Phase I & II Geo-Environmental Assessment

Meadhurst (Uppingham School)
11 Ayston Road
Uppingham
Oakham
LE15 9RL

Prepared for:

Uppingham School Estates Department
Units 1 & 2 Pullman Trading Estate
Uppingham
Rutland
LE15 9TX

EPS Reference Number:	UK23.6614
Date Issued:	13th October 2023
Report Status:	Issue 1

MEADHURST (UPPINGHAM SCHOOL)

NON-TECHNICAL CLIENT SUMMARY

This report presents the findings of a combined Phase I Desk Study and Phase II Geo-Environmental assessment undertaken to determine ground conditions, establish if there are any geo-environmental risks associated with the site and its proposed development and to provide a geotechnical appraisal. Pertinent findings and conclusions may be summarised as follows:

- The area of investigation includes two boarding houses associated with Uppingham School. It is proposed that a new boarding house is constructed adjacent to one of these boarding houses (Meadhurst) and that the existing boarding houses are refurbished and improved.
- Historical records suggest that the site has been associated with Uppingham School since before the 1880's, although the configuration of the site has changed throughout its history. The area is considered to have a moderate environmental sensitivity due to the underlying Northampton Sand Formation being a Secondary Aquifer which is locally abstracted, while some commercial and industrial land uses including a petrol filling station have been identified nearby no off-site sources of contamination pose a risk to the site.
- The intrusive works included the drilling of boreholes and excavation of trial pits and the ground profile was found to comprise a limited topsoil overlying Northampton Sand Formation materials (medium dense to dense, gravel and layers of clay, silts and sand) with very stiff clay of the Whitby Mudstone Formation recorded from 6.4m.
- Laboratory testing of the shallow soils identified some elevated concentrations of the metal's arsenic and lead likely associated with the natural geology, and due to the recorded concentration of lead in shallow soil samples. Recommendation have been made to further assess the associated risks to determine how the risks to current and future site users potentially being exposed to lead in shallow soil can be controlled.
- Waste classification has also been undertaken and the topsoil and Northampton Sand Formation have both been classified as **Inert** for the purposes of off-site disposal, the deeper Whitby Mudstone Formation however should be classified as **Non-Hazardous** for the purposes of off-site disposal.

ENGINEERING SUMMARY

- The ground conditions across the site are considered suitable for conventional spread foundations, with allowable bearing capacities starting from 110kN/m^2 from approximately 1.0m below existing levels, information on the deeper ground conditions is also presented should a piled foundation solution be preferred / required.
- Suspended ground floor construction is recommended and a CBR value of 8% is likely to be achievable for any new areas of pavement where the Northampton Sand Formation is present at formation level.
- Infiltration testing has allowed for infiltration rates indicative of 'low to medium permeability' conditions to be calculated for the Northampton Sand Formation.
- A design sulphate of DS-1 with an ACEC classification of AC-1^d is considered appropriate for shallow buried concrete in contact with topsoil and the Northampton Sand Formation.

The above points represent a simplified summary of the findings of this assessment and **must not** form the basis for key decisions for the proposed development. A thorough review of the details is contained within the following report, or alternatively get in touch and we'll talk you through it.

On Project Reference:	UK23.6614	
Title:	Phase I & II Geo–Environmental Assessment Uppingham School, Meadhurst	
Client:	Uppingham School Estates Department	
Date:	13th October 2023	
EPS Contact Details:	7B Caxton House Broad Street Cambourne Cambridge CB23 6JN	T: 01954 710666 F: 01954 710677 E: info@epstrategies.co.uk W: www.epstrategies.co.uk
Status:	Issue 1	

Author:	**Reviewed:**	**Authorised:**
		
Matthew Cook	Tom Androsiuk	Steve Bullock
Consultant	Senior Consultant	Director

The report has been written, reviewed and authorised by the persons listed above. It has also undergone EPS' in house quality management inspection. Should you require any further assistance regarding the information provided within the report, please do not hesitate to contact us.

The National Planning Policy Framework requires a competent person to prepare site investigation information, which is defined as a person with a recognised relevant qualification, sufficient experience in dealing with the type(s) of pollution or land instability, and membership of a relevant professional organisation. EPS considers that it fulfils these criteria and would welcome any request for staff CVs or case studies to demonstrate it.

As stated within DEFRA's Contaminated Land Statutory Guidance, with any complex risk assessment it is possible that different suitably qualified people may reach slightly different conclusions when interpreting the same information. EPS recognises this and considers the conclusions presented within this report to be robust and appropriate but input from the Local Authority and their judgement in line with this guidance would still be welcomed.

TABLE OF CONTENTS

Figures

Tables

Appendices

1 INTRODUCTION

In August 2023, Environmental Protection Strategies Ltd (EPS) was commissioned by Conisbee on behalf of the Uppingham School Estates Department to complete a Phase I & II Geo-Environmental Assessment for at the Meadhurst boarding house (associated with Uppingham Uppingham School), 11 Ayston Road, Uppingham, Oakham, LE15 9RL ('the site'); see Figure 1.

The work was commissioned in order to support planning proposals for a new scheme, understood to include a new boarding house to the west of the existing Meadhurst boarding house (henceforth referred to as Meadhurst) as well as the refurbishment of the existing Meadhurst and Farleigh boarding houses. It should be appreciated that the Phase II works undertaken as part of this project focussed solely on the Meadhurst part of the site and that no intrusive investigations have been undertaken for the Farleigh boarding house as part of these works.

This report presents the findings, conclusions, and recommendations of the Phase I Desk Study and subsequent Phase II Intrusive Investigation undertaken.

1.1 Objectives

The objectives of this investigation were as follows:

a) Compile a Phase I Desk Study and Conceptual Site Model (CSM) to evaluate the potential risks the site may pose to human and environmental receptors, both currently and in future.
b) Assess potential contaminant linkages identified through the CSM by means of investigating shallow soils.
c) Determine the potential risks posed by the site and make recommendations for further work that may be required, to ensure safe development in accordance with the Environment Agency's *Land Contamination: Risk Management* (2023) and the *National Planning Policy Framework*.
d) Collect information on ground conditions and strength in order to make appropriate recommendations for geotechnical design.

1.2 Scope of Work

To perform an exploratory assessment of the site in accordance with the principles and requirements of DEFRAs '*Contaminated Land Statutory Guidance*' (2012), BS10175 – '*Investigation of Potentially Contaminated Sites*', BS 5930:2015+A1:2020 '*Code of practice for ground investigations*' and BS EN 1997 '*Geotechnical Design*', the following tasks were undertaken:

<u>Desk Study:</u>

- Collection of site records.
- Study of existing geological, hydrogeological, and historic maps of the area.
- Consultation of environmental databases, including records held by the local authority (where available).
- Review of proposed development plans.
- Development of a Conceptual Site Model (CSM) and Preliminary Risk Assessment.

Intrusive Investigation:

- Site walkover, inspection of any visual evidence of contamination, obtaining photographic records.
- Health and safety briefing/ site supervision.
- Drilling of one cable percussive (shell and auger) borehole, to a depth of 20.0m below ground level (bgl).
- Drilling of three windowless sample boreholes to a depth of 5.0m below ground level (bgl) using a track-mounted, dynamic (drop weight) percussive drilling rig and installation of combined ground gas and groundwater monitoring standpipes on a precautionary basis.
- Excavation of three trial pits to a maximum depth of 2.0m bgl, using a mechanical excavator; with 'soakaway' infiltration testing attempted in each of trial pit.
- Excavation of two hand-dug foundation exposure pits to a maximum depth of 0.77m bgl, to assess the nature and extent of the foundations of the Meadhurst building.
- In-situ testing, to assist with geotechnical design including the undertaking of five dynamic cone penetrometer (DCP) throughout the area.
- Continual logging of ground conditions including inspection of samples for visual and olfactory contamination, and laboratory analysis of selected soil samples.

Reporting:

- Data collection
- Interpretation of data including completion of Generic Quantitative Risk Assessment
- Reporting

The findings of these investigations and their conclusions are presented in the following sections.

1.3 Project Limitations and Constraints

The purpose of this report is to present the findings of a soil sampling investigation conducted at the location(s) specified. When examining the data collected from the investigations made during the assessment, Environmental Protection Strategies Ltd (EPS) makes the following statements:

No investigation method is capable of completely identifying all ground conditions that might be present in the soil or groundwater under a site. Where outlined in our report, we have examined the ground beneath a site by constructing a number of boreholes and / or trial pits to recover soil and / or groundwater samples. The locations of these excavations and sampling points are considered to be representative of the condition of the whole site subsurface however, ground conditions are naturally variable and it may be possible that the ground conditions encountered may differ to those encountered during the investigation.

No visible evidence of Japanese Knotweed was identified during the site walkover. However, this plant can be difficult to identify in the early stages of growth and therefore it is not always possible to identify its presence at certain times of the year. For this reason, EPS cannot confirm that Japanese Knotweed rhizomes do not exist and it is recommended that if it is suspected that this species, or other similarly invasive plants are present at the site, a specialist contractor should be commissioned to make a detailed assessment.

The investigation was carried out to assess the significance of contamination resulting from the use of the site as identified in this report. Unless EPS has otherwise indicated, no assessment of potential impact of any other previous uses has been made.

2 SITE CHARACTERISATION

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

2.1 Site Location and Description

Detail	Description
Location	The site includes both the Meadhurst and Farleigh borading houses and associated ground which are associated with Uppingham School and are present on the western side of Ayston Road in the centre of the town of Uppingham, located approximately 9km south of the town of Oakham in Rutland.
National Grid Reference	486550, 299970
Topography	While levels are largely flat on a small scale, the site area slopes down gently from the west at around 146m Above Ordnance Datum (AOD) to the east at around 142m AOD.
Description of Site	The area of investigation comprises a roughly rectangular shaped parcel of land, covering approximately 2.1 hectares. The area features two boarding houses known as Farleigh in the north and Meadhurst in the south which are part of the nearby Uppingham School. Each of these houses have associated gardens and sports pitches. Both these houses can be accessed separately from the east via Ayston Road (A6003) with another entrance located in the north being an extension of Wheatley Avenue on the adjacent side of Ayston Road. The southern entrance (directly north of Meadhurst) extends west through the centre of the site and opens into a newly built car in the south west which is accessible via an automatic barrier. A footpath provides access to a maintained area of grass and an area of concrete hardstanding to the west and south of Meadhurst respected, both of these areas are understood to be used for sports and outdoor activities. On the western side of the Meadhurst building is a small courtyard for car parking / loading and to the south is a network of paths some of coniferous hedges. Farleigh house to the north is a similar structure to Meadhurst with similar attributes such as multiple sports pitches, space for parking, public walkways and gardens. The site is well maintained with many hedgerows and areas of planting that include shrubs and bushes as well as hosting many mature and juvenile deciduous and coniferous trees raging in size from small to large.
Surrounding Land Use	The site is mostly surrounded by residential dwellings on all sides with Uppingham Fire Station and various commercial entities are located on the eastern side of Ayston Road, these include a motorcycle dealership, clinic, various food outlets and stores and a petrol filling station 74m south 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 A and relevant extracts of the Envirocheck Report are included as Appendix B.

2.2 Geo-Environmental Setting

<table>
<tr><th>Detail</th><th colspan="2">Description</th></tr>
<tr><td>Geology</td><td colspan="2">Geological mapping indicates the site to be directly underlain by bedrock sandstone, limestone and ironstone of the Northampton Sand Formation, no superficial geology is mapped within the sites boundaries although superficial Mid Pleistocene glacial till is mapped in the wider surrounding area. Information on the site's geological context is included as Appendix C.</td></tr>
<tr><td rowspan="9">Geological Hazards</td><td>Hazard</td><td>On Site Risk</td></tr>
<tr><td>Mining Activities</td><td>No Hazard</td></tr>
<tr><td>Collapsible Ground</td><td>Very Low</td></tr>
<tr><td>Compressible Ground</td><td>No Hazard</td></tr>
<tr><td>Ground Dissolution</td><td>No Hazard</td></tr>
<tr><td>Running Sand</td><td>No Hazard</td></tr>
<tr><td>Landslide</td><td>Very Low (Low 152m NE)</td></tr>
<tr><td>Shrinking/ Swelling Clay</td><td>No Hazard (Low 32m E)</td></tr>
<tr><td colspan="2">Four British Geological Survey (BGS) recorded mineral sites are listed within 1km, the closest being 565m south west where a former opencast quarry for ironstone known as 'The Pitts' is present. All of the other recorded mineral site extracted ironstone and all have now ceased operating. No natural or man-made cavities have been recorded within 1km.</td></tr>
<tr><td>Radon</td><td colspan="2">The Envirocheck report indicates the site to lie in a location where the percentage of homes above the radon action level is in a higher probability radon area where 10% to 30% of homes are estimated to be at or above the radon Action Level.

It further reports that tfull radon protection measures are necessary in the construction of new buildings or extensions.</td></tr>
<tr><td>Hydrogeology</td><td colspan="2">Groundwater vulnerability maps for the area show that the bedrock Northampton Sand Formation is designated as a Secondary A Aquifer. The site does not lie within a Source Protection Zone (SPZ) for local groundwater abstraction. Two groundwater abstraction licenses are however reported within 1km, the closest of which is located 820m east and is operated by 'A F Carr' who abstract groundwater for general agriculture and domestic use. Groundwater vulnerability maps are included as Appendix D.</td></tr>
<tr><td>Hydrology & Flood Risk</td><td colspan="2">The nearest surface water feature is reported to be located 159m east and is possibly a drain or pond within the allotment gardens or recreation ground in this area.

Seven discharge consents are reported within 500m, the closest of which are for pumping stations operated by 'Anglian Water Services Limited' for Public Sewage: Storm Sewage Overflow which has a consent to be discharged into a tributary of the River Welland 233m north east. No surface water abstraction licenses are held within 1km.</td></tr>
</table>

<table>
<tr><th>Detail</th><th>Description</th></tr>
<tr><td></td><td>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 the technical guidance to the National Planning Policy Framework (NPPF) as ‘the area with a low probability of flooding from rivers or the sea’. It should be noted that the EA maps do not take into account flooding from other potential sources of floodwater, such as from poor drainage or groundwater. BGS Flood GFS Data does however show that the site lies in an area with a limited potential for groundwater flooding to occur.

An indicative flood zone map is also included in Appendix D.</td></tr>
<tr><td>Known Site Drainage & Utilities</td><td>According to mains services plans sourced from relative local providers, Gigaclear Fibre optic cables run through the centre of the site and evidence of other buried utilities including manhole and inspection covers and drain covers were also noted throughout the area.</td></tr>
<tr><td>Landfill & Waste</td><td>No active or historic landfills, waste management facilities or areas of infilled land have been highlighted within 500m by the BGS, Local Authority or Environment Agency although there is a historic landfill and some infilled land present from 975m south.</td></tr>
<tr><td>Licensed Industrial Activity</td><td>There are three sites licensed for industrial activity within 1km, the closest is Central Garage (Uppingham) which is a petrol filling station 99m south east of the site, the two other licences (now surrendered) were operated by Conegrade Ltd for adhesive and powder coating processes 899m south east.</td></tr>
<tr><td>Industrial Land Use</td><td>The Envirocheck report lists many industrial land uses within 1km, all of which are summarised below.
<table>
<tr><th>Land Use</th><th>Distance (Direction)</th><th>Status</th></tr>
<tr><td>Sycamore Harley-Davidson (Garage Services)</td><td>57m (SE)</td><td>Active</td></tr>
<tr><td>B P Service Station (Petrol Filling Station)</td><td>74m (SE)</td><td>Active</td></tr>
<tr><td>Midas Medical Storage Ltd (Storage & Shelving Systems Manufacturers)</td><td>101m (S)</td><td>Active</td></tr>
<tr><td>Alan Bastick Logistics Ltd (Frozen Food Processors & Distributors)</td><td>206m (SE)</td><td>Inactive</td></tr>
<tr><td>The Laundry Basket (Ironing & Home Laundry Services)</td><td>225m (SE)</td><td>Inactive</td></tr>
</table>
A single fuel station is also recorded within 1km, this is the open and active BP petrol station recorded 74m south east of the site which is also authorised by the local authority.</td></tr>
<tr><td>Pollution Incidents</td><td>No pollution incidents to controlled waters or entries on the substantiated pollution register have been recorded within 1km. There are also no records of any prosecutions relating to controlled waters or authorised processes within 1km and similarly there are also no hazardous sites or substances including registered radioactive substances recorded within 1km.</td></tr>
</table>

Detail	Description
Sensitive Land Use	The area of investigation is reported to be located within a Nitrate Vulnerable Zone where surface water is considered to be susceptible to the leaching of nitrates from agricultural land. There are no other sensitive land use designations within 1km.
Previous Investigation or Remediation	EPS are aware of three previous investigations undertaken within the grounds of Meadhurt & Farleigh. These include some soakaway testing undertaken by David Smith Associates in January 2017 (reference: BT/17/24414/CS), a Basic Contamination Investigation Report (Project Reference: JN1237) issued by Southern Testing / ST Consult in March 2019 and a Site Investigation Report (Report Refence No. C15319) issued by Ground Engineering Limited in June 2021.

2.3 Site History

A summary of historical map data from 1885 to 2023 is summarised below. Key points are highlighted as annotations on the aerial photograph below and discussed in the subsequent bullets. Copies of relevant historic maps and any others examined during the investigation are included in this report as Appendix E.

- The site has undergone noticeable changes since records began in 1885, whilst the first school buildings of Farleigh and Meadhurst existed before 1885 they have been expanded north several times in the last century, once in 1904 and again in the 1970's. Other than the development of

these structures the only other notable edition to the site was a new car park which first appears on historic maps from 2022.

- The surrounding town of Uppingham has been developing gradually since the 1960's, a large area of allotments existed along the east of Ayston Road from 1904 to 1905 before being developed, primarily into housing, another area of allotments are shown on maps from the 1960's slightly further east, this area of allotment approximately 80m east is still partially present today but the more easterly section was converted to houses in the 1990's.
- A laundry was identified approximately 100m north which was first seen in 1904 but was later repurposed as a mill (Ayston Mill) during the 1960's, this was then demolished to make way for residential properties in the 1980's which still exist today along Willow Close.
- Several possibly infilled ponds have been identified on historic maps in the nearby area to the site, one of which was in the south western part of the site and appeared on the first historic maps from the late 1800's and was seemingly infilled during the development of the wider town in the 1970's and 1980s. The other ponds were 40m north west, 30m south west and 30m east and 130m north which were all were seemingly infilled around the same time.

3 PRELIMINARY RISK ASSESSMENT AND CONCEPTUAL SITE MODEL

In accordance with the Environment Agency's *Land Contamination: Risk Management* (LC:RM, 2023) guidance, there are three stages to managing contaminated land (Risk Assessment, Remedial Options Appraisal / Remediation and Verification). This section outlines the first tier of Stage 1, the Preliminary Risk Assessment.

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 Background

A preliminary risk assessment 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 or geological risk to site users, the surrounding environment or proposed development, 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.
Pathway	A route or mechanism via which a source could come into contact with a receptor to cause significant harm.
Receptor	An environmentally sensitive object or condition e.g. person, property, controlled water, or ecological system, which may be present now or in future.

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.

3.2 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 & Historic Site Use	In-fill material of unknown origin (Made Ground) used to level areas beneath existing / historic buildings and hardstanding.	PAH, Metals, ACM
	Possible in-filled pond within the site boundary.	Ground Gas (CH_4, CO_2)
	Naturally elevated concentrations of metals associated with the natural geology.	Metals (Specifically Arsenic & Lead)
	Radioactive decay of natural geology.	Radon Gas
Current and Historical Surrounding Land Use	Current and historic commercial and industrial land uses including a historic laundry 100m north, fire station and motorcycle dealer adjacent to the east and a petrol filling station 74m south east.	PAH, Metals, PFAS, VOC's, SVOC's TPH (inc. MTBE & BTEX)
	Possible infilled ponds within 50m.	Ground Gas (CH_4, CO_2)
	Former and current allotment gardens on the eastern side of Ayston Road.	Metals, Herbicides & Pesticides

Notes:

PAH	Polycyclic Aromatic Hydrocarbons	ACM	Asbestos Containing Material
CH_4	Methane	CO_2	Carbon Dioxide
PFAS	Perfluoroalkyl & Polyfluoroalkyl Substances	VOC's	Volatile Organic Compounds
SVOC's	Semi Volatile Organic Compounds	TPH	Total Petroleum Hydrocarbons
MTBE	Methyl Tertiary Butyl Ether	BTEX	Benzene, Toluene, Ethylbenzene & Xylenes

3.3 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 have been further developed into six generic land uses in the Category 4 Screening Levels project for Land Affected by Contamination (DEFRA/Contaminated Land: Applications in Real Environments (CL:AIRE) Project Report SP1010, September 2014) which form a basis for the development of the Conceptual Site Model.

Risks posed to controlled waters have been considered in line with the Environment Agency's *approach to groundwater protection* (v1.2, 2018) and associated position statements.

It is proposed that a new boarding house is constructed within the area of investigation and that the existing Meadhurst and Farleigh buildings be refurbished, no change of land us is proposed and the site is to remain in use as boarding houses and grounds associated with Uppingham School. A Residential (with home-grown produce) land use setting is considered to be the most appropriate land use setting for this site. The amount of exposure to future site users (i.e. occupiers of the boarding houses and staff) will be much less than the lifetime exposure that this land use typically considers, however given that this is the most conservative land uses which includes all of the relevant exposure pathways, it is likely to result in a more stringent risk assessment and hence is considered the most appropriate at this stage.

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
Human	Future site users, construction workers involved in the proposed redevelopment, and those working and living in the surrounding area have the potential to be at risk from exposure to potential contaminants of concern (CoCs), including from former or adjacent land uses.
Groundwater	The site is reported to be underlain by the bedrock Northampton Sand Formation which is defined by the EA as a Secondary A Aquifer. Whilst the site does not lie within a SPZ for nearby groundwater abstraction, the underlying geology does have some resource potential and therefore groundwater should initially be considered as a potential receptor to site derived contaminants.
Surface Water	The nearest surface water course is likely to be a drain or pond 159m east within the allotments or recreation ground. It is possible that site derived contaminants of concern may enter this (or other nearby) watercourses by overland flow, migration through unsaturated soils or entering shallow surface drainage/ historical land drainage which discharges to these drains. Therefore, surface waters must also initially be considered as a sensitive receptor within the conceptual site model.
Flora and Fauna	The current and future use of the site will includes areas of soft landscaping including planters and given the use of the nature of the site being used as boarding houses, it is possible that homegrown produce may also be grown. Some of the identified contaminants of concern are known to be phytotoxic and as such, the potential for this impact should be considered.
Buildings & Infrastructure	Current and future subsurface structures are likely to be present which may be adversely affected by the potential presence of contaminants from the off-site sources identified. These include building foundations and services running beneath the site, installed as part of the proposed development.
Adjacent Land	Adjacent properties including private residential dwellings to the north, west and south could also be at risk from potential contaminants found at the site.

3.4 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 outdoors
- Inhalation of vapours indoors

Clearly, not all of these potential pathways apply for every standard land-use. For example, ingestion of contaminated vegetables will not apply to land uses other than residential with plant uptake and allotments. 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.

3.5 Summary of Site-Specific Contaminant Linkages

Considering the site use and environmental setting, and the proposed land use; the plausible contaminant linkages that require further investigation are summarised in the following table:

Source	Pathway	Receptor
Contaminated soil	Direct contact and inadvertent ingestion by eating or smoking with dirty hands	Construction workers during redevelopment & site users
	Inhalation of fugitive dusts	Site users
	Direct uptake and / or adherence of contaminated soil to vegetation and subsequent ingestion	
	Ingress / diffusion through permeable potable water supply pipes	
	Direct uptake via root systems	Plants

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:

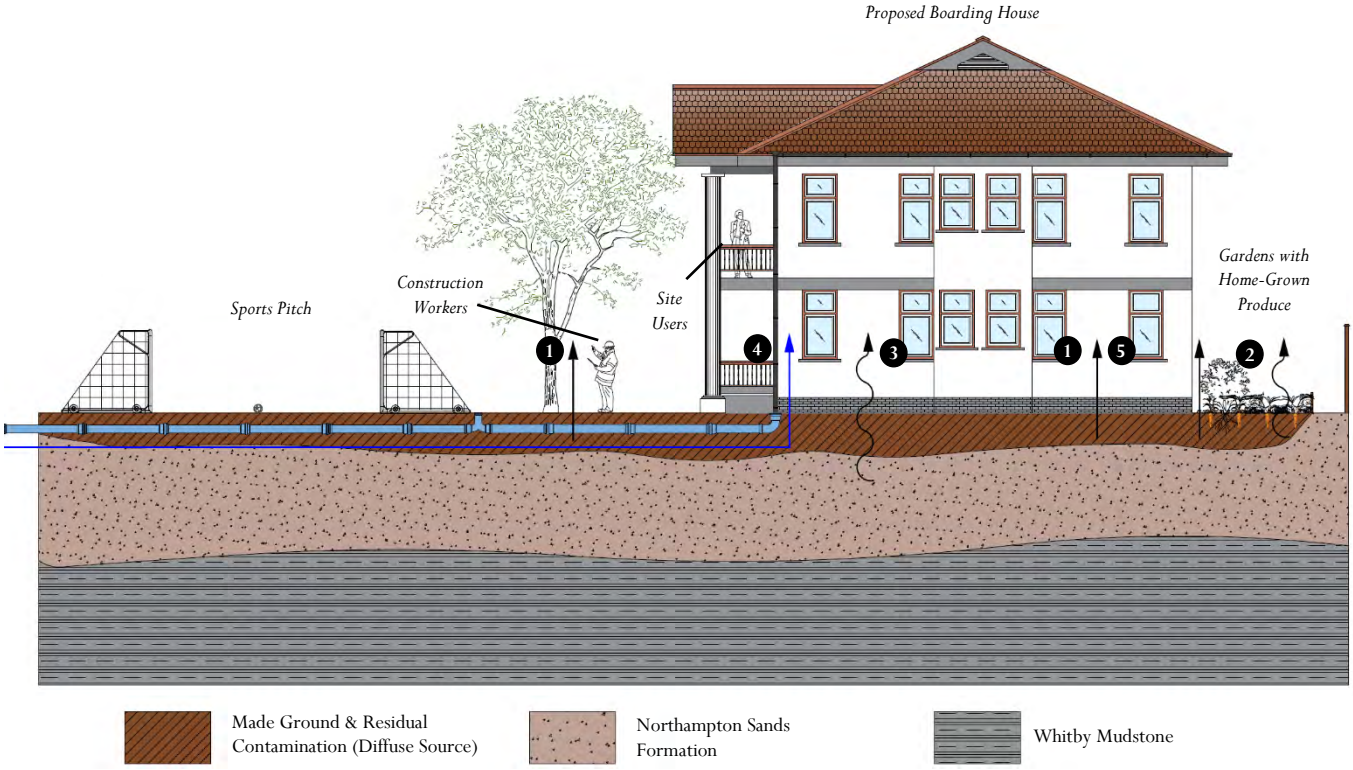
- PAH's and metals have been identified as contaminants of concern associated with the historic onsite infill, however these contaminants are considered to be relatively immobile in the environment by virtue of their very low solubility and volatility. On this basis, plausible pathways by which these potential contaminants could pose a significant risk to the underlying groundwater or nearby surface watercourses are not considered to be active.
- Whilst contaminants, including petroleum hydrocarbons, have been identified as being of concern associated with the nearby fire station, motorcycle dealer, petrol filling station 74m south east and historic laundry 100m to the north, it is not anticipated that volatile organic compounds i.e., petrol have been stored or used in significant concentrations or volumes within the sites boundaries. Therefore, with all due consideration to the nature and status of the nearby commercial and industrial land uses and the anticipated hydrogeological gradient, a plausible contaminant linkage has not been identified associated with the migration of contaminants in soil and / or groundwater and the volatilisation of contaminants to indoor and outdoor air within the sites boundaries.
- Agri-chemicals have been identified as potential contaminants associated with nearby historic and current allotments to the east. However, given the nature and scale of these allotments, it is considered highly unlikely that significant these contaminants were ever used in sigficant quantities on the adjacent land that would have affected the site and present a risk to existing or future site users.
- Whilst some small potentially infilled ponds have been identified on site and in the surrounding area, given the size and age (and therefore likely nature of fill material) of these features a

plausible contaminant linkage is not recognised associated with the migration of ground gas to indoor and outdoor air.

- Given the likely shallow nature of impacts to surface soils, no site derived contaminants of concern have been identified at the site which could pose a significant risk to the foundations of any on-site or adjacent buildings / infrastructure.

The following diagram provides an illustration of the plausible contaminant linkages that may be active at the site and which may need further investigation or control to ensure safe development:

Meadhurst (Uppingham School) – Illustrative Conceptual Site Model



Potential Pathways:

1. Direct contact with/ingestion of soil & inhalation of fugitive dusts
2. Direct uptake and / or adherence of contaminated soil to vegetation and subsequent ingestion
3. Migration of radon gas (from radioactive decay of natural geology) to indoor air
4. Ingress/diffusion through permeable potable supply pipes
5. Migration of naturally elevated concentrations of metal (Ar

4 SUMMARY OF INTRUSIVE INVESTIGATIONS

The intrusive ground investigation was undertaken between the 31st August and and 5th September 2023, in accordance with EPS standard operating procedures, copies of which will be made available on request. A summary of the site activities is presented in the following sections:

4.1 Exploratory Hole Locations

Exploratory hole locations were originally selected by the Clients structural engineers and were ultimately selected through consideration of the proposed development layout, the location of below ground utilities and as operational and health & safety considerations.

The overall objective, in terms of exploratory hole locations was to deliver an appropriate lateral and vertical coverage of the site in order to offer information relating to the nature, quality and strength of the underlying soils to the rear (west) of Meadhurst. Further rationale for each sampling location is provided within the table below:

Location	Rationale
BH01	Provide information on the nature and strength of underlying soils, particularly at depth, to assist with geotechnical (pile) design.
WS01 – WS03	Assess the nature, strength and quality of shallow soils providing detailed lateral coverage of the materials to support geotechnical design.
TP01 – TP03	Trial pits used to facilitate infiltration testing via 'soakaways' to assess the permeability of the underlying soils
FP01 & FP02	To provide information on the nature and extent of the existing foundations of the Meadhurst boarding house.
DCP1 – DCP5	Provide in-situ strength data for shallow soils, to assist with future road and pavement design parameters for the proposed new boarding house.

All exploratory hole positions were formed in accordance with standard EPS methodologies and all sub-contractors were supervised by an EPS engineer throughout the works.

