



PHASE 1: DESK TOP STUDY REPORT

(PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT)

PROPOSED RESIDENTIAL DEVELOPMENT:

LAND ADJACENT TO SEABREEZE LODGE

NETHERTOWN

CUMBRIA

FOR:

MR N KAY

GEO Environmental Engineering

DOCUMENT CONTROL SHEET

- Report Ref:2018-3238Report Date:05.10.2018Report Type:DRAFT DTSv1 for Design Team ReviewPrepared By:Andrew Hampson B.Sc. (Hons) FGS Geo Environmental Engineer/AssociateChecked By:Curtis Evans B.Sc. (Hons) FGS Geo Environmental Engineer/DirectorConsultant:Alpha Design Architectural Services
- Client: Mr N Kay

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1.0 Introduction

1.1 Instruction

Geo Environmental Engineering Ltd (GEO) has completed a Phase 1: Desk Top Study Report (Preliminary Environmental Risk Assessment – PERA) for land adjacent to Seabreeze Cottage, Nethertown to determine any potential geohazards that may affect the residential development of the site. Geo Environmental Engineering Ltd has been commissioned to complete the report by the Consultant, Alpha Design Architectural Services on behalf of the Client, Mr N Kay.

The Phase 1: Desk Top Study Report is suitable for submission to the Local Authority as part of a planning application as the site is currently undergoing consideration by the Client for residential development with associated access road, infrastructure, private gardens and general areas of soft landscaping. Further development details are available from the Consultant.

1.2 Aims and Objectives

The aims and objectives of this Phase 1: Desk Top Study (DTS) Report are to assess the geological and environmental sensitivity of the development area and the surrounding environs, with particular attention made to any potentially contaminative industries or processes that may have taken place on site or on immediately adjacent sites, which may be considered as potentially posing a risk of ground/groundwater contamination and ground gas that could negatively affect the proposed end users, adjacent sites and controlled waters. This Phase 1: Desk Top Study Report has generally been completed in accordance with the following documents:

- CLR11: Model Procedures for the Management of Land Contamination. DEFRA/EA, 2004.
- BS10175:2011: Code of Practice for the Investigation of Potentially Contaminated Sites.
- BS5930:2015: Code of Practice for Site Investigations.

During the completion of this DTS information has been obtained and reviewed from the following sources:

- British Geological Survey (BGS).
- Environment Agency (EA).
- Ground Sure Report (Geoinsight and Enviroinsight GSR Appendix II and III Incorporating Mapinsight Historical Ordnance Survey (OS) Plans)
- The Coal Authority On-Line Database (CA) Appendix IV.

1.3 Limitations of Use

The information, assessments, conclusions and recommendations presented within this Phase 1: Desk Top Study (DTS) Report are solely based on, and are limited to, the boundaries of the sites, the immediate area around the site, and the historical use(s) as described, with the approximate extent of the site marked on the Existing Site Layout Plan in Appendix I.

This DTS has been completed utilising information relating to the physical, environmental and industrial setting of the development area, highlighting, where possible, any potential geohazards that might be encountered when considering the future redevelopment of this land, with this DTS reflecting a proposed end use, as considered by the developer (i.e. "Best Fit" CLEA classification of *Residential*). Therefore, if a change in the proposed end use is envisaged, then a reassessment of the development area should be carried out.

Any comments, opinions, diagrams, cross sections and/or sketches contained within the DTS, and/or any configuration of the findings is purely conjectural and given for guidance only as no intrusive investigation works have been completed by Geo Environmental Engineering Ltd and it is recommended that confirmation of the anticipated ground conditions and feasibility of construction be considered by the developer before commencing acquisition or redevelopment.

Agreement for the use or copying of this report by any Third Party must be obtained in writing from Geo Environmental Engineering Ltd. The use and reliance on the report is strictly in accordance with the Geo Environmental Engineering Ltd standard terms and conditions, copies of which are available on request.

The conclusions and recommendations presented within this report are considered reasonable based on the available information. However, these cannot be guaranteed to gain regulatory approval. Therefore, the report should be passed to the appropriate regulatory authorities and/ or other key stakeholders in order to seek their approval of the findings prior to undertaking any works on site. Geo Environmental Engineering Ltd cannot accept responsibility for the accuracy of third party information.

2.0 Site Location and Development Proposals

2.1 Site Location

The development area comprises an irregular shaped agricultural field to the east of Seabreeze Cottage within Nethertown, Cumbria. The site lies within a mixed residential urbanised and agricultural setting. The village of Nethertown and residential properties are present to the south with agricultural fields and a holiday park to the north.

The site is centred on National Grid Reference (NGR) 299072, 507687 and equates to approximately c.0.55 hectares.

2.2 Existing Site Levels

From the walkover, the site was noted to generally slope to the west.

2.3 Existing Site Surfacing and Buildings

The site forms agricultural fields and at the time of the walkover vegetative surfacing was noted, possibly used as a paddock or for grazing. Some small garden sheds were present on site which did not appear to contain any asbestos containing materials. No areas of hard-standing were noted.

At the time of the walkover the site was in an acceptable condition in terms of housekeeping. There was no visual evidence of bonfires, fly-tipping or bulk fuel/chemical storage.

2.4 Surrounding Land Uses

The immediate surrounding area comprises a mixture of residential and agricultural land with a holiday park to the north.

2.5 Existing Infrastructure and Utilities

A review of statutory utility supplier records lies outside the scope of this report. However, as the site is close to developed areas it is likely that mains utilities will be present or nearby. Consequently, there should be a review of the statutory utility plans should include correspondence with the utility providers to determine the presence of buried utilities prior to commencing any redevelopment/construction works.

This will determine if any significant or mains utilities are present on site that may require easement strips, alterations to proposed layouts or potentially costly diversions/terminations. Determining the presence of on-site utilities will also protect the workforce by reducing the risk of utility strikes during the construction phase.

Overhead cables were noted to be present across the site.

2.6 Development Proposal

The proposed development is thought to comprise the construction of a residential property. Further details associated with the full (proposed) scope of redevelopment can be obtained from the Consultant.

3.0 Geo-Environmental Setting

Section 3.1 refers to the Ground Sure Report (GSR - Geoinsight) contained in Appendix II, with Sections 3.2 to 3.4 referring to the Ground Sure Report (GSR - Enviroinsight) contained in Appendix II.

3.1 Development Area Geology

A geological review of the site has been undertaken using information provided on published geological plans in conjunction with the Ground Sure Report (GSR - Geoinsight) contained in Appendix II.

3.1.1 Made Ground

A review of published geological plans and the GSR does not indicate the presence of made ground materials. It is likely that the agricultural fields comprise vegetative surfacing over topsoil and subsoil type materials. There is a potential for anthropogenic debris within the topsoil materials (perhaps coarse materials such as ash and clinker historically added to aid drainage) in addition to localised areas of made ground for levelling or infilling hollows to aid the working of the land.

It is therefore recommended that excavations be completed on site to confirm ground conditions with contamination sampling of topsoil materials to confirm its suitability for re-use within a residential context, in accordance with British Standards.

3.1.2 Drift Geological Deposits

A review of published geological plans and the GSR indicates that the site lies in an area where Glaciofluvial Deposits which comprise Sand & Gravels. An area of Peat is recorded c.22m southwest of the site although these deposits may extend towards the site although at this stage they are not anticipated to extend on to the site.

The GSR (Geoinsight Section 4.0) within Appendix II identifies the following geohazards and indicates a preliminary level of risk:

- Shrink-swell clays negligible risk.
- Landslides very low risk.
- Compressible deposits negligible risk.
- Collapsible deposits very low risk.
- Running sands very low risk.

It is recommended that reference be made to Section 4.0 of the Geoinsight GSR (Appendix II). Consequently, Phase 2: Ground Investigation works are recommended to aid the design of foundations, any retaining structures and highways, should they be deemed necessary by the Design Team.

3.1.3 Solid Geological Deposits

Solid geological deposits across the development site are indicated by the BGS as the St Bees Sandstone Formation. The BGS and GSR do not record any subcropping coal seams beneath or close to the site. The GSR Geoinsight (Section 4.3) indicates a *negligible* hazard rating with respect to ground dissolution of soluble rocks and recommends the following:

"Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks".

3.1.4 Historical Borehole Review

No historical borehole records are present within a representative distance of the site.

3.1.5 Geological Features

A geological structural fault is inferred below the site, trending in a northwest – southeast direction with further faults noted in the surrounding area. The presence of fault lines have the potential to act as a conduit for the migration (horizontally and vertically) of potentially harmful ground gases (if present).

3.1.6 Mining and Quarrying Assessment

Due to the geological setting (St Bees Sandstone) reference has been made to the CA on-line database, summarised below:

- No shallow coal seams are noted by the CA.
- No recorded shallow coal mine workings are present according to the CA.
- No suspected (unrecorded) shallow coal mine workings are present according to the CA.
- No mine entries are recorded by the CA.
- The site does not lie within a CA defined "High Risk Development Area".

As a result of the above information, in-conjunction with the geological review using the desk based information available from the CA, BGS and GSR the development site is not considered to be at potential risk of shallow coal mining related geohazards.

