownish white sand and gravel. Sand is fine to coarse. Gravel is fine to coarse and angular to sub-rounded with large brick fragments and rare ironmongery. (MADE GROUND)	0.50			8.70		
1.00-1.45	S			N=4	Firm consistency orangish brown slightly sandy slightly gravelly CLAY. (RIVER TERRACE DEPOSITS)						
1.50	JJ										
2.00-2.45	S			N=10							
3.00-3.45	S			N=22	...becoming stiff consistency from 3.0 m.	3.20			6.00		
3.60-3.92	S			N=50 315 mm	Dense orangish brown slightly clayey sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse and angular to sub-rounded. (RIVER TERRACE DEPOSITS)	4.00			5.20		
					(End of Hole)						
Core Recovery		Groundwater				Additional Tests					
Depth	Recovery	Hole Depth	Strike Depth	Water Depth	Observations	Test type	Test Depth	Test Value			
0.00-1.00	90%				No groundwater encountered						
1.00-2.00	60%										
2.00-3.00	40%										
3.00-4.00	100%										
Remarks * Ground level estimated from topographic survey provided by the Client. Windowless sample refusal at 4 m depth due to the very dense nature of the strata	Notes 1. All logging and sampling in accordance with BS 5930:1999+A2:2010 2. The depths to strata change are approximate only 3. Symbols and abbreviations are explained on the accompanying key 4. All linear dimensions are in metres unless otherwise stated 5. Undrained shear strength test value given in kN/m ²										



Hammer Energy Test Report

in accordance with BS EN ISO 22476-3:2005

Dynamic sampling uk ltd
Unit 8,
Victory park way,
Victory road,
Derby,
DE24 8ZF

Hammer Ref: LR110.50
Test Date: 11/11/2013
Report Date:
File Name: LR110.50.spt
Test Operator: TP

Instrumented Rod Data

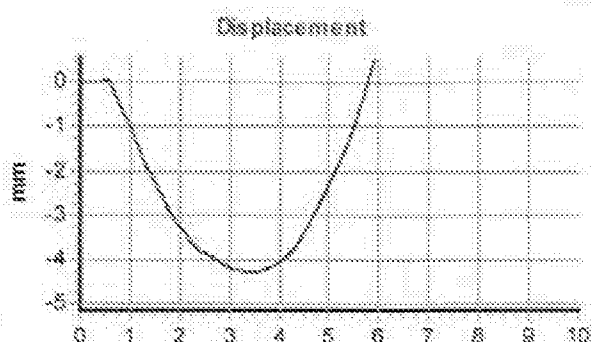
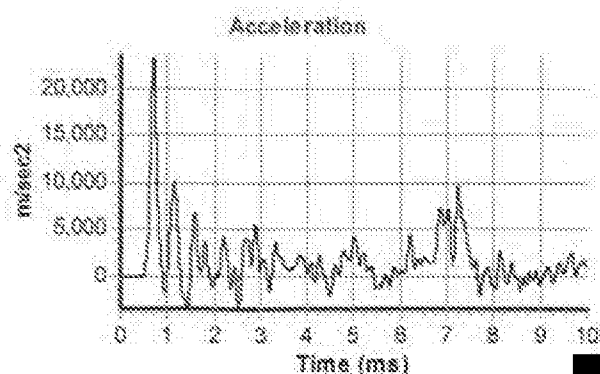
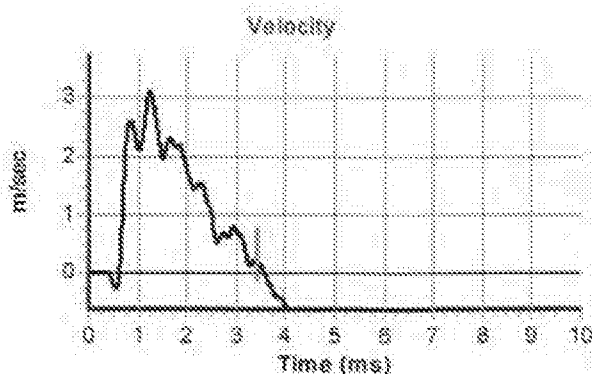
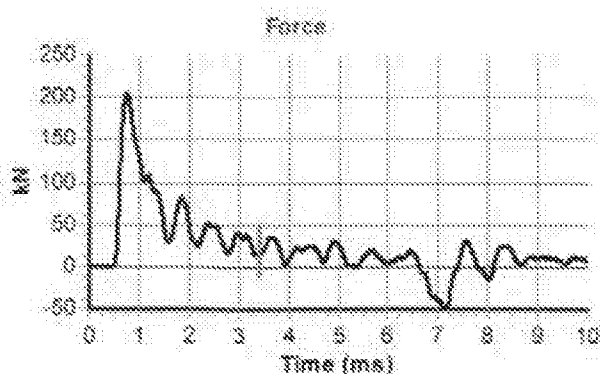
Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.9
Assumed Modulus E_s (GPa): 208
Accelerometer No.1: 6455
Accelerometer No.2: 6457

Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
String Length L (m): 13.0

Comments / Location

Hammer tested at Dynamic sampling yard.



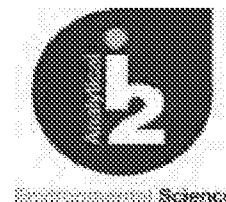
Calculations

Area of Rod A (mm²): 1021
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 391

Energy Ratio E_r (%): **83**

Title: operations manager

The recommended calibration interval is 12 months



Samantha Copper
Crossfield Consulting Ltd
The Granary
White Hall Farm
Learnington Road
Long Itchington
Warwickshire
CV47 9PU

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

e: mail@crossfield-consulting.co.uk

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 14-62059

Project / Site name:	Bradbury Hotel , Station Road , East Preston	Samples received on:	27/10/2014
Your job number:	CCL02593	Samples instructed on:	27/10/2014
Your order number:	PO8546	Analysis completed by:	05/11/2014
Report Issue Number:	1	Report issued on:	05/11/2014
Samples Analysed:	10 soil samples		

Signed:

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Thurstan Plummer
Organics Technical Manager
For & on behalf of i2 Analytical Ltd.

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Iss No 14-62059-1

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The results included within the report are representative of the samples submitted for analysis.

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Environmental Science

Analytical Report Number: 14-62059

Project / Site name: Bradbury Hotel, Station Road, East Preston

Your Order No: PO8546

Lab Sample Number				385715	385716	385717	385718	385719
Sample Reference				WS1	HP2	HP3	HP4	HP5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.60	0.70	0.40	0.40
Date Sampled				23/10/2014	23/10/2014	23/10/2014	23/10/2014	23/10/2014
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	3.6	14	13	20	19
Total mass of sample received	kg	0.001	NONE	1.2	1.0	1.2	1.2	1.2

Whole Sample Crushed		N/A	NONE	Crushed	-	-	-	-
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General Inorganics

pH	pH Units	N/A	MCERTS	10.5	8.1	8.0	8.2	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	ISO 17025	4200	240	570	390	390
Water Soluble Sulphate (Soil Equivalent)	g/l	0.0025	MCERTS	0.090	0.013	0.17	0.017	0.023
Water Soluble Sulphate as SO ₄ (2:1)	mg/kg	2.5	MCERTS	90	13	170	17	23
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.045	0.0067	0.084	0.0083	0.012
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	1.6
Total Sulphur	mg/kg	50	NONE	1500	220	350	250	290
Total Organic Carbon (TOC)	%	0.1	MCERTS	< 0.1	0.9	0.5	1.2	1.3

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
----------------------------	-------	---	--------	-------	-------	-------	-------	-------

