Phase I Geo-Environmental Desk Study

19 Main Street Little Thetford Ely Cambridgeshire CB6 3HA

Prepared for:

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EPS Project:

UK14.1709

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Final

25th November 2014

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Steve Bullock Director



Your specialists on the ground

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19 MAIN STREET, LITTLE THETFORD

NON TECHNICAL CLIENT SUMMARY

This report presents the findings of a Phase I Geo-Environmental Desk Study which was carried out to identify any potential contamination from previous or current uses of the site and surrounding area and if found, how the proposed development or surrounding environment might be affected.

- The site currently comprises a residential dwelling with two wooden sheds, and an associated garden and orchard. The site has retained a similar layout throughout its recent history.
- Geological mapping indicates the ground conditions to comprise Kimmeridge Clay Formation, which is classified as unproductive strata.
- There is a small watercourse located adjacent to the northern boundary, although the site lies within an area of relatively low environmental sensitivity.
- No plausible contamination linkages have been identified and no further environmental assessment is considered necessary.
- It is recommended that a copy of this report should be provided to the Environmental Health department of East Cambridgeshire District Council for inclusion into their land quality records.

By their very nature, the above bullet points represent a simplified summary of our work and should not be relied upon to form the basis for key decisions for the proposed development. A full picture is provided in the following report, or alternatively give us a call and we'll talk you through it.



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1 INTRODUCTION

In October 2014, Environmental Protection Strategies Ltd (EPS) was commissioned by Plansurv, on behalf of Mr and Mrs P Noton, to complete a Phase I Geo-Environmental Desk Study on land at 19 Main Street, Little Thetford, Ely, Cambridgeshire, CB6 3HA ('the site'); see Figure 1.

The work was commissioned in order to support a planning application for a new residential development to the north of the existing dwelling under planning reference number: 14/00158/FUL. The proposed development plan is included as Appendix A.

This report presents the findings, conclusions, and recommendations of the Phase I Desk Study undertaken for the site as instructed.

1.1 Background

A Desk Study comprises the first stage of any geo-environmental assessment, the purpose of which is to determine what potentially contaminative activities may have occurred at the property or the surrounding area which may pose an environmental risk to site users or the surrounding environment, either at present or in the future.

The method used in this investigation to assess the environmental risk posed is based on the concept of 'contaminant linkage', which considers the following three factors:

Source	The location from which an environmentally hazardous / contaminative substance is, (or was,) derived.		
Receptor An environmentally sensitive object or condition e.g. person, prop controlled water, or ecological system, which may be present now or in fut			
Pathway	A route or mechanism via which a source could come into contact with a receptor to cause significant harm.		

If all three factors are identified, there is the potential for a 'contaminant linkage' to be active, which could result in significant harm being caused to the environment or human health.

1.2 Objectives

The purpose of this desk study is to evaluate the potential contaminant linkages that may be active at the site in its current condition, or could become active in future, and to determine if any action is required to investigate them further or to break them.

This is achieved by carrying out the following activities:

• Examining the site history - late 1800s to present day, through collection of historical maps of the area, site records, records held by relevant local authorities, the Environment Agency and review of other information databases.



- Characterising the sites environmental sensitivity through examination of existing geological, hydrogeological, topographical, and historical maps and aerial photographs of the area.
- Identifying Potential Areas of Concern (PAOCs) through a combination of historical map and data review and site inspection.
- Consideration of any future plans for the site and the effects any proposed changes may have on contaminant linkages over time.
- Development of a site conceptual model and contaminant linkage assessment for the site.

1.3 Limitations and Constraints

The purpose of this report is to present the findings of a Phase I Ground Investigation conducted at the location(s) specified. When examining the data collected from the investigations made during the assessment, EPS makes the following statements:

If third parties have been contracted / consulted during compilation of this report, the validity of any data they may have supplied, and which are included in the report, have been assessed as far as possible by EPS however, EPS cannot guarantee the validity of these data.

This report does not include specific investigation for the presence of either Potential Asbestos Containing Material (PACM) or Japanese Knotweed at the subject site however, if obvious evidence of either is observed during EPS site walkover, details will be provided in this report. Specialist contractors should be commissioned to make detailed assessments and recommendations if these materials are suspected.

The report has been prepared for the client(s) listed on the report title page. EPS accepts no liability or responsibility for use of, or reliance upon, this report and / or the information contained within it by third parties.

No part of this report, or references to it, may be included in published documents of any kind without approval from EPS.