A review of the GSR indicates that the following activities do not affect the site:

- Natural Cavities
- Brine Extraction

Tin MiningClay Mining

Gypsum Mining

Historical quarrying activities are not identified on the site or the site boundaries according to the GSR and available historical plans.

GEO is not responsible for third party information and records may be inaccurate or incomplete. Consequently, GEO recommends that care and consideration of potential mining features should be made by the developer during construction.

3.1.7 Radon Gas Assessment

The GSR Geoinsight Section 3.1 indicates that the development site is not located within a Radon Affected Area as defined by the Health Protection Agency (HPA), as less than 1% of properties are above the action level. According to BR211 radon protection measures are not necessary.

3.1.8 Recorded Areas of Made Ground

No areas of artificial ground are recorded within c.250m of the site although a cutting is recorded c.241m west of the site. This feature is associated with an existing railway line is not considered to represent a potential risk of ground gas generation.

3.2 Development Area Hydrogeology (Groundwater)

3.2.1 Made Ground/Soils

The topsoil and made ground materials on site are likely to be classified as high permeability (worst case scenario) until site information is available.

3.2.2 Drift Geology

The natural drift deposits are classified as a Secondary 'A' Aquifer. This includes 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.

3.2.3 Solid Geology

The GSR records the site to be underlain by a Principal Aquifer (formerly Major Aquifer) deposits, which are of higher permeability layers and are likely to be considered as a strategic resource.

3.3 Development Area Hydrology

3.3.1 Groundwater

Groundwater is potentially present within the Drift geology, with the potential for localised pockets of trapped surface infiltration within the upper topsoil / made ground (where present). A review of the information in the GSR Environisight indicates the following:

- No groundwater abstractions are recorded within c.1km of the site.
- No surface water abstractions are recorded within c.1km of the development area.
- No potable water abstraction licences are held within c.2km.
- The site is not recorded as being located within a Source Protection Zone.

3.3.2 Surface Water Features

No Environment Agency (EA) GQA classified rivers, canals, ponds or lakes (biological and chemical monitoring points) are recorded within c.250m of the development area. No watercourses are noted to be present within close proximity.

3.3.3 Current Surface Water Run-off

It is considered that the current surface water will infiltrate directly into the topsoil (where present) as hard-standings are not present. There is likely to be some overland flow due to the sloping/undulating topography, particularly during heavy rainfall events.

3.4 Development Area Environmental Sensitivity

3.4.1 Site Ecology

- No Sites of Special Scientific Interest (SSSI) is noted within c.250m.
- No Local Nature Reserves (LNR) are present within c.250m.
- No Special Areas of Conservation (SAC) are noted within c.250m.
- No Special Protection Areas (SPA) are present within c.250m.
- No records of Ancient Woodland are recorded within c.250m.
- No World Heritage Sites are recorded within c.250m.
- No RAMSAR Sites are noted within c.250m.

- No Areas of Outstanding Natural Beauty (AONB) are recorded within c.250m.
- No National Parks are recorded within c.250m.
- The site lies out with a Nitrate Vulnerable Zone (NVZ).
- No Nitrate Sensitive Areas are within c.250m.
- The site is classified as being out with an area of Green Belt land.

The Design Team should refer to Section 8.0 of the GSR (Enviroinsight – Appendix II) for further information on the above mentioned records.

3.4.2 Authorisations, Incidents and Registers

- No records of IPC Authorisations are held within c.250m.
- No records of IPPC Authorisations are held within c.250m.
- No records of Water Industry Referrals (potentially harmful discharges to the public sewer) are held within c.250m.
- No records of Red List Discharge Consents (potentially harmful discharges to controlled waters) are held within c.250m.
- No records of List 1 Dangerous Substances Inventory sites are held within c.250m.
- No records of List 2 Dangerous Substances Inventory sites are held within c.250m.
- No Part A (2) or Part B Activities and Enforcements are noted within c.250m.
- No records of Category 3 or 4 Radioactive Substances Authorisations are held within c.250m.
- No Licensed Discharge Consents are held within c.250m.
- No records of Planning Hazardous Substance Consents or Enforcements are within c.250m.
- No records of COMAH and NIHHS sites are held within c.250m.
- No Environment Agency Recorded Pollution Incidents are detailed within c.250m.

The Design Team should refer to Section 2.0 of the GSR (Enviroinsight – Appendix II).

3.4.3 Determination of Contaminated Land (Part IIA)

A review of the GSR Enviroinsight has indicated that the site is not currently recorded as Contaminated Land under Part IIA EPA 1990. In addition, no sites determined as Contaminated Land under Part IIA EPA 1990 are recorded within c.500m of the development area.

3.4.4 Historical Industrial Land Uses

A review of Section 1.0 in the GSR (Envirolnsight – Appendix II) identifies the following:

- Potentially Contaminative Uses Identified within c.250m Seven entries within c.250m which are associated with an Unspecified Commercial / Industrial premises c.77m south with an Unspecified tank noted c.81m south and Cuttings located c.241m southwest. Neither entry is considered to pose a significant risk.
- Historical Tank Database No entries noted within c.250m.
- Historical Energy Features No entries are recorded within c.250m.
- Historical Petrol and Fuel Site Database No entries noted within c.250m.
- Historical Garage and Motor Vehicle Repair Database No entries are recorded within c.250m.
- Historical Military Sites No entries are recorded within c.250m.
- Potentially Infilled Land within c.250m Five entries are recorded within c.250m with all relating to a Cutting alongside an existing railway line. This feature is not considered to pose a potential risk of ground gas generation.

3.4.5 Current Industrial Land Uses

Due to the residential and rural nature of the immediate surrounding area there is only one entry associated with a current industrial land use (i.e. Dairy Farming) located c.125m south. It is recommended that reference be made to Section 4.0 of the GSR for further information (Enviroinsight – Appendix II).

3.4.6 Fuel Station Entries

According to the GSR information (Section 4.2, Enviroinsight – Appendix II) there are no fuel filling stations (active or in-active) within c.250m of the site.

3.4.7 Landfill and Waste Regulation/Management – Landfill Sites/Other Waste Sites

- No Environment Agency Registered Landfill Sites are recorded within c.250m.
- No Environment Agency Historic Landfill Sites are recorded within c.250m.
- The BGS/DoE Landfill Site Survey does not record any Landfill Sites within c.250m.
- No GroundSure Local Authority Landfill sites are recorded within c.250m.
- No Operational and Non-Operational Waste Treatment, Transfer or Disposal Sites are recorded within c.250m.
- No Environment Agency Licensed Waste Sites are recorded within c.250m.

It is recommended that reference be made to Section 3.0 of the GSR Enviroinsight (Appendix II) for further information. The GSR does not record any landfilling (historical or current) within an influencing distance of the site.

3.5 Development Area Historical Plan Appraisal

Section 3.5 is based on historical plans (Ordnance Survey extracts) obtained as part of the parcel of information within the GSR and provides a summary of the site history, highlighting any industries, processes or activities that may be considered as "Geohazards". Copies of old survey plans (1:10,560, 1:10,000 and 1:2,500 Scale) covering the site and adjacent areas have been reviewed with selected extracts included within Appendix III. Particular attention is made to the greater detail presented in the 1:2,500 scale plans dating between c.1863 and c.1995.

Between c.1861 and the present-day, the site is recorded as agricultural fields.

The immediate surrounding area also comprises agricultural fields. The village of Nethertown grew between c.1863 and the present day, with the majority of the development close to the site being residential properties. Netherton Farm (c.50m south) is recorded from c.1963. No significant features of potential contaminative concern have been identified on the historical plans.

4.0 Conceptual Site Model

A Conceptual Site Model (CSM) has been designed using the information presented within this P1 DTS to provide a graphical representation of the anticipated ground, groundwater and ground gas conditions below the development area (Existing Site CSM). The CSM is presented within Sections 4.1 to 4.3 and aids the completion of the Preliminary Qualitative Risk Assessment (PQRA – Section 5.0).

The CSM utilises the established *Source – Pathway – Receptor* pollutant linkage model and is designed to provide an improved understanding of the site characteristics, designing a Preliminary Screening Strategy (PSS) for the Potential Contaminants of Concern (PCOC's). This ensures adequate and appropriate Phase 2: Ground Investigation (P2 GI) Works are designed and undertaken for wide spread and targeted investigations, should they be deemed necessary.

During the P2 GI the CSM can be refined depending upon the outcomes of the intrusive works to ensure that appropriate remediation (if required) is completed to ensure the development area is "fit for purpose" in relation to the proposed end use. The CSM is presented on the following page.

Conceptual Site Model (CSM): Source – Pathway – Receptor Pollutant Linkage Model

Sources:

S1 = Generic/Organic Made Ground. Significant made ground/ground contamination is not anticipated across the site. A review of published geological plans and the GSR does not indicate the presence of made ground materials.

It is likely that the agricultural fields comprise vegetative surfacing over topsoil and subsoil type materials. There is a potential for anthropogenic debris within the topsoil materials (perhaps coarse materials such as ash and clinker historically added to aid drainage) in addition to localised areas of made ground for levelling or infilling hollows to aid the working of the land.

It is therefore recommended that excavations be completed on site to confirm ground conditions with contamination sampling of topsoil materials to confirm its suitability for re-use within a residential context.