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	0.60	< 0.10	< 0.10	< 0.10	0.48
Anthracene	mg/kg	0.1	MCERTS	0.19	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	2.3	< 0.10	< 0.10	< 0.10	0.92
Pyrene	mg/kg	0.1	MCERTS	2.2	< 0.10	< 0.10	< 0.10	0.89
Benzo(a)anthracene	mg/kg	0.1	MCERTS	1.6	< 0.10	< 0.10	< 0.10	0.44
Chrysene	mg/kg	0.05	MCERTS	2.6	< 0.05	< 0.05	< 0.05	0.60
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	1.4	< 0.10	< 0.10	< 0.10	0.29
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	1.5	< 0.10	< 0.10	< 0.10	0.25
Benzo(a)pyrene	mg/kg	0.1	MCERTS	1.5	< 0.10	< 0.10	< 0.10	0.37
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	0.47	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	14.4	< 1.60	< 1.60	< 1.60	4.24
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	2.0	10	10	11	9.5
Boron (water soluble)	mg/kg	0.2	MCERTS	1.5	0.7	1.1	1.1	1.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.2	0.5	0.3
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	11	21	22	26	23
Copper (aqua regia extractable)	mg/kg	1	MCERTS	7.4	21	28	32	27
Lead (aqua regia extractable)	mg/kg	1	MCERTS	2.6	43	400	58	55
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	7.5	15	17	19	17
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	15	82	100	150	120

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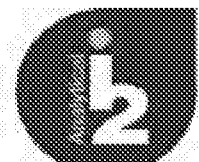
ARUN DISTRICT COUNCIL EP/88/17/DOC

The results included within the report are representative of the samples submitted for analysis.

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Environmental Science

Analytical Report Number: 14-62059

Project / Site name: Bradbury Hotel, Station Road, East Preston

Your Order No: PO8546

Lab Sample Number	385715	385716	385717	385718	385719
Sample Reference	WS1	HP2	HP3	HP4	HP5
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.50	0.60	0.70	0.40	0.40
Date Sampled	23/10/2014	23/10/2014	23/10/2014	23/10/2014	23/10/2014
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Monoaromatics

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic > EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic > EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic > EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic > EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic > EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic > EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic > EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic > EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic > EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic > EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic > EC21 - EC35	mg/kg	10	MCERTS	31	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	31	< 10	< 10	< 10	< 10

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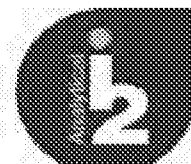
ARUN DISTRICT COUNCIL EP/88/17/DOC

The results included within the report are representative of the samples submitted for analysis.

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Environmental Science

Analytical Report Number: 14-62059

Project / Site name: Bradbury Hotel, Station Road, East Preston

Your Order No: PO8546

Lab Sample Number				385720	385721	385722	385723	385724
Sample Reference				WS1	HP2	HP3	HP4	WS6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.50	1.00	1.10	1.00	1.80
Date Sampled				23/10/2014	23/10/2014	23/10/2014	23/10/2014	23/10/2014
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	12	15	17	16	14
Total mass of sample received	kg	0.001	NONE	0.67	0.59	0.69	0.72	0.70

Whole Sample Crushed		N/A	NONE	-	-	-	-	-
----------------------	--	-----	------	---	---	---	---	---

General Inorganics

pH	pH Units	N/A	MCERTS	8.2	8.2	7.9	7.9	7.9
Total Cyanide	mg/kg	1	MCERTS	-	-	-	-	-
Total Sulphate as SO ₄	mg/kg	50	ISO 17025	-	-	-	-	-
Water Soluble Sulphate (Soil Equivalent)	g/l	0.0025	MCERTS	0.0097	0.010	0.011	0.015	0.036
Water Soluble Sulphate as SO ₄ (2:1)	mg/kg	2.5	MCERTS	9.7	10	11	15	36
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0049	0.0051	0.0057	0.0076	0.018
Sulphide	mg/kg	1	MCERTS	-	-	-	-	-
Total Sulphur	mg/kg	50	NONE	-	-	-	-	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	-	-	-	-	-
-----------------------------	-------	-----	--------	---	---	---	---	---