This report and its contents, together with any supporting correspondence or other documentation, remain the property of Environmental Protection Strategies Ltd until paid for in full.



2 ENVIRONMENTAL SETTING

The following section provides a summary of the information collected in relation to the site location and history.

2.1 Site Description

The site is located on Main Street to the southeast of Little Thetford and around National Grid Reference 553290, 276300. It measures approximately 0.43ha in surface area and is bound to the southwest by Main Street, to the northwest and southeast by houses and to the northeast by undeveloped farmland. The area lies approximately 7m above ordnance datum (AOD) in the southwest and slopes gently down to 4m AOD in the northeast.

A walkover survey was undertaken on November 14th 2014 and the site was noted to comprise a single residential property with a large wooden shed to the east and smaller wooden shed in the centre. Both sheds were noted to be derelict and constructed of wood and corrugated iron. The site is bound to the south by Main Street, with a landscaped undeveloped area to the rear of the building and an orchard further north than this.

Surrounding land use is generally residential although it was noted that there a Fireplace Installations firm further along Main Road. Local topography slopes in most directions down from Little Thetford to the Great River Ouse, particularly to the south and east.

A plan showing the site location is provided as Figure 1, the current site layout is detailed on Figure 2 and an aerial photograph is included as Figure 3. Selected site photographs are included as Appendix B, and relevant extracts of a Landmark Envirocheck report are included as Appendix C.

2.2 Geology and Geological Hazards

Geological maps of the area (British Geological Survey 1:50,000 series, Sheet 188 - Cambridge – Solid and Drift Edition) report the site to be underlain by a bedrock of Kimmeridge Clay Formation.

The site's geological context is presented as Appendix D.

A summary of potential geological hazards is presented in the table on the following page.



Hazard	On site Risk
Coal Mining	Might Not Be
	Affected
Collapsible Ground	Very Low
Compressible Ground	No Hazard
Ground Dissolution	No Hazard
Running Sand	No Hazard
Landslide	Very Low
Shrinking/Swelling Clay	Low

The BGS and Health Protection Agency, (HPA,) report entitled '*Indicative Atlas of Radon in England and Wales*' (November 2007) shows the site to lie within a 1km grid section where the percentage of homes above the radon action level is between 0% and 1%.

The joint Building Research Establishment Ltd (BRE) report entitled '*Radon: Guidance on Protective Measures for New Buildings* - 2007' reports that the site does not lie within an area where basic construction protection methods will need to be employed.

2.3 Regional Hydrogeology

The Environment Agency, (EA,) groundwater vulnerability map of the area (Groundwater Vulnerability of North Essex - Sheet 32 - 1:100,000) indicates that the underlying geology is classified as an unproductive aquifer. A groundwater vulnerability map for the area is included as Appendix E.

A search of the EA public database reveals that the site does not lie within a Source Protection Zone (SPZ) for groundwater abstraction and there are no source protection zones within 1km.

The Envirocheck report lists 22 groundwater abstractions within 500m. Of these, seven are within 250m, and the closest is around 65m east. All 22 relate to the use of the water for Spray Irrigation.

2.4 Regional Hydrology

The closest surface watercourse comprises a drain known as Thetford Catchwater which runs along the northeast boundary and around much of the southeast corner of Little Thetford. The Great River Ouse lies approximately 550m to the southeast.

The EA records two surface water quality measurements within 1km, both approximately 700m to the east located on the River Cam and the River Soham Lode, both in 2009. They report the quality to be as follows: (Chemistry and Biology rated on a scale of A (very good) to F (bad); Nitrates and Phosphates rated on a scale of 1 (very low levels) to 6 (very high levels):

- River Cam Chemistry (B), Biology (A), Nitrates (6), Phosphates (5)
- River Soham Lode Chemistry (D), Biology (n/a), Nitrates (6), Phosphates (4)



The Envirocheck report lists six discharge consents within 250m. These all pertain to either sewage discharges or storm / emergency overflow discharges to freshwater streams / rivers.

2.5 Flood Risk

Review of the EA flood zone map for the area indicates that the site lies within flood zone 1, which is defined within Table 1 of technical guidance to the National Planning Policy Framework (NPPF) as an area with the lowest potential risk of flooding from fluvial or tidal sources.

It should be noted that the EA maps do not take into account flooding from other potential sources of flood water, such as from poor drainage or groundwater.

2.6 Environmentally Sensitive Areas

The Envirocheck (EC) report indicates that the site lies within a nitrate vulnerable zone.

