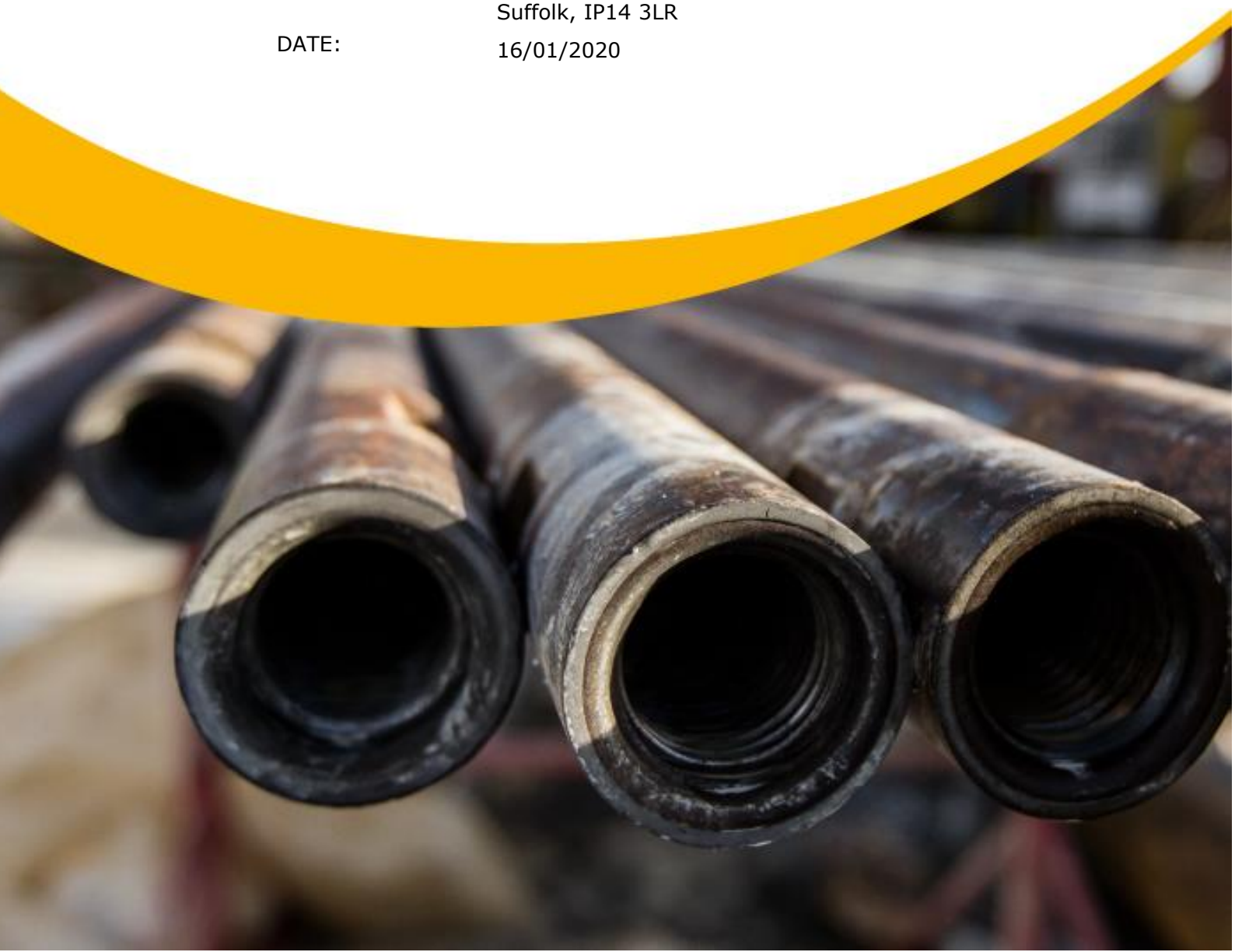
GEOSPHERE ENVIRONMENTAL

REPORT NUMBER:	4476,GI/GROUND/FS,TP/16-01-20/V1
SITE:	Progress Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR
DATE:	16/01/2020



DOCUMENT CONTROL SHEET

Report Number:	4476,GI/GROUND/FS,TP/16-01-20/V1
Client:	Josephine Fox
Project Name:	Progress Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR
Project Number:	4476,GI
Report Type:	Phase 2 – Ground Investigation
Status:	Final
Date of Issue:	16 January 2020

Issued By:

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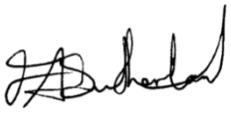
Limit of Reliance:

This report is based on the site findings at the time of the associated walkover/site investigation works and information provided by the client at the time of writing. Should site conditions alter or development proposals alter, a reassessment of the enclosed findings should be undertaken. Refer to Appendix 1 for full details of report limitations.

Prepared By:	Reviewed By:	Authorised By:
Flora Sutherland Assistant Geo-Environmental Consultant	Thomas Powling Director	Paul Davies Director



VERSION RECORD

Version	Date	Document Revision Details	Prepared By:	Admin

EXECUTIVE SUMMARY

Project Description		Geosphere Environmental Ltd was commissioned by the Client to undertake a Phase 2 Ground Investigation for a change in land use from agricultural to residential development at Progress Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR. It has been understood that the site is to undergo a proposed change of use from agricultural buildings to dwelling houses (Class C3) with associated gardens and parking areas – but the exact extents of the private garden areas have not yet been finalised.
Site Location / Description		The Site Investigation targeted the two areas to be converted. Both areas comprised of large agricultural structures of brick and corrugated metal construction and concrete flooring.
Site Works		Site works were carried out on the 6th December 2019 and comprised the following: • Formation of nine exploratory holes (WS1 to WS9), using windowless sampler techniques, to depths between 1.00 and 3.00m BGL; and • Associated soil logging and environmental sampling.
Ground Conditions		The ground conditions encountered comprised nominal layer of Topsoil/Concrete and Made Ground overlying deposits of Lowestoft Formation (cohesive). No groundwater was encountered during the Ground Investigation.
Laboratory Results		No elevated concentrations of determinants were noted above the most conservative screening values, with the exception of a single positive identification of fibrous asbestos within sample J2 at 0.40m bgl in WS4. Quantification testing was undertaken and indicated there to be 0.008% of asbestos identified. When compared with the CL:AIRE and Joint Industry Working Group CAR-SOIL guidance, this concentration is considered Very Low.
Recommendations		Although a full Development Plan is not available at this time, the location of WS4 is not anticipated to lie within any private gardens or soft landscaping and the quantifiable amount within the sample was confirmed as 'Very Low'. On this basis there is not considered to be a source of asbestos within near surface soils. Although there is not deemed to be a source currently, there may be a risk of finding potentially asbestos containing materials during the development process, and this risk is best managed with a robust discovery strategy, and if necessary, revision of any Conceptual Model.
This Executive Summary only provides a summary of the site data and its assessment. It does not provide a definitive engineering analysis and is for guidance only. It is recommended that the reader reviews the report in its entirety and any material referenced therein.		

CONTENTS

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TABLES

1. INTRODUCTION

Geosphere Environmental Ltd was commissioned by the Client, Josephine Fox, to undertake a Phase 2 Ground Investigation for a change in land use from agricultural to residential development at Progress Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR.

It has been understood that the site is to undergo a proposed change of use from agricultural buildings to dwelling houses (Class C3) with associated gardens and parking areas – it was these discrete areas that were the subject of our intrusive investigation – not the wider site. The exact boundaries of the plots and garden areas were unknown at the time of the investigation but the likely extent and location of soft standing within these areas was advised by the Client onsite and, as such, is considered representative of the proposed development.

A plan of the likely extent of areas to be developed is provided within Appendix 3 as Drawing ref. 4476,GI/003/Rev0 – should these anticipated boundaries or anticipated building footprint vary significantly once development starts, then this Risk Assessment may need to be revised.

The primary objectives of this Ground Investigation were to:

- Assess the ground conditions at the site;
- Assess the potential risk to human health and the environment based upon the findings of the investigation.

These were achieved by:

- Undertaking an intrusive investigation of the site, based upon the findings of the previous Desk Study, the advice on development layout from the Client and the scope agreed with the Client;
- Logging and sampling the soils on the site and noting any visual or olfactory evidence of contamination;
- Undertaking laboratory chemical analysis of selected soil samples to assess soil quality and ground conditions at the site;
- Updating the initial Conceptual Site Model and defining suitable remedial/mitigating and verification actions.

2. SITE SETTINGS

2.1. Site Description

The subject site was situated in Wetherden and may be located by National Grid Reference (NGR) TM 01206 63170.

The area of the land within the ownership of the Client comprised of soft and hard standing areas. The scope of investigation targeted two smaller areas within this land which have been specifically targeted for the Ground Investigation – see Section 1 of this report.

The Site Investigation targeted the two areas to be converted. These have been assigned Area 1 and Area 2 for the purpose of this site description and can be seen in Drawing ref. 4476,GI/003/Rev0.

Area 1 comprised of two large agricultural structures of brick and corrugated metal construction and concrete flooring. The most westerly structure was accessible and was the main target of investigation within Area 1 due to its intended residential garden end-use. This structure was noted to contain general farm waste and hay only.

The western section of Area 2 was predominantly covered by a large agricultural rectangular building which continued north and southwards from Area 2. Concrete hardstanding existed to the east of this building and a narrow strip of softstanding existed to the west.

A Site Location Plan is included within Appendix 3 as Drawing reference 4476,GI/001/Rev0.

Photographic records are presented in Appendix 7 of this report.

2.2. Previous Reports

A Phase One Desk Study report has been produced for the site:

- "***A Phase 1 Desk Study to support the change of use of agricultural buildings to residential use at Progress Farm, Base Green Road, Wetherden, IP14 3LR"*** dated 12 September 2019, report ref: "BJH/19.307/PhaseI.

This Desk Study encompassed the entirety of the wider site, whereas the focus of this subsequent Site Investigation will be two private dwellings where redevelopment will occur.

Relevant information from the Desk Study is summarised overleaf:

- Ground conditions anticipated were Lowestoft Formation (diamicton) underlain by the Crag Group (sand) at depth;
- Secondary A Aquifer within Lowestoft Formation overlying a Principal Aquifer in the Crag;
- Significant contamination sources are not expected but there could be isolated contamination in near surface soils from an agricultural land use;
- Low risk to controlled waters;
- No significant sources of ground gas;
- If domestic gardens and/or soft landscaping areas are proposed within the development, it is recommended that shallow soil sampling is carried out in these areas.