Monitoring wells were installed at all three windowless sample borheole positions (WS01, WS02 & WS03) on a precautionary basis for any future monitoring requirements. The installations used 50mm diameter HDPE well casing and were fitted with bungs and gas taps. Slotted casing (1mm slot) was installed at both locations from the base of the open borehole to approximately 1.0m below the surface and the installations were completed using plain casing. A filter pack of 2-3mm of washed gravel extended from the base of the open boreholes to approximately 0.8m above the slotted section, with a bentonite seal to surface. The monitoring installations were finished at the surface with, flush forecourt rated, bolt-down steel headworks.

Upon completion the remaining boreholes (BH01) and trial pits were backfilled with soil arisings to the surface.

An exploratory hole location plan is presented as Figure 4.

4.2 In-Situ Testing & Soil Sampling

Each borehole and foundation exposure were logged for ground conditions encountered and inspected for any physical evidence of contamination, such as soil staining, odour and the presence of separate phase liquids, on a precautionary basis.

Where potentially volatile organic compounds are suspected, EPS carries a Photoionisation Detector (PID), which can be used to measure the relative concentrations of vapour associated with soil samples collected from different depths and locations at the site. PID readings are only used to provide EPS with a basic means to quantify areas of volatile organic compound in the field to help guide the investigation. However, given the absence of any visual or olfactory evidence of soils / groundwater impacted by volatile contaminants, headspace testing was not undertaken as part of this investigation.

Standard or cone penetration tests (SPT's / CPT's) were carried out in all of the boreholes using an automatic trip hammer. The number of blows required to advance a standard split spoon, (or solid 60o nose cone for the CPT test) over the final 300mm of a 450mm total drive was recorded and is shown on the borehole records as the penetration resistance ("N" value).

Soil samples were recovered from each location at regular intervals for record purposes and future laboratory testing. Selection of samples from the exploratory hole locations focused on providing an assessment of the geotechnical properties of the soils encountered, as well as the quality of sub-surface materials present across the site and their waste characteristics.

4.3 Laboratory Testing

Soil samples were obtained for analysis of selected contaminants of concern in order to identify the presence of any contamination and confirm their suitability for future use as well as their waste characteristics. Samples were submitted to Element Materials Technology of Flintshire, who hold appropriate UKAS/ MCERT accreditation for the required testing. Samples were transported in laboratory supplied containers and delivered by an approved courier.

Geotechnical testing was undertaken by Soil Property Testing, Huntingdon, a UKAS accredited laboratory.

Copies of the chain of custody documentation are held by EPS and will be made available on request. Furthermore, laboratory testing schedules detailing all samples submitted for environmental and geotechnical laboratory analysis are included within Table 1 and Table 2 respectively.

5 FINDINGS OF THE INVESTIGATION

This section of the report provides a summary of the findings of the various aspects of the intrusive investigation undertaken.

5.1 Ground Conditions

A total of four boreholes and three trial pits were formed across the site and the ground conditions encountered, from surface level, have been interpreted to comprise:

- Topsoil
- Northampton Sand Formation
- Whitby Mudstone Formation

Site specific borehole and trial pit logs are included as Appendix F and give full descriptions and depths of strata encountered. A summary of the general ground profile beneath the site is provided in the table below, with more detailed description given in the following sub-sections.

Geological Strata	Maximum Depth to Base of Strata (m bgl)	Strata Thickness (m)
Topsoil	0.4	0.3-0.4
Northampton Sand Formation	6.4 (Where Proven)	>4.2 (Where Proven)
Whitby Mudstone Formation	Not Proven (>20.0)	Not Proven

5.1.1 Topsoil

A consistent layer of topsoil, comprising dark orangish brown, slightly gravelly, slightly silty sand was identified from the surface at each borehole and trial pit location, extending to around 0.4m.

No evidence of made ground was recorded in any of the boreholes or trial pit locations which were all positioned within the area immediately west of Meadhurst that is surfaced with grass.

5.1.2 Northampton Sand Formation

Directly beneath the topsoil at all borehole and trial pit locations, materials interpreted as the mapped bedrock Northampton Sand Formation were encountered. These materials were largely recovered as medium dense to dense, dark orangish brown ferruginous sandstone gravels within a sandy silty clay matrix. Gravel content was logged as fine to coarse rounded, ferruginous limestone. Separate layers of clays, silts and sands were also present within the same unit. Some slightly looser and very dense sections were also noted, which is likely due to variability in the composition of the material and the influence of groundwater.

The most notable sections of predominantly granular soils comprising loose to medium dense gravels, were recorded in WS01 (3.0m to 5.0m). These layers were recorded beyond the full completion depth of 5.0m at WS01.

5.1.3 Whitby Mudstone Formation

Soil indicative of the bedrock of the Whitby Mudstone Formation, which is mapped in the surrounding area, was identified at BH01 below the Northampton Sand Formation which extended to a depth of 6.4m at this location. This soil was recovered as very stiff, dark greyish brown to dark grey, sometimes fissured and friable, clay. These cohesive soils progressed beyond the 20m completion depth of BH01.

5.2 Groundwater

During the intrusive works, groundwater was struck at each borehole location. The groundwater appeared to be perched within the granular material of the Northampton Sand Formation. The table below summarises the depths at which groundwater was struck at each borehole location and the resting groundwater levels recorded from the monitoring standpipes in the windowless sample boreholes approximately are also outlined in the table below:

Borehole Location	Approximate Strike Depth (m bgl)	Approximate Rest Depth after 24 hours (m bgl)
BH01	3.80	-
WS01	4.04	2.85
WS02	3.91	2.56
WS03	3.27	2.65

5.3 Physical Evidence of Contamination

No palpable evidence of contamination was encountered at any of the borehole locations formed during the ground investigation. The soils did not include any notable evidence of waste or putrefiable material, with hydrocarbon staining/ odours also absent.

5.4 Existing Foundations

Two hand-dug foundation pits were excavated adjacent to the Meadhurst building. The objective of these pits was to assess the nature and extent of the existing foundations. Made ground comprising yellowish brown, sandy, gravelly silt with fragmented brick and concrete was recovered from each foundation exposure pit and surrounded the sides of the footings as well as immediately below them before the natural soils were recorded. Descriptions of the foundations encountered at each location are presented below.

5.4.1 FP01

At FP01, which was located adjacent to the northern face of the protruding section of the Meadhurst, the vertical face of the wall was found to extend to a depth of approximately 0.24m where it was founded on a brick footing measuring approximately 0.3m thick (extending to a total depth of 0.54m). The brick footing stepped out from the wall in three tiers by a total of approximately 0.17m.

***Photo 1** - A photograph showing the thickness of foundations within FP01.*

5.4.2 FP02

At FP02, which was located against the western face of the northern part of Meadhurst, the vertical face of the wall was found to extend to a depth of approximately 0.42m where it was founded on a brick footing measuring approximately 0.35m thick (extending to a total depth of 0.77m). The brick footing was also measured as stepping out from the wall in three tiers by a total of approximately 0.17m.

***Photo 2** - A photograph showing the thickness of foundations within FP02.*

Upon completion, the foundation exposure pits were backfilled with the arisings. Illustrations of the foundation exposures are included as Appendix G and the location of the foundation exposure pits are presented on Figure 4.

5.5 Laboratory Analysis – Soil

An environmental laboratory analysis testing schedule is presented as Table 1 and all environmental soil analysis results obtained from the laboratory are included as Appendix G.

The key results of laboratory testing on environmental soil samples are summarised below.

Contaminant	No. of Samples	No of Detections	Range of Detections (mg/kg)		Highest Location & Depth (m bgl)
			Min	Max	
Arsenic	5	5	60	125.9	WS02 (0-0.4)
Cadmium	5	0	-		
Chromium III	5	5	51.1	335	WS03 (1.6-2.0)
Chromium VI	5	0	-		
Copper	5	4	19	266	WS03 (0-0.4)
Lead	5	5	19	815	WS03 (0-0.4)
Mercury	5	5	0.2	1.2	WS03 (0-0.4)
Nickel	5	5	39.1	119.7	WS03 (1.6-2.0)
Selenium	5	1	1		WS02 (0-0.4)
Zinc	5	5	64	617	WS03 (1.6-2.0)
Benzo(a)pyrene	5	1	3.23		WS03 (0-0.4)
Dibenzo(ah)anthracene	5	1	0.29		WS03 (0-0.4)
Benzo(a)anthracene	5	3	0.08	4.48	WS03 (0-0.4)
Benzo(b)fluoranthene	5	3	0.09	3.96	WS03 (0-0.4)
Chrysene	5	3	0.08	4.44	WS03 (0-0.4)
Naphthalene	5	1	0.60		WS03 (0-0.4)
PAH (Total of 16)	5	2	1.0	60.7	WS03 (0-0.4)
Total Cyanide	5	0	-		
MTBE	3	0	-		
BTEX	3	0	-		
TPH (Total Aliphatics & Aromatics)	3	0	-		
PCB's	3	0	-		
ACM (mass % of sample)	5	0	-		

Notes: - Contaminant not identified above laboratory minimum instrument detection limits
PAH Polycyclic Aromatic Hydrocarbons MTBE Methyl Tertiary Butyl Ether
BTEX Benzene, Toluene, Ethylbenzene, Xylenes TPH Total Petroleum Hydrocarbons
PCB's Polychlorinated Biphenyls ACM Asbestos Containing Material

5.6 Waste Classification

Waste classification (i.e. hazardous or non-hazardous) was undertaken on representative samples of topsoil, Northampton Sand Formation and Whitby Mudstone Formation materials recovered from beneath the site; which included total concentrations of metals and hydrocarbons, using computer software provided by *HazWaste Online*™.

Waste Acceptance Criteria (WAC) testing was subsequently undertaken on one sample of each of these materials. The results of the WAC analysis are included within Appendix H and the outputs from the software are presented as a Waste Classification Report included as Appendix I.

These results, together with those of the waste classification above, are summarised in the following table:

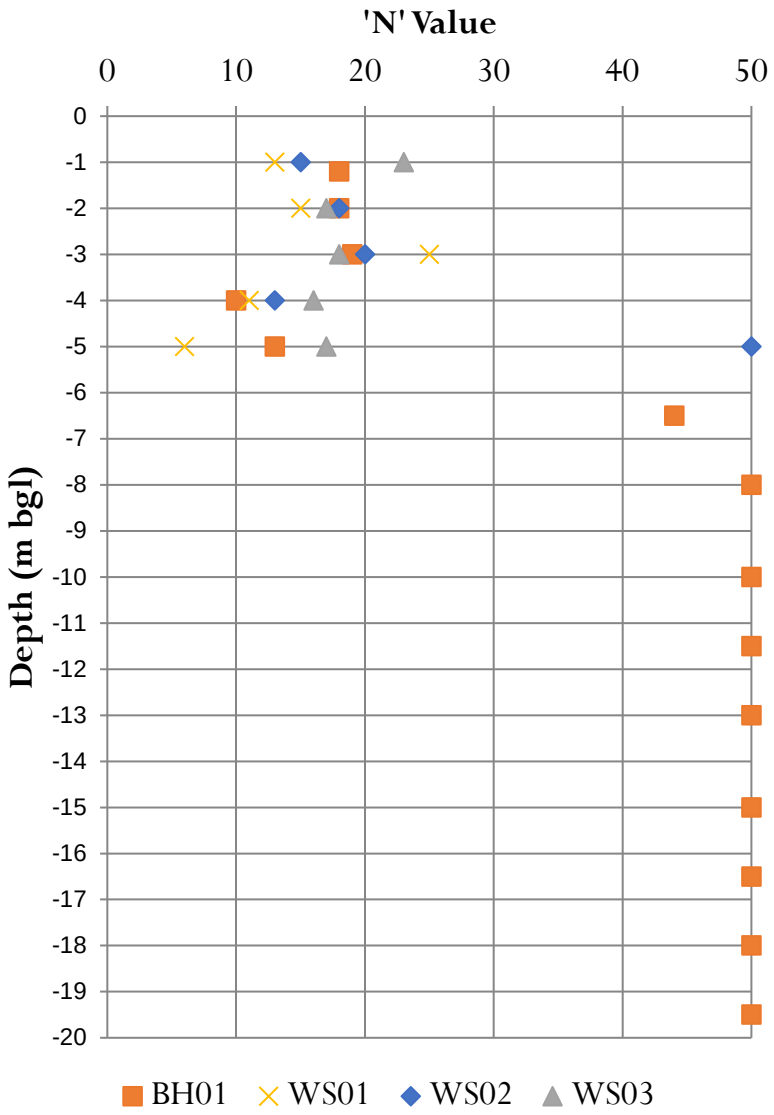
Waste Stream	Typical Depth (m bgl) and Description	Is it Hazardous?	Waste Code	Waste Acceptance Criteria	Appropriate Landfill
Topsoil	0.0 – 0.4m: Dark orangish brown, slightly gravelly, slightly silty sand.	No	17 05 04	Passed Criteria for Inert Landfill*	**INERT**
Northampton Sands Formation	0.3 – 6.4m: Dark orangish brown sandstone gravel.	No	17 05 04	Passed Criteria for Inert Landfill	**INERT**
Whitby Mudstone Formation	6.4m +: Very stiff, mottled, dark greyish brown to dark grey fissured CLAY	No	17 05 04	Failed Criteria for Inert Landfill	**NON-HAZARDOUS**

*The results of WAC testing indicate that the sample of topsoil has a Total Organic Carbon (TOC) concentration greater than the Inert Waste limit of 3%. However, '*Waste Sampling and Testing for Disposal to Landfill (2013)*' states that *"in the case of soils, a higher TOC Limit Value may be permitted by the Environment Agency at an inert waste landfill, provided the DOC value of 500mg/kg is achieved at L/S 10 l/kg, either at the soils own pH or at a pH value between 7.5 and 8.0."* In this scenario, the Dissolved Organic Carbon (DOC) value is 60mg/kg and hence below the 500mg/kg threshold. On this basis the topsoil can be classified as **INERT** for the purposes of offsite disposal. The same **INERT** waste classification can also be applied to the Northampton Sand Formation however due to elevated concentrations of sulphate, the Whitby Mudstone Formation does not meet inert landfill criteria as must be classified as **NON-HAZARDOUS** for the purposes of off-site disposal.

5.7 Geotechnical Testing

5.7.1 In-Situ Geotechnical Testing

The results of the SPT's / CPT's completed at regular intervals during the drilling of the boreholes are summarised on the graph below.



'N' values of 50 on the below graph represent technical refusals of the tests whereby the testing equipment does not achieve the full 300mm of penetration within 50 blows of the drop hammer. Overall, the data shows that there is some variability in the shallower Northampton Sand Formation with a clear decrease in the strength of these granular soils from depths of around 3m to 4m. This decrease is likely due to the soils at these depths being saturated with groundwater which can have a loosening effect on granular material.

5.7.2 Laboratory Geotechnical Testing

The results of geotechnical laboratory testing are summarised in the table below.

Strata	Range of Parameters							
	Moisture Content (%)		Plasticity Index (%)		Water Soluble Sulphate, 2:1 SO_3 (g/L)		pH	
	Min	Max	Min	Max	Min	Max	Min	Max
Northampton Sand Formation	-	40.1	-	-	0.04	0.07	6.4	6.9
Whitby Mudstone Formation	15.8	17.2	30	36	-	-	-	-

Strata	Range of Parameters							
	Particle Size Distribution						Bulk Density (Mg/m^3)	
	Fines (%)		Sand (%)		Gravel (%)			
	Min	Max	Min	Max	Min	Max	Min	Max
Northampton Sand Formation	17	38	17	36	26	61	1.95	
Whitby Mudstone Formation	-	-	-	-	-	-	1.98	2.14

The water content, liquid and plastic limits and plasticity and liquidity indexes were established for two samples of soil prepared according to BS EN ISO: 17892-1: 2014 & BS 1377: Part 2:1990:4.2 and tested in line with BS EN ISO: 17892-1: 2014 & BS 1377: Part 2:1990:3.2, 4.4, 5.3 and 5.4.

Particle Size Distribution (PSD) testing was carried out on four samples prepared and testing in accordance with BS1377: Part 1: 2016: 8.3 & 8.4.5 and BS1377: Part2: 1990: 9.2 accordingly.

The determination of the density of three samples was also undertaken in line with test method BS EN ISO 17892-1: 2014 & BS EN ISO 17892-2: 2014.

Sulphate contents and pH values determinations were carried out by both the environmental and geotechnical laboratories the results of which are summarised in Section 6.7.

A geotechnical laboratory analysis testing schedule is presented as Table 2 and all geotechnical sample results obtained from the laboratory are included as Appendix J.

6 GEOTECHNICAL APPRAISAL

Ground conditions have been found to comprise a limited thickness of topsoil underlain by predominantly granular material of the Northampton Sands Formation with very stiff, fissured clay of the Whitby Mudstone Formation encountered from 6.4m to beyond the base of the investigation (20m).

6.1 Geotechnical Category

Geotechnical Category (BS EN 1997-1:2004)	Definition
GC1	Geotechnical Category 1 (GC1) should only include small and relatively simple structures for which it is possible to ensure that the fundamental requirements will be satisfied on the basis of experience and qualitative geotechnical investigations with negligible risk in terms of overall stability or ground movements and in ground conditions which are known.
GC2	Geotechnical Category 2 (GC2) should include conventional types of structure and foundation with no exceptional risk or difficult or loading conditions. Designs for structures in Geotechnical Category 2 should normally include quantitative geotechnical data and analysis.
GC3	Geotechnical Category 3 (GC3) should include structures or parts of structures, which fall outside the limits of Geotechnical Categories 1 and 2. This may include very large or unusual structures, structures involving abnormal risks, or unusual or exceptionally difficult ground or loading conditions, or structures in areas of probable site instability or persistent ground movements that require separate investigation or special measures.

It is proposed that a new boarding house is constructed within the area of investigation and that the existing Meadhurst and Farleigh buildings be refurbished. Therefore, the below assessment has been undertaken in accordance with Geotechnical Category 2 (GC2), including types of structure and foundation with no exceptional risk or difficult or loading conditions, as defined by BS EN 1997-1:*2004*.

6.2 Structural Foundations

6.2.1 Spread Foundations

As detailed above, the development is anticipated to comprise a new boarding house as well as refurbishments to the existing Meadhusrt and Farleigh boarding houses. The foundation assessment has therefore been undertaken in accordance with BS EN 1997-1:2004, to take in to account;

- Bearing Pressure (Ultimate Limit State)
- Settlement (Serviceability Limit State)

The ground conditions are considered suitable for the use of conventional spread foundations, either strip footings or pad foundations, bearing upon the underlying soils of the Northampton Sand Formation. Allowable bearing capacities have been calculated and are presented in the table below;

Foundation Depth (m bgl)	Allowable Bearing Capacity (kN/m^2)
1.0	110
1.5	140
2.0	160

The allowable bearing capacity is the permissible increase in vertical stress at the level of the underside of the foundation, above existing overburden pressure, which may be calculated on the basis of a soil density of 19kN/m^3.

At the above allowable bearing capacities, total settlements are considered unlikely to exceed roughly 15 to 20mm. Settlements in granular soils will occur rapidly as loadings increase while settlement in cohesive material will occur gradually over a longer period of time.

A minimum foundation depth of 0.90m is considered suitable for the site, below existing or proposed ground level, subject to the following provisos:

a) All foundations should fully penetrate any surfacing soils including made or disturbed ground and extend a minimum of 150mm into undisturbed natural strata.

6.3 Ground Floor Construction

Given the predominantly granular nature of the Northampton Sand Formation either suspended or ground bearing floor construction is likely to be suitable for the proposed building.

6.4 External Works

6.4.1 Pavement Design

Five dynamic cone penetrometer (DCP) tests (DCP1-DCP5) were undertaken in the area to the west of Meadhurst. The aim of these tests was to allow CBR values to be calculated for use in the initial design / consideration of future areas of pavements such as access roads and areas of car

parking associated with the proposed new boarding house. CBR values were determined from the DCP test results, and the data is displayed graphically as Appendix K with DCP test locations presented on Figure 4.

In-situ testing returned a range of CBR values from DCP1 – DCP5, generally however, the calculated CBR values exceed 8% for the majority of the soil profile within the upper 0.7m.

Taking into consideration the above sources of information, EPS's experience of the shallow soils types encountered at the anticipated formation level and the classification testing undertaken by the geotechnical laboratory, a design CBR value of 8% is suggested for the Northampton Sand Formation subject to proof rolling and testing to confirm the required values have been achieved.

Once the formation level for any new pavements has been achieved, proof rolling should be carried out using a heavy roller, and any soft or loose areas revealed should be excavated and a greater depth of sub-base provided.

Exposed subgrades will likely deteriorate rapidly on exposure to wet weather and should be shaped to shed water. Sub-base should be placed as soon as possible to minimise the exposure of the subgrade to adverse weather conditions.

6.5 Infiltration Testing

'Soakaway' infiltration testing was undertaken at the three trial pits excavated as part of these works. These trial holes (TP01, TP02 & TP03) were excavated to depths of between 2.0m, 1.9m & 1.8m respectively. The results of the infiltration testing are summarised in the table below:

Location	Depth (m bgl)	Test Number	Infiltration Rate (m/s)	Comments
TP01	2.0	Test 1	$4.61*10^{-5}$	A characteristic infiltration rate of $3.36*10^{-5}$ m/s has been calculated based the infiltration rates from Test 2 & Test 3.
		Test 2	$3.18*10^{-5}$	
		Test 3	$3.54*10^{-5}$	
TP02	1.9	Test 1	$1.20*10^{-5}$	No comments
		Test 2	$2.30*10^{-5}$	
TP03	1.8	Test 1	$5.06*10^{-5}$	A characteristic infiltration rate of $2.13*10^{-5}$ m/s has been calculated based the infiltration rates from Test 2 & Test 3.
		Test 2	$2.12*10^{-5}$	
		Test 3	$2.14*10^{-5}$	

As can be seen from the above results, the infiltration testing within the top 2m soil profile of the Northampton Sand Formation is relatively consistent. In accordance with best practise, Characteristic infiltration rates have been calculated for TP01 & TP03 by taking an average of the infiltration rates from Test 2 & Test 3 which were completed when the ground was saturated after Test 1. All of the water added to the trial pits for the infiltration tests drained by at least 75% although a third test could not be completed at TP02.

6.6 Groundworks

Whilst excavations in cohesive soils may remain stable for short periods during construction, the stability of any granular soils (which the Northampton Sand Formation is predominantly made up of) should not be relied upon, particularly when influenced by the presence of groundwater which can loosen soils causing greater instability.

Heavy plant and stockpiles of materials should not be permitted close to the edges of unsupported excavations. Further reference may be made to CIRIA Report No. 97 *'Trenching Practice'* 1992.

Excavations must not be carried out in proximity of any existing neighbouring structures / retaining features without suitable support measures in place.

Based on the findings of the intrusive works, groundwater ingress is not anticipated within shallow excavations for new foundations and services, provided they are limited to 2.0m deep with resting groundwater being recorded at depths as shallow as 2.65m.

6.7 Concrete Grade

Sulphate contents and pH value determinations were conducted by both the environmental and the geotechnical laboratory, the latter of which present results as SO_3, which must be multiplied by 1.2 to convert them to SO_4. The results of this testing are summarised in the below table as well as being presented as part of Appendices H & J.

Strata	Water Soluble Sulphate (mg/l SO_4)		pH		Total Sulphur (%)		Total Potential Sulphate (%)		Design Sulphate Class	ACEC
	Min	Max	Min	Max	Min	Max	Min	Max		
Topsoil	<1.5	7.1	7.58	7.77	-	-	-	-	DS-1	AC-1[d]
Northampton Sands	48	84	6.4	7.37	-	-	-	-		
Whitby Mudstone	265.1	717.2	7.58	7.91	2.45	2.65	7.35	7.95	DS-5	AC-4s

In accordance with Part 1 of the BRE Special Digest 1 *'Concrete in Aggressive Ground'* 2005, a design sulphate class of DS-1 with an aggressive chemical environment for concrete (ACEC) of AC-1[d] is considered suitable for concrete in direct contact with the topsoil and Northampton Sand Formation.

For the Whitby Mudstone a Design Sulphate Class of DS-5 with an ACEC of AC-4s is considered applicable, which is a particularly high concrete grade and will likely require special protective measures. However, this would only be applicable for any concrete in direct contact with the Whitby Mudstone Formation which is present at depth. Furthermore, it should be appreciated that BRE Special Digest 1 '*Concrete in Aggressive Ground*' 2005 states "*Concrete in pyritic ground which is initially low in soluble sulphate does not have to be designed to withstand a high potential sulphate class unless it is exposed to ground which is has been disturbed to the extent that contained pyrite might oxidise and the*

resultant sulphate ions reach the concrete. This may prompt redesign of the structure or construction process to avoid grounds disturbance; for example, by using precast or cast in-situ piles instead of constructing a spread footing within an excavation".

7 ENVIRONMENTAL APPRAISAL

The following section outlines the approach applied to assessing the risks posed to human health through a Generic Quantitative Risk Assessment, then identifies any sample results found by this investigation which warrant further consideration.

In accordance with the Environment Agency's *Land Contamination: Risk Management* (2023) guidance, this section represents the second tier of Stage 1, the Generic Quantitative Risk Assessment.

Risks to controlled waters have not been assessed, as potential risks to these receptors (surface water and groundwater) were dismissed as part of the Phase I risk assessment; but will be considered further if any unexpected soil impacts are highlighted in the sections below.

7.1 Human Health

7.1.1 Land Use Setting & Generic Screening Criteria

In order to screen laboratory data for concentrations of contaminants in soil with potential to cause harm to human health, a Residential (with home-grown produce) land use setting has been adopted, as it is considered the most representative in the context of the site as outlined in Section 3.3.

The technical framework used to derive the assessment criteria and the documents in which they are published are summarised as follows:

- *EA Science Reports* (SC050021/SR2, SC050021/SR3, and SC050021/SR7)
- *EA Soil Guideline Value Science Reports*
- *Suitable For Use Levels (S4ULs) for Human Health Risk Assessment* – LQM and CIEH (2015)
- *Soil Generic Assessment Criteria for Human Health Risk Assessment* - EIC/AGS/CL:AIRE (2010)
- *Development of Category 4 Screening Levels for assessment of land affected by contamination* – SP1010 – DEFRA (2013)

Category 4 Screening Levels (C4SL's) provide generic suitable for use screening values for common contaminants in a variety of land uses and are also utilised as appropriate generic screening criteria. For concentrations of Arsenic, Lead and BaP in soil, EPS has used DEFRAs C4SL as an appropriate guide for professional judgement with respect to reasonable 'low risk' levels in the context of this site and its suitability for use.

It is considered reasonable to utilise Benzo(a)pyrene (BaP) as a risk driver or marker representative of genotoxic PAHs (i.e., including dibenzo(ah)anthracene and benzo(b)fluoranthene) given the absence of any 'low risk' (C4SL) equivalent screening values for these compounds.

A summary of the screening criteria and the methodology used to derive them is included in Appendix L.

7.1.2 Assessment of Soil Results

The results of the screening process for on-site human receptors showed that adopted criteria, representative of suitability limits to future site users were exceeded for the metals arsenic and lead as detailed in the below table.

Contaminant	Screening Criteria (mg/kg)	No. of Exceedances	Exceedance (mg/kg), Sampling Location & Depth
Arsenic	37	5	110.7 (WS01, 0.0m-0.4m) 125.9 (WS02, 0.0m-0.4m) 102.5 (WS03, 0.0m-0.4m) 60 (WS03, 1.6m-2.0m) 117.7 (BH01, 6.5m-7m)
Lead	200	2	222 (WS02, 0.0m-0.4m) 815 (WS03, 0.0m-0.4m)
Dibenzo(ah)anthracene	0.24	1	0.29 (WS03, 0.0m-0.4m)

7.1.3 Discussion of Soil Results

Given that no exceedances of the PAH compound benzo(a)pyrene, which is considered to be the risk driver of other genotoxic PAH compounds, (such as dibenzo(ah)anthracene which has been recorded as marginally exceeding the relevant generic screening criteria in one soil sample) have been identified, there are not considered to be any unacceptable risks associated with this contaminant exceedance.

The identified contaminant exceedances of the metals arsenic and lead have been considered in the context of the site in order to further assess the potential risks in a qualitative manner. Firstly, reference has been made to the BGS' Contaminant Distribution in Soil dataset for Normal Background Concentrations of the metals arsenic and lead, both of which are known to be found at naturally elevated concentrations in the Northampton Sand Formation and other bedrock geologies in the surrounding area (such as the Grantham Formation). This dataset reports that the site is in an area where concentrations of arsenic are in the 95th percentile (ranging from 33.4mg/kg to 77.4mg/kg) with the site being located within 300m of an area in the 99th percentile for normal background concentrations of arsenic in soil. Similarly, the area of investigation itself lies in an area where normal background concentrations of lead are reported to be in the 50th percentile. However, within 100m, the normal background concentrations of lead are reported to be in the 75th percentile ranging from 99.5mg/kg to 242mg/kg with the normal background concentrations of lead reported to be in the 90th + percentile 550m north west. This, together with the well-established geochemistry characteristics of the Northampton Sand Formation is considered suggests that the weathering of the natural geology is the source of the elevated concentrations of the metals arsenic and lead in the existing topsoil.

In terms of the associated risks, the generic screening criteria are very conservative and with all due consideration to the context of the land use, are likely to be over conservative for this site. This over conservatism is due to the Residential (with home-grown produce) land use setting being modelled based on lifetime exposure to contaminants in shallow soil, which is not anticipated, given that the site is used as boarding houses whereby both pupils and staff will both have much less exposure than the generic screening criteria have been derived to model. Therefore, risks associated with current and future site users being exposed to shallow soils containing elevated concentrations of the metals arsenic not considered to be unacceptable given the magnitude of the arsenic exceedance.

One of the exceedances of lead however is more than four times the generic screening value and, while the generic screening criteria are likely to be overconservative based on the context of the site (as outline above), the information and soil dataset from this investigation is not considered to be sufficient to completely discount the possibility of unacceptable risks associated with current and future site users being exposed to elevated concentrations of lead in shallow soils. Therefore, some outline recommendations have been made in Section 7.2 below to further assess the risks associated with elevated levels of lead so that the most suitable and effective control measure can be implemented to reduce the associated risks to safe levels.

Nonetheless, should any new areas where home-grown produce will be grown be incorporated into the new scheme, it would be prudent to consider the associated risks to minimise the potential for arsenic and lead to be taken up by home grown produce. Further detail on this is provided in Section 7.3.