If made ground is identified that includes anthropogenic debris (i.e. ash, clinker etc.) and/or visual/olfactory (malodorous) evidence of potential contamination then an appropriate Human Health Risk Assessment for the proposed residential end users should be undertaken. Should made ground be identified then Potential Contaminants of Concern (PCOC's) could comprise: Arsenic, Cadmium, Chromium (III and VI), Copper, Lead, Mercury, Nickel, Selenium, Zinc, Cyanide (free), pH, Water Soluble Sulphate, Total Organic Carbon, Asbestos Containing Materials and Speciated PAH.

If visual/olfactory evidence of fuel/oil type contamination is noted (considered unlikely) then screening should be undertaken for Speciated TPH, PAH, BTEX and MTBE.

In addition to the above, a prudent developer should implement a watching brief during the redevelopment works to ensure that if made ground and or visual/olfactory evidence of contamination is identified then works should be stopped, the Local Authority notified and advice should be sought from an appropriately qualified and experienced Geo-Environmental Engineer.

S2 = Ground Gas - PCOC's typically include Carbon Dioxide and Methane. For this site, potential *Sources* have been identified, an area of peat deposits located c.22m southwest.. The site lies within an area not requiring Radon Protection Measures.

Pathways:

- P1 = Inhalation of indoor / outdoor air (wind-blown particles)
- P2 = Dermal/direct contact (limited risk present through areas of soft landscaping)

P3 = Ingestion (limited risk present through areas of soft landscaping)

P4 = Migration through existing services

P5 = Direct contact with building materials

P6 = Surface Run-Off

P7 = Leaching from Soils

Receptors:

R1 = Human Health (Residents)

R2 = Human Health (Construction Workforce) – Not considered within this assessment

R3 = Groundwater (Secondary A and Principal Aquifers)

R4 = Building Materials and Buried Utilities

R5 = Flora and Fauna (Future private gardens and soft landscaping) - Not considered within this assessment

5.0 Preliminary Qualitative Risk Assessment (PQRA)

5.1 Qualitative Geotechnical Risk Assessment – Risk Meter

The following Preliminary Geotechnical Risk Meter determines the potential level of risk associated with the geotechnical properties of the site, considering any potential geohazards identified by the information presented within the DTS.

Geotechnical:						
RISK =	NEGLIGIBLE	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH

A preliminary risk level of *LOW* is currently determined appropriate for this development area for the following reasons:

- As well as topsoil materials across the site, some localised made ground may be present on site which may have been added to the site for levelling or infilling hollows to aid the working of the land.
- Surface water ponding and overland flow may occur particularly following periods of heavy rainfall.
- Shallow groundwater may be encountered within the sand and gravel depoists expected across the site. Any groundwater may also affect excavation stability and reduce maximum allowable bearing pressures.
- A geological structural fault is inferred on geological plans and is located trending in a northwest to southeast direction which may create zones of weakness within the underlying solid deposits and act as a conduit for ground gas migrations.
- The site does not currently require Radon Protection measures within structures.
- Potential ground gas (carbon dioxide and methane) risks have been identified which is associated with an area of Peat located c.22m southwest of the site.

Consequently, Phase 2: Ground Investigation works are recommended to determine ground/groundwater/gas conditions and to aid the design of foundations, retaining structures and highways, should they be deemed necessary by the Design Team.

5.2 Qualitative Contamination Risk Assessment – Risk Meter

The following Preliminary Ground Contamination, Groundwater Contamination and Ground Gas Risk Meter determines the potential level of risk associated with the redevelopment of the site when considering the anticipated *Sources – Pathways – Receptors* within the pollutant linkage model and CSM.

Ground Contamination:		Ţ				
RISK =	NEGLIGIBLE	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH
Groundwater Contamination:	\bigcup					
RISK =	NEGLIGIBLE	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH
Ground Gas:		Ţ				
RISK =	NEGLIGIBLE	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH

A preliminary risk level of VERY LOW is currently determined appropriate for this development with respect to ground contamination. In summary, it is considered unlikely that significant made ground/contamination will be present. Although an assessment of the topsoil should be made to determine if contamination is present and whether the topsoil present is suitable for re-use within a residential context (i.e. re-use of topsoil for residential gardens in accordance with current British Standards).

Therefore, it is recommended that excavations be completed on site to confirm the shallow ground conditions and if made ground is present (with anthropogenic debris) or if visual/olfactory evidence of contamination is identified then contamination screening and a human health risk assessment will be required. The PCOC's associated with the site are presented in Section 4.0 (CSM).

When considering the potential for made ground/contamination on site a risk level of *NEGLIGIBLE* is thought appropriate for this development with respect to potential risks to controlled waters (i.e. groundwater, nearby surface water features), primarily due to a lack of contamination *"Sources"*. However, if elevated levels of soil/ground contamination are identified then groundwater/leachate screening should be undertaken to determine if any impact is present.

A risk level of *VERYLOW is* currently considered appropriate for the site with respect to potential harmful ground gas (Carbon Dioxide and Methane) as limited potential sources have been identified. According to the GSR, the site lies in an area not currently requiring Radon Protection Measures.

GEO also recommends that a "watching brief" and "observational technique" be applied to this site to ensure that if ground conditions appear to vary from those identified within this investigation report then advice should be sought from a suitably qualified and experienced Engineering Geologist, Geotechnical or Geo-Environmental Engineer.

6.0 Conclusions

When considering the results of this DTS report the following can be seen:

- The development site is currently considered to represent a low geotechnical risk.
- The site is currently considered to pose a very low risk to the proposed end users (ground contamination).
- The site is currently considered to pose a negligible risk to adjacent sites (the surrounding environment) and controlled waters with respect to potential ground/groundwater contamination.
- A very low level of risk is currently considered present of ground gas.

It is recommended that intrusive investigations (boreholes/trial pits) take place on site to confirm the shallow ground conditions and if made ground is identified (with anthropogenic debris) or visual/olfactory evidence of contamination be noted then contamination screening and a human health risk assessment will be required, in addition to confirming the materials are suitable for re-use in a residential context. The PCOC's are presented within Section 4.1. A period of in-situ ground gas monitoring for Carbon Dioxide and Methane should also be undertaken primarily due to the proximity of the peat deposits.

GEO also recommends that a "watching brief" and "observational technique" be applied to this site to ensure that if ground conditions appear to vary from those inferred within this investigation report then advice should be sought from a suitably qualified and experienced Engineering Geologist, Geotechnical or Geo-Environmental Engineer.

GEO is not responsible for third party information and records may be inaccurate or incomplete. Consequently, GEO recommends that care and consideration of potential mining features should be made by the developer during construction.

The conclusions and recommendations presented within this report are considered reasonable based on the available information. However, these cannot be guaranteed to gain regulatory approval. Therefore, the report should be passed to the appropriate regulatory authorities and/ or other key stakeholders in order to seek their approval of the findings prior to finalising any land values as part of a site acquisition or prior to undertaking any construction or redevelopment works on site.

End of Report

Appendix I

- Site Location Plan
- Aerial Photograph Extract
- Existing Site Plan
- Site Photographs (October 2018)





GEO2018-3238: Site Location Plan (Not to Scale)





GEO2018-3238: Aerial Photograph Extract





GEO2018-3238: Existing Site Plan





GEO2018-3238: Site Images (October 2018)



Appendix II

Ground Sure Report (GSR – Geoinsight and Enviroinsight)





EmapSite

Masdar House, 1 Reading Road, Eversley, RG27 0RP Report Reference: EMS-503515_677820

Your Reference: EMS_503515_677820

Report Date 4 Oct 2018

Report Delivery Email - pdf Method:

Geo Insight

Address: ,

Dear Sir/ Madam,

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

If you would like further assistance regarding this report then please contact the emapsite customer services team on 0118 9736883 quoting the above report reference number.

