Verification Report

Plots 3 & 4
Land off Worlds End Road
Tydd St Mary
Spalding
PE13 5QW

Prepared for:

R K Wilson Builders Ltd
Sandpits Farm
Wisbech Road
Spalding
PE12 9AQ

EPS Reference Number:	UK18.4095d
Date Issued:	21st October 2020
Report Status:	Issue 1

PLOTS 3 AND 4, LAND OFF WORLDS END ROAD, TYDD ST MARY

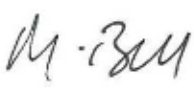
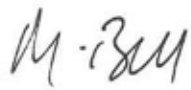
NON-TECHNICAL CLIENT SUMMARY

This report presents the findings of a soil validation exercise which was undertaken to confirm that an appropriate thickness/ quality of imported material has been installed within the private gardens and soft landscaped areas at the site. Pertinent findings and conclusions are summarised as follows:

- Previous investigations carried out by EPS in 2019 identified that high levels of lead were present in shallow soils at the land off Worlds End Road in Tydd St Mary. To control the risks associated with future site users interacting with the soils, it was recommended that all areas of proposed gardens and soft landscaping were to be covered by a minimum of 100mm of clean topsoil.
- EPS was commissioned to assess and inspect the quality and thickness of imported topsoil in plots 3 and 4 (with the remaining plots 2 and 5-6 to be validated at a later date once their development was complete), which was completed by the developer in September 2020; to ensure the remedial works had been carried out to the required standard.
- The replacement topsoil was sourced from Total Aggregates Ltd with environmental analysis supplied by KIWA CMT Testing Ltd. In addition, delivery notes were provided by the haulier, with all the supporting paperwork considered to be present and correct. To compliment the initial laboratory data on soil quality, further testing was carried out by EPS (to confirm consistency and quality) which found the soils from this source to meet the relevant requirements and to be clean and suitable for use within domestic gardens. This confirmed the findings of the physical inspection, with the soils appearing to be of consistently high quality throughout. The thickness of topsoil was also triple the recommended minimum thickness.
- Overall, the control measures which have been implemented in the garden/ soft landscaped areas at plots 3 and 4 are considered to have met the requirements of the remedial strategy and are considered safe and suitable for use with no further action or assessment considered necessary.
- A copy of this report should be provided to the Environmental Health Department of South Holland District Council and the NHBC so that it may be incorporated into their land quality records and to satisfy associated planning conditions for the relevant plots.

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

Project Reference:	UK18.4095d
Title:	Verification Report – Plots 3 and 4, Land off Worlds End Road, Tydd St Mary
Client:	R K Wilson Builders Ltd
Date:	21st October 2020
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:**
		
Shaun Cahill	Marcus Bell	Marcus Bell
Consultant	Associate Director	Associate Director

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

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

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

Where ground investigations have been conducted, these have been limited to the level of detail required for the site in order to achieve the objectives of the investigation.

The report has been written, reviewed and authorised by the persons listed above. It has also undergone EPS' 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 2019 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.

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1 INTRODUCTION

In September 2020, Environmental Protection Strategies Ltd (EPS) was commissioned by R K Wilson Builders Ltd. to produce a Verification Report following the installation of a clean topsoil cover system within private garden areas associated with the residential development of a site known as Land off Worlds End Road, Tydd St Mary, Spalding, PE13 5QW ('the site') (see Figure 1).

Redevelopment work at the property is to include the demolition of the previous farmyard buildings and subsequent construction of six residential dwellings (plots 1-6) with private gardens and associated infrastructure works under South Holland District Council's planning reference: H21-0859-16.

It is worth noting that the work undertaken by EPS refers to the verification of plots 2-6 only, and this report initially only relates to plots 3 and 4. A subsequent EPS report will cover plots 2, 5 & 6 although EPS are not currently involved in the verification of plot 1. The full discharge of relevant contamination conditions on the above planning consent will only be achieved once all plots are remediated and verified.

This report presents a summary of a recent soil validation exercise undertaken by EPS to ensure the following contaminant linkages will not become active post redevelopment works.

Source	Pathway	Receptor
Contaminated soil	Ingestion of soil through direct contact, eating or smoking with dirty hands	Site users
	Inhalation of fugitive dusts	
	Direct uptake and / or adherence of contaminated soil to vegetation and subsequent ingestion	

1.1 Previous Reports

This work has been undertaken subsequent to recommendations made within a Phase I Geo-Environmental Desk Study, Phase II Geo-Environmental Assessment and Remedial Strategy and Method Statement conducted by EPS in July 2018, May 2019 and February 2020 respectively. For background and context, it is recommended that the reader review the following reports:

- *Phase I Geo-Environmental Desk Study – Land off Worlds End Road, Tydd St Mary, Spalding, PE13 5QW– July 2018* (Report Ref: UK18.4095).
- *Phase II Geo-Environmental Assessment – Land off Worlds End Road, Tydd St Mary, Spalding, PE13 5QW– May 2019* (Report Ref: UK18.4095b).
- *Remedial Strategy & Method Statement – Land off Worlds End Road, Tydd St Mary, Spalding, PE13 5QW– February 2020* (Report Ref: UK18.4095c).

