

DESKTOP STUDY REPORT

Site Address:	Brimsole Barn, Brimstone Hill, Meopham, Gravesend, Kent DA13 0BN
Report Date:	March 2025
Project No.:	19458
Prepared for:	Open Architecture Ltd
Planning Application	Gravesham Borough Council - 20231221



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DESKTOP STUDY GENERAL NOTES

This report has been prepared based on the findings of investigations into the site's conditions using current available data which has been recovered from Envirocheck to provide environmental data in relation to the site and surrounding area. Where possible, local sources have been researched to gain a better understanding of the site's conditions. As part of this review, research has been undertaken with the Local Authority and the Environment Agency to aid in the assessment of the site's condition.

We can confirm that this report has been prepared based on the information gained and that this information is not exhaustive, and that subsequent research may reveal additional facts that may influence the reporting. Where possible, this information has been researched.

All geological information has been researched using the British Geological Society website, (the geology viewer). The disclaimer associated with this portal confirms 'The British Geological Society accept no responsibility for omissions or misinterpretations of the data from their Data Bank as this may be old or obtained from non-BGS sources and may not represent current interpretation.'

The accuracy of map extracts cannot be guaranteed, and it should be recognized that different conditions on site may have existed after the various map surveys.

We can confirm that within the assessment of the site, various websites have been visited and as such, we cannot confirm the validity of these sites and as such, this information is accepted de facto and without prejudice. Anyone relying on these sources does so at their own risk, however, Herts & Essex Site Investigations does undertake all reasonable care to ensure this data is relevant and correct.

It should be confirmed that the extent of review of this report has undertaken a broad review of on-site features which would promote a contamination ground risk, however, this does not include ecological features and in particular Japanese Knotweed which should be reviewed under separate cover.

A review of the site will be made to confirm the extent of obvious Asbestos products or sheet materials either on the surface of the site soil or evident above ground, however, does not constitute a full Asbestos Survey by any means. This should be sought under separate cover.

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1	Final	1 st March 2025		

SUMMARY

Client	Open Architecture Ltd.		
Site Location	Brimsole Barn, Brimstone Hill, Meopham, Gravesend, Kent DA13 0BN.		
Existing Development	The existing site is formed primarily by a storage area, formally farm barns which are accessed from the main road down a slope and into the site. A pond which is essentially sludge filled is present adjacent to the main entrance to the front of the site with barns and outbuildings to the rear. Upon gaining access to the main part of the site, the site is essentially flat.		
Proposed Development	The proposed development forms the construction of two new residential dwellings with associated access and park areas with landscaping proposed to both the front and rear of the site.		
Site Settings and Previous Uses	The existing site is recorded as the existing farm buildings in place from the earliest map records in 1869 until present day. A pond is also present on the site from the earliest map record until present day. Surrounding the site, Woodland and Open Land is in place from the earliest map records with Brimstone Cottage some 90 meters to the southeast of the site from again, the earliest map record until present day. A residential house is constructed on the northern boundary in 1961 and present to date. Farm buildings, (expansion of the farm), was completed in 1961 and remains in place to date some 20 meters to the east. Greenacres Farm is developed in 1961 and present to date some 50 meters to the north west.		
Geological and Hydrological Profile	Geology		Aquifer Classification
	Made Ground	Shallow Made Ground Anticipated	Not Classified
	Head Deposits	Clay, Silt and Sand	Secondary Aquifer
	New Pit Chalk Formation	Chalk	Principal Aquifer
Nearest Surface Water Feature	The nearest surface water feature is recorded as on site which is identified as a Pond. No river systems are identified within close proximity to the site.		
Groundwater Abstractions	The nearest abstraction well is located 823 meters to the north east of the site which is identified as a Public Water Supply.		
Source Protection Zone	The site lies within an SPZ II Source Protection Zone. An SPZ I is recorded as 221 meters to the east of the site.		
Potential Sources of Contamination	Features On Site - Farm, - Infilled Pond with organic material, - Garage Area. Features Off Site - Farm Buildings - Greenacres Farm, 50m, NW - Additional Barns Built, 20m, E		
Human Health Risk	We would suggest that where there are potential sources of contamination the potential pathways in place within the site area are recorded as :- - Dermal Contact. - Inhalation of dust and fibres. - Ingestion of dust and fibres via home-grown produce with plant uptake. - Inhalation of vapours from soils. - Inhalation of land Gases. - Inhalation of vapours through contaminated groundwaters - Ingestion of contaminated water through water main pipework. - Leaching, lateral migration of shallow groundwater to a target receptor. - Leaching, migration through fissures / cracks which may migrate to a groundwater receptor. - Plant Uptake. - Inhalation Asbestos dust and fibres (from Asbestos within the building). - Inhalation Asbestos dust and fibres (from asbestos within the soil).		
Receptors	Based on the proposed use of the site and the finding of this Desktop Study the following receptors will need to be considered :- - Human Health, (Site Development Personnel). - Human Health, (Residents or staff). - Adjoining Landowners, (unlikely). - Flora. - Groundwater. - Abstraction wells. - Surface water features.		
Proposed Investigation Work	Further works should be completed based on this assessment and follow protocols under BS 10175:2011+A2:2017, (Investigation of potentially contaminated sites). These recommended works are as follows :-		
Human Health Risk	- Intrusive investigation to assess and recover samples of the made ground and underlying natural geology to consider the geology and soil contamination. - Targeted samples to be recovered from with and/or around the sources noted above - Spatial sampling to be completed across the site area. - Chemical testing to be completed on an appropriate number of samples for the recommend pollutants.		
Land Gas Risks	- An assessment of risk Should be completed using RB17 A Pragmatic Approach to Ground Gas Risk Assessment (2012) - Install standpipes within the made ground and underlying superficial deposits to form the response zone for the site. - A Standpipe should be installed within the location of the pond on site to consider ground gases. - A minimum of 1 No standpipe should be installed and preferably 3 No standpipes around the site. - Complete six monitoring rounds over falling or low atmospheric pressure or frozen ground conditions.		
Vapour Risk	- Soil testing to be undertaken to assess whether contamination that may promote a vapour risk is in place within the site area and the groundwater, where present. - A minimum of 1 No standpipe should be installed and preferably 3 No standpipes around the site. - Complete vapour monitoring to assess vapour risk.		

<i>Groundwater Risks</i>	• Assess soils profile to consider the requirement for installation of standpipes, (Clay or absence of groundwater would suggest limited groundwater risk). • Where significant risk is identified in place, undertake leachate testing on samples to assess mobility of soil contamination. • Utilize ground gas monitoring wells as dual gas and groundwater monitoring wells and recover samples of the groundwater for later chemical analysis. ◦ Purge groundwater monitoring wells and recover fresh samples of the groundwater for this testing. • Testing suite to be as per the recommendations within this report.
<i>Watching Brief</i>	• Maintain a watching brief throughout all site investigation works. ◦ Sample recovery should undertake due diligence to consider the presence of Asbestos as a critical risk. ◦ An engineering description of the samples recovered and depths to be noted for use within environmental reporting. ◦ An olfactoral assessment of the site soils exposed and recovered should be made and recorded for use within the environmental reporting.
<i>Reporting</i>	• Complete an environmental report in accordance with BS 10175:2011+A2:2017. • Report all findings of the site investigation.

PRELIMINARY RISK ASSESSMENT – DESKTOP STUDY - PHASE 1 REPORT

1 Context and Objectives of this report

1.1 Introduction

We have been asked by Open Architecture Ltd to undertake an investigation of the above site to assess the potential environmental impact of the existing and historical use of the site on the proposed development sufficient to document the level of risk and impact on future users and the environment.

The client is proposing to develop residential dwellings with gardens, as such the derivation of risk has been assigned as a 'Residential Land Use with Home-grown Produce'.

1.2 Reference to the Current Planning Application Details

An application is in place with Gravesham Council as follows:-

Application no: 20231221

Application details: Conversion of existing agricultural barns into two 3 bedroom dwellings, with associated car ports, garden and landscaping.