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-	-	-
Chromium (hexavalent)	mg/kg	4	MCERTS	-	-	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-

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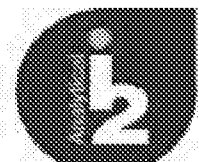
ARUN DISTRICT COUNCIL EP/88/17/DOC

The results included within the report are representative of the samples submitted for analysis.

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Environmental Science

Analytical Report Number: 14-62059

Project / Site name: Bradbury Hotel, Station Road, East Preston

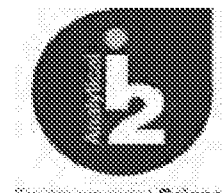
Your Order No: PO8546

Lab Sample Number				385720	385721	385722	385723	385724
Sample Reference				WS1	HP2	HP3	HP4	WS6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.50	1.00	1.10	1.00	1.80
Date Sampled				23/10/2014	23/10/2014	23/10/2014	23/10/2014	23/10/2014
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Monoparamatics								
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic > EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic > EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic > EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic > EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic > EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic > EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic > EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	-

TPH-CWG - Aromatic > EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	-



Analytical Report Number : 14-62059

Project / Site name: Bradbury Hotel , Station Road , East Preston

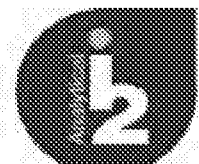
* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and topsoil/loam soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
385715	WS1	None Supplied	0.50	Beige clay and sand with gravel.
385716	HP2	None Supplied	0.60	Brown clay and topsoil with gravel and vegetation.
385717	HP3	None Supplied	0.70	Brown clay and topsoil with gravel and vegetation.
385718	HP4	None Supplied	0.40	Brown clay and topsoil with gravel and vegetation.
385719	HP5	None Supplied	0.40	Light brown clay and topsoil with gravel and vegetation.
385720	WS1	None Supplied	1.50	Light brown clay.
385721	HP2	None Supplied	1.00	Light brown clay.
385722	HP3	None Supplied	1.10	Light brown clay.
385723	HP4	None Supplied	1.00	Light brown clay.
385724	WS6	None Supplied	1.80	Light brown clay.



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Environmental Science

Analytical Report Number : 14-62059

Project / Site name: Bradbury Hotel , Station Road , East Preston

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L0735-PL	W	MCERTS
Crush Whole Sample	Either: Client specific preparation instructions - sample(s) crushed whole prior to analysis; OR Sample unsuitable for standard preparation and therefore crushed whole prior to analysis.	In house method, applicable to dry samples only.	L019-UK	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Stones not passing through a 10 mm sieve is determined gravimetrically and reported as a percentage of the dry weight. Sample	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by extraction with water followed by ICP-OES. Results reported corrected for extraction ratio (soil equivalent) as g/l and mg/kg; and upon the 2:1	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	ISO 17025
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	NONE
TPHCWG (Soil)	Determination of pentane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS

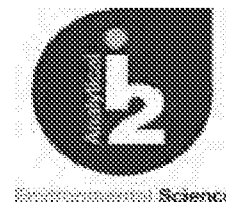
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The results included within the report are representative of the samples submitted for analysis.

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Analytical Report Number : 14-62059

Project / Site name: Bradbury Hotel , Station Road , East Preston

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.



