BUROHAPPOLD ENGINEERING

Land south of Warren Lane, Long Ashton

Geoenvironmental & Geotechnical Desk Study

0049867

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Revision 01

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Contents

1 Introduction

1.1 General

This report presents the results of a Geoenvironmental and Geotechnical Desk Study for Land south of Warren Lane, Long Ashton (the Site) prepared by BuroHappold on behalf of Long Ashton Land Company. The purpose of this Study is to establish the environmental, geological, hydrological and hydrogeological conditions present at the Site that may result in potential contamination risks for the proposed future use comprising residential properties and associated infrastructure. The report also summarises the potential geotechnical ground hazards for the proposed development.

The Site covers approximately 2ha at Weston Road, Long Ashton near Bristol, Grid Reference ST 53150 69940. The outline of the Site and proposed Site layout is shown below in Figure 1—1. The development on the Site is for up to 35 dwellings, allotments with associated access, parking, drainage infrastructure, gardens and landscaping.

Figure 1—1 Red-line boundary and proposed Site layout

1.2 Study Aims and Objectives

The overall aim of this study was to carry out a geoenvironmental and geotechnical assessment of the Site to inform the Client's understanding of potential ground-related risks associated with the proposed redevelopment.

This report will provide information relevant to redevelopment in accordance with the requirements of the National Planning Policy Framework (NPPF) [1] and also with respect to any potential liability under Part 2a of the Environmental Protection Act 1990 [2]. The work was carried out in general accordance with Land Contamination Risk Management [4], the relevant British Standard [5], the Environment Agency Guiding Principles [6] and other current good practice guidance. The particular objectives were:

- To determine the historical and current use of the Site and its surroundings;
- To determine the nature of the ground conditions and the environmental sensitivity of the Site;
- To assess the potential location, nature and extent of any ground and groundwater contamination;
- To identify any geotechnical potential constraints;
- To assess the potential risks to people and the environment (natural and built) associated with ground contamination (solid, liquid or gas) both in the Site's existing condition and for the proposed future use;
- To construct an initial Conceptual Site Model and carry out a preliminary contaminated land risk assessment, in general accordance with Land Contamination Risk Management [4];
- To prepare a report based upon all of the above suitable to inform the Client about potential risks related to ground conditions and also suitable to support a planning application in accordance with NPPF [1];
- To determine the status of the Site with respect to Part 2a of the Environmental Protection Act 1990 and the nature and extent of any associated environmental liabilities; and
- To evaluate the potential need for and scope of any subsequent Site investigations and/or remedial action or design.

1.3 Information Sources

The principal sources of information for this desk study report include: historical and current topographic maps and public register information from the Groundsure report Appendix B; published geological maps [7]; Magnetometer Survey Report [8]; the 2014 BuroHappold report entitled 'Phase I Contaminated Land Assessment' [9] and information available from the Environment Agency website and other online sources. It should be noted that the Groundsure report was requested in 2014 and has not been updated for this report, in addition no recent Site walkover has been undertaken. Although this information is from 2014, Google Earth images suggest that the status of the Site (agricultural use) has not changed in the intervening seven years.

In addition, information was obtained from a Site walkover survey undertaken by Buro Happold on 23rd June 2014. The objectives of this walkover were to assess visual evidence of any contamination, to review on-Site activities / processes and associated standards of housekeeping and to identify surrounding land uses with regards to impacts on the Site.

It is understood that no intrusive Site investigation has been undertaken at the Site as no further geoenvironmental or geotechnical information is available.

This report is therefore based upon information obtained from third party sources, a Groundsure report from 2014 together with observations from the Site walkover survey in 2014. The third party data has been accepted as face value and has not been independently verified. BuroHappold can therefore give no warranty, representation or assurance as to the accuracy or completeness of such information.

1.4 Competence

This work reported here was carried out by geoenvironmental scientists and engineers from BuroHappold. BuroHappold is a consulting engineering company that manages its work under various Quality Management Systems that are certified to ISO 9001. The work itself was carried out by the staff with relevant qualifications, training and experience. This overall technical responsibility for the work was held by an Associate Director with substantial experience in the assessment of land affected by contamination who is a Chartered Geologist and registered SiLC (Specialist is Land Contamination).

2 Current land use and proposed development

2.1 Site Location and Topography

The Site is centred south of Warren Lane, Long Ashton near Bristol, NGR ST 53150 69940, adjacent to residential houses to the east, Warren Lane to the north, Weston Road to the south and agricultural land to the west. The Site is approximately 2ha and at an approximate elevation of 65mOD to the north and slopes to the south/southeast to approximately 50mOD.

The Site can be accessed directly from Weston Road *via* a gated field entry.

2.2 Current Activities on Site

The Site was visited on the 23rd June 2014 and was observed to be agricultural land that was at the time laid to crop. No further Site visits were undertaken since this date. Google Earth images up to 23rd April 2021 show the Site remains as agricultural land. Therefore, although BuroHappold cannot confirm current Site use as a recent Site visit has not been undertaken, it is assumed that the Site is still in agricultural use. Invasive species were not noted during the Site walkover; however, no invasive species assessment was undertaken and BuroHappold cannot confirm whether any changes have occurred since 2014.

No visual evidence of contamination was observed during the Site walkover. An area of potentially filled ground was identified though no evidence that it was contaminated was observed. Some mature trees were noted within the field boundaries of the Site.

Areas of potential contamination could comprise spills/releases of fuel from the agricultural vehicles and agricultural chemical use relating to crop growing.

2.3 Current Activities in the Surrounding Area

During the 2014 walkover, also consistent with 2021 Google Earth images, the following was noted:

North: Open agricultural land, laid to crop.

East: The town of Long Ashton comprising mainly residential properties and associated infrastructure.

South: Weston road with an operational railway line (mainline to Weston-super-Mare) ~100m to the south, and agricultural land beyond.

West: Agricultural land, then Gatcombe Farm (buildings, farm shop and restaurant) is located ~300m west of the Site.

2.4 Proposed Development

The development on Site is for up to 35 dwellings, allotments and associated access, parking, drainage infrastructure, gardens and landscaping as shown in Figure 1—1.

3 Environmental Setting

3.1 Geology

The anticipated Site geology is summarised in Table 3-1 below. This has been determined with reference to the relevant 1:50 000 BGS Map [7], Groundsure Report (Appendix B), and the BuroHappold Desk Study Report [9]. No BGS borehole logs were available within 250m of the Site. In summary, the natural geology comprises agricultural topsoil overlying Mercia Mudstone Group (Mudstone and Halite stone) with an isolated area of Quartzitic Sandstone Formation (sandstone) in the northern portion of the Site.

Table 3-1 - Summary of Anticipated Geology

Strata	Description	Depth to top [Approximate Thickness]	Aquifer status
Agricultural Topsoil		Surface	Unproductive
Quartzitic Sandstone Formation	Sandstone (north of Site only).	Surface **[~<10m]**	Secondary A
Mercia Mudstone Group (Mudstone and Halitestone)	Brown and red-brown, calcareous clays and mudstones, with occasional beds of impersistent green siltstone and fine-grained sandstone.	Surface **[~50m]**	Secondary B

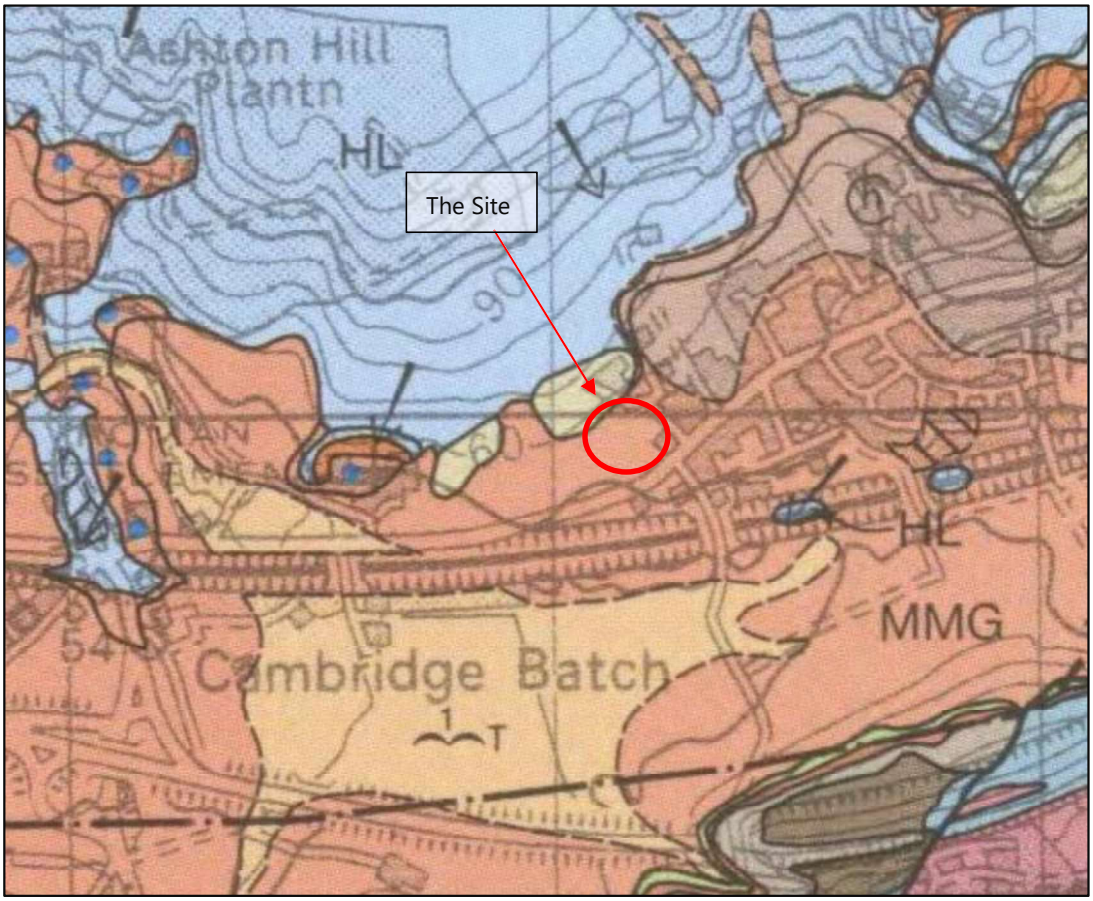

Figure 3—1 Geology of Site, BGS, 1:50,000 [7]

3.2 Hydrogeology

The Quartzitic Sandstone Formation is classified as a Secondary A Aquifer (permeable strata capable of supporting supplies at a local, rather than regional, level and in some cases forming an important source of base flow to rivers). Shallow groundwater could be present within the sandstone but is likely perched in nature. Based on the topography of the Site and the location of the River Land Yeo (see Section 3.3), shallow groundwater (if continuous and present) is likely to flow to the south. The Mercia Mudstone Group is Classified as a Secondary B Aquifer (lower permeability strata).

The Groundsure report reports that there are three groundwater abstractions within 2km of the Site. All located at Long Ashton (1780m SE) for spray irrigation and general use.

The Site does not lie within a Source Protection Zone.

3.3 Hydrology and Drainage

The River Land Yeo (secondary river) is located approximately 180m to the south and west of the Site, no river water quality is recorded for this area.

The Groundsure report suggests there is one surface water abstraction located 1090m to the east of the Site used for spray irrigation.

3.4 Flood Risk

The Site is situated in Flood Zone 1, assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%). BGS records the Site and an area within 50m of the Site as being within a Clearwater Flooding (i.e. groundwater flooding) area, although the BGS confidence rating for this assessment is Low.

3.5 Radon

The Indicative Atlas of Radon for England and Wales [10] and the Groundsure report (Appendix B) indicates that the Site is in a Radon Affected Area where between 10 and 30% of properties are above the Radon Action Level. Therefore, full radon protective measures will be required in any future buildings.

3.6 Mining

The Groundsure report (Appendix B) states that the Site is not within an area identified as has having historic or current underground workings. The Groundsure report also states that the risk of subsidence relating to shallow mining on the Site and within 150m is low to moderate.

The nearest (and only) coal mining area within 1000m of the Site is at 751m east. Non-mining related activities reported on the Site was for vein minerals; however, the assessment of likelihood for mining on the Site was 'rare – infrequent minor mining may have occurred but restricted in extent'.

3.7 Archaeology

Part of the Site lies within the Scheduled Monument of Gatcombe Roman Settlement and crosses a series of earthworks associated with a field system. Archaeological Surveys Ltd undertook a magnetometer survey at the Site in 2012 [8]. The results of the survey were provided by Archaeological Surveys:

- The survey located a number of areas of archaeological potential likely to be associated with former enclosures and boundary ditches; and
- Two discrete clusters within the southern area of the survey may infer that there has been intense burning or industrial activity in these areas.

The easterly discrete cluster is located on the Site as shown in Figure 3—2 below.

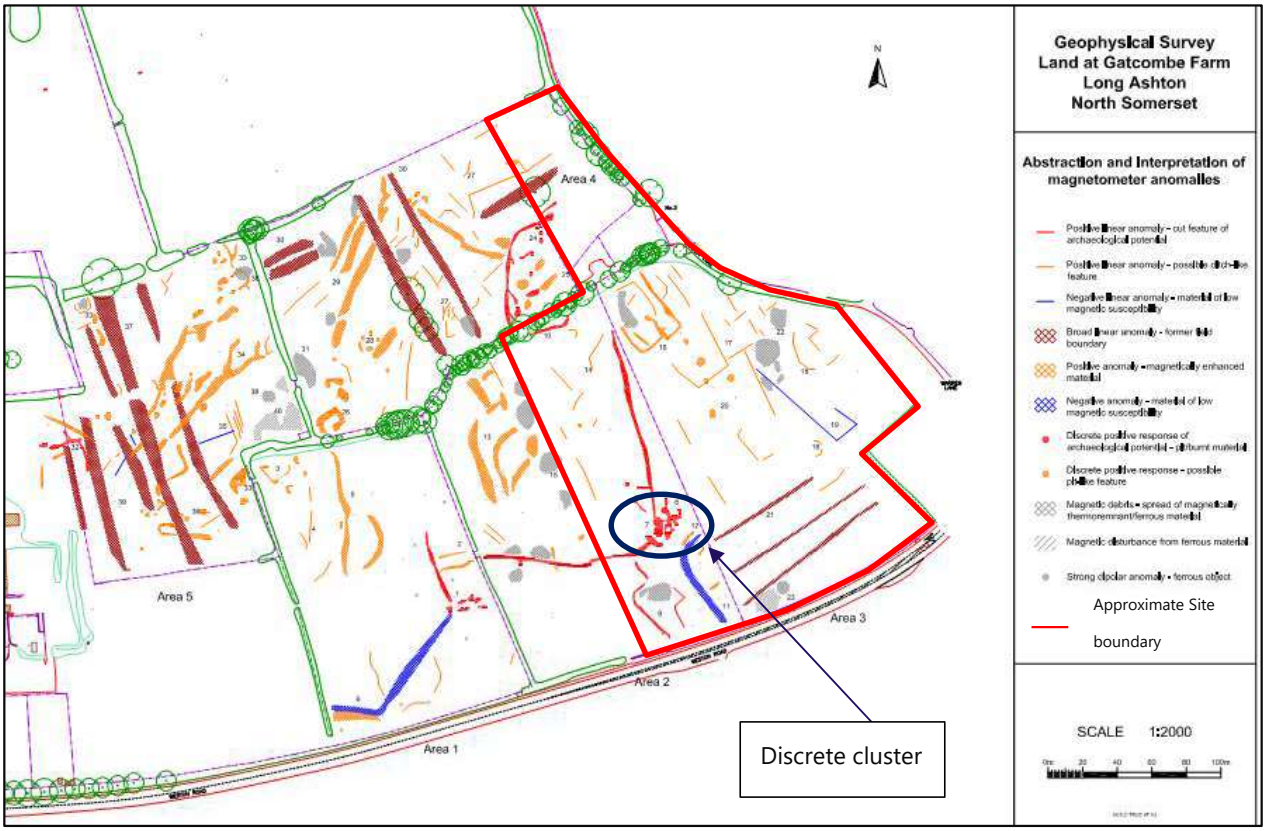

Figure 3—2 Archaeological survey showing clusters

Following the survey, an Archaeological Evaluation was undertaken including 13 trenches by Cotswold Archaeology in 2013. A North Somerset Pre-Application Response to Application No. 18/P/3710/PRE dated 25th September 2018 [11] stated that these excavations in 2013 revealed the presence of 'probably re-deposited vitrified clay, hearth/furnace linings and slag…indicative of smelting'. The North Somerset response also stated that 'any features of archaeological significance should be avoided entirely by development and preserved *in-situ*. If this goes to full application, and if it is deemed that public benefit of the development outweighs the 'less than substantial harm' to the scheduled monument, then a programme targeted excavation based on the results of the geophysical survey and subsequent trenching evaluation will be required…this will also require Scheduled Monument Consent'.

3.8 Unexploded Ordnance

A Preliminary UXO Risk Assessment has been carried out by BuroHappold in accordance with CIRIA C681 [12] and is included in Appendix A. In addition to the consideration of the potential for aerial delivered UXO, consideration has also been given to mitigation factors, namely: (i) the extent of post-war development); and (ii) the extent of proposed intrusive works. The assessment concluded that the risks associated with UXO are Low and that a detailed UXO assessment is not required (see Appendix A).

3.9 Ecology

Ashton Court SSSI is located 1.7km to the NE of the Site. Several areas of Ancient Woodland are located to the north of the Site (119-484m). The field boundaries include hedgerows and semi-mature and mature trees, and areas of scrubby vegetation.

4 Site Setting

4.1 Site History

The Site history and that for the surrounding area has been completed using historic maps from 1885 to 2012 (in Appendix B).

The Site is shown as agricultural land from the earliest maps (1885) until present day. A pond is shown on the central southern boundary (directly off Weston Road) on the 1885 plan (see Figure 4—1), this feature is no longer shown on the 1931 plan, the area being incorporated in the wider field system (presumably infilled). However, an area of marked vegetation die-back was noted corresponding to the location of the former pond during the Site walkover, and it is likely that this area still floods during periods of high rainfall.

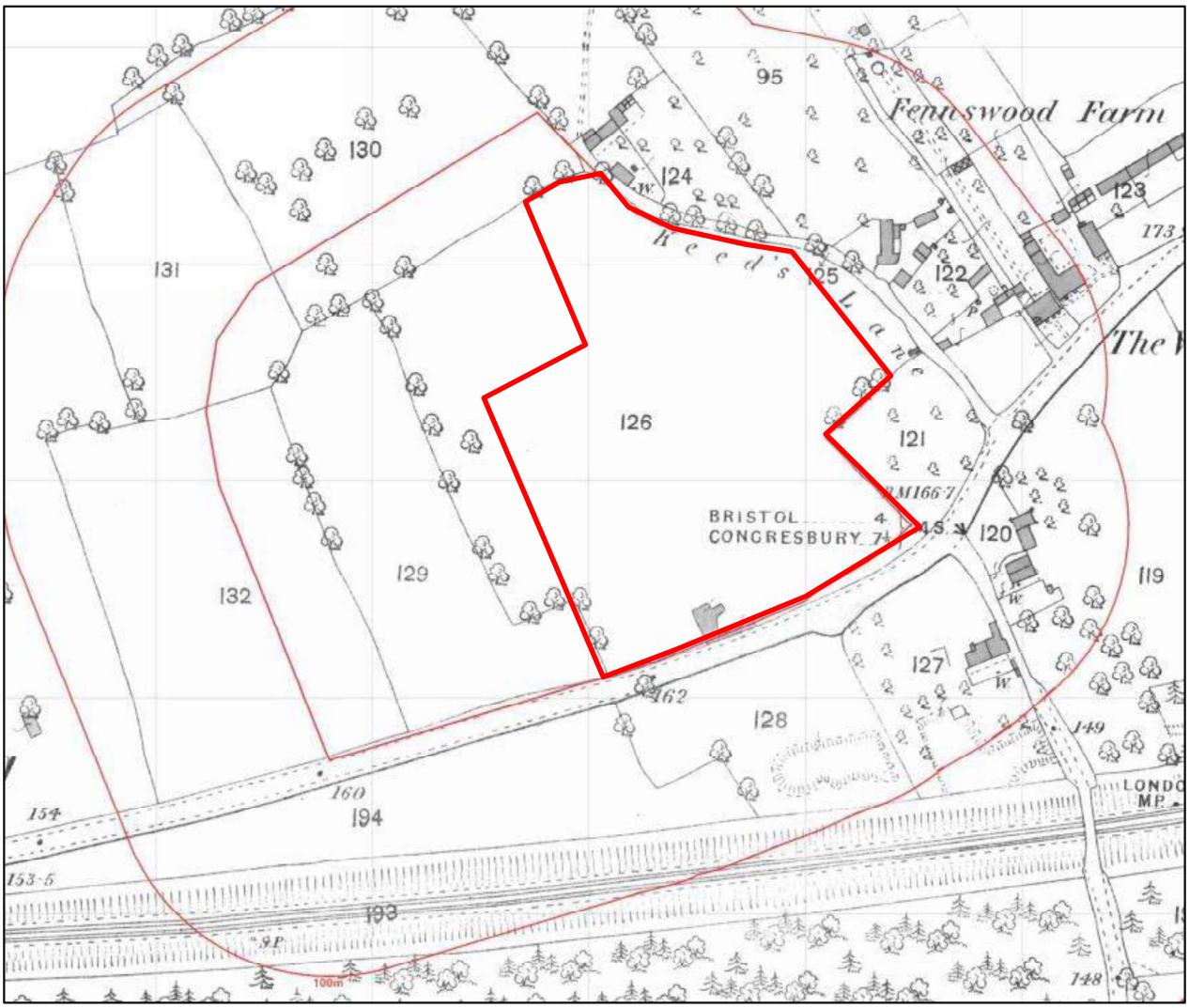

Figure 4—1 Site boundary and pond feature, from historical map 1885, with approximate Site boundary

4.2 History of Surrounding Area

The area surrounding the Site has mostly been in agricultural use from 1885 to the present day, Gatcombe Farm is shown to the West and Long Ashton directly to the east. The density of residential properties in Long Ashton has increased over time as infill development has taken place. Weston Road and the Mainline Railway are shown on the earliest plans and they remain to this day. A series of potable water supply pipes (Bristol Water Works) are shown running along (or close to) Weston Road on the 1931 map, and maintenance works were being carried out on these mains at the time of the Site walkover (albeit on the opposite side of the road to the Site).

Bristol University Agricultural Research Station is shown off-Site to the southeast on the 1931 plan, this facility has since been moved to other premises and the Site is now used as a pre-school nursery.

4.3 Regulatory Data

Regulatory data relating to potentially contaminative uses from 2014 is summarised in Table 4-1 below. This information was obtained from the Groundsure report, presented in full in Appendix B.