Yours faithfully,

emapsite customer services team

Enc. Groundsure Geo Insight

Groundsure Geo Insight

Address:

Date:

4 Oct 2018

Reference:

EMS-503515_677820

EmapSite

Client:

NW

Ν

NE



SW

Aerial Photograph Capture date:05-Oct-2008Grid Reference:299072,507687Site Size:0.55ha

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SE





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Overview of Findings

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

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

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

Section 1: Geology 1:10,000 Scale

1.1 Artificial Ground	1.1 Is there any Artificial Ground/ Made Ground present beneath the study site at 1:10,000 scale?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site at 1:10,000 scale?*	No
	1.2.2 Are there any records of landslip within 500m of the study site boundary at 1:10,000 scale?	No
1.3 Bedrock, Solid Geology and linear	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
features	1.3.2 Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale?	No
Section 2: Geolo	gy 1:50,000 Scale	
2.1 Artificial Ground	2.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	2.1.2 Are there any records relating to permeability of artificial ground within the study site*boundary?	No
2.2 Superficial Geology and	2.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?*	Yes
Landslips	2.2.2 Are there any records of permeability of superficial ground within 500m of the study site?	Yes
	2.2.3 Are there any records of landslip within 500m of the study site boundary?	No
	2.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No



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Section 2: Geolo	gy 1:50,000 Scale							
2.3 Bedrock, Solid Geology and linear features	2.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.							
	2.3.2 Are there any records relating to permo ground within the study site boundary?	Yes						
	2.3.3 Are there any records of linear features study site boundary?							
Section 3: Rador	1							
3. Radon	3.1Is the property in a Radon Affected Area a Protection Agency (HPA) and if so what perc above the Action Level?	as defined by entage of hoi	the Health mes are	The property Area, as less abov	is not in a Ra than 1% of p e the Action I	don Affected roperties are .evel.		
	3.2Radon Protection No radon protective measures a necessary.					easures are		
Section 4: Grour	nd Workings	On-site	0-50m	51-250	251-500	501-1000		
4.1 Historical Surface Scale Mapping	ce Ground Working Features from Small	0	0	5	Not Searched	Not Searched		
4.2 Historical Under	ground Workings from Small Scale Mapping	0	0	0	0	0		
4.3 Current Ground	Workings	0	0	0	0	0		
Section 5: Minin	g, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000		
5.1 Historical Mining	9	0	0	0	0	0		
5.2 Coal Mining		0	0	0	0	0		
5.3 Johnson Poole a	nd Bloomer Mining Area	0	0	0	0	0		
5.4 Non-Coal Mining]*	0	0	0	0	0		
5.5 Non-Coal Minin	g Cavities	0	0	0	0	0		
5.5 Natural Cavities		0	0	0	0	0		

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Section 5: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
5.6 Brine Extraction	0	0	0	0	0
5.7 Gypsum Extraction	0	0	0	0	0
5.8 Tin Mining	0	0	0	0	0
5.9 Clay Mining	0	0	0	0	0
Section 6: Natural Ground Subsidence	On-sit	te			
6.1 Shrink-Swell Clay	Negligik	ole			
6.2 Landslides	Very Lo	W			
6.3 Ground Dissolution of Soluble Rocks	Negligik	ole			
6.4 Compressible Deposits	High				
6.5 Collapsible Deposits	Very Lo	W			
6.5 Running Sand	Very Lo	W			
Section 7: Borehole Records	On-si	te	0-50m	5	1-250
7 BGS Recorded Boreholes	0		0		0
Section 8: Estimated Background Soil Chemistry	On-si	te	0-50m	5	1-250
8 Records of Background Soil Chemistry	2		3		0
Section 9: Railways and Tunnels	On-site	0-50m	51-250	250-500	
9.1 Tunnels	0	0	0	Not Searched	I
9.2 Historical Railway and Tunnel Features	0	0	0	Not Searched	I
9.3 Historical Railways	0	0	0	Not Searchec	I
9.4 Active Railways	0	0	0	Not Searchec	I
9.5 Railway Projects	0	0	0	0	





1:10,000 Scale Availability



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Availability of 1:10,000 Scale Geology Mapping

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

ID	Distance	Artificial Coverage	Superficial Coverage	Bedrock Coverage	Mass Movement Coverage
1	0.0	No deposits are mapped	No coverage	No coverage	No coverage
2	879.0	No deposits are mapped	No coverage	No coverage	No coverage

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

The definitions of coverage are as follows:

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

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Groundsure LOCATION INTELLIGENCE

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







1. Geology 1:10,000 scale

1.1 Artificial Ground

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

Are there any records of Artificial/Made Ground within 500m of the study site boundary at 1:10,000 scale? No

Database searched and no data found.





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









1.2 Superficial Deposits and Landslips

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

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary at 1:10,000 scale? No

Database searched and no data found.

1.2.2 Landslip

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

No

Database searched and no data found.

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

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



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



Bedrock and linear features Legend

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1.3 Bedrock and linear features

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

1.3.1 Bedrock/ Solid Geology

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

Database searched and no data found at this scale.

1.3.2 Linear features

Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale? No

Database searched and no data found at this scale.

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

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





2 Geology 1:50,000 Scale 2.1 Artificial Ground map







2. Geology 1:50,000 scale

2.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 037

2.1.1 Artificial/ Made Ground

Are there any records of Artificial/ Made Ground within 500m of the study site boundary?

No

Database searched and no data found.

2.1.2 Permeability of Artificial Ground

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





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



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2.2 Superficial Deposits and Landslips

2.2.1 Superficial Deposits/ Drift Geology

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

ID	Distance	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
2	22.0	SW	PEAT-P	PEAT	PEAT
3	185.0	E	PEAT-P	PEAT	PEAT
4	298.0	W	MBD-XSV	MARINE BEACH DEPOSITS	SAND AND GRAVEL
5	312.0	NE	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
6	330.0	S	PEAT-P	PEAT	PEAT
7	391.0	W	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
8	456.0	E	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL

2.2.2 Permeability of Superficial Ground

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

0.0 On Site Intergranular Very High High	 Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability	
ter y right	 0.0	On Site	Intergranular	Very High	High	
22.0 SW Mixed Low Very Low	22.0	SW	Mixed	Low	Very Low	

2.2.3 Landslip

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

No

Database searched and no data found.

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

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





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



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



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emapsite™ 2.3 Bedrock, Solid Geology & linear features

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 037

2.3.1 Bedrock/Solid Geology

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

ID	Distance	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	SBS-SDST	ST BEES SANDSTONE MEMBER - SANDSTONE	-
2A	0.0	On Site	SBS-SDST	ST BEES SANDSTONE MEMBER - SANDSTONE	-
3	89.0	SW	SBS-SDST	ST BEES SANDSTONE MEMBER - SANDSTONE	-
4	181.0	SW	SBS-SDST	ST BEES SANDSTONE MEMBER - SANDSTONE	-
5	274.0	NE	SBS-SDST	ST BEES SANDSTONE MEMBER - SANDSTONE	-
6	275.0	E	WLSF-SDST	WILMSLOW SANDSTONE FORMATION - SANDSTONE	-
7	385.0	E	SBS-SDST	ST BEES SANDSTONE MEMBER - SANDSTONE	-
8	408.0	E	WLSF-SDST	WILMSLOW SANDSTONE FORMATION - SANDSTONE	-

2.3.2 Permeability of Bedrock Ground

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

Distanc e Dir	ection	Flow Type	Maximum Permeability	Minimum Permeability
0.0 O	n Site	Mixed	High	Moderate

2.3.3 Linear features

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

Yes

ID	Distance	Direction	Category Description	Feature Description
11	0.0	On Site	FAULT	Fault, inferred, displacement unknown
12A	89.0	SW	FAULT	Fault, inferred, displacement unknown
13	181.0	SW	FAULT	Fault, inferred, displacement unknown
14	274.0	NE	FAULT	Fault, inferred, displacement unknown
15	385.0	E	FAULT	Fault, inferred, displacement unknown





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

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





3.1 Radon Affected Areas

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

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

3.2 Radon Protection

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





NE





4 Ground Workings

4.1 Historical Surface Ground Working Features derived from Historical Mapping

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

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

ID	Distance (m)	Direction	NGR	Use	Date
1A	241.0	W	298816 507508	Cuttings	1926
2A	241.0	W	298816 507508	Cuttings	1898
3	241.0	SW	298818 507497	Cuttings	1971
4A	243.0	SW	298818 507496	Cuttings	1951
5A	244.0	SW	298817 507503	Cuttings	1861

4.2 Historical Underground Working Features derived from Historical Mapping

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

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

Database searched and no data found.

4.3 Current Ground Workings

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

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

No



5 Mining, Extraction & Natural Cavities map







5 Mining, Extraction & Natural Cavities

5.1 Historical Mining

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

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

No

Database searched and no data found.

5.2 Coal Mining

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

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

No

Database searched and no data found.

5.3 Johnson Poole and Bloomer

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

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

No

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

5.4 Non-Coal Mining

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

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

No





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

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

No

No

Database searched and no data found.

5.6 Natural Cavities

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

Are there any Natural Cavities within 1000m of the study site boundary?

Database searched and no data found.

5.7 Brine Extraction

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

Are there any Brine Extraction areas within 1000m of the study site boundary?

Database searched and no data found.

5.8 Gypsum Extraction

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

Are there any Gypsum Extraction areas within 1000m of the study site boundary?

No

No

Database searched and no data found.

5.9 Tin Mining

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

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

No





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

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

No





6 Natural Ground Subsidence 6.1 Shrink-Swell Clay map







6.2 Landslides map





6.3 Ground Dissolution of Soluble Rocks map





6.4 Compressible Deposits map





6.5 Collapsible Deposits map







6.6 Running Sand map







6 Natural Ground Subsidence

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

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

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

6.1 Shrink-Swell Clays

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

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

6.2 Landslides

The following Landslides information provided by the British Geological Survey:

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

6.3 Ground Dissolution of Soluble Rocks

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

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

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





6.4 Compressible Deposits

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

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.
2	22.0	SW	High	Very significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build - consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Construction may not be possible at economic cost. For existing property - probable increase in insurance risk from compressibility especially if water conditions or loading of the ground change significantly.

6.5 Collapsible Deposits

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

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.
2	22.0	SW	Negligible	No indicators for collapsible deposits identified. No actions required to avoid problems due to collapsible deposits. No special ground investigation required, or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

6.6 Running Sands

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

Very l ar	w potential for running sand problems if water table rises or if sandy strata
1 0.0 On Site Very Low	exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased nstruction costs or increased financial risks are unlikely due to potential problems with running sand.