Decision: Granted Permission

1.3 Decision Notice Relating to Contaminated Land

Within the above application the following condition (s) are in place which relates to contaminated land and this report should be submitted as part of gaining the planning approval.

DECISION NOTICE – CONDITION 3

No development shall take place prior to a contaminated land assessment (in accordance with the CLEA guidelines and CLR 11 methodology) and if necessary an associated remedial strategy, together with a timetable of works, being submitted to and approved in writing by the Local Planning Authority.

a) The contaminated land assessment shall include a desk study to be submitted to the Local Planning Authority for approval. The desk study shall detail the history of the site uses and propose a site investigation strategy based on the relevant information discovered by the desk study. The strategy shall be approved by the Local Planning Authority prior to investigations commencing on site.

b) The site investigation, including relevant soil, soil gas, surface and groundwater sampling, shall be carried out by a suitably qualified and accredited consultant/contractor in accordance with a Quality Assured sampling and analysis methodology.

c) A site investigation report detailing all investigative works and sampling on site, together with the results of analysis, risk assessment to any receptors and a proposed remediation strategy shall be submitted to the Local Planning Authority. The Local Planning Authority shall approve such remedial works as required prior to any remediation commencing on site. The works shall be of such a nature so as to render harmless the identified contamination given the proposed end-use of the site and surrounding environment including any controlled waters.

d) Approved remediation works shall be carried out in full on site under a quality assurance scheme to demonstrate compliance with the proposed methodology and best practice guidance). If during any works contamination is encountered which has not previously been identified then the additional contamination shall be fully assessed and an appropriate remediation scheme agreed with the Local Planning Authority.

e) Upon completion of the works, this condition shall not be discharged until a closure report has been submitted to and approved by the Local Planning Authority. The closure report shall include details of the proposed remediation works and the quality assurance certificates to show that the works have been carried out in full in accordance with the approved methodology. Details of any post remediation sampling and analysis to show the site has reached the required clean-up criteria shall be included in the closure report together with the necessary documentation detailing what waste materials have been removed from the site.

f) Where applicable, a monitoring and maintenance scheme to include monitoring the long-term effectiveness of the proposed remediation over an agreed period of time, and the provision of reports on the same, must be prepared and approved in writing by the Local Planning Authority. Following completion of the measures identified in that scheme, and when the remediation objectives have been achieved, reports that demonstrate the effectiveness of the monitoring and maintenance carried out must be produced and submitted to the Local Planning Authority.

Reason: To prevent harm to human health and pollution of the environment in accordance with Policy CS19 of the Gravesham Local Plan Core Strategy 2014..

1.4 Report Objectives

The objective of this report is to assess and understand any potential sources, pathways and receptors associated with the site and preparation of a Conceptual Site Model (CSM) followed by a qualitative risk assessment, in line with UKs current regulatory guidance.

To complete the above the following will be undertaken.

- A visual walkover inspection of the site to review current and recent site activities, the condition of the site, potential ground related hazards and activities or areas that might have the potential to cause ground contamination as well as possible indicators of contamination.
- Review of historical land uses for the site and surroundings with a particular emphasis on identifying potential ground hazards and on-site and off-site contamination sources.
- A review of the geological, hydrological, and hydrogeological setting of the site, and public domain environmental information to build up an understanding of the site and its environmental setting/sensitivity/receptors.

1.5 Management Constraints

The site investigation has been prepared based on a budget and time scales which has been agreed with the client. The desk top study fees have been agreed at this time which will dictate a way forward.

2 Characteristics of the site

2.1 The Site

The site is located within a rural area of Meopham in Kent, the details of which are summarised in Table 1 with the location plan of the site shown in Appendix 3, Sheet 1.

Table 1 Site Detail

Site Address:	Brimsole Barn, Brimstone Hill, Meopham, Gravesend, Kent DA13 0BN
Site assessed under	Site Owners Request - Aid as part of planning and warranties.
Current use of land:	Farm.
Previous use of site, (if known)	As above.
Grid Reference	NGR 565540, 165830
Site Area	0.12 Hectares.
Local Authority	Gravesham Borough Council.
Gradient of the site	The site slopes down from the main road and into the site where the site levels out. A pond is in place in the front of the site.
Proximity of Controlled Waters, (if known)	The nearest surface water feature is recorded as on site which forms a pond.

2.2 Existing Site Use

The existing site is formed primarily by a storage area, formally farm barns which are accessed from the main road down a slope and into the site. A pond which is essentially sludge filled is present adjacent to the main entrance to the front of the site with barns and outbuildings to the rear. Upon gaining access to the main part of the site, the site is essentially flat.

2.3 Surrounding Land Uses

The surrounding land uses are detailed below: -

- To the north of the site area residential land is in place.
- To the east of the site farm buildings are in place.
- To the south of the site area farm buildings are in place
- To the west of the site area the main access road is in place beyond which is open land.

2.4 Site Reconnaissance

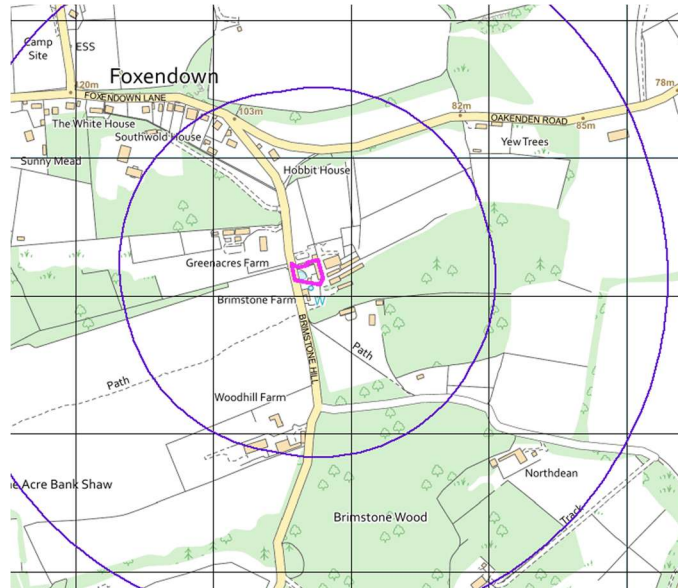
The site walk over visit was undertaken in February 2025 on which the weather conditions were recorded overcast.

Access

Access into the site is identified from the main road where the site enters gates which lead onto the site. The gates form five bar gates and are not locked.

Upon gaining access into the site, the main access slopes down and into the area in front of the main barns. Upon reaching the base of the main access road, the site levels out. No access was available into the main barns, although, some areas were available for visual access.

Site Area



The site is occupied by a variable shaped parcel of land which is access from the main road via an entrance area and through a five bar gate and down a small track and into the site area. The track leads between the northern fence boundary and the pond located to the immediate south of the site and up to the southern boundary.

The pond area was overgrown with weeds and wild grasses with the pond recorded as infilled with a slurry infill, (likely muds and organic material).

Towards the end of the pond to the east of the site, a barn / garage is in place which has a trailer, some tyres and construction materials in with limited other features. Some wooden pallets are recorded in place adjacent to this, although, limited other features.

To the rear of the site, two barns are recorded in place which are based on a column construction and have Asbestos sheet roofing across all sides and roofing. Internally to this, the areas are segregated into areas by wooden panels and have limited features present. Manholes are recorded in place internally, although, no access to these was available.

The cladding to the main barns is identified as in a relatively good state of repair with no significant breaks in the cladding.

The floor area surrounding the barns is identified as road stone.

Vegetation

With the exception of the areas surrounding the main pond, no vegetation was identified in place.

Above or below ground fuel or oil storage tanks

By examination of the site no above ground tanks are in place, no features are present to suggest that any below ground fuel tanks would be in place within the site area.

Asbestos Containing Materials

Possible Asbestos containing materials were reviewed on the roof and clad walls of the building towards the rear of the site area, the sheeting looked to be intact and in a good state of repair, suggesting that there is limited risk of this forming a risk of fragment being in place within the soils. From the walk over no obvious fragments were seen in place. We recommend that an asbestos survey of the building be carried out, if not done so already, prior to any further demolition or works on site. A full assessment for asbestos within the fill in site will be required to fully consider risk from Asbestos.