Table 4-1 - Summary of Regulatory Data

Item	Location [on/off Site]	Information	Potential to Impact
Environmental Permits, Incidents and Registers			
Records of Licensed Discharge Consents	One (440m SE)	University of Bristol (Fenswood Farm) – treated effluent to Ashton Brook *via* Highway Drain	No
Environment Agency Recorded Pollution Incidents: National Incidents Recording System, List 2	Two (340m SW & 415m W)	2001: Minor Water Impact 2002: Minor Water Impact	No
See Appendix B for a full list of recorded Permits, Incidents and Registers			
Landfill and Waste Sites			
Environment Agency Registered Landfill Sites	Three (1325m NE, 1325m NE & 1480m N)	Tarmac & Churngold Recycled Aggregates, Churngold Waste & Recycling Ltd, and ETM Recycling Ltd.	No
Current Land Use			
Current Industrial Sites Data	Six within 250m (not on-Site)	Including: Salt suppliers, electricity sub-stations and Heating Control Systems.	No
No records of Petrol or Fuel sites were identified.			
Hydrogeology and Hydrology			
Groundwater Abstraction Licences	Three (all at 1780m SE)	Spray irrigation and general use.	No
Surface Water Abstraction Licences	One (1090m E)	Spray irrigation.	No
No Source Protection Zones were identified.			
Environmentally Sensitive Sites			
Sites of Special Scientific Interest (SSSI)	One (1717m NE)	Ashton Court	No
Records of Ancient Woodland	Three within 500m	Cocks Wood/Shipley Brake (340m NW), Fenns Wood (385m N) and The Brake (485m NE)	No
Please refer to Appendix B for a full list of records for the Site and surrounding area.			

5 Preliminary Geotechnical Assessment

5.1 General

The following section discusses foundation design issues and the basis for the geotechnical ground investigation for the proposed development of residential family homes.

The Groundsure report states that the Site is not within an area identified as has having historic or current underground workings. The subsidence hazard relating to shallow mining are assessed as low to moderate. An area of surface works has been identified on the southern Site boundary which relates to an in filled pond.

The Groundsure report natural hazards assessment is summarised in Table 5—1 below which is taken from BGS GeoSure data.

Table 5—1 Natural Hazards

Hazard	Risk
Shrink swell	Very low
Landslides	Very low
Soluble rocks	Low
Compressible ground	Negligible
Collapsible rocks	Very low
Running sand	Negligible

The Site walkover identified a number of mature trees within Site field boundaries. When the Site is developed they could impact future buildings and infrastructure due to water drawdown and direct root action. A 2014 tree survey undertaken by Tyler Grange that was revisited in 2020 identified the location and types of trees present pre-development on Site.

Groundwater is anticipated to be at shallower depths in the southern part of the Site. The geotechnical ground investigation should aim to record and monitor groundwater flow in the areas of the proposed buildings.

5.2 Foundation options

Given that the shallow geology beneath the Site is agricultural soils over Mercia Mudstone and Quartzitic Sandstone it is likely that foundations for 2 to 3 storey structures could be founded within either the Mercia Mudstone or Quartzitic Sandstone. The depth and thickness of the Mercia Mudstone and Quartzitic Sandstone will have to be confirmed in a targeted geotechnical investigation.

Raft foundations could be considered and typically, higher settlements can be accepted for this type of foundation. The raft design is generally driven by acceptable settlements and the distribution of loads within the slabs and consequently extent of thickenings beneath the slab. It is difficult therefore at this stage to provide guidance in respect of acceptable bearing pressures, other than the fact that it may provide a viable, cost effective option compared to pads and strip foundations.

The foundation solution would require further geotechnical investigation once the structural loads are identified to confirm the geotechnical parameters and ground model of the Site.

6 Preliminary Geoenvironmental Risk Assessment

6.1 General Approach

In the UK, the assessment of risk from contamination is based on consideration of the conceptual site model and follows the "source-pathway-receptor" approach. If one of these three elements (source, pathway or receptor) is absent, it is considered that there is no risk of harm. If, however, there is considered to be a linkage between any given source and any given receptor, then a risk-based approach is used to assess the significance or impact of the linkage. Risks are defined as the probability of an event occurring combined with the severity of the consequence of that event. Particularly, to assess the risks to site end users posed by any given source, the sensitivity of each receptor is considered. For example, the concentration of contamination acceptable at a site to be developed as a residential property with a garden used to grow vegetables and accessible to young children is set lower than that for a commercial site where soil is exposed only in minor areas of landscaping and the only long-term users of the site are adults. Similarly, a site overlying a Principal Aquifer supplying potable water will be considered more stringently than a site overlying an impermeable geology with only minor seepages of groundwater.

6.2 Conceptual site model

The potential risks posed to human health and the environment by ground contamination at this site have been evaluated by a generic quantitative risk assessment which incorporates the 'source-pathway-receptor' identification and assessment methodology in accordance with the Model Procedures [3]. The risk assessment process therefore involves the identification of each source based on the information in this report, including any available existing ground investigation results together with the identification of relevant exposure pathway(s) and receptors. The potential risks to the receptors have been assessed by considering the potential effect of the source on the receptor as well as the likelihood of a pathway linking the two, i.e. a contaminant linkage as discussed above.

6.3 Sources

The potential contamination sources at the Site have been identified from the review of regulatory data, historical maps and previous Site investigations and are summarised in Table 6-1. The 'Contaminants of Concern' in this risk assessment are based primarily on information from this review of historical information and R&D 66 [13].

Table 6-1 Summary of potential sources of contamination

Potential Source	Location	Likely Age	Potential Contaminants of Concern
Infilled historic pond and ancient historic land use from burning and smelting	On-Site	Ancient historic - 1931	Unknown fill materials – Heavy metals, hydrocarbons, PAHs, inorganics and organics, ground gasses
Spills of fuels/agro-chemicals relating to farming activities	On-Site	1900-present	Heavy metals, hydrocarbons, PAHs, inorganics and organics
Underlying geology	On-Site	-	Ground gas and radon gas

6.4 Pathways and receptors

The proposed development comprises a residential development with gardens, green landscaping and an allotment to the north (see Section 2.4). The presence of contamination (in soils, liquids or gases) has the potential to impact upon human and environmental receptors both in the short term (during construction) and in the long term (during use and occupation). Those receptors and the pathways that could link them to the sources identified in Table 6-1 are summarised below.

Table 6-2 Summary table of receptors and potential pathways

Receptor		Pathway
Human Health	Investigation, maintenance and construction workers	Direct/ dermal contact. Ingestion/ inhalation of soils. Inhalation of gas / vapour.
	Future Site users / visitors (residents, guests, workers)	Direct/dermal contact. Ingestion of soils. Inhalation of contaminated dusts, gas & vapour.
	Off Site occupiers / visitors of neighbouring land	Inhalation/ingestion of contaminated dusts.
Controlled Waters	Surface waters (River Land Yeo)	Migration via permeable strata and preferential pathways (e.g. piling), surface water run-off
	Quartzitic Sandstone and Mercia Mudstone (Secondary A/B Aquifers)	Migration via permeable strata and preferential pathways (e.g. piling)
Plant life	Gardens, green landscaping and allotment	Uptake *via* root system
Building/Services	Potable water supply pipework	Direct contact / aggressive attack with contaminated ground/aggressive ground, potential ground gas (infilled pond area) and radon.

6.5 Assessment of risk

The assessment of the level of risk for each of the potential contaminant linkages identified above is summarised in Table 6-3. The table lists the potential sources identified above. For each source, an assessment is made, receptor by receptor as to the magnitude of the potential consequence (reflecting the potential severity of the hazard associated with that source and the sensitivity of the receptor).

Consideration has also been given to the level of uncertainty associated with each of these potential sources. For example, much of the information is based upon historical records which are likely to be partial and will not be complete, together with the limited nature of the existing Site investigation data. Because of this uncertainty, the identification of the sources is based upon a conservative assessment of the potential location, nature and extent of the source. The probability or likelihood of the hazard being realised is then assessed by consideration of the directness / integrity of the exposure pathway that could link the receptor to the source. The assigned level of risk is determined by the terms of consequence and probability in accordance with C552 [14]. The final column describes all of the factors considered in the assessment and presents the justification for the assessed level of risk.

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Table 6-3 - Preliminary Risk Assessment

Source		**Receptor**/ Pathway	**Risk assessment** (following CIRIA C552)			Comment on hazard realisation
Origin	Contaminants of concern		Consequence	Probability	Risk	
Infilled historic pond and ancient historic land use from burning and smelting	Unknown fill materials – Heavy metals, hydrocarbons, PAHs, inorganics and organics, ground gasses	**Proposed future use is for residential family homes with gardens, landscaping and an allotment to the north. The Site is undeveloped agricultural land with an infilled pond located on the central southern boundary, backfill may have included contaminated material and/or organic material. Agricultural uses to date (since before 1885) are likely to have included spraying with agricultural chemicals, with the potential for spills/releases of fuels. Archaeological survey and investigation suggest potential for contaminants relating to burning and smelting. Underlying geology includes limestone and Mercia Mudstone that may generate ground gas. The Site is in a radon affected area, between 10% and 30% of monitored properties are above the action level.**				
Spills of fuels/agro-chemicals relating to farming activities	Heavy metals, hydrocarbons, PAHs, inorganics and organics	**Investigation and construction workers** Direct / dermal contact. Ingestion / inhalation of contaminated soils, gases and vapours.	Minor	Likely	**Low**	Removal of potentially impacted material in infilled pond likely as part of normal development works. Period of exposure from infilled pond and other potential contaminants in shallow soils dependent on construction timescales but likely limited. Standard Health and Safety precautions likely to be used by workers. Mitigation of potential risks can be achieved by appropriate investigation/remediation if necessary and adoption of standard good construction practice.
Underlying geology	Ground gas and radon gas	**Future Site users / visitors (residents, guests and maintenance)** Direct / dermal contact. Inhalation of soils / dusts. Ingestion of potentially contaminated water supplies.	Minor	Likely	**Low**	Potential for contact with potentially impacted material in infilled pond and other potential contaminants in shallow soils and contaminated water supplies. Potential for dust generation, direct contact and ingestion. Mitigation of potential risks can be achieved by appropriate investigation / design and implementation of remediation / mitigation measures /suitable potable water pipe network.
		Future Site users / visitors (residents, guests and maintenance) Inhalation of hazardous gases then asphyxiation via migration and accumulation of hazardous gases.	Medium	Unlikely	**Low**	Volume within infilled pond of potentially gas producing material very small, removal likely as part of normal development works. Gas generation from such small historic sources likely to have ceased. Ground gas generation from natural geology is likely low.
		Future Site users Inhalation from migration and accumulation of radon	Medium	High	**High**	Without suitable protection measures within the future buildings in the long term exposure is likely to occur to residents.
		Off Site occupiers / visitors of neighbouring land Inhalation of contaminated dusts.	Mild	Low	**Low**	Increased potential to impact surrounding visitors by dust generation during earthworks; however, volume of potentially impacted material likely small, limited exposure time. Mitigation of potential risks can be achieved by appropriate investigation, remediation (if necessary) and adoption of standard good construction practice.

Source		**Receptor**/ Pathway	**Risk assessment** (following CIRIA C552)			Comment on hazard realisation
Origin	Contaminants of concern		Consequence	Probability	Risk	
		Degradation of Water quality **[Secondary aquifer]** Leaching and groundwater transport	Mild	Low	**Low**	Potential for increased infiltration and promotion of leaching during development earthworks. Site not within an SPZ. No groundwater abstractions in vicinity and sensitivity low. Mitigation of potential risks could be achieved by appropriate investigation, risk assessment and design.
		Degradation of Water quality [Surface Water] Migration via permeable strata and preferential pathways (e.g. piling), surface water run-off	Mild	Unlikely	**Very Low**	Potential for increased infiltration and promotion of leaching during development earthworks. Limited potential for migration to affect receptor as the River is 180m distant over a main road. Mitigation of potential risks could be achieved by appropriate investigation, risk assessment and design.
		Plants: Gardens, landscaping and allotment Root uptake	Minor	Likely	**Low**	Site flora in surrounding fields appeared in good condition. Observed die-back in one area likely to be due to seasonal inundation (groundwater flooding). Site used for agricultural crop growing.
		Buildings/services - permeation of water supply pipework, degradation of concrete Direct contact/, aggressive attack/ below ground structures/	Minor	Likely	**Low**	Limited potential for contaminants to be present affecting buildings/services. Mitigation of potential risks can be achieved by appropriate investigation / design and implementation of appropriate building and potable water pipe design.
		Buildings/services – ground gas Migration of ground gases from natural geology and accumulation to explosive concentrations in confined spaces	Medium	Unlikely	**Low**	Volume within infilled pond of potentially gas producing material very small, removal likely as part of normal development works. Gas generation from such small historic sources likely to have ceased. Ground gas generation from natural geology is likely low.

7 Conclusions

7.1 Geotechnical considerations

The Site is not within an area identified as has having historic or current underground workings. The subsidence hazard relating to shallow mining are assessed as low to moderate. An area of surface works has been identified on the southern Site boundary which relates to an in filled pond. The natural hazards at the Site are between low to negligible.

Mature trees within the Site field boundaries could impact future buildings and infrastructure due to water drawdown and direct root action. The 2014 tree survey that was revisited in 2020 identifies the types of trees present.

Groundwater is anticipated to be at shallower depths in the southern part of the Site. The geotechnical ground investigation should aim to record and monitor groundwater flow in the areas of the proposed buildings.

7.1.1 Foundation options

It is likely that foundations for 2 to 3 storey structures could be founded within either the Mercia Mudstone or Quartzitic Sandstone, the depth and thickness of which should be confirmed in a targeted geotechnical investigation.

Raft foundations could be considered and typically, higher settlements can be accepted for this type of foundation. The raft design is generally driven by acceptable settlements and the distribution of loads within the slabs and consequently extent of thickenings beneath the slab. It is difficult therefore at this stage to provide guidance in respect of acceptable bearing pressures, other than the fact that it may provide a viable, cost effective option compared to pads and strip foundations.

The foundation solution would require further geotechnical investigation once the structural loads are identified to confirm the geotechnical parameters and ground model of the Site.

7.1.2 Geotechnical Conclusions

No significant geotechnical issues have been identified by this desk study. In order to characterise the properties of the ground profile of the Site a geotechnical Site investigation will be required.

7.2 Geoenvironmental Considerations

An Initial Conceptual Site Model has been determined and a Preliminary Risk Assessment with respect to ground contamination has been carried out for the Site on the basis of desk based data. At this preliminary stage of the project the main sources of potential contamination have been identified and the potential risks have been qualitatively assessed. The assessment is based upon the Site in its current condition, but it also includes consideration of the potential risks associated with any below ground works (e.g. Site investigation or future foundation works etc.) and the potential future use. A summary of the potentially significant risks (i.e. greater than Low) is presented below:

- High risk to future users from inhalation of radon gas via migration and accumulation from Site soils.

7.3 Statutory Designation

In our opinion, it is unlikely that the Site would be determined as Contaminated Land (under the provisions of Part 2A of the Environmental Protection Act 1990) in its current status, or following the event of any redevelopment, provided the recommendations below are followed.

8 Recommendations

The following is recommended:

- Full radon protection measures in future buildings must be adopted;
- A Site investigation is required in order to characterise the properties of the ground profile of the Site to give geotechnical parameters; and
- Waste characterisation testing should be undertaken as part of the Site investigation for any soils which may be excavated/require disposal in order to establish the likely classification of soils for waste disposal purposes and/or to confirm the suitability of Site soils for re-use in the scheme (or off-Site, as appropriate).

The risks associated with UXO for the development have been assessed as Low. Therefore, a detailed UXO assessment is not considered to be required prior to development.

9 References

[1] Ministry of Housing, Communities and Local Goverment, "National Planning Policy Framework," Ministry of Housing, Communities and Local Government, 2021.

[2] The Stationary Office, "Environmental Protection Act," The Stationary Office, 1990.

[3] Environment Agency, "Model procedures for the management of land contamination - contaminated land report 11 (CLR11)," Environment Agency, 2004.

[4] Environment Agency, "Land contamination risk management (LCRM). How to assess and manage the risks from land contamination.," 8 October 2020. [Online]. Available: https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm. [Accessed 13 July 2021].

[5] British Standards Institute, "BS10175:2011 +A2:2017 Investigation of Potentially Contaminated Sites - Code of Practice," British Standards Institute, 2011.

[6] Environment Agency, "GPLC1 - Guiding principles for land contamination," Environment Agency, 2010.

[7] BGS, "Sheet 264 (Bristol), Scale 1:50,000," 2004.

[8] Archaelogical Surveys Ltd, "Land at Gatcombe Farm, Long Ashton, North Somerset, Magnetometer Survey Report (Ref 432)," September 2012.

[9] BuroHappold Engineering, "Phase I Contaminated Land Assessment (030289)," 1st July, 2014.

[10] B. G. S. Health Protection Agency, Indicative Atlas of Radon in England and Wales, 2007.

[11] North Somerset Council, "Response to Application No. 18/P/3710/PRE for Development of site to provide 35 dwellings including affordable homes," 25th September 2018.

[12] CIRIA, "Unexploded Ordnance (UXO). A Guide for the Construction Industry (C681)," CIRIA, 2009.

[13] NHBC, Environment Agency and Chartered Institute of Environmental Health, Guidance for the safe development of housing on land affected by contamination. R&D 66:2008, 2008.

[14] CIRIA, "Contaminated Land Risk Assessment. A guide to good practice. C552," CIRIA, 2001.

Appendix A Preliminary UXO Risk Assessment

This Preliminary UXO Risk Assessment has been carried out by BuroHappold in accordance with CIRIA C681. The purpose of the preliminary risk assessment is a qualitative screening exercise to assess the likelihood of finding UXO at the Site. This can then be used to make an informed decision if further UXO specific risk management is required.

The assessment is based on data obtained from a desktop review of information, including Site location, bombing records, historical uses, historical development and proposed development.

Item	Comments	Score
Site Setting	The Site, centred on the approximate OS National Grid Reference: ST 53150 69940, is located south of Warren Lane, Long Ashton near Bristol, adjacent to residential houses to the east, Warren Lane to the north, Weston Road to the south and agricultural land to the west.	2
Site description and historical land usage	The Site has not been developed and has been used as agricultural land since before 1885. The surrounding area comprises open agricultural land to the north and west, the town of Long Ashton comprising mainly residential properties and associated infrastructure to the east, and Weston road to the south with an operational railway line ~100m beyond to the south. Site within 5 miles of an industrial centre.	2
Record of bombing	Area of known WWII bombing in Bristol ~3km to the west.	4
Level of post war development	No post war development but regular ploughing and surface disturbance from farming activities.	0
Level of proposed intrusive works	Significant proposed development (>80% of Site)	0
Assessed Risk	Low	8
Recommendations	The assessment found risk associated with UXO to be low, therefore a detailed UXO risk assessment is not required.	
Attachments	**Table 9-1 -** Potential aerial delivered UXO hazards **Table 9-2 -** Mitigation factors **Table 9-3 -** Final score summary	

Table 9-1 Scoring process for indicators of potential aerial delivered UXO hazards

Data Item	Increasing Potential for aerial delivered UXO Hazards →			
	1	**2**	**4**	**8**
A - Site Setting	Rural	Small towns	Cities Large Towns	
B - Site description and historical land usage	Greenfield site only Agricultural land only	Residential only Within 10 mile radius of site of previous military use Within 5 mile radius of wartime[1] for following: Railway marshalling yard Power station Gas works Port Industrial centre	Within 5 mile radius of site of previous military use Within 1 mile radius of wartime[1] for following: Railway marshalling yard Power station Gas works Port Industrial centre On wartime[1] flight paths	Within 1 mile radius of site of previous military use Former wartime[1]: Railway marshalling yard Power station Gas works Port Industrial centre
C – Record of bombing	No history of WWII bombing	Within 10 mile radius of area of known WWII bombing	Within 5 mile radius of area of known WWII bombing	Area of known WWII bombing

[1]Wartime refers to the site being in use at the time of WWI and WWII when its significance may have caused it to be the target of an enemy attack.

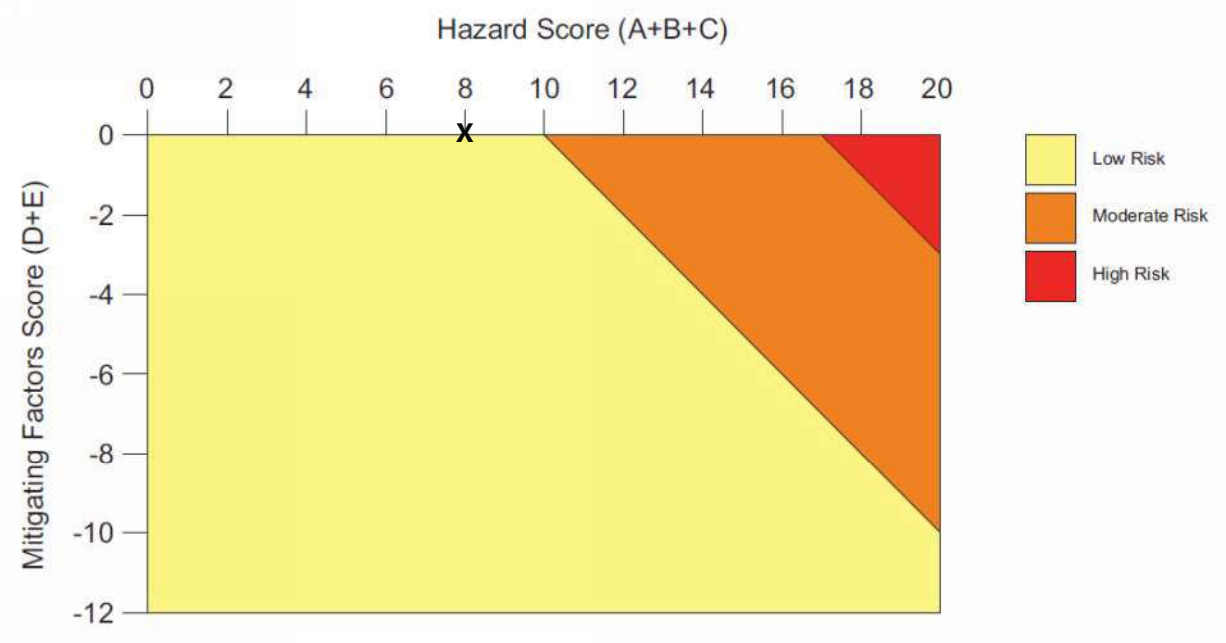
Table 9-2 Scoring process for considering mitigation factors

Data Item	Decreasing Potential for aerial delivered UXO Hazards ←				
	-6	**-5**	**-3**	**-1**	**0**
D - Level of post war development	Whole site redevelopment (100% of the site)	Significant post war development (>80% of the site)	Moderate level of post war development (<80% and ≥45% of the site)	Some post war development (<45% and ≥10% of the site)	Minimal post war development (<10% of the site)
E - Level of proposed intrusive works in areas not subject to post war development[1]	Very Small (<5%)	Small (<10%)	Some (<45% and ≥10%)	Moderate (<80% and ≥45%)	Significant (>80%)

[1]Only if the level of post-war development is known and can be quantified in terms of site area and an approximation of depth should a mitigation factor be applied.