The above works resulted in the following key findings:

- The Phase I Desk Study found that the site was historically developed since the late 1800's for use as a farmyard. Surrounding land use has generally been a combination of agricultural and residential.

- Intrusive investigations involved the excavation of eight trial pits, which found the ground conditions to be topsoil in the western half of the site (up to 0.25m) and made ground in the eastern half of the site (up to 0.85m) overlying natural, soft to firm, sandy, silty clays of the Tidal Flat Deposits present to at least 1.5m below ground level (bgl).

- Shallow soil sampling indicated that the subsurface materials present were not of suitable quality to fulfil planning requirements for modern domestic gardens or areas of soft landscaping due to high levels of lead. Therefore, it was recommended that a clean cover system of at least **100mm** of imported soils was placed in garden areas.

- The Remedial Method Statement echoed the recommendations made within the Phase II Geo-Environmental Assessment and also noted that upon completion of the installation of the cover system, the cover system should be verified and reported to South Holland District Council and the NHBC for approval.

1.2 Objectives & Scope of Works

The objective of these works was to provide confirmatory evidence to demonstrate that a control measure comprising a soil-based cover system has been properly installed at the site as specified in previous report.

The scope of works includes the following:

- The findings of an EPS engineer who will visit the site and confirm whether the remedial strategy has been implemented to the required standard, or if further work is necessary for this to be achieved. The investigation should comprise the formation of number of hand auger boreholes to confirm the presence and consistency of the installed topsoil within the areas outlined above. Photographic records should be taken to be included as evidence of the above.

- Any imported topsoil used to reinstate the external garden and peripheral soft landscaped areas to final finished levels should be accompanied by appropriate laboratory analysis to demonstrate its chemical and physical suitability for use. The analysis should include TPH, Asbestos, PAHs and Metals and should also comply with the relevant physical parameters outlined within the British Standard BS 3882:2015 '*Specification for Topsoil and Requirements for Use*'. If this information cannot be provided by the supplier, then independent testing would be necessary to ensure the quality of the imported topsoil meets the required standard.

The verification works, both the physical inspection and the gathering of supporting information was conducted by EPS in October 2020, the findings of which are detailed in the sections below:

1.3 Limitations and Constraints

The purpose of this report is to present the findings of a soil validation exercise 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 the contaminants 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. 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 localised ground controls could influence the spread of contaminants within the site subsurface. For this reason, it is possible that samples collected during the investigation may not represent the conditions across the entire site.

Where third party information has been consulted during compilation of this report, the validity of any information that has been supplied, and which are referenced in the report have been assessed as far as possible by EPS, however EPS cannot guarantee the validity of these data.

EPS Ltd cannot confirm that Japanese Knotweed rhizomes do not exist at the site, this is due to the difficulty of identifying the plant, especially in the early stages of growth. It is recommended that if Japanese Knotweed, (or any other similarly invasive plants,) is suspected to be present, a specialist contractor should be commissioned to make a detailed assessment.

2 VALIDATION WORKS

Following redevelopment of the residential dwellings and formation of the associated private garden areas, EPS was commissioned to independently validate the thickness and quality of the installed cover system. EPS attended the site on Monday 5th October 2020 to complete the validation works, the details of this work are included within the below sections with selected site photographs included as Appendix A.

2.1 Summary of Investigations

2.1.1 Location and Thickness of Imported Material

The cover system was installed at plots 3 and 4 in an initial phase (with the remaining plots 2, 5 and 6 to be validated at a later date), and was fully established in all of the required private gardens and soft landscaped areas prior to the EPS site inspection, which was undertaken on the 5th October 2020. To assess the imported topsoil thickness and physical consistency, four hand auger boreholes (HA1-HA4) were drilled at plots 3 and 4.

Evidence provided by the developer indicates that a total of approximately 137 tonnes of topsoil was imported to the site, to reinstate the garden/ landscaped areas, which had been excavated to accommodate the required cover system thickness. The replacement topsoil was all delivered directly from and by Total Aggregates Ltd. (Boston) on the 29th September 2020 and the delivery notes are included as Appendix B.

A borehole location plan, indicating the position of each test hole is included in this report as Figure 2.

2.1.2 Chemical Verification of Imported Material

Independent testing of the imported topsoil was undertaken once all the material had been delivered, to ensure that the material was consistent with the quality outlined by the laboratory analysis provided by the supplier.

Laboratory analysis of the imported material was provided by Kiwa CMT Testing on the 7th June 2019, EPS then attended on the 5th October 2020, to undertake independent testing of the supplied material, to ensure consistency and suitably for the proposed use.

Topsoil certification documentation provided by the supplier (Ref: 77429 / 59594) and independent testing data sheets facilitated by EPS are included as Appendix C.

2.2 Findings

2.2.1 Ground Conditions

EPS confirmed that a minimum of 100mm of imported topsoil had been installed within the private gardens and soft landscaped areas associated with the newly established dwellings (plots 3 and 4). Borehole logs, recording the thickness of topsoil observed at each position are shown in Appendix D.