3. SITE WORKS

3.1. Methodology

This Site Investigation was carried out in accordance with the practices set out in BS 10175: 2011+A1:2013, (ref. **R.7**) and BS 5930: 2015 (ref. **R.8**). The investigation and location of exploratory holes targeted the anticipated proposed garden areas of the development, as advised by the Desk Study and as located by the Client.

3.2. Scope

Site works were carried out on the 6th December 2019 and comprised the following:

- Formation of nine exploratory holes (WS1 to WS9), using windowless sampler techniques, to depths between 1.00 and 3.00m BGL; and
- Associated soil logging and environmental sampling.

An Exploratory Hole Location Plan is provided within Appendix 3 as Drawing ref. 4476,GI/002/Rev0.

3.3. Ground Conditions Encountered

The sequence of the strata encountered during the investigation generally confirmed the anticipated superficial geology as interpreted from the Desk Study.

The sequence and indicative thickness of the strata encountered are provided below:

Table 1 - Ground Conditions

Strata	Depth Encountered (mbgl)		Strata Thickness (m)	Composition
	From	To		
TOPSOIL	0.00	0.30 – 0.35	0.30 – 0.35	Within exploratory hole WS1 and WS4. Dark brown sand clay and silt.
HARDSTANDING	0.00	0.15 - 0.40	0.15 – 0.40	Within exploratory holes WS2, WS3, WS5, WS6, WS7, WS8 and WS9, Grey concrete.
MADE GROUND	0.15 – 0.30	0.42 – 0.80	0.27 – 0.50	Within exploratory hole WS4 and WS5. Brown gravelly clayey sand. Brick, pipe, concrete, glass and flint present.
LOWESTOFT FORMATION (Cohesive)	0.20 – 0.80	1.00 – 3.00	0.60 – 2.65	Within all exploratory holes. Brown sandy gravelly clay. Gravel is flint and chalk.

3.4. Visual and Olfactory Evidence of Contamination

No visual or olfactory evidence of gross contamination was encountered during the ground investigation.

4. LABORATORY TESTING

4.1. Methodology

Representative disturbed samples were taken at the depths shown on the Exploratory Hole records and despatched to the laboratory. The Exploratory Hole Logs are included in Appendix 3.

Samples were collected, for environmental purposes, in glass jars and a plastic tub and then kept in a Cool Box. Six samples were selected to be tested for commonly occurring contaminates.

4.2. Environmental Testing Suite

4.2.1. Quality Control

The environmental laboratory used, (DETS) is an accredited laboratory by the United Kingdom Accreditation Service (UKAS), and at least 50% of individual parameters are from methods pending accreditation to the Environment Agency Monitoring Certification Scheme (MCERTS) for the range of analyses undertaken as part of this investigation. The MCERTS performance standard for the chemical testing of soil is an application of ISO 17025: 2005, specifically for the chemical testing of soil.

4.2.2. Environmental Testing Suite – Soils

The suite of chemical analyses was based upon the findings of the Phase 1 Desk Study. The chemical analyses were carried out on multiple samples of soil. The nature of the analyses is detailed below:

- Metals screen - arsenic, cadmium, chromium, lead, mercury, selenium, boron (water soluble), beryllium, copper, nickel, vanadium and zinc;
- Organic screen - total petroleum hydrocarbons (TPH) – with specific carbon banding; benzene, toluene, ethylbenzene and xylenes (BTEX); polyaromatic hydrocarbons (PAH) – USEPA 16 suite;
- Inorganics screen - cyanide (total), sulphate (water soluble);
- Others - pH, organic matter, asbestos.

A copy of the laboratory test results is included in Appendix 6.

4.2.3. Groundwater

No groundwater was encountered in any of the exploratory holes during intrusive works.

5. RISK ASSESSMENT

5.1. Risk to Human Health

5.1.1. Methodology

The current guidance requires that a Conceptual Model be formulated, based upon the findings of the research. The Conceptual Model is limited, at this stage, to the identification and assessment of potential 'hazards' identified or suspected from the results of the research; the potential 'receptors' that may be affected and the anticipated 'pathways' to those receptors. The findings are summarised in the following subsections.

The guidance proposes a four-stage approach for the assessment of contamination and the associated risks. The four stages are listed below:

- Hazard Identification;
- Hazard Assessment;
- Risk Estimation;
- Risk Evaluation.

5.1.2. Soil Quality Screening Values

The results of the soil analyses have been compared to soil quality screening values where deemed applicable, such as:

- The LQM/CIEH S4ULs for Human Health Risk Assessment, (ref. **R.16**);
- Defra/CL:AIRE Final C4SLs, (ref. **R.15**);

The soil samples laboratory chemical results were compared against the most conservative screening values for a private residential development with plant uptake. The findings of which are discussed in the following sections.

5.1.3. Elevated Soil Concentrations

No elevated concentrations of determinants were noted above the most conservative screening values. Separately, the analysis did note a single positive identification of asbestos within sample J2 at 0.4m BGL in WS4, this is discussed in more detail overleaf.

5.1.4. Asbestos

A total of six samples were subject to asbestos screening, the results of which identified quantifiable levels of chrysotile asbestos within sample J2 in WS4 at 0.40m BGL. No asbestos was detected within all other samples tested.

Subsequent quantification testing was undertaken on this sample and returned a result of 0.008%. When compared with the CL:AIRE and Joint Industry Working Group CAR-SOIL guidance, this concentration is considered to be 'Very Low'.

Although a full Development Plan is not available at this time, the location of WS4 is not anticipated to lie within any private garden or soft landscaping and the quantifiable amount within the sample was confirmed as 'Very Low'. On this basis there is not considered to be a source of asbestos within near surface soils.

Although there is not deemed to be a source currently, there may be a risk of finding potentially asbestos containing materials during the development process, and this risk is best managed with a robust discovery strategy, and if necessary, revision of any Conceptual Model.

5.1.5. Risk to Controlled Waters

The Desk Study noted that risk to controlled waters was low, as long as no significant contamination is encountered.

No significant contamination was noted during this intrusive Ground Investigation.

5.1.6. Advanced Conceptual Site Model

No contamination which poses a risk to human health and/or controlled wasters has been encountered during this intrusive investigation, therefore, a Conceptual Model has been omitted as there are no sources to risk assess.

6. DISCOVERY STRATEGY

There is the possibility that contamination, including asbestos, may be encountered onsite, which was not detected during the investigation. Should such material be identified or suspected during the conversion of the barns, it should be dealt with accordingly. A method for dealing with this scenario is as follows:

- Having an on-call suitably experienced Environmental Engineer to assess any suspected contamination encountered;
- Sampling of any suspected contaminated material by an Environmental Engineer;
- Leave suspect material in-situ;
- Undertake further intrusive investigation, if required;
- Upon identification of the suspected contamination the impacted material may be either treated or removed from site, following suitable waste management licensing or obtaining appropriate consents or agreements with relevant Regulatory Authorities;
- All contaminated material, to be removed from site, should be disposed of at a suitably licensed tip;
- All works should be recorded and submitted to the relevant authorities in a technical report format.

7. CONCLUSIONS AND RECOMMENDATIONS

Geosphere Environmental Ltd was commissioned by Josephine Fox to undertake a Phase Two Site Investigation at Progress Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR, based upon the findings of the Phase 1 Investigation for the wider site.

It has been understood that the site is to undergo a proposed change of use from agricultural buildings to dwelling houses (Class C3). This will include soft landscaped areas including private gardens and areas for car parking. The exact boundaries of the plots and garden areas was unknown at the time of the investigation, but the likely extent and location of soft standing within these areas was advised by the Client onsite and as such, is considered representative of the proposed development.

The ground conditions encountered comprised nominal layer of Topsoil/Concrete and Made Ground overlying deposits of Lowestoft Formation (cohesive).

No elevated concentrations of determinants were noted above the most conservative screening values, although a single positive identification of fibrous asbestos within sample J2 at 0.40m bgl in WS4 was noted. Subsequent quantification testing was undertaken and indicated there to be 0.008% of asbestos within the subject sample. When compared with the CL:AIRE and Joint Industry Working Group CAR-SOIL guidance, this concentration is considered Very Low.

Although a full Development Plan is not available at this time, the location of WS4 is not anticipated to lie within any private garden or soft landscaping and the quantifiable amount within the sample was confirmed as 'Very Low'. On this basis there is not considered to be a source of asbestos within near surface soils.

Although there is not deemed to be a source currently, there may be a risk of finding potentially asbestos containing materials during the development process, and this risk is best managed with a robust discovery strategy, and if necessary, revision of any Conceptual Model.

It is recommended that this report be submitted to the Local Authority as part of the site's planning submission. Should the anticipated boundaries of each redevelopment or anticipated building footprint vary, then this Risk Assessment may need to be revised

Should demolition of the buildings be considered, it would be necessary to undertake a Refurbishment and Demolition (Asbestos Survey) of the buildings, in accordance with MDHS guidance (ref. **R.7**).

APPENDICES

Appendix 1 – Report Limitations and Conditions

General Limitations and Exceptions

This report was prepared solely for our Client for the stated purposes only and is not intended to be relied upon by any other party or for any other use. No extended duty of care to any third party is implied or offered.

Geosphere Environmental Ltd does not purport to provide specialist legal advice.

The Executive Summary, Conclusions and Recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon until considered in the context of the whole report.

Interpretations and recommendations contained in the report represent our professional opinions, which were arrived at in accordance with currently accepted industry practices at the time of reporting and based upon current legislation in force at that time.

Environmental and Geotechnical Reporting (including Phase 1, Phase 2 and Site Walkovers) Limitations and Exceptions

The comments given in this report and the options expressed herein are based on the readily available information collated for the report and an assessment based upon the current guidance which for Phase 1 / Phase 2 report is guidance BS 10175: 2011+A1:2013 and BS 5930: 2015.

The report has been prepared in relation to the proposed end-use and should another end-use be intended, reassessment may be required.

No warranty is given as to the possibility of future changes in the condition of the site.