7.2 Recommendations

In the context of potentially unacceptable or acceptable risks as outlined within the Environment Agency's *Land Contamination: Risk Management guidance* (LC:RM, 2023), the risks identified by this work will require further assessment as per the below recommendation.

a) In order to further assess the risks to current and future site users being exposed to elevated concentrations of lead in shallow soils, a detailed quantitative risk assessment (DQRA) for human health could be undertaken. This would involve considering the site-specific pathways and possible exposure frequencies of current and future site users to calculate site specific screening criteria to which the recorded concentrations of lead could be compared. As part of this additional phase of risk assessment, it may be beneficial to gather additional shallow soil samples as part of a larger soil dataset. It should also be appreciated that some form of control measure is likely to be required once the risks associated with elevated lead in shallow soils have been further assessed, at this stage, this would likely involve importing and emplacing certified clean topsoil (in the region of 300mm to 600mm which may require for some of the existing topsoil to be removed to maintain current levels) in areas of soft landscaping / gardens associated with the boarding house / houses. The requirements of such control measures, including the specific areas where they would be required, would need to be confirmed in response to the outcome of an additional phase of risk assessment. EPS can provide further advice and consultation on this recommendation on request.

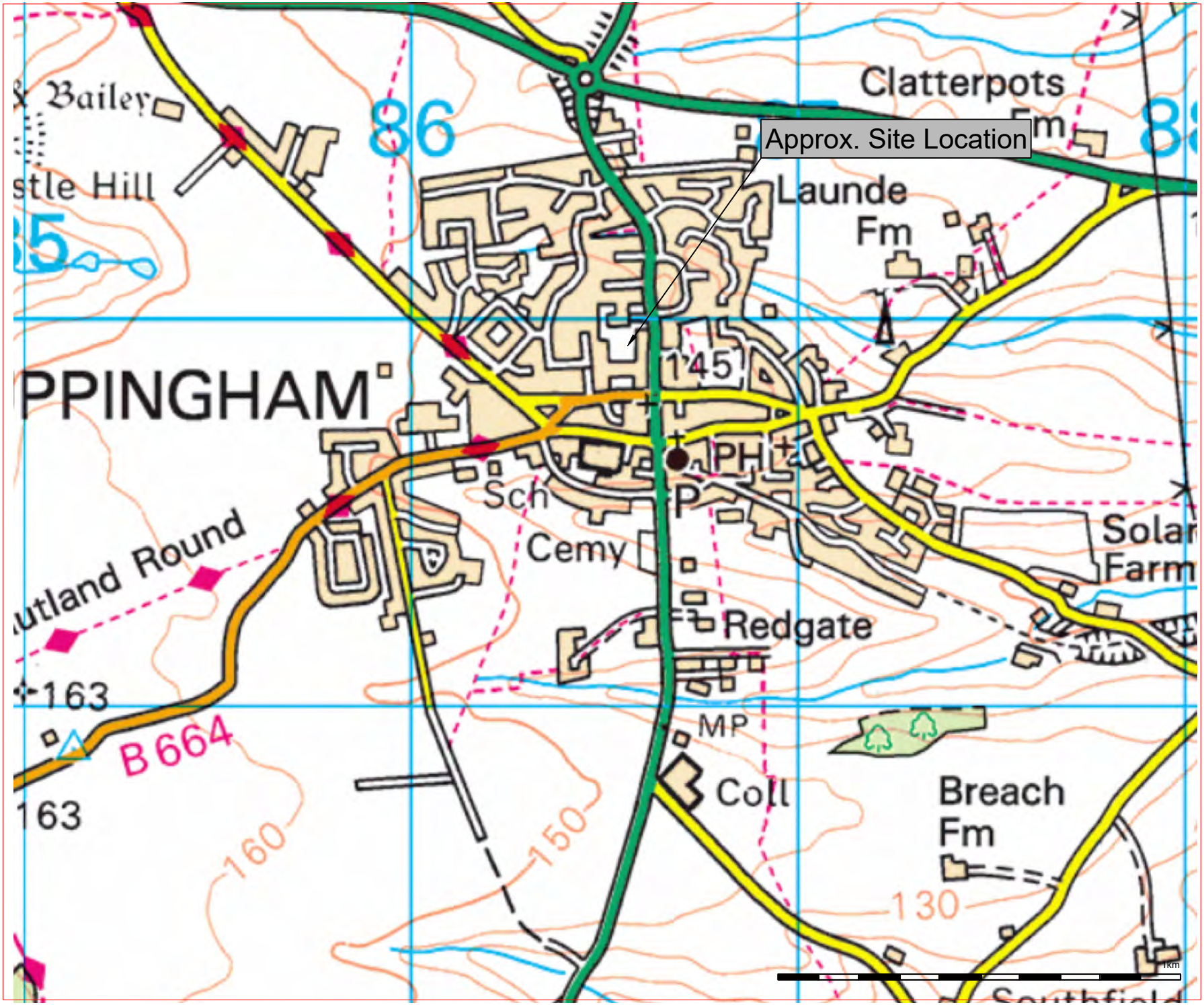
The following recommendations are also made in regards to good practise and safe development:

a) Although considered unlikely based on the findings of the EPS intrusive works, all construction workers operating at the site should be advised of the potential for contact with made ground material within shallow soils (on a precautionary basis). Appropriate health and safety precautions should be adopted during any excavation works to avoid exposure to soils. Reference should be made to relevant health & safety guidance including the following CIRIA document: *R132 Guide to Safe Working on Contaminated Sites*.

b) Should any palpable evidence of unexpected contamination be encountered during the redevelopment work, which significantly varies from the conditions described above, 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 M of this report.

It is also recommended that a copy of this report be provided to the Environmental Health Department of Rutland County Council for inclusion in their land quality records and to support future planning submission.

FIGURES



N

Rev	Date	Drawn	Description	Chk'd

The Geotechnical and Environmental Engineers
www.epstrategies.co.uk

Site
Uppingham School, Meadhurst
11 Ayston Road, Uppingham, Oakham, LE15 9RL

Client
Uppingham Estates Department c/o Conisbee

Title
Figure 1 - Site Location Plan

Surveyed:		Drawn by:	MC
Checked by:	TA	Date:	October 2023
Scale [A4 Sheet]	1:50,000	Drawing Reference	UK23.6614_01
Job No	UK23.6614	Rev	01

KEY:

SITE BOUNDARY

Rev	Date	Drawn	Description	Ch'kd

The Geotechnical and Environmental Engineers
www.epstrategies.co.uk

Site

Uppingham School, Meadhurst
11 Ayston Road, Uppingham, Oakham, LE15 9RL

Client

Uppingham Estates Department c/o Conisbee

Title

Figure 2 - Current Site Layout

Surveyed:		Drawn by:	MC
Checked by:	TA	Date:	October 2023
Scale [A4 Sheet]	Not to Scale	Drawing Reference	UK23.6614_02
Job No	UK23.6614	Rev	01

N

KEY:

SITE BOUNDARY

Rev	Date	Drawn	Description	Ch'k'd

The Geotechnical and Environmental Engineers
www.epstrategies.co.uk

Site
Uppingham School, Meadhurst
11 Ayston Road, Uppingham, Oakham, LE15 9RL

Client
Uppingham Estates Department c/o Conisbee

Title
Figure 3 - Aerial Photograph

Surveyed:		Drawn by:	MC
Checked by:	TA	Date:	October 2023

Scale [A4 Sheet]	Drawing Reference
Not to Scale	UK23.6614_03

Job No	Rev
UK23.6614	01

KEY:

- SITE BOUNDARY
- EPS WINDOWLESS SAMPLE BOREHOLE WITH GROUNDWATER MONITORING PIPE
- EPS SHELL & AUGER BOREHOLE
- EPS DYNAMIC CONE PENETRATION TESTING
- EPS TRIAL PIT / SOAKAWAY
- EPS FOUNDATION EXPOSURE

Rev	Date	Drawn	Description	Ch'kd

eps

The Geotechnical and Environmental Engineers
www.epstrategies.co.uk

Site
Uppingham School, Meadhurst
11 Ayston Road, Uppingham, Oakham, LE15 9RL

Client
Uppingham Estates Department c/o Conisbee

Title
Figure 4 - Exploratory Hole Location Plan

Surveyed:		Drawn by:	MC
Checked by:	TA	Date:	October 2023
Scale [A4 Sheet]	Not to Scale	Drawing Reference	UK23.6614_04
Job No	UK23.6614	Rev	01

TABLES

Table 1 – Environmental Laboratory Testing Schedule

Sample ID	Sample Depth (m bgl)	EPS Mini Suite	EPS Waste Suite
WS01	0.0-0.4	-	1
WS02	0.0-0.4	1	-
WS03	0.0-0.4	1	-
WS03	1.6-2.0	-	1

***Notes*:**

m bgl	meters below ground level	EPS Mini Suite	Organic Matter, Cyanide, Metals, PAH's, Phenols and Asbestos Screen
1	Sample Taken	EPS Waste Suite	Waste Acceptance Criteria
-	Sample Not Analysed		

Table 2 – Geotechnical Laboratory Testing Schedule

Sample ID	Sample Depth (m bgl)	pH & Water Soluble Sulphate	Liquid & Plastic Limits	Particle Size Distribution	Bulk Density	EPS Geotechnical Suite
BH01	4.0	1	-	1	-	-
BH01	8.0	1	1	-	-	-
BH01	9.5	-	-	-	1	-
BH01	14.0	1	1	-	-	-
BH01	14.5	-	-	-	1	-
BH01	6.5	-	-	-	-	1
BH01	13.0	-	-	-	-	1
WS01	3.8-4.0	1	-	1	-	-
WS02	0.8-1.0	1	-	1	-	-
WS03	1.8-2.0	1	-	1	-	-
WS03	2.0-3.0	-	-	-	1	-

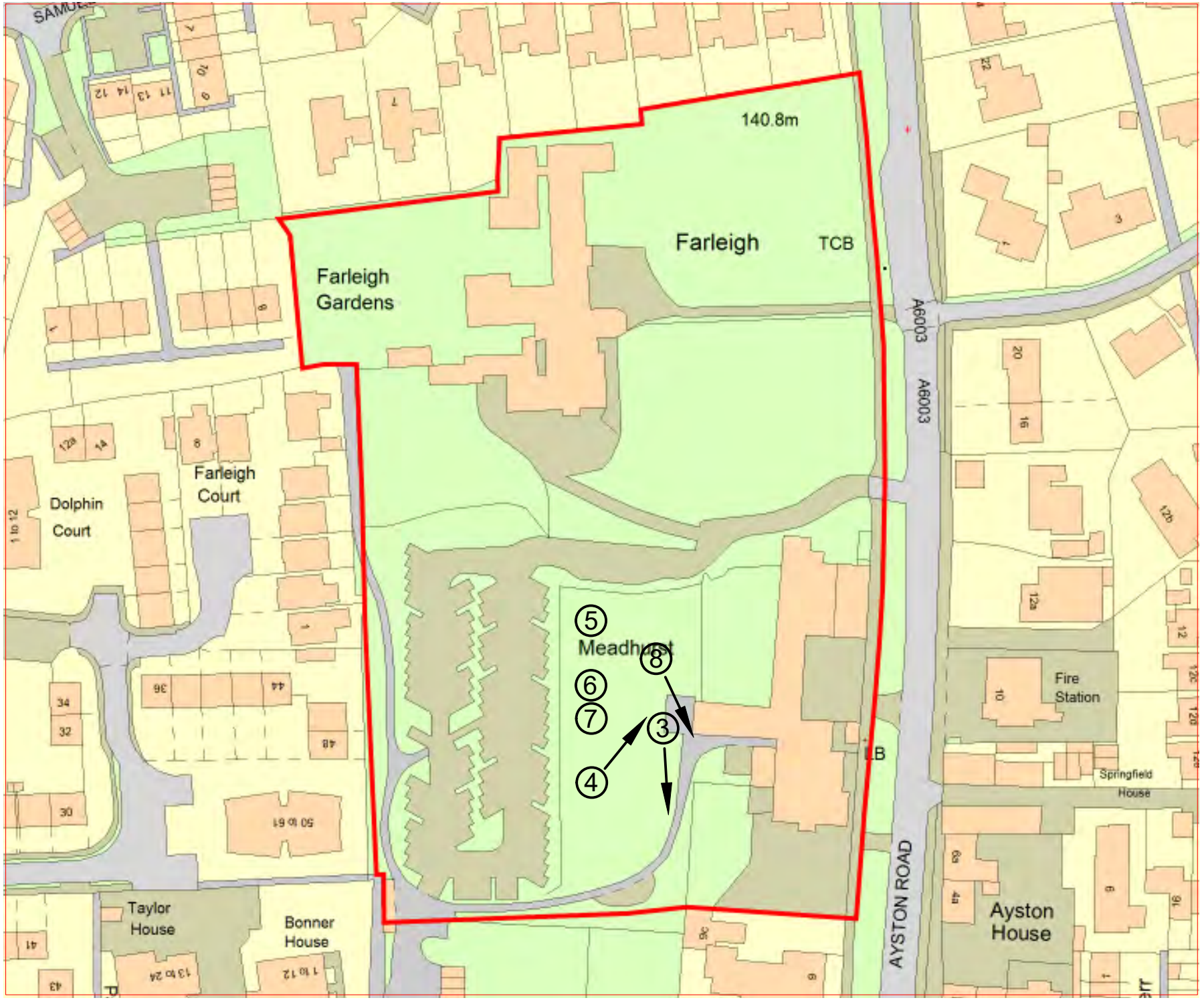
***Notes*:**

m bgl	meters below ground level
1	Sample Taken
-	Sample Not Analysed

APPENDICES

APPENDIX A

Selected Site Photographs



N

KEY:

- SITE BOUNDARY
- DIRECTION OF SITE PHOTOGRAPH
- SITE PHOTOGRAPH NUMBER

Rev	Date	Drawn	Description	Ch'kd

The Geotechnical and Environmental Engineers
www.epstrategies.co.uk

Site: Uppingham School, Meadhurst
11 Ayston Road, Uppingham, Oakham, LE15 9RL

Client: Uppingham Estates Department c/o Conisbee

Title: Appendix A - Site Photographs

Surveyed:		Drawn by:	MC
Checked by:	TA	Date:	October 2023
Scale [A4 Sheet]	Not to Scale	Drawing Reference	UK23.6614_05
Job No	UK23.6614	Rev	01

Photo 3 – A photo looking south across the area west of Meadhurst.

Photo 4 – A photo looking north-east towards Meadhurst.

Photo 5 – A photo showing the material recovered from WS01.

Photo 6 – A photo showing the material recovered from WS02.

Photo 7 – A photo showing the material recovered from TP01 and the 'soakaway' infiltration testing.

Photo 8 – A photo showing the southern side of Meadhurst.

Job No.	UK23.6614
Date	31/08/23
Who?	MC

To be completed by consultant for all Phase I Desk Studies and completed form must be scanned/photographed and saved in job folder under 'Scanned Site Notes'. EPS Lower Risk Assessment (EPS025a) also must be completed and scanned.

Site Walkover Checklist V3.0

Geotechnical		COMMENTS
	Are there any abrupt changes in slope profiles?	None Seen
	Is there evidence of overburden on the slopes?	None Seen
	Is there evidence of excavation at the base of a slope?	None Seen
	Are there signs of landslip, such as tilting trees/posts?	None Seen
	Are there signs of subsidence?	None Seen
	Is there evidence of cracked ground?	WITHIN CONCRETE HARDSTANDING NEAR MEADOWVIEW BUILDING
	Is there evidence of compressible ground (i.e. Peat)?	None Seen
	Is there evidence of an abrupt change in ground conditions?	ONLY FROM SOFT LANDSCAPE TO HARD STANDING
	Is there evidence of high groundwater, such as areas of waterlogged ground?	None Seen
	Do signs of water loving plants such as reeds exist?	None Seen
	Are there any ponds, streams, ditches (even if dry), springs or wells?	None Seen
	What is the nature of the vegetation?	MAINTAINED LANDSCAPING HEDGEROWS GRASSES / LAWNS PLANTED SHRUBS JUNIPER TREES + SEVERAL LARGER MATURE ONES
	Species & Height of trees	LARGE = CONIFERS SMALL = DECIDUOUS POPULAR / OAK
	What is the nature and condition of vegetation on adjoining land?	SIMILAR ALL MAINTAINED
	Is there evidence of former vegetation?	None Seen

Job No.	
Date	
Who?	

To be completed by consultant for all Phase I Desk Studies and completed form must be scanned/photographed and saved in job folder under 'Scanned Site Notes'. EPS Lower Risk Assessment (EPS025a) also must be completed and scanned.

	Is there evidence of movement in any existing structures?	None Seen
	Evidence of below ground structures & services?	MULTIPLE LOCAL DRAINS + ELECTRIC CABLES/ LAMPPOSTS.
	Any evidence of mine shafts or adits? (Check Coal Authority Mapping)	None Seen
	Is there any access issues for a digger/drilling rig (slopes, height, gates etc.)?	POTENTIALLY POOR BIG RIG
Any other comments?		

Contamination		**COMMENTS**
	Evidence of ground contamination?	None Seen
	Evidence of groundwater /surface water contamination?	None Seen
	Evidence of historic site use?	SHEDS WITHIN PRIVATE GARDEN.
	Have all buildings been accessed internally, what was found?	NO BUILDINGS ACCESSED
 	Evidence of /suspected asbestos? In building fabric or on ground, describe condition and form (cement/fibrous).	None Seen UPDATE RAMS & WEAR PPE IF REQUIRED – DO NOT CLOSELY INSPECT OR DISTURB
	Any man-made surfacing present? Including bituminous road planings/scalpings. Describe condition of hardstanding.	HARDSTANDING PRESENT WITH CRACKS ROAD IN GOOD CONDITION.

Job No.	
Date	
Who?	

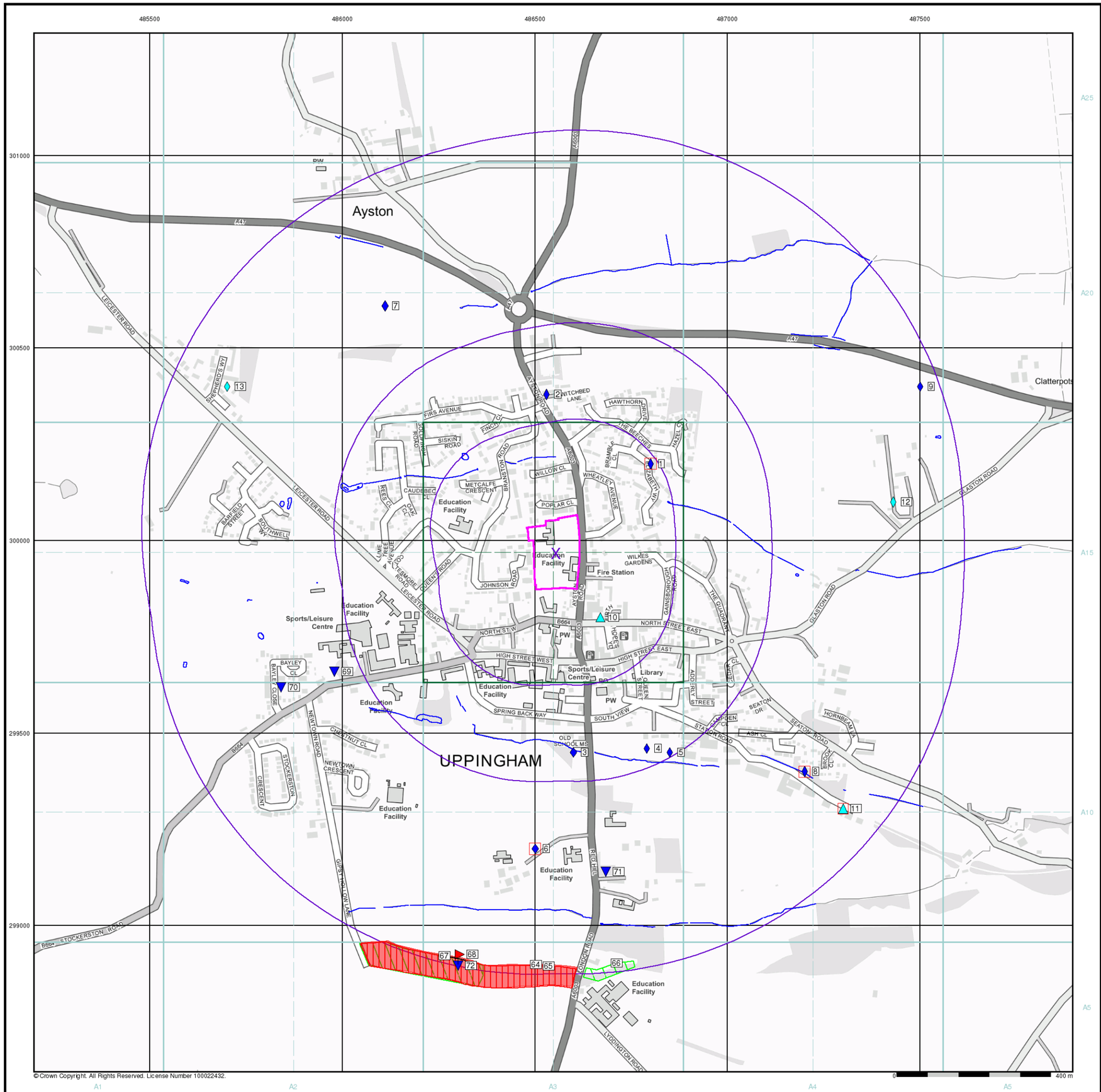
To be completed by consultant for all Phase I Desk Studies and completed form must be scanned/photographed and saved in job folder under 'Scanned Site Notes'. EPS Lower Risk Assessment (EPS025a) also must be completed and scanned.

	Any fuel or oil storage? If above ground, are tanks bunded/ steel/with above ground pipe or any staining?	None Seen
	Obvious drainage features observed such as 3-chamber oil-water interceptor?	YES VARIOUS DRAINS FEATURE STRUCTURES.
	Any waste deposition observed, such as fly-tipped soils or chemical containers/ drums or areas of burning?	None Seen
	Electricity substation present, maintained/operational? Are there any warning stickers on the gates/fence regarding chemicals?	SMALL JUNCTION BOX NEAR BARRIER
	Evidence of previous investigation/remediation (e.g. old monitoring wells)?	KNOWN TO BE NEARBY BUT NOT PRESENT / VISIBLE.
	Walked around surrounding areas? Identify any off-site sources such as petrol stations, heating oil tanks.	None Seen
	Anecdotal evidence	None Seen
Any other comments?		

Air Quality (ONLY NECESSARY IF INSTRUCTED – CHECK WITH AQ TEAM)	
Completed Air Quality Walkover Checklist?	Yes/No

APPENDIX B

Surrounding Land Use



General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Map ID

Several of Type at Location

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Hazardous Substances

COMAH Site | Explosive Site | NIHHS Site

- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

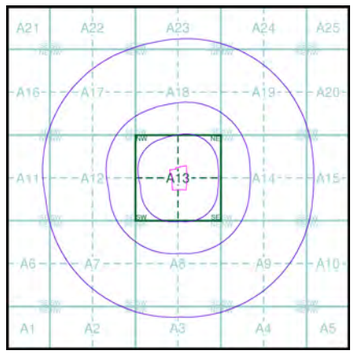
Geological

- BGS Recorded Mineral Site

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Site Sensitivity Map - Slice A



Order Details

Order Number:	315456184_1_1
Customer Ref:	UK23.6614
National Grid Reference:	486550, 299970
Slice:	A
Site Area (Ha):	2.1
Search Buffer (m):	1000

Site Details

Uppingham School, Meadhurst, Uppingham, LE15 9RP

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

Industrial Land Use Map

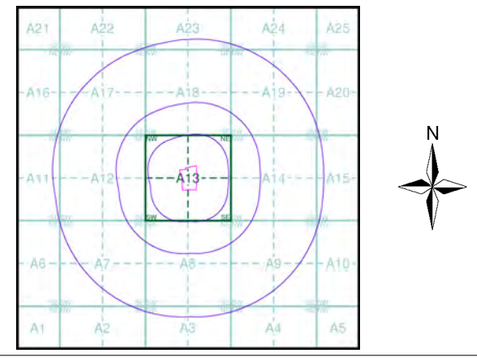
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry
- Gas Pipeline
- Points of Interest - Commercial Services
- Points of Interest - Education and Health
- Points of Interest - Manufacturing and Production
- Points of Interest - Public Infrastructure
- Points of Interest - Recreational and Environmental
- Underground Electrical Cables

Industrial Land Use Map - Slice A



Order Details

Order Number:	315456184_1_1
Customer Ref:	UK23.6614
National Grid Reference:	486550, 299970
Slice:	A
Site Area (Ha):	2.1
Search Buffer (m):	1000

Site Details

Uppingham School, Meadhurst, Uppingham, LE15 9RP

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

APPENDIX C

Geological Context

Geology 1:50,000 Maps Legends

Artificial Ground and Landslip

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	SLIP	Landslide Deposit	Unknown/Unclassified Entry	Not Supplied - Quaternary

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	ALV	Alluvium	Clay, Silt, Sand and Gravel	Not Supplied - Holocene
	TILMP	Till, Mid Pleistocene	Diamicton	Not Supplied - Cromerian
	HEAD	Head	Clay, Silt, Sand and Gravel	Not Supplied - Quaternary

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	LLL	Lower Lincolnshire Limestone Member	Limestone	Not Supplied - Bajocian
	NS	Northampton Sand Formation	Sandstone, Limestone and Ironstone	Not Supplied - Aalenian
	GRF	Grantham Formation	Sandstone, Siltstone and Mudstone	Not Supplied - Aalenian
	WHM	Whitby Mudstone Formation	Mudstone	Not Supplied - Toarcian
	MRB	Marlstone Rock Formation	Limestone, Ferruginous	Not Supplied - Pliensbachian
		Faults		

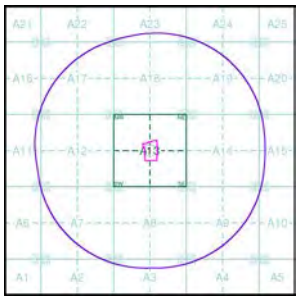
Geology 1:50,000 Maps

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:	**1**
Map Sheet No:	**157**
Map Name:	**Stamford**
Map Date:	**1978**
Bedrock Geology:	**Available**
Superficial Geology:	**Available**
Artificial Geology:	**Available**
Faults:	**Not Supplied**
Landslip:	**Available**
Rock Segments:	**Not Supplied**

Geology 1:50,000 Maps - Slice A



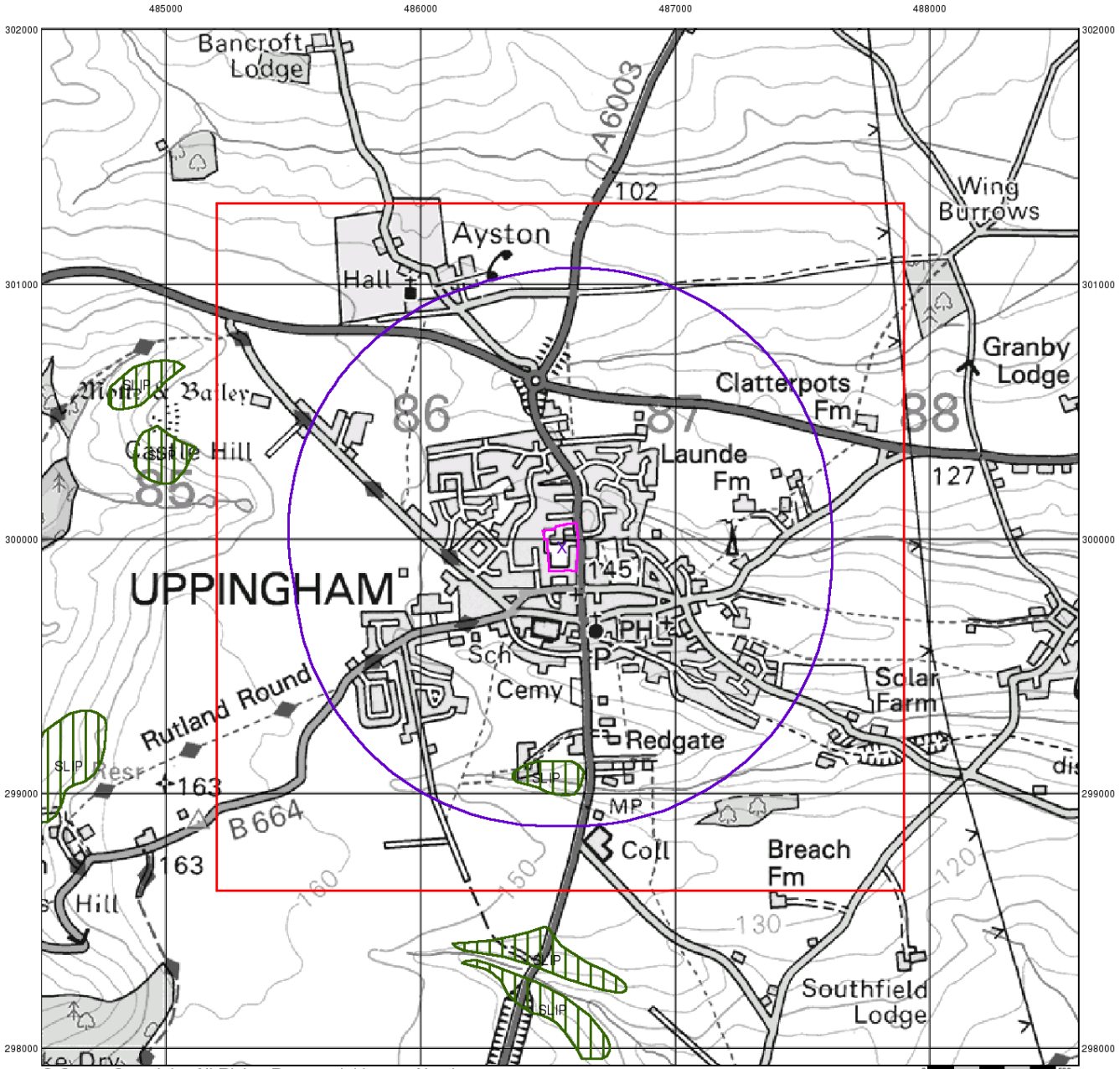
Order Details:

Order Number:	315456184_1_1
Customer Reference:	UK23.6614
National Grid Reference:	486550, 299970
Slice:	A
Site Area (Ha):	2.1
Search Buffer (m):	1000

Site Details:

Uppingham School, Meadhurst, Uppingham, LE15 9RP

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Artificial Ground and Landslip

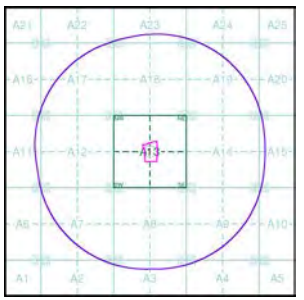
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions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



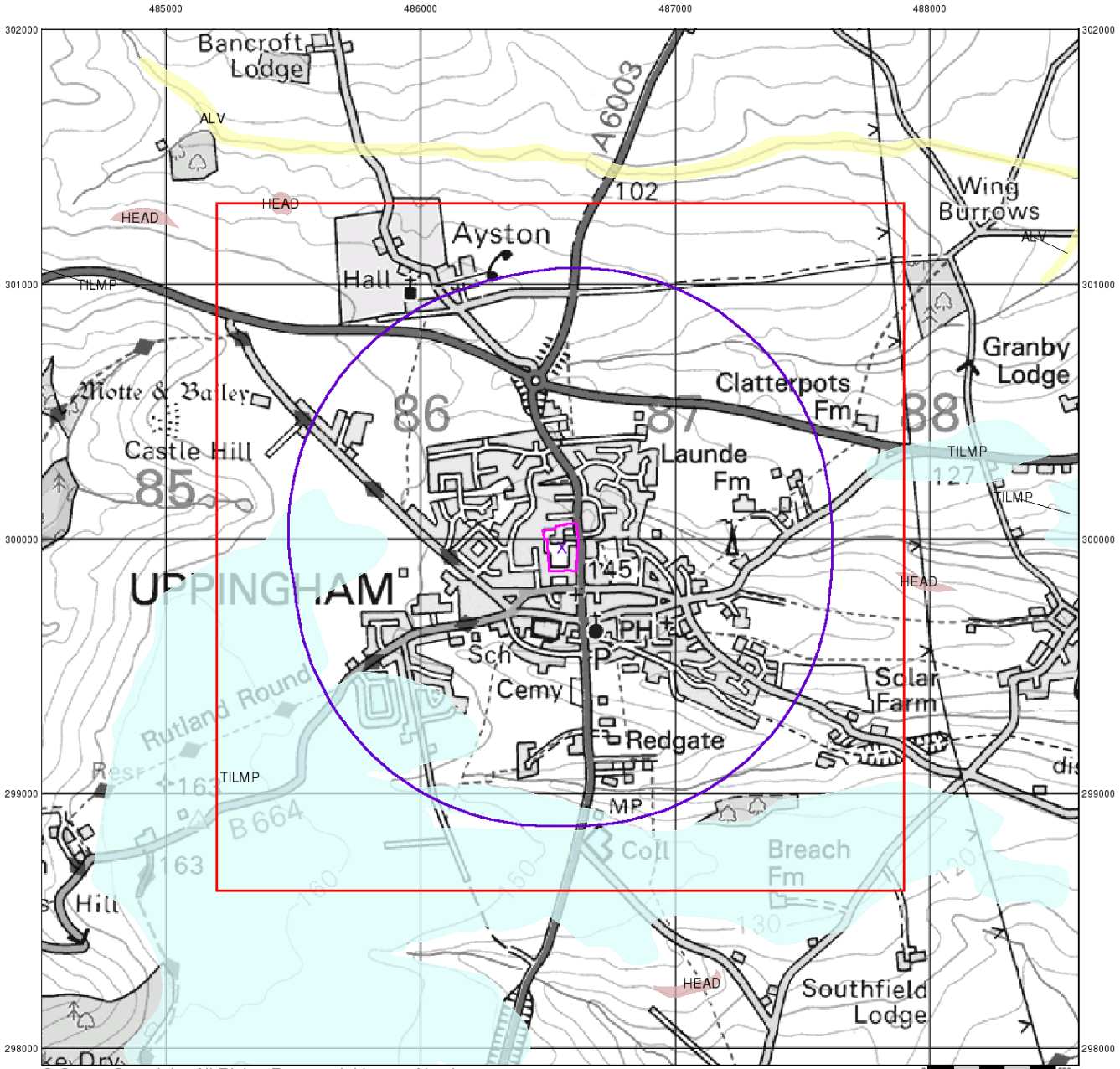
Order Details:

Order Number:	315456184_1_1
Customer Reference:	UK23.6614
National Grid Reference:	486550, 299970
Slice:	A
Site Area (Ha):	2.1
Search Buffer (m):	1000

Site Details:

Uppingham School, Meadhurst, Uppingham, LE15 9RP

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



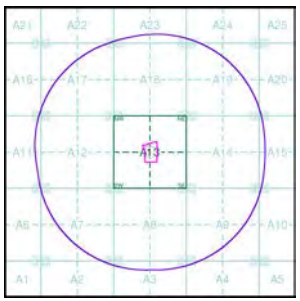
Superficial Geology

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.

