



# PHASE 1: DESK TOP STUDY REPORT

# (PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT)

# **PROPOSED RESIDENTIAL DEVELOPMENT:**

LAND ADJACENT TO THORNLEA

**CARLETON, EGREMONT** 

**CUMBRIA** 

FOR:

ANDREW PARK AND MYRA O'FEE

**GEO** Environmental Engineering

Web: www.geoenvironmentalengineering.com Email: info@geoenvironmentalengineering.com Telephone: 08456 768 895

### **DOCUMENT CONTROL SHEET**

- **Report Ref:** 2018-3324
- Report Date: 11.01.2019
- **<u>Report Type:</u>** DRAFT DTSv1 for Design Team Review
- Prepared By: Andrew Hampson B.Sc. (Hons) FGS Geo Environmental Engineer/Associate
- Checked By: Curtis Evans B.Sc. (Hons) FGS Geo Environmental Engineer/Director
- Client: Andrew Park and Myra O'Fee

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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 Thornlea, Carleton, Egremont, Cumbria 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 Client, Mr Bob Metcalfe.

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 Client.

#### **1.2 Aims and Objectives**

The main objective of this Phase 1: Desk Top Study (DTS) Report is 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
- Historical Ordnance Survey (OS) Maps Appendix II
- 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 piece of land to the south of Thornlea (a residential property) located to the southeast of Egremont, Cumbria. The site lies within a mixed residential urbanised and agricultural setting. The village of Egremont and residential properties are present to the north and northwest with agricultural fields also surrounding the site.

The site is centred on National Grid Reference (NGR) 301685, 509231 and equates to c.0.36 hectares.

#### **2.2 Existing Site Levels**

Site levels fall to the west. A topographical survey was not available, however, Ordnance Survey data indicates that the site is at an elevation of c.99m AOD.

#### 2.3 Existing Site Surfacing and Buildings

The site currently comprises areas of overgrown scrub vegetation and occasional small trees. There were no permanent structures noted.

The site appears to be 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.

#### 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.

#### 2.6 Development Proposal

It is understood that the site will be developed for residential end use. A site layout plan has not been provided, however, it is likely that the development will comprise residential building(s) with private gardens, car parking and associated infrastructure. 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
- Sections 3.2 to 3.4 refer to the Ground Sure Reports contained in Appendix II
- Section 3.5 refer to the historical Ordnance Survey Maps included in Appendix III

#### 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 maps and the GSR does not indicate the presence of made ground materials. However, since the site appears to have historically been developed or at least utilised, made ground of natural disturbed deposits (i.e. sand, gravel and clay) may be present as well as the potential for anthropogenic debris including brick, concrete, timbers, ash, clinker, etc.

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 maps and the GSR indicates that the site lies in an area where Glacial Till deposits typically comprising firm to stiff sandy gravelly clay.

The GSR (Geoinsight Section 6.0) within Appendix II identifies the following geohazards and indicates a preliminary level of risk:

- Shrink-swell clays very low 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 6.0 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 6.3) 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**

No geological structural faults are inferred below or within close proximity to the site.

#### 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

Tin Mining 

Gypsum Mining

Brine Extraction

Clay Mining

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

Section 5.4 of the GSR Geoinsight (Appendix II) indicates historical iron ore mining in the general vicinity of the site. Section 5.4 of the GSR Geoinsight also indicates the following:

> "Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered".

It is therefore recommended that investigations be completed across the site to further assess the risks from potential historical iron ore mine workings. In addition, it is recommended that the developer implement a watching brief on site and ensure a contingency sum in the event that should evidence of mine workings/entries be identified during construction, then they can be dealt with in an appropriate manner.

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 two small reservoirs are recorded c.13m and c.23m north of the site. Due to the small size of these features and the presence of Glacial Till Deposits, these features are 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 Drift Geological deposits below the development site are classified by the EA as being a Secondary Aquifer (Undifferentiated) with respect to water resources and are unlikely to be considered as a significant strategic resource.

#### 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 not anticipated to be present at shallow depth within the Drift geology, with the potential for localised pockets of trapped surface infiltration within the upper made ground (where present). Although the site is underlain by a Principal Aquifer, the initial drift deposits will likely act as a natural impermeable barrier to reduce the potential for contaminant migrations to the underlying Aquifer.

A review of the information in the GSR Enviroinsight indicates the following:

- Seventeen groundwater abstractions are recorded within c.1km of the site although only one is currently "active" c.993m southeast.
- No surface water abstractions are recorded within c.1km of the development area.
- Four potable water abstraction licences are held within c.1km although all are "historical" entries.
- The site is recorded as being located within a Source Protection Zone 3 Total Catchment.

#### 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 / made ground (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 No entries noted within c.250m.
- Historical Tank Database One entry (Tank or Trough) is recorded on site as well as a further eight 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 Two entries are recorded within c.250m with both relating to former reservoirs located 13m and 23m north. These features are 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 surrounding area there is only one entry associated with a current industrial land use (i.e. Dairy Farming) located c.186m north. It is recommended that reference is 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) 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 c.1963, the site is recorded as undeveloped, possibly agricultural fields with field boundaries noted.

By c.1993 and c.1994, varying structures are recorded in the south and east of the site although the use is unknown. However, by c.2010, no structures are present and the site appears to remain as it does to the present day.

The immediate surrounding area also comprises agricultural fields with sporadic dwellings noted in the surrounding area. Items of note in the surrounding area include the reservoirs to the north (c.1926) as well as the development of the property (now Thornlea) directly adjacent to the northern boundary by c.1961.

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

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 since the site has been utilised by unknown structures made ground comprising disturbed natural deposits and anthropogenic debris may be present on site. 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 - No Significant Potential Sources Identified.

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:	$\bigcirc$					
RISK =	NEGLIGIBLE	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH

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

- Made ground is anticipated on site associated with on site and adjacent historical developments.
- Where previous structures have been present on site, ground slabs and foundations may be present although the type, dimensions and construction is unknown.
- The shallow drift deposits are considered to be glacial in origin (i.e. Till) typically comprising firm to stiff sandy gravelly clay.
- Historical mineral vein extraction may have occurred below the site, which requires further consideration and investigation. Initially, it is recommended that a more detailed mining search of desk based information is completed to ascertain if the risk warrants intrusive investigation.
- Shallow groundwater is not expected within the cohesive deposits although water may be present in any granular deposits which could affect the soil bearing capacity and trench wall stability.
- Surface overland flow may occur particularly following periods of heavy rainfall.
- At this stage, no significant issues are considered to be present with respect to potential sources of ground gas.
- The site does not currently require Radon Protection measures within structures.