Laboratory Report



Contract Number: 24904

Client's Reference: **CCL02593**Report Date: **31-10-2014**

Client **Crossfield Consulting**
The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Contract Title: **Bradbury Hotel, Station Road, East Preston**
For the attention of: **Samantha Cooper**

Date Received: **27-10-2014**
Date Commenced: **27-10-2014**
Date Completed: **31-10-2014**

Test Description	Qty
Moisture Content	5
1377 : 1990 Part 2 : 3.2 - * UKAS	
4 Point Liquid & Plastic Limit (LL/PL)	5
1377 : 1990 Part 2 : 4.3 & 5.3 - * UKAS	

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
* - denotes test included in laboratory scope of accreditation
- denotes test carried out by approved contractor
@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced in full, without the prior written approval of the laboratory.

Approved Signatories:

Alex Wynn (Associate Director) - Benjamin Sharp (Contracts Manager) - D V Edwards (Managing Director)
Emma Williams (Office Manager) - Paul Evans (Quality/Technical Manager)

GEO Site & Testing Services Ltd

Unit 4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN

ARUN DISTRICT COUNCIL EP/88/17/DOC

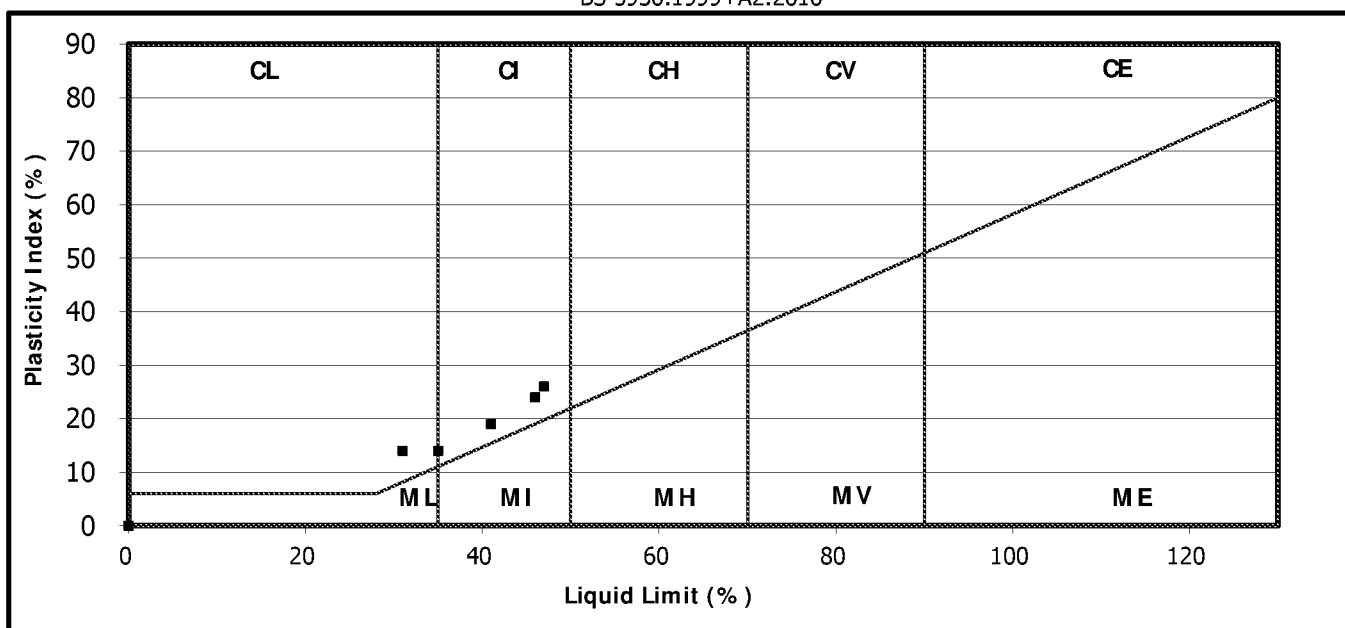
Tel: 01554 784040 Fax: 01554 784041 info@geo.uk.com geo.uk.com

Test Report: Method of the Determination of the plastic limit and plasticity index
BS 1377 : Part 2 : 1990 Method 5