Table 9-3 Final score is based on the sum of rows A, B, C, D and E in Table 9-1and Table 9-2

Final Hazard Score	Risk of encountering an Aerial dropped UXO	Implication
-9 - 9	Low Risk	No further UXO risk assessment likely to be required
10 - 17	Moderate Risk	Detailed UXO Risk Assessment required
17 - 20	High Risk	Detailed UXO Risk Assessment required.



This risk assessment methodology is intended as a generic tool. A small number of sites with unusual site-specific conditions may require additional consideration of the hazard scoring.

Appendix B Groundsure

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

Gatcombe Farm, Western Road,
Long Aston, Bristol, BS41 9AE

Client Ref: 030289 2006 01 Gatcombe Farm
Report Ref: GS-1491814
Grid Ref: 353063, 169910

Map Name: MasterMap
Map date: 2012
Scale: 1:1,250
Printed at: 1:2,500

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2012

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T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

Production date: 09 June 2014

To view map legend click here *Legend*

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

Gatcombe Farm, Western Road,
Long Aston, Bristol, BS41 9AE

Client Ref: 030289 2006 01 Gatcombe Farm
Report Ref: GS-1491814
Grid Ref: 353063, 169910

Map Name: National Grid
Map date: **1988-1992**
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed N/A
Revised N/A
Edition N/A
Copyright 1992
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Copyright 1992
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1992
Levelled N/A

Surveyed 1953
Revised 1988
Edition N/A
Copyright 1988
Levelled 1953

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GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

Gatcombe Farm, Western Road,
Long Aston, Bristol, BS41 9AE

Client Ref: 030289 2006 01 Gatcombe Farm
Report Ref: GS-1491814
Grid Ref: 353063, 169910

Map Name: National Grid
Map date: **1989-1992**
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1992
Revised 1992
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1957
Revised 1989
Edition N/A
Copyright 1989
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Surveyed 1992
Revised 1992
Edition N/A
Copyright N/A
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Revised N/A
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Site Details:

Gatcombe Farm, Western Road,
Long Aston, Bristol, BS41 9AE

Client Ref: 030289 2006 01 Gatcombe Farm
Report Ref: GS-1491814
Grid Ref: 353063, 169910

Map Name: National Grid
Map date: **1976-1977**
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1976
Revised 1976
Edition N/A
Copyright 1977
Levelled 1957

Surveyed 1977
Revised 1977
Edition N/A
Copyright 1978
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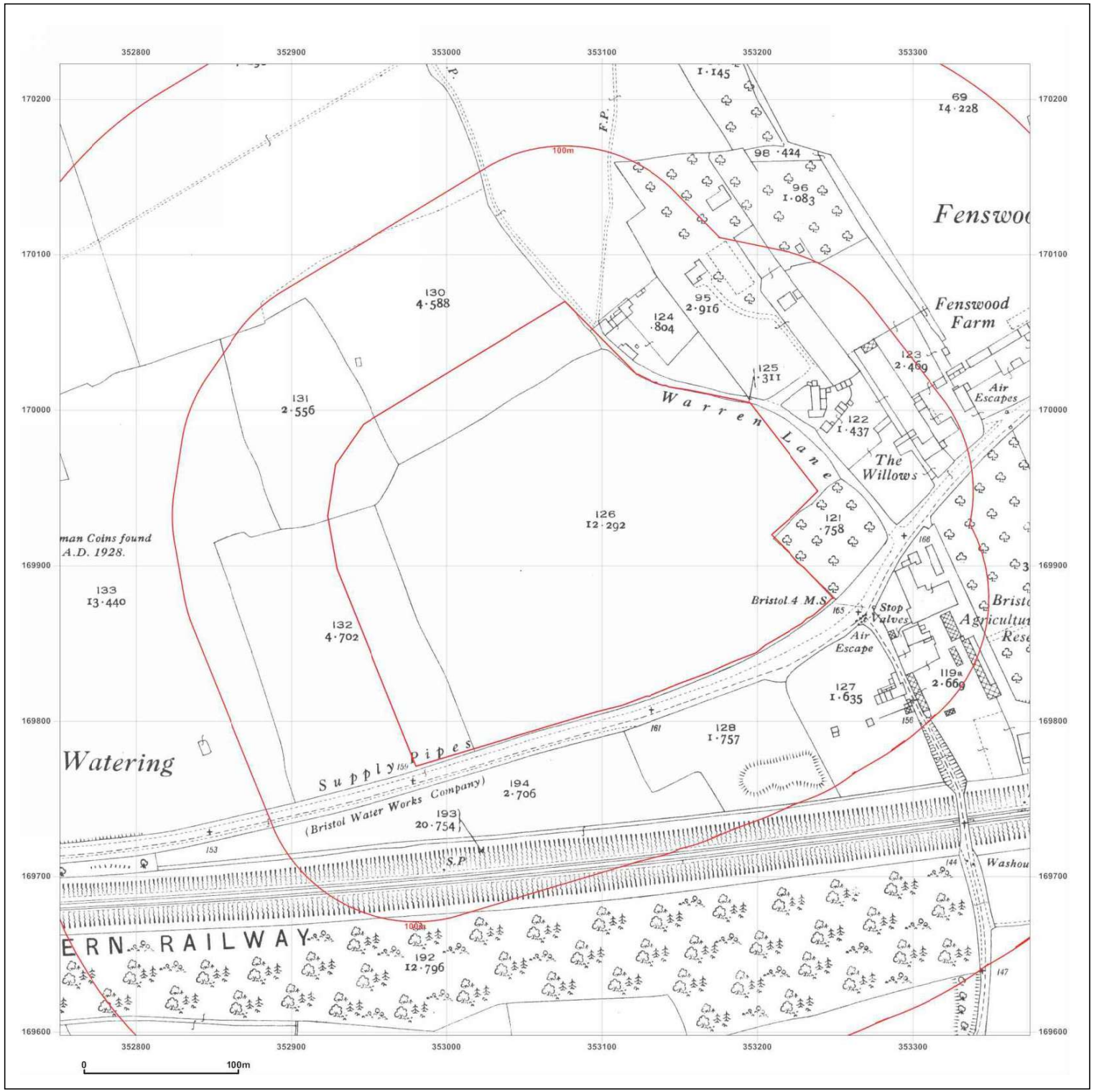

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

Gatcombe Farm, Western Road,
Long Aston, Bristol, BS41 9AE

Client Ref: 030289 2006 01 Gatcombe Farm
Report Ref: GS-1491814
Grid Ref: 353063, 169910

Map Name: County Series
Map date: 1931
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1931
Revised 1931
Edition N/A
Copyright N/A
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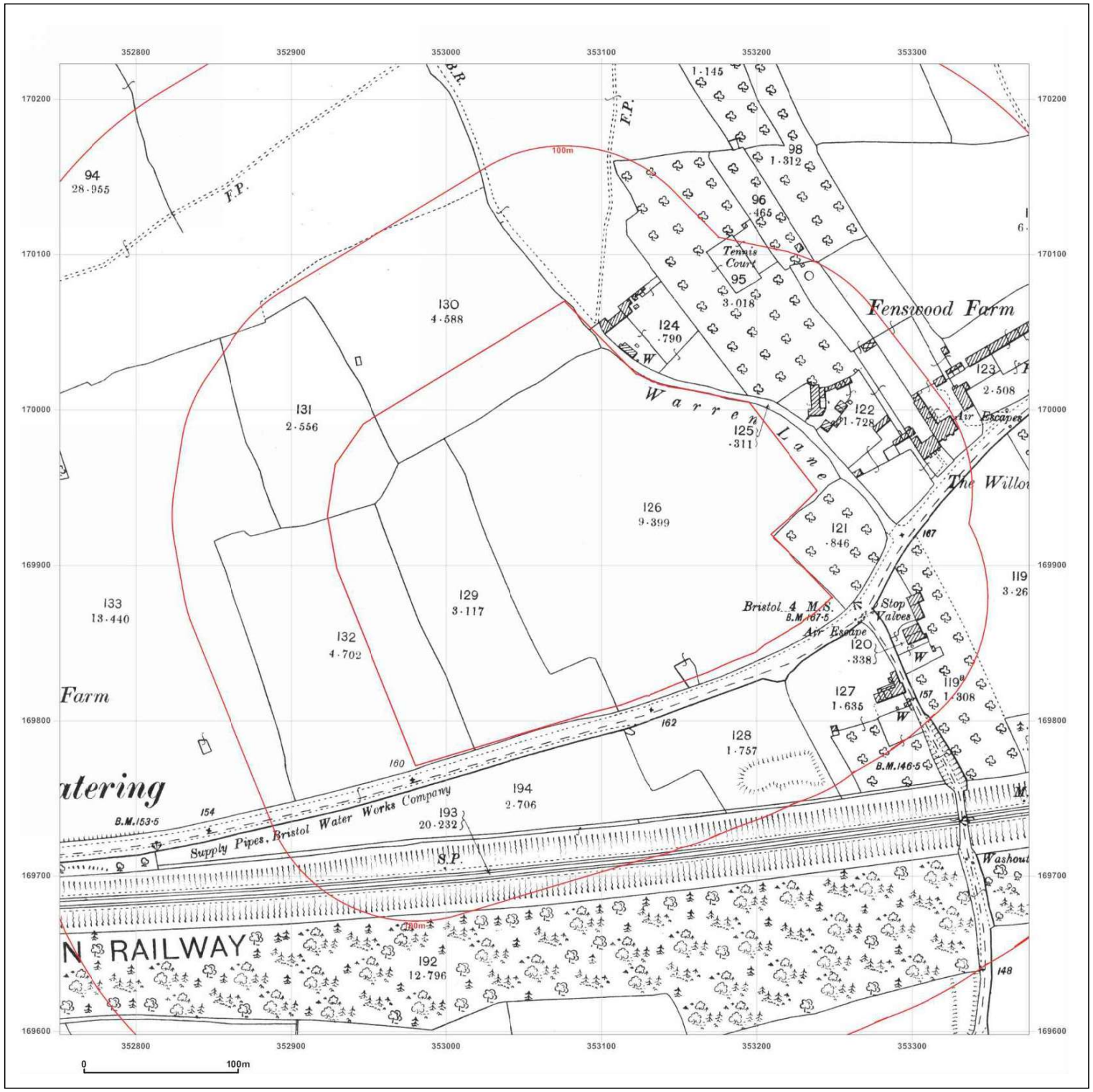

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Site Details:

Gatcombe Farm, Western Road,
Long Aston, Bristol, BS41 9AE

Client Ref: 030289 2006 01 Gatcombe Farm
Report Ref: GS-1491814
Grid Ref: 353063, 169910

Map Name: County Series
Map date: 1903
Scale: 1:2,500
Printed at: 1:2,500

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Surveyed 1903
Revised 1903
Edition N/A
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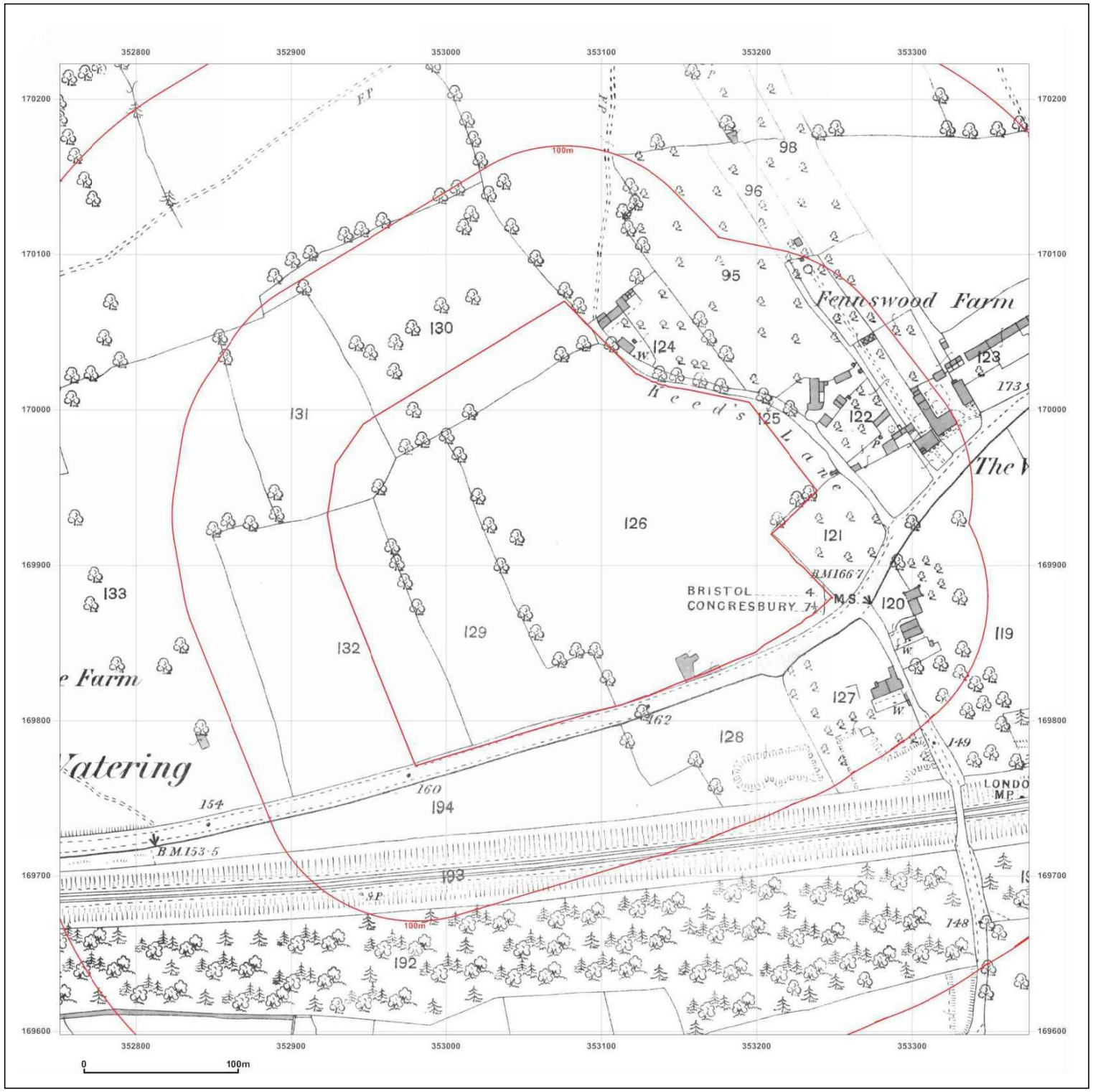

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

Gatcombe Farm, Western Road,
Long Aston, Bristol, BS41 9AE

Client Ref: 030289 2006 01 Gatcombe Farm
Report Ref: GS-1491814
Grid Ref: 353063, 169910

Map Name: County Series
Map date: **1885**
Scale: 1:2,500
Printed at: 1:2,500

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Revised 1885
Edition N/A
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Buro Happold

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LONDON, W1T 1PD

GroundSure Reference:	GS-1491815
Your Reference:	030289 2006 01 Gatcombe Farm
Report Date	9 Jun 2014
Report Delivery Method:	Email - pdf

Address: Gatcombe Farm, Western Road, Long Aston, Bristol, BS41 9AE

Dear Sir/ Madam,

Thank you for placing your order with GroundSure. Please find enclosed the as requested.

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

Yours faithfully,

Managing Director
Groundsure Limited

Enc.
GroundSure EnviroInsight

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Aerial Photograph Capture date:	01-Jun-2009
Grid Reference:	353063,169910
Site Size:	6.19ha

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

Section 1: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
1.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
1.1.1 Records of historic IPC Authorisations	0	0	0	0
1.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
1.1.3 Records of Water Industry Referrals (potentially harmful discharges to the public sewer)	0	0	0	0
1.1.4 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters)	0	0	0	0
1.1.5 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
1.1.6 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
1.1.7 Records of Part A(2) and Part B Activities and Enforcements	0	0	0	0
1.1.8 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
1.1.9 Records of Licensed Discharge Consents	0	0	0	1
1.1.10 Records of Planning Hazardous Substance Consents and Enforcements	0	0	0	0
1.2 Records of COMAH and NIHHS sites	0	0	0	0
1.3 Environment Agency Recorded Pollution Incidents				
1.3.1 National Incidents Recording System, List 2	0	0	0	2
1.3.2 National Incidents Recording System, List 1	0	0	0	0
1.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0

Section 2: Landfill and Other Waste Sites	On-site	0-50m	51-250	251-500	501-1000	1000-5000
2.1 Landfill Sites						
2.1.1 Environment Agency Registered Landfill Sites	0	0	0	0	0	Not searched
2.1.2 Environment Agency Historic Landfill Sites	0	0	0	0	0	0
2.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
2.1.4 GroundSure Local Authority Landfill Sites Data	0	0	0	0	0	0
2.2 Landfill and Other Waste Sites Findings						
2.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	Not searched	Not searched
2.2.2 Environment Agency Licensed Waste Sites	0	0	0	0	0	3

Section 3: Current Land Use

	On-site	0-50m	51-250	251-500
3.1 Current Industrial Sites Data	0	1	5	Not searched
3.2 Records of Petrol and Fuel Sites	0	0	0	0
3.3 Underground High Pressure Oil and Gas Pipelines	0	0	0	0

Section 4: Geology

4.1 Are there any records of Artificial Ground and Made Ground present beneath the study site?	No
4.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site?	None
4.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 5: Hydrogeology and Hydrology

	0-500m
5.1 Are there any records of Strata Classification in the Superficial Geology within 500m of the study site?	Yes
5.2 Are there any records of Strata Classification in the Bedrock Geology within 500m of the study site?	Yes

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
5.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	3
5.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	1
5.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
5.6 Source Protection Zones (within 500m of the study site)	0	0	0	0	Not searched	Not searched

	On-site	0-50m	51-250	251-500	501-1000	1000-1500
5.7 Is there any Environment Agency information on river quality within 1500m of the study site?	No	No	No	No	No	No
5.8 Detailed River Network entries within 500m of the site	0	0	2	4	Not searched	Not searched
5.9 Surface water features within 250m of the study site	No	No	Yes	Not searched	Not searched	Not searched

Section 6: Flooding

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

Section 7: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
7.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	0	1
7.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
7.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
7.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
7.5 Records of Ramsar sites	0	0	0	0	0	0
7.6 Records of Ancient Woodlands	0	0	0	3	4	7
7.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	0
7.8 Records of World Heritage Sites	0	0	0	0	0	0
7.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0
7.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0
7.11 Records of National Parks	0	0	0	0	0	0
7.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
7.13 Records of Nitrate Vulnerable Zones	0	0	0	0	0	0

Section 8: Natural Hazards

8.1 What is the maximum risk of natural ground subsidence?	Low

Section 9: Mining

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

0 ,

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 ˚ - ˇ .

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.

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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.

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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 underground oil and gas pipelines.

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

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

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

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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.

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

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Provides information on areas of coal and shallow mining.

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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.

6 8 ,

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.

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Mapping sourced from Ordnance Survey

- Site Outline
- Search Buffers (m) — 250 — 500
- Recorded Pollution Incident
- Dangerous Substances (List 1)
- Dangerous Substances (List 2)
- Water Industry Referrals
- Licenced Discharge Consents
- Red List Discharge Consents
- RAS 3 & 4 Authorisations
- Part A(1) Authorised Processes and Historic IPC Authorisations
- Part A(2) and Part B Authorised Processes
- COMAH / NIHHS Sites
- Sites Determined as Contaminated Land
- Hazardous Substance Consents and Enforcements

1.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency and Local Authorities reveal the following information:

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

1.1.4 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.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

1.1.8 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

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

1

The following Licensed Discharge Consents records are represented as points on the Authorisations, Incidents and Registers map:

"	"	"	6 ˙	" °	
3	438.0	SE	353560 169570	Address: University Of Bristol, Fenswood Farm, Wild Country Lane, Long Ashton, North Somerset, BS8 8BB Effluent Type: Sewage Discharges - Final/treated Effluent - Not Water Company Permit Number: 102607 Permit Version: 1	Receiving Water: Ashton Brook Via Highway Drain Status: New Consent (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 7/7/2004 Effective Date: 30/4/2004 Revocation Date: -

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

0

Database searched and no data found.

1.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site: 0

Database searched and no data found.

1.3 Environment Agency Recorded Pollution Incidents

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

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

"	"	"	6 ·	" °	
1	339.0	SW	352700 169580	Incident Date: 19/06/2001 Incident Identification: 10246 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
2	413.0	W	352530 169790	Incident Date: 26/06/2002 Incident Identification: 87552 Pollutant: Contaminated Water Pollutant Description: Suspended Solids	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

1.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site: 0

Database searched and no data found.

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

How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site? 0

Database searched and no data found.

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Reservoir
Fenn's Wood
George's Hill Plantation
Monarch Way
Shipley Brake
Cook's Wood
Hall
PW
Long Ashton Research Station
(Agricultural and Horticultural)
RAVENS CROSS ROAD
WESTON ROAD
PO
Liby
Gatcombe Mill
WARREN LANE
WARREN LA
500
250
Gatcombe Court
Gatcombe Farm
Ashton Watering
Hall
WESTON ROAD
Fenswood Farm
mbridge Batch
The Birches
Barrow Cottage
Redwood Lane

W E

SW S SE

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Mapping sourced from Ordnance Survey

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2.1 Landfill Sites

2.1.1 Records from Environment Agency landfill data within 1000m of the study site:

0

Database searched and no data found.

2.1.2 Records of Environment Agency historic landfill sites within 1500m of the study site:

0

Database searched and no data found.

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

0

Database searched and no data found.

2.1.4 Records of Local Authority landfill sites within 1500m of the study site:

0

Database searched and no data found.

2.2 Other Waste Sites

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

0

Database searched and no data found.