No other areas of significance including: Sites of Special Scientific Interest (SSSI), RAMSAR sites, World Heritage Sites, National Parks, Special Areas of Conservation, Special Protection Areas or Local Nature Reserves have been identified through inspection of databases within 1km.

2.7 Landfill Sites & Sources of Industrial Pollution

The Environment Agency and the Envirocheck report indicate that there are no historic or current landfills within 1km.

The Envirocheck report lists one pollution incident to controlled waters within 500m, which comprised a land run-off of oil into a freshwater stream / river (noted as: tributary Cam) 402m to the northwest. A release of diesel to a freshwater stream / river approximately 850m to the south is also noted.

2.8 Current Industrial Sites

The Envirocheck report lists six industrial land-uses within 500m. These comprise an active woodburning stoves firm roughly 72m to the south, an active stained-glass designers and producers 227m to the west, an active concrete pumping services 285m to the west, an inactive disability equipment manufacturers and suppliers 288m to the west, an inactive scaffolding and work platforms company 325m to the southeast, and an inactive catering equipment servicing and repairs property 344m to the northwest.

2.9 Site History

A summary of historical map data from 1887 to 2013 is provided below and copies of relevant historic maps and any others examined during the investigation are included in this report as Appendix F.

EPS has examined the maps provided and identified the following key features:



- In 1887, the site comprised a building in the southwest corner with an orchard covering a section adjacent to the house to the north and the far north of the site. Thetford Catchwater can be seen as a drain passing along the northern boundary from the earliest mapping.
- By the 1926 mapping, there has been construction of two small out buildings. This layout remains more or less to this day, although in mapping of the 1970s the two small outbuildings have been reduced to only one.
- In the surrounding area in the late 1800s, a railway exists approximately 275m to the southeast, aligned NE-SW, which appears to remain presently and has been known as The Great Eastern Railway, or from the 1920s onward The London and North Eastern Railway. A farm was located approximately 100m to the southwest containing a well. A chapel, church and school could also be seen in the village around this time, all of which have remained until the present day.



3 CONCEPTUAL MODEL

The following section provides a review of the contaminant linkages that may be active at the site through examination of the potential sources that may be present as a result of historic and / or current site activities and where potential interaction between these sources and the identified human / environmental receptors may occur.

3.1 Source Characterisation

The following potential contaminant sources have been identified at the site and in the surrounding area:

Potential Source	Source Description	Principal Contaminants of Concern
Current Surrounding Land Use	Industrial land use for Woodburning Stoves to the south east.	РАН

Notes: PAH Polycyclic Aromatic Hydrocarbons

3.2 Potential Receptors

A framework for the assessment of risks arising from the presence of contamination in soils has been produced by the Environment Agency and the Department for the Environment, Food and Rural Affairs (DEFRA) and is presented with the report: 'Using Science to Create A Better Place: Updated Technical Background to the CLEA Model – Science Report SC050021/SR3'. This guidance document defines a series of standard land-uses, which form a basis for the development of a Conceptual Site Model.

The proposed development plan for the site includes the erection of a second property on the site, to the north of the existing property. This proposed future land use, as defined within Science Report SC050021/SR3, has been considered as:

• Residential

In view of the environmental setting, current and potential future land use of the site and surrounding sites, the potential receptors for any contaminant impact are discussed below:

Receptor Site Specific Description				
	Future site users, site workers involved in the site redevelopment, and those			
	working and living in the surrounding area have the potential to be at risk			
Human	from exposure to potential contaminants of concern (CoCs). As no site			
	derived contaminants of concern have been identified these receptors are not			
	considered to be at risk.			
	The site is reported to be underlain by Kimmeridge Clay Formation which is			
Crowndructor	defined by the EA as an unproductive aquifer. The site does not lie within a			
Groundwater	SPZ for groundwater abstraction. As such, the potential for groundwater			
	contamination is not considered plausible.			



Receptor	Site Specific Description			
Surface Water Bodies	The closest surface water body lies on the site boundary to the northeast. However, no site derived contaminants of concern have been identified and surface water bodies are not considered to be at risk.			
Flora and Fauna	No risk to flora and fauna has been established through this study.			
Buildings & Infrastructure	Subsurface structures are likely to be present at the site that may be adversely affected but as there is no potential presence of the identified contaminants of concern it is not deemed a sensitive receptor.			
Adjacent Land	Adjacent properties are not considered a risk from onsite contaminants as there have been none discovered through this desk study.			