Superficial Geology Map - Slice A



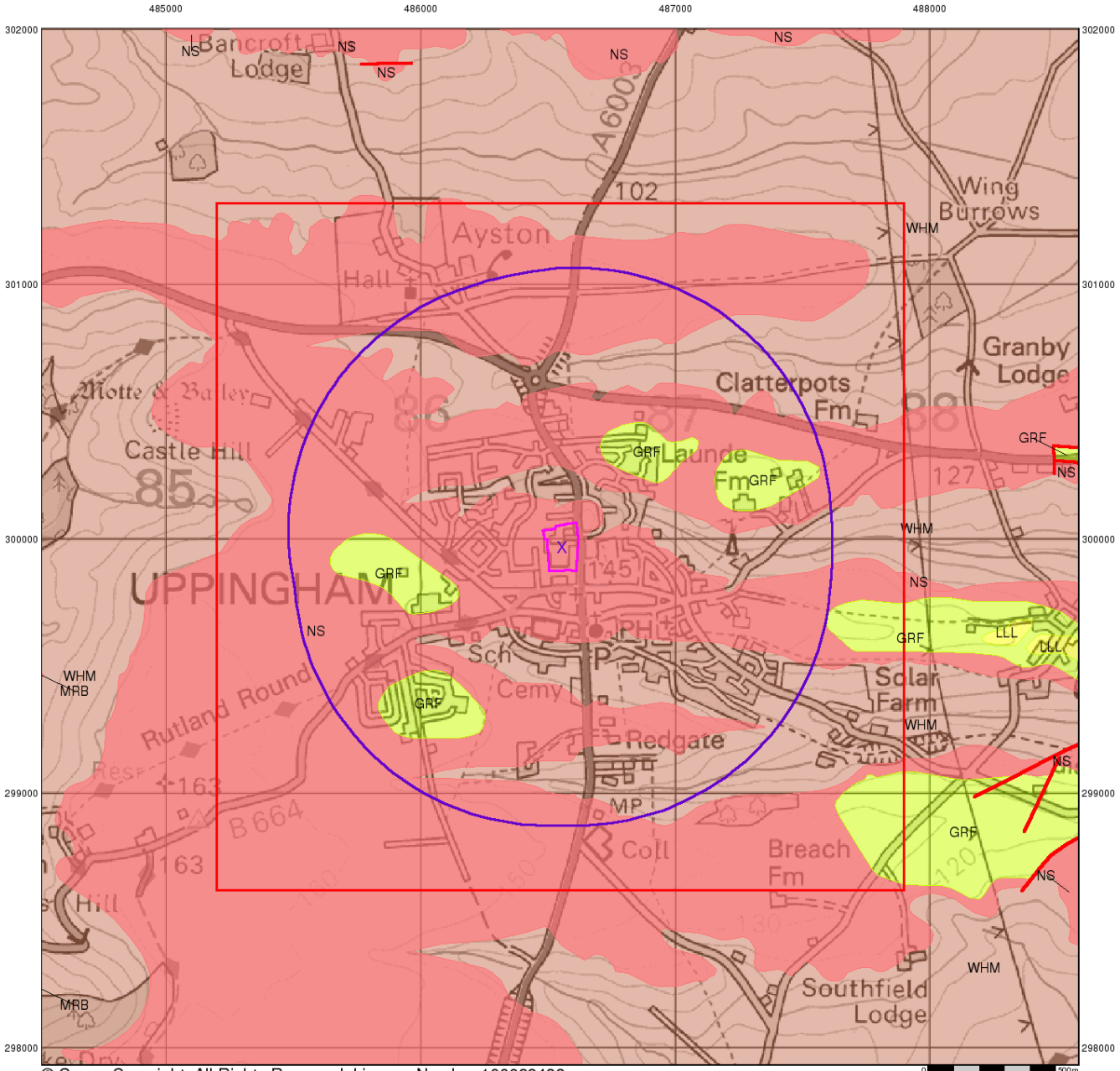
Order Details:

Order Number:	315456184_1_1
Customer Reference:	UK23.6614
National Grid Reference:	486550, 299970
Slice:	A
Site Area (Ha):	2.1
Search Buffer (m):	1000

Site Details:

Uppingham School, Meadhurst, Uppingham, LE15 9RP

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Bedrock and Faults

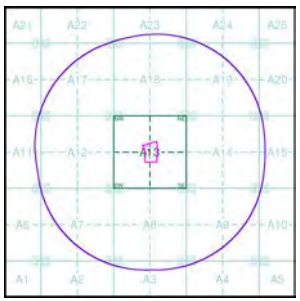
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

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.

Bedrock and Faults Map - Slice A



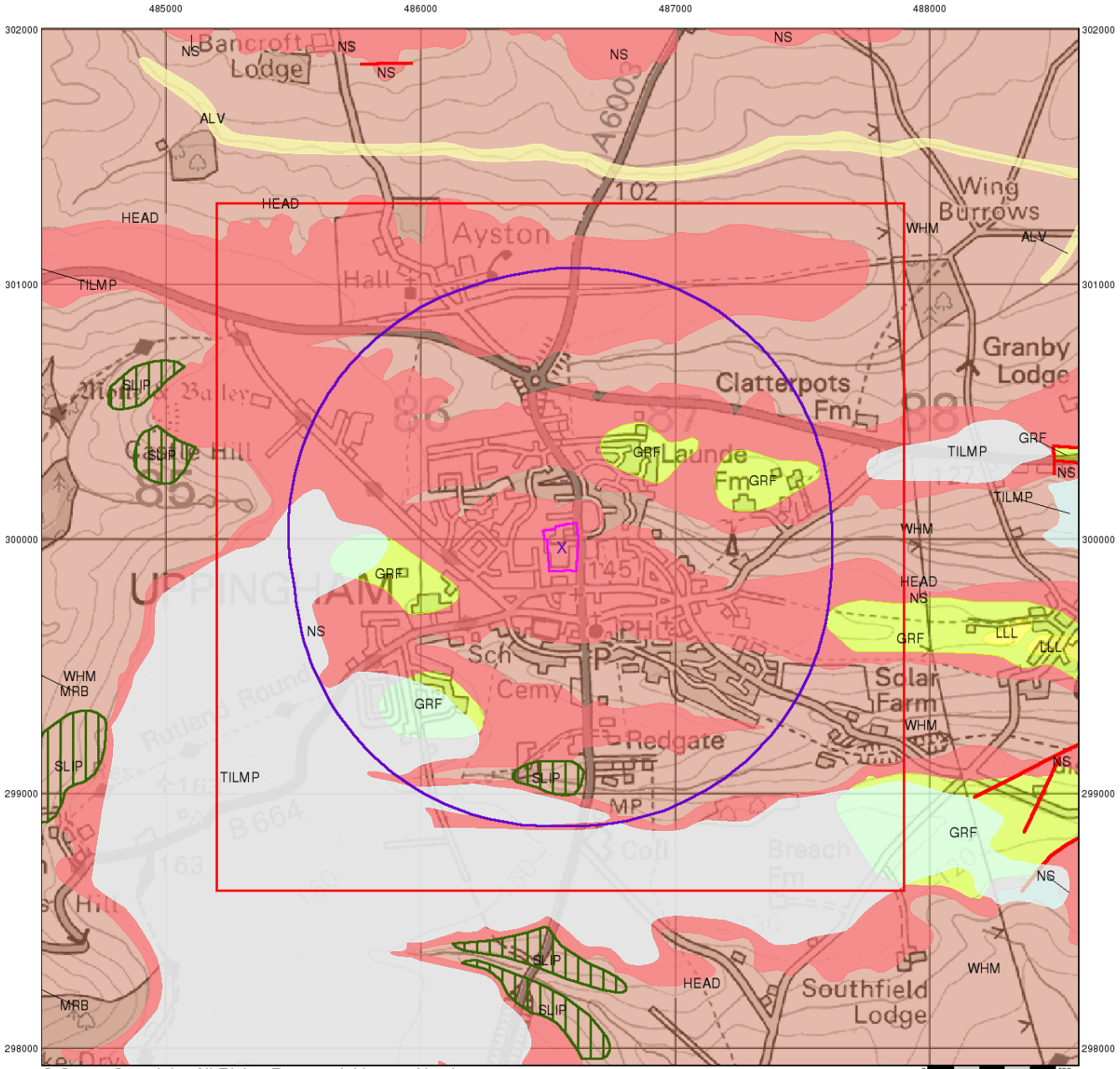
Order Details:

Order Number:	315456184_1_1
Customer Reference:	UK23.6614
National Grid Reference:	486550, 299970
Slice:	A
Site Area (Ha):	2.1
Search Buffer (m):	1000

Site Details:

Uppingham School, Meadhurst, Uppingham, LE15 9RP

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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.

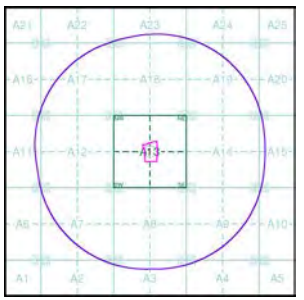
Additional Information

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



Order Details:

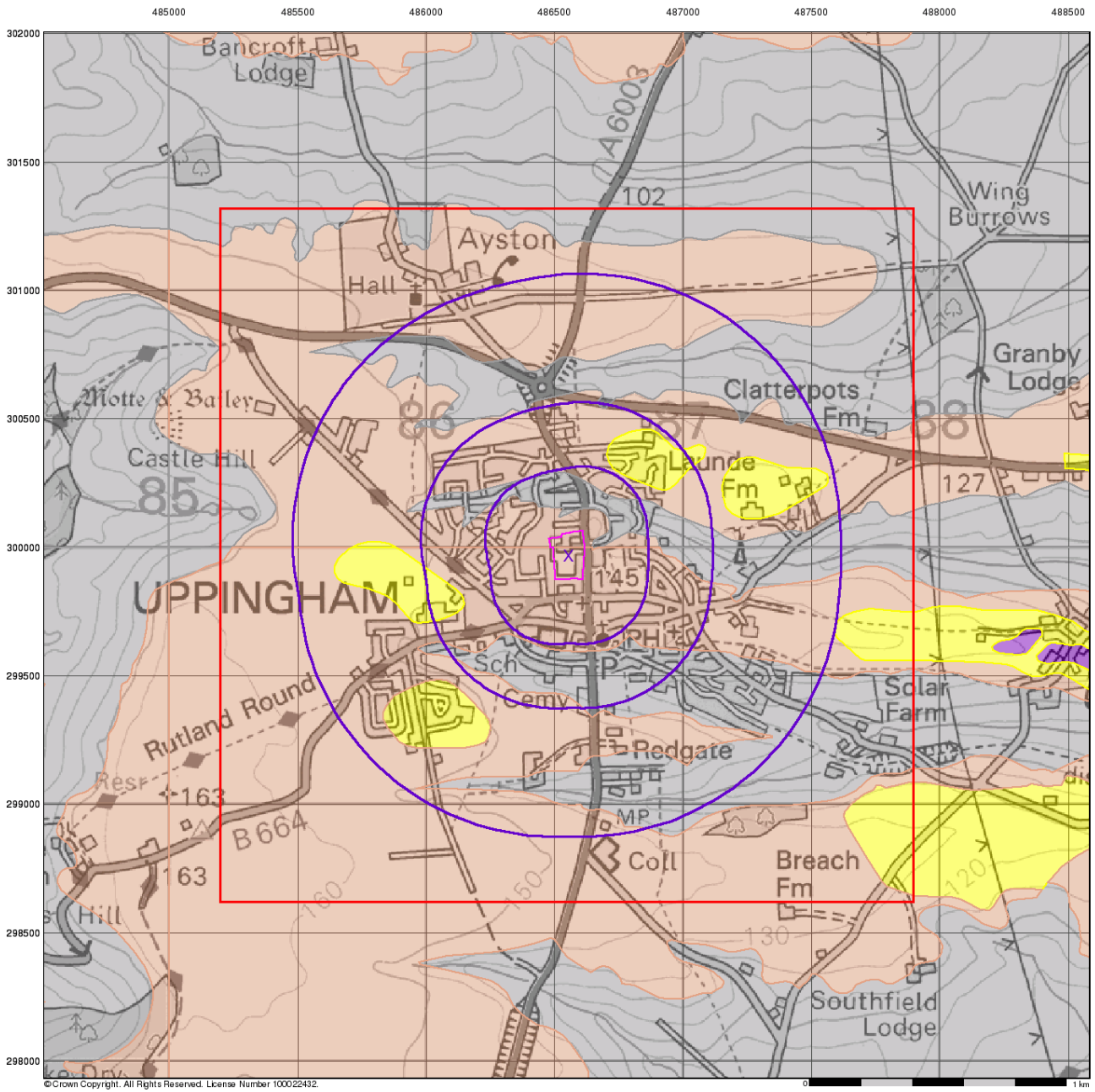
Order Number:	315456184_1_1
Customer Reference:	UK23.6614
National Grid Reference:	486550, 299970
Slice:	A
Site Area (Ha):	2.1
Search Buffer (m):	1000

Site Details:

Uppingham School, Meadhurst, Uppingham, LE15 9RP

APPENDIX D

Groundwater Vulnerability and Flood Maps



Bedrock Aquifer Designation

General

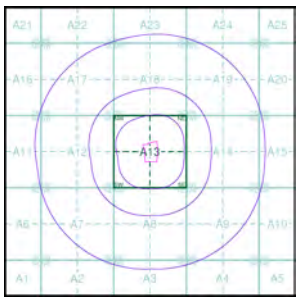
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



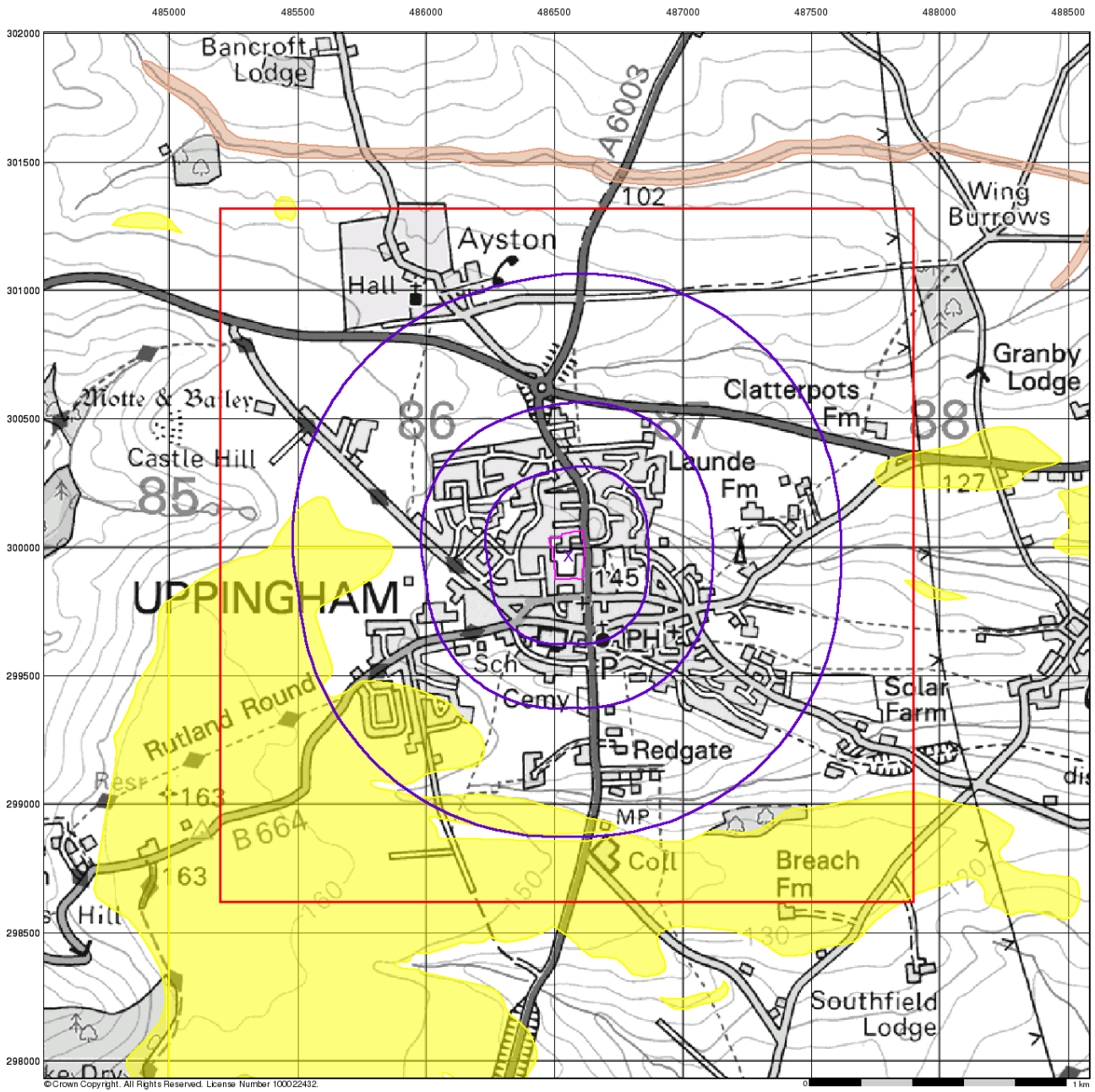
Order Details

Order Number:	315456184_1_1
Customer Ref:	UK23.6614
National Grid Reference:	486550, 299970
Slice:	A
Site Area (Ha):	2.1
Search Buffer (m):	1000

Site Details

Uppingham School, Meadhurst, Uppingham, LE15 9RP

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Superficial Aquifer Designation

General

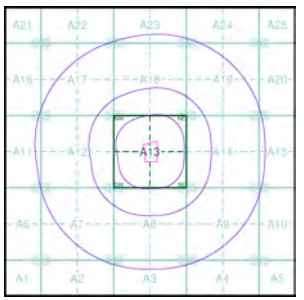
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A

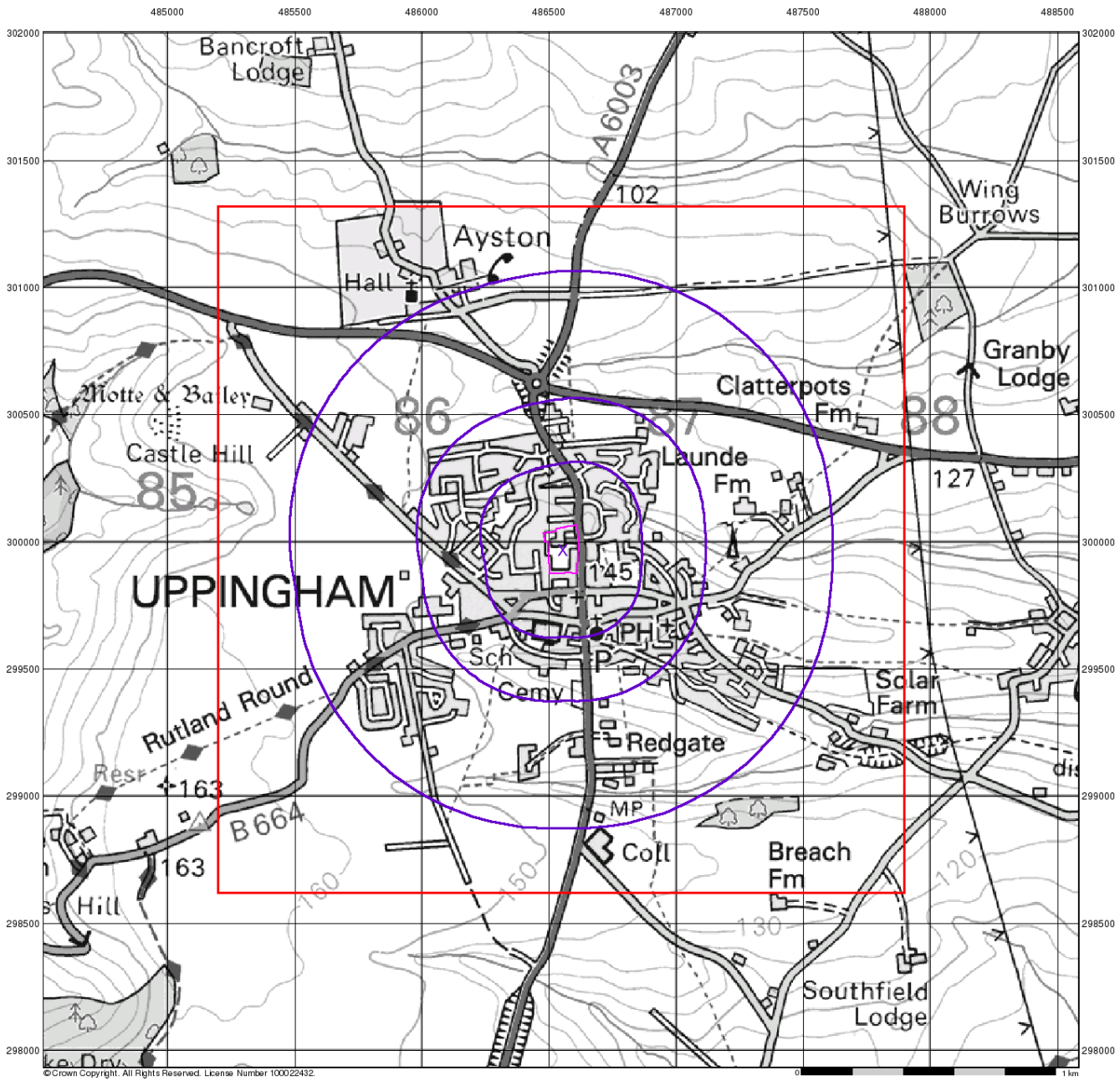


Order Details

Order Number:	315456184_1_1
Customer Ref:	UK23.6614
National Grid Reference:	486550, 299970
Slice:	A
Site Area (Ha):	2.1
Search Buffer (m):	1000

Site Details

Uppingham School, Meadhurst, Uppingham, LE15 9RP



Source Protection Zones

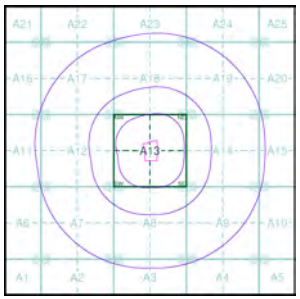
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)

Site Sensitivity Context Map - Slice A



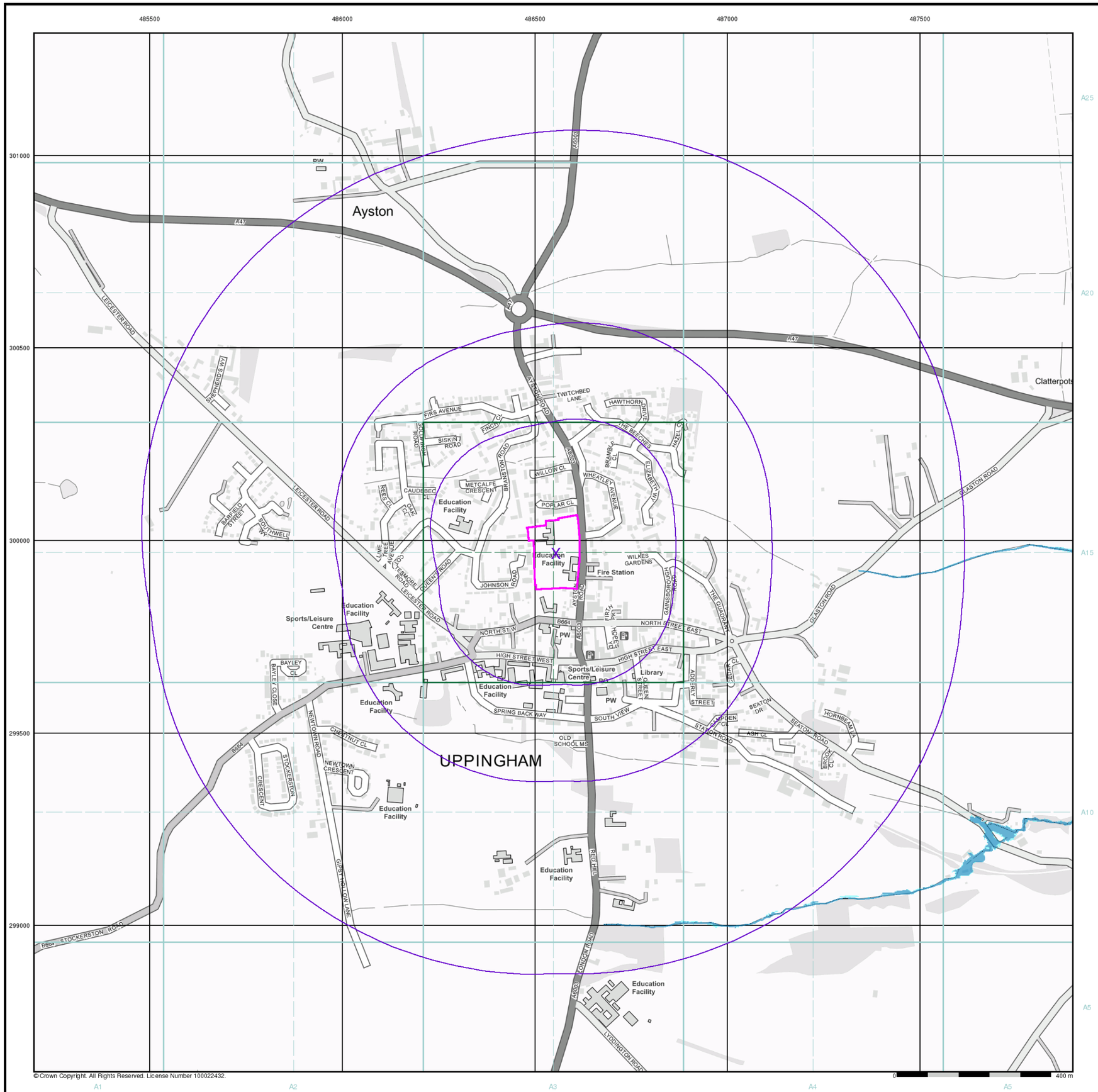
Order Details

Order Number:	315456184_1_1
Customer Ref:	UK23.6614
National Grid Reference:	486550, 299970
Slice:	A
Site Area (Ha):	2.1
Search Buffer (m):	1000

Site Details

Uppingham School, Meadhurst, Uppingham, LE15 9RP

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



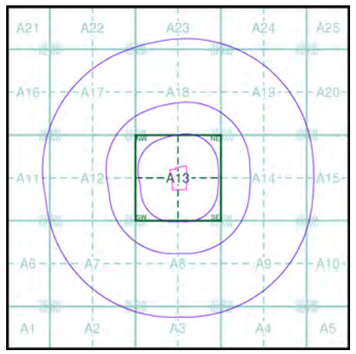
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