2.2.2 Records of Environment Agency licensed waste sites within 1500m of the study site:

3

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

Not shown	1324.0	NE	353628 171273	Site Address: Durnford Quarry, Longwood Lane, Long Ashton, Bristol, Avon, BS41 9DW Type: Treatment of waste to produce soil <75,000 tpy Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: TCR002 EPR reference: EA/EPR/GB3639RT/A001 Operator: Tarmac And Churngold Recycled Aggregates Ltd Waste Management licence No: 104166 Annual Tonnage: 74999.0	Issue Date: 14/05/2012 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Durnford Quarry Correspondence Address: -, -
Not shown	1324.0	NE	353628 171273	Site Address: Durnford Quarry, Longwood Lane, Long Ashton, Bristol, Avon, BS41 9DW Type: Treatment of waste to produce soil <75,000 tpy Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: CHU098 EPR reference: EA/EPR/LB3431RA/S002 Operator: Churngold Waste & Recycling Ltd Waste Management licence No: 104166 Annual Tonnage: 74999.0	Issue Date: 14/05/2012 Effective Date: 06/11/2012 Modified: 22/04/2013 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Durnford Quarry Correspondence Address: -, -
Not shown	1480.0	N	353488 171492	Site Address: E T M Quarry, Longwood Lane, Long Ashton, Bristol, BS41 9DW Type: Treatment of waste to produce soil <75,000 tpy Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: ETM006 EPR reference: EA/EPR/MB3834AV/A001 Operator: E T M Recycling Limited Waste Management licence No: 104968 Annual Tonnage: 74999.0	Issue Date: 22/04/2013 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: E T M Quarry Correspondence Address: -, -

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Mapping sourced from Ordnance Survey

Site Outline

250
500
Search Buffers (m)

Current Industrial Sites

Petrol & Fuel Sites

Underground High Pressure Oil & Fuel Pipelines

21 * " 0

3.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site: 6

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

"	" 9 :	"	* , 3	6 ˙	3	* 3	
1	27.0	N	Absoft Salt Supplies	353164 170039	8, Warren Lane, Long Ashton, Bristol, BS41 9DA	Colours, Chemicals and Water Softeners and Supplies	Industrial Products
2	83.0	NE	Electricity Sub Station	353274 170038	BS41	Electrical Features	Infrastructure and Facilities
3	169.0	E	Electricity Sub Station	353418 169873	BS41	Electrical Features	Infrastructure and Facilities
4	202.0	SE	Electricity Sub Station	353350 169701	BS48	Electrical Features	Infrastructure and Facilities
5	227.0	E	Suka Heating & Control Systems Ltd	353469 169933	16, Pear Tree Avenue, Long Ashton, Bristol, BS41 9FF	Industrial Repairs and Servicing	Repair and Servicing
6	244.0	SE	Electricity Sub Station	353368 169662	BS48	Electrical Features	Infrastructure and Facilities

3.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: 0

Database searched and no data found.

3.3 Underground High Pressure Oil and Gas Pipelines

Records of high pressure underground pipelines within 500m of the study site: 0

Database searched and no data found.

~ 1 ° 3

4.1 Artificial Ground and Made Ground

Database searched and no data found.

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

4.2 Superficial Ground and Drift Geology

Database searched and no data found.

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

4.3 Bedrock and Solid Geology

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

Lex Code	Description	Rock Type
QSG-SDST	QUARTZITIC SANDSTONE FORMATION	SANDSTONE
MMG-MDHA	MERCIA MUDSTONE GROUP	MUDSTONE AND HALITE-STONE
QSG-SDST	QUARTZITIC SANDSTONE FORMATION	SANDSTONE
OHL-OOLM	OXWICH HEAD LIMESTONE FORMATION	OOIDAL LIMESTONE
MMMF-CONG	MERCIA MUDSTONE GROUP (MARGINAL FACIES)	CONGLOMERATE

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

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Mapping sourced from Ordnance Survey®

Site Outline

250
500
Search Buffers (m)

Principal Aquifer

Secondary (A) Aquifer - Permeable Layers

Secondary (B) Aquifer - Lower Permeability Layers

Secondary Aquifer - Undifferentiated Layers

Unproductive

Unknown (lakes and landslip)

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Mapping sourced from Ordnance Survey®

Site Outline

Search Buffers (m)
250
500

Principal Aquifer

Secondary (A) Aquifer - Permeable Layers

Secondary (B) Aquifer - Lower Permeability Layers

Groundwater Abstraction Licence

Secondary Aquifer - Undifferentiated Layers

Unproductive

Unknown (lakes and landslip)

Surface Water Abstraction Licence

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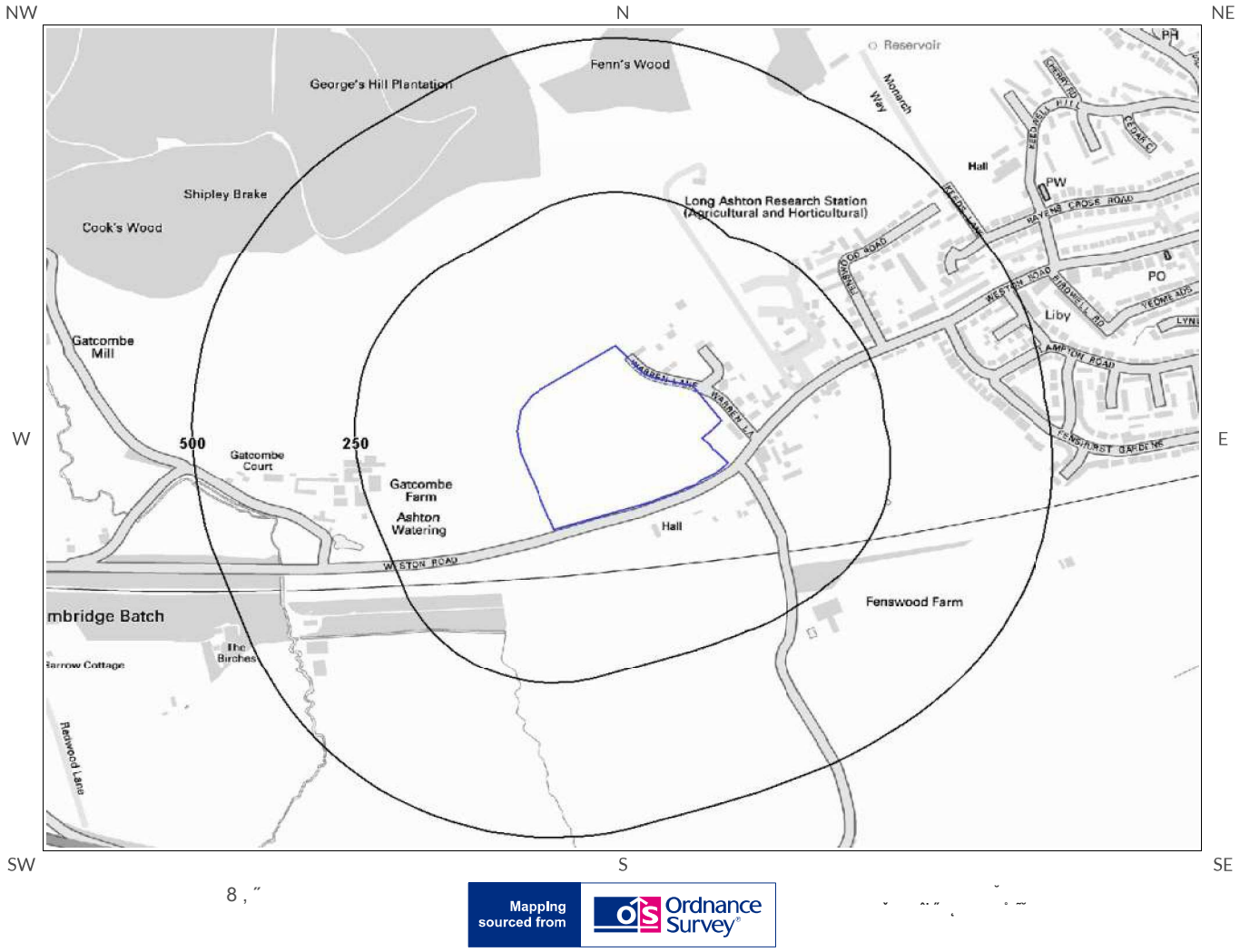
NW
N
NE
W
E
SW
S
SE
George's Hill Plantation
Fenn's Wood
Reservoir
Monarch Way
Shipley Brake
Cook's Wood
Long Ashton Research Station (Agricultural and Horticultural)
Hall
PW
PO
Liby
Gatcombe Mill
500
250
Gatcombe Court
Gatcombe Farm
Ashton Watering
Hall
WESTON ROAD
Fenswood Farm
mbridge Batch
Barrow Cottage
The Birches
Ranwood Lane
Mapping sourced from
Ordnance Survey
Site Outline
250
500
Search Buffers (m)
Source Protection Zone 1 - Inner Catchment
Source Protection Zone 2 - Outer Catchment
Source Protection Zone 3 - Total Catchment
Source Protection Zone 4 - Zone of Special Interest
Potable Water Abstraction Licence

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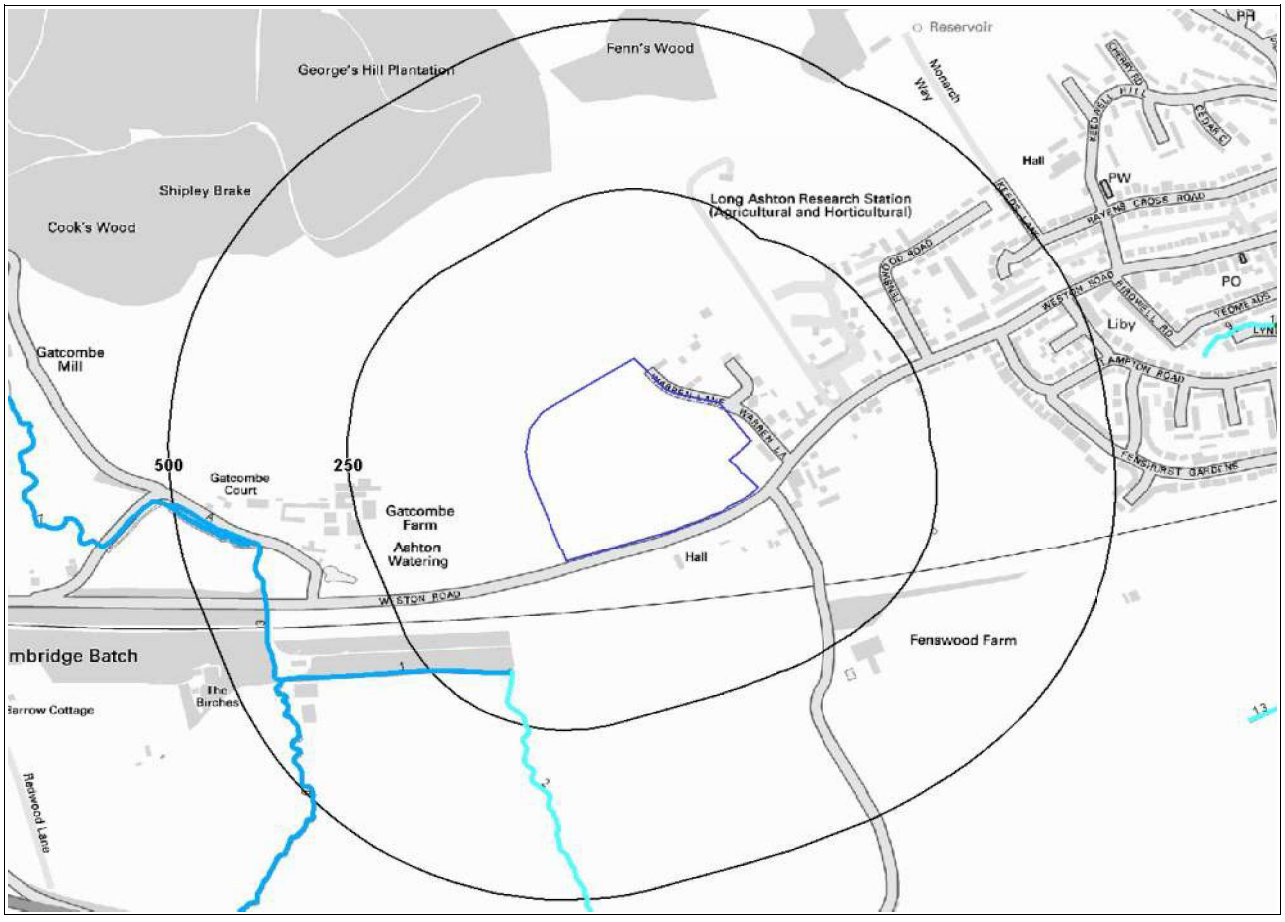
NW N NE



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SW S SE

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Mapping sourced from Ordnance Survey®

Site Outline

250 500 Search Buffers (m)

Primary River
Secondary River
Tertiary River
Lake/Reservoir
Underground River (inferred)
General Quality Assessment: Biology
General Quality Assessment: Chemistry

Canal
Canal Tunnel
Culvert
Multiple Channel Culvert
Underground River (Potential Sewer)
Underground River (local knowledge)

) 1 +3 ° 3
+3 ° 3

5.1 Aquifer within Superficial Deposits

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

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

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

"	" 9 :	"	"	" ,
2	79.0	NE	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
7	156.0	SW	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
8	250.0	W	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

5.2 Aquifer within Bedrock Deposits

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

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

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

"	" 9 :	"	Designation	" ,
6	0.0	On Site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
7	0.0	On Site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
12	0.0	On Site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeablehorizons and weathering. These are generally the water-bearing parts of the former non-aquifers
13	0.0	On Site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeablehorizons and weathering. These are generally the water-bearing parts of the former non-aquifers

"	" 9 :	"	Designation	" ,
14	0.0	On Site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeablehorizons and weathering. These are generally the water-bearing parts of the former non-aquifers
8	24.0	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
1	25.0	NW	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
2	53.0	NW	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
3	243.0	SE	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
15	401.0	W	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeablehorizons and weathering. These are generally the water-bearing parts of the former non-aquifers
4	500.0	E	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers

5.3 Groundwater Abstraction Licences

Are there any Groundwater Abstraction Licences within 2000m of the study site? Yes

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (5b):

"	" 9 :	"	6 ˙	" °	
Not shown	1783.0	SE	354800 169000	Licence No: 17/53/001/G/452 Details: Spray Irrigation - Direct Direct Source: Ground Water - Fresh Point: Borehole At Long Ashton Data Type: Point	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 13/6/1995 Expiry Date: - Issue No: 100 Version Start Date: 13/6/1995 Version End Date:
Not shown	1783.0	SE	354800 169000	Licence No: 17/53/001/G/452 Details: Spray Irrigation - Direct Direct Source: Ground Water - Fresh Point: Borehole At Long Ashton Data Type: Point	Annual Volume (m^3): 15150 Max Daily Volume (m^3): 151 Original Application No: - Original Start Date: 13/6/1995 Expiry Date: - Issue No: 102 Version Start Date: 8/5/2006 Version End Date:
Not shown	1783.0	SE	354800 169000	Licence No: 17/53/001/G/452 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: Ground Water - Fresh Point: Borehole At Long Ashton Data Type: Point	Annual Volume (m^3): 15150 Max Daily Volume (m^3): 151 Original Application No: - Original Start Date: 13/6/1995 Expiry Date: - Issue No: 102 Version Start Date: 8/5/2006 Version End Date:

5.4 Surface Water Abstraction Licences

Are there any Surface Water Abstraction Licences within 2000m of the study site? Yes

The following Surface Water Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (5b):

Not shown	1087.0	E	354300 169600	Licence No: 17/53/001/S/383 Details: Spray Irrigation - Storage Direct Source: Surface Water - Fresh Point: Bristol University Data Type: Point	Annual Volume (m^3): 7000 Max Daily Volume (m^3): 7000 Application No: 17/53/001/S/383 Original Start Date: 30/6/1972 Expiry Date: - Issue No: 100 Version Start Date: 30/6/1972 Version End Date:

5.5 Potable Water Abstraction Licences

Are there any Potable Water Abstraction Licences within 2000m of the study site? No

Database searched and no data found.

5.6 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site? No

Database searched and no data found.

5.7 River Quality

Is there any Environment Agency information on river quality within 1500m of the study site? No

5.7.1 Biological Quality:

Database searched and no data found.

5.7.2 Chemical Quality:

Database searched and no data found.

5.8 Detailed River Network

Are there any Detailed River Network entries within 500m of the study site? Yes

The following Detailed River Network records are represented on the Hydrology Map (5d):

" " 9 : "			" °	
1	180.0	SW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
2	180.0	SW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
3	392.0	W	River Name: Land Yeo Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
4A	401.0	W	River Name: Land Yeo Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
5A	401.0	W	River Name: Land Yeo Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
6	437.0	SW	River Name: Land Yeo Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined

5.9 Surface Water Features

Are there any surface water features within 250m of the study site? Yes

The following surface water records are not represented on mapping:

" 9 :	"
180.0	SW
180.0	SW
250.0	S

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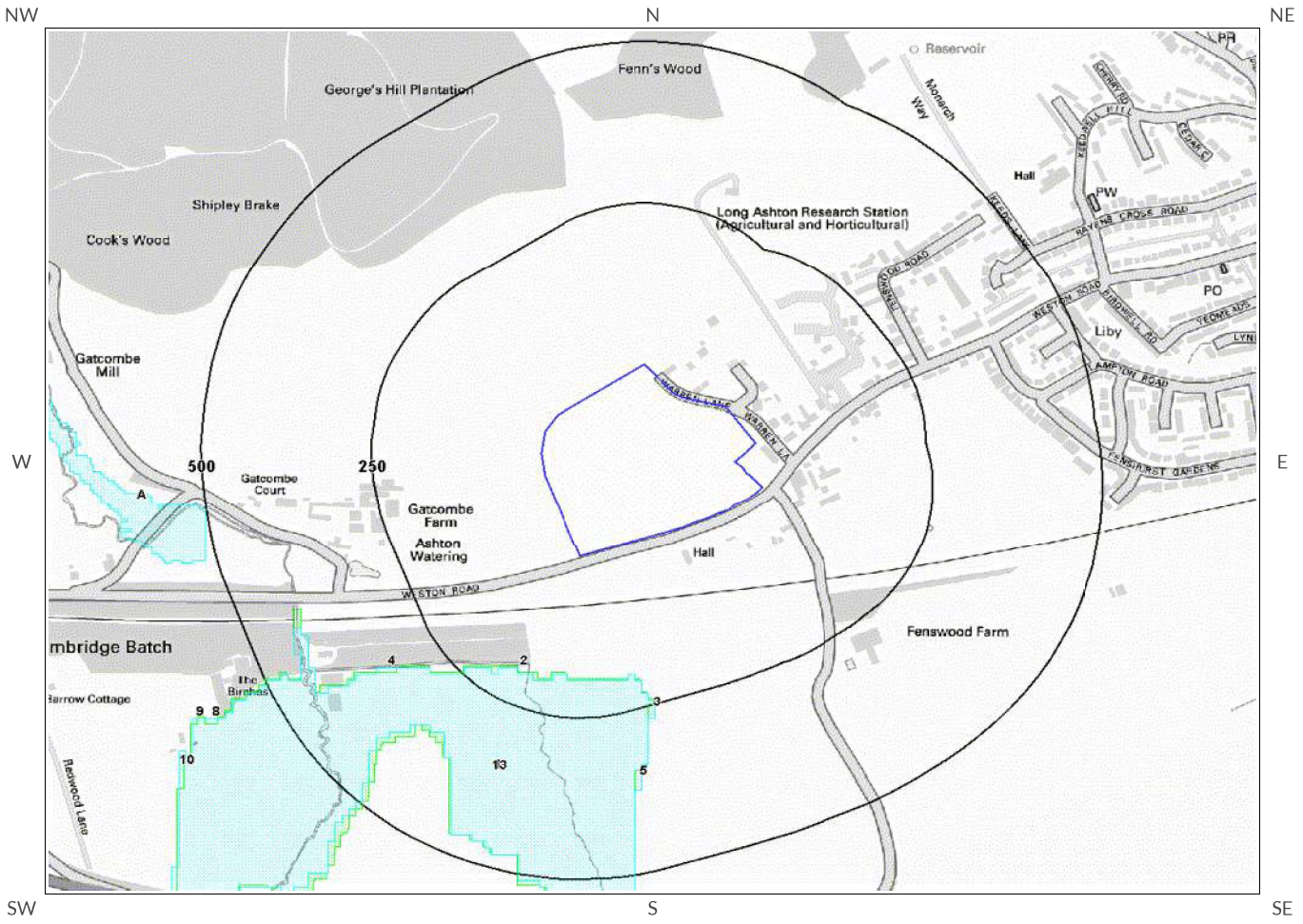
& ,° 9& :



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Mapping sourced from Ordnance Survey

Site Outline

250
500
Search Buffers (m)

Zone 2 Floodplain

Zone 3 Floodplain

Flood Storage Area

Area Benefiting from Flood Defences

Flood Defences

41 °°

6.1 Zone 2 Flooding

Environment Agency 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 1 – Environment Agency Flood Map for Planning:

Is the site within 250m of an Environment Agency Zone 2 floodplain? Yes

The following floodplain records are represented as green shading on the Flood Map:

"	" 9 :	"	0,	@3,
1	180.0	S	27-Feb-2014	Zone 2 - (Fluvial Models)
2	193.0	SW	27-Feb-2014	Zone 2 - (Fluvial Models)
3	243.0	S	27-Feb-2014	Zone 2 - (Fluvial Models)

6.2 Zone 3 Flooding

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 1 – Environment Agency Flood Map for Planning.

Is the site within 250m of an Environment Agency Zone 3 floodplain? Yes

The following floodplain records are represented as blue shading on the Flood Map:

"	" 9 :	"	0,	@3,
13	182.0	S	27-Feb-2014	Zone 3 - (Fluvial Models)

6.3 Flood Defences

Are there any Flood Defences within 250m of the study site? No

Database searched and no data found.

6.4 Areas benefiting from Flood Defences

Are there any areas benefiting from Flood Defences within 250m of the study site? No

6.5 Areas benefiting from Flood Storage

Are there any areas used for Flood Storage within 250m of the study site? No

6.6 Groundwater Flooding Susceptibility Areas

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

Yes

Does this relate to Clearwater Flooding or Superficial Deposits Flooding? Clearwater Flooding

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

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

Limited potential

Where limited potential for groundwater flooding to occur is indicated, this means that although given the geological conditions there may be a groundwater flooding hazard, unless other relevant information, e.g. records of previous flooding, suggests groundwater flooding has occurred before in this area, you need take no further action in relation to groundwater flooding hazard.

6.7 Groundwater Flooding Confidence Areas

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

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.

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NW N NE

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SW S SE

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Mapping sourced from Ordnance Survey®

Site Outline

Areas of Outstanding Natural Beauty

SAC

SPA

Nitrate Vulnerable Zones

SSSI

Ramsar

Nitrate Sensitive Areas

NNR

LNR

National Parks

World Heritage Sites

Environmentally Sensitive Areas

Ancient Woodlands

51" °°3

Presence of Designated Environmentally Sensitive Sites within 2000m of the study site? No

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

1

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

" 9 :	"	SSSI Name	"
Not shown	1717.0 NE	Ashton Court	Natural England

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

7.5 Records of Ramsar sites within 2000m of the study site:

0

Database searched and no data found.