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:	Ţ					
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 *LOW* is currently determined appropriate for this development with respect to ground contamination. In summary, although it is considered unlikely that significant made ground/contamination will be present due to the historical structures on site and the unknown use, there is a potential for contamination to be present.

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 on site a risk level of NEGLIGIBLE is thought appropriate for this development with respect to potential risks to controlled waters (i.e. groundwater) and adjacent sites, as the clay soils envisaged to be present will likely act as a natural impermeable barrier to reduce the potential for contaminant migrations.

A risk level of NEGLIGIBLE is currently considered appropriate for the site with respect to potential harmful ground gas since there are no significant sources of ground gas identified. In addition, 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 moderate geotechnical risk.
- The site is currently considered to pose a 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 negligible level of risk is currently considered present of ground gas.

It is recommended that intrusive investigations take place on site to further characterise the site setting with respect to the geohazards identified herein.

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 Layout Plan





### **GEO2018-3324: Site Location Plan (Not to Scale)**





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



#### GEO2018-3324: Aerial Photograph



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



#### GEO2018-3324: Existing Layout Plan



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

### Appendix II

Ground Sure Report (GSR – Geoinsight and Enviroinsight)





EmapSite

Masdar House, 1 Reading Road, Eversley, RG27 0RP Report Reference: EMS-516633\_695238

Your Reference: EMS\_516633\_695238

Report Date 10 Dec 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:	
Reference:	

EmapSite

Ν

EMS-516633\_695238

10 Dec 2018

NW

Client:

NE



SW

Aerial Photograph Capture date:05-Oct-2008Grid Reference:301685,509231Site Size:0.36ha

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SE





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6 Natural Ground Subsidence
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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 perme 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?	is defined by entage of hoi	the Health mes are	The property Area, as less abov	r 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 are necessary.							
Section 4: Grour	nd Workings	On-site	0-50m	51-250	251-500	501-1000		
4.1 Historical Surface Scale Mapping	e Ground Working Features from Small	0	2	0	Not Searched	Not Searched		
4.2 Historical Under	ground Workings from Small Scale Mapping	0	0	0	0	8		
4.3 Current Ground	Workings	0	0	0	1	2		
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	10		
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	]*	1	0	0	0	4		
5.5 Non-Coal Minin	g Cavities	0	0	0	1	3		
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	Very Lo	W			
6.2 Landslides	Very Lo	W			
6.3 Ground Dissolution of Soluble Rocks	Negligik	ole			
6.4 Compressible Deposits	Negligik	ole			
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		1
Section 8: Estimated Background Soil Chemistry	On-si	te	0-50m	5	1-250
8 Records of Background Soil Chemistry	1		0		0
Section 9: Railways and Tunnels	On-site	0-50m	51-250	250-500	
9.1 Tunnels	0	0	0	Not Searched	1
9.2 Historical Railway and Tunnel Features	0	0	0	Not Searched	1
9.3 Historical Railways	0	0	1	Not Searched	1
9.4 Active Railways	0	0	0	Not Searched	1
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
N2	1619.0	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	

# Groundsure 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)



Artificial Ground Legend

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# 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







(undivided)

**Reclaimed Ground** 





### 2. Geology 1:50,000 scale

### 2.1 Artificial Ground

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

Database searched and no data found.





### 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	<b>Rock Description</b>
1	0.0	On Site	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
2	366.0	NW	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
3	430.0	W	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
4	485.0	NW	RTDU-XSV	RIVER TERRACE DEPOSITS (UNDIFFERENTIATE D)	SAND AND GRAVEL
5	500.0	NW	ALV-XCZSV	ALLUVIUM	CLAY, SILT, 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

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

Database searched and no data found.



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



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 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	-

### 2.3.2 Permeability of Bedrock Ground

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

ection Flo	ow Type	Maximum Permeability	Minimum Permeability
n Site	Mixed	High	Moderate
	n Site	n Site Mixed	n Site Mixed High

### 2.3.3 Linear features

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

Yes

ID	Distance	Direction	Category Description	Feature Description
4	0.0	On Site	FAULT	Fault, inferred, displacement unknown
5	302.0	SW	FAULT	Fault, inferred, displacement unknown
6	356.0	NE	FAULT	Fault, inferred, displacement unknown
7	403.0	Ν	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.



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### **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
	1 13.0	Ν	301637 509277	Reservoir	1926
	2 23.0	Ν	301704 509292	Reservoir	1951

#### 4.2 Historical Underground Working Features derived from Historical Mapping

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

Are there any Historical Underground Working Features within 1000m of the study site boundary? Yes

The following Historical Underground Working Features are provided by Groundsure:

ID	Distance (m)	Direction	NGR	Use	Date
Not shown	549.0	E	302543 509481	Iron Ore Mine	1951
Not shown	549.0	E	302543 509481	Unspecified Mine	1971
Not shown	685.0	E	302532 509476	Unspecified Mine	1926
Not shown	695.0	E	302539 509433	Unspecified Disused Mine	1994
Not shown	731.0	E	302461 509393	Unspecified Disused Shaft	1981
Not shown	948.0	SE	302607 508662	Unspecified Mine	1971
Not shown	950.0	SE	302583 508602	Iron Ore Mine	1951
Not shown	955.0	SE	302612 508598	Unspecified Disused Mine	1981





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

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

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

ID	Distanc e (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	328.0	Ν	301552 509577	Sandstone	Beggargill Quarry	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	860.0	Ν	301790 510120	Hematite (Iron Ore)	Florence Pit No 1	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	976.0	E	302660 509570	Sandstone	Whitehow Head	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased



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### 5 Mining, Extraction & Natural Cavities map





### 5.1 Historical Mining

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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?