The opinions expressed cannot be absolute due to the limitation of time and resources imposed by the agreed brief.

With regards to any aspect of land contamination referred to, this is limited to those aspects specifically stated and necessarily qualified. No liability shall be accepted for other aspects which may be the result of gradual or sudden pollution incidents, past or present land uses and the potential for associated contamination migration.

Any Desk Study Report / data has been produced largely from the information purchased from The Landmark Information Group. The information is not necessarily exhaustive and further information

relevant to the site may be available from other sources. The information purchased has been assumed to be correct and free from errors; However, there is the possibility that some data may be missing from the report including (but not limited to) unrecorded land uses both onsite and offsite or unrecorded pollution events. No attempt has been made to verify the information.

The accuracy of any map extracts cannot be guaranteed. It is possible that different conditions existed onsite, between and subsequent to the various map surveys provided.

Any site walkover undertaken is a snapshot of the site recording the visually evident conditions at the time of the walkover in the areas readily accessible. It is possible that after the walkover, the site was altered (for example by fly-tipping or groundworks) or before the walkover, the site conditions changed removing evidence of potentially contaminative features (such as oil tanks removed).

Any intrusive works only cover a tiny proportion of the site. Where exploratory holes are positioned by GEL, they are located to give as good a coverage of the site as possible and to target features / proposed land use where applicable while allowing for areas that cannot be accesses, Client requested locations and other site / time / budget constraints. While assumptions may have been drawn between exploratory holes on the ground conditions and / or extent or otherwise of any contamination, this is for guidance only and no liability can be accepted on its accuracy.

Foundation design is outside of the remit of Geosphere Environmental unless specifically stated and it is recommended that the services of foundation design specialists are sought as required. Any foundation appraisal contained with the report is limited to foundation optioneering.

Any conceptual site model is based on the information available at the time of conducting this assessment and is an interpretive assessment of the conditions at the site. Redevelopment and / or further investigation of the site may reveal additional information and therefore alter the conceptual site model and the report conclusions.

Any infiltration testing results are considered to be representative of the ground conditions at the locations tested and at the time of testing. As well as lateral variation in ground conditions, seasonal changes in ground water level may affect the results.

Any post-fieldwork monitoring (including ground gas / groundwater) is a snapshot of the conditions at the time of monitoring.

Appendix 2 – References

R.1. CLR 11, 'Model Procedures for the Management of Contaminated Land: Risk Assessment Procedure', DoE 2004.

R.2. The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.

R.3. BRE Digest 465, 'Cover Systems for Land Regeneration – Thickness Cover Systems for Contaminated Land', 2004.

R.4. Nitrates Directive (91/676/EEC) 1991.

R.5. The Environmental Protection Act, Part IIA, Section 78, 1990.

R.6. Environment Act 1995, Section 57, DoE 1995.

R.7. British Standards Institute: BS 10175 'Investigation of Potentially Contaminated Sites', Code of Practice, BSI 2011+A2:2017.

R.8. British Standards Institute: BS 5930 'Code of Practice for Ground Investigations', 2015.

R.9. Asbestos: The Survey Guide, HSG 264, 2nd Edition, 2012.

R.10. CL:AIRE 'Guidance on Comparing Soil Contamination Data with a Critical Concentration', The Chartered Institute of Environmental Health, May 2008.

R.11. EIC/AGS/CL:AIRE. Soil Generic Assessment Criteria for Human Health Risk Assessment. Contaminated Land: Applications in Real Environments, London, UK, January 2010.

R.12. Contaminated Land Assessment Guidance Protocols, published by agreement between Water UK and the Home Builders Federation, Published by Water UK, January 2014.

R.13. UKWIR 'Guidance for the Selection of Water Supply Pipes to be Used in Brownfield Sites, August 2010.

R.14. Environment Agency. Performance Standard for Laboratories Undertaking Chemical Testing on Soil, Version 4, March 2012.

R.15. SP1010 – Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination, Final Project Report (Revision 2), Contaminated Land: Applications in Real Environments (CL:AIRE) September 2014. Appendix H – Lead.

R.16. Land Quality Press, The LQM/CIEH S4ULs for Human Health Risk Assessment, 2015.