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

14

The following Ancient Woodland records are supplied by English Nature/Scottish Natural Heritage/Countryside Council for Wales and are represented as polygons on the Designated Environmentally Sensitive Sites Map:

"	" 9 :	"	^ ° 6	"
2	339.0	NW	COCKS WOOD/SHIPLEY BRAKE	Ancient and Semi-Natural Woodland
3	384.0	N	FENNS WOOD	Ancient and Semi-Natural Woodland
4	484.0	NE	THE BRAKE	Ancient and Semi-Natural Woodland
5	508.0	NW	COCKS WOOD/SHIPLEY BRAKE	Ancient Replanted Woodland
6	646.0	W	COCKS WOOD/SHIPLEY BRAKE	Ancient and Semi-Natural Woodland
7	662.0	NE	THE BRAKE	Ancient Replanted Woodland
8	952.0	S	CROSSGROVE WOOD	Ancient and Semi-Natural Woodland
9	1109.0	SE	UNKNOWN	Ancient and Semi-Natural Woodland
10A	1376.0	SW	UNKNOWN	Ancient Replanted Woodland
11A	1383.0	SW	UNKNOWN	Ancient and Semi-Natural Woodland
12	1462.0	SW	UNKNOWN	Ancient Replanted Woodland
13	1529.0	W	BREACH HILL WOOD	Ancient Replanted Woodland
Not shown	1614.0	SW	BREACH HILL WOOD	Ancient and Semi-Natural Woodland
Not shown	1751.0	SE	BARROW BIG WOOD	Ancient and Semi-Natural Woodland

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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8.1 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 GeoInsight, available from our website. The following information has been found:

8.1.1 Shrink Swell

What is the maximum Shrink-Swell* hazard rating identified on the study site? Very Low

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

+ 7
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.

8.1.2 Landslides

What is the maximum Landslide* hazard rating identified on the study site? Very Low

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

+ 7
Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

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

8.1.3 Soluble Rocks

What is the maximum Soluble Rocks* hazard rating identified on the study site? Low

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

+ 7

Significant soluble rocks are present. Low possibility of subsidence occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow. Consider implications for stability when changes to drainage or new construction are planned. For new build site investigation should consider potential for dissolution problems on the site and its surroundings. Care should be taken with local drainage into the bedrock. Some possibility groundwater pollution. For existing property possible increase in insurance risk due to soluble rocks.

8.1.4 Compressible Ground

What is the maximum Compressible Ground* hazard rating identified on the study site? Negligible

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

+ 7

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.

8.1.5 Collapsible Rocks

What is the maximum Collapsible Rocks* hazard rating identified on the study site? Very Low

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

+ 7

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.

8.1.6 Running Sand

What is the maximum Running Sand* hazard rating identified on the study site? Negligible

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

+ 7

No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

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

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9.1 Coal Mining

Are there any coal mining areas within 75m of the study site? No

Database searched and no data found.

9.2 Shallow Mining

What is the subsidence hazard relating to shallow mining on-site*? Low-Moderate

*Please note this data is searched with a 150m buffer.

9.3 Brine Affected Areas

Are there any brine affected areas within 75m of the study site? No

Guidance: No Guidance Required.

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GroundSure
ENVIRONMENTAL INSIGHT

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British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

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National Customer Contact Centre, PO Box 544
Rotherham, S60 1BY
Tel: 08708 506 506
Web:///1 ' 31 1 <
Email: ; A ' 31 1 <

Environment Agency

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Public information access office
Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
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Email: ; A, 1 1 <
Main switchboard %$% 54)˜ (%%%

Public Health England

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Mapping sourced from Ordnance Survey®

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G*˚ H means the party or parties entering into a Contract with GroundSure.

G* ˚H means any building or property which is not Residential.

G* & ˚ & H means the contents of this Contract and all information received from the Client as a result of, or in connection with, this Contract other than

(i) information which the Client can prove was rightfully in its possession prior to disclosure by GroundSure and

(ii) any information which is in the public domain (other than by virtue of a breach of this Contract).

G ,, H means Support Services provided by GroundSure including, without limitation, interpreting third party and in-house environmental data, providing environmental support advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

G* H means the contract between GroundSure and the Client for the provision of the Services, and which shall incorporate these terms and conditions, the Order, and the relevant User Guide.

G@ - 3 " - H means any third party providing Third Party Content to GroundSure.

G" ˙, H means reports comprising factual data with no accompanying interpretation.

G˘ H has the meaning set out in clause 5.1.

G H means GroundSure Limited, a company registered in England and Wales under number 03421028.

G 8 ˚H means all materials prepared by GroundSure and provided as part of the Services, including but not limited to Third Party Content, Data Reports, Mapping, and Risk Screening Reports.

G ˚˚ ˚- , 3H means any patent, copyright, design rights, trade or service mark, moral rights, data protection rights, know-how or trade mark in each case whether registered or not and including applications for the same or any other rights of a similar nature anywhere in the world.

G8 ,, H means a map, map data or a combination of historical maps of various ages, time periods and scales.

G. H means an electronic, written or other order form submitted by the Client requesting Services from GroundSure in respect of a specified Site.

G. 3H means the Secretary of State for Business, Innovation and Skills, acting through Ordnance Survey, Adanac Drive, Southampton, SO16 0AS, UK.

G. ˆ H means the online platform through which Orders may be placed by the Client and accepted by GroundSure.

G˙, H means a Risk Screening Report or Data Report for Commercial or Residential property.

G˙ ˚H means any building or property used as or intended to be used as a single dwelling.

G˙ < ˙, H means a risk screening report comprising factual data with an accompanying interpretation by GroundSure.

G H means any Report, Mapping and/or Support Services which GroundSure has agreed to provide by accepting an Order pursuant to clause 2.6.

I I means the area of land in respect of which the Client has requested GroundSure to provide the Services.

G@ - 3 * H means data, database information or other information which is provided to GroundSure by a Third Party Data Provider.

"User Guide" means the user guide, as amended from time to time, available upon request from GroundSure and on the website (www.GroundSure.com) and forming part of this Contract.

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2.1 GroundSure agrees to provide the Services in accordance with the Contract.

2.2 GroundSure shall exercise reasonable skill and care in the provision of the Services.

2.3 Subject to clause 7.3 the Client acknowledges that it has not relied on any statement or representation made by or on behalf of GroundSure which is not set out and expressly agreed in writing in the Contract and all such statements and representations are hereby excluded to the fullest extent permitted by law.

2.4 The Client acknowledges that terms and conditions appearing on a Client's order form, printed stationery or other communication, or any terms or conditions implied by custom, practice or course of dealing shall be of no effect, and that this Contract shall prevail over all others in relation to the Order.

2.5 If the Client or Beneficiary requests insurance in conjunction with or as a result of the Services, GroundSure shall use reasonable endeavours to recommend such insurance, but makes no warranty that such insurance shall be available from insurers or that it will be offered on reasonable terms. Any insurance purchased by the Client or Beneficiary shall be subject solely to the terms of the policy issued by insurers and GroundSure will have no liability therefor. In addition you acknowledge and agree that GroundSure does not act as an agent or broker for any insurance providers. The Client should take (and ensure that the Beneficiary takes) independent advice to ensure that the insurance policy requested or offered is suitable for its requirements.

2.6 GroundSure's quotations or proposals are valid for a period of 30 days only unless an alternative period of time is explicitly stipulated by GroundSure. GroundSure reserves the right to withdraw any quotation or proposal at any time before an Order is accepted by GroundSure. GroundSure's acceptance of an Order shall be binding only when made in writing and signed by GroundSure's authorised representative or when accepted through the Order Website.

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3.1The Client shall comply with the terms of this Contract and

(i) procure that the Beneficiary or any third party relying on the Services complies with and acts as if it is bound by the Contract and

(ii) be liable to GroundSure for the acts and omissions of the Beneficiary or any third party relying on the Services as if such acts and omissions were those of the Client.

3.2 The Client shall be solely responsible for ensuring that the Services are appropriate and suitable for its and/or the Beneficiary's needs.

3.3 The Client shall supply to GroundSure as soon as practicable and without charge all requisite information (and the Client warrants that such information is accurate, complete and appropriate), including without limitation any environmental information relating to the Site and shall give such assistance as GroundSure shall reasonably require in the provision of the Services including, without limitation, access to the Site, facilities and equipment.

3.4 Where the Client's approval or decision is required to enable GroundSure to carry out work in order to provide the Services, such approval or decision shall be given or procured in reasonable time and so as not to delay or disrupt the performance of the Services.

3.5 Save as expressly permitted by this Contract the Client shall not, and shall procure that the Beneficiary shall not, re-sell, alter, add to, or amend the GroundSure Materials, or use the GroundSure Materials in a manner for which they were not intended. The Client may make the GroundSure Materials available to a third party who is considering acquiring some or all of, or providing funding in relation to, the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.

3.6 The Client is responsible for maintaining the confidentiality of its user name and password if using the Order Website and the Client acknowledges that GroundSure accepts no liability of any kind for any loss or damage suffered by the Client as a consequence of using the Order Website.

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4.1The Client acknowledges that the Services provided by GroundSure consist of the presentation and analysis of Third Party Content and other content and that information obtained from a Third Party Data Provider cannot be guaranteed or warranted by GroundSure to be reliable.

4.2 In respect of Data Reports, Mapping and Risk Screening Reports, the following classes of person and no other are entitled to rely on their contents;

(i) the Beneficiary,

(ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate),

(iv) the first purchaser or first tenant of the Site, and

(v) the professional advisers and lenders of the first purchaser or tenant of the Site.

4.3 In respect of Support Services, only the Client, Beneficiary and parties expressly named in a Report and no other parties are entitled to rely on its contents.

4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise expressly agreed in writing, no other person or entity of any kind is entitled to rely on any Services or Report issued or provided by GroundSure. Any party considering such Reports and Services does so at their own risk.

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5.1GroundSure shall charge and the Client shall pay fees at the rate and frequency specified in the written proposal, Order Website or Order acknowledgement form, plus (in the case of Support Services) all proper disbursements incurred by GroundSure. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services (together "Fees").

5.2 The Client shall pay all outstanding Fees to GroundSure in full without deduction, counterclaim or set off within 30 days of the date of GroundSure's invoice or such other period as may be agreed in writing between GroundSure and the Client ("Payment Date"). Interest on late payments will accrue on a daily basis from the Payment Date until the date of payment (whether before or after judgment) at the rate of 8% per annum.

5.3 The Client shall be deemed to have agreed the amount of any invoice unless an objection is made in writing within 28 days of the date of the invoice. As soon as reasonably practicable after being notified of an objection, without prejudice to clause 5.2 a member of GroundSure's management team will contact the Client and the parties shall then use all reasonable endeavours to resolve the dispute within 15 days.

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6.1 Subject to

(i) full payment of all relevant Fees and

(ii) compliance with this Contract, the Client is granted (and is permitted to sub-licence to the Beneficiary) a royalty-free, worldwide, non-assignable and (save to the extent set out in this Contract) non-transferable licence to make use of the GroundSure Materials.

6.2 All Intellectual Property in the GroundSure Materials are and shall remain owned by GroundSure or GroundSure's licensors (including without limitation the Third Party Data Providers) the Client acknowledges, and shall procure acknowledgement by the Beneficiary of, such ownership. Nothing in this Contract purports to transfer or assign any rights to the Client or the Beneficiary in respect of such Intellectual Property.

6.3 Third Party Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.

6.4 The Client shall, and shall procure that any recipients of the GroundSure Materials shall:

(i) not remove, suppress or modify any trade mark, copyright or other proprietary marking belonging to GroundSure or any third party from the Services;

(ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;

(iii) not create any product or report which is derived directly or indirectly from the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);

(iv) not combine the Services with or incorporate such Services into any other information data or service;

(v) not reformat or otherwise change (whether by modification, addition or enhancement), the Services (save that those acting for the Beneficiary in a professional capacity shall not be in breach of this clause 6.4(v) where such reformatting is in the normal course of providing advice based upon the Services);

(vi) where a Report and/or Mapping contains material belonging to Ordnance Survey, acknowledge and agree that such content is protected by Crown Copyright and shall not use such content for any purpose outside of receiving the Services; and

(vii) not copy in whole or in part by any means any map prints or run-on copies containing content belonging to Ordnance Survey (other than that contained within Ordnance Survey's OS Street Map) without first being in possession of a valid Paper Map Copying Licence from Ordnance Survey,

6.5 Notwithstanding clause 6.4, the Client may make reasonable use of the GroundSure Materials in order to advise the Beneficiary in a professional capacity. However, GroundSure shall have no liability in respect of any advice, opinion or report given or provided to Beneficiaries by the Client.

6.6 The Client shall procure that any person to whom the Services are made available shall notify GroundSure of any request or requirement to disclose, publish or disseminate any information contained in the Services in accordance with the Freedom of Information Act 2000, the Environmental Information Regulations 2004 or any associated legislation or regulations in force from time to time.

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7.1 This Clause 7 sets out the entire liability of GroundSure, including any liability for the acts or omissions of its employees, agents, consultants, subcontractors and Third Party Content, in respect of:

(i) any breach of contract, including any deliberate breach of the Contract by GroundSure or its employees, agents or subcontractors;

(ii) any use made of the Reports, Services, Materials or any part of them; and

(iii) any representation, statement or tortious act or omission (including negligence) arising under or in connection with the Contract.

7.2 All warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.

7.3 Nothing in the Contract limits or excludes the liability of the Supplier for death or personal injury resulting from negligence, or for any damage or liability incurred by the Client or Beneficiary as a result of fraud or fraudulent misrepresentation.

7.4 GroundSure shall not be liable for

(i) loss of profits;

(ii) loss of business;

(iii) depletion of goodwill and/or similar losses;

(iv) loss of anticipated savings;

(v) loss of goods;

(vi) loss of contract;

(vii) loss of use;

(viii) loss or corruption of data or information;

(ix) business interruption;

(x) any kind of special, indirect, consequential or pure economic loss, costs, damages, charges or expenses;

(xi) loss or damage that arise as a result of the use of all or part of the GroundSure Materials in breach of the Contract;

(xii) loss or damage arising as a result of any error, omission or inaccuracy in any part of the GroundSure Materials where such error, omission or inaccuracy is caused by any Third Party Content or any reasonable interpretation of Third Party Content;

(xiii) loss or damage to a computer, software, modem, telephone or other property; and

(xiv) loss or damage caused by a delay or loss of use of GroundSure's internet ordering service.

7.5 GroundSure's total liability in relation to or under the Contract shall be limited to £10 million for any claim or claims.

7.6 GroundSure shall procure that the Beneficiary shall be bound by limitations and exclusions of liability in favour of GroundSure which accord with those detailed in clauses 7.4 and 7.5 (subject to clause 7.3) in respect of all claims which the Beneficiary may bring against GroundSure in relation to the Services or other matters arising pursuant to the Contract.

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8.1 If GroundSure reasonably believes that the Client or Beneficiary has not provided the information or assistance required to enable the proper provision of the Services, GroundSure shall be entitled to suspend all further performance of the Services until such time as any such deficiency has been made good.

8.2 GroundSure shall be entitled to terminate the Contract immediately on written notice in the event that:

(i) the Client fails to pay any sum due to GroundSure within 30 days of the Payment Date; or

(ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an administration order made against it or if a receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or

(iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or

(iv) the Client or the Beneficiary breaches any term of the Contract (including, but not limited to, the obligations in clause 4) which is incapable of remedy or if remediable, is not remedied within five days of notice of the breach.

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9.1 Subject to clause 10.1, the Client may at any time upon written notice terminate or suspend the provision of all or any of the Services.

9.2 In any event, where the Client is a consumer (and not a business) he/she hereby expressly acknowledges and agrees that:

(i) the supply of Services under this Contract (and therefore the performance of this Contract) commences immediately upon GroundSure's acceptance of the Order; and

(ii) the Reports and/or Mapping provided under this Contract are

(a) supplied to the Client's specification(s) and in any event

(b) by their nature cannot be returned.

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10.1 Upon termination of the Contract:

(i) GroundSure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client and/or Beneficiary any property of the Client and/or Beneficiary in

GroundSure's possession or control; and

(ii) the Client shall pay to GroundSure all and any Fees payable in respect of the performance of the Services up to the date of termination or suspension. In respect of any Support Services provided, the Client shall also pay GroundSure any additional costs incurred in relation to the termination or suspension of the Contract.

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11.1 The Client warrants that it shall:

(i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010;

(ii) comply with such of GroundSure's anti-bribery and anti-corruption policies as are notified to the Client from time to time; and

(iii) promptly report to GroundSure any request or demand for any undue financial or other advantage of any kind received by or on behalf of the Client in connection with the performance of this Contract.

11.2 Breach of this Clause 11 shall be deemed a material breach of this Contract.

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12.1 The Mapping contained in the Services is protected by Crown copyright and must not be used for any purpose other than as part of the Services or as specifically provided in the Contract.

12.2 The Client shall be permitted to make one copy only of each Report or Mapping Order. Thereafter the Client shall be entitled to make unlimited copies of the Report or Mapping Order only in accordance with an Ordnance Survey paper map copy license available through GroundSure.

12.3 GroundSure reserves the right to amend or vary this Contract. No amendment or variation to this Contract shall be valid unless signed by an authorised representative of GroundSure.

12.4 No failure on the part of GroundSure to exercise, and no delay in exercising, any right, power or provision under this Contract shall operate as a waiver thereof.

12.5 Save as expressly provided in this Contract, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.

12.6 The Secretary of State for Business, Innovation and Skills ("BIS") or BIS' successor body, as the case may be, acting through Ordnance Survey may enforce a breach of clause 6.4(vi) and clause 6.4(vii) of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.

12.7 GroundSure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:

(i) the Client or Beneficiary's failure to provide facilities, access or information;

(ii) fire, storm, flood, tempest or epidemic;

(iii) Acts of God or the public enemy;

(iv) riot, civil commotion or war;

(v) strikes, labour disputes or industrial action;

(vi) acts or regulations of any governmental or other agency;

(vii) suspension or delay of services at public registries by Third Party Data Providers;

(viii) changes in law; or

(ix) any other reason beyond GroundSure's reasonable control.

In the event that GroundSure is prevented from performing the Services (or any part thereof) in accordance with this clause 12.6 for a period of not less than 30 days then GroundSure shall be entitled to terminate this Contract immediately on written notice to the Client.

12.8 Any notice provided shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.

12.9 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email (save to the extent such day is not a working day where it shall be deemed to have been delivered on the next working day) and on the second working day after the day of posting if sent by first class post.

12.10 The Contract constitutes the entire agreement between the parties and shall supersede all previous arrangements between the parties relating to the subject matter hereof.

12.11 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.

12.12 This Contract shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with this Contract shall be subject to the exclusive jurisdiction of the English courts.

12.13 GroundSure is an executive member of the Council of Property Search Organisation (CoPSO) and has signed up to the Search Code administered by the Property Codes Compliance Board (PCCB). All Risk Screening Reports shall be supplied in accordance with the provisions of the Search Code.

12.14 If the Client or Beneficiary has a complaint about the Services, written notice should be given to the Compliance Officer at GroundSure who will respond in a timely manner.

12.15 The Client agrees that it shall, and shall procure that each Beneficiary shall, treat in confidence all Confidential Information and shall not, and shall procure that each Beneficiary shall not (i) disclose any Confidential Information to any third party other than in accordance with the terms of this Contract; and (ii) use Confidential Information for a purpose other than the exercise of its rights and obligations under this Contract. Subject to clause 6.6, nothing shall prevent the Client or any Beneficiary from disclosing Confidential Information to the extent required by law. K ˝ # $% 2

Buro Happold

17 BURO HAPPOLD ENGINEERS LTD, NEWMAN STREET,
LONDON, W1T 1PD

GroundSure Reference:	GS-1491816
Your Reference:	030289 2006 01 Gatcombe Farm
Report Date	9 Jun 2014
Report Delivery Method:	Email - pdf

Address: Gatcombe Farm, Western Road, Long Aston, Bristol, BS41 9AE

Dear Sir/ Madam,

Thank you for placing your order with GroundSure. Please find enclosed the as requested.

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

Yours faithfully,

Managing Director
Groundsure Limited

Enc.
GroundSure GeoInsight

GroundSure

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Aerial Photograph Capture date:	01-Jun-2009
Grid Reference:	353063,169910
Site Size:	6.19ha

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

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

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

Section 1: Geology		
1.1 Artificial Ground	1.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?	No
	1.2.2 Are there any records relating to permeability of superficial geology within the study site boundary?	No
	1.2.3 Are there any records of landslip within 500m of the study site boundary?	No
	1.2.4 Are there any records relating to permeability of landslips within the study site boundary?	No
1.3 Bedrock, Solid Geology & Faults	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records relating to permeability of bedrock within the study site boundary?	Yes
	1.3.3 Are there any records of faults within 500m of the study site boundary?	No
1.4 Radon data	1.4.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is in a Radon Affected Area, as between 10 and 30% of properties are above the Action Level
	1.4.2 Is the property in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	Full radon protective measures are necessary

Section 2: Ground Workings	On-site	0-50m	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	1	1	28	Not Searched	Not Searched
2.2 Historical Underground Workings from Small Scale Mapping	0	0	0	0	2
2.3 Current Ground Workings	0	0	0	1	5

Section 3: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
3.1 Historical Mining	0	0	0	0	0
3.2 Coal Mining	0	0	0	0	1
3.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
3.4 Non-Coal Mining	1	2	2	1	5
3.5 Non-Coal Mining Cavities	0	0	0	0	0
3.6 Natural Cavities	0	0	0	0	0
3.7 Brine Extraction	0	0	0	0	0
3.8 Gypsum Extraction	0	0	0	0	0
3.9 Tin Mining	0	0	0	0	0
3.10 Clay Mining	0	0	0	0	0

Section 4: Natural Ground Subsidence	On-site
4.1 Shrink Swell Clay	Very Low
4.2 Landslides	Very Low
4.3 Ground Dissolution of Soluble Rocks	Low
4.4 Compressible Deposits	Negligible
4.5 Collapsible Deposits	Very Low
4.6 Running Sand	Negligible

Section 5: Borehole Records	On-site	0-50m	51-250
5 BGS Recorded Boreholes	0	0	0

Section 6: Estimated Background Soil Chemistry	On-site	0-50m	51-250
6 Records of Background Soil Chemistry	8	4	11

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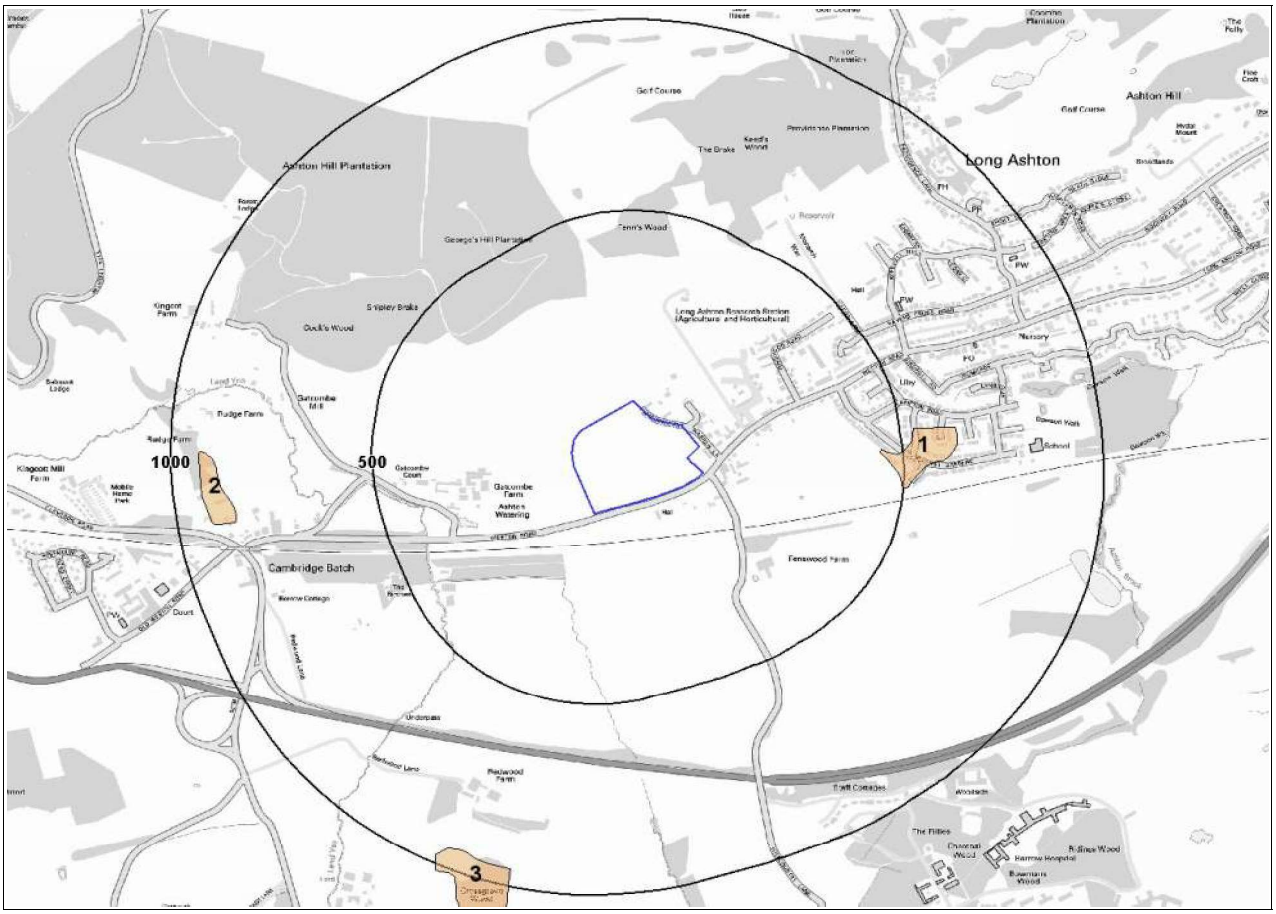

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Mapping sourced from Ordnance Survey

Site Outline

500
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Search Buffers (m)

Made Ground (undivided)

Disturbed Ground (undivided)

Worked Ground (undivided)

Landscaped Ground (undivided)

Infilled Ground

Reclaimed Ground

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1.1.1Artificial/ Made Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:264

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

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1	443.0	E	MGR-MGRD	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

1.1.2 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.