Surrounding Area

Surrounding the site area residential land is in place to the north of the site with farm land to the east and south recorded as barns and outbuildings. The area to the west of the site is recorded as open land beyond the main road.

Site Levels and Ground Cover

The site is recorded as a sloping site from the main road and down into the site with an embankment in front of the main pond. Upon gaining access into the site, the area levels out to form a relatively flat area of land.

Current site activities

The current site use forms a vacant farm, with buildings.

Effluent, Site Drainage and Services

Drainage is identified in place, although, no access is available into the buildings.

2.5 Site Reconnaissance – Photos

Print 1 View of main access



Print 2 View to south of the site along main road



Print 3 View of the main entrance



Print 4 View of planning condition sign



Print 5 View of main entrance



Print 6 View of main entrance and pond



Print 7 View of front embankment



Print 8 View of historic pond



Print 9 View of front of the main pond



Print 10 View of residential land to north.



Print 11 View of rear barns



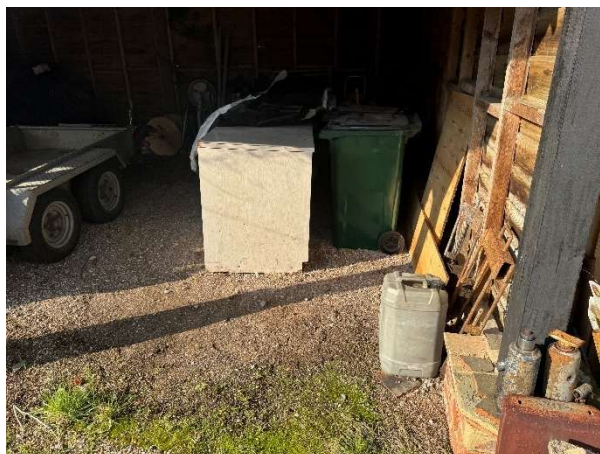
Print 12 View of rear barns



Print 13 View of small garage



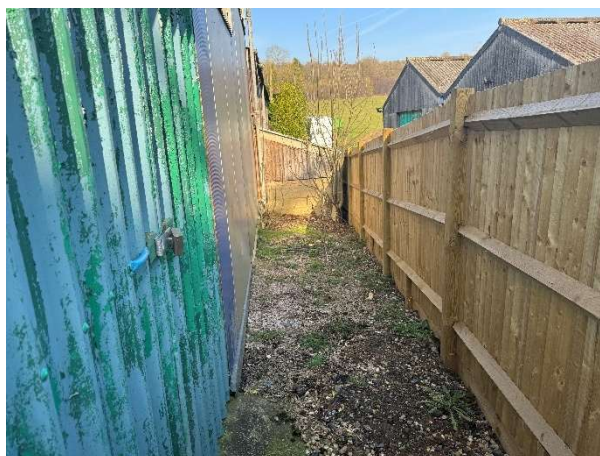
Print 14 View of garage area



Print 15 View of internal garage area



Print 16 View of rear of the main barns



Print 17 View across front of the site



Print 18 View to the north to the front



Table 2 **Walk Over Inspection Risk**

<i>Feature</i>	<i>Location</i>	<i>Elevation</i>	<i>Is A Risk Assessment Required?</i>	<i>Justification</i>
Infilled pond with organic material	Front of the site	At GL.	✓	
External barns, (Storage and Cladding Asbestos)	Rear Section	At GL.	✓	
Garage area	Rear Section	At GL.	✓	
External Farm Buildings	East of the site	At GL.	✓	

3 *Details of Searches Undertaken*

Within this report, various searches have been undertaken to assess the risk associated with the development of the site from the historical and current use of the site and surrounding area. These include: -

- Environmental Data Search 1:10,000.
- Environmental Data Search 1:2,500.
- Site Sensitivity Maps and Data Sheets.
- Historical Maps.
- Internet Search.
- Local Authority Search – Planning Files.
- Consultation with Site Owner / Architect.

4 *Information on Historical and Current Activities on the Site and Surrounding Area*

The history of the site's land-use and development from Victorian times onwards has been researched from Ordnance Survey, (O.S.) maps. Extracts of the O.S. Maps and plans are presented in Appendix 4. Reference to historical maps provides invaluable information regarding the land use/history of the site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive map references.

4.1 *Discussion of the Development History*

A summary of the historical development of the site and surrounding area based on the information obtained from the above sources is provided in Table 3. It should be noted that these maps are only a small section of time and represent the timescales given in each of the map records. It is highly possible that development or features may have been developed within or surrounding the site which may influence the site, and this should be born in mind when assessing the history of the site.

Table 3 *Historic Maps Assessment*

Date	Scale	On Site Feature	Off Site Features
1869	1:10,560	Brimstone Farm, (Including Farm Buildings and a Pond)	Woodland and open land. Small building to SW, 10m Brimstone Cottage, 90m, SE
1894	1:2,500		
1896	1:2,500		
1897	1:10,560		
1908	1:2,500		
1909	1:10,560		
1931	1:10,560		
1936	1:2,500		
1947	1:10,560		
1961	1:10,000		Residential House, 2m, N Farm Buildings, 10m, E Greenacres Farm, 50m, NW
1962	1:2,500	Additional Garage Built	
1965	1:10,000		

Table 4 **Historic Maps Assessment**

Date	Scale	On Site Feature	Off Site Features
1967	1:2,500		Additional Barn Built, 20m, E
1975	1:10,000		
1993	1:2,500		
1999	1:2,500		
1999	1:10,000		
2006	1:10,000		
2024	1:10,000		

Table 5 **Overview of Historic Map Assessment Risk**

Identified Risk	Distance & Direction	Year	Is A Risk Assessment Required?	Justification
Brimstone Farm, (Including Farm Buildings and a Pond)	On Site	1869 – Present	X	No Source
Additional Garage Built	On Site	1962 - Present	✓	Possible risk in place from made ground and historic sources
Woodland & Open Land	Off Site, All Directions	1869 - Present	X	No Source
Small building	Off Site, 10m, SW	1869 - Present	X	No Source
Brimstone Cottage	Off Site, 90m, SE	1869 - Present	X	No Source
Residential House	Off Site, 2m, N	1961 - Present	X	No Source
Farm Buildings	Off Site, 10m, E	1961 - Present	✓	Possible risk in place from made ground and historic sources
Greenacres Farm	Off Site, 50m, NW	1961 - Present	✓	Possible risk in place from made ground and historic sources
Additional Barn Built	Off Site, 20m, E	1967 - Present	✓	Possible risk in place from made ground and historic sources

5 *Details of the Intended Future Use of the Site*

The proposed development forms the construction of two new residential dwellings with associated access and park areas with landscaping proposed to both the front and rear of the site.

6 *References of Planning Applications*

From a review of the Gravesham Borough Council web site the following applications is recorded for the site area.

Application No: 20230184

Proposal: Conversion (change of use) of existing barn into new three bedroom dwelling with associated parking

Decision: Granted Permission

Historical applications are in place with Council as follows: -

Application No: 20231221

Proposal: Conversion of existing agricultural barns into two 3 bedroom dwellings, with associated car ports, garden and landscaping.

Decision: Permitted

7 *Discussion with Local Authority*

No current contact is in place within the site with Local Authority.

8 *Consultation with Environment Agency*

Consultation has not been made with the Environment Agency at this time. The information gained from Envirocheck and the EA web site has provided sufficient information at this stage. The assessment of the site should consider the groundwater regime within the site area and the possible risk from both on-site and off-site contamination.

Should heavy or persistent contamination be identified within any Phase 2 or intrusive investigation, consultation will be required and will be undertaken.

9 *Unexploded Bomb Assessment*

A review of the data available on Zeticauxo web site, revealed the site was located within a moderate-risk area associated with unexploded ordnance (UXO), as having a bombing density of 15 to 49 bombs per 1000acre.