Client ref: CCL02593
Location: Bradbury Hotel, Station Raod, East Preston
Contract Number: 24904-

Hole/ Sample Number	Sample Type	Depth m	Moisture Content % Cl. 3.2	Liquid Limit % Cl. 4.3/ 4.4	Plastic Limit % Cl. 5.	Plasticity Index % Cl. 6.	% Passing .425mm	Remarks
WS1	J	1.50	19	31	17	14	88	CL Low Plasticity
WS6	J	1.80	20	35	21	14	100	CL/ I Low/ Inter. Plasticity
HP2	J	1.00	22	46	22	24	94	CI Intermediate Plasticity
HP3	J	1.10	23	47	21	26	95	CI Intermediate Plasticity
HP4	J	1.00	24	41	22	19	100	CI Intermediate Plasticity

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved
PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.
 BS 5930:1999+A2:2010



For and behalf of GEO Site & Testing Services Ltd

Authorised By:
 Emma Williams (Office Manager)
Date: 31.10.14

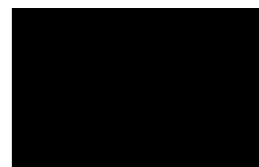
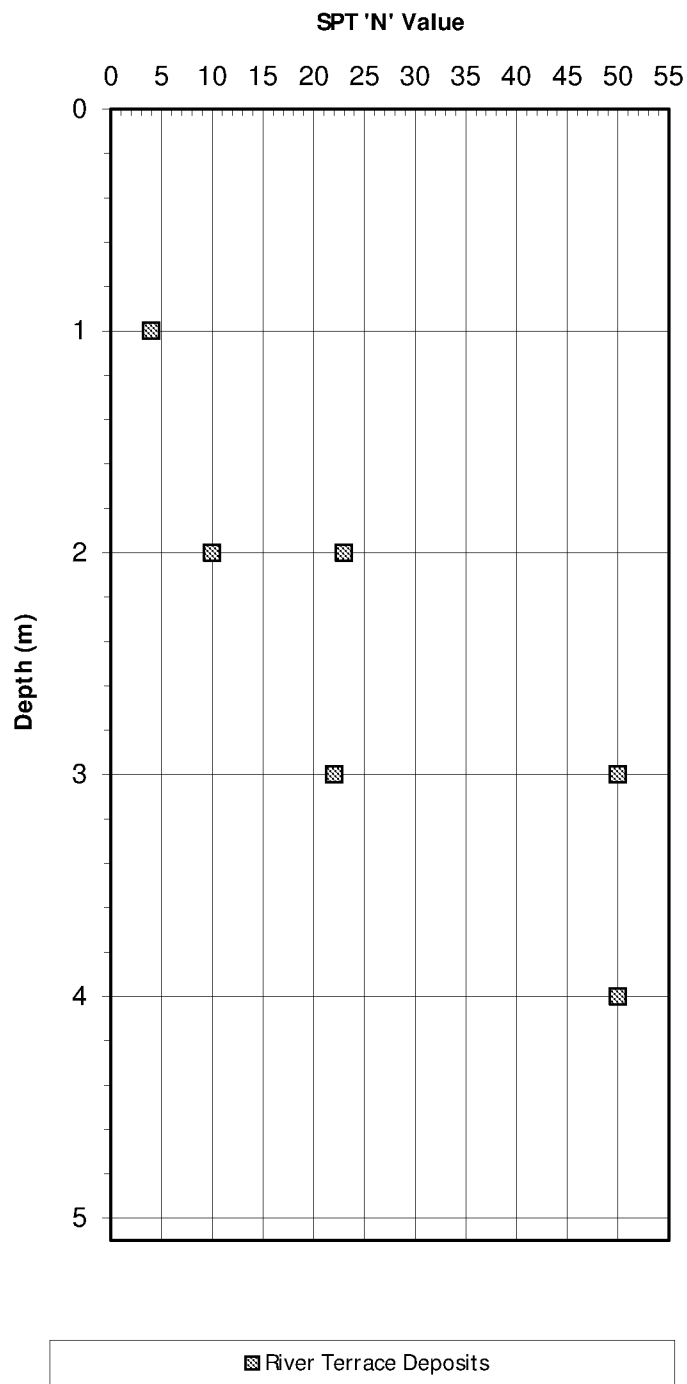
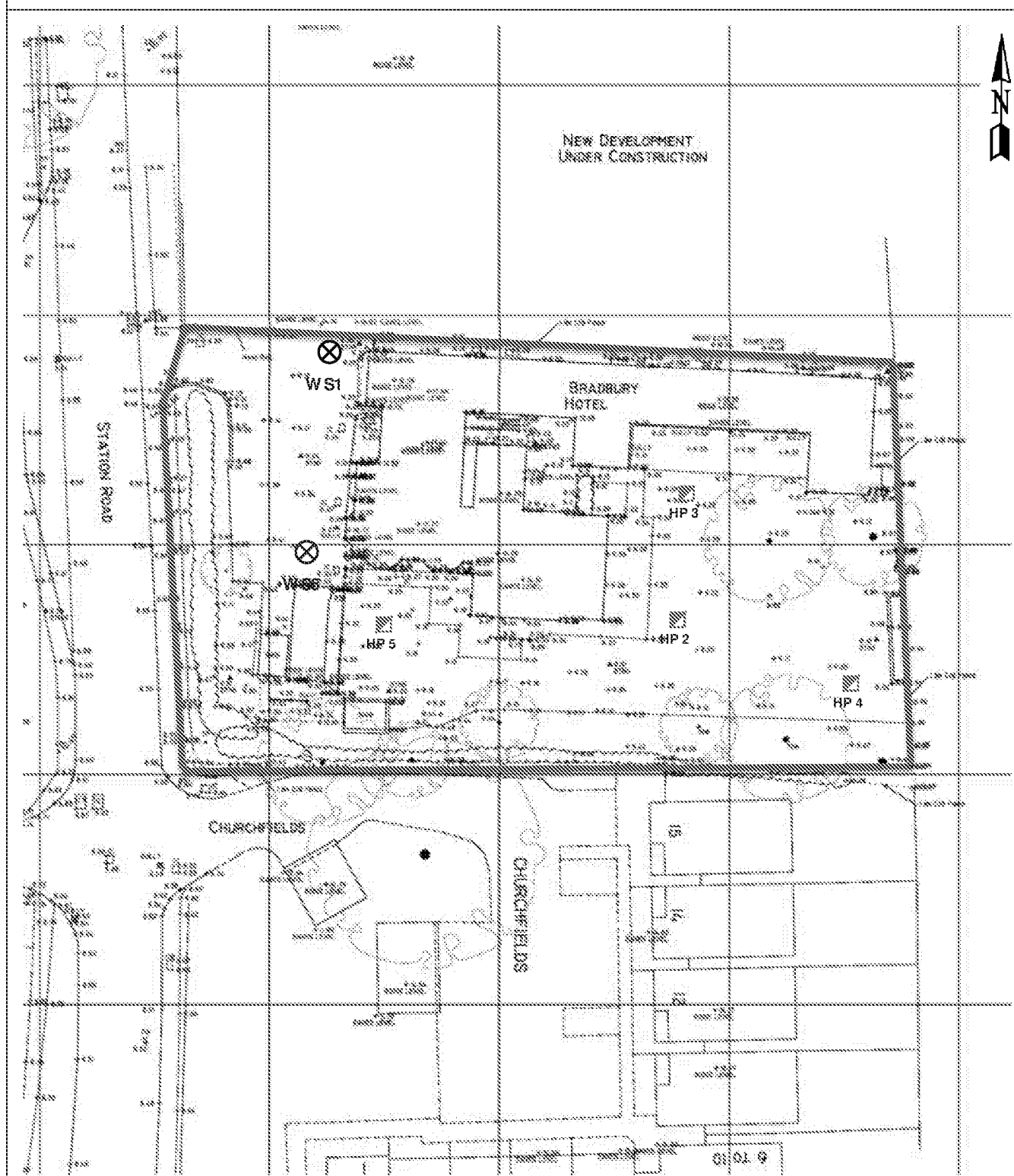