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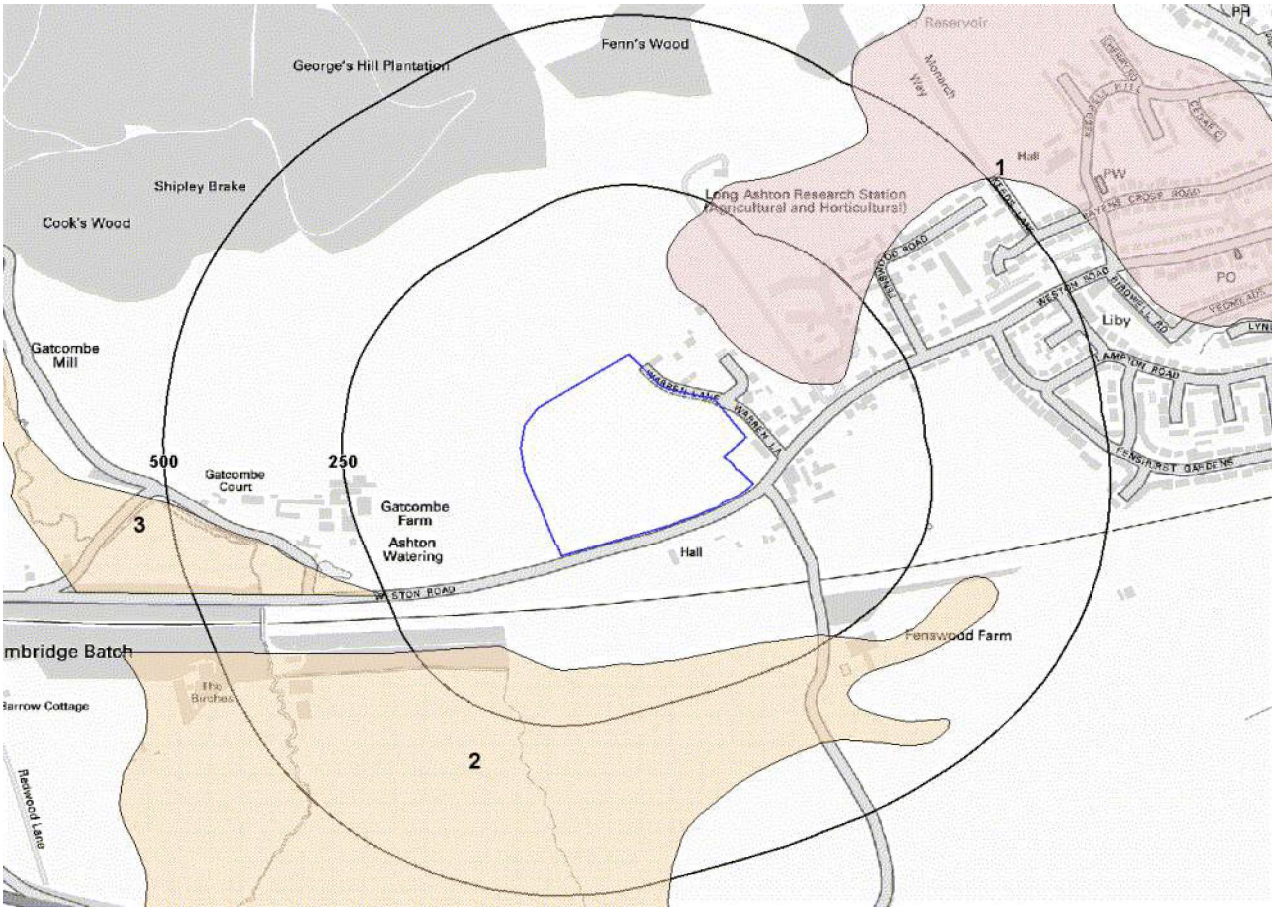

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Mapping sourced from Ordnance Survey

Site Outline

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Search Buffers (m)

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1.2.1 Superficial Deposits/ Drift Geology

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

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1	79.0	NE	HEAD-CSSG	HEAD	CLAY, SILT, SAND AND GRAVEL
2	156.0	SW	RTD1-SILT	RIVER TERRACE DEPOSITS, 1	SILT
3	250.0	W	RTD1-SILT	RIVER TERRACE DEPOSITS, 1	SILT

1.2.2 Permeability of Superficial Ground

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

Database searched and no data found.

1.2.3 Landslip

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

Database searched and no data found.

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

1.2.4 Landslip Permeability

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

Database searched and no data found.

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

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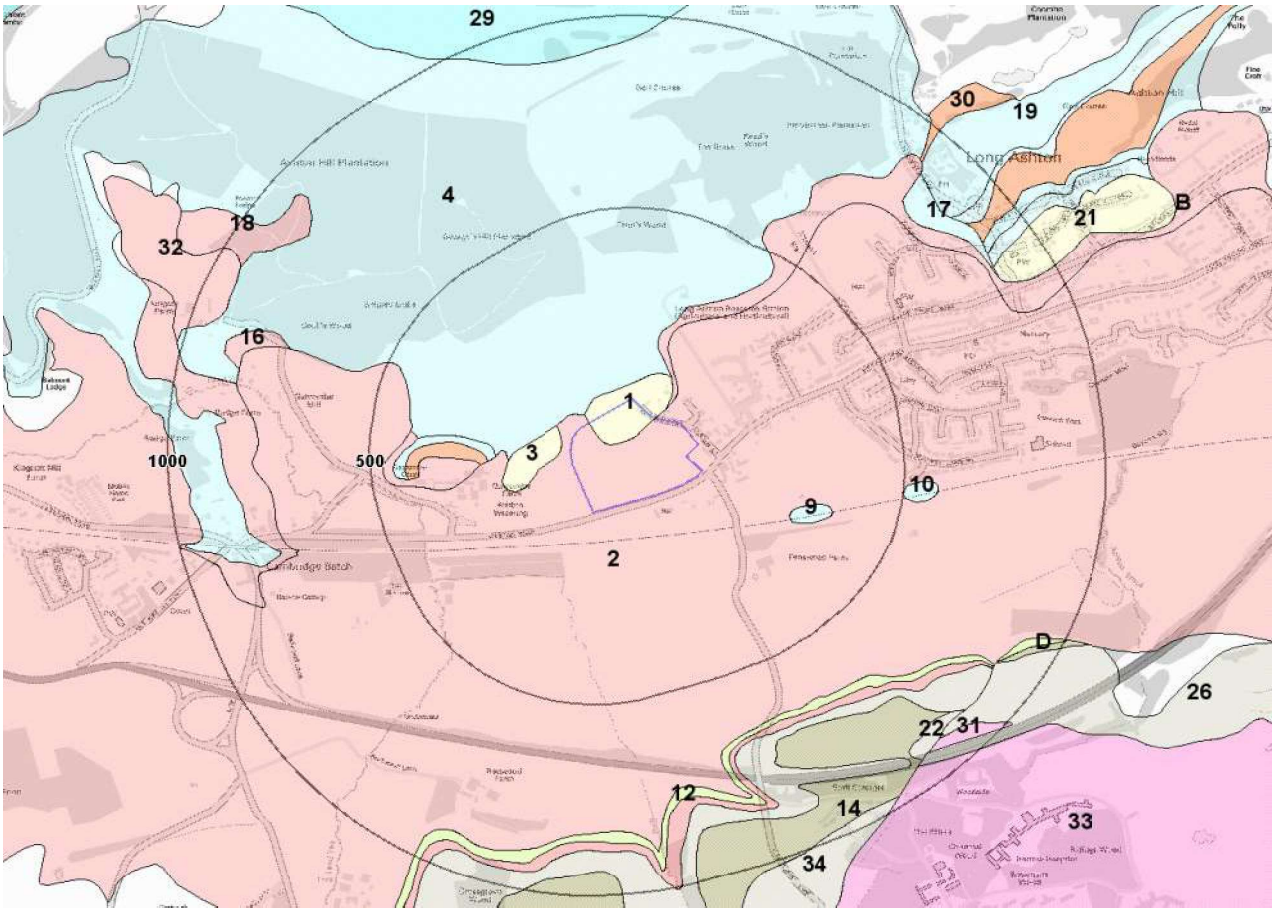

W E

SW S SE

6

Mapping sourced from Ordnance Survey®

Site Outline

500
1000
Search Buffers (m)

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The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:264

1.3.1 Bedrock/ Solid Geology

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

!	! □ 3□4	! □ □□	5)□	! +□□□	6 □
1	0.0	On Site	QSG-SDST	Quartzitic Sandstone Formation - Sandstone	Yeadonian / Pendleian
2	0.0	On Site	MMG-MDHA	Mercia Mudstone Group - Mudstone And Halite-stone	Rhaetian / Scythian
3	24.0	W	QSG-SDST	Quartzitic Sandstone Formation - Sandstone	Yeadonian / Pendleian
4	25.0	NW	OHL-OOLM	Oxwich Head Limestone Formation - Ooidal Limestone	Brigantian / Asbian
5B	30.0	N	MMMF-CONG	Mercia Mudstone Group (marginal Facies) - Conglomerate	Triassic
6A	190.0	W	OHL-OOLM	Oxwich Head Limestone Formation - Ooidal Limestone	Brigantian / Asbian
7A	211.0	W	CHSA-SDST	Cromhall Sandstone Formation - Sandstone	Brigantian / Arundian
8A	229.0	W	MMMF-CONG	Mercia Mudstone Group (marginal Facies) - Conglomerate	Triassic
9	243.0	SE	OHL-OOLM	Oxwich Head Limestone Formation - Ooidal Limestone	Brigantian / Asbian
10	500.0	E	OHL-OOLM	Oxwich Head Limestone Formation - Ooidal Limestone	Brigantian / Asbian

1.3.2 Permeability of Bedrock Ground

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

! □ 3□4	! □ □□	/ 90+	2□ □ , □0	2 □□ , □0
0.0	On Site	Fracture	Low	Low
0.0	On Site	Fracture	High	Moderate
0.0	On Site	Fracture	High	Moderate
0.0	On Site	Fracture	Low	Low
0.0	On Site	Fracture	Low	Low
24.0	W	Fracture	High	Moderate
25.0	NW	Fracture	Very High	High
30.0	N	Fracture	Very High	Very High

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

1.3.3 Faults

Are there any records of Faults 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, 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.

---

1 □ !□□

1.4.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is in a Radon Affected Area, as between 10 and 30% of properties are above the Action Level

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1.4.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? Full radon protective measures are necessary

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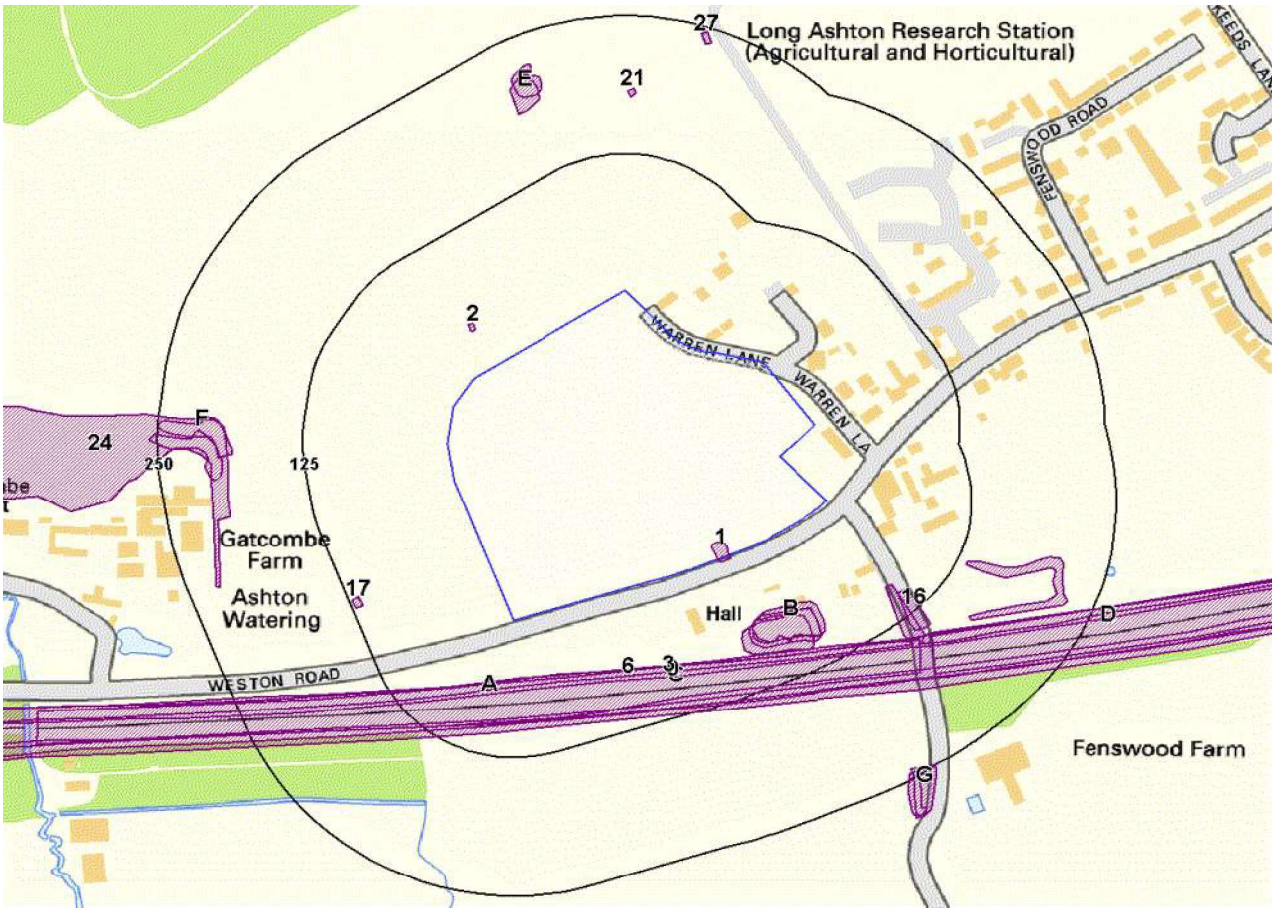
NW N NE

W E

SW S SE



6

Mapping sourced from Ordnance Survey®

Site Outline

125
250
Search Buffers (m)

Historic Surface Ground Workings

Historic Underground Workings

Current Ground Workings

□ □6 □□

2.1 Historical Surface Ground Working Features derived from Historical Mapping

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

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

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

ID	! □ 3□4	! □ □□	;□□	<□	!□
1	0.0	On Site	353159 169834	Pond	1902
2	37.0	NW	352944 170037	Pond	1932
3	53.0	S	353504 169764	Cuttings	1883
4A	54.0	S	352950 169706	Cuttings	1932
5A	54.0	S	352950 169706	Cuttings	1902
6	55.0	S	353648 169795	Cuttings	1979
7B	59.0	SE	353217 169769	Unspecified Heap	1932
8B	59.0	SE	353217 169769	Unspecified Heap	1902
9	60.0	S	353806 169822	Cuttings	1949
10B	61.0	SE	353216 169766	Unspecified Ground Workings	1883
11B	64.0	S	353214 169764	Unspecified Heap	1949
12C	64.0	S	353625 169781	Cuttings	1913
13C	64.0	S	353625 169781	Cuttings	1938
14B	66.0	S	353207 169758	Unspecified Heap	1913
15B	66.0	S	353207 169758	Unspecified Heap	1938
16	104.0	SE	353325 169781	Cuttings	1932
17	116.0	W	352845 169787	Pond	1932
18	133.0	SE	353449 169799	Unspecified Heap	1932
19D	152.0	SE	353544 169775	Cuttings	1932
20D	152.0	SE	353544 169775	Cuttings	1902
21	177.0	N	353082 170251	Pond	1932

ID	! □ 3□4	! □ □□	;□□	<□	!□
22E	185.0	NW	352989 170249	Unspecified Quarry	1949
23F	185.0	W	352728 169934	Unspecified Heap	1932
24	190.0	W	352619 169883	Unspecified Ground Workings	1979
25E	194.0	NW	352991 170261	Unspecified Quarry	1932
26F	194.0	W	352721 169921	Unspecified Ground Workings	1949
27	235.0	N	353146 170300	Pond	1932
28G	242.0	SE	353333 169616	Unspecified Heap	1883
29G	245.0	SE	353328 169614	Unspecified Ground Workings	1902
30G	245.0	SE	353328 169614	Unspecified Ground Workings	1932

2.2 Historical Underground Working Features derived from Historical Mapping

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

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

The following Historical Underground Working Features are provided by GroundSure:

!	! □ 3□4	! □ □□	;□□	<□	!□
Not shown	818.0	W	352092 169673	Tunnel	1949
Not shown	818.0	W	352092 169673	Tunnel	1979

2.3 Current Ground Workings

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

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

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

ID	! □ 3□4	! □ □□	;□□	)□ □0 ,□ □	, □;□	90+ □% /□6 □□	
Not shown	499.0	N	352967 170557	Limestone	Fenn's Wood Quarries	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

ID	! □ 3□4	! □ □□	;□□	)□ □0 ,□ □	, □;□	90+ □% /□6 □□	
Not shown	635.0	N	353193 170694	Limestone	Fenn's Wood Quarry	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	817.0	NW	352705 170798	Limestone	Failand Quarry	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	944.0	W	351990 169788	Limestone	Kingcot Mill Quarries	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	978.0	NE	353552 170924	Limestone	Providence Quarries	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	983.0	NE	353909 170680	Limestone	Providence Quarry	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

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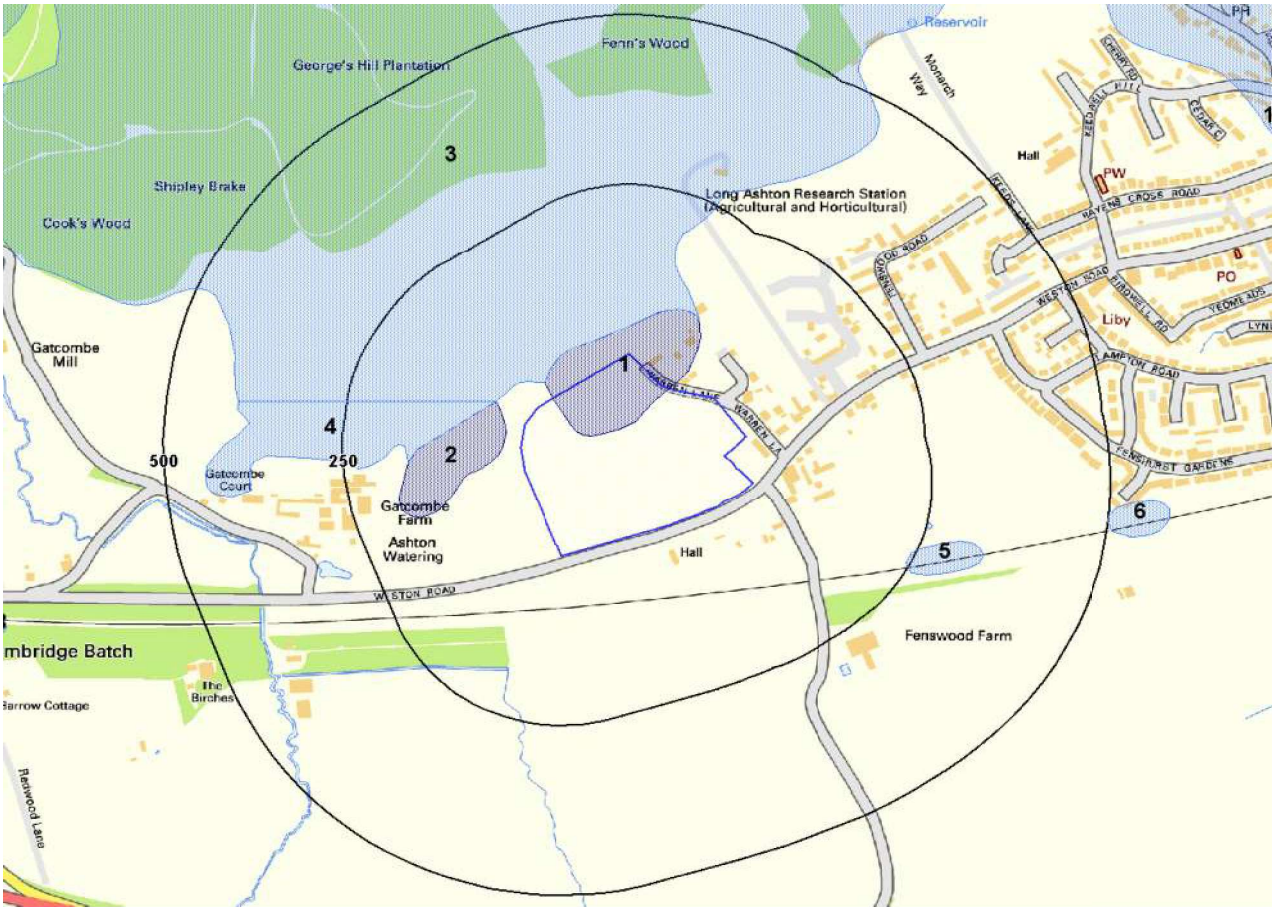

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Mapping sourced from Ordnance Survey

Site Outline

250
500
Search Buffers (m)

Historical Mining

Non-Coal Mining Cavities

Natural Cavities

Non-Coal Mining

Highly likely

Likely

Unlikely

Highly unlikely

Rare

7 2 □□ :□ □8 ;□)□. □ □

3.1 Historical Mining

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

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

Database searched and no data found.