([Risk Maps](#) | [Zetica UXO](#))

10 *Consultation with Appropriate Bodies/Local Sources*

A request for information relating to the site has been made to confirm the site condition, any potential sources of risk within the site. No additional information has been supplied which could be added to this report. The requested information is as follows :-

- Prior knowledge in relation to the history of the site uses.

- Service search to confirm the location of any and all Gas, Electric, Water Main, Fibre Optic, drainage works.
- Asbestos Containing Materials, (reporting or building management plan).
- Underground Fuel or Oil Tanks.
- Above Ground Fuel or Oil Tanks.
- Petrol Interceptors.
- Pollution Incidents.
- Storage of Chemicals, Pesticides, Herbicides.
- Electric Sub Station Uses.

11 Previous Reporting

No previous reports relating to contaminated land, or the ground conditions are known to us at the time of writing this report which relate to the site specifically.

12 Environmental Settings

12.1 Superficial Deposits and Solid Geology

The ground conditions based on geological maps and BGS information shows the site to be located within an area recorded as Head Deposits which in turn overlie New Pit Chalk Formation.

12.2 BGS Boreholes

BGS Boreholes have been identified close to the site which are recorded below:-

- BOREHOLE REFERENCE : TQ66NE11
- GEOLOGY : Upper Chalk
- GROUNDWATER : Unknown

12.3 Hydrogeology

The published Environment Agency Groundwater Vulnerability Map of the area indicates the site to be located within an area classified as a Secondary A Aquifer. The underlying geology is recorded as an Principal Aquifer which is formed by New Pit Chalk formation.

Principal aquifers provide significant quantities of drinking water, and water for business needs. They may also support rivers, lakes and wetlands.

Secondary A aquifers comprise permeable layers that can support local water supplies and may form an important source of base flow to rivers.

The nearest abstraction well is located 823 meters to the north east of the site which is identified as a Public Water Supply.

The site lies within an SPZ II Source Protection Zone. An SPZ I is recorded as 221 meters to the east of the site.

Table 6 **Summary of Geological Information**

Geological Unit	Brief Description	Anticipated thickness, (m)	Aquifer Type
Superficial Deposits/Drift On Site			
Filled/Re-worked ground	Made Ground, (Potentially Contaminated Stratum).	0.5-1.00 meters+	Not Classified
Head Deposits	Clay, silt, sand and gravel	4-6 meters	Secondary A Aquifer
Solid Geology Deposits			
New Pit Chalk	Chalk	15m +	Principal Aquifer

The above information has been taken from the BGS website based on the postcode location of the site.

12.4 Hydrology

The nearest surface water feature is recorded as on site which is identified as a Pond. No river systems are identified within close proximity to the site.

No discharge consents are recorded surrounding the site.

The nearest pollution incident to controlled waters is identified as 237 meters to the southeast of the site. This is recorded as a Minor Incident from Miscellaneous – Fire water / Foam.

12.5 Implication of groundwater

Considering the underlying Secondary A Aquifer, groundwater links are possible and therefore some degree of assessment will be required to classify the extent of risk to a groundwater system, as well as abstraction wells, surface water features and source protections zones surrounding the site area.

In accordance with Environment Agency guidance document: -

- The Environment Agency's approach to groundwater protection, Version 1.2, (February 2018)

The document confirms: -

- "Selecting compliance points for use in land contamination risk assessments the distance to a set compliance point should not exceed 50 metres for hazardous substances or a maximum of 250 metres for non-hazardous pollutants unless there are specific physical constraints on the ability to use the groundwater resource. Any increases above these specified distances may be justified but must be supported by a sustainability assessment that considers environmental, social and economic factors."

Considering the above, groundwater risk may be in place if significant contamination or a persistent source of contamination are encountered or recorded within the site area, within the information to date risk is considered possible.

12.6 Flooding

Based on the BGS Flood GFS Data the site is recorded within an area with potential for groundwater flooding to occur at surface. Off site to the north and east of the site there are area at a low risk (1000 year return) for flooding from surface water.

Based on a post code search of the Gov.com website the risks are noted as follows.

Surface water:

Yearly chance of flooding – Very Low

Yearly chance of flooding between 2040 and 2060 - Low

River and the sea:

Yearly chance of flooding – Very Low

Yearly chance of flooding between 2036 and 2069 – Very Low

Groundwater – Unlikely

Reservoirs - Unlikely

12.7 Landfill Sites

No landfill sites are recorded in place surrounding the site area.

No infilled land has been recorded surrounding the site.

Table 7 *Sensitivity of Environmental Receptors in the Vicinity of the Site*

Receptor Type	Receptor(s)	Sensitivity	Comments
Groundwater	Secondary A Aquifer	Moderate	Possible risk to underlying Gravel Deposits.
	Principal Aquifer	High	Migration to a lower target is possible and may cause risk to groundwater
Water Abstraction	Potable Water Supply	Medium	The nearest abstraction well is located 823 meters to the north east of the site which is identified as a Public Water Supply.
Source Protection Zone	NONE		
Surface Water	Pond	Low	The nearest surface water feature is recorded as a pond on site.
Flooding	NONE		

13 Site Drainage and Other Potential Man-Made Pathways

Drainage is recorded in place, although, the site has not been reviewed for drainage routes. A full drainage assessment may aid in the assessment of the site in relation to pathway creation for pollution to migrate.

14 *Regulatory Data*

Information relating to the potential hazards associated with environmental regulatory controls are summarised in Table 7 and 8. This information is recorded in full within the Envirocheck Data provided within Appendix 5. The salient points recorded within this data are re-created below.

Table 8 **Summery of Regulatory Data - Sources**

<i>Data Sources</i>	<i>On Site</i>	<i>Off Site</i>	<i>Distance from site</i>	<i>Is A Risk Assessment Required?</i>	<i>Justification</i>
Discharge Consents	None	Sewage Discharges - Final/Treated Effluent - Not Water Company	647m, S	X	Distance Removes Risk
Pollution Incident to Controlled Waters	None	Miscellaneous/Other Pollution Type	237m, SE	X	Distance Removes Risk
Radon Potential - Radon Protection Measures	The property is in an Intermediate probability radon area (1 to 3% of homes are estimated to be at or above the Action Level).		On Site	X	No radon protective measures are necessary in the construction of new dwellings or extensions.

Table 9 **Summary of Regulatory Data - Receptors**

<i>Data Receptors</i>	<i>On Site</i>	<i>Off Site</i>	<i>Distance from site</i>	<i>Is this a potential receptor for risk ?</i>	<i>Justification</i>
Nearest Surface Water Feature	Pond		On Site	✓	Possible risk on site
Water Abstractions	None	Public Water Supply	823m, NE	✓	Possible pollution of the groundwater may impact on SPZ
		Public Water Supply: Potable Water Supply - Direct	847m, NE	✓	
OS Water Network Lines	None			X	
Source Protection Zone	SPZ II	SPZ I	221m, E	X	Possible pollution of the groundwater may impact on SPZ

<i>BGS Estimated Soil Chemistry Pollutant</i>	<i>BGS Estimated Soil Chemistry (mg / kg)</i>
Arsenic	<15
Cadmium	<1.8
Chromium	60-90
Lead	<100
Nickel	15-30

Table 10 Geological Hazards

<i>Geological Hazard</i>	<i>Distance & Direction</i>	<i>Feature</i>	<i>Risk Assessment Required</i>
Non-Coal Mining Areas of Great Britain	On Site		Rare
Collapsible Ground	On Site		Very Low
Compressible Ground	On Site		No Hazard
Ground Dissolution Features	On Site		Very Low
Landslide	On Site		Very Low
Running Sand	On Site		Very Low
Shrinking or Swelling Clay	On Site		Very Low

Table 11 Summary of Contemporary Trade Entries

<i>Trade Name</i>	<i>Trade Use</i>	<i>Distance & Direction from Site</i>	<i>Is A Risk Assessment Required?</i>	<i>Comment</i>
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No trades are recorded within 500 meters of the site area.