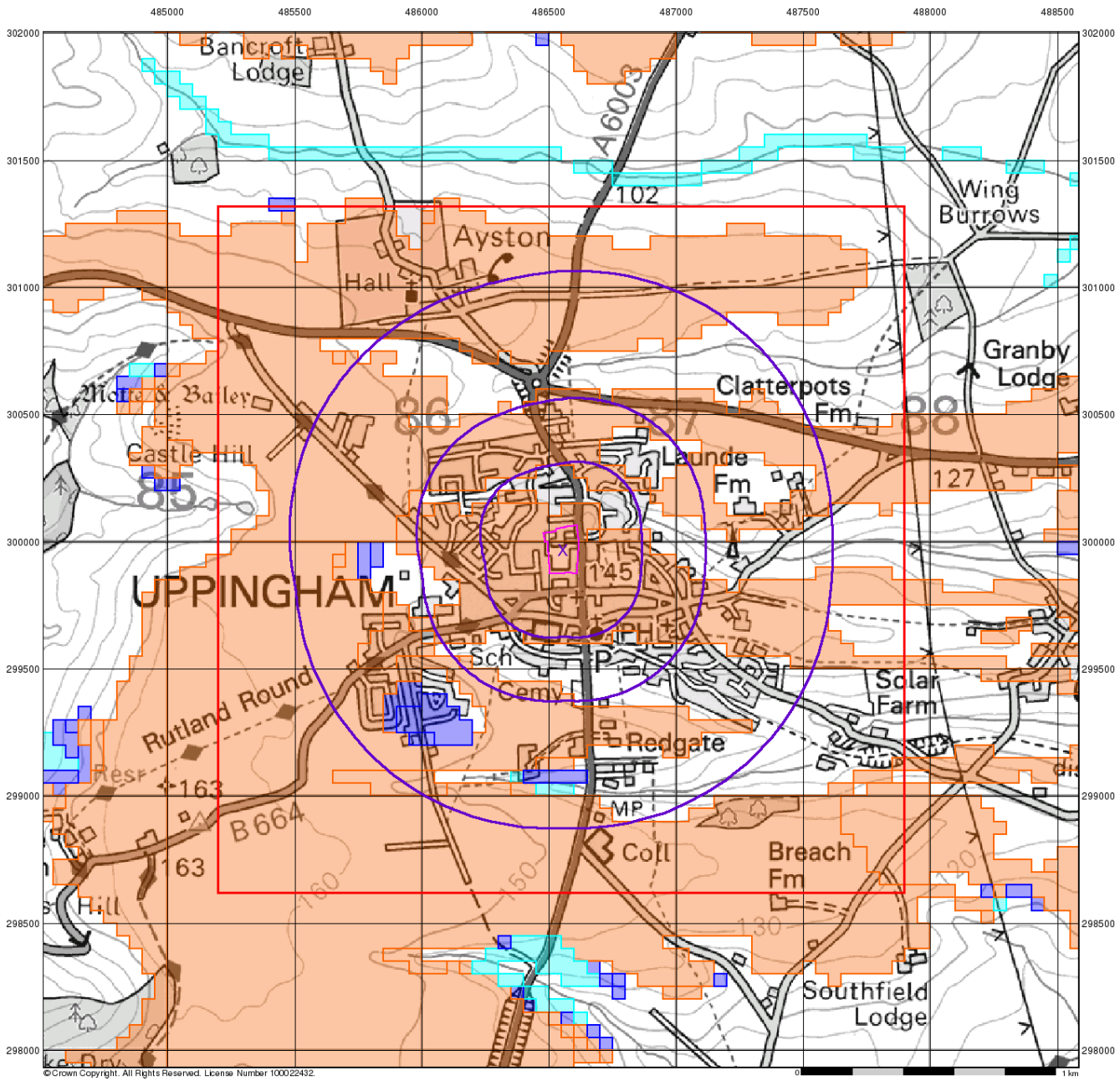
Order Details

Order Number:	315456184_1_1
Customer Ref:	UK23.6614
National Grid Reference:	486550, 299970
Slice:	A
Site Area (Ha):	2.1
Search Buffer (m):	1000

Site Details

Uppingham School, Meadhurst, Uppingham, LE15 9RP

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



BGS Flood GFS Data

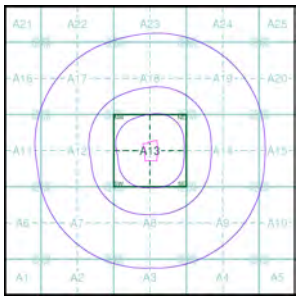
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice

Agency and Hydrological (Flood)

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Site Sensitivity Context Map - Slice A



Order Details

Order Number:	315456184_1_1
Customer Ref:	UK23.6614
National Grid Reference:	486550, 299970
Slice:	A
Site Area (Ha):	2.1
Search Buffer (m):	1000

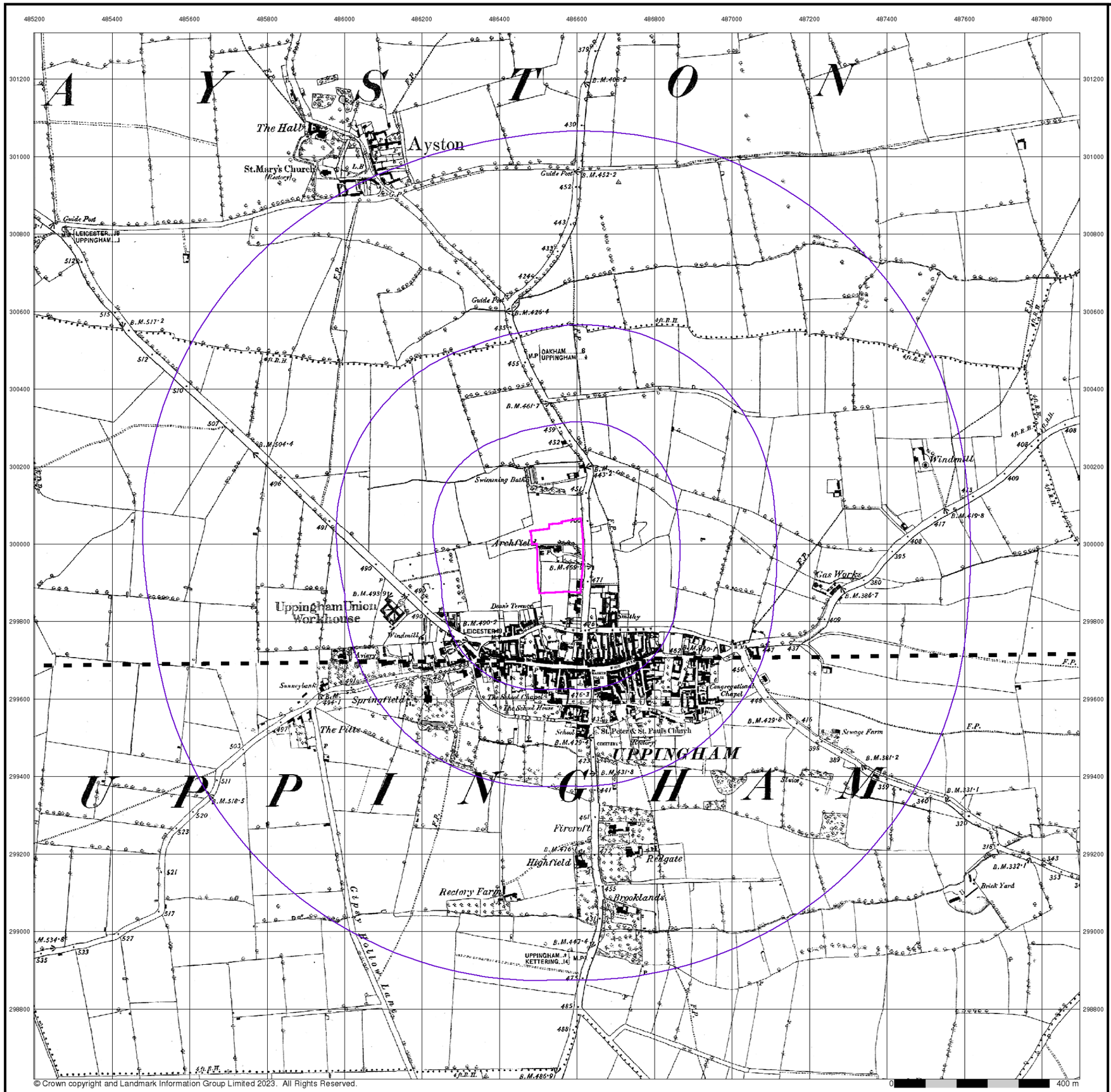
Site Details

Uppingham School, Meadhurst, Uppingham, LE15 9RP

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

APPENDIX E

A Selection of Historic Maps



Rutland

Published 1885

Source map scale - 1:10,560

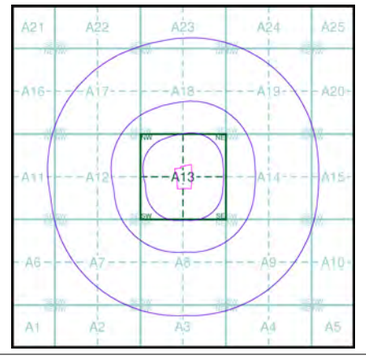
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some 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 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.

Map Name(s) and Date(s)

013NW
1885
1:10,560

013SW
1885
1:10,560

Historical Map - Slice A



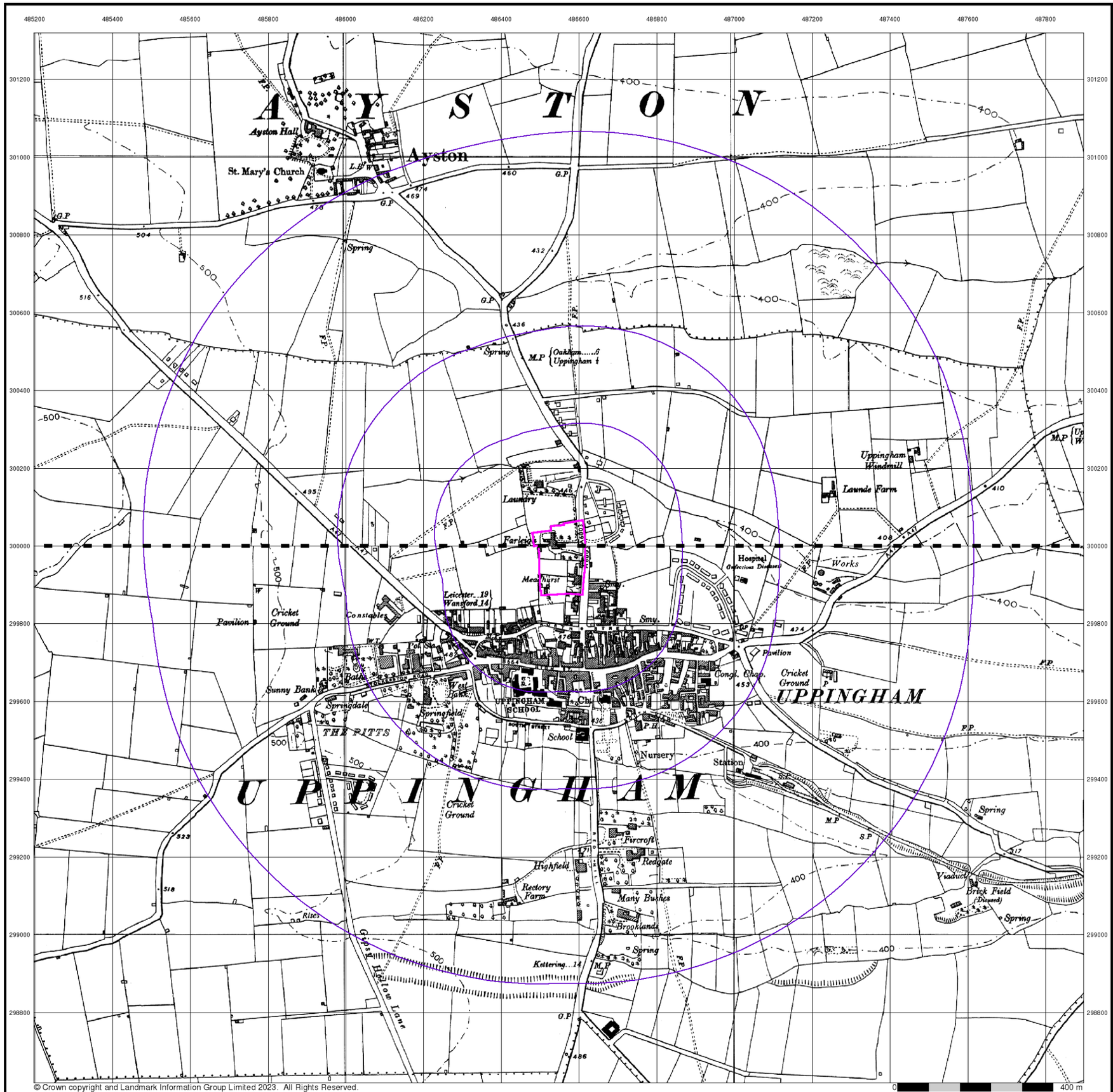
Order Details

Order Number:	315456184_1_1
Customer Ref:	UK23.6614
National Grid Reference:	486550, 299970
Slice:	A
Site Area (Ha):	2.1
Search Buffer (m):	1000

Site Details

Uppingham School, Meadhurst, Uppingham, LE15 9RP

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Ordnance Survey Plan

Published 1958

Source map scale - 1:10,000

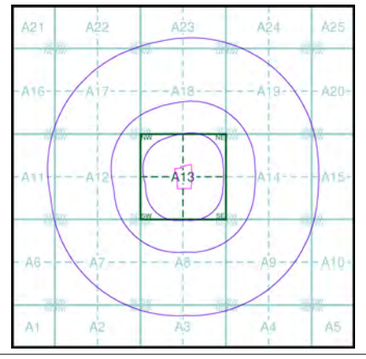
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some 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 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.

Map Name(s) and Date(s)

SK80SE
1958
1:10,560

SP89NE
1958
1:10,560

Historical Map - Slice A



N

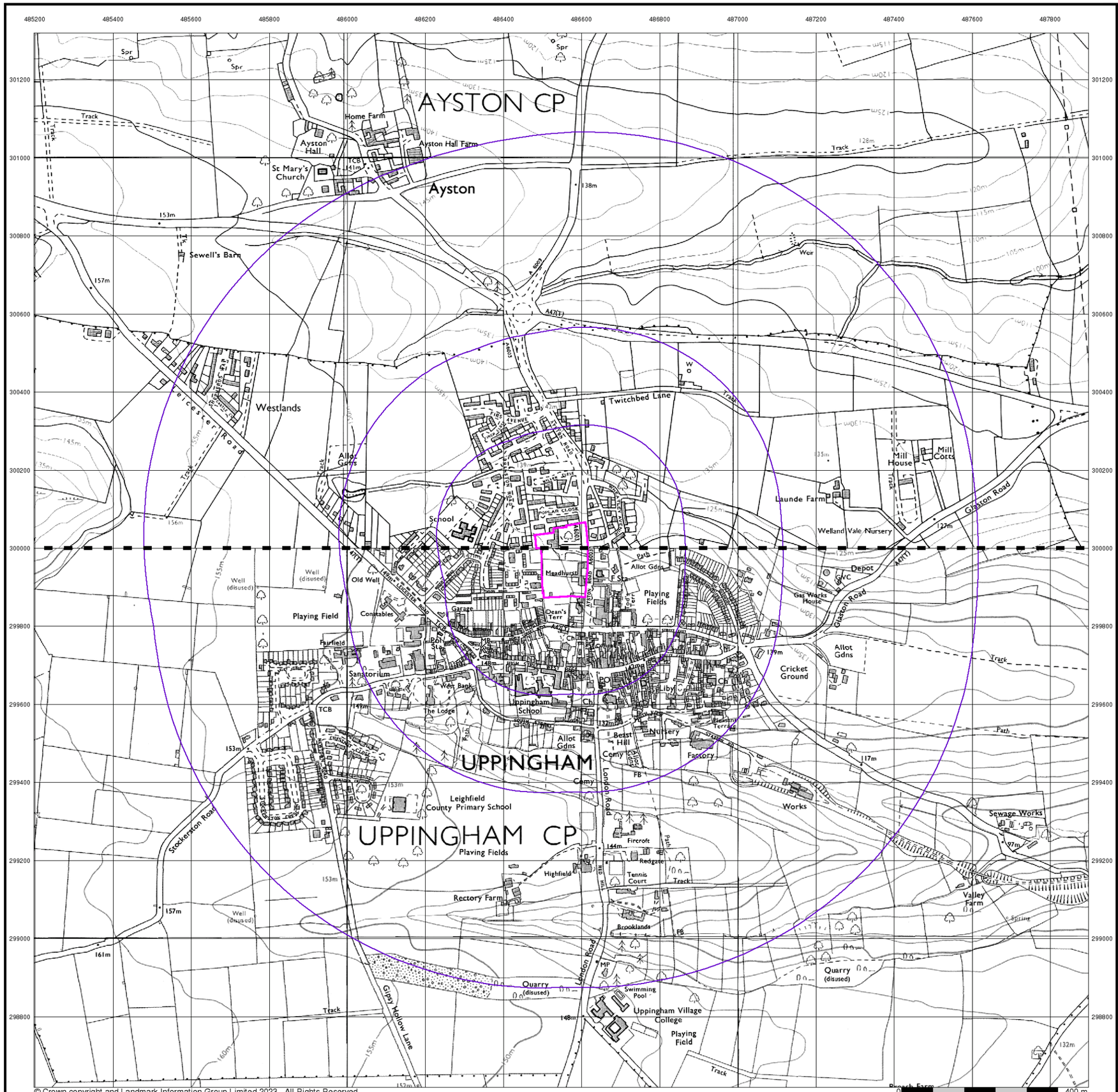
Order Details

Order Number:	315456184_1_1
Customer Ref:	UK23.6614
National Grid Reference:	486550, 299970
Slice:	A
Site Area (Ha):	2.1
Search Buffer (m):	1000

Site Details

Uppingham School, Meadhurst, Uppingham, LE15 9RP

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Ordnance Survey Plan

Published 1984 - 1988

Source map scale - 1:10,000

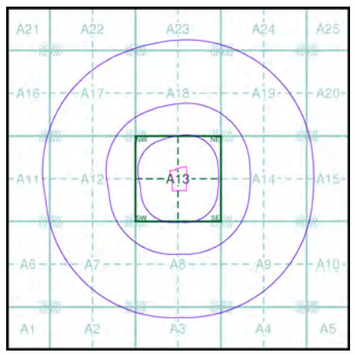
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some 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 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.

Map Name(s) and Date(s)

SK80SE
1988
1:10,000

SP89NE
1984
1:10,000

Historical Map - Slice A



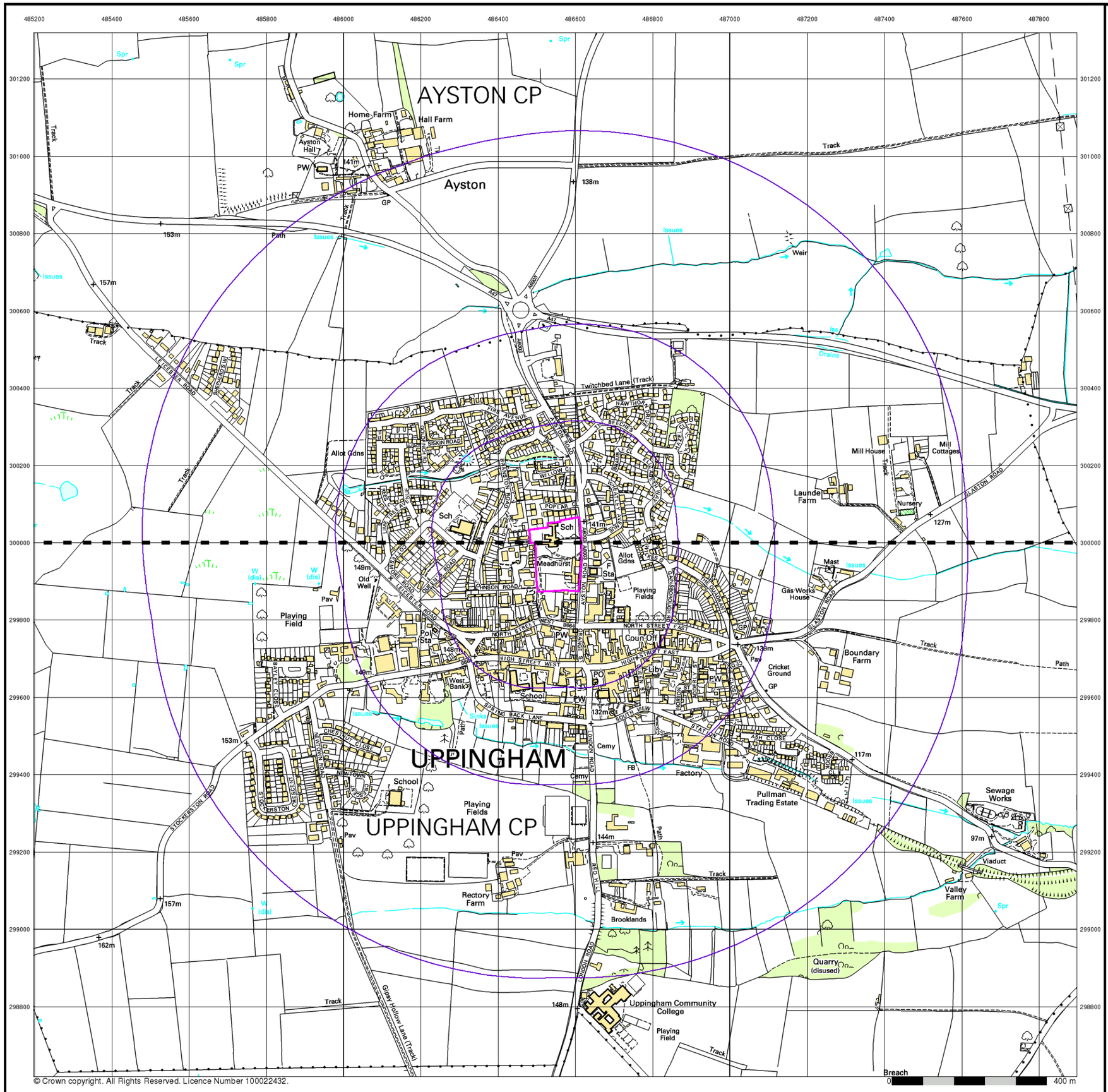
Order Details

Order Number:	315456184_1_1
Customer Ref:	UK23.6614
National Grid Reference:	486550, 299970
Slice:	A
Site Area (Ha):	2.1
Search Buffer (m):	1000

Site Details

Uppingham School, Meadhurst, Uppingham, LE15 9RP

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



eps

10k Raster Mapping

Published 2006

Source map scale - 1:10,000

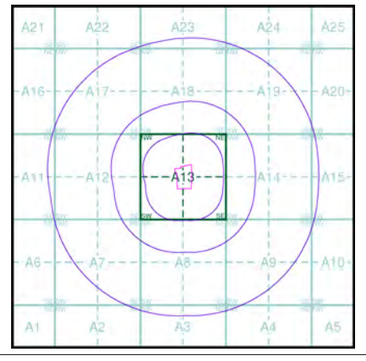
The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

SK80SE
2006
1:10,000

SP89NE
2006
1:10,000

Historical Map - Slice A



Order Details

Order Number:	315456184_1_1
Customer Ref:	UK23.6614
National Grid Reference:	486550, 299970
Slice:	A
Site Area (Ha):	2.1
Search Buffer (m):	1000

Site Details

Uppingham School, Meadhurst, Uppingham, LE15 9RP

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

VectorMap Local

Published 2023

Source map scale - 1:10,000

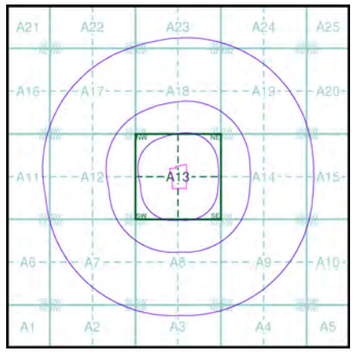
VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities),1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)

SK80SE
2023
Variable

SP89NE
2023
Variable

Historical Map - Slice A



Order Details

Order Number:	315456184_1_1
Customer Ref:	UK23.6614
National Grid Reference:	486550, 299970
Slice:	A
Site Area (Ha):	2.1
Search Buffer (m):	1000

Site Details

Uppingham School, Meadhurst, Uppingham, LE15 9RP

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

APPENDIX F

Site Specific Borehole Logs & Trial Pit Logs

Borehole Log

Borehole No. **BH01**

Sheet 1 of 1

Project Name:	Uppingham School, Meadhurst	Project No. UK23.6614	Co-ords: -80516E - 6907603N
Location:	11 Ayston Rd, Uppingham, Oakham, LE15 9RL		Level:
Client:	Uppingham Estates Department c/o Conisbee		Dates: 04/09/2023

Hole Type: CP

Scale: 1:100

Logged By: MC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	In Situ Results				
					0.35			Dark orangish brown, slightly gravelly, slightly silty SAND. Gravel is fine to coarse, sub-rounded to rounded ferruginous sandstone. (TOPSOIL)
		1.20	SPT	N=18 (4,4/5,5,4,4)				Medium dense, dark orangish brown ferruginous sandstone GRAVEL. Gravel is very weathered, rounded sandstone in a dark orangish brown, sandy, silty clay matrix. (NORTHAMPTON SAND FORMATION)
		2.00	SPT	N=18 (3,4/4,5,5,4)	2.20			
		3.00	SPT	N=19 (4,4/5,6,4,4)				Firm, dark orangish brown, slightly gravelly, sandy, silty CLAY. Gravel is dark orangish brown, very weathered, rounded ferruginous sandstone. (NORTHAMPTON SAND FORMATION)
	▼	4.00	D					
		4.00	SPT	N=10 (4,4/3,3,2,2) PSD FI: 38 PSD SA: 36 PSD GR: 26				
		5.00	SPT	N=13 (3,3/3,4,3,3)				
		6.50	SPT	N=44 (7,9/10,10,12,12)	6.40			Very stiff, mottled, dark greyish brown to dark grey CLAY. (WHITBY MUDSTONE)
		8.00	D					
		8.00	SPT	N=52 (7,9/10,12,14,16) PI: 30 MC: 16.7				
		9.50	B					
		10.00	SPT	N=62 (7,8/12,14,16,20)				
		11.50	SPT	N=62 (8,11/13,13,15,21)				
		13.00	SPT	N=69 (8,10/14,15,18,22)				
		14.00	D					
				PI: 36 MC: 17.2				
		14.50	B					
		15.00	SPT	N=110 (12,14/16,20,24,50)				
		16.50	SPT	N=120 (14,14/19,24,27,50)				
		18.00	SPT	N=118 (14,14/18,24,26,50)				
		19.50	SPT	N=102 (16,18/22,30,50,0)				
					20.00			End of Borehole at 20.000m

Remarks

Groundwater Encountered at 3.8m & Refusal at 20m Into Dense Sand.

Trial Pit Log

Trialpit No **TP01**

Sheet 1 of 1

Project Name: Uppingham School, Meadhurst	Project No. UK23.6614	Co-ords: -80577.40 - 6907563.54 Level:	Date 01/09/2023
Location: 11 Ayston Rd, Uppingham, Oakham, LE15 9RL		Dimensions (m): 1.8 × 0.4 Depth 2.00	Scale 1:10
Client: Uppingham Estates Department c/o Conisbee			Logged MC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Dark orangish brown, slightly gravelly, slightly silty SAND. Gravel is fine to coarse, sub-rounded to rounded ferruginous sandstone. (TOPSOIL)
				0.40			Dark orangish brown ferruginous sandstone GRAVEL. Gravel is very weathered, rounded sandstone in a dark orangish brown, sandy, silty clay matrix. (NORTHAMPTON SAND FORMATION)
				2.00			End of pit at 2.00 m

Remarks: No Groundwater Encountered & Reached Target Depth

Stability: Stable

Trial Pit Log

Trialpit No **TP02**

Sheet 1 of 1

Project Name: Uppingham School, Meadhurst	Project No. UK23.6614	Co-ords: -80577.64 - 6907505.26 Level:	Date 01/09/2023
Location: 11 Ayston Rd, Uppingham, Oakham, LE15 9RL		Dimensions (m): 2.4 × 0.4 Depth 1.90	Scale 1:10
Client: Uppingham Estates Department c/o Conisbee			Logged MC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.00			Dark orangish brown, slightly gravelly, slightly silty SAND. Gravel is fine to coarse, sub-rounded to rounded ferruginous sandstone. (TOPSOIL)
				0.40			Dark orangish brown ferruginous sandstone GRAVEL. Gravel is very weathered, rounded sandstone in a dark orangish brown, sandy, silty clay matrix. (NORTHAMPTON SAND FORMATION)
				1.90			End of pit at 1.90 m

Remarks: No Groundwater Encountered & Reached Target Depth

Stability: Stable

Trial Pit Log

Trialpit No **TP03**

Sheet 1 of 1

Project Name: Uppingham School, Meadhurst	Project No. UK23.6614	Co-ords: -80514.58 - 6907606.30 Level:	Date 01/09/2023
Location: 11 Ayston Rd, Uppingham, Oakham, LE15 9RL		Dimensions (m): 2.1 × 0.4 Depth 1.80	Scale 1:10
Client: Uppingham Estates Department c/o Conisbee			Logged MC

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Dark orangish brown, slightly gravelly, slightly silty SAND. Gravel is fine to coarse, sub-rounded to rounded ferruginous sandstone. (TOPSOIL)
				0.30			Dark orangish brown, gravelly, sandy, clayey SILT. Gravel is very weathered, rounded ferruginous sandstone. (NORTHAMPTON SAND FORMATION)
				1.00			Dark orangish brown, gravelly, silty, clayey SAND. Gravel is very weathered, rounded ferruginous sandstone. (NORTHAMPTON SAND FORMATION)
				1.30			Dark orangish brown, gravelly, sandy, clayey SILT. Gravel is very weathered, rounded ferruginous sandstone. (NORTHAMPTON SAND FORMATION)
				1.80			End of pit at 1.80 m

1

2

Remarks: No Groundwater Encountered & Reached Target Depth

Stability: Stable

Borehole Log

Borehole No. **WS01**

Sheet 1 of 1

Project Name:	Uppingham School, Meadhurst	Project No. UK23.6614	Co-ords: -80577E - 6907596N
Location:	11 Ayston Rd, Uppingham, Oakham, LE15 9RL		Level:
Client:	Uppingham Estates Department c/o Conisbee		Dates: 31/08/2023

Hole Type: WLS

Scale: 1:27

Logged By: MC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	In Situ Results				
					0.40			Dark orangish brown, slightly gravelly, slightly silty SAND. Gravel is fine to coarse, sub-rounded to rounded ferruginous sandstone. (TOPSOIL)
		1.00	SPT	N=13 (3,3/3,4,3,3)				Loose to medium dense, dark orangish brown ferruginous sandstone GRAVEL. Gravel is very weathered, rounded sandstone in a dark orangish brown, sandy, silty clay matrix. (NORTHAMPTON SAND FORMATION)
		2.00	SPT	N=15 (4,2/3,4,4,4)				
		3.00	SPT	N=25 (5,5/5,8,6,6)				*Becomes increasingly less dense and more saturated.*
		3.80 - 4.00	D	PSD FI: 29 PSD SA: 31 PSD GR: 40				
		4.00	SPT	N=11 (2,2/3,3,2,3)				
		5.00	SPT	N=6 (2,3/2,1,1,2)	5.00			End of Borehole at 5.000m

Remarks

Groundwater Encountered at 4.04m, Rising to 2.85m in 24 Hours & Reached Target Depth at 5m.