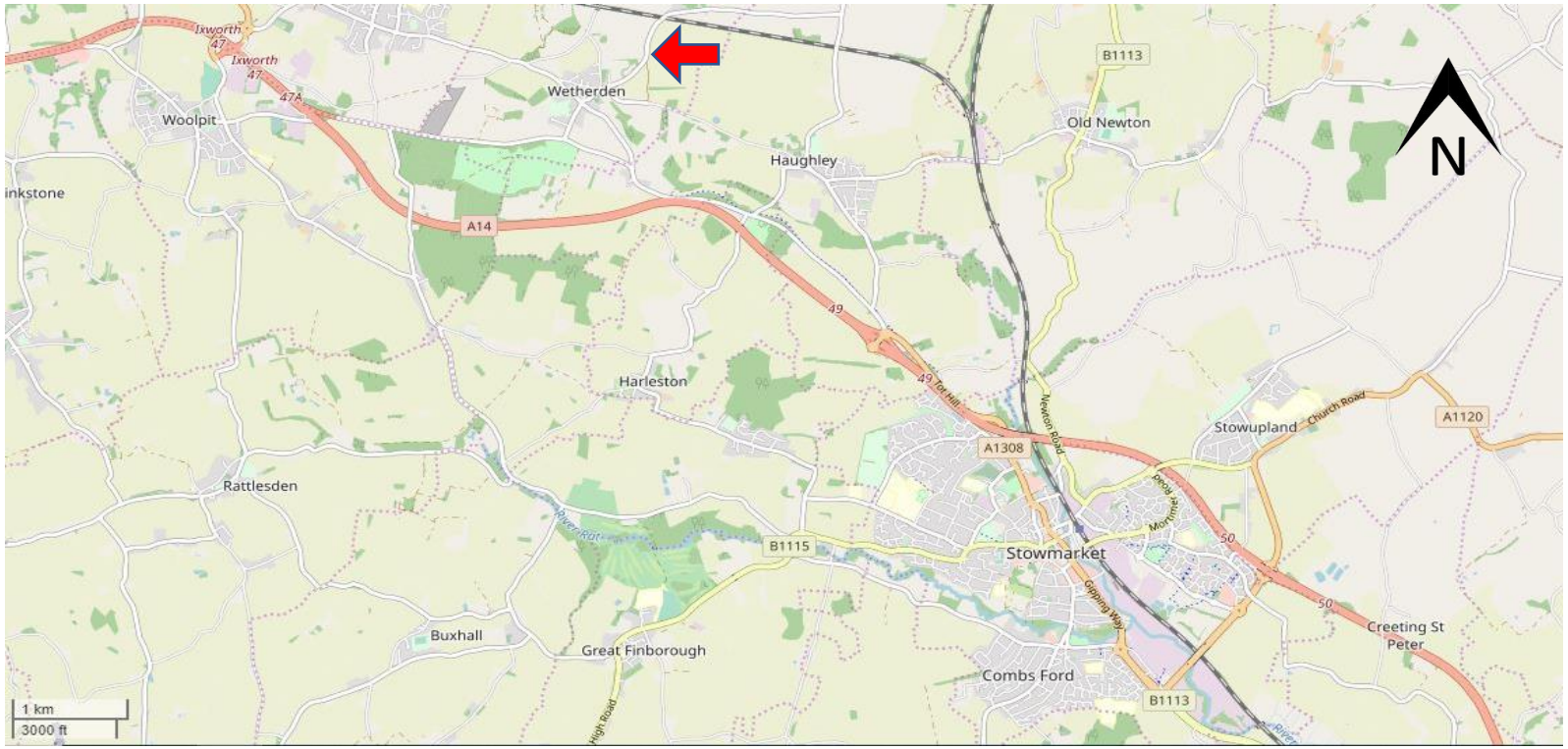
Appendix 3 – Drawings

Site Location Plan – Drawing ref. 4476,GI/001/Rev0

Exploratory Hole Location Plan – Drawing ref. 4476,GI/002/Rev0

Two Areas of the Of Proposed Land Use Change – Drawing ref. 4476,GI/003/Rev0

Block Plan – Drawing ref. 209-SK-106



GEOSPHERE ENVIRONMENTAL

LEGEND

Site Location

SOURCE

© OpenStreetMap contributors

PROJECT

Progress Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR

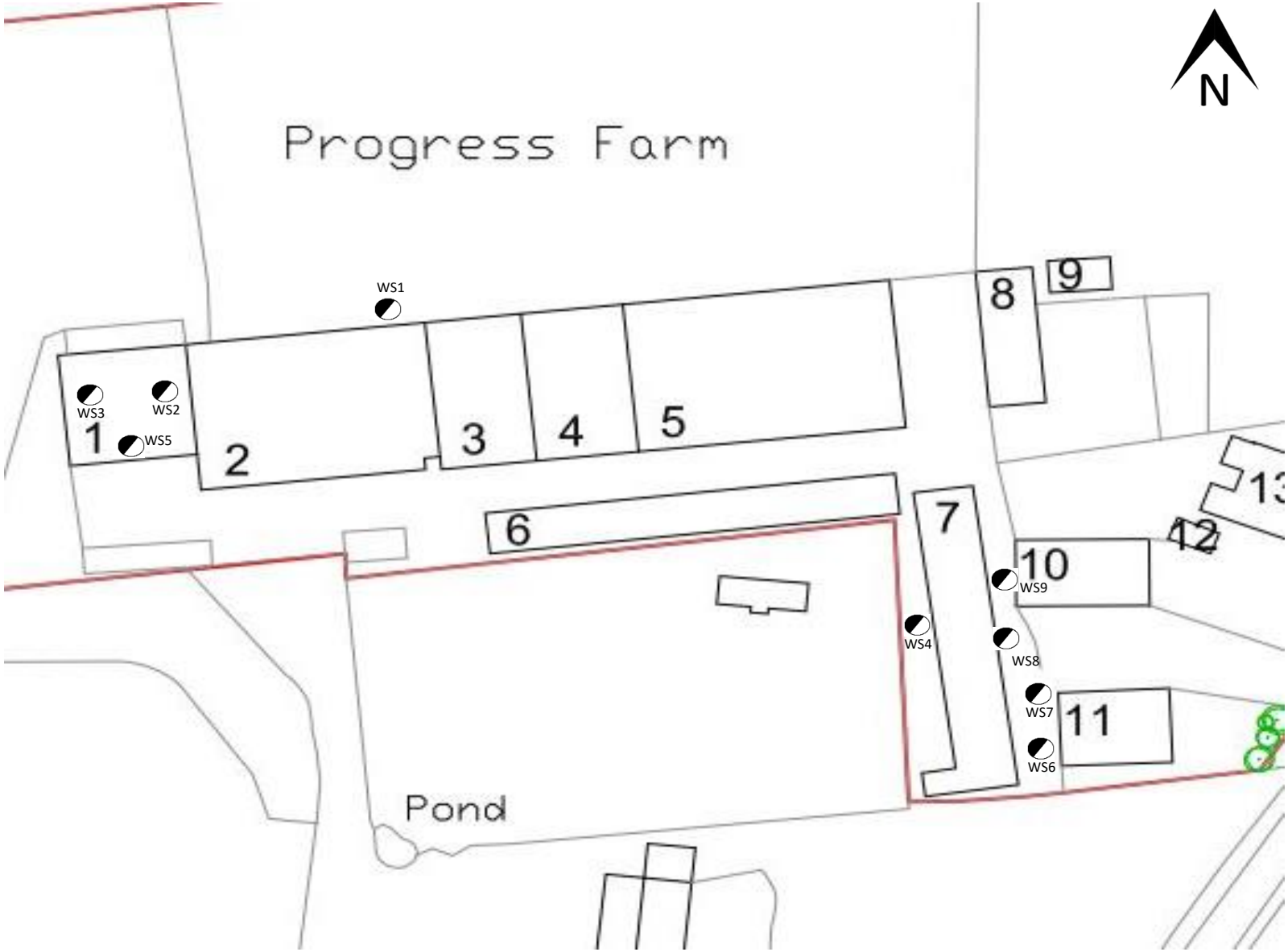
TITLE

Site Location Plan

DRAWING NUMBER

4476,GI/001/Rev0

SCALE	DATE
As shown	09/12/2019
DRAWN BY	**CHECKED BY**
FS	TP



GEOSPHERE ENVIRONMENTAL

LEGEND

Window Sample

SOURCE

Image provided by the Client

PROJECT

Progress Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR

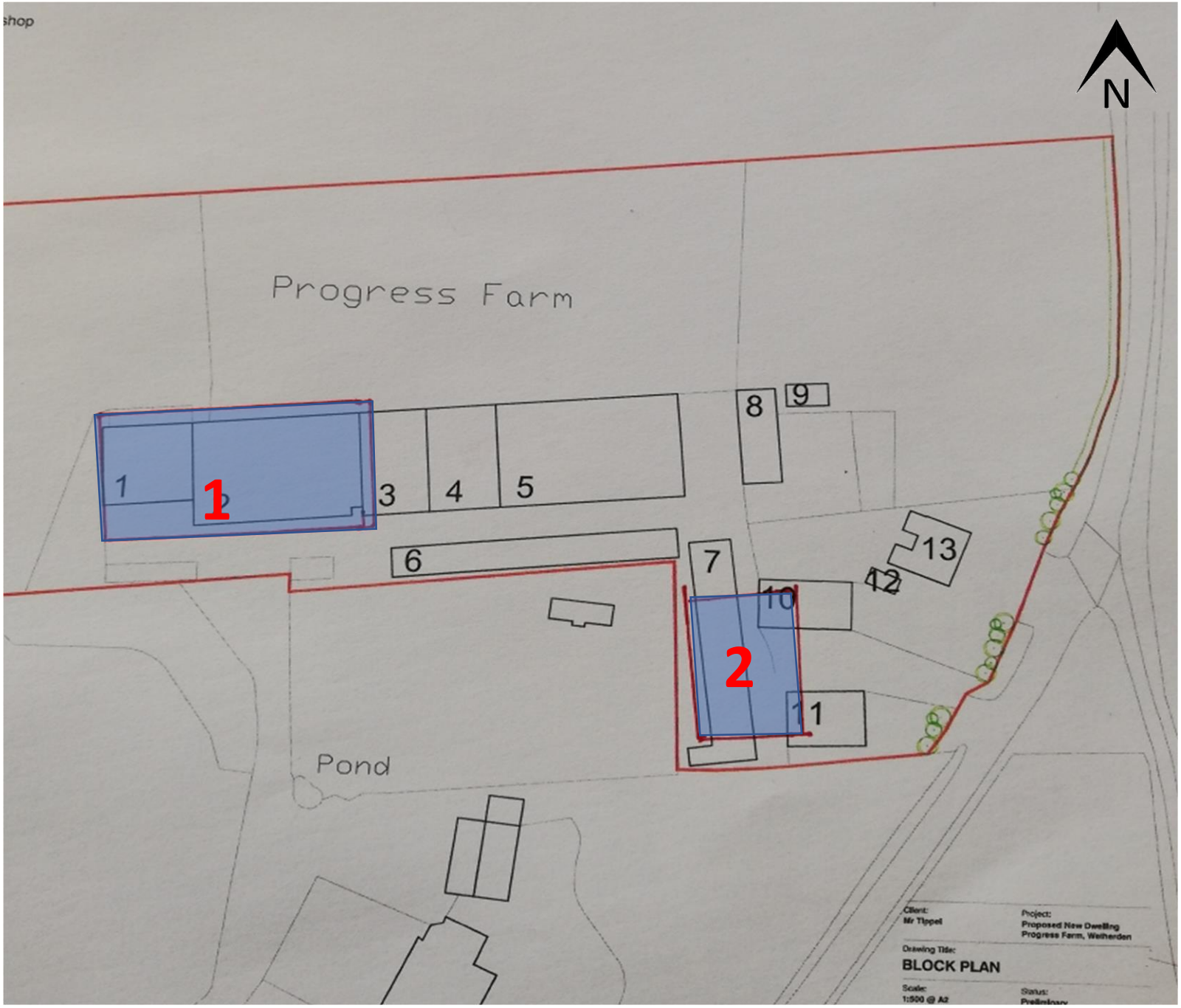
TITLE

Exploratory Hole Location Plan

DRAWING NUMBER

4476,GI/002/Rev0

SCALE	DATE
NTS	09/12/2019
DRAWN BY	**CHECKED BY**
FS	TP



GEOSPHERE ENVIRONMENTAL

LEGEND

Subject areas for development.

1 Area number

SOURCE

Image provided by the Client.

PROJECT

Progress Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR

TITLE

Two Areas of the Proposed Land Use Change

DRAWING NUMBER

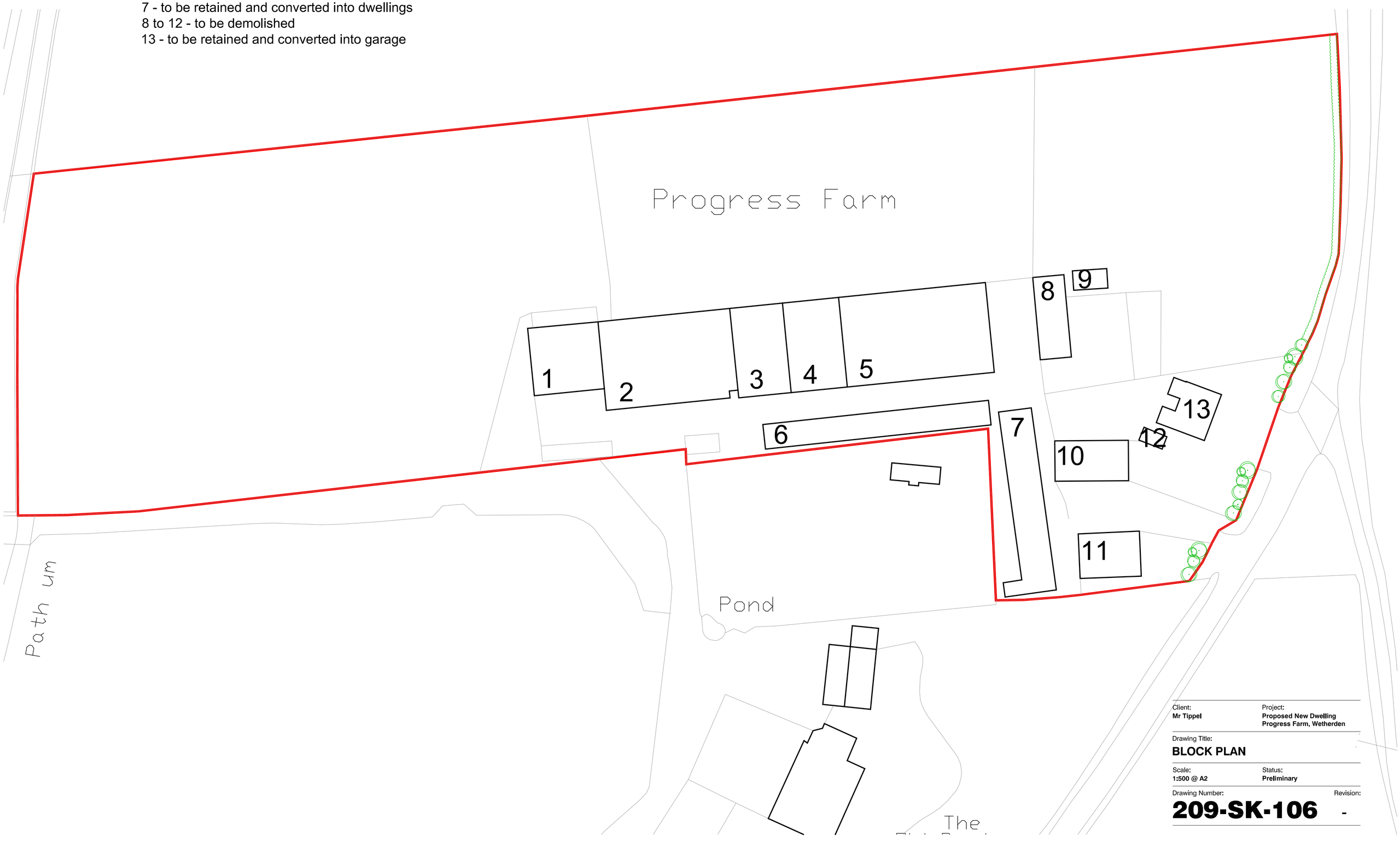
4476,GI/003/Rev0

SCALE	DATE
NTS	13/12/2019
DRAWN BY	**CHECKED BY**
FS	TP

Revisions

Rev:	Description:	Date:

SCHEDULE OF BUILDINGS
1 - to be demolished
2 - existing duo pitch barn & lean to to be converted to dwelling
3 - to be moved to site of barn 5
4 - barn to be retained and converted to workshop
5 - to be demolished
6 - to be retained?
7 - to be retained and converted into dwellings
8 to 12 - to be demolished
13 - to be retained and converted into garage



Client:
Mr Tippel

Project:
Proposed New Dwelling
Progress Farm, Wetherden

Drawing Title:
BLOCK PLAN

Scale:
1:500 @ A2

Status:
Preliminary

Drawing Number:
209-SK-106

Revision:
-

Appendix 4 – Comparison of Consequences Against Probability

		Consequence (Severity of Linkage)			
		Severe (S)	Moderate (Mo)	Mild (Mi)	Negligible (N)
Probability (Likelihood of linkage from)	Highly Likely (HL)	Very High Risk (VH)	High Risk (HR)	Moderate Risk (MR)	Moderate/Low Risk (MR-LR)
	Likely (L)	High Risk (HR)	Moderate Risk (MR)	Moderate/Low Risk (MR-LR)	Low Risk (LR)
	Unlikely (U)	Moderate Risk (MR)	Moderate/Low Risk (MR-LR)	Low Risk (LR)	Negligible Risk (NR)
	Negligible (N)	Moderate/Low Risk (MR-LR)	Low Risk (LR)	Negligible Risk (NR)	Negligible Risk (NR)

This table is to provide reference information in conjunction with the GEL Conceptual Model attached within the Hazard Risk Assessment section of this report, Table 1 – Conceptual Model.

Very High Risk (VH)

- There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is happening currently.
- Urgent investigation and remediation are likely to be required and advised.

High Risk (HR)

- Harm is likely to arise to a designated receptor from an identified hazard.
- Urgent investigation is required and remedial works are likely necessary in both the short to long term.

Moderate Risk (MR)

- It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild.
- Investigation is required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.

Low Risk (LR)

- It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild. Limited investigation recommended.

Negligible Risk (NR)

- There is a minimal possibility that harm could arise to a receptor. In the event of such harm being realised it is high likely to not be severe. Investigation not deemed necessary.

Appendix 5 – Exploratory Hole Logs

Windowless Sample Hole Logs

(WS1 to WS9)

CLIENT: Joesphine Fox

PROJECT: Progress Farm, Wetherden

GROUND LEVEL m

HOLE No. WS1

LOGGED BY: FS
FIELDWORK BY: GEL
TEMPLATE REF: GEL AGS BH BETA

CHECKED BY: LF
DATE: 10/01/2020

EXCAVATION METHOD: Windowless sampler
Uncased to 3.0 m

Coordinates: ,

DATES 06/12/2019 - 06/12/2019

SHEET 1 OF 1

PROJECT NO. 4476,GI

Date/Time and Depth	Depth of Casing	Depth* of Water	Piez.	Description of Strata	Strata: Leg	Strata: Reduced Level	Strata: Depth	Graphical Representation: SPT 'N' Value (0 10 20 30 40)	Sampling/In-Situ Testing: Depths	Type	No.	Blows	SPT N	Laboratory Testing: <425 %	WC %	PL %	LL %	ρ Mg/m³	Cu kN/m²	Additional Tests and Notes
				Soft dark brown ORGANIC CLAY. Sand is fine and medium.			0.00		0											
				(TOPSOIL)			0.35		0.20	J	1									
				Firm brown sandy CLAY. Sand is fine. (LOWESTOFT FORMATION)					0.40	J	2									
									0.50	D	1									
				Firm light brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine and medium angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION)			0.90		1			2 2 3 5 4 4	16							
				1.95 Becoming stiff with depth.					1.40	J	3									
									1.50	D	2									
									2			3 4 5 5 7 6	23							
									2.40	J	4									
									2.50	D	3									
				EXPLORATORY HOLE COMPLETED AT 3.00m BGL. NO GROUNDWATER ENCOUNTERED DURING DRILLING.			3.00		3			4 5 7 6 10 7	30							
									4											
									5											
									6											
									7											
									8											

*WATER ▼ Standing water level ▽ Water strikes

PIEZOMETER Upper seal, Response zone, Lower seal

SAMPLE AND TEST KEY
D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample
P Piston sample
J Disturbed jar sample
ES Environmental soil sample
W Water Sample
S Standard penetration test
C Cone penetration test
K Permeability test

Blows SPT blows for each 75mm increment (35) Undisturbed sample blow count
SPT N N = SPT N value (blows after seating) N*120 = Total blows/penetration including seating
<425 Sample % passing 425 micron sieve

DEPTH All depths, level and thicknesses in metres

Geosphere Environmental Ltd
Unit 11, Brightwell Barns
Brightwell, Suffolk, IP10 0BJ
Telephone: 01603 298 076

HOLE No. WS1.

SHEET 1 OF 1

PROJECT No. 4476,GI

GEL AGS BH BETA 4476,GI.WETHERDEN.08.01.2020.GPJ GINT STD AGS 3_1.GDT 13/01/20

CLIENT: Joesphine Fox

PROJECT: Progress Farm, Wetherden

GROUND LEVEL m

HOLE No. WS2

LOGGED BY: FS
FIELDWORK BY: GEL
TEMPLATE REF: GEL AGS BH BETA

CHECKED BY: LF
DATE: 10/01/2020

EXCAVATION METHOD: Windowless sampler
Uncased to 1.0 m

Coordinates: ,

DATES 06/12/2019 - 06/12/2019

SHEET 1 OF 1

PROJECT NO. 4476,GI

Date/Time and Depth	Depth of Casing	Depth* of Water	Piez.	Description of Strata	Strata: Leg	Strata: Reduced Level	Strata: Depth	Graphical Representation: SPT 'N' Value (0 10 20 30 40)	Sampling/In-Situ Testing: Depths	Type	No.	Blows	SPT N	Laboratory Testing: <425 %	WC %	PL %	LL %	ρ Mg/m³	Cu kN/m²	Additional Tests and Notes
				Grey concrete.			0.00													
				Soft brown sandy CLAY. Gravel is fine and medium. (LOWESTOFT FORMATION)			0.30		0.20	J	1									
									0.60	J	2									
				Soft brown gravelly sandy CLAY. Gravel is fine and medium angular to sub-rounded flint and chalk. Sand is fine and medium. (LOWESTOFT FORMATION)			0.90		0.95	J	3									
							1.00													
				EXPLORATORY HOLE COMPLETED AT 1.00m BGL. NO GROUNDWATER ENCOUNTERED DURING DRILLING.																

*WATER: Standing water level; Water strikes

PIEZOMETER: Upper seal; Response zone; Lower seal

SAMPLE AND TEST KEY

D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample
P Piston sample
J Disturbed jar sample
ES Environmental soil sample
W Water Sample
S Standard penetration test
C Cone penetration test
K Permeability test

Blows SPT blows for each 75mm increment (35) Undisturbed sample blow count
SPT N N = SPT N value (blows after seating) N*120 = Total blows/penetration including seating
<425 Sample % passing 425 micron sieve

DEPTH All depths, level and thicknesses in metres

Geosphere Environmental Ltd
Unit 11, Brightwell Barns
Brightwell, Suffolk, IP10 0BJ
Telephone: 01603 298 076

HOLE No. WS2.

SHEET 1 OF 1

PROJECT No. 4476,GI

GEL AGS BH BETA 4476,GI.WETHERDEN.08.01.2020.GPJ GINT STD AGS 3_1.GDT 13/01/20

CLIENT: Joesphine Fox

PROJECT: Progress Farm, Wetherden

GROUND LEVEL m

HOLE No. WS3

LOGGED BY: FS
FIELDWORK BY: GEL
TEMPLATE REF: GEL AGS BH BETA

CHECKED BY: LF
DATE: 10/01/2020

EXCAVATION METHOD: Windowless sampler
Uncased to 2.0 m

Coordinates: ,

DATES 06/12/2019 - 06/12/2019

SHEET 1 OF 1

PROJECT NO. 4476,GI

Date/Time and Depth	Depth of Casing	Depth* of Water	Piez.	Description of Strata	Strata: Leg	Strata: Reduced Level	Strata: Depth	Graphical Representation: SPT 'N' Value (0 10 20 30 40)	Sampling/In-Situ Testing: Depths	Type	No.	Blows	SPT N	Laboratory Testing: <425 %	WC %	PL %	LL %	ρ Mg/m³	Cu kN/m²	Additional Tests and Notes
				Grey concrete.			0.00		0											
				Soft brown gravelly sandy CLAY. Gravel is fine and medium angular and sub-angular flint. (LOWESTOFT FORMATION)			0.15													
				Firm light brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular to sub-rounded chalk and flint. (LOWESTOFT FORMATION)			0.50		0.40	J	1									
									0.80	J	2									
									1.50	J	3									
				EXPLORATORY HOLE COMPLETED AT 2.00m BGL. NO GROUNDWATER ENCOUNTERED DURING DRILLING.			2.00													

*WATER: Standing water level; Water strikes

PIEZOMETER: Upper seal; Response zone; Lower seal

SAMPLE AND TEST KEY

D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample
P Piston sample
J Disturbed jar sample
ES Environmental soil sample
W Water Sample
S Standard penetration test
C Cone penetration test
K Permeability test

Blows SPT blows for each 75mm increment (35) Undisturbed sample blow count
SPT N N = SPT N value (blows after seating) N*120 = Total blows/penetration including seating
<425 Sample % passing 425 micron sieve

DEPTH All depths, level and thicknesses in metres

Geosphere Environmental Ltd
Unit 11, Brightwell Barns
Brightwell, Suffolk, IP10 0BJ
Telephone: 01603 298 076

HOLE No. WS3.