3.3 Potential Pathways

Where contaminants may be present in soil, there are a number of potential pathways that enable human receptors to come into contact with or be exposed to them. The most direct pathways, considered under current UK legislation, can be summarised as follows:

- Direct ingestion of contaminated soil
- Ingestion of household dust
- Ingestion of contaminated vegetables
- Ingestion of soil attached to vegetables
- Dermal contact with contaminated soil
- Dermal contact with household dust
- Inhalation of fugitive soil dust
- Inhalation of fugitive household dust
- Inhalation of vapours outside
- Inhalation of vapours inside

Clearly, not all of these potential pathways apply for every standard land-use; the simplest example for exclusions being a commercial / industrial site which is covered by concrete hardstanding. The concrete precludes the direct exposure of humans working at the site to any contaminated soils.

However in addition to direct exposure pathways, a number of physical transport mechanisms / pathways may also exist at a site that allow remote or less accessible contaminants in soil or groundwater to reach human or environmental receptors both at a site and beyond the site boundary. These include the following:

- Downward and lateral movement of contaminants in soil either by gravity or through being 'leached' by percolating rainwater
- Lateral migration of contaminants dissolved in groundwater.
- Direct seepage or leaching of contaminants from soil into subsurface drains or supply pipework.
- Volatilisation of contaminants from groundwater or unsaturated soils into buildings or outdoor air.



Through examination of the standard land use and environmental setting at each site, the presence of pathways and transport mechanisms described above must be considered when assessing whether a contaminant linkage may plausibly be active, and therefore be included in the conceptual site model.

3.4 Summary of Contaminant Linkages

The following comments are made with respect to contaminant linkages which have been considered through development of the conceptual model, but have not been concluded as 'plausible' - i.e. through which a significant possibility of significant harm could occur to an identified receptor:

• Although the Envirocheck report indicated a Woodburning industrial land use 70m south; through the site visit it transpired that it is only an installations business. Also any contamination from a woodburning stove, if one were to be used 70m south, tends to be a localised event that would not migrate the significant distance.

Through the examination of the evidence available, and consideration of the possible contaminant source, receptors and pathways, this desk study has found no plausible contaminant linkages.



4 GEOTECHNICAL APPRAISAL

Geological records indicate the ground conditions to comprise Kimmeridge Clay Formation. A conceptual geotechnical ground model is provided in the table below which assesses design elements, anticipated strata and ground conditions:

Element	Anticipated Strata	Parameter(s)	Anticipated Conditions	
		Allowable Bearing Pressure	100kN/m^2 to 150kN/m^2	
Foundations	Kimmeridge Clay Formation	Settlement	Moderate sensitivity/ Long term consolidation under loading.	
		Volume Change	High volume change potential.	
Drainage	Kimmeridge Clay Formation	Permeability	Unlikely to be suitable for infiltration drainage.	
Concrete Grade	Kimmeridge Clay Formation	Grade	Moderate to High risk of high sulphate levels	



5 CONCLUSIONS & RECOMMENDATIONS

This Phase I Desk Study has not identified any plausible contaminant linkages which have the potential to become active as a result of the historic use of the site and its development in recent years.

In accordance with the Model Procedures for Management of Land Contamination (Contaminated Land Report 11) no further assessment is required for this site. A summary of the approach outlined in CLR11, marking the work already completed under the risk assessment phase, is presented as a flow diagram in Figure 4 of this report.

Should any palpable evidence of unexpected contamination be encountered during the redevelopment work, it should be reported to EPS so that an inspection can be made and appropriate sampling and assessment work carried out. A method statement for encountering any unexpected contamination is included as Appendix G of this report.

A copy of this report should be provided to the Environmental Health department of East Cambridgeshire District Council for inclusion into their land quality records.



FIGURES

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	raham	Ouse Valley	
Bedwett Hey	Fm		
	1		Ha
Little			
Thetford /00 Quarterway Ho	LC	Chapel Hill	5 Barway
HIRE DI	ST		st-Hill
Approximate Site Location		Crown Licence	Copyright. All rights reserved. e Number: 100054115
	Title: Project:	Site Location Plan Main Street, Little Thetford,	Scale: As Shown
eos	Client:	CB6 3HA Plansurv	Drawn By: RG Approved By: WE Job No: UK14.1709

Fig No: 1

Dwg No:

Date:

Plansurv/LittleThetford/1114/01

November 2014



Fig	No:	2
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JOD NO:UK14.1709Dwg No:Plansurv/LittleThetford/1114/02Date:November 2014