7 Borehole Records map







7 Borehole Records

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

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

0



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

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

 Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	<15 mg/kg	<100 mg/kg
 0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	<15 mg/kg	<100 mg/kg
 22.0	SW	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
22.0	W	Sediment	<15 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	<15 mg/kg	<100 mg/kg
 23.0	W	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 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.

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9 Railways and Tunnels map







9 Railways and Tunnels

9.1 Tunnels

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

Have any underground railway lines been identified within the study site boundary?	No
Have any underground railway lines been identified within 250m of the study site boundary?	No
Database searched and no data found.	
Any records that have been identified are represented on the Railways and Tunnels map.	

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

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

Have any other railway tunnels been identified within 250m of the site boundary?

Database searched and no data found.

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

9.2 Historical Railway and Tunnel Features

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

Have any historical railway or tunnel features been identified within the study site boundary? No

Have any historical railway or tunnel features been identified within 250m of the study site boundary? No

Database searched and no data found.

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





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

Have any historical railway lines been identified within the study site boundary?	No
Have any historical railway lines been identified within 250m of the study site boundary?	No
Database searched and no data found.	
Multiple sections of the same track may be listed in the detail above Any records that have been identified are represented on the Railways and Tunnels map.	
9.4 Active Railways	
These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide inform on the possible locations of active railway lines in proximity to the study site.	ation
Have any active railway lines been identified within the study site boundary?	No

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

Database searched and no data found.

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

9.5 Railway Projects

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

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

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

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

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





Contact Details

emapsite Telephone: 0118 9736883 sales@emapsite.com

emapsite™





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



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Standard Terms and Conditions

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EmapSite

Masdar House, 1 Reading Road, Eversley, RG27 0RP

Groundsure Reference:	EMS-503515_677821
Your Reference:	EMS_503515_677821
Report Date	4 Oct 2018
Report Delivery Method:	Email - pdf

Enviro Insight

Address: ,

Dear Sir/ Madam,

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

If you would like further assistance regarding this report then please contact the emapsite customer services team on 0118 9736883 quoting the above report reference number.

Yours faithfully,

emapsite customer services team

Enc. Groundsure Enviroinsight

Enviro Insight

Address:	
Date:	
Reference:	
Client:	

9

Groundsure

4 Oct 2018

EmapSite

EMS-503515_677821



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SW

Aerial Photograph Capture date:05-Oct-2008Grid Reference:299072,507687Site Size:0.55ha

Report Reference: EMS-503515_677821 Client Reference: EMS_503515_677821

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NW

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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: Historical Industrial Sites	On-site	0-50	51-250	251-500
1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping	0	0	7	23
1.2 Additional Information - Historical Tank Database	0	0	0	0
1.3 Additional Information – Historical Energy Features Database	0	0	0	0
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	0	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	0	0	0	0
1.6 Historical military sites	0	0	0	0
1.7 Potentially Infilled Land	0	0	5	5
Section 2: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	0	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	0	0	0	0
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
2.1.8 Records of Licensed Discharge Consents	0	0	0	3
2.1.9 Records of Water Industry Referrals	0	0	0	0
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	0	0	0	0
2.2 Records of COMAH and NIHHS sites	0	0	0	0
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents				
2.3.1 National Incidents Recording System, List 2	0	0	0	0
2.3.2 National Incidents Recording System, List 1	0	0	0	0
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0



Section 3: Landfill and Other Waste Sites	On-site	0-50m	51-250	251-500	501-1000	1000- 1500
3.1 Landfill Sites						
3.1.1 Environment Agency/Natural Resources Wales Registered Landfill Sites	0	0	0	0	0	Not searched
3.1.2 Environment Agency/Natural Resources Wales Historic Landfill Sites	0	0	0	0	0	0
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	0	0
3.2 Landfill and Other Waste Sites Findings						
3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	Not searched	Not searched
3.2.2 Environment Agency/Natural Resources Wales Licensed Waste Sites	0	0	0	0	0	0
Section 4: Current Land Use	On-site	е	0-50m	51-25	0 2	51-500
4.1 Current Industrial Sites Data	0		0	1	Nc	ot searched
4.2 Records of Petrol and Fuel Sites	0		0	0		0
4.3 National Grid Underground Electricity Cables	0		0	0		0
4.4 National Grid Gas Transmission Pipelines	0		0	0		0
Section 5: Geology						
the study site			None id	lentified		
5.2 Records of Superficial Ground and Drift Geology present beneath the study site			Iden	tified		
5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.						
Section 6: Hydrogeology and Hydrology			0-50	00m		
6.1 Records of Strata Classification in the Superficial Geology within 500m of the study site			Iden	tified		
6.2 Records of Strata Classification in the Bedrock Geology within 500m of the study site	Identified					
	On-site	0-50m	51-250	251-500	501-1000	1000- 2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	2
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	2
6.6 Source Protection Zones (within 500m of the study site)	0	0	0	0	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	1	0	#250GWV #	#500GWV #	Not searched	Not searched



On-siteOn-siteO-50m51-250251-500501-10001000-15006.9 Environment Agency/Natural Resources Wales information on river quality within 1500m of the study siteNoNoNoNoNoNo6.10 Ordnance Survey MasterMap Water Network entries within 500m of the site0006Not searchedNot searchedNot searched6.11 Surface water features within 250m of the study siteNoNoNoNot searchedNot searchedNot searched	Section 6: Hydrogeology and Hydrology 0-500m						
6.9 Environment Agency/Natural Resources Wales information on river quality within 1500m of the study siteNoNoNoNoNoNo6.10 Ordnance Survey MasterMap Water Network entries within 500m of the site0006Not searchedNot searchedNot searched6.11 Surface water features within 250m of the study siteNoNoNoNot searchedNot searchedNot searched		On-site	0-50m	51-250	251-500	501-1000	1000- 1500
6.10 Ordnance Survey MasterMap Water Network entries within 500m of the site0006Not searchedNot searched6.11 Surface water features within 250m of the study siteNoNoNoNot searchedNot searchedNot searched	6.9 Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site	No	No	No	No	No	No
6.11 Surface water features within 250m of the study site No No No Not searched Not searched Not searched Not searched	6.10 Ordnance Survey MasterMap Water Network entries within 500m of the site	0	0	0	6	Not searched	Not searched
	6.11 Surface water features within 250m of the study site	No	No	No	Not searched	Not searched	Not searched

Section 7: Flooding

7.1 Enviroment Agency Zone 2 floodplains within 250m of the study site	None identified
7.2 Environment Agency/Natural Resources Wales Zone 3 floodplains within 250m of the study site	None identified
7.3 Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site	Very Low
7.4 Flood Defences within 250m of the study site	None identified
7.5 Areas benefiting from Flood Defences within 250m of the study site	None identified
7.6 Areas used for Flood Storage within 250m of the study site	None identified
7.7 Maximum BGS Groundwater Flooding susceptibility within 50m of the study site	Limited potential
7.8 BGS confidence rating for the Groundwater Flooding susceptibility areas	Low

Section 8: Designated Environmentally Sensitive Sites	On-site	0-50m	51-250	251-500	501-1000	1000- 2000
8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	4	2
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
8.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
8.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
8.5 Records of Ramsar sites	0	0	0	0	0	0
8.6 Records of Ancient Woodlands	0	0	0	0	0	0
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	0
8.8 Records of World Heritage Sites	0	0	0	0	0	0
8.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0

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Section 8: Designated Environmentally Sensitive Sites	On-site	0-50m	51-250	251-500	501-1000	1000- 2000
8.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0
8.11 Records of National Parks	0	0	0	0	0	0
8.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
8.13 Records of Nitrate Vulnerable Zones	0	0	0	0	0	0
8.14 Records of Green Belt land	0	0	0	0	0	0
Section 9: Natural Hazards						
9.1 Maximum risk of natural ground subsidence			Hi	gh		
9.1.1 Maximum Shrink-Swell hazard rating identified on the study site			Negl	igible		
9.1.2 Maximum Landslides hazard rating identified on the study site			Very	' Low		
9.1.3 Maximum Soluble Rocks hazard rating identified on the study site			Negl	igible		
9.1.4 Maximum Compressible Ground hazard rating identified on the study site	High					
9.1.5 Maximum Collapsible Rocks hazard rating identified on the study site			Very	Low		
9.1.6 Maximum Running Sand hazard rating identified on the study site	Very Low					
9.2 Radon						
9.2.1 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?	he The site is not in a Radon Affected Area, as less than 1% of propert are above the Action Level.					properties
9.2.2 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.					
Section 10: Mining						
10.1 Coal mining areas within 75m of the study site			None ic	lentified		
10.2 Non-Coal Mining areas within 50m of the study site boundary			None ic	lentified		
10.3 Brine affected areas within 75m of the study site			None ic	lentified		





Using this report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between Groundsure and the Client. The document contains the following sections:

1. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 500m.

2. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

3. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

4. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure gas pipelines and underground electricity transmission lines.

5. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

6. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licences, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

7. Flooding

Provides information on river and coastal flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

8. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

9. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence and radon..