The following Historical Mining information is provided by Groundsure:

ID	Distance (m)	Direction	NGR	Details	Date
10A	549.0	E	302543 509481	Iron Ore Mine	1951
11A	549.0	E	302543 509481	Unspecified Mine	1971
Not shown	685.0	E	302532 509476	Unspecified Mine	1926
Not shown	695.0	E	302539 509433	Unspecified Disused Mine	1994
Not shown	731.0	Е	302461 509393	Unspecified Disused Shaft	1981
Not shown	732.0	Ν	301759 510111	Iron Ore Pit	1948
Not shown	734.0	Ν	301790 510114	Iron Ore Pit	1926
Not shown	948.0	SE	302607 508662	Unspecified Mine	1971
Not shown	950.0	SE	302583 508602	Iron Ore Mine	1951
Not shown	955.0	SE	302612 508598	Unspecified Disused Mine	1981

### 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

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Yes

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?

Yes

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

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
1	0.0	On Site	Not available	Iron Ore (Non Vein)	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
2	520.0	E	Not available	Iron Ore (Non Vein)	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
3	539.0	NE	Not available	Iron Ore (Non Vein)	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
4	598.0	SE	Not available	Iron Ore (Non Vein)	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
Not shown	735.0	Ν	Not available	Iron Ore (Non Vein)	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered





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? Yes

The following Non-Coal Mining Cavities information provided by Peter Brett Associates:

ID	Distance (m)	Direction	NGR	Address	Superficial Deposits	Bedrock Deposits	Extracted Mineral
6	277.0	NW	301500 509500	FLORENCE, Cumbria	-	-	Hematite
Not shown	793.0	Ν	302000 510000	ULLBANK MINE, Cumbria	-	-	Hematite
Not shown	835.0	Ν	301700 510100	FLORENCE MINE, Cumbria	-	-	Hematite
Not shown	993.0	SE	302500 508600	HAILE MOOR, Cumbria	-	-	Hematite

#### **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 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

No

Database searched and no data found.





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?

Database searched and no data found.

### 5.10 Clay Mining

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

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

No

No

Database searched and no data found.





# 6 Natural Ground Subsidence

### 6.1 Shrink-Swell Clay map











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### 6.3 Ground Dissolution of Soluble Rocks map





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### 6.5 Collapsible Deposits map





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### 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? Very Low

#### 6.1 Shrink-Swell Clays

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

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

#### 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.

### 6.5 Collapsible Deposits

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

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

### 6.6 Running Sands

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

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

# 7 Borehole Records map

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### NW Ν NE Carleton Low Thorny PH Thornlea 250 Е W High Thorny HORN Wins SW SE S © Crown copyright and database rights 2018. Ordnance Survey licence 100035207. **Borehole Records Legend** Site Outline Borehole Locations 125 Search Buffers (m)

250

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### 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:

1

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	152.0	SW	301500 509150	NY00NW617	-1.0	THORNHILL, NO 3

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





### 8 Estimated Background Soil Chemistry

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

1

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

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



emapsite™

### 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?	No
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?	Yes

Distance (m)	Direction	Status
152	SE	Abandoned

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

### 9.4 Active Railways

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

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

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

Groundsure

emapsite Telephone: 0118 9736883 sales@emapsite.com

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British Geological Survey Enquiries Kingsley Dunham Centre Keyworth, Nottingham NG12 5GG British Tel: 0115 936 3143. **Geological Survey** Fax: 0115 936 3276. Email:enquiries@bgs.ac.uk NATURAL ENVIRONMENT RESEARCH COUNCIL Web:www.bgs.ac.uk BGS Geological Hazards Reports and general geological enquiries British Gypsum British Gypsum Ltd **British Gypsum** East Leake Loughborough Leicestershire LE12 6HX The Coal Authority 200 Lichfield Lane Mansfield Notts NG18 4RG The Coal Tel: 0345 7626 848 DX 716176 Mansfield 5 Authority www.coal.gov.uk **Public Health England** Public information access office Public Health England, Wellington House 133-155 Waterloo Road, London, SE1 8UG **Public Health** https://www.gov.uk/government/organisations/public-healthengland England Email: enquiries@phe.gov.uk Main switchboard: 020 7654 8000 Johnson Poole & Bloomer Limited Harris and Pearson Building, Brettel Lane JOHNSON Brierley Hill, West Midlands POOLE & DY5 3LH Tel: +44 (0) 1384 262 000 BLOOMER Email:enquiries.gs@jpb.co.uk CONSULTANTS Website: www.jpb.co.uk Ordnance Survey Adanac Drive, Southampton SO16 0AS Tel: 08456 050505

Getmapping PLC

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

Website: http://www.ordnancesurvey.co.uk/







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-516633_695239
Your Reference:	EMS_516633_695239
Report Date	10 Dec 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

# Groundsure Enviro Insight

Address:	9
Date:	10 Dec 2018
Reference:	EMS-516633_695239
Client:	EmapSite

9

LOCATION INTELLIGENCE

N



W

NW

SW

Aerial Photograph Capture date: 05-Oct-2008 Grid Reference: 301685,509231 Site Size: 0.36ha

S

SE

NE

Е

Report Reference: EMS-516633\_695239 Client Reference: EMS\_516633\_695239





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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	0	12
1.2 Additional Information - Historical Tank Database	1	0	8	6
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	2	0	13
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	0
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	2	4
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	2	2
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	3	7
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	No	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 5.1 Records of Artificial Ground and Made Ground present beneath			Nono io	loptified		
the study site	None identified					
5.2 Records of Superficial Ground and Drift Geology present beneath the study site	Identified					
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			Iden	tified		
	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	17	11
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	4	5
6.6 Source Protection Zones (within 500m of the study site)	1	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



	00-
On-site 0-50m 51-250 251-500 501-1000 1	500
6.9 Environment Agency/Natural Resources Wales information on No No No No No No No No No	٩o
6.10 Ordnance Survey MasterMap Water Network entries within 500m of the site00410Not searched Not searched	earched
6.11 Surface water features within 250m of the study site No No Yes Not searched No	earched

### 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	Potential below Surface
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	1	5
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	3
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	2

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LOCATION INTELLIGENCE



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			Very	/ Low		
9.1.1 Maximum Shrink-Swell hazard rating identified on the study site			Very	/ Low		
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	Negligible					
9.1.4 Maximum Compressible Ground hazard rating identified on the study site	n Negligible					
9.1.5 Maximum Collapsible Rocks hazard rating identified on the study site	2 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?	The site is r	iot in a Rado ar	on Affected e above the	Area, as less Action Leve	s than 1% of <sub> </sub> el.	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 p	rotective m	neasures are	necessary.	
Section 10: Mining						
10.1 Coal mining areas within 75m of the study site			None ic	dentified		
10.2 Non-Coal Mining areas within 50m of the study site boundary			Iden	tified		
10.3 Brine affected areas within 75m of the study site			None ic	dentified		