Borehole Log

Borehole No. **WS02**

Sheet 1 of 1

Project Name:	Uppingham School, Meadhurst	Project No. UK23.6614	Co-ords: -80578E - 6907578N
Location:	11 Ayston Rd, Uppingham, Oakham, LE15 9RL		Level:
Client:	Uppingham Estates Department c/o Conisbee		Dates: 31/08/2023

Hole Type: WLS

Scale: 1:27

Logged By: MC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	In Situ Results				
								Dark orangish brown, slightly gravelly, slightly silty SAND. Gravel is fine to coarse, sub-rounded to rounded ferruginous sandstone. (TOPSOIL)
					0.40			Medium dense, dark orangish brown ferruginous sandstone GRAVEL. Gravel is very weathered, rounded sandstone in a dark orangish brown, sandy, silty clay matrix. (NORTHAMPTON SAND FORMATION)
		0.80 - 1.00	D	PSD FI: 17 PSD SA: 22 PSD GR: 61				
		1.00	SPT	N=15 (6,6/4,4,3,4)				
		2.00	SPT	N=18 (4,3/4,4,5,5)				
								Becomes more saturated and clayey with depth.
		3.00	SPT	N=20 (4,5/4,5,6,5)				
					3.40			Medium dense, dark orangish brown, gravelly, sandy, clayey SILT. Gravel is very weathered, rounded ferruginous sandstone. (NORTHAMPTON SAND FORMATION)
								Becomes heavily saturated with dark red sandstone cobbles.
		4.00	SPT	N=13 (3,3/3,4,3,3)				
					4.50			Very dense, dark orangish brown, gravelly, silty, clayey SAND. Gravel is very weathered, rounded ferruginous sandstone. (NORTHAMPTON SAND FORMATION)
		5.00	SPT	N=109 (17,9/9,24,26,50)	5.00			End of Borehole at 5.000m

Remarks

Groundwater Encountered at 3.91m, Rising to 2.56m in 24 Hours & Reached Target Depth at 5m.

Borehole Log

Borehole No. **WS03**

Sheet 1 of 1

Project Name:	Uppingham School, Meadhurst	Project No. UK23.6614	Co-ords: -80526E - 6907588N	Hole Type WLS
Location:	11 Ayston Rd, Uppingham, Oakham, LE15 9RL		Level:	Scale 1:27
Client:	Uppingham Estates Department c/o Conisbee		Dates: 31/08/2023	Logged By MC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	In Situ Results				
								Dark orangish brown, slightly gravelly, slightly silty SAND. Gravel is fine to coarse, sub-rounded to rounded, ferruginous sandstone. (TOPSOIL)
					0.40			Medium dense, dark orangish brown ferruginous sandstone GRAVEL. Gravel is very weathered, rounded sandstone in a dark orangish brown, sandy, silty clay matrix. (NORTHAMPTON SAND FORMATION)
		1.00	SPT	N=23 (5,4/6,6,6,5)				
		1.80 - 2.00	D	PSD FI: 29 PSD SA: 17 PSD GR: 54				
		2.00 - 3.00	B		2.10			Firm, dark orangish brown, slightly gravelly, sandy, silty CLAY. Gravel is dark orangish brown, very weathered, rounded ferruginous sandstone. (NORTHAMPTON SAND FORMATION)
		2.00	SPT	N=17 (3,3/4,4,5,4)				
		3.00	SPT	N=18 (4,4/5,4,5,4)	3.00			Medium dense, slightly saturated, dark orangish brown ferruginous sandstone GRAVEL. Gravel is very weathered, rounded sandstone in a dark orangish brown, sandy, silty clay matrix. (NORTHAMPTON SAND FORMATION)
		4.00	SPT	N=16 (5,4/4,4,4,4)				
		5.00	SPT	N=17 (4,4/4,5,4,4)	5.00			End of Borehole at 5.000m

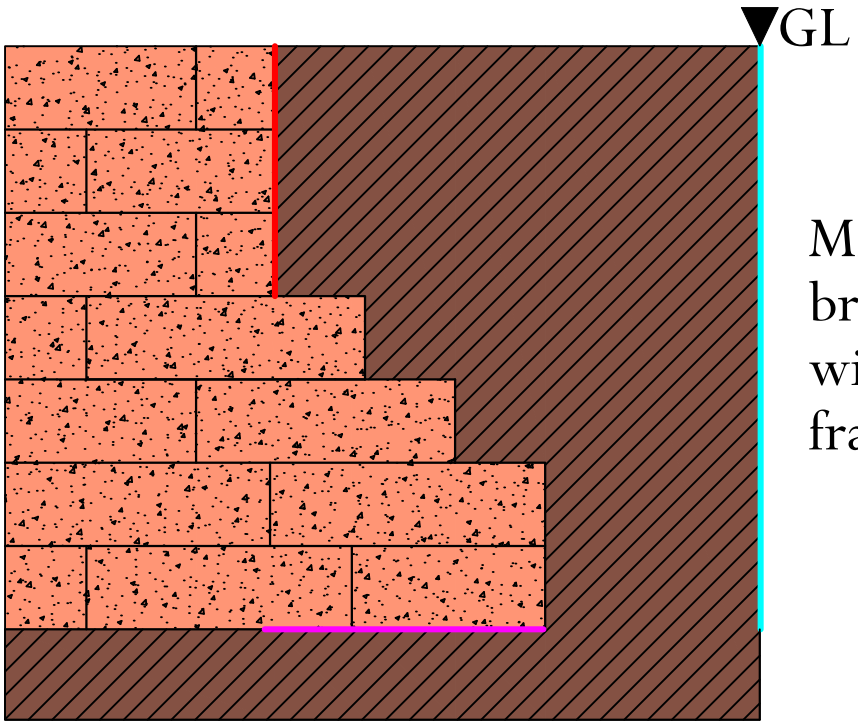
Remarks

Groundwater Encountered at 3.27m, Rising to 2.65m in 24 Hours & Reached Target Depth at 5m.

APPENDIX G

Foundation Exposure Logs

Brick Wall



MADE GROUND: Yellowish brown, sandy, gravelly SILT with bricks and concrete fragments.

N

MEASUREMENT KEY:
- 0.24m
- 0.17m
- 0.54m

Rev	Date	Drawn	Description	Ch'kd

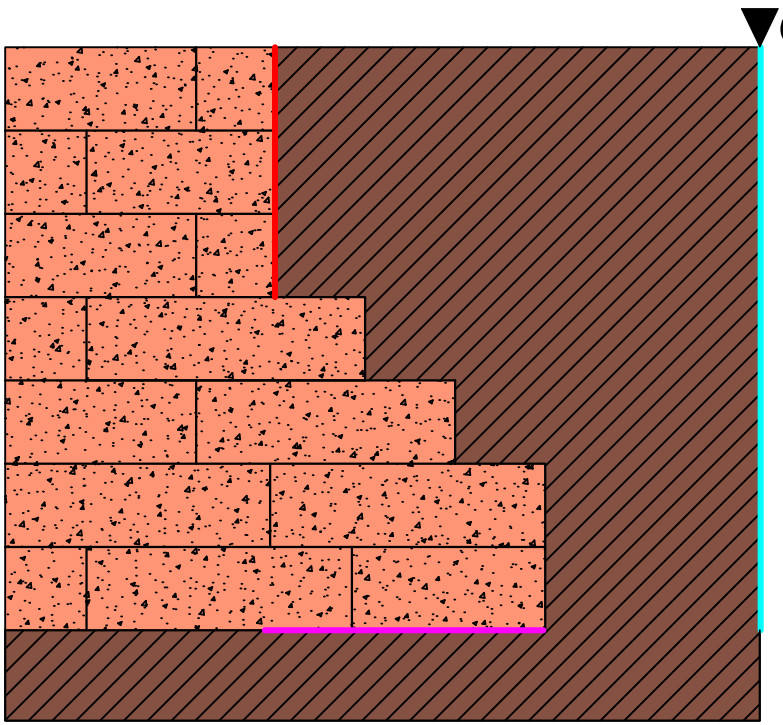
The Geotechnical and Environmental Engineers
www.epstrategies.co.uk

Site
Uppingham School, Meadhurst
11 Ayston Road, Uppingham, Oakham, LE15 9RL

Client
Uppingham Estates Department c/o Conisbee

Title
FP01 - Foundation Exposure 1

Surveyed:		Drawn by:	MC
Checked by:	TA	Date:	October 2023
Scale [A4 Sheet]	Not to Scale	Drawing Reference	UK23.6614_06
Job No	UK23.6614	Rev	01



MADE GROUND: Yellowish brown, sandy, gravelly SILT with bricks and concrete fragments.

N

MEASUREMENT KEY:
- 0.42m
- 0.17m
- 0.77m

Rev	Date	Drawn	Description	Ch'k'd

The Geotechnical and Environmental Engineers
www.epstrategies.co.uk

Site
Uppingham School, Meadhurst
11 Ayston Road, Uppingham, Oakham, LE15 9RL

Client
Uppingham Estates Department c/o Conisbee

Title
FP02 - Foundation Exposure 2

Surveyed:		Drawn by:	MC
Checked by:	TA	Date:	October 2023
Scale [A4 Sheet]	Not to Scale	Drawing Reference	UK23.6614_07
Job No	UK23.6614	Rev	01

APPENDIX H

Laboratory Results – Environmental

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

EPS Ltd
7B Caxton House
Broad Street
Cambourne
Cambridgeshire
United Kingdom
CB23 6JN

Attention :	Matthew Cook
Date :	19th September, 2023
Your reference :	UK23.6614
Our reference :	Test Report 23/14875 Batch 1 23/14735 Batch 1
Location :	Meadhurst, Uppingham
Date samples received :	6th & 8th September, 2023
Status :	Final report
Issue :	1

Six samples were received for analysis on 6th & 8th September, 2023 which were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 24.471 kg of CO2

Scope 1&2&3 emissions - 57.832 kg of CO2

Authorised By:

Phil Sommerton BSc
Senior Project Manager

Client Name: EPS Ltd
Reference: UK23.6614
Location: Meadhurst, Uppingham
Contact: Matthew Cook

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Job No.	23/14735	23/14735	23/14735	23/14735	23/14875	23/14875					LOD/LOR	Units	Method No.
EMT Sample No.	1-4	5-8	9-12	13-16	1	2							
Sample ID	WS01 ES1	WS02 ES1	WS03 ES1	WS03 ES2	BH1 D6	BH1 D13							
Depth	0.00-0.40	0.00-0.40	0.00-0.40	1.60-2.00	6.5	13.00							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	B	B							
Sample Date	01/09/2023	01/09/2023	01/09/2023	01/09/2023	04/09/2023	04/09/2023							
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay							
Batch Number	1	1	1	1	1	1							
Date of Receipt	06/09/2023	06/09/2023	06/09/2023	06/09/2023	08/09/2023	08/09/2023							
Arsenic #M	110.7	125.9	102.5	60.0	117.7	-					<0.5	mg/kg	TM30/PM15
Cadmium #M	<0.1	<0.1	<0.1	<0.1	<0.1	-					<0.1	mg/kg	TM30/PM15
Chromium #M	144.4	153.8	133.3	335.0 AA	51.1	-					<0.5	mg/kg	TM30/PM15
Copper #M	31	54	266 AA	<1	19	-					<1	mg/kg	TM30/PM15
Lead #M	199	222	815	60	19	-					<5	mg/kg	TM30/PM15
Mercury #M	0.6	0.9	1.2	0.4	0.2	-					<0.1	mg/kg	TM30/PM15
Nickel #M	61.8	68.6	66.6	119.7	39.1	-					<0.7	mg/kg	TM30/PM15
Selenium #M	<1	1	<1	<1	<1	-					<1	mg/kg	TM30/PM15
Sulphur as S	-	-	-	-	2.45	2.65					<0.01	%	TM30/PM15
Total Sulphate as SO4 #M	775	559	706	-	4203	3036					<50	mg/kg	TM50/PM29
Zinc #M	262	296	479	617	64	-					<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #M	<0.04	<0.04	0.60	<0.04	<0.04	-					<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	0.13	<0.03	<0.03	-					<0.03	mg/kg	TM4/PM8
Acenaphthene #M	<0.05	<0.05	2.40	<0.05	<0.05	-					<0.05	mg/kg	TM4/PM8
Fluorene #M	<0.04	<0.04	2.26	<0.04	<0.04	-					<0.04	mg/kg	TM4/PM8
Phenanthrene #M	0.10	0.07	12.72	<0.03	<0.03	-					<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	4.18	<0.04	<0.04	-					<0.04	mg/kg	TM4/PM8
Fluoranthene #M	0.18	0.11	10.24	<0.03	<0.03	-					<0.03	mg/kg	TM4/PM8
Pyrene #	0.17	0.10	7.78	<0.03	0.03	-					<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.14	0.08	4.48	<0.06	<0.06	-					<0.06	mg/kg	TM4/PM8
Chrysene #M	0.14	0.08	4.44	<0.02	<0.02	-					<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	0.20	0.12	5.50	<0.07	<0.07	-					<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	3.23	<0.04	<0.04	-					<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #M	0.05	<0.04	1.36	<0.04	<0.04	-					<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	0.29	<0.04	<0.04	-					<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.06	<0.04	1.12	<0.04	<0.04	-					<0.04	mg/kg	TM4/PM8
Coronene	<0.04	-	-	<0.04	<0.04	-					<0.04	mg/kg	TM4/PM8
PAH 16 Total	1.0	<0.6	60.7	<0.6	<0.6	-					<0.6	mg/kg	TM4/PM8
PAH 17 Total	1.04	-	-	<0.64	<0.64	-					<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.14	0.09	3.96	<0.05	<0.05	-					<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.06	0.03	1.54	<0.02	<0.02	-					<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	97	100	100	99	96	-					<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30	-	-	<30	<30	-					<30	mg/kg	TM5/PM8/PM16

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: EPS Ltd
Reference: UK23.6614
Location: Meadhurst, Uppingham
Contact: Matthew Cook

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Job No.	23/14735	23/14735	23/14735	23/14735	23/14875	23/14875							
EMT Sample No.	1-4	5-8	9-12	13-16	1	2							
Sample ID	WS01 ES1	WS02 ES1	WS03 ES1	WS03 ES2	BH1 D6	BH1 D13							
Depth	0.00-0.40	0.00-0.40	0.00-0.40	1.60-2.00	6.5	13.00					Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V J T	V J T	V J T	V J T	B	B							
Sample Date	01/09/2023	01/09/2023	01/09/2023	01/09/2023	04/09/2023	04/09/2023							
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay							
Batch Number	1	1	1	1	1	1							
Date of Receipt	06/09/2023	06/09/2023	06/09/2023	06/09/2023	08/09/2023	08/09/2023							
											LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #M	<0.1	-	-	<0.1	<0.1 SV	-					<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #M	<0.1	-	-	<0.1	<0.1 SV	-					<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	-	-	<0.1	<0.1 SV	-					<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #M	<0.2	-	-	<0.2	<0.2	-					<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #M	<4	-	-	<4	<4	-					<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #M	<7	-	-	<7	<7	-					<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #M	<7	-	-	<7	<7	-					<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_CU_1D_AL)	<7	-	-	<7	<7	-					<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS_CU_1D_AL)	<26	-	-	<26	<26	-					<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	-	-	<0.1	<0.1 SV	-					<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	-	-	<0.1	<0.1 SV	-					<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #M	<0.1	-	-	<0.1	<0.1 SV	-					<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	-	-	<0.2	<0.2	-					<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	-	-	<4	<4	-					<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	-	-	<7	<7	-					<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	-	-	<7	<7	-					<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_CU_1D_AR)	<7	-	-	<7	<7	-					<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_CU_1D_AR)	<26	-	-	<26	<26	-					<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	-	-	<52	<52	-					<52	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	-	-	<5	<5 SV	-					<5	ug/kg	TM36/PM12
Benzene #	<5	-	-	<5	<5 SV	-					<5	ug/kg	TM36/PM12
Toluene #	<5	-	-	<5	6 SV	-					<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	-	-	<5	<5 SV	-					<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	-	-	<5	<5 SV	-					<5	ug/kg	TM36/PM12
o-Xylene #	<5	-	-	<5	<5 SV	-					<5	ug/kg	TM36/PM12
PCB 28 #	<5	-	-	<5	<5	-					<5	ug/kg	TM17/PM8
PCB 52 #	<5	-	-	<5	<5	-					<5	ug/kg	TM17/PM8
PCB 101 #	<5	-	-	<5	<5	-					<5	ug/kg	TM17/PM8
PCB 118 #	<5	-	-	<5	<5	-					<5	ug/kg	TM17/PM8
PCB 138 #	<5	-	-	<5	<5	-					<5	ug/kg	TM17/PM8
PCB 153 #	<5	-	-	<5	<5	-					<5	ug/kg	TM17/PM8
PCB 180 #	<5	-	-	<5	<5	-					<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	-	-	<35	<35	-					<35	ug/kg	TM17/PM8
Total Phenols HPLC	<0.15	<0.15	<0.15	-	-	-					<0.15	mg/kg	TM26/PM21B
Natural Moisture Content	15.4	13.0	15.2	22.4	14.6	-					<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	-					<0.3	mg/kg	TM38/PM20

Client Name: EPS Ltd
Reference: UK23.6614
Location: Meadhurst, Uppingham
Contact: Matthew Cook

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Job No.	23/14735	23/14735	23/14735	23/14735	23/14875	23/14875							
EMT Sample No.	1-4	5-8	9-12	13-16	1	2							
Sample ID	WS01 ES1	WS02 ES1	WS03 ES1	WS03 ES2	BH1 D6	BH1 D13							
Depth	0.00-0.40	0.00-0.40	0.00-0.40	1.60-2.00	6.5	13.00					Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V J T	V J T	V J T	V J T	B	B							
Sample Date	01/09/2023	01/09/2023	01/09/2023	01/09/2023	04/09/2023	04/09/2023							
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay							
Batch Number	1	1	1	1	1	1							
Date of Receipt	06/09/2023	06/09/2023	06/09/2023	06/09/2023	08/09/2023	08/09/2023					LOD/LOR	Units	Method No.
Sulphate as SO4 (2:1 Ext) #M	<0.0015	<0.0015	0.0071	-	0.7172	0.2651					<0.0015	g/l	TM38/PM20
Chromium III	144.4	153.8	133.3	335.0	51.1	-					<0.5	mg/kg	NONE/NONE
Total Cyanide #M	<0.5	<0.5	<0.5	-	-	-					<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	3.21	-	-	0.17	1.56	-					<0.02	%	TM21/PM24
Organic Matter	5.5	5.9	17.0	-	-	-					<0.2	%	TM21/PM24
Loss on Ignition #	15.6	-	-	14.2	4.8	-					<1.0	%	TM22/PM0
pH #M	7.73	7.77	7.58	7.37	7.58	7.91					<0.01	pH units	TM73/PM11
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay						None	PM13/PM0
Sample Colour	Dark Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown						None	PM13/PM0
Other Items	roots, vegetation	stones, roots	stones, roots	stones	stones	stones						None	PM13/PM0

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: EPS Ltd
Reference: UK23.6614
Location: Meadhurst, Uppingham
Contact: Matthew Cook

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Job No.	23/14735	23/14735	23/14875								Please see attached notes for all abbreviations and acronyms		
EMT Sample No.	1-4	13-16	1										
Sample ID	WS01 ES1	WS03 ES2	BH1 D6										
Depth	0.00-0.40	1.60-2.00	6.5										
COC No / misc													
Containers	V J T	V J T	B										
Sample Date	01/09/2023	01/09/2023	04/09/2023										
Sample Type	Clay	Clay	Clay										
Batch Number	1	1	1								LOD/LOR	Units	Method No.
Date of Receipt	06/09/2023	06/09/2023	08/09/2023										
Mass of raw test portion	0.1099	0.1167	0.1038									kg	NONE/PM17
Mass of dried test portion	0.09	0.09	0.09									kg	NONE/PM17

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: EPS Ltd
Reference: UK23.6614
Location: Meadhurst, Uppingham
Contact: Matthew Cook

Report : CEN 10:1 1 Batch (Duplicate results)

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Job No.	23/14735										Please see attached notes for all abbreviations and acronyms		
EMT Sample No.	1-4												
Sample ID	WS01 ES1												
Depth	0.00-0.40												
COC No / misc													
Containers	V J T												
Sample Date	01/09/2023												
Sample Type	Clay												
Batch Number	1										LOD/LOR	Units	Method No.
Date of Receipt	06/09/2023												
Mass of raw test portion	0.1101											kg	NONE/PM17
Mass of dried test portion	0.09											kg	NONE/PM17

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: EPS Ltd
Reference: UK23.6614
Location: Meadhurst, Uppingham
Contact: Matthew Cook

Report : CEN 10:1 1 Batch (Duplicate results)

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Job No.	23/14735										Please see attached notes for all abbreviations and acronyms		
EMT Sample No.	13-16												
Sample ID	WS03 ES2												
Depth	1.60-2.00												
COC No / misc													
Containers	V J T												
Sample Date	01/09/2023												
Sample Type	Clay												
Batch Number	1										LOD/LOR	Units	Method No.
Date of Receipt	06/09/2023												
Mass of raw test portion	0.116											kg	NONE/PM17
Mass of dried test portion	0.09											kg	NONE/PM17

CEN 10:1 LEACHATE RESULTS BS EN 12547-2

Mass of sample taken (kg)	0.1038	Moisture Content Ratio (%) =	15.0
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	87.0
Particle Size <4mm =	>95%		

		Landfill Waste Acceptance Criteria Limits		
EMT Job No	**23/14875**			
Sample No	**1**			
Client Sample No	**BH1 D6**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Depth/Other	**6.5**			
Sample Date	**04/09/2023**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	1.56	3	5	6
Loss on Ignition (%)	4.8	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-	-
PAH Sum of 17(mg/kg)	<0.64	100	-	-
pH (pH Units)	7.58	-	>6	-
ANC to pH 7 (mol/kg)	-	-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	-	-	to be evaluated	to be evaluated

Eluate Analysis	**10:1 conc^{n} leached**		**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	C_{10}	**A_{10}**			
	mg/l	**mg/kg**	**mg/kg**		
Arsenic	0.0033	0.033	0.5	2	25
Barium	0.005	0.05	20	100	300
Cadmium	<0.0005	<0.005	0.04	1	5
Chromium	<0.0015	<0.015	0.5	10	70
Copper	<0.007	<0.07	2	50	100
Mercury	<0.001	<0.01	0.01	0.2	2
Molybdenum	0.018	0.18	0.5	10	30
Nickel	0.025	0.25	0.4	10	40
Lead	<0.005	<0.05	0.5	10	50
Antimony	<0.002	<0.02	0.06	0.7	5
Selenium	<0.003	<0.03	0.1	0.5	7
Zinc	<0.003	<0.03	4	50	200
Chloride	24.4	244	800	15000	25000
Fluoride	<0.3	<3	10	150	500
Sulphate as SO4	154.1	1542	1000	20000	50000
Total Dissolved Solids	372	3722	4000	60000	100000
Phenol	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	<2	<20	500	800	1000

All solid results are expressed on a dry weight basis unless stated otherwise.

CEN 10:1 LEACHATE RESULTS BS EN 12547-2

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	22.0
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	82.0
Particle Size <4mm =	>95%		

		Landfill Waste Acceptance Criteria Limits		
EMT Job No	**23/14735**			
Sample No	**4**			
Client Sample No	**WS01 ES1**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Depth/Other	**0.00-0.40**			
Sample Date	**01/09/2023**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	3.21	3	5	6
Loss on Ignition (%)	15.6	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-	-
PAH Sum of 17(mg/kg)	1.04	100	-	-
pH (pH Units)	7.73	-	>6	-
ANC to pH 7 (mol/kg)	-	-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	-	-	to be evaluated	to be evaluated

Eluate Analysis	**10:1 conc^{n} leached**		**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	C_{10}	**A_{10}**			
	mg/l	**mg/kg**	**mg/kg**		
Arsenic	0.0046	0.046	0.5	2	25
Barium	0.006	0.06	20	100	300
Cadmium	<0.0005	<0.005	0.04	1	5
Chromium	<0.0015	<0.015	0.5	10	70
Copper	<0.007	<0.07	2	50	100
Mercury	<0.001	<0.01	0.01	0.2	2
Molybdenum	<0.002	<0.02	0.5	10	30
Nickel	<0.002	<0.02	0.4	10	40
Lead	<0.005	<0.05	0.5	10	50
Antimony	<0.002	<0.02	0.06	0.7	5
Selenium	<0.003	<0.03	0.1	0.5	7
Zinc	0.003	<0.03	4	50	200
Chloride	<0.3	<3	800	15000	25000
Fluoride	<0.3	<3	10	150	500
Sulphate as SO4	<0.5	<5	1000	20000	50000
Total Dissolved Solids	88	880	4000	60000	100000
Phenol	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	6	60	500	800	1000

All solid results are expressed on a dry weight basis unless stated otherwise.

CEN 10:1 LEACHATE RESULTS BS EN 12547-2

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	29.3
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	77.3
Particle Size <4mm =	>95%		

		Landfill Waste Acceptance Criteria Limits		
EMT Job No	**23/14735**			
Sample No	**16**			
Client Sample No	**WS03 ES2**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Depth/Other	**1.60-2.00**			
Sample Date	**01/09/2023**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.17	3	5	6
Loss on Ignition (%)	14.2	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-	-
PAH Sum of 17(mg/kg)	<0.64	100	-	-
pH (pH Units)	7.37	-	>6	-
ANC to pH 7 (mol/kg)	-	-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	-	-	to be evaluated	to be evaluated

Eluate Analysis	**10:1 conc^{n} leached**		**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	C_{10}	**A_{10}**			
	mg/l	**mg/kg**	**mg/kg**		
Arsenic	<0.0025	<0.025	0.5	2	25
Barium	<0.003	<0.03	20	100	300
Cadmium	<0.0005	<0.005	0.04	1	5
Chromium	0.0019	0.019	0.5	10	70
Copper	<0.007	<0.07	2	50	100
Mercury	<0.001	<0.01	0.01	0.2	2
Molybdenum	<0.002	<0.02	0.5	10	30
Nickel	<0.002	<0.02	0.4	10	40
Lead	<0.005	<0.05	0.5	10	50
Antimony	<0.002	<0.02	0.06	0.7	5
Selenium	<0.003	<0.03	0.1	0.5	7
Zinc	0.004	0.04	4	50	200
Chloride	<0.3	<3	800	15000	25000
Fluoride	0.8	8	10	150	500
Sulphate as SO4	0.5	5	1000	20000	50000
Total Dissolved Solids	<35	<350	4000	60000	100000
Phenol	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	4	40	500	800	1000

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: EPS Ltd

Reference: UK23.6614

Location: Meadhurst, Uppingham

Contact: Matthew Cook

Matrix : Solid

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	EPH Interpretation
23/14735	1	WS01 ES1	0.00-0.40	1-4	No interpretation possible
23/14735	1	WS03 ES2	1.60-2.00	13-16	No interpretation possible
23/14875	1	BH1 D6	6.5	1	No interpretation possible

Client Name: EPS Ltd
Reference: UK23.6614
Location: Meadhurst, Uppingham
Contact: Matthew Cook

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Asbestos sub-samples are retained for not less than 6 months from the date of analysis unless specifically requested.

The LOQ of the Asbestos Quantification is 0.001% dry fibre of dry mass of sample.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

Where trace asbestos is reported the amount of asbestos will be <0.1%.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
23/14735	1	WS01 ES1	0.00-0.40	3	Anthony Carman	14/09/2023	**General Description (Bulk Analysis)**	Brown Soil/Stones
					Anthony Carman	14/09/2023	**Asbestos Fibres**	NAD
					Anthony Carman	14/09/2023	**Asbestos ACM**	NAD
					Anthony Carman	14/09/2023	**Asbestos Type**	NAD
23/14735	1	WS02 ES1	0.00-0.40	7	Catherine Coles	14/09/2023	**General Description (Bulk Analysis)**	brown soil,stone,roots
					Catherine Coles	14/09/2023	**Asbestos Fibres**	NAD
					Catherine Coles	14/09/2023	**Asbestos ACM**	NAD
					Catherine Coles	14/09/2023	**Asbestos Type**	NAD
23/14735	1	WS03 ES1	0.00-0.40	11	Catherine Coles	14/09/2023	**General Description (Bulk Analysis)**	brown soil,roots
					Catherine Coles	14/09/2023	**Asbestos Fibres**	NAD
					Catherine Coles	14/09/2023	**Asbestos ACM**	NAD
					Catherine Coles	14/09/2023	**Asbestos Type**	NAD
23/14735	1	WS03 ES2	1.60-2.00	15	Anthony Carman	14/09/2023	**General Description (Bulk Analysis)**	Brown Soil/Stones
					Anthony Carman	14/09/2023	**Asbestos Fibres**	NAD
					Anthony Carman	14/09/2023	**Asbestos ACM**	NAD
					Anthony Carman	14/09/2023	**Asbestos Type**	NAD
23/14875	1	BH1 D6	6.5	1	Anthony Carman	15/09/2023	**General Description (Bulk Analysis)**	Grey Soil/Stones
					Anthony Carman	15/09/2023	**Asbestos Fibres**	NAD
					Anthony Carman	15/09/2023	**Asbestos ACM**	NAD
					Anthony Carman	15/09/2023	**Asbestos Type**	NAD

Client Name: EPS Ltd

Matrix : Solid

Reference: UK23.6614

Location: Meadhurst, Uppingham

Contact: Matthew Cook

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
23/14875	1	BH1 D6	6.5	1	EPH	Sample received in inappropriate container

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/14875 23/14735

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 23/14875 23/14735

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	Yes	AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes	Yes	AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	No

EMT Job No: 23/14875 23/14735

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.			AD	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.	Yes		AD	Yes
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes

EMT Job No: 23/14875 23/14735

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013l	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013l	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes	Yes	AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013l	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	A hot hydrochloric acid digest is performed on a dried and ground sample, and the resulting liquor is analysed.	Yes	Yes	AD	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 Second edition (2021)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes	Yes	AR	No

EMT Job No: 23/14875 23/14735

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes	Yes	AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.				
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

APPENDIX I

Waste Classification Report

HazWasteOnline™

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

a) understand the origin of the waste
b) select the correct List of Waste code(s)
c) confirm that the list of determinands, results and sampling plan are fit for purpose
d) select and justify the chosen metal species (Appendix B)
e) correctly apply moisture correction and other available corrections
f) add the meta data for their user-defined substances (Appendix A)
g) check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

C8QV7-UZ2N7-NV9PH

Job name

Meadhurst, Uppingham

Description/Comments

Project

UK23.6614

Site

Meadhurst, Uppingham

Classified by

Name:
Michael Judson
Date:
03 Oct 2023 13:17 GMT
Telephone:
01954 710 666

Company:
Environmental Strategies Ltd EPS
7B Caxton House, Broad Street, Cambourne
Cambridge
CB23 6JN

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification: **CERTIFIED**

Course	Date
Hazardous Waste Classification	08 Dec 2016
Most recent 3 year Refresher	07 Dec 2021

Next 3 year Refresher due by Dec 2024

Purpose of classification

2 - Material Characterisation

Address of the waste

Uppingham School, Meadhurst 11 Ayston Rd Uppingham Oakham **Post Code** LE15 9RL

SIC for the process giving rise to the waste

41201 Construction of commercial buildings

Description of industry/producer giving rise to the waste

School and associated playing fields.