10. Mining

Provides information on areas of coal and non-coal mining and brine affected areas.

11. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, Groundsure provide a free Technical Helpline (08444 159000) for further information and guidance.

Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier "A" on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.





Tanks Garages





1. Historical Industrial Sites

1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 30

ID	Distance [m]	Direction	Use	Date
1A	77	S	Unspecified Commercial/Industrial	1861
2A	81	S	Unspecified Tank	1861
3В	241	W	Cuttings	1926
4B	241	W	Cuttings	1898
5B	241	SW	Cuttings	1971
6B	243	SW	Cuttings	1951
7B	244	SW	Cuttings	1861
8C	254	SW	Railway Sidings	1951
9C	277	W	Railway Sidings	1926
10F	285	SW	Cuttings	1861
11	301	W	Railway Sidings	1898
12	307	SW	Railway Building	1926
13	309	SW	Railway Buildings	1926
14	321	SW	Railway Building	1926
15D	331	SW	Railway Buildings	1926
16	336	SW	Railway Building	1926
17D	343	SW	Railway Building	1926
18	344	S	Railway Sidings	1951
19	352	SW	Railway Building	1926
20	383	W	Railway Sidings	1861
21	401	S	Railway Building	1926
22H	454	S	Unspecified Pit	1898
23E	459	W	Railway Station	1971
24E	459	NW	Railway Station	1861
25E	466	W	Railway Station	1898
26E	466	W	Railway Station	1926
27	477	S	Railway Building	1926
28	479	NW	Railway Station	1951
29	487	S	Railway Building	1926
30	497	W	Railway Sidings	1898





1.2 Additional Information - Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 500m of the search boundary:

Database searched and no data found.

1.3 Additional Information – Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 500m of the search boundary:

0

0

0

Database searched and no data found.

1.4 Additional Information – Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 500m of the search boundary:

Database searched and no data found.

1.5 Additional Information - Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 500m of the search boundary: 0

Database searched and no data found.

1.6 Historical military sites

Certain military installations were not noted on historic mapping for security reasons. Whilst not all military land is necessarily of concern, Groundsure has researched and digitised a number of Ordnance Factories and other military industrial features (e.g. Ordnance Depots, Munitions Testing Grounds) which may be of contaminative concern. This research was drawn from a number of different sources, and should not be regarded as a definitive or exhaustive database of potentially contaminative military installations. The boundaries of sites within this database have been estimated from the best evidence available to Groundsure at the time of compilation.





0

Records of historical military sites within 500m of the search boundary:

Database searched and no data found.

1.7 Potentially Infilled Land

Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 10

The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by Groundsure:

ID	Distance(m)	Direction	Use	Date
31B	241	W	Cuttings	1926
32B	241	W	Cuttings	1898
33B	241	SW	Cuttings	1971
34B	243	SW	Cuttings	1951
35B	244	SW	Cuttings	1861
36F	285	SW	Cuttings	1861
37G	329	S	Pond	1951
38G	330	S	Pond	1926
39G	330	S	Pond	1898
40H	454	S	Unspecified Pit	1898



2. Environmental Permits, Incidents and Registers Map







2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency/Natural Resources Wales and Local Authorities reveal the following information:

2.1.1 Records of historic IPC Authorisations within 500m of the study site:

Database searched and no data found.

2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

0

0

Database searched and no data found.

2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:

0

Database searched and no data found.

2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:

0

Database searched and no data found.

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

0

Database searched and no data found.

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





Database searched and no data found.

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

Database searched and no data found.

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

3

0

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

ID	Distance (m)	Direction	NGR	Details				
1	298	W	298730 507620	Address: NETHERTOWN SEA OUTFALL, NETHERTOWN, CUMBRIA Effluent Type: SEWAGE DISCHARGES - PUMPING STATION - WATER COMPANY Permit Number: 017470153 Permit Version: 3	Receiving Water: IRISH SEA Status: VARIED BY APPLICATION - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995) Issue date: Effective Date: 11-Feb-2005 Revocation Date:			
2A	426	W	298610 507570	Address: NETHERTOWN SEA OUTFALL, NETHERTOWN, CUMBRIA Effluent Type: SEWAGE DISCHARGES - UNSPECIFIED - WATER COMPANY Permit Number: 017470153 Permit Version: 1	Receiving Water: - Status: REVOKED - UNSPECIFIED Issue date: Effective Date: 01-Apr-1991 Revocation Date: 31/12/1994			
3A	426	W	298610 507570	Address: NETHERTOWN SEA OUTFALL, NETHERTOWN, CUMBRIA Effluent Type: SEWAGE DISCHARGES - UNSPECIFIED - WATER COMPANY Permit Number: 017470153 Permit Version: 2	Receiving Water: IRISH SEA Status: CONSENT REVOKED OR REVISED - NEW CONSENT ISSUED (37(1)) Issue date: Effective Date: 01-Jan-1995 Revocation Date: 10/02/2005			

2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site:

Database searched and no data found.



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2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:

Database searched and no data found.

2.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site:

Database searched and no data found.

2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents

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

0

0

0

Database searched and no data found.

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

Database searched and no data found.

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

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.



3. Landfill and Other Waste Sites Map







3. Landfill and Other Waste Sites

3.1 Landfill Sites

3.1.1 Records from Environment Agency/Natural Resources Wales landfill data within 1000m of the study site:

Database searched and no data found.

3.1.2 Records of Environment Agency/Natural Resources Wales historic landfill sites within 1500m of the study site:

0

0

Database searched and no data found.

3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

0

Database searched and no data found.

3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:

0

Database searched and no data found.

3.2 Other Waste Sites

3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site:

0

Database searched and no data found.



3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site:

Database searched and no data found.



0

4. Current Land Use Map

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4. Current Land Uses

4.1 Current Industrial Data

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

1

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

ID	Distance (m)	Directio n	Company	NGR	Address	Activity	Category
1	125	S	J I Brough	299092 507498	Town Head Farm, Nethertown, Egremont, CA22 2UH	Dairy Farming	Farming

4.2 Petrol and Fuel Sites

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

Database searched and no data found.

4.3 National Grid High Voltage Underground Electricity Transmission Cables

This dataset identifies the high voltage electricity transmission lines running between generating power plants and electricity substations. The dataset does not include the electricity distribution network (smaller, lower voltage cables distributing power from substations to the local user network). This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high voltage underground electricity transmission cables within 500m of the study site:

Database searched and no data found.

0

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4.4 National Grid High Pressure Gas Transmission Pipelines

This dataset identifies high-pressure, large diameter pipelines which carry gas between gas terminals, power stations, compressors and storage facilities. The dataset does not include the Local Transmission System (LTS) which supplies gas directly into homes and businesses. This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high pressure gas transmission pipelines within 500m of the study site:

0

Database searched and no data found.





5. Geology

5.1 Artificial Ground and Made Ground

Database searched and no data found.

The database has been searched on site, including a 50m buffer.

5.2 Superficial Ground and Drift Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type	
GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL	
PEAT-P	PEAT	PEAT	

5.3 Bedrock and Solid Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type	
SBS-SDST	ST BEES SANDSTONE MEMBER	SANDSTONE	
SBS-SDST	ST BEES SANDSTONE MEMBER	SANDSTONE	

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)



6 Hydrogeology and Hydrology 6a. Aquifer Within Superficial Geology





6b. Aquifer Within Bedrock Geology and Abstraction Licences





6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licences





6d. Hydrogeology – Source Protection Zones within confined aquifer



Potable Water Abstraction Licence

250

- 500

Search Buffers (m)

Groundsure



6e. Hydrology – Watercourse Network and River Quality





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6.Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

Records of strata classification within the superficial geology at or in proximity to the property Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales'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 Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (6a):

ID	Distanc e (m)	Direction	Designation	Description
1	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
8	22	SW	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
9	185	E	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
10	330	S	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
3	391	W	Secondary (undifferentiated)	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

6.2 Aquifer within Bedrock Deposits

Records of strata classification within the bedrock geology at or in proximity to the property Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales'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 Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (6b):

ID	Distanc e (m)	Direction	Designation	Description
1	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





Groundwater Abstraction Licences within 2000m of the study site

Identified

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details	
Not show n	Not 29952 show 1234 N 508910 n		299525 508910	Status: Active Licence No: NW/074/0005/003 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: KELLHEAD - EGREMONT BOREHOLE B Data Type: Point Name: UNITED UTILITIES WATER LTD	Annual Volume (m ³): 3.65e+006 Max Daily Volume (m ³): 11000 Original Application No: - Original Start Date: 21/07/2015 Expiry Date: 31/03/2026 Issue No: 1 Version Start Date: 21/07/2015 Version End Date:
Not show n	Status: Active Licence No: NW/074/0005/003 Details: Potable Water Supply - Direct 300473 Direct Source: Ground Water - North West 508472 Region Point: MERRY HILL - EGREMONT BOREHOLE Data Type: Point Name: UNITED UTILITIES WATER LTD		Status: Active Licence No: NW/074/0005/003 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: MERRY HILL - EGREMONT BOREHOLE A Data Type: Point Name: UNITED UTILITIES WATER LTD	Annual Volume (m ³): 3.65e+006 Max Daily Volume (m ³): 11000 Original Application No: - Original Start Date: 21/07/2015 Expiry Date: 31/03/2026 Issue No: 1 Version Start Date: 21/07/2015 Version End Date:	

6.4 Surface Water Abstraction Licences

Surface Water Abstraction Licences within 2000m of the study site

Database searched and no data found.