Ground conditions across all sampling locations (HA1-HA4) were very consistent with the recovered soils recorded as a dark brown, slightly clayey, sandy, silty topsoil extending to a maximum depth of 0.3m overlying dark orangish brown, slightly gravelly, sandy, silty clay that progressed beyond the maximum depth of investigation. Topsoil materials imported to the site did not include any visual or olfactory evidence of contamination including common made ground indicators such as brick or concrete fragments.

2.3 Evaluation of Findings

As the site has been redeveloped for a residential end use with areas of private gardens and landscaping, laboratory analysis of the topsoil (provided by the supplier and independently verified by EPS) has been compared against generic screening criteria relevant to a residential (with home-grown produce) land use setting, which is consistent with the previous Phase II assessment. The technical framework used to derive the screening values and the documents in which they are published are summarised in that report.

The reported concentrations of the contaminants fall significantly below the relevant screening criteria. As such the imported topsoil material at the site is considered suitable for use in the context of the proposed land use setting. This process has confirmed the quality of the imported material, as initially declared within the soil reports provided by KIWA CMT Testing as well as the subsequent independent testing completed by EPS in October 2020, once the material had been delivered to site and was sampled in-situ.

The analysis of the source material provided by Total Aggregates Ltd. has confirmed that the material sampled prior to delivery met the requirements of BS3882:2015, which include physical and chemical parameter limits, which define a minimum standard for the soils present in residential gardens. The physical evidence gathered on site supported these findings with the topsoil appearing to be high quality and very consistent throughout each of the landscaped areas assessed.

It should be also recognised that the cover thickness of 300mm is triple that of the minimum requirement as outlined within the remedial strategy issued by EPS in February 2020.