Description of the specific process, sub-process and/or activity that created the waste

Excavation of soils for construction of an extension to the existing school.

Description of the waste

Waste soils comprising made ground and underlying natural soils.

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	BH1 D6-04/09/2023-6.5m		Non Hazardous		3
2	WS01 ES1-01/09/2023-0.00-0.40m		Non Hazardous		6
3	WS02 ES1-01/09/2023-0.00-0.40m		Non Hazardous		8
4	WS03 ES1-01/09/2023-0.00-0.40m		Non Hazardous		10
5	WS03 ES2-01/09/2023-1.60-2.00m		Non Hazardous		12

Related documents

#	Name	Description
1	EMT-23-14875-Batch-1-202309191454.HWOL	Element .hwol file used to populate the Job
2	EMT-23-14735-Batch-1-202309190950.HWOL	Element .hwol file used to populate the Job
3	EPS Waste Stream	waste stream template used to create this Job

Report

Created by: Michael Judson

Created date: 03 Oct 2023 13:17 GMT

Classification of sample: BH1 D6-04/09/2023-6.5m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
BH1 D6-04/09/2023-6.5m
Moisture content:
14.6%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 14.6% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic pentoxide }	033-004-00-6	215-116-9	1303-28-2		117.7 mg/kg	1.534	157.537 mg/kg	0.0158 %	✓	
2	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	048-001-00-5			1	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		51.1 mg/kg	1.462	65.171 mg/kg	0.00652 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		19 mg/kg	1.126	18.667 mg/kg	0.00187 %	✓	
5	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	19 mg/kg		16.579 mg/kg	0.00166 %	✓	
6	mercury { mercury }	080-001-00-0	231-106-7	7439-97-6		0.2 mg/kg		0.175 mg/kg	0.0000175 %	✓	
7	nickel { nickel }	028-002-00-7	231-111-4	7440-02-0	7	39.1 mg/kg		34.119 mg/kg	0.00341 %	✓	
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<**LOD**
9	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		64 mg/kg	1.245	69.513 mg/kg	0.00695 %	✓	
10	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<**LOD**
11	acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<**LOD**
12	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
13	fluorene		201-695-5	86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<**LOD**
14	phenanthrene		201-581-5	85-01-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<**LOD**

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15		anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
16		fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
17		pyrene		204-927-3	129-00-0		0.03	mg/kg		0.0262	mg/kg	0.00000262 %	✓	
18		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
19		chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
20		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
22		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
23		benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24		coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
25		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
26		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
27		TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
28		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
29		benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
30		toluene	601-021-00-3	203-625-9	108-88-3		0.006	mg/kg		0.0052	mg/kg	0.000000524 %	✓	
31		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
32		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
33		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
34		pH			PH		7.58	pH		7.58	pH	7.58 pH		
35		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
36		sulfur { sulfur }	016-094-00-1	231-722-6	7704-34-9		24500	mg/kg		21378.709	mg/kg	2.138 %	✓	
											Total:	2.18 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because WM3 states that the Hazard Statement HP 3 (first and fourth indents) can be discounted as this is a solid waste without a free draining liquid phase

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

toluene: (conc.: 5.24e-07%)

Classification of sample: WS01 ES1-01/09/2023-0.00-0.40m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS01 ES1-01/09/2023-0.00-0.40m
Moisture content:
15.4%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 15.4% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic pentoxide }	033-004-00-6	215-116-9	1303-28-2		110.7 mg/kg	1.534	147.14 mg/kg	0.0147 %	✓	
2	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	048-001-00-5			1	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		144.4 mg/kg	1.462	182.884 mg/kg	0.0183 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		31 mg/kg	1.126	30.245 mg/kg	0.00302 %	✓	
5	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	199 mg/kg		172.444 mg/kg	0.0172 %	✓	
6	mercury { mercury }	080-001-00-0	231-106-7	7439-97-6		0.6 mg/kg		0.52 mg/kg	0.000052 %	✓	
7	nickel { nickel }	028-002-00-7	231-111-4	7440-02-0	7	61.8 mg/kg		53.553 mg/kg	0.00536 %	✓	
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<**LOD**
9	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		262 mg/kg	1.245	282.595 mg/kg	0.0283 %	✓	
10	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<**LOD**
11	acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<**LOD**
12	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
13	fluorene		201-695-5	86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<**LOD**
14	phenanthrene		201-581-5	85-01-8		0.1 mg/kg		0.0867 mg/kg	0.00000867 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
15		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			204-371-1	120-12-7									
16		fluoranthene				0.18	mg/kg		0.156	mg/kg	0.0000156 %	✓	
			205-912-4	206-44-0									
17		pyrene				0.17	mg/kg		0.147	mg/kg	0.0000147 %	✓	
			204-927-3	129-00-0									
18		benzo[a]anthracene				0.14	mg/kg		0.121	mg/kg	0.0000121 %	✓	
		601-033-00-9	200-280-6	56-55-3									
19		chrysene				0.14	mg/kg		0.121	mg/kg	0.0000121 %	✓	
		601-048-00-0	205-923-4	218-01-9									
20		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
21		indeno[123-cd]pyrene				0.05	mg/kg		0.0433	mg/kg	0.00000433 %	✓	
			205-893-2	193-39-5									
22		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
23		benzo[ghi]perylene				0.06	mg/kg		0.052	mg/kg	0.0000052 %	✓	
			205-883-8	191-24-2									
24		coronene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-881-7	191-07-1									
25		benzo[b]fluoranthene				0.14	mg/kg		0.121	mg/kg	0.0000121 %	✓	
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				0.06	mg/kg		0.052	mg/kg	0.0000052 %	✓	
		601-036-00-5	205-916-6	207-08-9									
27		TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
				TPH									
28		polychlorobiphenyls; PCB				<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
29		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
30		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
31		ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
32		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
33		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
34		pH				7.73	pH		7.73	pH	7.73 pH		
				PH									
35		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
36		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
										Total:	0.0926 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS02 ES1-01/09/2023-0.00-0.40m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS02 ES1-01/09/2023-0.00-0.40m
Moisture content:
13%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic pentoxide }	033-004-00-6	215-116-9	1303-28-2		125.9 mg/kg	1.534	170.898 mg/kg	0.0171 %	✓	
2	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	048-001-00-5			1	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		153.8 mg/kg	1.462	198.927 mg/kg	0.0199 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		54 mg/kg	1.126	53.804 mg/kg	0.00538 %	✓	
5	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	222 mg/kg		196.46 mg/kg	0.0196 %	✓	
6	mercury { mercury }	080-001-00-0	231-106-7	7439-97-6		0.9 mg/kg		0.796 mg/kg	0.0000796 %	✓	
7	nickel { nickel }	028-002-00-7	231-111-4	7440-02-0	7	68.6 mg/kg		60.708 mg/kg	0.00607 %	✓	
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1 mg/kg	1.405	1.243 mg/kg	0.000124 %	✓	
9	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		296 mg/kg	1.245	326.049 mg/kg	0.0326 %	✓	
10	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<**LOD**
11	acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<**LOD**
12	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
13	fluorene		201-695-5	86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<**LOD**
14	phenanthrene		201-581-5	85-01-8		0.07 mg/kg		0.0619 mg/kg	0.00000619 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
15		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
16		fluoranthene				0.11	mg/kg		0.0973	mg/kg	0.00000973 %	✓	
			205-912-4	206-44-0									
17		pyrene				0.1	mg/kg		0.0885	mg/kg	0.00000885 %	✓	
			204-927-3	129-00-0									
18		benzo[a]anthracene				0.08	mg/kg		0.0708	mg/kg	0.00000708 %	✓	
		601-033-00-9	200-280-6	56-55-3									
19		chrysene				0.08	mg/kg		0.0708	mg/kg	0.00000708 %	✓	
		601-048-00-0	205-923-4	218-01-9									
20		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
21		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
22		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
23		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
24		benzo[b]fluoranthene				0.09	mg/kg		0.0796	mg/kg	0.00000796 %	✓	
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				0.03	mg/kg		0.0265	mg/kg	0.00000265 %	✓	
		601-036-00-5	205-916-6	207-08-9									
26		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<**LOD**
		024-001-00-0	215-607-8	1333-82-0									
27		pH				7.77	pH		7.77	pH	7.77 pH		
				PH									
28		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
										Total:	0.101 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS03 ES1-01/09/2023-0.00-0.40m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS03 ES1-01/09/2023-0.00-0.40m
Moisture content:
15.2%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 15.2% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic pentoxide }	033-004-00-6	215-116-9	1303-28-2		102.5	mg/kg	1.534	136.478	mg/kg	0.0136 %	✓	
2		cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		133.3	mg/kg	1.462	169.119	mg/kg	0.0169 %	✓	
4		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		266	mg/kg	1.126	259.971	mg/kg	0.026 %	✓	
5		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	815	mg/kg		707.465	mg/kg	0.0707 %	✓	
6		mercury { mercury }	080-001-00-0	231-106-7	7439-97-6		1.2	mg/kg		1.042	mg/kg	0.000104 %	✓	
7		nickel { nickel }	028-002-00-7	231-111-4	7440-02-0	7	66.6	mg/kg		57.812	mg/kg	0.00578 %	✓	
8		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
9		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		479	mg/kg	1.245	517.55	mg/kg	0.0518 %	✓	
10		naphthalene	601-052-00-2	202-049-5	91-20-3		0.6	mg/kg		0.521	mg/kg	0.0000521 %	✓	
11		acenaphthylene		205-917-1	208-96-8		0.13	mg/kg		0.113	mg/kg	0.0000113 %	✓	
12		acenaphthene		201-469-6	83-32-9		2.4	mg/kg		2.083	mg/kg	0.000208 %	✓	
13		fluorene		201-695-5	86-73-7		2.26	mg/kg		1.962	mg/kg	0.000196 %	✓	
14		phenanthrene		201-581-5	85-01-8		12.72	mg/kg		11.042	mg/kg	0.0011 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
15		anthracene				4.18	mg/kg		3.628	mg/kg	0.000363 %	✓	
			204-371-1	120-12-7									
16		fluoranthene				10.24	mg/kg		8.889	mg/kg	0.000889 %	✓	
			205-912-4	206-44-0									
17		pyrene				7.78	mg/kg		6.753	mg/kg	0.000675 %	✓	
			204-927-3	129-00-0									
18		benzo[a]anthracene				4.48	mg/kg		3.889	mg/kg	0.000389 %	✓	
		601-033-00-9	200-280-6	56-55-3									
19		chrysene				4.44	mg/kg		3.854	mg/kg	0.000385 %	✓	
		601-048-00-0	205-923-4	218-01-9									
20		benzo[a]pyrene; benzo[def]chrysene				3.23	mg/kg		2.804	mg/kg	0.00028 %	✓	
		601-032-00-3	200-028-5	50-32-8									
21		indeno[123-cd]pyrene				1.36	mg/kg		1.181	mg/kg	0.000118 %	✓	
			205-893-2	193-39-5									
22		dibenz[a,h]anthracene				0.29	mg/kg		0.252	mg/kg	0.0000252 %	✓	
		601-041-00-2	200-181-8	53-70-3									
23		benzo[ghi]perylene				1.12	mg/kg		0.972	mg/kg	0.0000972 %	✓	
			205-883-8	191-24-2									
24		benzo[b]fluoranthene				3.96	mg/kg		3.438	mg/kg	0.000344 %	✓	
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				1.54	mg/kg		1.337	mg/kg	0.000134 %	✓	
		601-036-00-5	205-916-6	207-08-9									
26		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<**LOD**
		024-001-00-0	215-607-8	1333-82-0									
27		pH				7.58	pH		7.58	pH	7.58 pH		
				PH									
28		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
										Total:	0.191 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS03 ES2-01/09/2023-1.60-2.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS03 ES2-01/09/2023-1.60-2.00m
Moisture content:
22.4%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 22.4% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic pentoxide }	033-004-00-6	215-116-9	1303-28-2		60	mg/kg	1.534	75.19	mg/kg	0.00752 %	✓	
2		cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		335	mg/kg	1.462	400.017	mg/kg	0.04 %	✓	
4		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		<1	mg/kg	1.126	<1.126	mg/kg	<0.000113 %		<**LOD**
5		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	60	mg/kg		49.02	mg/kg	0.0049 %	✓	
6		mercury { mercury }	080-001-00-0	231-106-7	7439-97-6		0.4	mg/kg		0.327	mg/kg	0.0000327 %	✓	
7		nickel { nickel }	028-002-00-7	231-111-4	7440-02-0	7	119.7	mg/kg		97.794	mg/kg	0.00978 %	✓	
8		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
9		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		617	mg/kg	1.245	627.442	mg/kg	0.0627 %	✓	
10		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
11		acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
12		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
13		fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
14		phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
15		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			204-371-1	120-12-7									
16		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-912-4	206-44-0									
17		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			204-927-3	129-00-0									
18		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
19		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
20		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
21		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-893-2	193-39-5									
22		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
23		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-883-8	191-24-2									
24		coronene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-881-7	191-07-1									
25		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
27		TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
				TPH									
28		polychlorobiphenyls; PCB				<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
29		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
30		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
31		ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
32		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
33		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
34		pH				7.37	pH		7.37	pH	7.37 pH		
				PH									
35		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
										Total:	0.131 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non GB MCL determinands

cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex

GB MCL index number: 048-001-00-5
Description/Comments: Worst Case: IARC considers cadmium compounds Group 1; Carcinogenic to humans
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

lead compounds with the exception of those specified elsewhere in this Annex

GB MCL index number: 082-001-00-6
Description/Comments: Least-worst case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following MCL protocols, considers many simple lead compounds to be Carcinogenic category 2
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html. Review date 29/09/2015

acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

fluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

pyrene (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

indeno[123-cd]pyrene (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

benzo[ghi]perylene (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

coronene (EC Number: 205-881-7, CAS Number: 191-07-1)

Description/Comments: Data from C&L Inventory Database; no entries in Registered Substances or Pesticides Properties databases; SDS: Sigma Aldrich, 1907/2006 compliant, dated 2012 - no entries; IARC – Group 3, not carcinogenic.
Data source: http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en
Data source date: 16 Jun 2014
Hazard Statements: STOT SE 2; H371

TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

polychlorobiphenyls; PCB (EC Number: 215-648-1, CAS Number: 1336-36-3)

GB MCL index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans;

POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex

GB MCL index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

Appendix B: Rationale for selection of metal species

arsenic {arsenic pentoxide}

Worst Case

cadmium {cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex}

Using elemental Cadmium with no CrVI

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Worst case species

copper {dicopper oxide; copper (I) oxide}

Worst case species

lead {lead compounds with the exception of those specified elsewhere in this Annex}

Worst case species

mercury {mercury}

Worst case species

nickel {nickel}

Worst case species

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Worst case species

zinc {zinc oxide}

Elemental Zinc with no CrVI

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case species

sulfur {sulfur}

.

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

.

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2023.271.5764.10641 (28 Sep 2023)
HazWasteOnline Database: 2023.270.5761.10634 (27 Sep 2023)

This classification utilises the following guidance and legislation:
WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
15th ATP - Regulation (EU) 2020/1182 of 19 May 2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
GB MCL List - version 1.1 of 09 June 2021

APPENDIX J

Laboratory Results – Geotechnical

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 02/10/2023

UKAS TESTING 0998

Contract	**UK23.6614 Uppingham**
Serial No.	**43335_1**

Client:

Environmental Protection Strategies Ltd
Unit 7
Caxton House
Broad Street
Great Cambourne
Cambridge
CB23 6JN

Soil Property Testing Ltd

15, 16, 18 Halcyon Court, St Margaret's Way, Stukeley Meadows, Huntingdon, Cambridgeshire, PE29 6DG

Tel: 01480 455579
Email: enquiries@soilpropertytesting.com
Website: www.soilpropertytesting.com

Samples Submitted By:

Environmental Protection Strategies Ltd

Samples Labelled:

UK23.6614 Uppingham

Approved Signatories:

☑ **J.C. Garner B.Eng (Hons) FGS**
Technical Director & Quality Manager

☐ **W. Johnstone**
Materials Lab Manager

Date Received: 11/09/2023

Samples Tested Between: 11/09/2023 **and** 02/10/2023

Remarks:

For the attention of Matthew Cook
Your Reference No: UK23.6614

Notes:

1. All remaining samples or remnants from this contract will be disposed of after 21 days from today, unless we are notified to the contrary.
2. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
3. Tests marked "NOT UKAS ACCREDITED" in this test report are not included in the UKAS Accreditation Schedule for this testing laboratory.
4. This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.
5. The results within this report only relate to the items tested or sampled.

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 02/10/2023

UKAS TESTING 0998

Contract	**UK23.6614 Uppingham**		
Serial No.	**43335_1**	**Target Date**	25/09/2023
Scheduled By	Environmental Protection Strategies Ltd		
Schedule Remarks			

Bore Hole No.	Type	Sample Ref.	Top Depth	Particle Size Distribution (BS1377)	Sulphate Content/pH Value	Water Content (BSEN)	Liquid/Plastic Limits	Density Determination BSEN														Sample Remarks
BH1	D	4	4.00	1	1																	
BH1	D	7	8.00			1	1															
BH1	B	5	9.50					1														
BH1	D	14	14.00			1	1															
BH1	B	6	14.50					1														
WS01	D	2	3.80	1	1																	
WS02	D	1	0.80	1	1																	
WS03	D	2	1.80	1	1																	
WS03	B	1	2.00					1														
Totals				**4**	**4**	**2**	**2**	**3**														**End of Schedule**

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 02/10/2023

UKAS TESTING 0998

Contract	**UK23.6614 Uppingham**
Serial No.	**43335_1**

SUMMARY OF WATER CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole /Pit No.	Depth (m)	Type	Ref.	Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasti-city Index (%)	Liquid-ity Index	Sample Preparation				Description	Class
									Method	Ret'd 0.425mm (%)	Corr'd W/C <0.425mm	Curing Time (hrs)		
BH1	8.00	D	7	**16.7**	50	20	30	-0.11	From Natural	0 (A)		25	Very stiff mottled dark greyish brown and dark grey CLAY	CI/CH
BH1	14.00	D	14	**17.2**	58	22	36	-0.13	From Natural	0 (A)		24	Very stiff friable dark grey CLAY	CH

Method Of Preparation: BS EN ISO: 17892-1: 2014 & BS 1377: Part 2:1990:4.2
Method of Test: BS EN ISO: 17892-1: 2014 & BS 1377: Part 2:1990:3.2, 4.4, 5.3, 5.4
Type of Sample Key: U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter
Comments:

Table Notation: Ret'd 0.425mm: (A) = Assumed, (M) = Measured

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

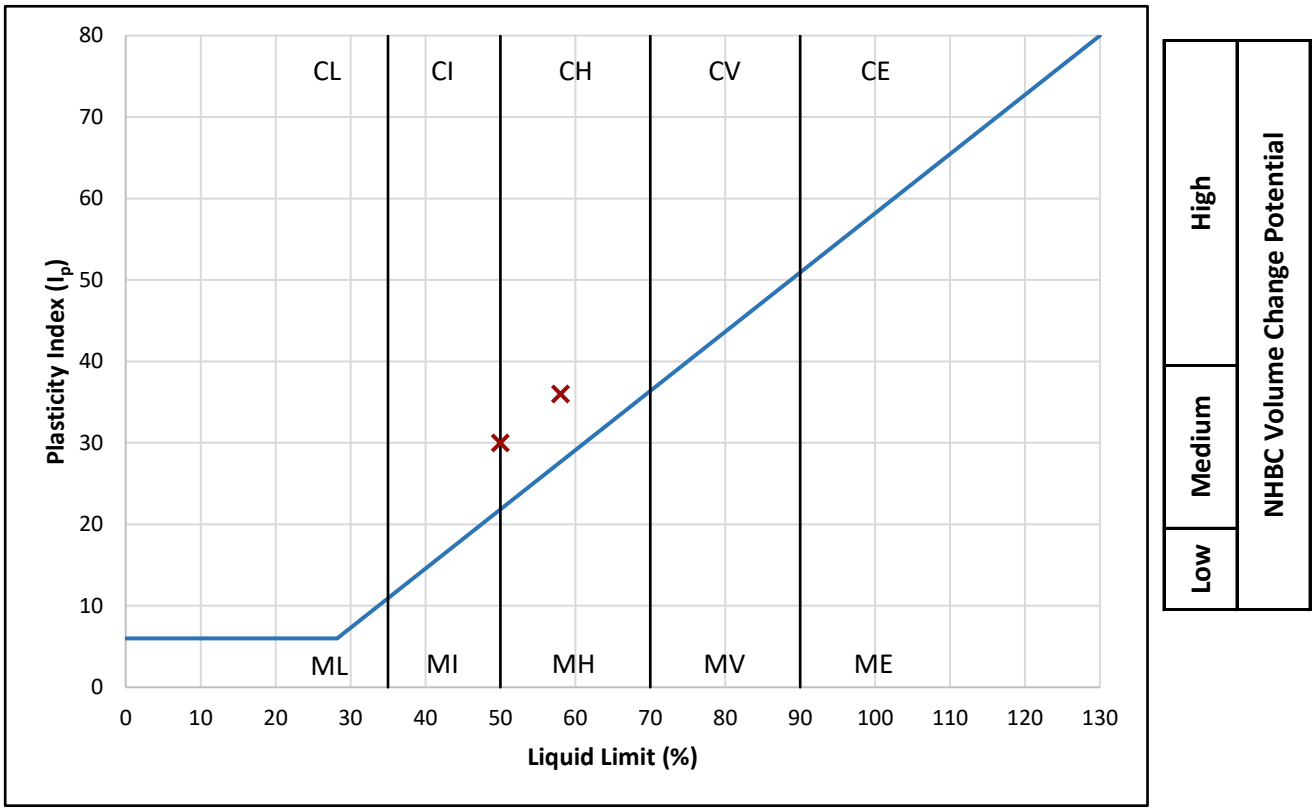
DATE ISSUED: 02/10/2023

UKAS TESTING 0998

Contract	**UK23.6614 Uppingham**
Serial No.	**43335_1**

PLOT OF PLASTICITY INDEX AGAINST LIQUID LIMIT USING CASAGRANDE CLASSIFICATION CHART

Plasticity				
Low	Medium	High	Very High	Extremely High



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation:	BS 1377: Part 2: 1990: 4.2
Method of Test:	BS1377: Part 2: 3.2, 4.4, 5.3, 5.4
Type of Sample Key:	U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter
Comments:	Volume Change Potential: NHBC Standards Chapter 4.2 Unmodified Plasticity Index

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 02/10/2023

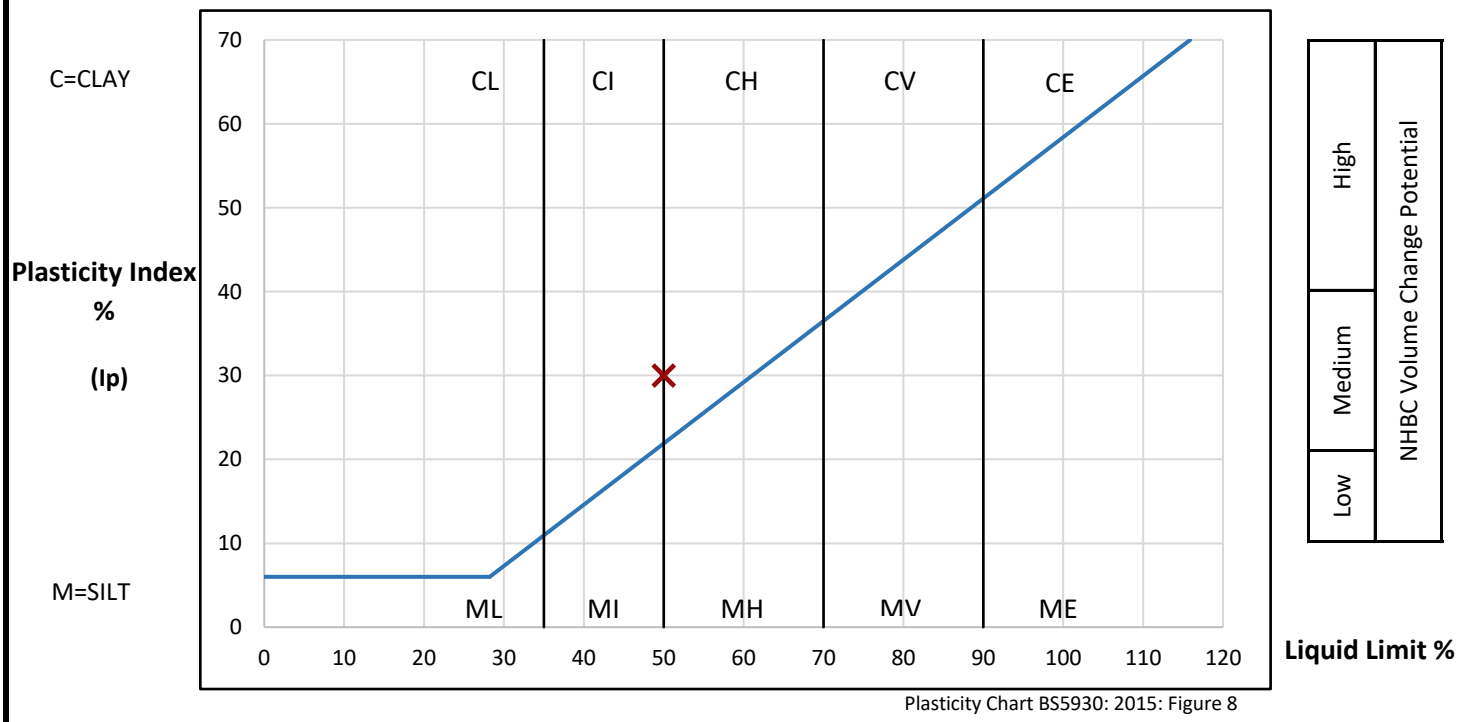
UKAS TESTING 0998

Contract	**UK23.6614 Uppingham**
Serial No.	**43335_1**

DETERMINATION OF WATER CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
BH1	8.00	D	7	16.7	Very stiff mottled dark greyish brown and dark grey CLAY	

PREPARATION			Liquid Limit	50 %
Method of preparation		From natural	Plastic Limit	20 %
Sample retained 0.425mm sieve	(Assumed)	0 %	Plasticity Index	30 %
Corrected water content for material passing 0.425mm			Liquidity Index	-0.11
Sample retained 2mm sieve	(Assumed)	0 %	NHBC Modified (I'p)	n/a
Curing time	25 hrs	Clay Content Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation:	BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 4.2
Method of Test:	BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 3.2, 4.4, 5.3, 5.4
Type of Sample Key:	U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:	

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 02/10/2023

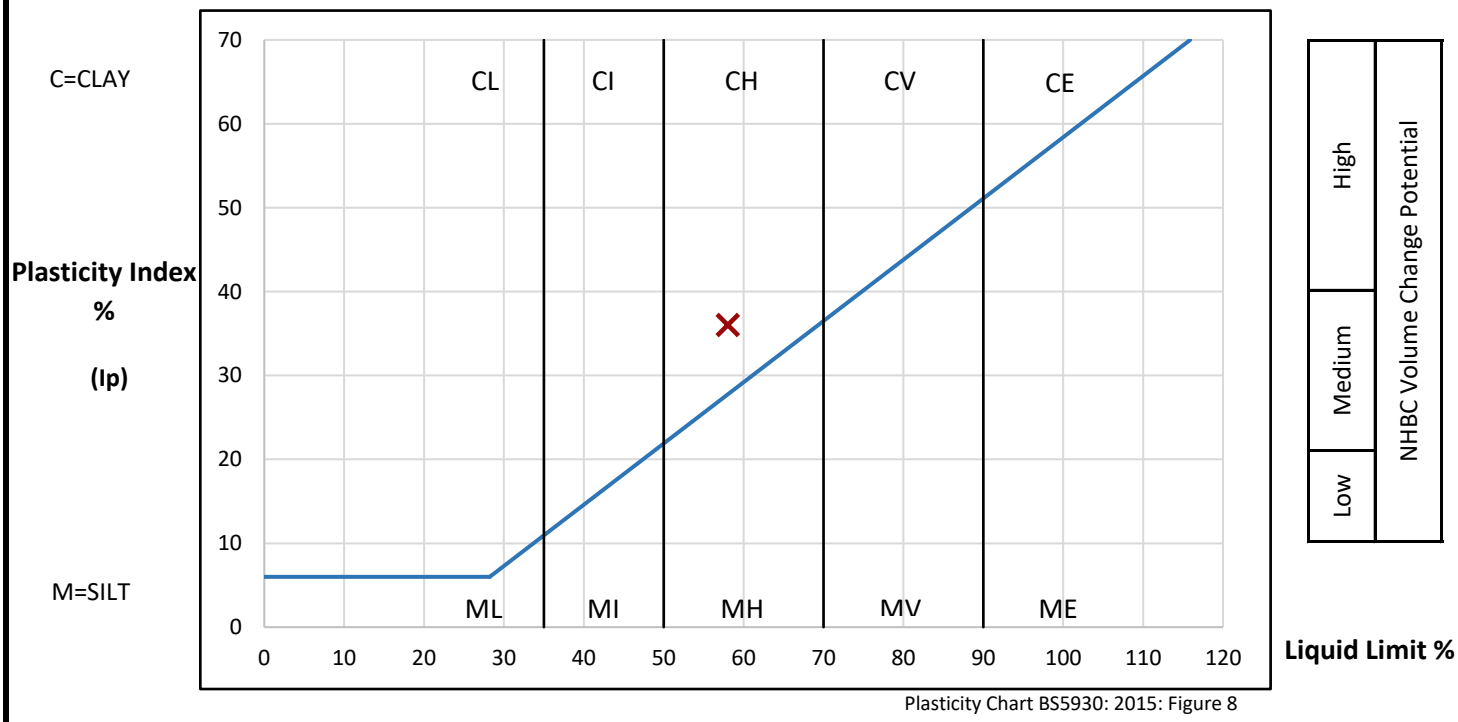
UKAS TESTING 0998

Contract	**UK23.6614 Uppingham**
Serial No.	**43335_1**

DETERMINATION OF WATER CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
BH1	14.00	D	14	17.2	Very stiff friable dark grey CLAY	