Approximate Site Boundary



Crown Copyright. All rights reserved. Licence Number: 100054115

Title:	Aerial Photograph			
Project:	Main Street, Little Thetford, CB6 3HA	Scale:	NTS	
		Drawn By:	RG	Approved By: WE
Client:	Plansurv	Job No:	UK14	.1709
		Dwg No:	Plansu	rv/LittleThetford/1114/03
Fig No:	3	Date:	Nover	nber 2014





APPENDICES



APPENDIX A

Indicative Proposed Development Plan





APPENDIX B

Selected Site Photographs









APPENDIX C

Surrounding Land Use







General

🖒 Specified Site 🛛 Specified Buffer(s) 🛛 X Bearing Reference Point 🛽 Map ID Several of Type at Location Agency and Hydrological Waste Contaminated Land Register Entry or Notice (Location) BGS Recorded Landfill Site (Location) Contaminated Land Register Entry or Notice BGS Recorded Landfill Site Discharge Consent EA Historic Landfill (Buffered Point) EA Historic Landfill (Polygon) A Enforcement or Prohibition Notice Integrated Pollution Control Registered Waste Site A Integrated Pollution Control Licensed Waste Management Facility (Landfill Boundary) Integrated Pollution Prevention Control Local Authority Integrated Pollution Prevention and Control Licensed Waste Management Facility (Location) Local Authority Pollution Prevention and Control Local Authority Recorded Landfill Site (Location) Control Enforcement Local Authority Recorded Landfill Site Pollution Incident to Controlled Waters 🚫 Registered Landfill Site Prosecution Relating to Authorised Processes > Registered Landfill Site (Location) Prosecution Relating to Controlled Waters Registered Landfill Site (Point Buffered to 100m) A Registered Radioactive Substance Registered Landfill Site (Point Buffered to 250m) River Network or Water Feature Registered Waste Transfer Site (Location) 🖶 River Quality Sampling Point IIII Registered Waste Transfer Site Registered Waste Treatment or Disposal Site (Location) 🔷 Substantiated Pollution Incident Register Water Abstraction Registered Waste Treatment or Disposal Site 🔶 Water Industry Act Referral Hazardous Substances Geological 🙀 COMAH Site BGS Recorded Mineral Site 🙀 Explosive Site Industrial Land Use 🙀 NIHHS Site ★ Contemporary Trade Directory Entry Planning Hazardous Substance Consent ★ Fuel Station Entry Reaning Hazardous Substance Enforcement





Order Details

Order Number: 61816040_1_1 Customer Ref: UK14.1709 National Grid Reference: 553290, 276300 Slice: А 0.46 Site Area (Ha): Search Buffer (m): 1000 Site Details Site at 553280, 276280 **Landmark** Tel: Fax: 0844 844 9952

A Landmark Information Group Service v47.0 05-Nov-2014 Page 1 of 4

0844 844 9951

www.envirocheck.co.uk

Web:



APPENDIX D

Geological Context

Geology 1:50,000 Maps Legends

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	ALV	Alluvium	Clay, Silt, Sand and Gravel	Flandrian - Flandrian
	T1T2	River Terrace Deposits, 1 to 2	Sand and Gravel	Flandrian - Flandrian
	SLM	Shell Marl	Clay, Shell	Holocene - Holocene
	TFD	Tidal Flat Deposits	Clay and Silt	Holocene - Holocene
	ODT	Oadby Member	Diamicton	Anglian - Anglian
	PEAT	Peat	Peat [Unlithified Deposits Coding Scheme]	Quaternary - Quaternary

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	GLT	Gault Formation	Mudstone	Albian - Albian
	WBS Woburn Sands Formation		Sandstone	Albian - Aptian
	кс	Kimmeridge Clay Formation	Mudstone	Kimmeridgian - Kimmeridgian
	AMC	Ampthill Clay Formation	Mudstone	Oxfordian - Oxfordian
	UPL	Upware Limestone Member	Limestone	Oxfordian - Oxfordian



Geology 1:50,000 Maps

This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published paper maps.