SHEET 1 OF 1

PROJECT No. 4476,GI

GEL AGS BH BETA 4476,GI.WETHERDEN.08.01.2020.GPJ GINT STD AGS 3_1.GDT 13/01/20

CLIENT: Joesphine Fox

PROJECT: Progress Farm, Wetherden

GROUND LEVEL m

HOLE No. WS4

LOGGED BY: FS
FIELDWORK BY: GEL
TEMPLATE REF: GEL AGS BH BETA

CHECKED BY: LF
DATE: 10/01/2020

EXCAVATION METHOD: Windowless sampler
Uncased to 3.0 m

Coordinates: ,

DATES 06/12/2019 - 06/12/2019

SHEET 1 OF 1

PROJECT NO. 4476,GI

Date/Time and Depth	Depth of Casing	Depth* of Water	Piez.	Description of Strata	Strata: Leg	Strata: Reduced Level	Strata: Depth	Graphical Representation: SPT 'N' Value (0 10 20 30 40)	Sampling/In-Situ Testing: Depths	Type	No.	Blows	SPT N	Laboratory Testing: <425 %	WC %	PL %	LL %	ρ Mg/m³	Cu kN/m²	Additional Tests and Notes
				Dark brown sandy clayey ORGANIC SILT. Sand is fine.			0.00		0											
				(TOPSOIL)			0.30		0.15	J	1									
				MADE GROUND: Brown slightly gravelly clayey fine and medium SAND. Gravel is fine to coarse angular pipe, glass and flint.					0.40 0.50	J D	2 1									
				Soft light brown sandy CLAY. Sand is fine and medium. (LOWESTOFT FORMATION)			0.80		0.90	J	3	1 2 3 3 4 4	14							
									1.50	D	2									
				Soft brown slightly sandy gravelly CLAY. Sand is fine. Gravel is fine and medium flint and chalk. (LOWESTOFT FORMATION)			2.10		2.00	D	3	2 3 3 4 5 5	17							
									2.60	D	4									
				EXPLORATORY HOLE COMPLETED AT 3.00m BGL. NO GROUNDWATER ENCOUNTERED DURING DRILLING.			3.00					4 4 4 6 8 7	25							

*WATER ▼ Standing water level ▽ Water strikes

PIEZOMETER Upper seal, Response zone, Lower seal

SAMPLE AND TEST KEY
D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample
P Piston sample
J Disturbed jar sample
ES Environmental soil sample
W Water Sample
S Standard penetration test
C Cone penetration test
K Permeability test

Blows SPT blows for each 75mm increment (35) Undisturbed sample blow count
SPT N N = SPT N value (blows after seating) N*120 = Total blows/penetration including seating
<425 Sample % passing 425 micron sieve

DEPTH All depths, level and thicknesses in metres

Geosphere Environmental Ltd
Unit 11, Brightwell Barns
Brightwell, Suffolk, IP10 0BJ
Telephone: 01603 298 076

HOLE No. WS4. SHEET 1 OF 1 PROJECT No. 4476,GI

GEL AGS BH BETA 4476,GI.WETHERDEN.08.01.2020.GPJ GINT STD AGS 3_1.GDT 13/01/20

CLIENT: Joesphine Fox

PROJECT: Progress Farm, Wetherden

GROUND LEVEL m

HOLE No. WS5

LOGGED BY: FS
FIELDWORK BY: GEL
TEMPLATE REF: GEL AGS BH BETA

CHECKED BY: LF
DATE: 10/01/2020

EXCAVATION METHOD: Windowless sampler
Uncased to 1.0 m

Coordinates: ,

DATES 06/12/2019 - 06/12/2019

SHEET 1 OF 1

PROJECT NO. 4476,GI

Date/Time and Depth	Depth of Casing	Depth* of Water	Piez.	Description of Strata	Strata: Leg	Strata: Reduced Level	Strata: Depth	Graphical Representation: SPT 'N' Value (0 10 20 30 40)	Sampling/In-Situ Testing: Depths	Type	No.	Blows	SPT N	Laboratory Testing: <425 %	WC %	PL %	LL %	ρ Mg/m³	Cu kN/m²	Additional Tests and Notes
				Grey concrete.			0.00													
				Soft brown sandy CLAY. Sand is fine. (LOWESTOFT FORMATION)			0.20													
				Soft light brown sandy CLAY. Sand is fine to medium. (LOWESTOFT FORMATION)			0.30		0.25	J	1									
									0.50	J	2									
				EXPLORATORY HOLE COMPLETED AT 1.00m BGL. NO GROUNDWATER ENCOUNTERED DURING DRILLING.			1.00													

*WATER ▼ Standing water level ▽ Water strikes

PIEZOMETER Upper seal / Response zone / Lower seal

SAMPLE AND TEST KEY

D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample
P Piston sample
J Disturbed jar sample
ES Environmental soil sample
W Water Sample
S Standard penetration test
C Cone penetration test
K Permeability test

Blows SPT blows for each 75mm increment (35) Undisturbed sample blow count
SPT N N = SPT N value (blows after seating) N*120 = Total blows/penetration including seating
<425 Sample % passing 425 micron sieve

DEPTH All depths, level and thicknesses in metres

Geosphere Environmental Ltd
Unit 11, Brightwell Barns
Brightwell, Suffolk, IP10 0BJ
Telephone: 01603 298 076

HOLE No. WS5. SHEET 1 OF 1 PROJECT No. 4476,GI

GEL AGS BH BETA 4476,GI.WETHERDEN.08.01.2020.GPJ GINT STD AGS 3_1.GDT 13/01/20

CLIENT: Joesphine Fox

PROJECT: Progress Farm, Wetherden

GROUND LEVEL m

HOLE No. WS6

LOGGED BY: FS
FIELDWORK BY: GEL
TEMPLATE REF: GEL AGS BH BETA

CHECKED BY: LF
DATE: 10/01/2020

EXCAVATION METHOD: Windowless sampler
Uncased to 2.0 m

Coordinates: ,

DATES 06/12/2019 - 06/12/2019

SHEET 1 OF 1

PROJECT NO. 4476,GI

Date/Time and Depth	Depth of Casing	Depth* of Water	Piez.	Description of Strata	Strata: Leg	Strata: Reduced Level	Strata: Depth	Graphical Representation: SPT 'N' Value (0 10 20 30 40)	Sampling/In-Situ Testing: Depths	Type	No.	Blows	SPT N	Laboratory Testing: <425 %	WC %	PL %	LL %	ρ Mg/m³	Cu kN/m²	Additional Tests and Notes
				Grey concrete.			0.00													
				MADE GROUND: Reddish brown and grey crushed concrete and brick.			0.15		0.10	J	1									
				Soft greyish brown sandy CLAY. Sand is fine and medium. (LOWESTOFT FORMATION)			0.42		0.40	J	2									
				Greyish brown clayey fine and medium SAND. (LOWESTOFT FORMATION)			0.60													
				Stiff light brown sandy CLAY. Sand is fine. (LOWESTOFT FORMATION)			1.40		1.45	J	3									
				EXPLORATORY HOLE COMPLETED AT 2.00m BGL. NO GROUNDWATER ENCOUNTERED DURING DRILLING.			2.00													

*WATER: Standing water level; Water strikes

PIEZOMETER: Upper seal; Response zone; Lower seal

SAMPLE AND TEST KEY

D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample
P Piston sample
J Disturbed jar sample
ES Environmental soil sample
W Water Sample
S Standard penetration test
C Cone penetration test
K Permeability test

Blows SPT blows for each 75mm increment (35) Undisturbed sample blow count
SPT N N = SPT N value (blows after seating) N*120 = Total blows/penetration including seating
<425 Sample % passing 425 micron sieve

DEPTH All depths, level and thicknesses in metres

Geosphere Environmental Ltd
Unit 11, Brightwell Barns
Brightwell, Suffolk, IP10 0BJ
Telephone: 01603 298 076

HOLE No. WS6. SHEET 1 OF 1 PROJECT No. 4476,GI

GEL AGS BH BETA 4476,GI.WETHERDEN.08.01.2020.GPJ GINT STD AGS 3_1.GDT 13/01/20

CLIENT: Joesphine Fox

PROJECT: Progress Farm, Wetherden

GROUND LEVEL m

HOLE No. WS7

LOGGED BY: FS
FIELDWORK BY: GEL
TEMPLATE REF: GEL AGS BH BETA

CHECKED BY: LF
DATE: 10/01/2020

EXCAVATION METHOD: Windowless sampler
Uncased to 1.0 m

Coordinates: ,

DATES 06/12/2019 - 06/12/2019

SHEET 1 OF 1

PROJECT NO. 4476,GI

Date/Time and Depth	Depth of Casing	Depth* of Water	Piez.	Description of Strata	Strata: Leg	Strata: Reduced Level	Strata: Depth	Graphical Representation: SPT 'N' Value (0 10 20 30 40)	Sampling/In-Situ Testing: Depths	Type	No.	Blows	SPT N	Laboratory Testing: <425 %	WC %	PL %	LL %	ρ Mg/m³	Cu kN/m²	Additional Tests and Notes
				Grey concrete.			0.00		0											
				Soft greyish brown very sandy CLAY. Sand is fine and medium. (LOWESTOFT FORMATION)			0.20		0.40	J	1									
				Firm greyish brown gravelly sandy CLAY. Gravel is fine and medium angular flint and chalk. Sand is fine to coarse. (LOWESTOFT FORMATION)			0.60		0.80	J	2									
				EXPLORATORY HOLE COMPLETED AT 1.00m BGL. NO GROUNDWATER ENCOUNTERED DURING DRILLING.			1.00		1											
									2											
									3											
									4											
									5											
									6											
									7											
									8											

*WATER ▼ Standing water level ▽ Water strikes

PIEZOMETER Upper seal, Response zone, Lower seal

SAMPLE AND TEST KEY
D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample
P Piston sample
J Disturbed jar sample
ES Environmental soil sample
W Water Sample
S Standard penetration test
C Cone penetration test
K Permeability test

Blows SPT blows for each 75mm increment (35) Undisturbed sample blow count
SPT N N = SPT N value (blows after seating) N*120 = Total blows/penetration including seating
<425 Sample % passing 425 micron sieve

DEPTH All depths, level and thicknesses in metres

Geosphere Environmental Ltd
Unit 11, Brightwell Barns
Brightwell, Suffolk, IP10 0BJ
Telephone: 01603 298 076

HOLE No. WS7.