PREPARATION					
Method of preparation		From natural		Liquid Limit	58 %
Sample retained 0.425mm sieve	(Assumed)	0 %		Plastic Limit	22 %
Corrected water content for material passing 0.425mm				Plasticity Index	36 %
Sample retained 2mm sieve	(Assumed)	0 %		Liquidity Index	-0.13
Curing time	24 hrs		Clay Content Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation:	BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 4.2
Method of Test:	BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 3.2, 4.4, 5.3, 5.4
Type of Sample Key:	U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:	

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 02/10/2023

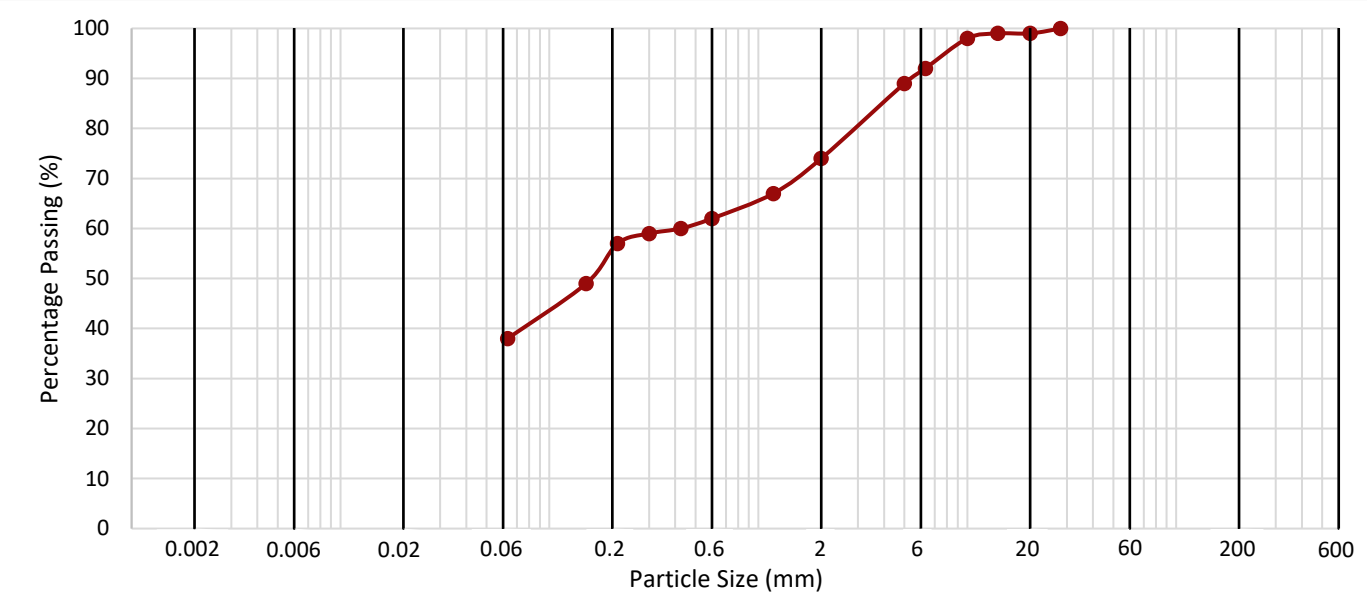
UKAS TESTING 0998

Contract	**UK23.6614 Uppingham**
Serial No.	**43335_1**

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Pit No.	Depth (m)	Sample Type	Sample Reference	Description	Remarks
BH1	4.00	D	4	Dark orangish brown slightly gravelly sandy silty CLAY. Gravel is dark orangish brown ferruginous sandstone	

Method of Test:	Wet Sieve	Method of Pretreatment:	Not required



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Hydrometer	Particle Size (mm)	Passing (%)	**Silt by Dry Mass (%)**
			Clay by Dry Mass (%)

Sieve Size (mm)	Passing (%)	**Sand By Dry Mass (%)**
2.00	74	**36**
1.18	67	
0.600	62	
0.425	60	
0.300	59	
0.212	57	
0.150	49	
0.063	38	

Fines By Dry Mass (%)	
<0.063mm	**38**

Sieve Size (mm)	Passing (%)	**2mm+ By Dry Mass (%)**
300		**26**
125		
90		
63		
50		
37.5		
28	100	
20	99	
14	99	
10	98	
6.3	92	
5	89	

Method of Preparation: BS1377: Part 1: 2016: 8.3 & 8.4.5
Method of test: BS1377: Part 2: 1990: 9.2
Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 02/10/2023

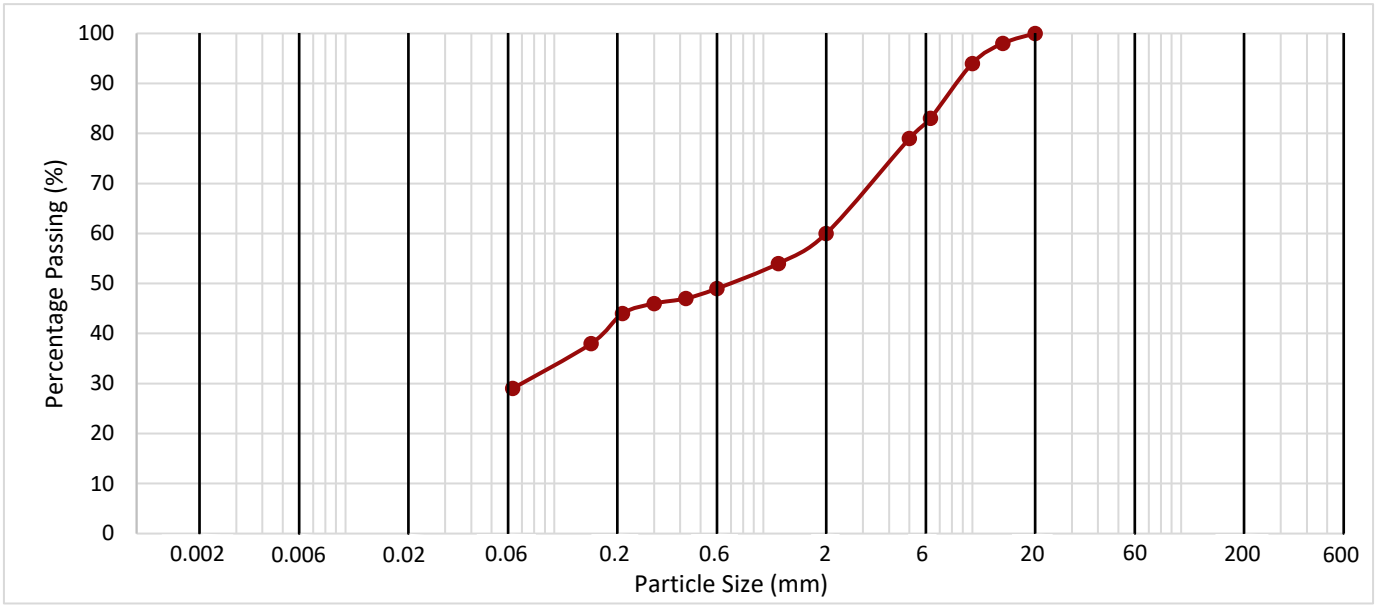
UKAS TESTING 0998

Contract	**UK23.6614 Uppingham**
Serial No.	**43335_1**

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Pit No.	Depth (m)	Sample Type	Sample Reference	Description	Remarks
WS01	3.80 - 4.00	D	2	Dark orangish brown ferruginous sandstone GRAVEL in a dark orangish brown sandy silty clay matrix	

Method of Test:	Wet Sieve	Method of Pretreatment:	Not required



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Hydrometer	Particle Size (mm)	Passing (%)	**Silt by Dry Mass (%)**
			Clay by Dry Mass (%)

Sieve Size (mm)	Passing (%)	**Sand By Dry Mass (%)**
2.00	60	**31**
1.18	54	
0.600	49	
0.425	47	
0.300	46	
0.212	44	
0.150	38	
0.063	29	

Fines By Dry Mass (%)	
<0.063mm	**29**

Sieve Size (mm)	Passing (%)	**2mm+ By Dry Mass (%)**
300		**40**
125		
90		
63		
50		
37.5		
28		
20	100	
14	98	
10	94	
6.3	83	
5	79	

Method of Preparation: BS1377: Part 1: 2016: 8.3 & 8.4.5
Method of test: BS1377: Part 2: 1990: 9.2
Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 02/10/2023

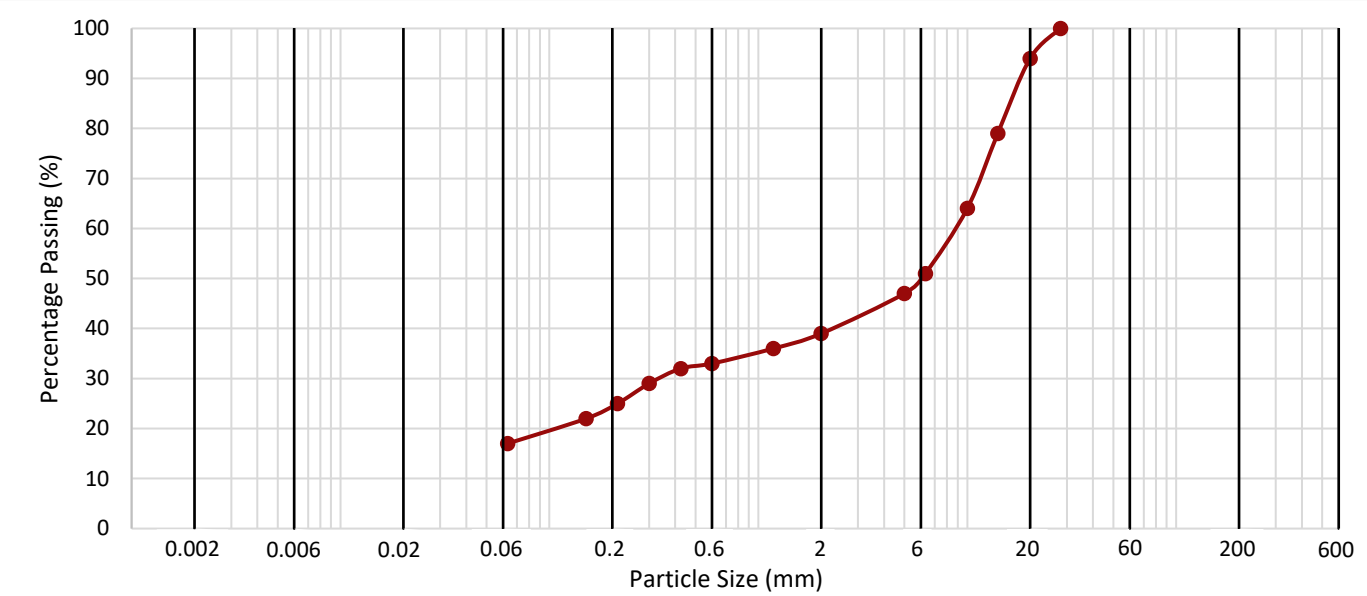
UKAS TESTING 0998

Contract	**UK23.6614 Uppingham**
Serial No.	**43335_1**

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Pit No.	Depth (m)	Sample Type	Sample Reference	Description	Remarks
WS02	0.80 - 1.00	D	1	Dark orangish brown ferruginous sandstone GRAVEL in a dark orangish brown sandy silty clay matrix	

Method of Test:	Wet Sieve	Method of Pretreatment:	Not required



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Hydrometer	Particle Size (mm)	Passing (%)	**Silt by Dry Mass (%)**
			Clay by Dry Mass (%)

Sieve Size (mm)	Passing (%)	**Sand By Dry Mass (%)**
2.00	39	**22**
1.18	36	
0.600	33	
0.425	32	
0.300	29	
0.212	25	
0.150	22	
0.063	17	

Fines By Dry Mass (%)	
<0.063mm	**17**

Sieve Size (mm)	Passing (%)	**2mm+ By Dry Mass (%)**
300		**61**
125		
90		
63		
50		
37.5		
28	100	
20	94	
14	79	
10	64	
6.3	51	
5	47	

Method of Preparation: BS1377: Part 1: 2016: 8.3 & 8.4.5
Method of test: BS1377: Part 2: 1990: 9.2
Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 02/10/2023

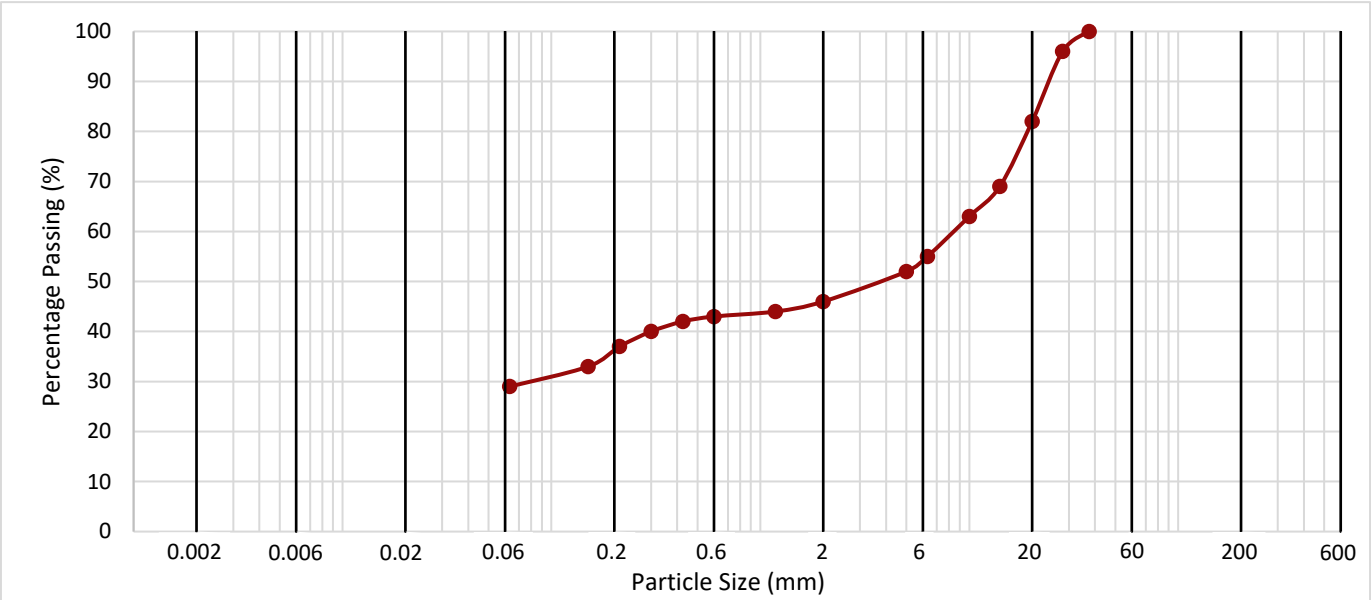
UKAS TESTING 0998

Contract	**UK23.6614 Uppingham**
Serial No.	**43335_1**

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Pit No.	Depth (m)	Sample Type	Sample Reference	Description	Remarks
WS03	1.80 - 2.00	D	2	Dark orangish brown ferruginous sandstone GRAVEL in a dark orangish brown sandy silty clay matrix	Dry mass of sample required 2kg. Mass of sample submitted 0.903kg. Sample Unrepresentative BS1377:Part 2:1990 Table 3.

Method of Test:	Wet Sieve	Method of Pretreatment:	Not required



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Hydrometer	Particle Size (mm)	Passing (%)	Silt by Dry Mass (%)	Clay by Dry Mass (%)

Sieve Size (mm)	Passing (%)	Sand By Dry Mass (%)
2.00	46	17
1.18	44	
0.600	43	
0.425	42	
0.300	40	
0.212	37	
0.150	33	
0.063	29	

Fines By Dry Mass (%)	
<0.063mm	29

Sieve Size (mm)	Passing (%)	2mm+ By Dry Mass (%)
300		54
125		
90		
63		
50		
37.5	100	
28	96	
20	82	
14	69	
10	63	
6.3	55	
5	52	

Method of Preparation: BS1377: Part 1: 2016: 8.3 & 8.4.5
Method of test: BS1377: Part 2: 1990: 9.2
Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 02/10/2023

UKAS TESTING 0998

Contract	**UK23.6614 Uppingham**
Serial No.	**43335_1**

DETERMINATION OF DENSITY AND WATER CONTENT

Borehole /Pit No.	Depth (m)	Sample		Water Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Description	Remarks
		Type	Reference					
BH1	9.5	B	5	16.5	2.14	1.84	Very stiff fissured dark grey CLAY	
BH1	14.5	B	6	15.8	1.98	1.71	Very stiff fissured dark grey CLAY	
WS03	2.00 - 3.00	B	1	40.1	1.95	1.39	Firm yellowish brown slightly gravelly slightly sandy silty CLAY. Gravel is fine and medium angular to subangular ferruginous sandstone/ironstone	

Method of Preparation:

Method of Test: BS EN ISO 17892-1: 2014 & BS EN ISO 17892-2: 2014

Type of Sample Key: U = Undisturbed, B = Bulk, D = Disturbed, J - Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

Comments:

Remarks to Include: Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110°C.

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 02/10/2023

Contract:	**UK23.6614 Uppingham**
Serial No:	**43335_1**

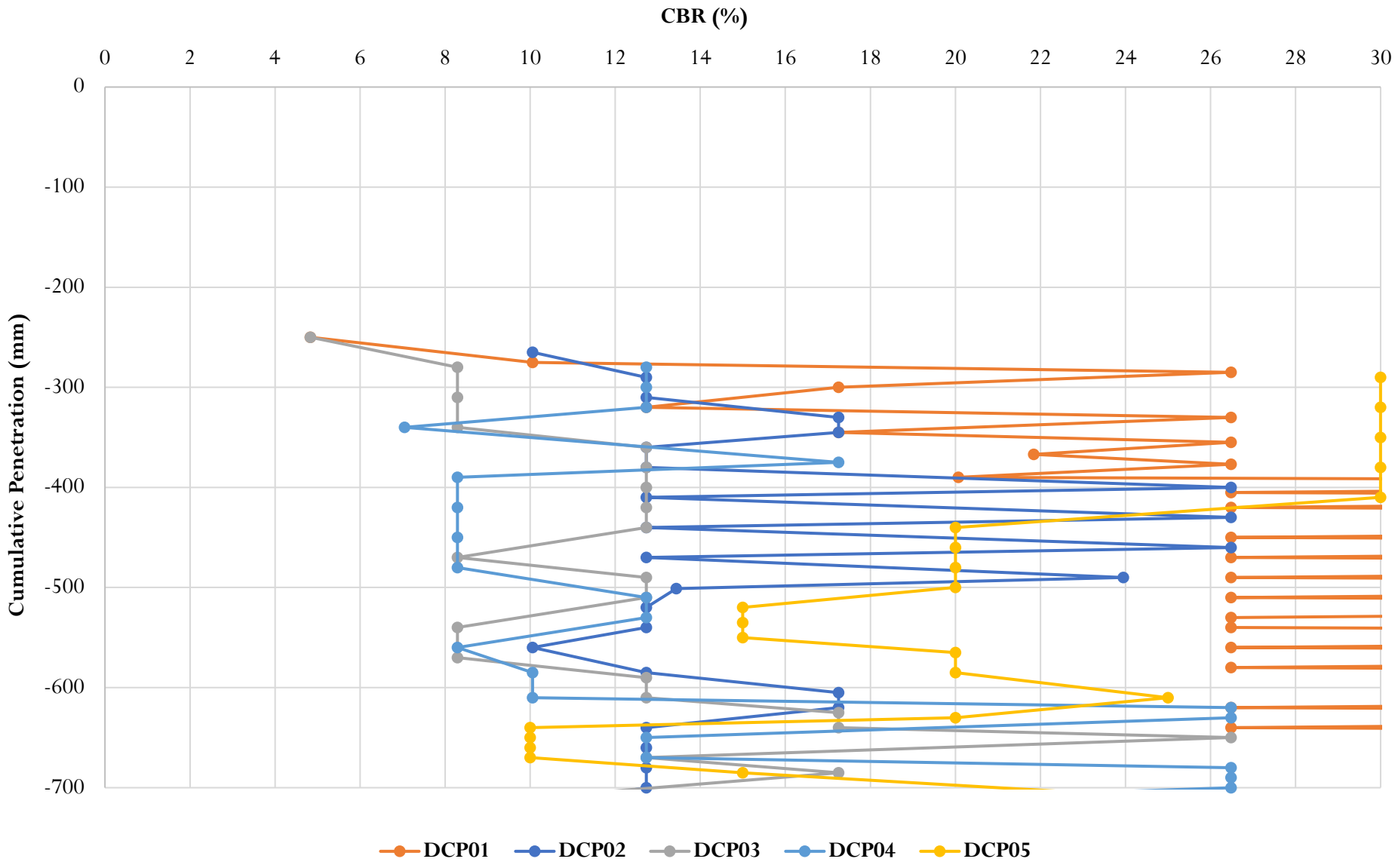
DETERMINATION OF THE SULPHATE CONTENT AND pH OF SOIL AND GROUNDWATER

Borehole / Pit No.	Depth (m)	Sample		Conc. of Soluble SO3		Calc'd Conc. Of SO4 (g/L)	pH Value	% Sample Passing 2mm Sieve	Description	Remarks
		Type	Ref.	Water Soluble 2:1 (g/L)	Ground Water (g/L)					
BH1	4.00	D	4	0.04		0.05	6.5	74	Dark orangish brown slightly gravelly sandy silty CLAY. Gravel is dark orangish brown ferruginous sandstone	
WS01	3.80 - 4.00	D	2	0.07		0.08	6.5	60	Dark orangish brown ferruginous sandstone GRAVEL in a dark orangish brown sandy silty clay matrix	
WS02	0.80 - 1.00	D	1	0.06		0.07	6.9	39	Dark orangish brown ferruginous sandstone GRAVEL in a dark orangish brown sandy silty clay matrix	
WS03	1.80 - 2.00	D	2	0.06		0.08	6.4	46	Dark orangish brown ferruginous sandstone GRAVEL in a dark orangish brown sandy silty clay matrix	

Method of Preparation:	BS1377: Part 1: 2016: 8.5, BS1377: Part 3: 1990: 5.3 Soil/Water Extract, 5.4 Groundwater
Method of Test:	BS1377: Part 3: 1990: 5.5
Type of Sample Key:	U= Undisturbed, B= Bulk, D= Disturbed, J= Jar, W= Water, SPT= Split Spoon Sample, C= Core Cutter
Comments:	**Test not UKAS accredited**
Remarks to Include:	Sample disturbance, loss of moisture, variation from test procedure, location, and origin of test specimen within original sample. Oven drying temperature if not 105-110C.

APPENDIX K

Dynamic Cone Penetrometer (DCP) Test Results


CBR (%)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
Cumulative Penetration (mm)
0
-100
-200
-300
-400
-500
-600
-700
DCP01
DCP02
DCP03
DCP04
DCP05

APPENDIX L

Summary of Screening Criteria

EPS Generic Quantitative Risk Assessment - Residential Land Use

Contaminant	Soil Targets			Groundwater Targets		
	Human Health	Controlled Waters		Human Health	Controlled Waters	
		Surface Water	Groundwater		Surface Water	Groundwater
Unit	**mg/kg**			**µg/l**		
Arsenic	See C4SL	n/c	n/c	n/c	50	10
Cadmium	See C4SL	n/c	n/c	n/c	2.5#	5
Chromium III	910	n/c	n/c	n/c	4.7	50
Chromium VI	See C4SL	n/c	n/c	n/c	3.4	
Copper	2400	n/c	n/c	n/c	93.1#	2000
Mercury (elemental)	1.2	0.085	1.22	1.1	1	1
Nickel	180	n/c	n/c	n/c	14.8#	20
Lead	See C4SL	n/c	n/c	n/c	27.7#	10
Selenium	250	n/c	n/c	n/c	10	10
Zinc	3700	n/c	n/c	n/c	373#	3000
Benzene	See C4SL	0.064	0.0064	210	10	1
Toluene	130	1.33	12.6	230,000	74	700
Ethylbenzene	47	0.77	11.5	10,000	20	300
Xylene (para)	56	1.18	19.6	9,900	30	500
MTBE#	49	4.41	0.026	83,000	2600	15
Benzo(a)Pyrene	See C4SL	n/c	n/c	n/c	0.005 (0.00017)	0.01
Naphthalene	2.3	0.11	0.11	220	2	2
Aliphatic C5-C6	42	4.06	0.81	1,900	50	10
Aliphatic C6-C8	100	17.8	3.57	1,500	50	10
Aliphatic C8-C10	27	n/c	n/c	57	50	10
Aliphatic C10-C12	130(48)*	n/c	n/c	37	50	10
Aliphatic C12-C16	1100(8.48)**	n/c	n/c	n/c	50	10
Aliphatic C16-C35	65000 (8.48)**	n/c	n/c	n/c	50	10
Aromatic C8-C10	34	6.71	1.34	1,900	50	10
Aromatic C10-C12	74	10.6	2.13	6,800	50	10
Aromatic C12-C16	140	21.2	4.23	39,000	50	10
Aromatic C16-C21	260	n/c	n/c	n/c	50	10
Aromatic C21-C35	1100	n/c	n/c	n/c	50	10
Tetrachloroethene	See C4SL	0.24	0.24	34	10	10
Trichloroethene	See C4SL	0.13	0.13	5.7	10	10
cis-1,2 Dichloroethene		0.21	0.21	130	50	50
Vinyl Chloride	See C4SL	0.0012	0.0012	0.62	0.5	0.5

Notes:
f = Oral, dermal and inhalation exposure compared with oral HCV N/C = Not Calculated
* = S4UL exceeds vapour saturation limit (in brackets) ** = S4UL exceeds solubility saturation limit (in brackets)
n/c = not calculated. Under normal conditions contaminant exhibits low solubility /volatility, therefore risks from leaching and or vapour pathways are considered low.

To establish suitable compliance criteria for Surface Water review of basline groundwater quality in England and Wales was completed following research reported in Shand, P, Edmunds, W M, Lawrence, A R, Smedle y, P L, and Burke, S. 2007. The natural (baseline) quality of groundwater in England and Wales. British Geological Survey Research Report No. RR/07/06. Where compliance criteria was found below the 97.7 percentile of baseline value, the latter was adopted as GAC.

Soil Targets

Targets for Human Health have been taken from *S4ULs 'Suitable For Use Levels for Human Health Risk Assessment' – LQM and CIEH (2014)* derived using standard sandy loam soil with 1% SOM, except (#) = *EIC/AGS/CL:AIRE GAC 'Soil Generic Assessment Criteria' (2010)* . For sites where ground conditions differ significantly from sandy loam or site-specific SOM and pH are available, the generic human health targets may be revised.

Targets for Controlled waters have been derived using EA Remedial Targets Worksheet (v3.1) - using standard Sandy Loam ground conditions as described in Science Report SC050021/SR3, assuming no degradation for a 10m compliance distance with criteria of EQS or UKDWS for Surface Water and Groundwater respectively (see notes for GW targets).

Groundwater Targets
For Surface Water, targets have been taken as Freshwater EQS where available. For MTBE Predicted No Effect Concentration (European Risk Assessment Report, 2002) was used. For individual TPH fractions, in absence of UK EQS, a 5 times multiplier of UKDWS has been taken.

For Groundwater, targets have been taken as UKDWS where available. In the absence of UK targets internationally recognised criteria were adopted. For MTBE, WHO taste threshold has been adopted.

Targets for Human Health have been taken from *Society of Brownfield Risk Assessment (SoBRA) 'Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater' - Version 1.0, February 2017,* derived using sandy soil and 1%SOM. GAC were set up assuming source at 50cm below typical ground bearing slab of 15cm thickness. GAC were derived for vapour pathways only. For sites where ground conditions, or differ significantly from described above, the generic human health targets may be revised.

EPS Generic Quantitative Risk Assessment

Generic Screening Criteria (C4SLs) - All Land Uses

Contaminant	Soil Targets					
	Residential		Allotments	Commercial	Public Open Spaces	
	With Home Grown Produce	Without Home Grown Produce			Residential	Parks
Unit	mg/kg					
Arsenic	37	40	49	640	79	168
Benzene	0.87	3.3	0.18	98	140	230
Benzo(a)pyrene	5	5.3	5.7	76	10	21
Cadmium	26	149	4.9	410	220	880
Chromium (VI)	21	21	170	49	23	250
Lead	200	310	80	2330	630	1300
Chloroethene (Vinyl Chloride)	0.017	0.029	0.0058	2.2	7.8	19
Trichloroethene (TCE)	0.043	0.045	0.16	3.4	79	69
Tetrachloroethene (PCE)	1.6	1.6	11	130	3400	2500

Notes:

Targets for Human Health have been taken from the publicly available Category 4 Screening Levels (C4SLs) for assessment of land affected by contamination issued by DEFRA/CL:AIRE in December 2013 and May 2021.

Within the modelling for C4SLs, a Soil Organic Matter content of 6% has been used. Reference to site-specific data should be made where possible.

The C4SLs for the contaminant benzene along with the three chlorinated solvents are the most susceptable to changes in SOM.

May-23

APPENDIX M

Method Statement for Encountering Unexpected Contamination

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:

Marcus Bell	Associate Director	Tel: 0787 206 9979
Will Evans	Director	Tel: 0781 253 9655
Steve Bullock	Director	Tel: 0786 694 9221

Email: info@epstrategies.co.uk (Automatically forwarded to the above and office-based personnel)

7B Caxton House
Broad Street
Cambourne
Cambridge CB23 6JN

T +44(0) 1954 710666
F +44(0) 1954 710677
E info@epstrategies.co.uk
W www.epstrategies.co.uk

Registered Number: 4330320

Accredited Contractor
CHAS.co.uk