*NB The above information has been provided by Envirocheck and is taken from the Thomson Directories

15 Identification of Potential Contaminants of Concern and Source Areas

Potential sources of contamination are brought forward for further risk assessment which are detailed in Table 14: -

Table 12 **Table of Source Risk**

Risk Assessment	Source Risk	Associated Contaminants	Source of Information	Location	Date	Considering Site Specific Pathways	
						Assessment Required.	Method of Assessment
A	Farm, Infilled Pond with organic material, Garage Area.	Metal, semi metals, PAHs, Asbestos, TPHs, CO2, CH4, (Land Gases).	Historic Maps and Walk Over Survey	On Site	1869 – Present	Possible Soil Risk Possible GW Risk Possible Land Gas Possible Vapour Risk	Recover Soil Samples Install Standpipes Land Gas Assessment GW & Vapour Assessments
B	Farm Buildings Greenacres Farm, 50m, NW Additional Barns Built, 20m, E	Metal, semi metals, PAHs, Asbestos, TPHs, CO2, CH4, (Land Gases).	Historic Maps	Off Site	1896 - Present	Possible GW Risk Possible Land Gas Possible Vapour Risk	Install Standpipes Land Gas Assessment GW & Vapour Assessments

16 Outline Conceptual Model

What must now be considered is what contamination should be identified as a potential hazard because of the use of the site-specific source pathway and receptor. To undertake this task, the risk assessment process is based on guidance provided in CIRIA C552 (2001) Contaminated Land Risk Assessment – A Guide to Good Practice.

The information below incorporates a hazard assessment of the features surrounding the site that could potentially impact on the proposed development and has also been reproduced as a pictorial conceptual site model in Appendix 2. This is based on the information below: -

Table 13 *CIRIA Contaminated Land Risk Assessment Table*

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate/Low Risk
	Likely	High Risk	Moderate Risk	Moderate/Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate/Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate/Low Risk	Low Risk	Very Low Risk	Very Low Risk

Extracted from CIRIA Publication C552 Contaminated Land Risk Assessment

Table 14 Risk Assessment A

Source (Potential Contaminating Use)	Potential Contaminants	Receptors	Pathways	Associated Hazard, [Severity]	Proposed Site Use Risk Assessment		
					Likelihood of occurrence	Potential Risk	Notes
Farm, Infilled Pond with organic material, Garage Area	TPHs Naphthalene, CO ₂ CH ₄	Site Users. Construction Workers.	Dermal contact. Inhalation dust and fibres.	Medium	Likely	Moderate	Possible risk in place.
			Ingestion of dust and fibres via home-grown produce and plant uptake.	Medium	Likely	Moderate	Possible risk in place.
			Ingestion of contaminated water through water main pipework.	Medium	Likely	Moderate	Possible risk in place.
			Inhalation of vapours.	Medium	Likely	Moderate	Possible risk in place.
			Inhalation of land Gases.	Medium	Likely	Moderate	Possible risk in place.
			Inhalation of vapours through contaminated ground waters.	Medium	Likely	Moderate	Possible risk in place.
		Adjoining Landowners.	Dermal contact. Inhalation of dust and fibres. Ingestion of dust and fibres	Medium	Low Likelihood	Moderate / Low	Limited risk in place.
			Ingestion of home-grown produce.	Medium	Low Likelihood	Moderate / Low	Limited risk in place.
			Ingestion of contaminated water through water main pipework.	Medium	Low Likelihood	Moderate / Low	Limited risk in place.
			Inhalation of vapours.	Medium	Low Likelihood	Moderate / Low	Limited risk in place.
			Inhalation of vapours through contaminated ground waters.	Medium	Low Likelihood	Moderate / Low	Limited risk in place.
		Controlled Surface Water.	Leaching, lateral migration of shallow groundwater to a target receptor.	Medium	Likely	Moderate	Possible risk in place.
		Ground Water. Abstraction Well.	Leaching, migration through fissures / cracks which may migrate to a groundwater receptor.	Medium	Likely	Moderate	Possible risk in place.
	Asbestos	Site Users Construction Workers.	Inhalation dust and fibres (from Asbestos within the building)	Severe	Likely	High	Possible risk in place.
			Inhalation dust and fibres (from asbestos within the soil)	Severe	Likely	High	Possible risk in place.
	Metals Metalloids PAHs	Site Users. Construction Workers.	Direct contact. Inhalation dust and fibres. Dermal contact.	Medium	Likely	Moderate	Possible risk in place.
			Ingestion of home-grown produce.	Medium	Likely	Moderate	Possible risk in place.
		Flora	Plant Uptake. Direct Contact.	Medium	Likely	Moderate	Possible risk in place.
		Controlled Surface Water.	Leaching, lateral migration of shallow groundwater to a target receptor.	Medium	Likely	Moderate	Possible risk in place.
		Ground Water. Abstraction Well.	Leaching, migration through fissures / cracks which may migrate to a groundwater receptor.	Medium	Likely	Moderate	Possible risk in place.
	TPHs, Naphthalene.	Buildings. Construction Materials. Services	Direct contact with contaminated soils.	Medium	Likely	Moderate	Possible risk in place.
			Direct contact with contaminated groundwater.	Medium	Likely	Moderate	Possible risk in place.

Table 15 Risk Assessment B

Source (Potential Contaminating Use)	Potential Contaminants	Receptors	Pathways	Associated Hazard, [Severity]	Proposed Site Use Risk Assessment		
					Likelihood of occurrence	Potential Risk	Notes
Farm Buildings, 5m, E Greenacres Farm, 50m, NW Additional Barns Built, 20m, E	TPHs Naphthalene.	Site Users. Construction Workers.	Dermal contact. Inhalation dust and fibres.	Medium	Low Likelihood	Moderate / Low	Possible risk in place.
			Ingestion of dust and fibres via home-grown produce and plant uptake.	Medium	Low Likelihood	Moderate / Low	Possible risk in place.
			Ingestion of contaminated water through water main pipework.	Medium	Low Likelihood	Moderate / Low	Possible risk in place.
			Inhalation of vapours.	Medium	Low Likelihood	Moderate / Low	Possible risk in place.
			Inhalation of land Gases.	Medium	Low Likelihood	Moderate / Low	Possible risk in place.
			Inhalation of vapours through contaminated ground waters.	Medium	Low Likelihood	Moderate / Low	Possible risk in place.
		Adjoining Landowners.	Dermal contact. Inhalation of dust and fibres. Ingestion of dust and fibres	NO LIABILITY FROM THIRD PARTIES			
			Ingestion of home-grown produce.				
			Ingestion of contaminated water through water main pipework.				
			Inhalation of vapours.				
			Inhalation of vapours through contaminated ground waters.				
		Controlled Surface Water.	Leaching, lateral migration of shallow groundwater to a target receptor.	NO LIABILITY FROM THIRD PARTIES			
		Ground Water. Abstraction Well.	Leaching, migration through fissures / cracks which may migrate to a groundwater receptor.				
	Asbestos	Site Users. Construction Workers.	Inhalation dust and fibres (from Asbestos within the building)	Severe	Low Likelihood	Moderate	Possible risk in place.
			Inhalation dust and fibres (from asbestos within the soil)	Severe	Low Likelihood	Moderate	Possible risk in place.
	Metals Metalloids PAHs	Site Users. Construction Workers.	Direct contact. Inhalation dust and fibres. Dermal contact.	Medium	Low Likelihood	Moderate / Low	Possible risk in place.
			Ingestion of home-grown produce.	Medium	Low Likelihood	Moderate / Low	Possible risk in place.
		Flora.	Plant Uptake. Direct Contact.	Medium	Low Likelihood	Moderate / Low	Possible risk in place.
		Controlled Surface Water.	Leaching, lateral migration of shallow groundwater to a target receptor.	NO LIABILITY FROM THIRD PARTIES			
		Ground Water. Abstraction Well.	Leaching, migration through fissures / cracks which may migrate to a groundwater receptor.				
		Buildings. Construction Materials. Services.	Direct contact with contaminated soils.	Medium	Low Likelihood	Moderate / Low	Possible risk in place.
			Direct contact with contaminated groundwater.	Medium	Low Likelihood	Moderate / Low	Possible risk in place.