### 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.









## **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: 12

ID	Distance [m]	Direction	Use	Date
1A	293	Ν	Unspecified Disused Quarry	1951
2A	295	Ν	Unspecified Disused Quarry	1971
ЗА	295	Ν	Unspecified Disused Quarry	1981
4A	295	Ν	Unspecified Disused Quarry	1994
5A	296	Ν	Unspecified Quarry	1898
6A	296	Ν	Unspecified Disused Quarry	1926
7A	306	Ν	Unspecified Quarry	1861
8F	353	NW	Unspecified Quarry	1861
9	433	NW	Railway Sidings	1926
10	443	NW	Railway Sidings	1951
11B	462	NW	Railway Building	1926
12B	465	NW	Railway Building	1951

#### 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:

15

ID	Distance (m)	Direction	Use	Date
13	0	On Site	Tank or Trough	1863
14C	169	Ν	Tank or Trough	1863
15C	173	Ν	Tank or Trough	1863
16	185	Ν	Tank or Trough	1863
17	208	NE	Tank or Trough	1863
18D	221	Ν	Unspecified Tank	1990
19D	221	Ν	Unspecified Tank	1993
20D	221	Ν	Unspecified Tank	1990



21D	221	Ν	Unspecified Tank	1993
22	263	NW	Tank or Trough	1863
23E	302	NE	Tank or Trough	1863
24E	318	NE	Tank or Trough	1863
25	407	E	Tank or Trough	1863
26	491	NE	Tank or Trough	1863
27	493	NE	Tank or Trough	1863

#### 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

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:

0

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: 15

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

ID	Distance(m)	Direction	Use	Date
28	13	Ν	Reservoir	1926
29	23	Ν	Reservoir	1951
30A	293	Ν	Unspecified Disused Quarry	1951
31A	295	Ν	Unspecified Disused Quarry	1971
32A	295	Ν	Unspecified Disused Quarry	1994
33A	295	Ν	Unspecified Disused Quarry	1981
34A	296	Ν	Unspecified Disused Quarry	1926
35A	296	Ν	Unspecified Quarry	1898
36A	306	Ν	Unspecified Quarry	1861
37F	353	NW	Unspecified Quarry	1861
38G	454	SE	Reservoir	1926
39G	464	SE	Reservoir	1971
40G	464	SE	Reservoir	1981
41G	464	SE	Reservoir	1994
42G	468	SE	Reservoir	1951



# 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.

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

0

0

0

0

0

0

Database searched and no data found.

#### 2.2 Dangerous or Hazardous Sites

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





0

0

#### 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:

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



# 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:

0

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:

6

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	GR Details		
Not shown	683	NE		Site Address: Florence No.1 Mine, Scurgill Terrace, Carleton, Egremont, Cumbria Waste Licence: Yes Site Reference: 116, 89, E160.64 Waste Type: Inert, Industrial Environmental Permitting Regulations (Waste) Reference: NT1/L/ALC004	Licence Issue: 26-Apr-1982 Licence Surrendered: Licence Holder Address: Clay Flatts, Workington, Cumbria Operator: Alco Waste Management Limited Licence Holder: Alco Transport Servicest Limited First Recorded: 31-Dec-1977 Last Recorded: 06-Apr-2000	
Not shown	835	Ν		Site Address: Disused Railway Cuttings, Egremont Bypass, St Thomas's Cross, Egremont, Cumbria Waste Licence: Yes Site Reference: 164 Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: 10-Dec-1991 Licence Surrendered: 11-Mar-1993 Licence Holder Address: Hooton, South Wirral, Cheshire Operator: - Licence Holder: Alfred McAlpine Construction Limited First Recorded: 01-Oct-1991 Last Recorded: 31-Oct-1991	
Not shown	1048	NE		Site Address: M Fleming and T Coulthard, Field No 3323 and 4031, Grange Road, Egremont, Cumbria Waste Licence: Yes Site Reference: 152 Waste Type: Special Environmental Permitting Regulations (Waste) Reference: NT1/L/FLE003	Licence Issue: 22-Mar-1981 Licence Surrendered: Licence Holder Address: Keaslow, Netherton, Egremont, Cumbria Operator: - Licence Holder: M Fleming and T Coulthard First Recorded: - Last Recorded: -	
Not shown	1089	NE		Site Address: Field Nos 4031 3323 and 4527, Grange Road, Egremont, Cumbria Waste Licence: Yes	Licence Issue: 22-Mar-1991 Licence Surrendered: Licence Holder Address: -	

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ID	Distance (m)	Direction	NGR	Det	tails
				Site Reference: 152, TW23 Waste Type: Inert, Special Environmental Permitting Regulations (Waste) Reference: -	Operator: Inter County Skip Hire Limited Licence Holder: M Fleming and T Coulthard T/A Inter Country Waste First Recorded: 01-Jan-1981 Last Recorded: 06-Sep-1996
Not shown	1128	NE		Site Address: Field No 4527 and parts of 3323 4216 4031 5214, Grange Road, Egremont, Cumbria Waste Licence: Yes Site Reference: 271, E160.263 Waste Type: Inert, Special Environmental Permitting Regulations (Waste) Reference: NT1/L/INT002	Licence Issue: 01-Aug-1994 Licence Surrendered: Licence Holder Address: Keaslow, Nethertown, Egremont Operator: Inter County Skip Hire Limited Licence Holder: Inter County Skip Hire Limited First Recorded: 01-Aug-1994 Last Recorded: -
Not shown	1332	NE		Site Address: Field Nos 4031 3323 and 4527, Ullcoats, Egremont, Cumbria Waste Licence: Yes Site Reference: 88 Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: 19-May-1982 Licence Surrendered: 30-Apr-1994 Licence Holder Address: PO Box 8, Moresby Road, Whitehaven, Cumbria Operator: - Licence Holder: T Milburn Limited First Recorded: 01-Jan-1981 Last Recorded: 31-Dec-1983

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:

The following landfill records are represented as points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Site Address	Source	Data Type
Not shown	687	Ν	301873 509965	Refuse Tip	1961 mapping	Polygon
Not shown	979	SE	302487 508577	Refuse Tip	1961 mapping	Polygon
Not shown	1043	SE	302646 508587	Refuse Tip	1961 mapping	Polygon
Not shown	1196	NE	302387 510315	Refuse Tip	1961 mapping	Polygon





#### 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:

10

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details		
Not shown	732	NW	301267 509891	Site Address: J. M. Skips Brownriggs Yard, Ennerdale Mill, Egremont, Cumbria, CA22 2PN Type: 75kte HCI Waste Transfer Station Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: JAC099 EPR reference: EA/EPR/AB3806LV/A001 Operator: Jacksons Marine Limited Waste Management licence No: 402645 Annual Tonnage: 74999.0	Issue Date: 03/09/2015 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: J. M. Skips Brownriggs Yard Correspondence Address: -	
Not shown	761	Ν	301900 510000	Site Address: Scurgill Transfer Station, Scurgill Terrace, Egremont, Cumbria, CA22 2NS Type: Household, Commercial & Industrial Waste T Stn Size: >= 25000 tonnes < 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: ALC008 EPR reference: EA/EPR/KP3293ZF/A001 Operator: Alco Waste Management Ltd Waste Management licence No: 57149 Annual Tonnage: 755.0	Issue Date: 22/03/1991 Effective Date: - Modified: - Surrendered Date: - Expiry Date: 17/01/2000 Cancelled Date: - Status: Expired Site Name: Alco Waste Management Correspondence Address: -	
Not shown	761	Ν	301900 510000	Site Address: Florence No 1 Mine, Scurgill Terrace, Egremont, Cumbria, CA22 2NS Type: Landfill taking Non-Biodegradeable Wastes Size: >= 25000 tonnes < 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: ALC004 EPR reference: EA/EPR/GP3293ZG/A001 Operator: Alco Waste Management Ltd Waste Management licence No: 57116 Annual Tonnage: 500.0	Issue Date: 19/09/1986 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Expired Site Name: Alco Waste Management Correspondence Address: -	
Not shown	1080	SE	302618 508609	Site Address: Lawson's Recycling Centre, Energy Coast Business Park, Haile, Egremont, Cumbria, CA22 2NH Type: Physical Treatment Facility Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: LAW041 EPR reference: EA/EPR/KB3838RE/A001 Operator: G & A M Lawson Ltd	Issue Date: 10/12/2012 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Lawson's Recycling Centre Correspondence Address: -	



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ID	Distance (m)	Direction	NGR	Details		
				Waste Management licence No: 104669 Annual Tonnage: 74999.0		
Not shown	1110	NE	302300 510200	Site Address: Field No 3323 & 4031, Grange Road, Egremont, Cumbria Type: Other Landfill Site taking Special Waste Size: Unknown Environmental Permitting Regulations (Waste) Licence Number: FLE003 EPR reference: - Operator: M Fleming & T Coulthard Waste Management licence No: 57152 Annual Tonnage: 0.0	Issue Date: 22/03/1981 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Part revoke Site Name: M Fleming & T Coulthard Correspondence Address: Keaslow, Netherton, Egremont, Cumbria, CA22 2UJ	
Not shown	1110	NE	302300 510200	Site Address: Field No 3323 & 4031, Grange Road, Egremont, Cumbria Type: Other Landfill Site taking Special Waste Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: FLE003 EPR reference: EA/EPR/KP3693ZR/A001 Operator: M Fleming & T Coulthard Waste Management licence No: 57152 Annual Tonnage: 300000.0	Issue Date: 22/03/1981 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Expired Site Name: M Fleming & T Coulthard Correspondence Address: -	
Not shown	1248	NE	302400 510300	Site Address: Field No 4527, Grange Road, Egremont, Cumbria Type: Other Landfill Site taking Special Waste Size: Unknown Environmental Permitting Regulations (Waste) Licence Number: INT002 EPR reference: - Operator: Inter County Skip Hire Ltd Waste Management licence No: 57271 Annual Tonnage: 0.0	Issue Date: 01/08/1994 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Expired Site Name: Inter County Skip Hire Ltd Correspondence Address: Keaslow, Nethertown, Egremont, Cumbria, CA22 2UJ	
Not shown	1248	NE	302400 510300	Site Address: Field No 4527, Grange Road, Egremont, Cumbria Type: Other Landfill Site taking Special Waste Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: INT002 EPR reference: EA/EPR/NP3293ZN/A001 Operator: Inter County Skip Hire Ltd Waste Management licence No: 57271 Annual Tonnage: 300000.0	Issue Date: 01/08/1994 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Expired Site Name: Inter County Skip Hire Ltd Correspondence Address: -	
Not shown	1304	NE	302500 510300	Site Address: Grange Road Transfer Station, Part Field No 4031 & 4527, Grange Road, Egremont, Cumbria Type: Special Waste Transfer Station Size: Unknown Environmental Permitting Regulations (Waste) Licence Number: FLE004 EPR reference: - Operator: M Fleming & T Coulthard Waste Management licence No: 57220 Annual Tonnage: 0.0	Issue Date: 27/05/1993 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Expired Site Name: M Fleming & T Coulthard Correspondence Address: Keaslow, Nethertown, Egremont, Cumbria, CA22 2UJ	
Not shown	1304	NE	302500 510300	Site Address: Grange Road Transfer Station, Part Field No 4031 & 4527, Grange Road, Egremont, Cumbria Type: Special Waste Transfer Station Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: FLE004 EPR reference: EA/EPR/FP3893ZA/A001	Issue Date: 27/05/1993 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Expired Site Name: M Fleming & T Coulthard	





ID Distance Direction NGR (m)

Details

Operator: M Fleming & T Coulthard Waste Management licence No: 57220 Annual Tonnage: 50000.0

Correspondence Address: -









### 4. Current Land Uses

#### 4.1 Current Industrial Data

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

1

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

ID	Distance (m)	Directio n	Company	NGR	Address	Activity	Category
1	186	Ν	Sherwen	301749 509445	Low Thorny, Carleton, Egremont, Cumbria, CA22 2NU	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





#### 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





# 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
TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON

#### 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

(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



Secondary (B) Aquifer - Lower Permeability Layers

Groundwater Abstraction Licence

Unknown (lakes and landslip)

Surface Water Abstraction Licence

500



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





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### 6d. Hydrogeology – Source Protection Zones within confined aquifer