SHEET 1 OF 1

PROJECT No. 4476,GI

GEL AGS BH BETA 4476,GI.WETHERDEN.08.01.2020.GPJ GINT STD AGS 3_1.GDT 13/01/20

CLIENT: Joesphine Fox

PROJECT: Progress Farm, Wetherden

GROUND LEVEL m

HOLE No. WS8

LOGGED BY: FS
FIELDWORK BY: GEL
TEMPLATE REF: GEL AGS BH BETA

CHECKED BY: LF
DATE: 10/01/2020

EXCAVATION METHOD: Windowless sampler
Uncased to 1.0 m

Coordinates: ,

DATES 06/12/2019 - 06/12/2019

SHEET 1 OF 1

PROJECT NO. 4476,GI

Date/Time and Depth	Depth of Casing	Depth* of Water	Piez.	Description of Strata	Strata: Leg	Strata: Reduced Level	Strata: Depth	Graphical Representation: SPT 'N' Value (0 10 20 30 40)	Sampling/In-Situ Testing: Depths	Type	No.	Blows	SPT N	Laboratory Testing: <425 %	WC %	PL %	LL %	ρ Mg/m³	Cu kN/m²	Additional Tests and Notes
				Grey concrete.			0.00													
				Greyish brown very sandy CLAY. Sand is fine and medium. Occasional fine and medium gravel of angular flint. (LOWESTOFT FORMATION)			0.40		0.30	J	1									
									0.60	J	2									
				Firm brown gravelly sandy CLAY. Gravel is fine and medium angular and sub-angular flint and chalk. Sand is fine to coarse. (LOWESTOFT FORMATION)			0.70		0.90	J	3									
				EXPLORATORY HOLE COMPLETED AT 1.00m BGL. NO GROUNDWATER ENCOUNTERED DURING DRILLING.			1.00													

Depths: 0, 1, 2, 3, 4, 5, 6, 7, 8

*WATER: Standing water level; Water strikes

PIEZOMETER: Upper seal; Response zone; Lower seal

SAMPLE AND TEST KEY

D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample
P Piston sample
J Disturbed jar sample
ES Environmental soil sample
W Water Sample
S Standard penetration test
C Cone penetration test
K Permeability test

Blows: SPT blows for each 75mm increment (35) Undisturbed sample blow count
SPT N: N = SPT N value (blows after seating) N*120 = Total blows/penetration including seating
<425: Sample % passing 425 micron sieve

DEPTH All depths, level and thicknesses in metres

Geosphere Environmental Ltd
Unit 11, Brightwell Barns
Brightwell, Suffolk, IP10 0BJ
Telephone: 01603 298 076

HOLE No. WS8.

SHEET 1 OF 1

PROJECT No. 4476,GI

GEL AGS BH BETA 4476,GI.WETHERDEN.08.01.2020.GPJ GINT STD AGS 3_1.GDT 13/01/20

CLIENT: Joesphine Fox	**PROJECT: Progress Farm, Wetherden**	**GROUND LEVEL m**	**HOLE No. WS9**
LOGGED BY: FS FIELDWORK BY: GEL TEMPLATE REF: GEL AGS BH BETA CHECKED BY: LF DATE: 10/01/2020	EXCAVATION METHOD: Windowless sampler Uncased to 2.0 m	Coordinates: , DATES 06/12/2019 - 06/12/2019	SHEET 1 OF 1 PROJECT NO. 4476,GI

Date/Time and Depth	Depth of Casing	Depth* of Water	Piez.	Description of Strata	Strata: Leg	Strata: Reduced Level	Strata: Depth	Graphical Representation: SPT 'N' Value (0 10 20 30 40)	Sampling/In-Situ Testing: Depths	Type	No.	Blows	SPT N	Laboratory Testing: <425 %	WC %	PL %	LL %	ρ Mg/m³	Cu kN/m²	Additional Tests and Notes
				Grey concrete and red brick.			0.00													
				Greyish brown sandy CLAY. Sand is fine and medium. (LOWESTOFT FORMATION)			0.30		0.50	J	1									
				Firm brown gravelly sandy CLAY. Gravel is fine and medium angular flint and chalk. Sand is fine and medium. (LOWESTOFT FORMATION)			1.10		1.00	J	2									
				EXPLORATORY HOLE COMPLETED AT 2.00m BGL. NO GROUNDWATER ENCOUNTERED DURING DRILLING.			2.00													

*WATER: Standing water level; Water strikes

PIEZOMETER: Upper seal; Response zone; Lower seal

SAMPLE AND TEST KEY

- D Small disturbed sample
- B Bulk disturbed sample
- U Undisturbed sample
- P Piston sample
- J Disturbed jar sample
- ES Environmental soil sample
- W Water Sample
- S Standard penetration test
- C Cone penetration test
- K Permeability test

Blows: SPT blows for each 75mm increment (35) Undisturbed sample blow count

SPT N: N = SPT N value (blows after seating) N*120 = Total blows/penetration including seating

<425: Sample % passing 425 micron sieve

DEPTH All depths, level and thicknesses in metres

Geosphere Environmental Ltd
Unit 11, Brightwell Barns
Brightwell, Suffolk, IP10 0BJ
Telephone: 01603 298 076

HOLE No. WS9. SHEET 1 OF 1 PROJECT No. 4476,GI

GEL AGS BH BETA 4476,GI.WETHERDEN.08.01.2020.GPJ GINT STD AGS 3_1.GDT 13/01/20

Appendix 6 – Environmental Laboratory Test Results

Flora Sutherland
Geosphere Environmental Ltd
Brightwell Barns
Ipswich Road
Brightwell
Suffolk
IP10 0BJ

DETS Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 19-17200

Site Reference:	Progess Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR
Project / Job Ref:	4476,GI
Order No:	None Supplied
Sample Receipt Date:	10/12/2019
Sample Scheduled Date:	10/12/2019
Report Issue Number:	1
Reporting Date:	16/12/2019

Authorised by:

Dave Ashworth
Technical Manager

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate						
DETS Report No: 19-17200	**Date Sampled**	06/12/19	06/12/19	06/12/19	06/12/19	06/12/19
Geosphere Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Progess Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR	**TP / BH No**	WS2	WS3	WS5	WS6	WS7
Project / Job Ref: 4476,GI	**Additional Refs**	J2	J1	J1	J2	J1
Order No: None Supplied	**Depth (m)**	0.60	0.40	0.25	0.40	0.40
Reporting Date: 16/12/2019	**DETS Sample No**	451890	451891	451892	451893	451894

Determinand	**Unit**	**RL**	**Accreditation**					
Asbestos Screen (S)	N/a	N/a	**ISO17025**	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Sample Matrix (S)	Material Type	N/a	NONE					
Asbestos Type (S)	PLM Result	N/a	**ISO17025**					
pH	pH Units	N/a	**MCERTS**	8.1	7.7	8.7	10.8	7.4
Total Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Complex Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Free Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	**MCERTS**	40	32	17	< 10	41
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	**MCERTS**	0.04	0.03	0.02	< 0.01	0.04
Organic Matter	%	< 0.1	**MCERTS**	0.6	0.9	1.1	0.7	0.9
Arsenic (As)	mg/kg	< 2	**MCERTS**	11	8	8	7	5
Barium (Ba)	mg/kg	< 5	NONE	46	36	27	40	29
Beryllium (Be)	mg/kg	< 0.5	NONE	1.1	0.6	0.6	< 0.5	< 0.5
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	**MCERTS**	0.4	0.3	0.3	0.2	< 0.2
Chromium (Cr)	mg/kg	< 2	**MCERTS**	24	15	13	12	11
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	**MCERTS**	20	12	12	10	8
Lead (Pb)	mg/kg	< 3	**MCERTS**	14	15	19	9	10
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Molybdenum (Mo)	mg/kg	< 1	NONE	1.6	1.5	1.6	1.6	1.4
Nickel (Ni)	mg/kg	< 3	**MCERTS**	35	15	14	10	11
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3	< 3	< 3	< 3
Vanadium (V)	mg/kg	< 2	NONE	36	24	23	21	20
Zinc (Zn)	mg/kg	< 3	**MCERTS**	55	63	45	61	29

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
Subcontracted analysis (S)

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate						
DETS Report No: 19-17200	**Date Sampled**	06/12/19				
Geosphere Environmental Ltd	**Time Sampled**	None Supplied				
Site Reference: Progess Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR	**TP / BH No**	WS4				
Project / Job Ref: 4476,GI	**Additional Refs**	J2				
Order No: None Supplied	**Depth (m)**	0.40				
Reporting Date: 16/12/2019	**DETS Sample No**	451895				

Determinand	**Unit**	**RL**	**Accreditation**					
Asbestos Screen (S)	N/a	N/a	**ISO17025**	Detected				
Sample Matrix (S)	Material Type	N/a	NONE	Chrysotile present in microscopic asbestos sheeting board debris				
Asbestos Type (S)	PLM Result	N/a	**ISO17025**	Chrysotile				
pH	pH Units	N/a	**MCERTS**	6.5				
Total Cyanide	mg/kg	< 2	NONE	< 2				
Complex Cyanide	mg/kg	< 2	NONE	< 2				
Free Cyanide	mg/kg	< 2	NONE	< 2				
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	**MCERTS**	27				
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	**MCERTS**	0.03				
Organic Matter	%	< 0.1	**MCERTS**	4.3				
Arsenic (As)	mg/kg	< 2	**MCERTS**	6				
Barium (Ba)	mg/kg	< 5	NONE	62				
Beryllium (Be)	mg/kg	< 0.5	NONE	0.5				
W/S Boron	mg/kg	< 1	NONE	< 1				
Cadmium (Cd)	mg/kg	< 0.2	**MCERTS**	0.5				
Chromium (Cr)	mg/kg	< 2	**MCERTS**	11				
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2				
Copper (Cu)	mg/kg	< 4	**MCERTS**	23				
Lead (Pb)	mg/kg	< 3	**MCERTS**	88				
Mercury (Hg)	mg/kg	< 1	NONE	< 1				
Molybdenum (Mo)	mg/kg	< 1	NONE	1.8				
Nickel (Ni)	mg/kg	< 3	**MCERTS**	13				
Selenium (Se)	mg/kg	< 3	NONE	< 3				
Vanadium (V)	mg/kg	< 2	NONE	19				
Zinc (Zn)	mg/kg	< 3	**MCERTS**	433				