The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page. Not all layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:50,000 Maps Coverage Map ID: 2 Map ID:

2	wap iD.	
173	Map Sheet No:	188
Ely	Map Name:	Cambridge
1980	Map Date:	1981
Available	Bedrock Geology:	Available
Available	Superficial Geology:	Available
Not Available	Artificial Geology:	Not Available
Not Supplied	Faults:	Not Supplied
Not Available	Landslip:	Not Available
Not Supplied	Rock Segments:	Not Supplied
	2 173 Ely 1980 Available Available Not Available Not Supplied Not Available Not Supplied	2 map tu. 173 Map Sheet No: Ely Map Name: 1990 Map Date: Available Bedrock Geology: Available Superficial Geology: Not Available Aurificial Geology: Not Supplied Faults: Not Available Landslip: Not Supplied Rock Seaments:









Artificial Ground and Landslip

Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground areas where the ground has been cut away such as guarries and road cuttings.
- Infilled ground areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground areas where the surface has been reshaped.
- Disturbed ground areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes foundered strata, where the ground has collapsed due to subsidence.

Artificial Ground and Landslip Map - Slice A







Superficial Geology

Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.







Bedrock and Faults

Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults (e.g. normal, thrust), and thin beds mapped as lines (e.g. coal seam, gypsum bed). Some of these are linked to other particular 1:50,000 Geology datasets, for example, coal seams are part of the bedrock sequence, most faults and mineral veins primarily affect the bedrock but cut across the strata and post date its deposition.







Combined Surface Geology

The Combined Surface Geology map combines all the previous maps into one combined geological overview of your site.

Please consult the legends to the previous maps to interpret the Combined "Surface Geology" map.

Additional Information

More information on 1:50,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

Contact

British Geological Survey Kingsley Dunham Centre Keyworth Nottingham NG12 5GG Telephone: 0115 936 3143 Fax: 0115 936 3276 email: enquiries@bgs.ac.uk website: www.bgs.ac.uk