Potable Water Abstraction Licence

500



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## 6e. Hydrology – Watercourse Network and River Quality





### **emapsite**<sup>™</sup>

# 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
8	0	On Site	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
1	366	NW	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
2	430	W	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
3	485	NW	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

#### 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	993	SE	302500 508600	Status: Historical Licence No: 2774005010 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: BECKERMET MINE AT BECKERMET, CUMBRIA B\$461 Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: 28/11/1987 Version End Date:	
Not show n	993	SE	302500 508600	Status: Historical Licence No: 2774005010 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: BECKERMET MINE AT BECKERMET, CUMBRIA B\$461 Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: 28/11/1987 Version End Date:	
Not show n	993	SE	302500 508600	Status: Historical Licence No: 2774005010 Details: Transfer between sources Direct Source: Ground Water - North West Region Point: BECKERMET MINE AT BECKERMET, CUMBRIA B461 Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: 28/11/1987 Version End Date:	
Not show n	993	SE	302500 508600	Status: Historical Licence No: 2774005010 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: BECKERMET MINE AT BECKERMET, CUMBRIA B461 Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: 28/11/1987 Version End Date:	
Not show n	993	SE	302500 508600	Status: Historical Licence No: 2774005010 Details: Transfer between sources Direct Source: Ground Water - North West Region Point: "BECKERMET MINE AT BECKERMET, CUMBRIA B\$461" Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: 28/11/1987 Version End Date:	



LOCATION INTELLIGENCE



ID	ID Distance Direction NGR Details				
Not show n	993	SE	302500 508600	Status: Historical Licence No: 2774005010 Details: Process water Direct Source: Ground Water - North West Region Point: "BECKERMET MINE AT BECKERMET, CUMBRIA B\$461" Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: 28/11/1987 Version End Date:
Not show n	993	SE	302500 508600	Status: Historical Licence No: 2774005010 Details: Transfer between Sources (Pre Water Act 2003) Direct Source: Ground Water - North West Region Point: BECKERMET MINE AT BECKERMET, CUMBRIA Data Type: Point Name: NUCLEAR DECOMMISSIONING AUTHORITY	Annual Volume (m <sup>3</sup> ): 4830125 Max Daily Volume (m <sup>3</sup> ): 15911 Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 101 Version Start Date: 01/04/2006 Version End Date:
Not show n	993	SE	302500 508600	Status: Historical Licence No: 2774005010 Details: Process water Direct Source: Ground Water - North West Region Point: BECKERMET MINE AT BECKERMET, CUMBRIA B461 Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: 28/11/1987 Version End Date:
Not show n	993	SE	302500 508600	Status: Historical Licence No: 2774005010 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: BECKERMET MINE AT BECKERMET, CUMBRIA Data Type: Point Name: NUCLEAR DECOMMISSIONING AUTHORITY	Annual Volume (m <sup>3</sup> ): 4830125 Max Daily Volume (m <sup>3</sup> ): 15911 Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 101 Version Start Date: 01/04/2006 Version End Date:
Not show n	993	SE	302500 508600	Status: Historical Licence No: 2774005010 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: "BECKERMET MINE AT BECKERMET, CUMBRIA B\$461" Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: 28/11/1987 Version End Date:
Not show n	993	SE	302500 508600	Status: Historical Licence No: 2774005010 Details: "Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services" Direct Source: Ground Water - North West Region Point: "BECKERMET MINE AT BECKERMET, CUMBRIA B\$461" Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: 28/11/1987 Version End Date:



LOCATION INTELLIGENCE



ID	Distance (m)	Direction	NGR	Details		
Not show n	993	SE	302500 508600	Status: Historical Licence No: 2774005010 Details: Process water Direct Source: Ground Water - North West Region Point: BECKERMET MINE AT BECKERMET, CUMBRIA B\$461 Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: 28/11/1987 Version End Date:	
Not show n	993	SE	302500 508600	Status: Active Licence No: 2774005010 Details: Process Water Direct Source: Ground Water - North West Region Point: BECKERMET MINE AT BECKERMET, CUMBRIA Data Type: Point Name: NUCLEAR DECOMMISSIONING AUTHORITY	Annual Volume (m <sup>3</sup> ): 3.504e+006 Max Daily Volume (m <sup>3</sup> ): 14400 Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 103 Version Start Date: 01/04/2007 Version End Date:	
Not show n	993	SE	302500 508600	Status: Historical Licence No: 2774005010 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: BECKERMET MINE AT BECKERMET, CUMBRIA Data Type: Point Name: NUCLEAR DECOMMISSIONING AUTHORITY	Annual Volume (m <sup>3</sup> ): 4830125 Max Daily Volume (m <sup>3</sup> ): 15911 Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 101 Version Start Date: 01/04/2006 Version End Date:	
Not show n	993	SE	302500 508600	Status: Active Licence No: 2774005010 Details: Evaporative Cooling Direct Source: Ground Water - North West Region Point: BECKERMET MINE AT BECKERMET, CUMBRIA Data Type: Point Name: NUCLEAR DECOMMISSIONING AUTHORITY	Annual Volume (m <sup>3</sup> ): 3.504e+006 Max Daily Volume (m <sup>3</sup> ): 14400 Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 103 Version Start Date: 01/04/2007 Version End Date:	
Not show n	993	SE	302500 508600	Status: Historical Licence No: 2774005010 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: BECKERMET MINE AT BECKERMET, CUMBRIA B461 Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: 28/11/1987 Version End Date:	
Not show n	993	SE	302500 508600	Status: Historical Licence No: 2774005010 Details: Transfer between sources Direct Source: Ground Water - North West Region Point: BECKERMET MINE AT BECKERMET, CUMBRIA B\$461 Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: 28/11/1987 Version End Date:	