Table 16 **Overview of Risk Assessments - Proposed Site Use**

Receptors	Pathways	A	B
Site Users Construction Workers	Direct Contact, Inhalation of Dust and Fibres, Dermal Contact.	✓	✓
	Ingestion of home-grown produce.	✓	✓
	Ingestion of contaminated water through water main pipework.	✓	✓
	Inhalation of vapours from soils.	✓	✓
	Inhalation of vapor from contaminated ground waters.	✓	✓
	Inhalation of land gas vapours.	✓	✓
	Inhalation Asbestos dust and fibres (from Asbestos within the building)	✓	✓
	Inhalation Asbestos dust and fibres (from asbestos within the soil)	✓	✓
Adjoining Landowners	Direct Contact, Inhalation of Dust and Fibres, Dermal Contact.	✓	No Liability from third parties
	Ingestion of home-grown vegetation.	✓	
	Ingestion of contaminated water through water main pipework.	✓	
	Inhalation of vapours from soils.	✓	
	Inhalation of vapours from contaminated ground waters.	✓	
Flora	Plant Uptake / Direct Contact.	✓	✓
Groundwater; Abstraction Well & Surface Water	Leaching, lateral migration of shallow groundwater to a River or surface water receptor.	✓	No Liability from third parties
	Leaching, lateral migration of shallow groundwater system underlying the site and subsequent abstraction well or SPZ.	✓	
Construction Materials	Direct contact with contaminated soils.	✓	✓
	Direct contact with contaminated groundwater.	✓	✓

*NB: Due to Severe Consequence from Asbestos and Explosive Gases, some risk is assessed and potentially in place and therefore highlighted above.

GW Only: Some risks have been assessed as a direct result of potential mobilisation of groundwater contamination that may influence the site. A pictorial conceptual model has been reproduced within this report to confirm the above findings

16 Discussion on Sources of Contamination

Considering the risk assessment and conceptual site model produced, the following contaminants of concern have been identified based on land uses and features.

Table 17 Methodology for further assessment of potential contaminants

Risk Assessment	Land Use	Pollutant	
Risk Assessment A		Soil, Groundwater & Vapour Risk	
	Farm,		
	Infilled Pond with organic material,	Moisture Content, pH, Electrical Conductivity, Cyanide, (Free), Cyanide, (Total), Organic Matter, Boron, Sulfate, (2:1 water soluble), Chromium, (Hexavalent), Sulfate, (Total), Arsenic, Cadmium, Chromium, Copper, Mercury, Nickel, Lead, Zinc, Speciated PAHs, (EPA Priority 16), Phenols, Asbestos, Total Petroleum Hydrocarbons (aliphatic/ aromatic 8-Band), Naphthalene, Land Gases CO ₂ , CH ₄ .	
	Garage Area	Soil Sampling Groundwater & Vapour Assessment	
Risk Assessment B		Soil, Groundwater & Vapour Risk	
	Farm Buildings, 5m, E		
	Greenacres Farm, 50m, NW	Moisture Content, pH, Electrical Conductivity, Cyanide, (Free), Cyanide, (Total), Organic Matter, Boron, Sulfate, (2:1 water soluble), Chromium, (Hexavalent), Sulfate, (Total), Arsenic, Cadmium, Chromium, Copper, Mercury, Nickel, Lead, Zinc, Speciated PAHs, (EPA Priority 16), Phenols, Asbestos, Total Petroleum Hydrocarbons (aliphatic/ aromatic 8-Band), Naphthalene.	
	Additional Barns Built, 20m, E	Soil Sampling Groundwater & Vapour Assessment	
Spatial Sampling, (General Assessment)		Moisture Content, pH, Electrical Conductivity, Cyanide, (Free), Cyanide, (Total), Organic Matter, Boron, Sulfate, (2:1 water soluble), Chromium, (Hexavalent), Sulfate, (Total), Arsenic, Cadmium, Chromium, Copper, Mercury, Nickel, Lead, Zinc, Speciated PAHs, (EPA Priority 16), Phenols. BS3882:2015	25-meter Centres In accordance with BS10175: 2011+A2:2017.
		Asbestos	5-10-meter Centres In accordance with BS10175: 2011+A2:2017.

17 Next Steps

Considering the information gathered to date, we would suggest that an appropriate way forward would be to assess the condition of the subsoil within the site resulting from the historical and former uses of the site as detailed within previous sections of this report. We would suggest that the most viable way of assessing risk will be to consider the following assessment techniques.

The assessment of the site proposed in this report and the following recommendations which are detailed below have been prepared in accordance with key guidance documents as follows: -

- National Planning Policy Framework.
- British Standards 10175:2011+A2:2017.
- Land contamination risk management (LCRM).
- DEFRA: Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance, (April 2012).
- Environment Agency, (2010) GPLC1 Guidance Principles for Land Contamination.

The investigation is proposing to undertake the following at the site: -

- Determine the ground and groundwater conditions.
- Determine if there are any obstructions such as old service and foundations, buried tanks, etc.
- Install gas, vapour and groundwater monitoring well installations and monitor the levels of groundwater, gas and vapours.
- Obtain samples of the made ground, natural soils and groundwater for contamination testing at targeted site-specific designed locations. Test soil and groundwater samples for a range of contaminants, as identified in Table 17.
- Obtain samples of soil to test for vapours contaminants, as identified in Table 18.
- Visually appraise soils to consider olfactorily or visual presence of contamination factors, risk, vapours or fragments.
- All laboratory testing should be completed to MCERT/UKAS accredited standard.
- All detection limits provided by chemical laboratories must fall below the set screening values.

17.1 Soil Assessment

Soil sampling will be completed recovering samples in appropriate containers for analysis by the analytical chemist. All sampling will be sent directly to the chemist in cool boxes to retain the integrity of the soil sample.

At least one sample will be recovered and chemically tested from the natural underlying subsoil to consider any pollution within the lower soils. Most of the sampling and chemical analysis will be recovered from the upper made ground / FILL material where risk is likely higher. Should any areas of the soil profile recovered cause concern in terms of visual or olfactoral risk, this will be recorded, and testing completed.

Based on the site area and size of the site, (approximately 1200 m²), we would recommend that the site should be subjected to a sampling density of between 15-20 meter grid pattern or moderate risk pollutants which is broadly in line with that proposed by 10175:2011+A2:2017 and offers a greater density sampling pattern of 10-15 meter grid pattern for high risk pollutant such as Asbestos. As such, we can confirm that a likely 4-5 samples locations will be required across the site to provide a 'good' spatial density and an additional 5-6 sample locations being tested for Asbestos.

Table 18 **Soils Assessment - Targeted Sampling**

<i>Feature</i>	<i>Contaminant</i>	<i>Method of Investigation</i>
Barns, (Asbestos, General Suite)	Metals, Semi Metals, PAHs, TPHs, Asbestos	Window Sampler Boreholes Hand Auger Boreholes Trial Pits
Land Gases, (Close to Pond)	Metals, Semi Metals, PAHs, TPHs, Asbestos, Land Gases.	
Historic Farm Use	Metals, Semi Metals, PAHs, TPHs, Asbestos, Land Gases.	

Table 19 **Soils Assessment – Spatial Sampling**

<i>Feature</i>	<i>Contaminant</i>	<i>Method of Investigation</i>
General Farming Use	Metals, Semi Metals, PAHs, TPHs, Asbestos, Land Gases.	Window Sampler Boreholes Hand Auger Boreholes Trial Pits

Upon completion of on-site sampling and the associated chemical analysis, the soil data will be compared against the Generic Assessment Criteria for residential land with home grown produce / commercial land use derived by AtRisk Soils which has been purchased as a reviewing standard. This has been prepared by Atkins as Soil Screening Values, (SSV's). Additionally, values will be adopted for screening values using LQM / CIEH – Suitable 4 Use Levels in the absence of Atkins adopted values.

17.2 Groundwater Assessment

To gain an understanding of the groundwater system and the level of risk in place, we can confirm that the following works should be completed: -

The Geology within the site should be confirmed.