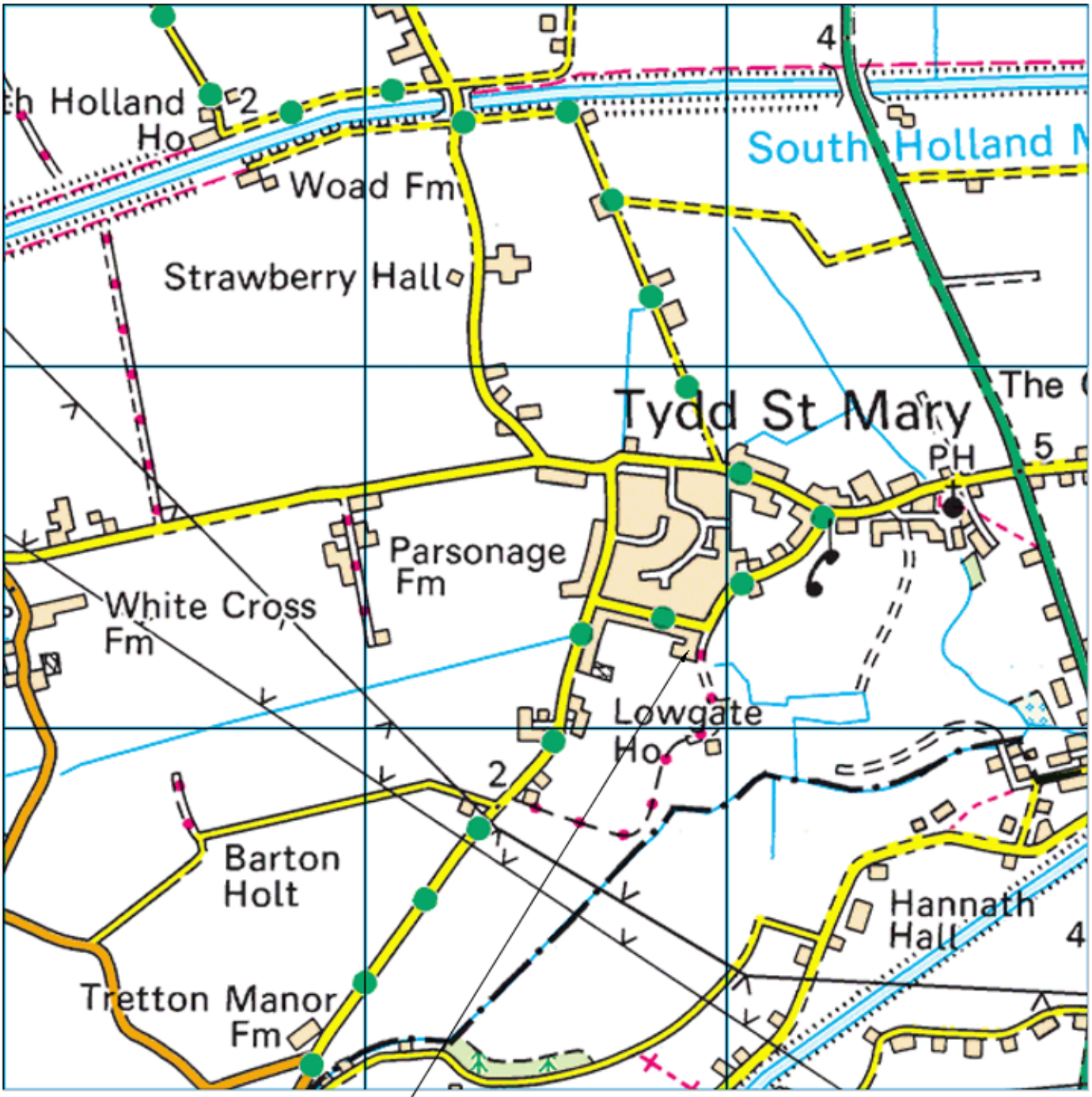
3 VERIFICATION STATEMENT

On the basis of the information provided by the developer and the results of the detailed validation sampling described in the report, it is concluded by EPS that the imported topsoil is suitable for use at the site and that the remedial strategy as declared in February 2020 has been carried out to the required standard.

Overall, the control measures which have been implemented in the private garden/ soft landscaped areas of the new developments (plots 3 and 4) are considered to have met the requirements of the remedial strategy and no further action or assessment is viewed necessary. This process is considered to have reduced the risks posed to site users by subsurface soils to acceptable levels and plots 3 and 4 are deemed fit for their proposed residential end use. A subsequent EPS report will cover plots 2, 5 & 6 although EPS are not currently involved in the verification of plot 1.

It is recommended that a copy of this report is provided to the Environmental Health Department of South Holland District Council and the NHBC so that it may be incorporated into their land quality records and to satisfy associated planning conditions of the relevant plots.

FIGURES



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Licence Number: 100054115

Title:	**Site Location Plan**
Project:	Plots 3 and 4, Land off Worlds End Road, PE13 5QW
Fig No:	1
Scale:	NTS
Drawn By:	SC
Approved By:	WE
Job No:	UK18.4095d
Dwg No:	TyddStMary/1020/01
Date:	October 2020



Approximate Site Boundary

Approximate Borehole Location

Please note: Image supplied by client

eps	**Title:**	**Borehole Location Plan**	
	Project:	Plots 3 and 4, Land off Worlds End Road, PE13 5QW	Scale: NTS
			Drawn By: SC / Approved By: WE
	Fig No:	2	Job No: UK18.4095d
			Dwg No: TyddStMary/1020/02
			Date: October 2020

APPENDIX A

Selected Site Photographs



Approximate Site Boundary

(1) Approximate Photo Location

Please note: Image supplied by client

Title:	**Photo Location Plan**		
Project:	Plots 3 and 4, Land off Worlds End Road, PE13 5QW	Scale:	NTS
		Drawn By: SC	Approved By: WE
Appendix: A		Job No:	UK18.4095d
		Dwg No:	TyddStMary/1020/A
		Date:	October 2020

Photo 1: Photograph taken from the front of the newly developed property (plot 3).



Photo 2: Image showing the area to the rear of the dwelling (plot 3).



Photo 3: View showing the location of HA3 (plot 4).



Photo 4: Image showing the nature of the topsoil profile installed within the garden areas.



Photo 5: Photograph showing the full depth of 300mm topsoil in HA3.



Photo 6: View showing the location of HA4 (plot 4).



APPENDIX B

Topsoil Delivery Notes

TOTAL Aggregates

Delivery Ticket

30669

Office:
Melvyn Robert House,
Bakerbrook Industrial Estate,
Wigwam Lane, Hucknall,
Nottingham NG15 7SZ
Tel: 0115 963 7444
Fax: 0115 963 7445

Customer's Name	Date
R K Wilson	29/9/20

Place of Loading: Railhead

Haulage Contractor	Driver's Name	Reg. No.
TA	Paul	FN14 LXT

Delivery Address: Worlds End Lane, Tydd St mary

Product Description: Screened Topsoil

No. of Loads: 1

8 Wheeler	✓	Skips	
6 Wheeler		Others (please specify)	

	TONNES	KILOS
Gross		
Tare		
Nett	19·10	

Waiting/Standing Time:
Customer Signature: X
Print Name: X

You are required by law to keep this document for a minimum of two years

THE AGGREGATE WAS PRODUCED UNDER A QUALITY MANAGEMENT SCHEME CONFORMING TO THE AGGREGATES QUALITY PROTOCOL

TOTAL Aggregates

Delivery Ticket

48987

Office:
Melvyn Robert House,
Bakerbrook Industrial Estate,
Wigwam Lane, Hucknall,
Nottingham NG15 7SZ
Tel: 0115 963 7444
Fax: 0115 963 7445

Customer's Name	Date
R K Wilson Builders LTD	29/9/20

Place of Loading: Railhead Boston

Haulage Contractor	Driver's Name	Reg. No.
	CRAIG	FP69 WWA

Delivery Address: Worlds End Lane
Tydd St mary Wisbech

Product Description: Top Soil

No. of Loads: one

8 Wheeler	✓	Skips	
6 Wheeler		Others (please specify)	

	TONNES	KILOS
Gross		
Tare		
Nett	19	850

Waiting/Standing Time:
Customer Signature: Dale Wilson
Print Name:

You are required by law to keep this document for a minimum of two years

THE AGGREGATE WAS PRODUCED UNDER A QUALITY MANAGEMENT SCHEME

TOTAL Aggregates

Delivery Ticket

30673

Office:
Melvyn Robert House,
Bakerbrook Industrial Estate,
Wigwam Lane, Hucknall,
Nottingham NG15 7SZ
Tel: 0115 963 7444
Fax: 0115 963 7445

Customer's Name	Date
RK Wilson Builders	29/9/20

Place of Loading: Railhead

Haulage Contractor	Driver's Name	Reg. No.
TA	Paul	FN14 LXT

Delivery Address: Worlds End Lane Tydd ST Mary

Product Description: Screend Topsoil

No. of Loads: 1

8 Wheeler	✓	Skips	
6 Wheeler		Others (please specify)	

	TONNES	KILOS
Gross		
Tare		
Nett	18·85	

Waiting/Standing Time
Customer Signature X [signature]
Print Name X [signature]

You are required by law to keep this document for a minimum of two years

THE AGGREGATE WAS PRODUCED UNDER A QUALITY MANAGEMENT SCHEME CONFORMING TO THE AGGREGATES QUALITY PROTOCOL

TOTAL Aggregates

Delivery Ticket

30671

Office:
Melvyn Robert House,
Bakerbrook Industrial Estate,
Wigwam Lane, Hucknall,
Nottingham NG15 7SZ
Tel: 0115 963 7444
Fax: 0115 963 7445

Customer's Name	Date
RK Wilson Builders	29/9/20

Place of Loading: Railhead

Haulage Contractor	Driver's Name	Reg. No.
TA	Paul	FN14 LXT

Delivery Address: Worlds End Lane Tydd ST Mary

Product Description: Screened Topsoil

No. of Loads: 1

8 Wheeler	✓	Skips	
6 Wheeler		Others (please specify)	

	TONNES	KILOS
Gross		
Tare		
Nett	18·95	

Waiting/Standing Time
Customer Signature X [signature]
Print Name X D Wilson

You are required by law to keep this document for a minimum of two years

THE AGGREGATE WAS PRODUCED UNDER A QUALITY MANAGEMENT SCHEME CONFORMING TO THE AGGREGATES QUALITY PROTOCOL

TOTAL Aggregates

Delivery Ticket

44599

Office:
Melvyn Robert House,
Bakerbrook Industrial Estate,
Wigwam Lane, Hucknall,
Nottingham NG15 7SZ
Tel: 0115 963 7444
Fax: 0115 963 7445

Customer's Name: R K WILSON		Date: 29 9 10	
Place of Loading: BOSTON R H			
Haulage Contractor: HAZE	Driver's Name:	Reg. No.	
Delivery Address: TOD ST MARY			
Product Description: TOPSOIL			
No. of Loads			
8 Wheeler		Skips	
6 Wheeler		Others (please specify)	
	TONNES	KILOS	
Gross			
Tare			
Nett	20 T		
Waiting/Standing Time			
Customer Signature			
Print Name			

You are required by law to keep this document for a minimum of two years

THE AGGREGATE WAS PRODUCED UNDER A QUALITY MANAGEMENT SCHEME CONFORMING TO THE AGGREGATES QUALITY PROTOCOL

TOTAL Aggregates

Delivery Ticket

44598

Office:
Melvyn Robert House,
Bakerbrook Industrial Estate,
Wigwam Lane, Hucknall,
Nottingham NG15 7SZ
Tel: 0115 963 7444
Fax: 0115 963 7445

Customer's Name: R K WILSON		Date: 29 9 10	
Place of Loading: BOSTON R H			
Haulage Contractor: HAZE	Driver's Name:	Reg. No.	
Delivery Address: TOD ST MARY			
Product Description: TOPSOIL			
No. of Loads			
8 Wheeler		Skips	
6 Wheeler		Others (please specify)	
	TONNES	KILOS	
Gross			
Tare			
Nett	20 100		
Waiting/Standing Time			
Customer Signature			
Print Name			

You are required by law to keep this document for a minimum of two years

THE AGGREGATE WAS PRODUCED UNDER A QUALITY MANAGEMENT SCHEME CONFORMING TO THE AGGREGATES QUALITY PROTOCOL

TOTAL Aggregates

Delivery Ticket

44595

Office:
Melvyn Robert House,
Bakerbrook Industrial Estate,
Wigwam Lane, Hucknall,
Nottingham NG15 7GZ
Tel: 0115 963 7444
Fax: 0115 963 7445

Customer's Name			Date
R K WILSON			29 9 20
Place of Loading			
BOSTON B H			
Haulage Contractor	Driver's Name		Reg. No.
HAZE			SK12 RKW
Delivery Address			
TYDD ST MARY			
Product Description			
TOPSOIL			
No. of Loads			
8 Wheeler		Skips	
6 Wheeler		Others (please specify)	
	TONNES		KILOS
Gross			
Tare			
Nett	30 150		
Waiting/Standing Time			
Customer Signature			
Print Name			

You are required by law to keep this document for a minimum of two years

THE AGGREGATE WAS PRODUCED UNDER A QUALITY MANAGEMENT SCHEME CONFORMING TO THE AGGREGATES QUALITY PROTOCOL

APPENDIX C

Topsoil Certification

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
CB23 6JN

Attention :	Shaun Cahill
Date :	13th October, 2020
Your reference :	UK18.4095D
Our reference :	Test Report 20/13722 Batch 1
Location :	Plots 3 and 4 Land off Worlds End Road
Date samples received :	7th October, 2020
Status :	Final report
Issue :	1

Four samples were received for analysis on 7th October, 2020 of which four 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.