ID	ID Distance Direction NGR Details				
Not show n	1035	Ν	301700 510300	Status: Historical Licence No: 2774005010 Details: Process water Direct Source: Ground Water - North West Region Point: FLORENCE MINE AT EGREMONT,CUMBRIA Data Type: Point Name: NUCLEAR DECOMMISSIONING AUTHORITY	Annual Volume (m³): 4830125 Max Daily Volume (m³): 15911 Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 101 Version Start Date: 01/04/2006 Version End Date:
Not show n	1035	Ν	301700 510300	Status: Historical Licence No: 2774005010 Details: Transfer between sources Direct Source: Ground Water - North West Region Point: "FLORENCE MINE AT EGREMONT,CUMBRIA" Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: 28/11/1987 Version End Date:
Not show n	1035	Ν	301700 510300	Status: Historical Licence No: 2774005010 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: FLORENCE MINE AT EGREMONT,CUMBRIA Data Type: Point Name: NUCLEAR DECOMMISSIONING AUTHORITY	Annual Volume (m³): 4830125 Max Daily Volume (m³): 15911 Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 101 Version Start Date: 01/04/2006 Version End Date:
Not show n	1035	Ν	301700 510300	Status: Historical Licence No: 2774005010 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: "FLORENCE MINE AT EGREMONT,CUMBRIA" Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: 28/11/1987 Version End Date:
Not show n	1035	Ν	301700 510300	Status: Historical Licence No: 2774005010 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: FLORENCE MINE AT EGREMONT,CUMBRIA Data Type: Point Name: NUCLEAR DECOMMISSIONING AUTHORITY	Annual Volume (m³): 4830125 Max Daily Volume (m³): 15911 Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 101 Version Start Date: 01/04/2006 Version End Date:
Not show n	1035	Ν	301700 510300	Status: Historical Licence No: 2774005010 Details: "Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services" Direct Source: Ground Water - North West Region Point: "FLORENCE MINE AT EGREMONT,CUMBRIA" Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: 28/11/1987 Version End Date:





ID	Distance (m)	Direction	NGR	Details		
Not show n	1035	Ν	301700 510300	Status: Historical Licence No: 2774005010 Details: Transfer between Sources (Pre Water Act 2003) Direct Source: Ground Water - North West Region Point: FLORENCE MINE AT EGREMONT,CUMBRIA Data Type: Point Name: NUCLEAR DECOMMISSIONING AUTHORITY	Annual Volume (m <sup>3</sup> ): 4830125 Max Daily Volume (m <sup>3</sup> ): 15911 Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 101 Version Start Date: 01/04/2006 Version End Date:	
Not show n	1035	Ν	301700 510300	Status: Historical Licence No: 2774005010 Details: Process water Direct Source: Ground Water - North West Region Point: "FLORENCE MINE AT EGREMONT,CUMBRIA" Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: 28/11/1987 Version End Date:	
Not show n	1382	SW	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 Name: UNITED UTILITIES WATER LTD	Annual Volume (m <sup>3</sup> ): 3.65e+006 Max Daily Volume (m <sup>3</sup> ): 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	1496	W	300222 509780	Status: Active Licence No: NW/074/0005/003 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: GULLEY FLATTS - EGREMONT BOREHOLE C Data Type: Point Name: UNITED UTILITIES WATER LTD	Annual Volume (m <sup>3</sup> ): 3.65e+006 Max Daily Volume (m <sup>3</sup> ): 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	1685	W	299975 509615	Status: Active Licence No: NW/074/0005/003 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: BLACK LING - EGREMONT BOREHOLE D Data Type: Point Name: UNITED UTILITIES WATER LTD	Annual Volume (m <sup>3</sup> ): 3.65e+006 Max Daily Volume (m <sup>3</sup> ): 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

None identified




#### Potable Water Abstraction Licences within 2000m of the study site

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 shown	993	SE	302500 508600	Status: Historical Licence No: 2774005010 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: BECKERMET MINE AT BECKERMET, CUMBRIA B461 Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: Version End Date:		
Not shown	993	SE	302500 508600	Status: Historical Licence No: 2774005010 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: BECKERMET MINE AT BECKERMET, CUMBRIA Data Type: Point Name: NUCLEAR DECOMMISSIONING AUTHORITY	Annual Volume (m³): 4830125 Max Daily Volume (m³): 15911 Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 101 Version Start Date: Version End Date:		
Not shown	993	SE	302500 508600	Status: Historical Licence No: 2774005010 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: BECKERMET MINE AT BECKERMET, CUMBRIA B\$461 Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: Version End Date:		
Not shown	993	SE	302500 508600	Status: Historical Licence No: 2774005010 Details: "Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services" Direct Source: Ground Water - North West Region Point: "BECKERMET MINE AT BECKERMET, CUMBRIA B\$461" Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: Version End Date:		
Not shown	1035	Ν	301700 510300	Status: Historical Licence No: 2774005010 Details: "Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services" Direct Source: Ground Water - North West Region Point: "FLORENCE MINE AT EGREMONT,CUMBRIA" Data Type: Point Name: BRITISH NUCLEAR FUELS PLC	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 100 Version Start Date: Version End Date:		



LOCATION INTELLIGENCE



ID	Distanc e (m)	Direction	NGR	Details		
Not shown	1035	Ν	301700 510300	Status: Historical Licence No: 2774005010 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: FLORENCE MINE AT EGREMONT,CUMBRIA Data Type: Point Name: NUCLEAR DECOMMISSIONING AUTHORITY	Annual Volume (m <sup>3</sup> ): 4830125 Max Daily Volume (m <sup>3</sup> ): 15911 Original Application No: - Original Start Date: 28/11/1987 Expiry Date: - Issue No: 101 Version Start Date: Version End Date:	
Not shown	1382	SW	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 Name: UNITED UTILITIES WATER LTD	Annual Volume (m <sup>3</sup> ): 3.65e+006 Max Daily Volume (m <sup>3</sup> ): 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	1496	W	300222 509780	Status: Active Licence No: NW/074/0005/003 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: GULLEY FLATTS - EGREMONT BOREHOLE C Data Type: Point Name: UNITED UTILITIES WATER LTD	Annual Volume (m <sup>3</sup> ): 3.65e+006 Max Daily Volume (m <sup>3</sup> ): 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	1685	W	299975 509615	Status: Active Licence No: NW/074/0005/003 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: BLACK LING - EGREMONT BOREHOLE D Data Type: Point Name: UNITED UTILITIES WATER LTD	Annual Volume (m <sup>3</sup> ): 3.65e+006 Max Daily Volume (m <sup>3</sup> ): 11000 Original Application No: - Original Start Date: 21/07/2015 Expiry Date: 31/03/2026 Issue No: 1 Version Start Date: Version End Date:	

#### **6.6 Source Protection Zones**

Source Protection Zones within 500m of the study site

Identified

The following Source Protection Zones records are represented on the SPZ and Potable Water Abstraction Map (6c):

ID	Distanc e (m)	Direction	Zone	Description
1	0	On Site	3	Total catchment





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/Intermediate Leaching Potential	11	Soils which can possibly transmit a wide range of pollutants.
145	SE	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.
145	E	Major Aquifer/Low Leaching Potential	L	Soils in which pollutants are unlikely to penetrate the soil layer because either water movement is largely horizontal, or they have the ability to attenuate diffuse pollutants.
485	NW	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.