3.2 Coal Mining

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

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

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

! □ 3□4	! □ □□	! □□
751.0	E	The study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

3.3 Johnson Poole and Bloomer

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

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

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

3.4 Non-Coal Mining

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

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

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

!	! □ 3□4	! □ □□	;□	)□ □0	□% □6 □
1	0.0	On Site	Not available	Vein Mineral	Rare - Infrequent minor mining may have occurred but restricted in extent.

!	! □ 3□4	! □ □□	;□	)□ □0	□% □6 □
2	24.0	W	Not available	Vein Mineral	Rare - Infrequent minor mining may have occurred but restricted in extent.
3	25.0	NW	Not available	Vein Mineral	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
4	53.0	NW	Not available	Vein Mineral	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
5	243.0	SE	Not available	Vein Mineral	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
6	500.0	E	Not available	Vein Mineral	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
Not shown	745.0	NE	Not available	Vein Mineral	Likely - Underground mining known or suspected within or close to the area.
8	761.0	W	Not available	Vein Mineral	Highly Unlikely - Localised small scale mining may have occurred but restricted in extent.
Not shown	845.0	NE	Not available	Vein Mineral	Highly likely - Underground mining known within or very close to the area.
10	861.0	NE	Not available	Vein Mineral	Rare - Infrequent minor mining may have occurred but restricted in extent.
Not shown	939.0	NW	Not available	Vein Mineral	Likely - Underground mining known or suspected within or close to the area.

3.5 Non-Coal Mining Cavities

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

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

Database searched and no data found.

3.6 Natural Cavities

This dataset provides information based on Peter Brett Associates natural cavities database.

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

Database searched and no data found.

3.7 Brine Extraction

This dataset provides information from the Brine Compensation Board which has been discontinued and is now covered by the Coal Authority.

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

Database searched and no data found.

3.8 Gypsum Extraction

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

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

Database searched and no data found.

3.9 Tin Mining

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

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

Database searched and no data found.

3.10 Clay Mining

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

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

Database searched and no data found.

;

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Mapping sourced from Ordnance Survey

Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

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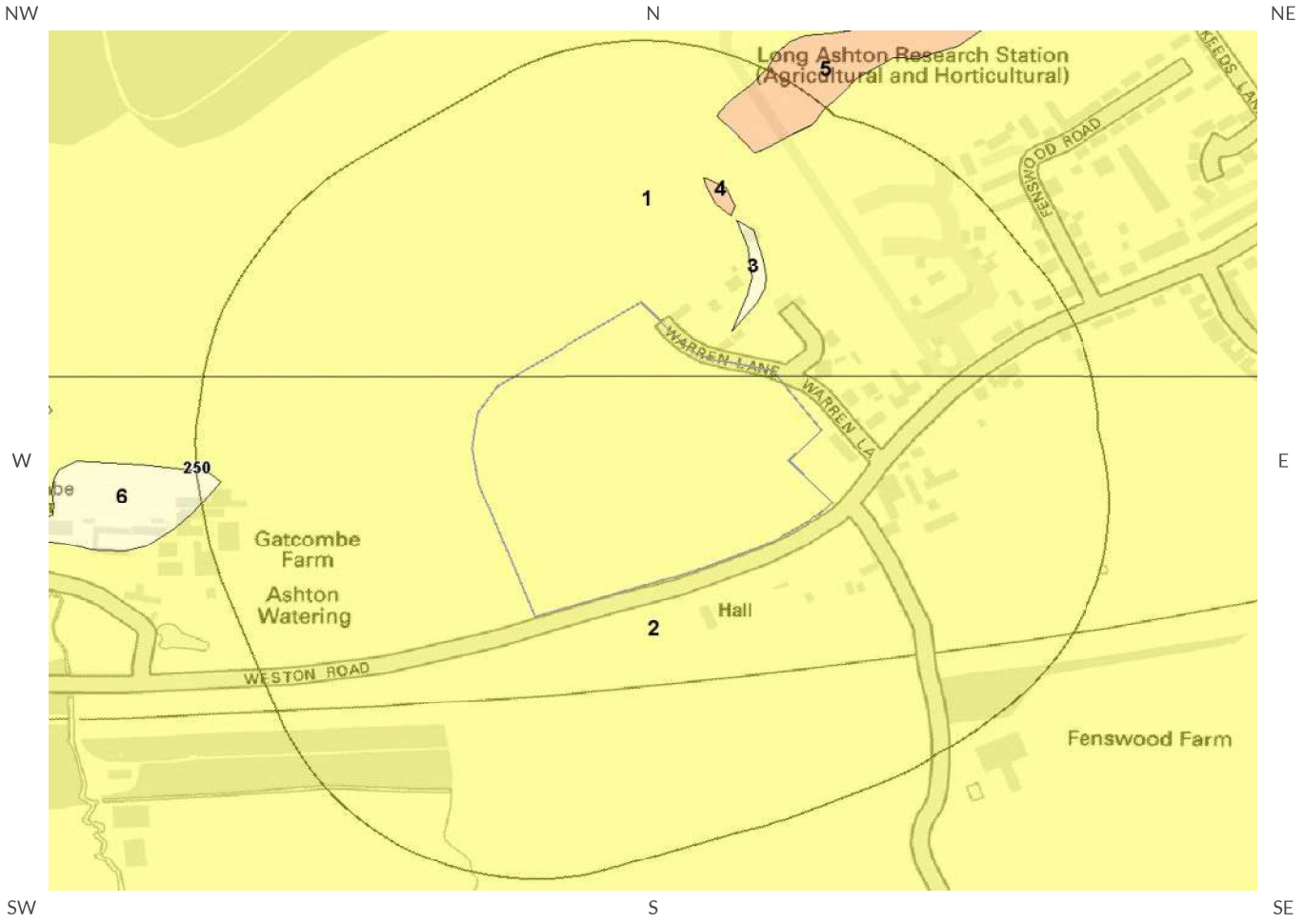

Mapping sourced from Ordnance Survey

Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low
Low
Moderate
High

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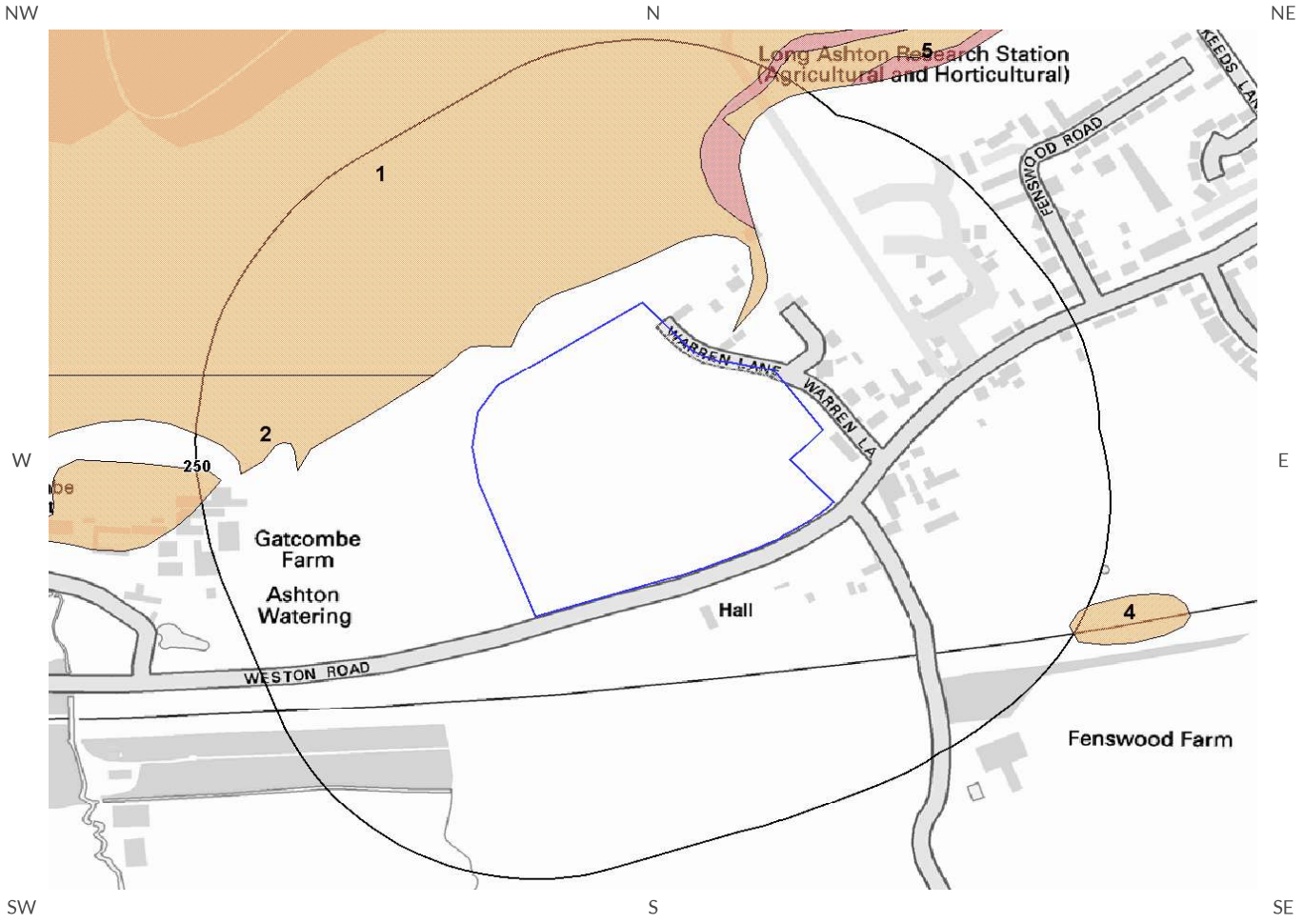
2 +



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Mapping sourced from Ordnance Survey

Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

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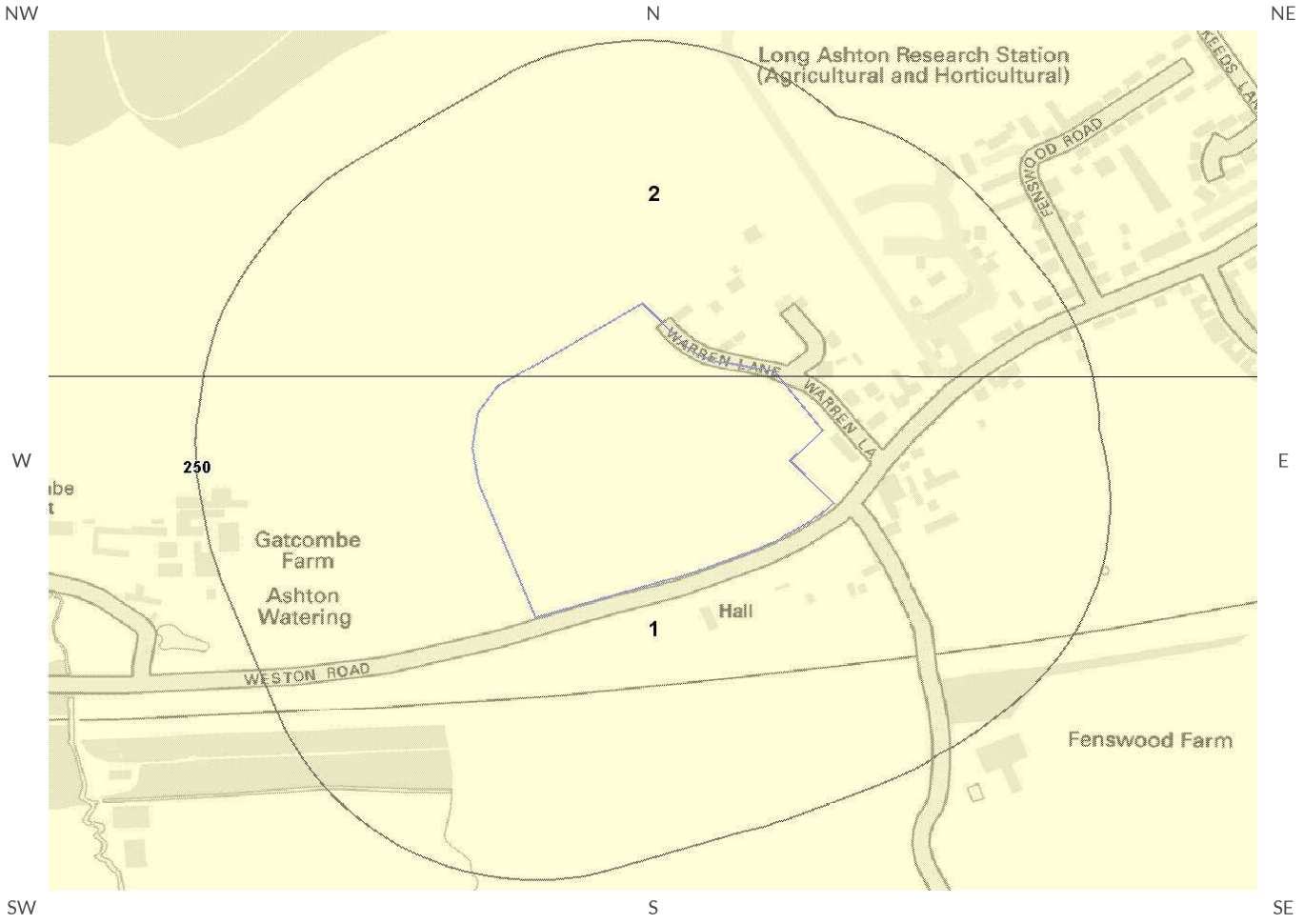

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Mapping sourced from Ordnance Survey

Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

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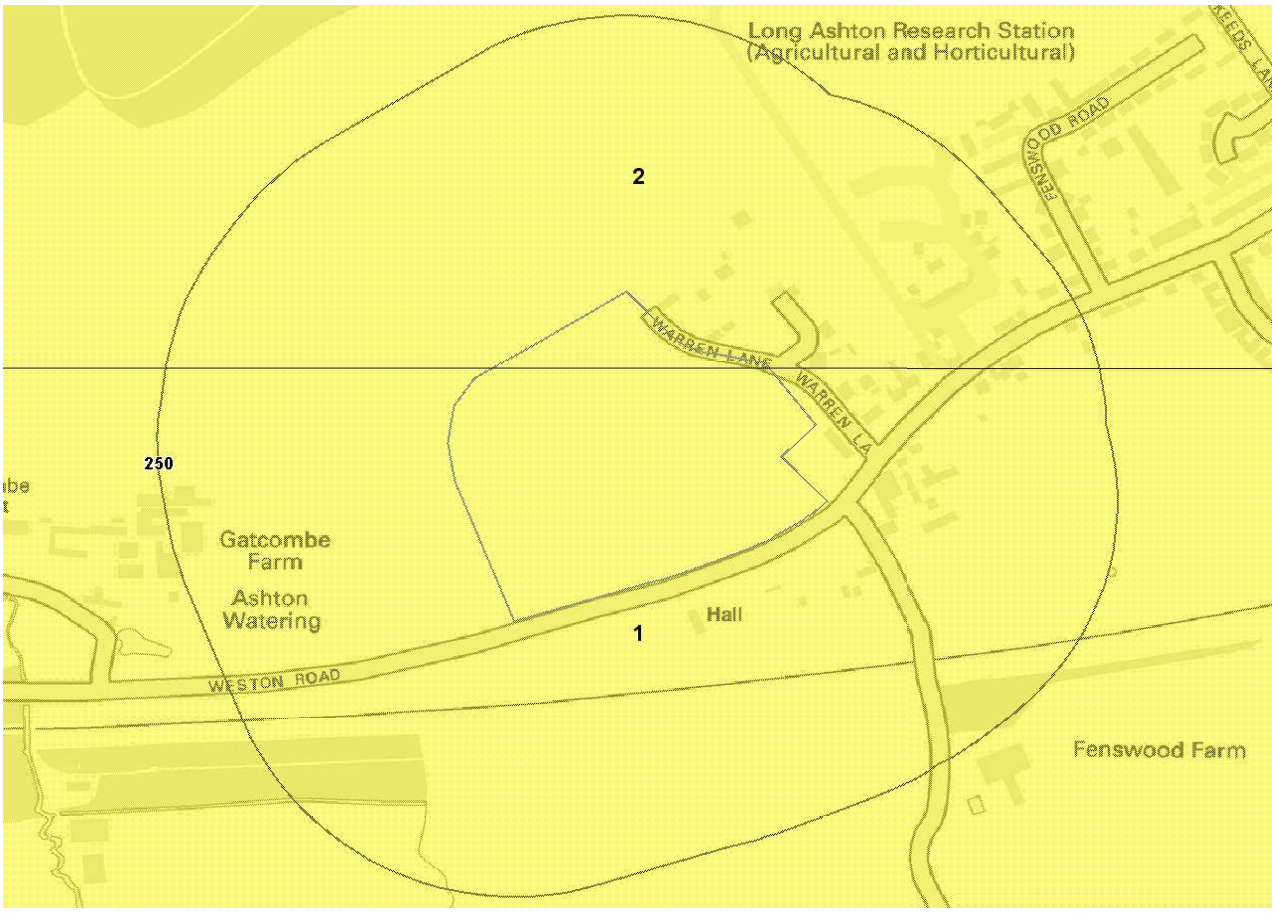

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Mapping sourced from Ordnance Survey

Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

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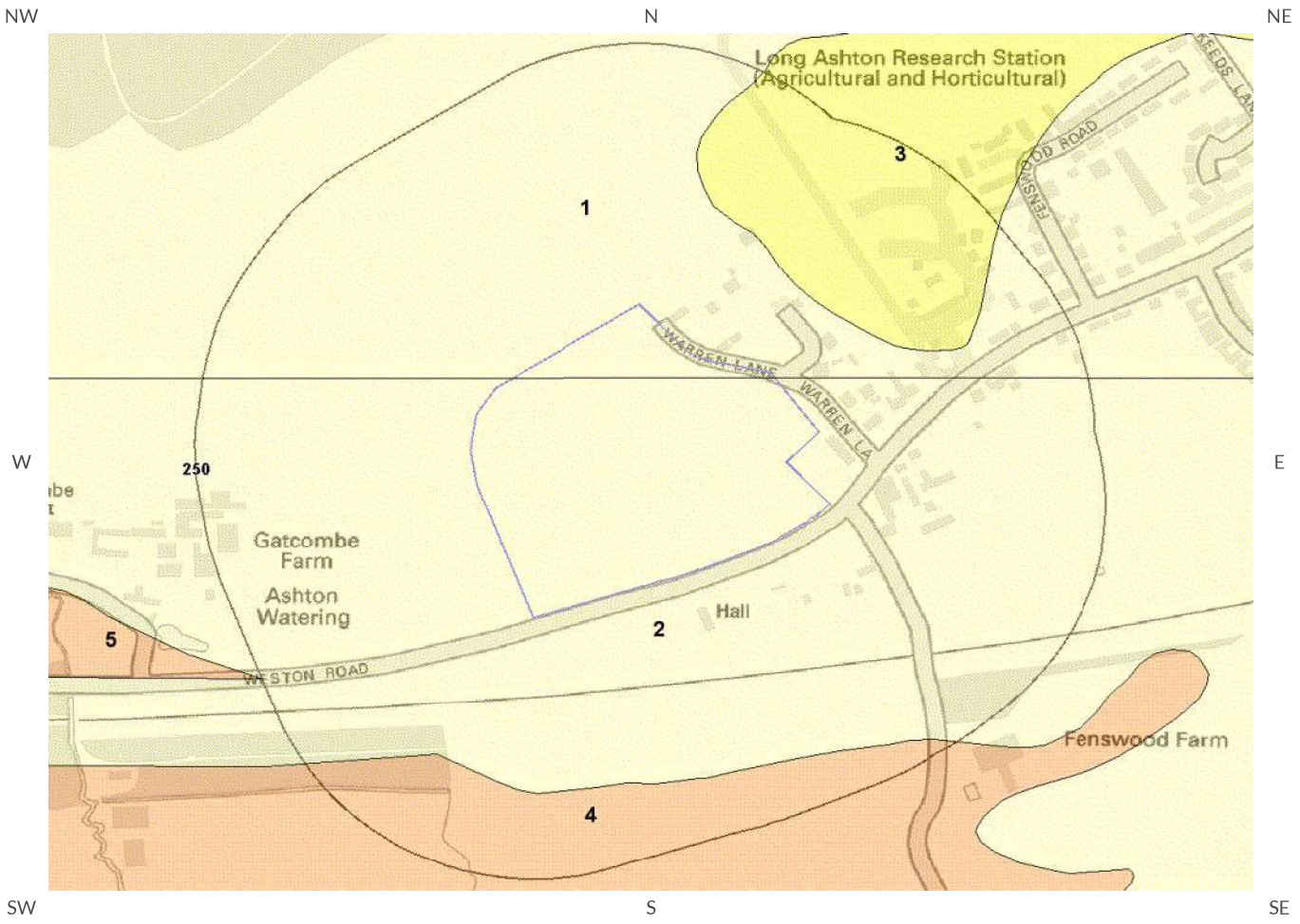


Mapping sourced from Ordnance Survey

Site Outline

125
250
Search Buffers (m)

No Data / Null
Negligible
Very Low

Low
Moderate
High

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? Low

4.1 Shrink-Swell Clays

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

!	!	!	*	!
1	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.
2	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.
3	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.
4	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.
5	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	24.0	W	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.

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

4.2 Landslides

The following Landslides information provided by the British Geological Survey:

!	! □ 3⊿4	! □ ◫	*▻□ □ ◫	! ◫
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.
2	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.
3	30.0	N	Negligible	No indicators for slope instability identified. 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.

4.3 Ground Dissolution of Soluble Rocks

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

!	! □ 3⊿4	! □ ◫	*▻□ □ ◫	! □
1	25.0	NW	Low	Significant soluble rocks are present. Low possibility of subsidence occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow. Consider implications for stability when changes to drainage or new construction are planned. For new build - site investigation should consider potential for dissolution problems on the site and its surroundings. Care should be taken with local drainage into the bedrock. Some possibility groundwater pollution. For existing property - possible increase in insurance risk due to soluble rocks.