6.5 Potable Water Abstraction Licences

Potable Water Abstraction Licences within 2000m of the study site

Identified

None identified

The following Potable Water Abstraction Licences records are represented as points, lines and regions on the SPZ and Potable Water Abstraction Licences Map (6c):

ID	Distanc e (m)	Direction	NGR	Details	
Not 1234 N shown		299525 508910	Status: Active Licence No: NW/074/0005/003 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: KELLHEAD - EGREMONT BOREHOLE B Data Type: Point Name: UNITED UTILITIES WATER LTD	Annual Volume (m ³): 3.65e+006 Max Daily Volume (m ³): 11000 Original Application No: - Original Start Date: 21/07/2015 Expiry Date: 31/03/2026 Issue No: 1 Version Start Date: Version End Date:	
Not shown	1583	NE	300473 508472	Status: Active Licence No: NW/074/0005/003 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: MERRY HILL - EGREMONT BOREHOLE A Data Type: Point	Annual Volume (m ³): 3.65e+006 Max Daily Volume (m ³): 11000 Original Application No: - Original Start Date: 21/07/2015 Expiry Date: 31/03/2026 Issue No: 1 Version Start Date:

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Details

Name: UNITED UTILITIES WATER LTD

Version End Date:

6.6 Source Protection Zones

Source Protection Zones within 500m of the study site

NGR

Database searched and no data found.

6.7 Source Protection Zones within Confined Aquifer

Source Protection Zones within the Confined Aquifer within 500m of the study site None identified

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.

6.8 Groundwater Vulnerability and Soil Leaching Potential

Environment Agency/Natural Resources Wales information on groundwater vulnerability and soil leaching potential within 500m of the study site Identified

Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Major Aquifer/High Leaching Potential	H1	Soils which readily transmit liquid discharges because they are shallow or susceptible to rapid flow directly to rock, gravel or groundwater.
355	Ν	Major Aquifer/Intermediate Leaching Potential	11	Soils which can possibly transmit a wide range of pollutants.
382	W	Major Aquifer/High Leaching Potential	H2	Deep, permeable, coarse textured soils which readily transmit a wide range of pollutants because of their rapid drainage and low attenuation potential.

6.9 River Quality

Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site None identified



ID Distanc Direction e (m)

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None identified





Database searched and no data found.

6.9.2 Chemical Quality:

Database searched and no data found.

6.10 Ordnance Survey MasterMap Water Network

Ordnance Survey MasterMap Water Network entries within 500m of the study site

This watercourse information is provided by Ordnance Survey MasterMap Water Network. The data provides a detailed centre line following the curve of the waterway precisely, so all distances provided in the report should be understood as measurements to the centreline rather than a measurement to the nearest point of the watercourse. Underground watercourses are inferred from entry and exit points so caution is advised in using these to indicate precise locations of underground watercourses when planning site investigation and development.

The following Ordnance Survey MasterMap Water Network records are represented on the Hydrology Map (6e):

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
1	454 E	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Ehen-Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	454 E	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Ehen-Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
2	455 E	Ellergill Beck	Inland river not influenced by normal tidal action.	Catchment Area: Ehen-Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.0
3	455 E	Ellergill Beck	Inland river not influenced by normal tidal action.	Catchment Area: Ehen-Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	455 E	Ellergill Beck	Inland river not influenced by normal tidal action.	Catchment Area: Ehen-Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.0
Not shown	455 E	Ellergill Beck	Inland river not influenced by normal tidal action.	Catchment Area: Ehen-Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided





6.11 Surface Water Features

Surface water features within 250m of the study site

None identified

Database searched and no data found.



7a. Environment Agency/Natural Resources Wales Flood Map for Planning (from rivers and the sea)





7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS) Map





7 Flooding

7.1 River and Coastal Zone 2 Flooding

Environment Agency/Natural Resources Wales Zone 2 floodplain within 250m None identified

Environment Agency/Natural Resources Wales Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 7a – Flood Map for Planning:

Database searched and no data found.

7.2 River and Coastal Zone 3 Flooding

Environment Agency/Natural Resources Wales Zone 3 floodplain within 250m None identified

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 7a – Flood Map for Planning.

Database searched and no data found.

7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating

Highest risk of flooding onsite

The Environment Agency/Natural Resources Wales RoFRaS database provides an indication of river and coastal flood risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach by considering their location, type, condition and standard of protection.

RoFRaS data for the study site indicates the property is in an area with a Very Low (less than 1 in 1000) chance of flooding in any given year.

7.4 Flood Defences

Flood Defences within 250m of the study site Database searched and no data found.

Areas benefiting from Flood Defences within 250m of the study site

None identified

Very Low

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None identified



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).

7.7.1 British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of

7.7.2 Highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions

Limited potential Where limited potential for groundwater flooding to occur is indicated, this means that although given the geological conditions there may be a groundwater flooding hazard, 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.

7.8 Groundwater Flooding Confidence Areas

British Geological Survey confidence rating in this result

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.

Areas used for Flood Storage within 250m of the study site

Groundsure LOCATION INTELLIGENCE 7.6 Areas benefiting from Flood Storage



39

Low

None identified

Identified

Clearwater Flooding


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8. Designated Environmentally Sensitive Sites Map







8. Designated Environmentally Sensitive Sites

Designated Environmentally Sensitive Sites within 2000m of the study site

Identified

8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:

6

The following Site of Special Scientific Interest (SSSI) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	SSSI Name	Data Source
1	820	SE	Silver Tarn, Hollas and Harnsey Mosses	Natural England
2	955	SE	Silver Tarn, Hollas and Harnsey Mosses	Natural England
3	989	SE	Silver Tarn, Hollas and Harnsey Mosses	Natural England
4	995	SE	Silver Tarn, Hollas and Harnsey Mosses	Natural England
5	1061	SE	Silver Tarn, Hollas and Harnsey Mosses	Natural England
6	1145	SE	Silver Tarn, Hollas and Harnsey Mosses	Natural England

8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:

0

Database searched and no data found.

8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:

0

Database searched and no data found.

8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:

0

Database searched and no data found.



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0

0

0

0

Database searched and no data found.

8.6 Records of Ancient Woodland within 2000m of the study site:

Database searched and no data found.

8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:

Database searched and no data found.

8.8 Records of World Heritage Sites within 2000m of the study site:

Database searched and no data found.

8.9 Records of Environmentally Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:

Database searched and no data found.

8.11 Records of National Parks (NP) within 2000m of the study site:

0

0

Database searched and no data found.





Database searched and no data found.

8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:

0

0

0

Database searched and no data found.

8.14 Records of Green Belt land within 2000m of the study site:

Database searched and no data found.

9. Natural Hazards Findings

9.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a Groundsure Geo Insight, available from our website. The following information has been found:

9.1.1 Shrink Swell

Maximum Shrink-Swell*^{*} hazard rating identified on the study site

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.

Hazard

9.1.2 Landslides

Maximum Landslide* hazard rating identified on the study site

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

9.1.3 Soluble Rocks

Maximum Soluble Rocks* hazard rating identified on the study site

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

Hazard

* This indicates an automatically generated 50m buffer and site.

Groundsure

44

Very Low

Negligible

Negligible

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High

Very Low

Very Low

Maximum Compressible Ground* hazard rating identified on the study site

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Very significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Construction may not be possible at economic cost. For existing property probable increase in insurance risk from compressibility especially if water conditions or loading of the ground change significantly.

Hazard

9.1.5 Collapsible Rocks

Maximum Collapsible Rocks* hazard rating identified on the study site

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or
increased construction costs or increased financial risk due to potential problems with collapsible deposits.

9.1.6 Running Sand

Maximum Running Sand** hazard rating identified on the study site

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

^{*} This indicates an automatically generated 50m buffer and site.





9.2.1 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 site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

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

9.2.2 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.





10. Mining

10.1 Coal Mining

Coal mining areas within	75m of the study site
--------------------------	-----------------------

Database searched and no data found.

10.2 Non-Coal Mining

Non-Coal Mining areas within 50m of the study site boundary

Database searched and no data found.

10.3 Brine Affected Areas

Brine affected areas within 75m of the study site Guidance: No Guidance Required.

None identified

None identified

None identified



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Contact Details

emapsite Telephone: 0118 9736883 sales@emapsite.com

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British Geological Survey Enquiries Kingsley Dunham Centre Keyworth, Nottingham NG12 5GG Tel: 0115 936 3143. Fax: 0115 936 3276.

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

> Environment Agency National Customer Contact Centre, PO Box 544 Rotherham, S60 1BY Tel: 03708 506 506 Web: <u>www.environment-agency.gov.uk</u> Email: enquiries@environment-agency.gov.uk

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

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

Ordnance Survey Adanac Drive, Southampton SO16 0AS Tel: 08456 050505

Local Authority Authority: Copeland Borough Council Phone: 0845 054 8600 Web: http://www.copeland.gov.uk Address: The Copeland Centre, Catherine Street, Whitehaven,

> Gemapping PLC Virginia Villas, High Street, Hartley Witney, Hampshire RG27 8NW Tel: 01252 845444



British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL





The Coal Authority









Acknowledgements: Site of Special Scientific Interest, National Nature Reserve, Ramsar Site, Special Protection Area, Special Area of Conservation data is provided by, and used with the permission of, Natural England/Natural Resources Wales who retain the Copyright and Intellectual Property Rights for the data.