#### 6.9 River Quality

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

6.9.1 Biological Quality:

Database searched and no data found.





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	189 NE	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	
29	189 NE	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	198	Not Specified	Inland river not influenced	Catchment Area: Ehen-Calder Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal	
	NE		sy normal doal action	conditions) Average Width in Watercourse Section (m): Not Provided	
30	198	Not Specified	Inland river not influenced	Catchment Area: Ehen-Calder Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal	
	NE	·	by normal tidal action.	conditions) Average Width in Watercourse Section (m): Not Provided	
	255			Catchment Area: Ehen-Calder Relationship to Ground Level: On ground surface	
3	Ν	Not Specified	by normal tidal action.	Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided	
	255			Catchment Area: Ehen-Calder Relationship to Ground Level: On ground surface	
31	N	Not Specified	Inland river not influenced by normal tidal action.	Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided	
	308			Catchment Area: Ehen-Calder Relationship to Ground Level: Not provided	
4	N	Not Specified	Inland river not influenced by normal tidal action.	Permanence: Watercourse contains water year round (in normal conditions)	
Not	308	Not Specified	Inland river not influenced	Catchment Area: Ehen-Calder	
shown	500	not specified	by normal tidal action.	Relationship to Ground Level: Not provided	
	N			Permanence: Watercourse contains water year round (in normal	





ID	Distance/ Direction	Name	Type of Watercourse	Additional Details		
				conditions) Average Width in Watercourse Section (m): Not Provided		
	365		Inland river not influenced	Catchment Area: Ehen-Calder Relationship to Ground Level: On ground surface		
5	NW	Not Specified	by normal tidal action.	Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided		
Not	365	Not Specified	Inland river not influenced	Catchment Area: Ehen-Calder Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal		
shown	NW		by normal tidal action.	conditions) Average Width in Watercourse Section (m): Not Provided		
6	457		Inland river not influenced	Catchment Area: Ehen-Calder Relationship to Ground Level: Not provided		
	NW	Not Specified	by normal tidal action.	Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided		
Not	457		Inland river not influenced	Catchment Area: Ehen-Calder Relationship to Ground Level: Not provided		
shown	NW	Not Specified	by normal tidal action.	Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided		
7	497	Not Specified	Inland river not influenced	Catchment Area: Ehen-Calder Relationship to Ground Level: On ground surface Dermannen: Waterseurse contains water year round (in permal		
/	NE	Not specified	by normal tidal action.	conditions) Average Width in Watercourse Section (m): Not Provided		
Not shown	497		Inland river not influenced	Catchment Area: Ehen-Calder Relationship to Ground Level: On ground surface		
	NE	Not Specified	by normal tidal action.	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

Identified

The following surface water records are not represented on mapping:

Distance (m)	Direction
189	NE
238	Ν



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





emapsite™

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





Report Reference: EMS-516633\_695239 Client Reference: EMS\_516633\_695239

#### 7.5 Areas benefiting from Flood Defences

Flood Defences within 250m of the study site

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

#### 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

7.4 Flood Defences

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.

Database searched and no data found.

### 7.1 River and Coastal Zone 2 Flooding

7 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.

None identified

Very Low

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

None identified

#### 7.7 Groundwater Flooding Susceptibility Areas

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

Clearwater Flooding or Superficial Deposits Flooding

Clearwater Flooding

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

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

Potential below Surface

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

#### 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.

Low



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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	990	Ν	Florence Mine	Natural England
2	1308	E	Haile Great Wood	Natural England
Not shown	1731	NE	Black Moss	Natural England
Not shown	1752	NE	Black Moss	Natural England
Not shown	1832	E	Haile Great Wood	Natural England
Not shown	1895	Е	Haile Great Wood	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:

Database searched and no data found.

#### 8.5 Records of Ramsar sites within 2000m of the study site:

Database searched and no data found.

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

The following records of Designated Ancient Woodland provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	Ancient Woodland Name	Data Source
9	1308	E	GREAT WOOD/+	Ancient and Semi-Natural Woodland
Not shown	1393	E	GREAT WOOD/+	Ancient and Semi-Natural Woodland
Not shown	1865	E	GREAT WOOD/+	Ancient Replanted Woodland

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

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

Database searched and no data found.

Database searched and no data found.





0

0

3

0



0

0

0

The following Environmentally Sensitive Area records produced by DEFRA are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	ESA Name	Data Source
7	1009	Ν	Lake District	Natural England
8	1308	E	Lake District	Natural England

### 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:

Database searched and no data found.

#### 8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:

Database searched and no data found.

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

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.

0

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:

Hazard

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

#### 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:

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:

Hazard

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 indicates an automatically generated 50m buffer and site.

53

Very Low

#### Hazard

Very Low

Negligible







Negligible

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:

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.

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	huffer	and site
	inits indicates	an	automatically	generateu	20111	Duilei	and site.

Very Low

Very Low





#### 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

None identified

Identified

Database searched and no data found.

#### 10.2 Non-Coal Mining

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

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

Distance (m)	Direction	Name	Commodity	Assessment of likelihood
0.0	On Site	Not available	Iron Ore (Non Vein)	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered

These are areas known or suspected to contain past underground mining for minerals and/or other materials where workings are likely to be extensive. In the case of mineral veins these are areas within 200m of mapped mineral veins within which it is likely that mining activities may have occurred. It should be noted, however, that there is always the possibility of the existence of other sub-surface excavations, such as wells, cess pits, follies, air raid shelters/bunkers and other military structures etc. that could affect surface ground stability but which are outside the scope of this dataset. However, if in a coalfield area you should still consider a Coal Authority mining search for the area of interest.

#### **10.3 Brine Affected Areas**

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

None identified



### **emapsite**<sup>™</sup>

## **Contact Details**

emapsite Telephone: 0118 9736883 sales@emapsite.com

## emapsite™

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

### **Appendix III**

Historical Map Extracts





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#### Site Details:



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Map legend available at: www.groundsure.com/sites/default/files/groundsure\_legend.pdf



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