- The depth of the Geology within the site should be assessed and if ground water is encountered or has the potential to be in place, some assessment of the risk to groundwater and surface water features should be carried out as well as potential human health risk from vapours.
 - Considering the size and nature of the site, the groundwater elevation may be perched at locations and as such, strikes may be local to lenses or pockets of more permeable ground to provide surface water runoff.

Standpipes should be installed across the site, to orientate the groundwater table to identify groundwater flow direction. Three standpipes should be installed for groundwater assessment such that orientation of the groundwater table can be undertaken.

- We would recommend that the installation of the boreholes at the site should be completed in order to determine the groundwater elevation, if present. The boreholes should be left for a minimum period of one week to allow the groundwater to reach equilibrium at which time, purging of the standpipe well should be completed to consist of a minimum of 3 well volumes removed from the standpipes prior to samples being recovered. Should groundwater be identified, sampling of the groundwater can be completed and retained in appropriate containers dependent upon the analysis proposed. The sample should then be sent to the analytical chemist for assessment in appropriate transport conditions.
- It is possible that groundwater assessments may require extending the standpipes through any superficial deposits suggested by the Envirocheck report.
- Considering the size and nature of the site should ground water risk be recorded within the site area each borehole should be sampled and tested for the range of pollutants as identified within this report. The potential risks should be initially assessed against the UK Drinking Water standard as a Tier 1 assessment Criteria with possible further assessments required where heavy contamination or risk deemed in place. Groundwater samples should be compared against the EQS standards, (Environmental Quality Standards).
- The assessment of groundwater will also be used to consider the risks to surface water features and whether the site may impact of this feature.
- Risk assessments A to B, should be tested for so the extent of pollutants can be identified within the groundwater sample.

17.3 Land Gas Assessment

Considering the potential for Land Gas risks due to the potential made ground, infilled ground and pond adjacent to the site which is heavily filled with organic materials potentially in place within the site area Land Gas risk assessments must be completed. These will include the potential for contamination migration from on and off-site sources which may be present in concentrations where risk is recorded.

Land gas monitoring should be specifically targeting the following land uses.

Table 20 Land Gas Assessment - Response Zone

<i>Feature</i>	<i>Targeted Response Zone</i>	<i>Location to Target</i>	<i>Gas risk</i>
Made ground and Infilled ground, Pond	Made Ground	Site Wide	Land Gases - CO ₂ , CH ₄ .

Infilled land is recorded in place off site, although, we would suggest that an assessment of risk could be completed using RB17 A Pragmatic Approach to Ground Gas Risk Assessment (2012). The surrounding land is primarily residential and as such, a pragmatic approach is deemed most suitable for the site and if risk confirmed, additional more intrusive assessments completed.

Considering the above, we would suggest that soil testing is undertaken to assess the infilled ground its depth and type, and a standpipe should be installed within the site with response zones placed within the upper made ground solely, and the following assessments completed as follows:-

- Install standpipes to allow vapour and Land Gas risk to be considered from the upper made ground.
- Assess vapour risk over a minimum of six monitoring rounds to comply with CIRIA C665 to consider risks to buildings, LCRM and R & D Publication 66.
- Monitoring should be completed over falling or low atmospheric pressures or in periods where ground conditions are frozen to provide the worst-case scenario for the site, although, the site is laid to hard cover which will restrict natural ventilation of any gases.
- Reporting of land gas and vapour risk/ can be completed assessing soils in situ using a Photo Ionisation Detector for Volatile Organic Compounds, (which include BTEX). Flow rates should also be noted for reporting purposes.

17.4 Vapour Risk Assessment

Considering the potential for vapour risk to be in place from various source as noted below, the following risk are in place.

Table 21 Vapour Risk Assessment - Response Zone

<i>Feature</i>	<i>Targeted Response Zone</i>	<i>Location to Target</i>	<i>Vapour risk</i>
Garage, Farm Use, Infilled Pond	Made Ground / Head Deposits, New Pit Chalk	Site wide	TPHs, Naphthalene.

Considering the above, we would suggest that soil testing is undertaken to assess whether contamination that may promote a vapour risk is in place within the site area and the groundwater.

17.5 Working Brief

It should be noted that this investigation is undertaken to identify the extent of contamination because of historic and ongoing use. Should any areas of the site be encountered within the development that appear potentially contaminated through visual or olfactory assessment outside that discussed within this report, consultation with ourselves should be undertaken to identify the risk associated with the material.

Table 22 **Overview of Works**

Receptor	Scope of Investigation Works Required			Proposed Method of Assessment	Proposed Site Works to Complete
	Assessment of: Soils	Vapour and Gas	Ground Surface Water and		
Human Health	✓	✓	✓	Window Sampling - Soil sampling - Install standpipe - Groundwater sampling*	Recover samples of the made ground. Assessment of the underlying natural soils to consider contamination. Groundwater Risk Assessment. Vapour Risk Assessment. Analysis of soil samples for GQRA Assessment. Reporting.
Surface Water	X	X	X	No Action	Pond already infilled with organic material.
Ground Water	✓	✓	✓	Window Sampling - Soil sampling - Install standpipe - Groundwater sampling*	Recover samples of the made ground. Assessment of the underlying natural soils to consider contamination. Groundwater Risk Assessment. Vapour Risk Assessment. Analysis of soil samples for GQRA Assessment. Reporting.
Services & Building	✓	✓ #	X	Window Sampling - Soil sampling	Recover samples of the made ground. Vapour Risk Assessment. Groundwater Assessment. Analysis of soil samples for GQRA Assessment. Reporting.
Geotechnical Assessment	✓	N/A	X	Window Sampling	Recover samples of the natural soils for laboratory testing. Assessment of shallow soils for conventional foundation. Consider deeper or piled foundations. Reporting.

NB * Initial assessments of the site should be undertaken using Leachate Testing and water sampling if required.

Complete soils testing to assess if vaporous contamination is in place within the site area.