Combined Geology Map - Slice A





APPENDIX E

Groundwater Vulnerability Maps

















0844 844 9952 0844 844 9951

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APPENDIX F

A Selection of Historic Maps

	Historical Mapping Legends	S	
Ordnance Survey County Series and Ordnance Survey Plan 1:2,500	Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250	Large-Scale National Grid Data 1:2,500 and 1:1,250	Historical Mapping & Photography included:
Ountry Gravel Sand Pri Clay Pit Single Refuse Heap Stooing Masonry Flat Rock Marsh Reeds Ociers Marsh Reeds Ociers Marsh Reeds Ociers Marsh Forze Wood Marsd Wood Enustrwood Orchard Marsd Wood Ford Stepping Stanes Forg Watertal Look A Trg. Station Attude at Trg. Station	Inactive Quarry, Chaits Pet or Clay Pit Active Quairy, Chaits Pet or Clay Pit Rock Image: Imag	Citr Term Term Term Citr Term Term Term Rock Rock Rock (scattered) Baulders Baulders (scattered) Possiblened Boulder Scree Non-Conferous Tree Conferous Tree Non-Conferous Trees Scree Non-Conferous Trees Screet Non-Conferous Trees Screet Scree Screet	Mapping Type Scale Date Pg Cambridgeshire & Isle Of Ely 1:2,500 1887 2 Cambridgeshire & Isle Of Ely 1:2,500 1902 3 Cambridgeshire & Isle Of Ely 1:2,500 1902 3 Cambridgeshire & Isle Of Ely 1:2,500 1902 4 Ordnance Survey Plan 1:2,500 1927 6 Large-Scale National Grid Data 1:2,500 1994 7 Large-Scale National Grid Data 1:2,500 1996 8
Arrow denotes Arrow denotes Row of water Arrow denotes Row of water Arrow denotes Row of water Arrow denotes Row denotes Row of water Arrow denotes Row of water Arrow denotes Row of water Arrow denotes Row of water Cuting Row denotes Row denotes Row of water Cuting Row denotes Row	Image: Copprode Online Reeds Marsh, Sattings Rough Orline Reeds Marsh, Sattings Rough Orline Reeds Antiputy Objection of wales flow of wales flow Marsh Image Orline Antiputy Image Orline Image Orline Image Orline Image Orline Image Orline<	divater flow Station o rate of ra	Historical Map - Segment A13
River or Canal single stream Hiver or Canal County Boundary (Geographical) County & Civil Parish Boundary + Administrative County & Civil Parish Boundary + Administrative County & Civil Parish Boundary County Boundary (England) Cell Barn Bay County Boundary (England) Cell Barn Bay County Boundary (Sootland) HP Ba Boundary Postor Store PCE HP Ba Boundary Postor Store PCE Parish Bati Rosa P LP Eleminity Postor 8.7 Pa Fort Hings Store PA Fort Hings Store PA Fort Parish Bp Baing G.P Store County Boundary Postor Store Store Baing Baing Store PA Fort Parish Bp Baing G.P Store County Social Parish Bp Store County Social Parish Bp Store PA Fort Parish Bp Store County Social Parish Bp Store County Social Parish Store Store PA </td <td>Symbol marking point where boundary mining changes:</td> <td>Bits Barracks P Paint Pole or Point Wy Netway PO Post Office Using Crimitary PC Pusits Conventionse Uning Crimitary PC Pusits Conventionse Uning Crimitary Pp Pumps Use Cristein Prog Stat Prog Stat Olamitar Riy Diamatried Rulewy PW Place of Wannig El Gen Stat Electricity Pole, Piltar Statson Sensor Pou Stat Sensor Pou Stat El P Electricity Pole, Piltar Stats Sensor Statson Statson El P Electricity Pole, Piltar Stats Stat Signal Bolk or Bridge B Sub Stat Electricity Pole, Piltar Stats Stats Signal Bolk or Bridge B Sub Stat Electricity Pole, Piltar Stats Signal Bolk or Bridge B Sub Stat Electricity Pole, Piltar Stats Signal Bolk or Bridge B Sub Stat Electricity Pole, Piltar Stats Signal Bolk or Bridge B Sub Stat Electricity Pole, Piltar</td> <td>Order Details Order Number: 61816040_1_1 Customer Ref: UK14.1709 National Grid Reference: 553290, 276300 Site: A Site Area (Ha): 0.46 Search Buffer (m): 100 Site Details Site at 553280, 276280 Tel: 0844 844 9952 Web: 0844 844 9951 Web: 0844 844 9951 Veb: 0844 844 9951 Handmark Information Group Service v47.0 05-Nov-2014</td>	Symbol marking point where boundary mining changes:	Bits Barracks P Paint Pole or Point Wy Netway PO Post Office Using Crimitary PC Pusits Conventionse Uning Crimitary PC Pusits Conventionse Uning Crimitary Pp Pumps Use Cristein Prog Stat Prog Stat Olamitar Riy Diamatried Rulewy PW Place of Wannig El Gen Stat Electricity Pole, Piltar Statson Sensor Pou Stat Sensor Pou Stat El P Electricity Pole, Piltar Stats Sensor Statson Statson El P Electricity Pole, Piltar Stats Stat Signal Bolk or Bridge B Sub Stat Electricity Pole, Piltar Stats Stats Signal Bolk or Bridge B Sub Stat Electricity Pole, Piltar Stats Signal Bolk or Bridge B Sub Stat Electricity Pole, Piltar Stats Signal Bolk or Bridge B Sub Stat Electricity Pole, Piltar Stats Signal Bolk or Bridge B Sub Stat Electricity Pole, Piltar	Order Details Order Number: 61816040_1_1 Customer Ref: UK14.1709 National Grid Reference: 553290, 276300 Site: A Site Area (Ha): 0.46 Search Buffer (m): 100 Site Details Site at 553280, 276280 Tel: 0844 844 9952 Web: 0844 844 9951 Web: 0844 844 9951 Veb: 0844 844 9951 Handmark Information Group Service v47.0 05-Nov-2014

Historical Mapping Legends

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----- Civil Parish Boundary

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(3. A)	. Dunes		****	Boulders
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φ φ	Orchard	D.0	Scrub	Mrd Coppice
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	- Marsh	w.Vn.	Reeds	-±⊥⊱ Saltings
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(123)	Gravel Pit	虚弱	Retuse tip or stag heap
19-5	Rock	10	Rock (scattered)
-	Bauldens	w.,	Boulders (scattered)
(1988) (1988)	Shingle	0	Mut
0	Sand	0.572	Sand Pit
DOMAS	Sopes	1077711110 MALLULALI	Top of citt
	General detail		Underground detail
	Overhead detail		Namow gauge railway
-	Multi-track railway		Single track railway
	County boundary (England only)		Civil, parish or community boundary
	District, Unitary, Metropolitam, London Borough Boundary		Constituency boundary
20 17	Area of wooded vegetation	10	Non-coniferous trees
ä o	Non-coniferents trees (scattered)	12 18	Conifernas
۰.	Coniferous trees (seathered)	à	Positioned tree
	Ornhaitt	1.1	Coppice or Osiers
	Rough Grassland		Heath
e *	Scrub		Marsh, Sall Marsh or Reeda
-	Water feature	-	Flow arrows
ing.	Mean high water (springs)		Mean kiw water (springs)
	Telephone line (where shown)		Electricity (ransmission line (with poles)
and the second	Bench mark (where shown)		Triangulation
	Point feature (n.g. Guide Post or Mile Stone)	2	Pylon, flare stack or lighting tower
·ŀ·	Site of (antiquity)		Glasshouse
-	General Building		Important Building