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Standard Terms and Conditions

Groundsure's Terms and Conditions can be viewed online at this link:

https://www.groundsure.com/terms-and-conditions-may25-2018

Appendix III

Ground Sure Report Historical Map Extracts (GSR – Mapinsight)





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Site Details:



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Site Details:













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County Series 1:10,560 scale



 County Boundary
 Parish Boundary
 Contours

 			Parliamentary Division Boundary
×	х	х	Union Boundary
v	V	V	Rural District Boundary

National Grid 1:10,000 scale

Loose rock

Outcrop

Scree

ROCK FEATURES

als

的影

CONVERSION SCALE

Metres - Feet

_____6500 ______Feet

- 6000

4000

2000 Metres

HEIGHTS (METRES)

Values are given in metres above mear at Newlyn.	n sea level
Surface heights ground survey determined by air survey	• 163m
Bench marks and their values are show scale maps, and bench mark lists c	n on large ontaining

scale maps, and bench mark lists containing fuller and possibly later levelling information are obtainable from the Director General, Ordnance Survey.

Contours are at 5 metres vertical interval

ABBREVIATIONS

BP,BS	Boundary Post or Stone	PO	Post Office	-
Ch	Church	PC	Public Convenience	
СН	Club House	РН	Public House	- 5000
F Sta	Fire Station	S	Stone	1500 —
FB	Foot Bridge	Spr	Spring	
Fn	Fountain	TCB	Telephone Call Box	
GP	Guide Post	TCP	Telephone Call Post	-
MP,MS	Mile Post or Stone	тн	Town Hall	-
Ρ	Pole or Post	w	Well	
Pol Sta	Police Station	Y	Youth hostel	-

ROADS

 Road	Track Track	Path Path
 Roau	Where unferced shown by pecked lines	
	mere america snown by peekea mes.	

RAILWAYS Cutting Embankment Multiple track // Road ..Ц. Standard gauge Single track Level // || Road under Bridge Siding, tramway or mineral line Narrow gauge

GENERAL FEATURES \bigcirc Antiquity, (site of) Lake, loch or pond ÷ H Boulders Sloping masonry Building = = Chalk pit, clay pit or quarry Pylon = = Gravel pit Electricity transmission line ____Pole = = Sand pit \boxtimes Glasshouse Refuse or slag heap Triangulation station Δ Direction of flow of water Shingle Sand

VEGETATION					
, .ΥΥ, ,	Bracken, rough grassland	<u></u>	Marsh	lYn,	Coppice
00-	Scrub	- <u>} }</u>	Saltings	ローク - 〇 - 〇 - 〇 - 〇 - 〇 - 〇 - 〇 - 〇 - 〇 - 〇	Orchard Coniferous trees
auto	Heath	551¥///	Reeds	AAA	Non-coniferous trees

In some areas bracken ($\widetilde{\gamma}$) and rough grassland ($\widetilde{\gamma}$) $\widetilde{\gamma}$) are shown separately.



Historical Map Pack Legend

County Series & National Grid

1:10,560 scale

Information present on these legends is sourced from the same Ordnance Survey mapping as the maps used in this product.

If you have a query regarding any of the maps provided please contact GroundSure's technical helpline. We will endeavour to answer any queries you may have.

Technical Helpline

Tel 08444159000

groundsureinsight@groundsure.com www.groundsure.com

County Series 1:2,500 scale





RAILWAYS



Cutting

ABBREVIATIONS

A	Trigonometrical Station	うんがない	SL	Sluice
607 1.	Altitude at Trigonometrical S	tation	$T\pi$	Trough
		Sec. Const.	82.	Spring
B.M. 325 8 2	Bench Mark	自動力という	W	Well
342 +	Surface Level	나는 아이지 않는 것	M.R	Mooring Ring
		$f \in \mathcal{M}$	M.P	Mooring Post
A	Permanent Traverse Station	laine oge	88	Boundary Stone
0-10 -0	Antiquities (site of)		BP	Boundary Post
Communication of the first	Arrow denotes flow of water			

National Grid 1:2,500 / 1:1,250 scale

GENERAL FEATURES

ධූයිNon-coniferous Trees	1917 The Stopes	of Anciquity (site o
今本 Coniferous Trees	Preserver 292Cliff	Culver
우 쇼 Surveyed Trees	ØCave Entrance	>>> Direction of water flor
lo chard Trees	Rock	Electricity Pylo
Coppice, Osier	a 🤐 🙇	ETLElectricity Transmission Lin
♀ ₀ ۉScrub	Sloping Masonry	A
TBracken	Roofed Building	-tsTraverse Station (permanent
^ ₁₀ 000 ₀₀	Glasshouse	个Bench Mar
	Archway	+Surface Leve
	oo "> Change of boundary mereing	-rpRevision Point (instrumentally fixed
Ma Reeds	? J see AREAS notes	$\hat{\boldsymbol{\wedge}}$. Revision Point & Bunch Mark coincider
Slopes	Quarry Refuse He	ap Sloping Masonry
Top		· · · ·



BOUNDARIES

England & Wales
County Boundary (geographical)
• • • County & Civil Parish Boundary coterminous
• — • • • • • • • · · · · · Admin County or County Borough Boundary
-OOOO London Borough Boundary
M B Bdy U D Bdy R D BdyCounty District Boundaries based on civil parish
England, Wales & Scotland
•••••Civil Parish Boundary
Boro (or Burgh) Const & Ward BdyParly & Ward Boundaries Co Const Bdy based on civil parish
Boro (or Burgh) Const & Ward Bdy Parly & Ward Boundaries Co Const Bdy not based on civil parish
Scotland
* County Boundary (geographical)
• • • Ť " " " "
Co_Cnl_Bdy *
<u>Co</u> CnIB <u>dy</u> †
Co of City Bdy * County of the City Boundary
Co of City Rdy

-+++-	* County of	the City Boundary
Co of City Bdy	†	., ,, ,,
Burgh Bdy	*	Burgh Boundary
Burgh Bdy	t	,, ,, ,,
Dist Bdy	* Distric	t Council Boundary
Dist Bdy	t	» » .
* Not with	parish †Coincident with p	parish

Gas Valv Hydrant

Mean High W

.Mea ... Mean Low W

... Mile or Mooring Post

A	Q	R	D	EN	/1	Δ	375	0	6.5	C	

8 H Beer Hou	\$ê
B M Bench Ma	rk
B P Boundary Po	st
B S Boundary Stor	ne
CCra	ne
C HCiub Hee	3@
Chy., Chimne	ey
Cn Cápeta	ŝn
D FnDrinking Founta	in
Dk Do	ck
El P Flectricity Pillar or Po	st
ETL Electricity Transmission Li	n e
FA Fire Alar	786
FAPFire Alarm Pill	ar
F B Filter Bed, Foot Brid,	ţе
FBM Fundamental Bench Mai	ric
2 C	46

GP

L 8 St

LTw MHW... MHWS.

M L W .. M L W S. M P

	the second of the second of the	
	Niles Content of the Stringt	
Fire Station	M P U Mail Pick-up	
Guide Post	M S Mile Stone	
e Compound	N T National Trust	
ar Hydraulic	N T LNormal Tidal Limit	
Hectares	N T S National Trust for Scotland	
Letter Box	P Pillar, Pole or Post	
beat Station	P C Public Convenience	
vel Crossing	PCSPolice Call Box	
ading Gauge	P.HPublic House	
Lighthouse	P O Post Office	
hting Tower	PpPump	
···· Metres	PTPPolice Telephone Pillar	
High Water	Resr	
ater Springs	R.H	
Low Water	rp Revision Point	
ater Springs	S B Signal Ray	
Inneige Beak	a second se	

-			
C D			C - maller
S L	 		Signal Light
SI	 		Sluice
S P	 		Signal Post
Spr	 		Spring
S Sta	 		gnal Station
тсв	 	Telepho	ne Call Box
TCP	 	Telepho	ne Call Post
Tk	 		nk or Track
Tr	 		Trough
ts	 	Trav	erse Station
w	 		
W 8	 		Veighbridge
Wd Pp .	 		Wind Pump
Wks	 		Works
Wr Pc .	 		Water Point
WrT	 		Water Tap



Historical Map Pack Legend

County Series 1:1,250 scale **County Series & National Grid** 1:2,500 scale

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Tel 08444159000

groundsureinsight@groundsure.com www.groundsure.com

Appendix IV

The Coal Authority Online Database





GEO2018-3238: Coal Authority Online Database



Approximate Site Location marked with the

Website: www.geoenvironmentalengineering.com Email: info@geoenvironmentalengineering.com Telephone: 08456 768 895 / 07883 440 186



GEO Environmental Engineering Ltd Geotechnical & Environmental Drilling Experts & Consultants

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