APPENDIX ONE

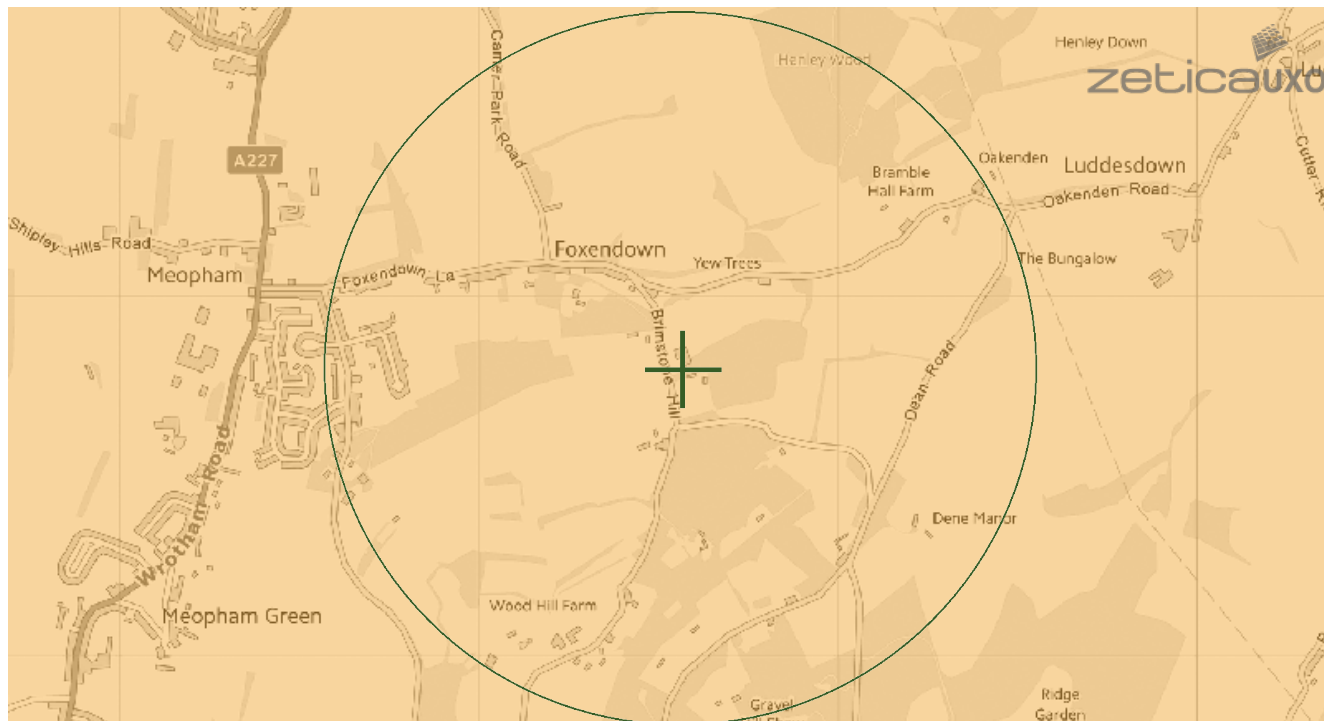
ADDITIONAL INFORMATION

UNEXPLODED BOMB RISK MAP



SITE LOCATION

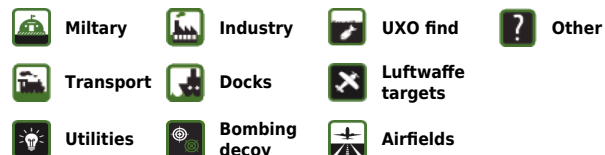
Location: DA13 0BN,
Map Centre: 565533,165804



This map principally indicates a hazard from Unexploded Bombs (UXB) due to WWII bombardment. Other sources of Unexploded Ordnance (UXO) may be present. It should be noted that this map does not represent UXO risk and should not be reported as such when reproduced.

LEGEND

- High:** Areas indicated as having a bombing density of 50 bombs per 1000acre or higher.
- Moderate:** Areas indicated as having a bombing density of 15 to 49 bombs per 1000acre.
- Low:** Areas indicated as having 15 bombs per 1000acre or less.



How to use your Unexploded Bomb (UXB) risk map?

This map indicates the potential for UXBs to be present because of World War Two (WWII) bombing. It can be incorporated into a technical report, such as a Phase 1 Desk Study, or similar document as an indication of the potential for UXO encounter on a Site. Other sources of UXO may also be indicated, although note that these are not comprehensive and more detailed research is required to confirm their presence.

What if my Site is in a moderate or high density area?

We typically recommend that a detailed UXO desk study and risk assessment is undertaken for sites in an area with a moderate or high bombing density. Additionally, if your site is in close proximity to a strategic target, military establishment, airfield or bombing decoy, then [additional detailed research](#) is recommended.

If my site is in a low risk area, do I need to do anything?

If both the map and other research confirm that there is a low potential for UXO to be present on your site, then, subject to your own comfort and risk tolerance, works can proceed with no special precautions.

If you are unsure whether other sources of UXO may be present, you can request one of our [pre-desk study assessments \(PDSA\)](#) by emailing a site boundary and location to pdsa@zetica.com.

You should never plan site work or undertake a risk assessment using these maps alone. More detail is required, to include an assessment of the likelihood of a source of UXO hazard from other military activity not reflected on these maps.

If I have any questions, who do I contact?

tel: [+44 \(0\) 1993 886682](tel:+44201993886682) email: uxo@zetica.com web: www.zeticauxo.com

The information in this UXB risk map is derived from a range of sources and should be used with the [accompanying notes on our website](#).

Zetica cannot guarantee the accuracy or completeness of the information or data used and cannot accept any liability for any use of the maps. These maps can be used as part of a technical report or similar publication, subject to acknowledgement. The copyright remains with Zetica Ltd.

APPENDIX TWO

CONCEPTUAL MODEL

Site Conceptual Model - Proposed Site Plan



APPENDIX THREE

SITE PLANS

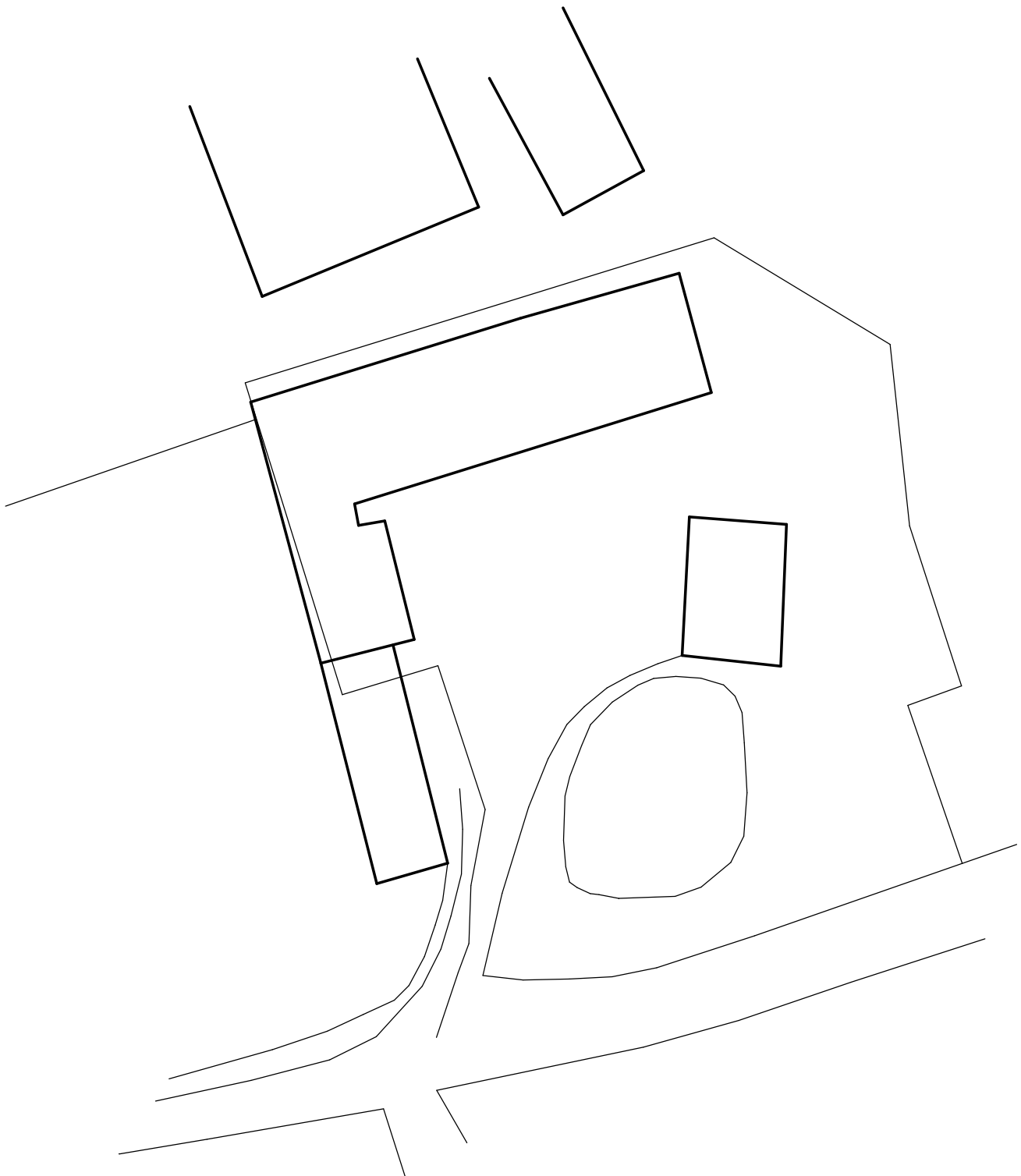
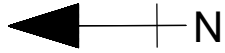
Brimsole Barn, Brimstone Hill, Meopham, Gravesend, Kent DA13 0BN

Location Plan



Brimsole Barn, Brimstone Hill, Meopham, Gravesend, Kent DA13 0BN

Existing Site Plan



Brimsole Barn, Brimstone Hill, Meopham, Gravesend, Kent DA13 0BN

Proposed Site Plan