1:10,000 Raster Mapping



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Cambridgeshire & Isle Of Ely	1:10,560	1887	2
Cambridgeshire & Isle Of Ely	1:10,560	1903	3
Cambridgeshire & Isle Of Ely	1:10,560	1927	4
Cambridgeshire & Isle Of Ely	1:10,560	1952	5
Ordnance Survey Plan	1:10,000	1958	6
Ordnance Survey Plan	1:10,000	1974	7
Ordnance Survey Plan	1:10,000	1980	8
Ordnance Survey Plan	1:10,000	1992	9
10K Raster Mapping	1:10,000	2006	10
VectorMap Local	1:10,000	2014	11

Historical Map - Slice A



Order Details

Customer Ref:	01010040_1	_1		
National Grid Reference:	553290, 276	300		
Slice:	A			
Site Area (Ha):	0.46			
Search Buffer (m):	1000			
Site Details				
Site at 553280, 276280				
		Tel	0044 044 0050	-
Landma	rĸ	Fax:	0844 844 9952	
		Web:	www.envirocheck.co.uk	

A Landmark Information Group Service v47.0 05-Nov-2014 Page 1 of 11



Cambridgeshire & Isle Of Ely Published 1887 Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scottand in the 1840's. In 1854 the 12,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.



Historical Map - Segment A13



Order Details



A Landmark Information Group Service v47.0 05-Nov-2014 Page 2 of 8



Cambridgeshire & Isle Of Ely Published 1887

Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 12,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassin's Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.





Cambridgeshire & Isle Of Ely Published 1902 Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is offen some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.



Historical Map - Segment A13



61816040_1_1 UK14.1709 National Grid Reference: 553290, 276300 А 0.46 100 Tel: Fax: Web: 0844 844 9952 0844 844 9951

www.envirocheck.co.uk



Cambridgeshire & Isle Of Ely Published 1903

Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840 s. In 1854 the 12,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapsing from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.





















Historical Map - Segment A13



Order Details















APPENDIX G

Method Statement for Unexpected Contamination



MS No: 034 Page: 1 of 1 Version: 1.0 Issue Date: Nov 2013

METHOD STATEMENT

ACTIONS TO BE TAKEN IN THE EVENT OF DISCOVERING UNEXPECTED CONTAMINATION DURING INTRUSIVE GROUNDWORKS

If at any point during intrusive groundworks at a site, evidence of unforeseen contamination is encountered in the form of significant noxious odours, discolouration, or instability within soils or sheen / discolouration in groundwater, the following actions will be taken:

- Intrusive works in the immediate area of the impacted ground will be suspended and the continuation of work in other areas of the site will be considered within the context of the site specific health & safety plan.
- Environmental Protection Strategies Ltd (EPS) will be contacted and appraised of the situation so that arrangements can be made to characterise the impact and determine what action may be necessary in addition to the scheduled site works. Where possible / health & safety plan permits, digital photographs of the impacted ground will be taken and emailed to EPS at the address below to assist in the initial assessment.
- It may well be necessary for EPS to attend site to undertake visual inspection and obtain samples for field and/or laboratory analysis, although the actions taken will be dependent on the nature of what is encountered.
- In cases where EPS consider the unforeseen contamination likely to pose a significant risk of significant harm to adjacent site users or local environmental receptors, the local authority and the Environment Agency will be informed of the situation and the actions being taken.
- Once appropriate action has been agreed and undertaken a written summary will be produced by EPS for submission to the Local Authority (and where relevant, the Environment Agency) in accordance with planning requirements. The submission will include details of work undertaken, analytical results of investigative and validation samples obtained and conclusions and recommendations for any further actions considered necessary.
- Where regulatory bodies have been involved, site works should only recommence following their agreement and in all cases should only recommence when the site manager considers it safe to do so within the context of the site specific health & safety plan.

EPS Contact Details:

Principal Contact	Giles Lock	Director	Tel: 0781 253 9656
Secondary Contact	Will Evans	Director	Tel: 0781 253 9655

Email: <u>info@epstrategies.co.uk</u> (automatically forwarded to both of the above and office based personnel)