4.4 Compressible Deposits

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

!	! □ 3⊿4	! □ ◫	*▻□ □ ◫	! □
1	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.
2	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.

4.5 Collapsible Deposits

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

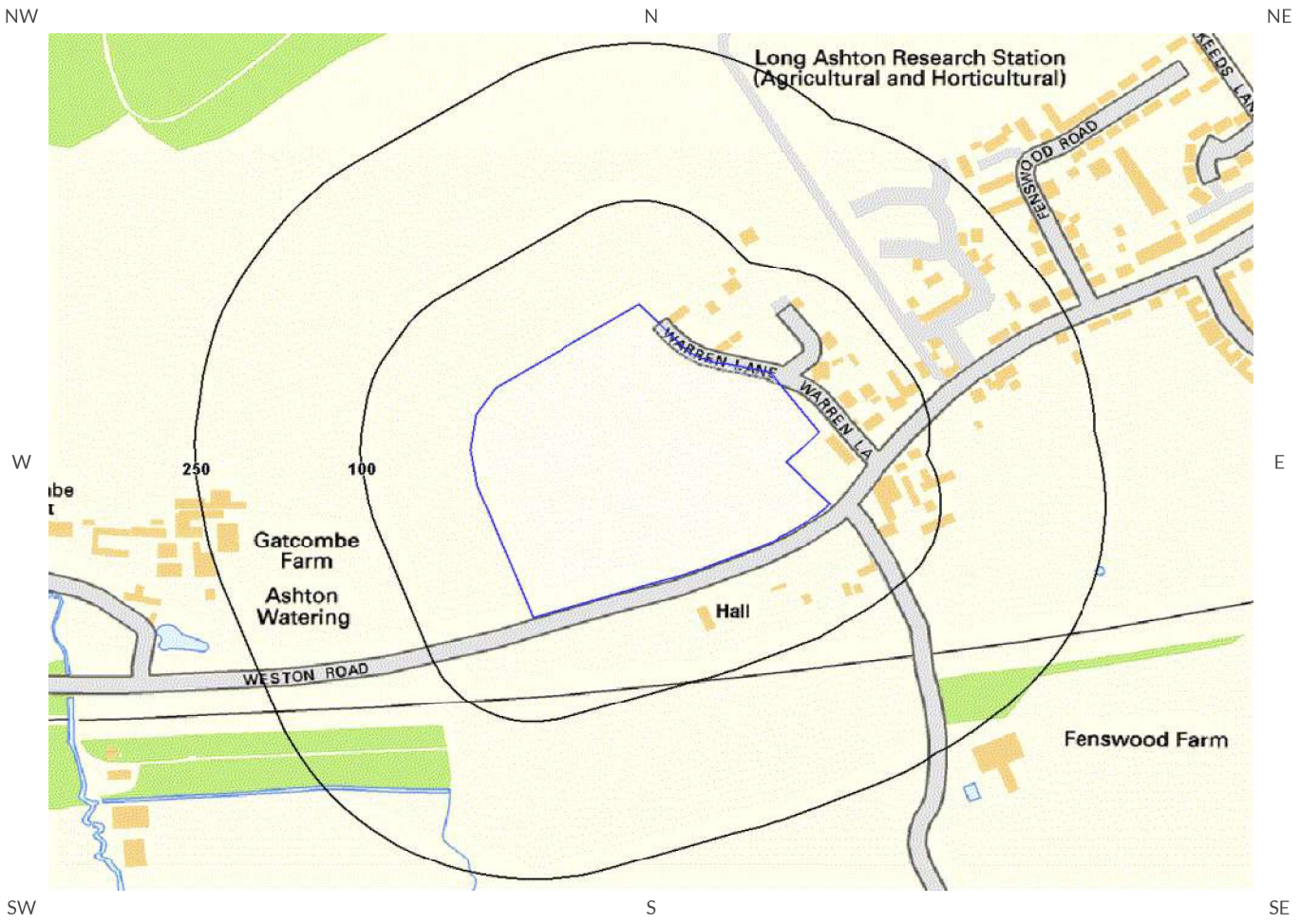
!	! □ 3□4	! □ □□	*□>□ □ □□	! □
1	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.
2	0.0	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.

4.6 Running Sands

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

!	! □ 3□4	! □ □□	*□>□ □ □□	! □□
1	0.0	On Site	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
2	0.0	On Site	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

= 2 +



Mapping sourced from Ordnance Survey

Site Outline

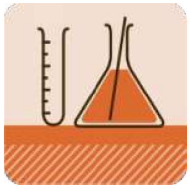
Borehole Locations

125
250
Search Buffers (m)

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

Records of boreholes within 250m of the study site boundary:	0

Database searched and no data found.



(□ □ □6□ □ □) □0

Records of background estimated soil chemistry within 250m of the study site boundary: 23

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

! □ 3□4	! □ □□	+□90+	□3□4	)□ □3)□4	) □ □3)□4	; □6 3; 4	3,□4
0.0	On Site	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
0.0	On Site	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
0.0	On Site	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
0.0	On Site	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
0.0	On Site	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
24.0	W	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
25.0	NW	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
30.0	N	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
37.0	NW	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
53.0	NW	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
79.0	NE	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	150 - 300 mg/kg
117.0	NE	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
118.0	NE	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
156.0	SW	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
167.0	S	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
190.0	W	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
211.0	W	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
229.0	W	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
243.0	SE	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
250.0	W	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg

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

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GroundSure ENVIRONMENTAL INSIGHT

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Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email: @□□ ?□1□1□6
Web:///1□1□1□6
BGS Geological Hazards Reports and general geological enquiries

British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL

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British Gypsum Ltd
East Leake
Loughborough
Leicestershire
LE12 6HX

British Gypsum SAINT-GOBAIN

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200 Lichfield Lane
Mansfield
Notts NG18 4RG
Tel: 0345 7626 848
DX 716176 Mansfield 5
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The Coal Authority

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, ublic information access office
Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
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Email: @□□ ?+ 1□1□6
Main switchboard: 020 7654 8000

Public Health England

"□□ ,□ 8 □ □□□□
Harris and Pearson Building, Brettel Lane
Brierley Hill, West Midlands
DY5 3LH
Tel: +44 (0) 1384 262 000
Email: @□□ 1□?B+□1□1□6
Website: ///1B+□1□1□6

JOHNSON POOLE & BLOOMER CONSULTANTS

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Adanac Drive, Southampton
SO16 0AS

Tel: 08456 050505
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Mapping sourced from Ordnance Survey®

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Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444
Website: □+□AA///□1□ ++ □1□A

getmapping®

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Caversham Bridge House
Waterman Place
Reading
Berkshire RG1 8DN
Tel: +44 (0)118 950 0761 E-mail: □?+□1□1□6
Website: □+□AA///1+ 1□A □

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C)□ D means the party or parties entering into a Contract with GroundSure.
C)□ □D means any building or property which is not Residential.
C)□% □ □ □%□ □D means the contents of this Contract and all information received from the Client as a result of, or in connection with, this Contract other than
(i) information which the Client can prove was rightfully in its possession prior to disclosure by GroundSure and
(ii) any information which is in the public domain (other than by virtue of a breach of this Contract).
C□++□ □. □D means Support Services provided by GroundSure including, without limitation, interpreting third party and in-house environmental data, providing environmental support advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.
C)□ D means the contract between GroundSure and the Client for the provision of the Services, and which shall incorporate these terms and conditions, the Order, and the relevant User Guide.
C9 □,□0 !□ ,□. □D means any third party providing Third Party Content to GroundSure.
C!□ □+□ D means reports comprising factual data with no accompanying interpretation.
C□ D has the meaning set out in clause 5.1.
C□ D means GroundSure Limited, a company registered in England and Wales under number 03421028.
C□ 2□ □D means all materials prepared by GroundSure and provided as part of the Services, including but not limited to Third Party Content, Data Reports, Mapping, and Risk Screening Reports.
C□ ,□+ 0D means any patent, copyright, design rights, trade or service mark, moral rights, data protection rights, know-how or trade mark in each case whether registered or not and including applications for the same or any other rights of a similar nature anywhere in the world.
C2□++ □D means a map, map data or a combination of historical maps of various ages, time periods and scales.
C-□ D means an electronic, written or other order form submitted by the Client requesting Services from GroundSure in respect of a specified Site.
C-□ □. 0D means the Secretary of State for Business, Innovation and Skills, acting through Ordnance Survey, Adanac Drive, Southampton, SO16 0AS, UK.
C-□ □ □D means the online platform through which Orders may be placed by the Client and accepted by GroundSure.
C□+□D means a Risk Screening Report or Data Report for Commercial or Residential property.
C□ □ □D means any building or property used as or intended to be used as a single dwelling.
C□6 □ □ □+□ D means a risk screening report comprising factual data with an accompanying interpretation by GroundSure.
C□. □D means any Report, Mapping and/or Support Services which GroundSure has agreed to provide by accepting an Order pursuant to clause 2.6.
E□□E means the area of land in respect of which the Client has requested GroundSure to provide the Services.
C9 □,□0)□ D means data, database information or other information which is provided to GroundSure by a Third Party Data Provider.
"User Guide" means the user guide, as amended from time to time, available upon request from GroundSure and on the website (www.GroundSure.com) and forming part of this Contract.

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2.1 GroundSure agrees to provide the Services in accordance with the Contract.
2.2 GroundSure shall exercise reasonable skill and care in the provision of the Services.
2.3 Subject to clause 7.3 the Client acknowledges that it has not relied on any statement or representation made by or on behalf of GroundSure which is not set out and expressly agreed in writing in the Contract and all such statements and representations are hereby excluded to the fullest extent permitted by law.
2.4 The Client acknowledges that terms and conditions appearing on a Client's order form, printed stationery or other communication, or any terms or conditions implied by custom, practice or course of dealing shall be of no effect, and that this Contract shall prevail over all others in relation to the Order.
2.5 If the Client or Beneficiary requests insurance in conjunction with or as a result of the Services, GroundSure shall use reasonable endeavours to recommend such insurance, but makes no warranty that such insurance shall be available from insurers or that it will be offered on reasonable terms. Any insurance purchased by the Client or Beneficiary shall be subject solely to the terms of the policy issued by insurers and GroundSure will have no liability therefor. In addition you acknowledge and agree that GroundSure does not act as an agent or broker for any insurance providers. The Client should take (and ensure that the Beneficiary takes) independent advice to ensure that the insurance policy requested or offered is suitable for its requirements.
2.6 GroundSure's quotations or proposals are valid for a period of 30 days only unless an alternative period of time is explicitly stipulated by GroundSure. GroundSure reserves the right to withdraw any quotation or proposal at any time before an Order is accepted by GroundSure. GroundSure's acceptance of an Order shall be binding only when made in writing and signed by GroundSure's authorised representative or when accepted through the Order Website.

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3.1The Client shall comply with the terms of this Contract and
(i) procure that the Beneficiary or any third party relying on the Services complies with and acts as if it is bound by the Contract and
(ii) be liable to GroundSure for the acts and omissions of the Beneficiary or any third party relying on the Services as if such acts and omissions were those of the Client.
3.2 The Client shall be solely responsible for ensuring that the Services are appropriate and suitable for its and/or the Beneficiary's needs.
3.3 The Client shall supply to GroundSure as soon as practicable and without charge all requisite information (and the Client warrants that such information is accurate, complete and appropriate), including without limitation any environmental information relating to the Site and shall give such assistance as GroundSure shall reasonably require in the provision of the Services including, without limitation, access to the Site, facilities and equipment.
3.4 Where the Client's approval or decision is required to enable GroundSure to carry out work in order to provide the Services, such approval or decision shall be given or procured in reasonable time and so as not to delay or disrupt the performance of the Services.
3.5 Save as expressly permitted by this Contract the Client shall not, and shall procure that the Beneficiary shall not, re-sell, alter, add to, or amend the GroundSure Materials, or use the GroundSure Materials in a manner for which they were not intended. The Client may make the GroundSure Materials available to a third party who is considering acquiring some or all of, or providing funding in relation to, the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.
3.6 The Client is responsible for maintaining the confidentiality of its user name and password if using the Order Website and the Client acknowledges that GroundSure accepts no liability of any kind for any loss or damage suffered by the Client as a consequence of using the Order Website.

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4.1The Client acknowledges that the Services provided by GroundSure consist of the presentation and analysis of Third Party Content and other content and that information obtained from a Third Party Data Provider cannot be guaranteed or warranted by GroundSure to be reliable.
4.2 In respect of Data Reports, Mapping and Risk Screening Reports, the following classes of person and no other are entitled to rely on their contents;
(i) the Beneficiary,
(ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate),
(iv) the first purchaser or first tenant of the Site, and
(v) the professional advisers and lenders of the first purchaser or tenant of the Site.
4.3 In respect of Support Services, only the Client, Beneficiary and parties expressly named in a Report and no other parties are entitled to rely on its contents.
4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise expressly agreed in writing, no other person or entity of any kind is entitled to rely on any Services or Report issued or provided by GroundSure. Any party considering such Reports and Services does so at their own risk.

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5.1GroundSure shall charge and the Client shall pay fees at the rate and frequency specified in the written proposal, Order Website or Order acknowledgement form, plus (in the case of Support Services) all proper disbursements incurred by GroundSure. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services (together "Fees").
5.2 The Client shall pay all outstanding Fees to GroundSure in full without deduction, counterclaim or set off within 30 days of the date of GroundSure's invoice or such other period as may be agreed in writing between GroundSure and the Client ("Payment Date"). Interest on late payments will accrue on a daily basis from the Payment Date until the date of payment (whether before or after judgment) at the rate of 8% per annum.
5.3 The Client shall be deemed to have agreed the amount of any invoice unless an objection is made in writing within 28 days of the date of the invoice. As soon as reasonably practicable after being notified of an objection, without prejudice to clause 5.2 a member of GroundSure's management team will contact the Client and the parties shall then use all reasonable endeavours to resolve the dispute within 15 days.

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6.1 Subject to
(i) full payment of all relevant Fees and
(ii) compliance with this Contract, the Client is granted (and is permitted to sub-licence to the Beneficiary) a royalty-free, worldwide, non-assignable and (save to the extent set out in this Contract) non-transferable licence to make use of the GroundSure Materials.
6.2 All Intellectual Property in the GroundSure Materials are and shall remain owned by GroundSure or GroundSure's licensors (including without limitation the Third Party Data Providers) the Client acknowledges, and shall procure acknowledgement by the Beneficiary of, such ownership. Nothing in this Contract purports to transfer or assign any rights to the Client or the Beneficiary in respect of such Intellectual Property.
6.3 Third Party Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.

6.4 The Client shall, and shall procure that any recipients of the GroundSure Materials shall:

(i) not remove, suppress or modify any trade mark, copyright or other proprietary marking belonging to GroundSure or any third party from the Services;

(ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;

(iii) not create any product or report which is derived directly or indirectly from the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);

(iv) not combine the Services with or incorporate such Services into any other information data or service;

(v) not reformat or otherwise change (whether by modification, addition or enhancement), the Services (save that those acting for the Beneficiary in a professional capacity shall not be in breach of this clause 6.4(v) where such reformatting is in the normal course of providing advice based upon the Services);

(vi) where a Report and/or Mapping contains material belonging to Ordnance Survey, acknowledge and agree that such content is protected by Crown Copyright and shall not use such content for any purpose outside of receiving the Services; and

(vii) not copy in whole or in part by any means any map prints or run-on copies containing content belonging to Ordnance Survey (other than that contained within Ordnance Survey's OS Street Map) without first being in possession of a valid Paper Map Copying Licence from Ordnance Survey,

6.5 Notwithstanding clause 6.4, the Client may make reasonable use of the GroundSure Materials in order to advise the Beneficiary in a professional capacity. However, GroundSure shall have no liability in respect of any advice, opinion or report given or provided to Beneficiaries by the Client.

6.6 The Client shall procure that any person to whom the Services are made available shall notify GroundSure of any request or requirement to disclose, publish or disseminate any information contained in the Services in accordance with the Freedom of Information Act 2000, the Environmental Information Regulations 2004 or any associated legislation or regulations in force from time to time.

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7.1 This Clause 7 sets out the entire liability of GroundSure, including any liability for the acts or omissions of its employees, agents, consultants, subcontractors and Third Party Content, in respect of:

(i) any breach of contract, including any deliberate breach of the Contract by GroundSure or its employees, agents or subcontractors;

(ii) any use made of the Reports, Services, Materials or any part of them; and

(iii) any representation, statement or tortious act or omission (including negligence) arising under or in connection with the Contract.

7.2 All warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.

7.3 Nothing in the Contract limits or excludes the liability of the Supplier for death or personal injury resulting from negligence, or for any damage or liability incurred by the Client or Beneficiary as a result of fraud or fraudulent misrepresentation.

7.4 GroundSure shall not be liable for

(i) loss of profits;

(ii) loss of business;

(iii) depletion of goodwill and/or similar losses;

(iv) loss of anticipated savings;

(v) loss of goods;

(vi) loss of contract;

(vii) loss of use;

(viii) loss or corruption of data or information;

(ix) business interruption;

(x) any kind of special, indirect, consequential or pure economic loss, costs, damages, charges or expenses;

(xi) loss or damage that arise as a result of the use of all or part of the GroundSure Materials in breach of the Contract;

(xii) loss or damage arising as a result of any error, omission or inaccuracy in any part of the GroundSure Materials where such error, omission or inaccuracy is caused by any Third Party Content or any reasonable interpretation of Third Party Content;

(xiii) loss or damage to a computer, software, modem, telephone or other property; and

(xiv) loss or damage caused by a delay or loss of use of GroundSure's internet ordering service.

7.5 GroundSure's total liability in relation to or under the Contract shall be limited to £10 million for any claim or claims.

7.6 GroundSure shall procure that the Beneficiary shall be bound by limitations and exclusions of liability in favour of GroundSure which accord with those detailed in clauses 7.4 and 7.5 (subject to clause 7.3) in respect of all claims which the Beneficiary may bring against GroundSure in relation to the Services or other matters arising pursuant to the Contract.

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8.1 If GroundSure reasonably believes that the Client or Beneficiary has not provided the information or assistance required to enable the proper provision of the Services, GroundSure shall be entitled to suspend all further performance of the Services until such time as any such deficiency has been made good.

8.2 GroundSure shall be entitled to terminate the Contract immediately on written notice in the event that:

(i) the Client fails to pay any sum due to GroundSure within 30 days of the Payment Date; or

(ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an administration order made against it or if a receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or

(iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or

(iv) the Client or the Beneficiary breaches any term of the Contract (including, but not limited to, the obligations in clause 4) which is incapable of remedy or if remediable, is not remedied within five days of notice of the breach.

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9.1 Subject to clause 10.1, the Client may at any time upon written notice terminate or suspend the provision of all or any of the Services.

9.2 In any event, where the Client is a consumer (and not a business) he/she hereby expressly acknowledges and agrees that:

(i) the supply of Services under this Contract (and therefore the performance of this Contract) commences immediately upon GroundSure's acceptance of the Order; and

(ii) the Reports and/or Mapping provided under this Contract are
(a) supplied to the Client's specification(s) and in any event
(b) by their nature cannot be returned.

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10.1 Upon termination of the Contract:

(i) GroundSure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client and/or Beneficiary any property of the Client and/or Beneficiary in GroundSure's possession or control; and

(ii) the Client shall pay to GroundSure all and any Fees payable in respect of the performance of the Services up to the date of termination or suspension. In respect of any Support Services provided, the Client shall also pay GroundSure any additional costs incurred in relation to the termination or suspension of the Contract.

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11.1 The Client warrants that it shall:

(i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010;

(ii) comply with such of GroundSure's anti-bribery and anti-corruption policies as are notified to the Client from time to time; and

(iii) promptly report to GroundSure any request or demand for any undue financial or other advantage of any kind received by or on behalf of the Client in connection with the performance of this Contract.

11.2 Breach of this Clause 11 shall be deemed a material breach of this Contract.

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12.1 The Mapping contained in the Services is protected by Crown copyright and must not be used for any purpose other than as part of the Services or as specifically provided in the Contract.

12.2 The Client shall be permitted to make one copy only of each Report or Mapping Order. Thereafter the Client shall be entitled to make unlimited copies of the Report or Mapping Order only in accordance with an Ordnance Survey paper map copy license available through GroundSure.

12.3 GroundSure reserves the right to amend or vary this Contract. No amendment or variation to this Contract shall be valid unless signed by an authorised representative of GroundSure.

12.4 No failure on the part of GroundSure to exercise, and no delay in exercising, any right, power or provision under this Contract shall operate as a waiver thereof.

12.5 Save as expressly provided in this Contract, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.

12.6 The Secretary of State for Business, Innovation and Skills ("BIS") or BIS' successor body, as the case may be, acting through Ordnance Survey may enforce a breach of clause 6.4(vi) and clause 6.4(vii) of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.

12.7 GroundSure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:

(i) the Client or Beneficiary's failure to provide facilities, access or information;

(ii) fire, storm, flood, tempest or epidemic;

(iii) Acts of God or the public enemy;

(iv) riot, civil commotion or war;

(v) strikes, labour disputes or industrial action;

(vi) acts or regulations of any governmental or other agency;

(vii) suspension or delay of services at public registries by Third Party Data Providers;

(viii) changes in law; or

(ix) any other reason beyond GroundSure's reasonable control.

In the event that GroundSure is prevented from performing the Services (or any part thereof) in accordance with this clause 12.6 for a period of not less than 30 days then GroundSure shall be entitled to terminate this Contract immediately on written notice to the Client.

12.8 Any notice provided shall be in writing and shall be deemed to be properly

given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.

12.9 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email (save to the extent such day is not a working day where it shall be deemed to have been delivered on the next working day) and on the second working day after the day of posting if sent by first class post.

12.10 The Contract constitutes the entire agreement between the parties and shall supersede all previous arrangements between the parties relating to the subject matter hereof.

12.11 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.

12.12 This Contract shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with this Contract shall be subject to the exclusive jurisdiction of the English courts.

12.13 GroundSure is an executive member of the Council of Property Search Organisation (CoPSO) and has signed up to the Search Code administered by the Property Codes Compliance Board (PCCB). All Risk Screening Reports shall be supplied in accordance with the provisions of the Search Code.

12.14 If the Client or Beneficiary has a complaint about the Services, written notice should be given to the Compliance Officer at GroundSure who will respond in a timely manner.

12.15 The Client agrees that it shall, and shall procure that each Beneficiary shall, treat in confidence all Confidential Information and shall not, and shall procure that each Beneficiary shall not (i) disclose any Confidential Information to any third party other than in accordance with the terms of this Contract; and (ii) use Confidential Information for a purpose other than the exercise of its rights and obligations under this Contract. Subject to clause 6.6, nothing shall prevent the Client or any Beneficiary from disclosing Confidential Information to the extent required by law

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