Authorised By:

Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Client Name: EPS Ltd
Reference: UK18.4095D
Location: Plots 3 and 4 Land off Worlds End Road
Contact: Shaun Cahill
EMT Job No: 20/13722

Report : Solid

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

EMT Sample No.	1	2	3	4							LOD/LOR	Units	Method No.
Sample ID	HA1	HA2	HA3	HA4									
Depth	0.10-0.30	0.10-0.30	0.10-0.30	0.10-0.30									
COC No / misc													
Containers	J	J	J	J									
Sample Date	05/10/2020	05/10/2020	05/10/2020	05/10/2020									
Sample Type	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam									
Batch Number	1	1	1	1									
Date of Receipt	07/10/2020	07/10/2020	07/10/2020	07/10/2020									
Arsenic [M]	13.2	14.0	13.4	13.2							<0.5	mg/kg	TM30/PM15
Cadmium [M]	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM30/PM15
Chromium [M]	50.3	54.1	47.5	49.7							<0.5	mg/kg	TM30/PM15
Copper [M]	36	31	30	29							<1	mg/kg	TM30/PM15
Lead [M]	23	22	22	22							<5	mg/kg	TM30/PM15
Mercury [M]	0.1	0.5	0.2	0.4							<0.1	mg/kg	TM30/PM15
Nickel [M]	19.8	21.2	19.5	19.1							<0.7	mg/kg	TM30/PM15
Selenium [M]	<1	<1	<1	<1							<1	mg/kg	TM30/PM15
Total Sulphate as SO4 [M]	1066	1125	1079	1034							<50	mg/kg	TM50/PM29
Zinc [M]	73	73	73	76							<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene [M]	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03							<0.03	mg/kg	TM4/PM8
Acenaphthene [M]	<0.05	<0.05	<0.05	<0.05							<0.05	mg/kg	TM4/PM8
Fluorene [M]	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Phenanthrene [M]	0.04	0.05	<0.03	0.06							<0.03	mg/kg	TM4/PM8
Anthracene [#]	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Fluoranthene [M]	0.11	0.14	0.08	0.14							<0.03	mg/kg	TM4/PM8
Pyrene [#]	0.09	0.14	0.08	0.13							<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene [#]	<0.06	0.10	<0.06	0.09							<0.06	mg/kg	TM4/PM8
Chrysene [M]	0.05	0.09	0.05	0.08							<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene [M]	0.11	0.29	0.12	0.16							<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene [#]	0.05	0.17	0.05	0.09							<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene	<0.04	0.13	<0.04	0.05							<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene [#]	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene [#]	<0.04	0.16	<0.04	0.08							<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	1.3	<0.6	0.9							<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.08	0.21	0.09	0.12							<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.03	0.08	0.03	0.04							<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	91	94	93	96							<0	%	TM4/PM8
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15							<0.15	mg/kg	TM26/PM21
Natural Moisture Content	32.5	31.2	32.4	25.0							<0.1	%	PM4/PM0
Hexavalent Chromium [#]	<0.3	<0.3	<0.3	<0.3							<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) [M]	0.2057	0.2855	0.2289	0.2509							<0.0015	g/l	TM38/PM20
Chromium III	50.3	54.1	47.5	49.7							<0.5	mg/kg	NONE/NONE
Total Cyanide [M]	<0.5	<0.5	<0.5	<0.5							<0.5	mg/kg	TM89/PM45
Organic Matter	3.8	3.8	3.8	3.9							<0.2	%	TM21/PM24

Please see attached notes for all abbreviations and acronyms

Client Name: EPS Ltd
Reference: UK18.4095D
Location: Plots 3 and 4 Land off Worlds End Road
Contact: Shaun Cahill
EMT Job No: 20/13722

Report : Solid

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

EMT Sample No.	1	2	3	4							LOD/LOR	Units	Method No.
Sample ID	HA1	HA2	HA3	HA4									
Depth	0.10-0.30	0.10-0.30	0.10-0.30	0.10-0.30									
COC No / misc													
Containers	J	J	J	J									
Sample Date	05/10/2020	05/10/2020	05/10/2020	05/10/2020									
Sample Type	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam									
Batch Number	1	1	1	1									
Date of Receipt	07/10/2020	07/10/2020	07/10/2020	07/10/2020									
pH [#M]	7.81	7.76	7.75	7.82							<0.01	pH units	TM73/PM11
Sample Type	Clayey Loam	Clayey Loam	Clayey Loam	Clayey Loam								None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown								None	PM13/PM0
Other Items	stones	stones	stones	none								None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: EPS Ltd
Reference: UK18.4095D
Location: Plots 3 and 4 Land off Worlds End Road
Contact: Shaun Cahill