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{o}C
Subcontracted analysis (S)

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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 19-17200	**Date Sampled**	06/12/19	06/12/19	06/12/19	06/12/19	06/12/19
Geosphere Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Progess Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR	**TP / BH No**	WS2	WS3	WS5	WS6	WS7
Project / Job Ref: 4476,GI	**Additional Refs**	J2	J1	J1	J2	J1
Order No: None Supplied	**Depth (m)**	0.60	0.40	0.25	0.40	0.40
Reporting Date: 16/12/2019	**DETS Sample No**	451890	451891	451892	451893	451894

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.13	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.15	0.30	0.15
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.13	0.25	0.11
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.30	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.13	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.36	0.44	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.27	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.23	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.24	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	2.3	< 1.6

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{0}C

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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 19-17200	**Date Sampled**	06/12/19				
Geosphere Environmental Ltd	**Time Sampled**	None Supplied				
Site Reference: Progess Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR	**TP / BH No**	WS4				
Project / Job Ref: 4476,GI	**Additional Refs**	J2				
Order No: None Supplied	**Depth (m)**	0.40				
Reporting Date: 16/12/2019	**DETS Sample No**	451895				

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1				
Acenaphthylene	mg/kg	< 0.1	MCERTS	0.14				
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1				
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1				
Phenanthrene	mg/kg	< 0.1	MCERTS	0.65				
Anthracene	mg/kg	< 0.1	MCERTS	0.17				
Fluoranthene	mg/kg	< 0.1	MCERTS	1.15				
Pyrene	mg/kg	< 0.1	MCERTS	1				
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.66				
Chrysene	mg/kg	< 0.1	MCERTS	0.56				
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	1.02				
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.31				
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.61				
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.54				
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1				
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.50				
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	7.3				

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{0}C

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Soil Analysis Certificate - TPH CWG Banded						
DETS Report No: 19-17200	**Date Sampled**	06/12/19	06/12/19	06/12/19	06/12/19	06/12/19
Geosphere Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Progess Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR	**TP / BH No**	WS2	WS3	WS5	WS6	WS7
Project / Job Ref: 4476,GI	**Additional Refs**	J2	J1	J1	J2	J1
Order No: None Supplied	**Depth (m)**	0.60	0.40	0.25	0.40	0.40
Reporting Date: 16/12/2019	**DETS Sample No**	451890	451891	451892	451893	451894

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	< 3	12	< 3
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	14	< 3
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21	< 21	26	< 21
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Total >C5 - C35	mg/kg	< 42	NONE	< 42	< 42	< 42	< 42	< 42

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C

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Soil Analysis Certificate - TPH CWG Banded						
DETS Report No: 19-17200	**Date Sampled**	06/12/19				
Geosphere Environmental Ltd	**Time Sampled**	None Supplied				
Site Reference: Progess Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR	**TP / BH No**	WS4				
Project / Job Ref: 4476,GI	**Additional Refs**	J2				
Order No: None Supplied	**Depth (m)**	0.40				
Reporting Date: 16/12/2019	**DETS Sample No**	451895				

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01				
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05				
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2				
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2				
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3				
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3				
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10				
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21				
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01				
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05				
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2				
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2				
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2				
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3				
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10				
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21				
Total >C5 - C35	mg/kg	< 42	NONE	< 42				

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{o}C

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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 19-17200	**Date Sampled**	06/12/19	06/12/19	06/12/19	06/12/19	06/12/19
Geosphere Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Progess Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR	**TP / BH No**	WS2	WS3	WS5	WS6	WS7
Project / Job Ref: 4476,GI	**Additional Refs**	J2	J1	J1	J2	J1
Order No: None Supplied	**Depth (m)**	0.60	0.40	0.25	0.40	0.40
Reporting Date: 16/12/2019	**DETS Sample No**	451890	451891	451892	451893	451894

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{o}C

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Soil Analysis Certificate - BTEX / MTBE							
DETS Report No: 19-17200	**Date Sampled**	06/12/19					
Geosphere Environmental Ltd	**Time Sampled**	None Supplied					
Site Reference: Progess Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR	**TP / BH No**	WS4					
Project / Job Ref: 4476,GI	**Additional Refs**	J2					
Order No: None Supplied	**Depth (m)**	0.40					
Reporting Date: 16/12/2019	**DETS Sample No**	451895					

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2				
Toluene	ug/kg	< 5	MCERTS	< 5				
Ethylbenzene	ug/kg	< 2	MCERTS	< 2				
p & m-xylene	ug/kg	< 2	MCERTS	< 2				
o-xylene	ug/kg	< 2	MCERTS	< 2				
MTBE	ug/kg	< 5	MCERTS	< 5				

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{o}C

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Soil Analysis Certificate - Sample Descriptions
DETS Report No: 19-17200
Geosphere Environmental Ltd
Site Reference: Progess Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR
Project / Job Ref: 4476,GI
Order No: None Supplied
Reporting Date: 16/12/2019

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
451890	WS2	J2	0.60	14.5	Brown loamy clay
451891	WS3	J1	0.40	13.7	Brown loamy clay with stones
451892	WS5	J1	0.25	13.1	Brown loamy clay with brick and concrete
451893	WS6	J2	0.40	9.1	Brown sandy clay with concrete
451894	WS7	J1	0.40	10.8	Brown loamy sand
451895	WS4	J2	0.40	13.7	Brown loamy sand with stones and vegetation

Moisture content is part of procedure E003 & is not an accredited test
Insufficient Sample I/S
Unsuitable Sample U/S

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Soil Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 19-17200
Geosphere Environmental Ltd
Site Reference: Progess Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR
Project / Job Ref: 4476,GI
Order No: None Supplied
Reporting Date: 16/12/2019

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

Flora Sutherland
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UKAS TESTING
4480

DETS Report No: 19-17209

Site Reference:	Progress Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR
Project / Job Ref:	4476,GI
Order No:	None Supplied
Sample Receipt Date:	10/12/2019
Sample Scheduled Date:	11/12/2019
Report Issue Number:	1
Reporting Date:	16/12/2019

Authorised by:

Dave Ashworth
Technical Manager

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Soil Analysis Certificate						
DETS Report No: 19-17209	**Date Sampled**	06/12/19	06/12/19	06/12/19		
Geosphere Environmental Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied		
Site Reference: Progress Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR	**TP / BH No**	WS3	WS6	WS9		
Project / Job Ref: 4476,GI	**Additional Refs**	J2	J3	J2		
Order No: None Supplied	**Depth (m)**	0.80	1.45	1.00		
Reporting Date: 16/12/2019	**DETS Sample No**	451931	451932	451933		

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	MCERTS	8.2	8.1	8.0		
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	< 10	< 10	< 10		
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	< 0.01	< 0.01	< 0.01		

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C
Subcontracted analysis (S)

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Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 19-17209	
Geosphere Environmental Ltd	
Site Reference: Progress Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR	
Project / Job Ref: 4476,GI	
Order No: None Supplied	
Reporting Date: 16/12/2019	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
451931	WS3	J2	0.80	14.7	Brown loamy clay with chalk
451932	WS6	J3	1.45	13.4	Brown clay
451933	WS9	J2	1.00	12.3	Brown sandy clay

Moisture content is part of procedure E003 & is not an accredited test
Insufficient Sample I/S
Unsuitable Sample U/S

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4480

Soil Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 19-17209
Geosphere Environmental Ltd
Site Reference: Progress Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR
Project / Job Ref: 4476,GI
Order No: None Supplied
Reporting Date: 16/12/2019

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

Flora Sutherland
Geosphere Environmental Ltd
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Ipswich Road
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Suffolk
IP10 0BJ

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Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
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ME17 2JN
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UKAS TESTING
4480

DETS Report No: 20-00112

Site Reference:	Progess Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR
Project / Job Ref:	4476,GI
Order No:	None Supplied
Sample Receipt Date:	10/12/2019
Sample Scheduled Date:	09/01/2020
Report Issue Number:	1
Reporting Date:	14/01/2020

Authorised by:

Dave Ashworth
Technical Manager

DETS Ltd
Unit 1, Rose Lane Industrial Estate
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Lenham Heath
Maidstone
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Tel : 01622 850410

UKAS TESTING
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Soil Analysis Certificate						
DETS Report No: 20-00112	**Date Sampled**	06/12/19				
Geosphere Environmental Ltd	**Time Sampled**	None Supplied				
Site Reference: Progess Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR	**TP / BH No**	WS4				
Project / Job Ref: 4476,GI	**Additional Refs**	J2				
Order No: None Supplied	**Depth (m)**	0.40				
Reporting Date: 14/01/2020	**DETS Sample No**	455216				

Determinand	Unit	RL	Accreditation					
Asbestos Quantification (S)	%	< 0.001	ISO17025	0.008				

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
Subcontracted analysis (S)

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D Dried
AR As Received

Appendix 7 – Photographs

Photograph 1

Photograph 2

GEOSPHERE ENVIRONMENTAL

DESCRIPTION

Photograph 1

WS2

Photograph 2

WS8

Photograph 3

WS3

Photograph 3

Photograph 4

Photograph 4

WS5

PROJECT

Progress Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR

PROJECT NUMBER

4476,GI

TITLE

Selected Photographs Relating To The Ground Investigation

DATE

16/01/2020

Photograph 5

Photograph 6

GEOSPHERE ENVIRONMENTAL

DESCRIPTION

Photograph 5
WS6

Photograph 6
WS7

PROJECT
Progress Farm, Base Green Road, Wetherden, Suffolk, IP14 3LR

PROJECT NUMBER
4476,GI

TITLE
Selected Photographs Relating To The Ground Investigation

DATE
16/01/2020

GEOSPHERE ENVIRONMENTAL

Ec Ecology.

Fr Flood Risk.

Ge Geotechnical.

En Environmental.

Kw Knotweed.

GEOSPHERE ENVIRONMENTAL LTD

Brightwell Barns, Ipswich Road, Brightwell, Suffolk, IP10 0BJ

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