FIGURE III-1



SPT 'N' Value Profile

FIGURE III-2



EXPLORATORY HOLE LOCATION PLAN

Scale 1: 500

Reproduced from a Proposals Limited 1:200 Scale October 2014 drawing no. PP/3037/M&S/2014/R

APPENDIX IV

APPENDIX IV – BASIS OF GEOTECHNICAL ASSESSMENT FOR FOUNDATIONS

Geotechnical Design Category of Structure: 2

Design Working Life: Standard building structure (50 years)

Design Approach: 1

1. Geotechnical Model

On the basis of the ground investigation data, the following model of the ground conditions is considered appropriate for foundation design purposes:

Depth (m)	General Description of Strata (and classification)	Parameter	Characteristic Value & Units	Remarks
0.00 to 0.5 ave. (1.2 max.)	Made Ground	γ	18 kN/m ³	Assumed value based on site description
0.50 to 3.20	Firm and firm to stiff consistency, slightly sandy, slightly gravelly clay River Terrace Deposits	N	10	Based on field data
		γ	19 kN/m ³	Assumed value based on site description
		c_u	60 kN/m ²	Assumed value based on site data and observations
		ϕ_u	0°	Assumed value based on site data and observations
2.20 – 4.00	Dense orangish brown clayey sandy gravel to clayey sand and gravel River Terrace Deposits	Modified PI	20 %	Medium volume-change potential NHBC (2014)
		N	50	Based on field data
		γ	19 kN/m ³	Assumed value based on site description
		c_u	0 kN/m ²	Peck, Hanson and Thornburn (1974)
		ϕ_u	40°	Peck, Hanson and Thornburn (1974)
		Modified PI	n/a	Non volume-change potential NHBC (2014)

Characteristic Depth to Groundwater (or groundwater level): >5.0 m

Reference should be made to Sections 7 – 8 of the report for an assessment of overall ground stability, seismic risk, combined failure of the structure/ground, excessive settlements and potential soil-volume changes (including heave).

2. Imposed Actions from Proposed Structure

The following are generic values, based on the development proposed, as described in the report. In compliance with BS EN 1997-1:2004, final designs should include consideration of the calculated imposed loads.

Imposed Load on Foundations: 125 kN/m run

Serviceability Limit Values (associated with above action)

Maximum Total Settlement: 25 mm

Maximum Deflection (angular distortion value): 1/1000

3. Geometry of Proposed Foundations

Footing Width (assumed for assessment): Up to 2.0 m

Footing Depth (assumed for assessment): 0.9 m minimum

4. Shallow Foundations

In assessing the allowable bearing pressures below structural foundations, a number of methods are used, as outlined below.

4.1. Fine Grained Soils

Where the foundations are to be placed on these soils, the ultimate bearing capacity has been estimated using the method proposed by Terzaghi (1943) using total stress parameters. Partial factors have been considered in this assessment, in accordance with BSEN 1997-1:2004 and the relevant National Annex.

The recommended Nett Allowable Bearing Pressure is based on a value less than 0.3 times the ultimate bearing capacity and, therefore, the serviceability limit state will be satisfied where imposed serviceability loading is not greater than this value.

4.2. Coarse Grained Soils

Where foundations are to be placed on these soils, the allowable bearing pressure is estimated using the method of Terzaghi and Peck, as modified by Meyerhof (1965). Using this method, total settlements are assumed to be not greater than 25 mm (and a detailed serviceability limit calculation is not necessary).