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). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

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

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
20/13722	1	HA1	0.10-0.30	1	10/10/2020	**General Description (Bulk Analysis)**	soil.stones
					10/10/2020	**Asbestos Fibres**	NAD
					10/10/2020	**Asbestos ACM**	NAD
					10/10/2020	**Asbestos Type**	NAD
					10/10/2020	**Asbestos Level Screen**	NAD
20/13722	1	HA2	0.10-0.30	2	10/10/2020	**General Description (Bulk Analysis)**	soil.stones
					10/10/2020	**Asbestos Fibres**	NAD
					10/10/2020	**Asbestos ACM**	NAD
					10/10/2020	**Asbestos Type**	NAD
					10/10/2020	**Asbestos Level Screen**	NAD
20/13722	1	HA3	0.10-0.30	3	10/10/2020	**General Description (Bulk Analysis)**	soil.stones
					10/10/2020	**Asbestos Fibres**	NAD
					10/10/2020	**Asbestos ACM**	NAD
					10/10/2020	**Asbestos Type**	NAD
					10/10/2020	**Asbestos Level Screen**	NAD
20/13722	1	HA4	0.10-0.30	4	10/10/2020	**General Description (Bulk Analysis)**	soil.stones
					10/10/2020	**Asbestos Fibres**	NAD
					10/10/2020	**Asbestos ACM**	NAD
					10/10/2020	**Asbestos Type**	NAD
					10/10/2020	**Asbestos Level Screen**	NAD

Client Name: EPS Ltd
Reference: UK18.4095D
Location: Plots 3 and 4 Land off Worlds End Road
Contact: Shaun Cahill

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 20/13722						

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.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 20/13722

SOILS

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.

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.

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.

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 UKAS requirement 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.

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.

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 calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	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

EMT Job No: 20/13722

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
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
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	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital 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	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
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 (comparabl	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 (comparabl	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

EMT Job No: 20/13722

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
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
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	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
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
NONE	No Method Code	NONE	No Method Code			AD	Yes

Please include all sections of this report if it is reproduced

Kiwa CMT Testing

BS3882 Topsoil Report

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Hucknall
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NG15 7SH



Report Number 77429 / 59594 (20847)

Site:

Sleaford Sidings, Boston

Date: 7th June 2019

Trust
Quality
Progress

Kiwa CMT Testing

Client Information
Total Aggregates Ltd.
Total House, Baker Brook Industrial Estate
Wigwam Lane
Hucknall
Nottinghamshire
NG15 7SH

Date:	07.06.2019	**Originator:**	Ben Taylor
Order Ref:	Email	**Our Ref:**	59594

Site Location Information:
Sleaford Sidings, Boston

Document Control

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Document Authorised By: **Mike Barham** **Departmental Manager**		
Issue Number and Date	**1**	**07.06.2019**

Kiwa CMT Testing

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Appendix 2 Client Sampling Certificates
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Appendix 8 General References

Kiwa CMT Testing

1.0 Client

1.1 The Client is Total Aggregates Limited.

2.0 Scope of Works

2.1 To sample material on site from a stockpile in a specified pattern arrangement.

2.2 Each of the composite samples are to be compiled from a number of small increments to form a subsample in accordance with the standard BS EN 12579:2013.

2.3 To analyse samples of 'topsoil' for a range of analytical parameters commensurate with BS 3882:2015.

3.0 Site Work

3.1 Site work was carried out on the 23rd May 2019 by KCMT.

3.2 Photographs pertaining to the site/ of the samples are presented in Appendix 7.

4.0 Samples

4.1 The samples obtained from the site on the 23rd May are:

KCMT Reference	Client Reference/Location/Other Information
59594/1	Stockpile Subsample 1
59594/2	Stockpile Subsample 2

Table 4.1 Sample References

KCMT Reference	Sample Description
59594/1	Dark brown slightly gravelly, slightly clayey SAND LOAM. Gravels of rootlets, wood, & rare slate & limestone.
59594/2	Dark brown slightly clayey, slightly gravelly SANDY LOAM. Gravels of wood, rootlets & rare limestone, slate & concrete.

Table 4.2 Sample Descriptions

4.2 The soil samples weighed c.10.6kg each.

4.3 Photographs pertaining to the site are presented in Appendix 7.

4.4 The samples had **NO** olfactory contamination/identifiable pieces of asbestos containing materials (ACMs)/visible oil contamination/olfactory evidence of hydrocarbon contamination/visible discolouration.

4.5 The samples exhibited rare amounts of visible physical contaminants (e.g. concrete, slate).

4.6 The scheduled analysis for each sample is:

KCMT Reference	Analysis Schedule
59594/1	BS3882:2015
59594/2	BS3882:2015

Table 4.3 Analytical Schedules

5.0 Analysis

5.1 For compliance to Table 1 of BS3882:2015 the sample(s) submitted have been analysed for the following components:

Contamination Analysis

Metals/Metalloids	Antimony, Arsenic, Barium, Boron, Cadmium, Chromium, Chromium (VI), Copper, Lead, Mercury, Nickel, Selenium, Vanadium, Zinc
Inorganics/Physical	Asbestos Screen, Total Sulfate, Sulfide, Water Soluble Sulfate, Thiocyanate, pH, Cyanide, Moisture Content, Loss on Ignition
Organics	Total Organic Carbon, Organic Matter, Petroleum Hydrocarbons (TPHCWG), BTEX, Phenols
Polyaromatic Hydrocarbons	Acenaphthene, Acenaphthylene, Anthracene, Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo(ghi)perylene, Chrysene, Dibenz[a,h]anthracene, Fluoranthene, Fluorene, Indeno[123-cd]pyrene, Naphthalene, Phenanthrene, Pyrene

Table 5.1 Contamination Schedule

BS3882:2015 Analysis

Phytotoxic Elements	Extractable Copper, Extractable Nickel, Extractable Zinc.
Major Nutrient Analysis	Kjeldahl (Total) Nitrogen, Available Phosphorous, Available Potassium, Available Magnesium, Carbon:Nitrogen Ratio, Available Calcium, Available Sodium, Exchangeable Sodium Percentage
Physical	Particle Size Distribution by Hydrometer/Pipette Method to BS ISO 11277: 2009

Table 5.2 BS3882 Schedule

6.0 Results Assessment

6.1 The certificates of analysis for the samples are presented in Appendix 3.

6.2 The results relate only to the samples tested.

6.3 The assessment relates only to the presented results.

6.4 The results are assessed below:

Kiwa CMT Testing

Samples 59594/1 and 59594/2

Parameter	BS3882:2015 Multipurpose Topsoil Threshold (Table 1)	BS3882:2015 Multipurpose Topsoil Compliant?		BS3882:2015 Specific Use Topsoil Compliant?	
		59594/1	59594/2	59594/1	59594/2
Total Nitrogen % m/m	>0.15%	Y	Y	-	-
Extractable Phosphorous mg/L	16 to 140	Y	Y	-	-
Extractable Potassium mg/L	121 to 1500	Y	Y	-	-
Extractable Magnesium mg/L	51 to 600	Y	Y	-	-
Electrical Conductivity µS/cm	3300	Y	Y	-	-
Carbon:Nitrogen	<20:1	Y	Y	-	-
Soil pH	5.5 to 8.5	Y	Y	-	-
Extractable Zinc mg/kg	<200 (pH 6.0-7.0) <300 (pH >7.0)	Y	Y	-	-
Extractable Copper mg/kg	<100 (pH 6.0) <135 (pH 6.0 to 7.0) <200 (pH > 7.0)	Y	Y	-	-
Extractable Nickel mg/kg	<60 (pH 6.0) <75 (pH 6.0 to 7.0) <110 (pH > 7.0)	Y	Y	-	-
Loss on Ignition %	Clay Content 5% to 20% : 3 to 20% Clay Content 20% to 35% : 5 to 20%	Y	Y	-	-

Table 6.1a Topsoil Compliance to BS3882:2015

Results Analysis – Nutrients, Phytotoxic Elements, pH and Electrical Conductivity

6.5 The samples were noted to be generally alkaline (pH 7.8). This pH falls within the threshold and is suitable for general landscaping purposes.

6.6 The electrical conductivity of the sample is a measure of the salinity and the value presented is less than the threshold and therefore is unlikely to contain soluble salts that would hinder plant growth.

6.7 The sample is well supplied with Carbon and Nitrogen and all other major plant nutrients.

6.8 The C:N ratio of the sample is acceptable for general landscape purposes.

6.9 The concentrations of phytotoxic elements (Harmful to Plants) were below the required thresholds and are permissible as per Table 1 of BS3882:2015.

Contamination Analysis

6.10 With reference to BS3882:2015 Table 1 Notes 1 to 5, and the requirements within them, it is necessary to ensure that there is no harm presented to human health for the proposed end use, no release of prohibited plants (Wildlife and Countryside Act 1981, Schedule 9).

6.11 With no site-specific criteria to work to the concentrations of the contaminants of concern for human health are assessed to the *residential end-use* against the Generic Assessment Criteria in the form of SGVs (EA, 2009), C4SLs (DEFRA, 2014) and S4ULs (LQM/CIEH, 2009, 2nd Ed.).

6.12 Those criteria are reproduced in Appendix 5.

6.13 The exceedances noted from the Tables presented in Appendix 5 are:

Parameter	Relevant GAC	Exceedance Value and Sample Reference	Notes
None	-	-	No exceedances noted.

Table 6.2 Contamination Compliance for Human Health

6.14 It is considered that the material presents a **VERY LOW RISK** to human health and is considered suitable for use as a BS3882:2015 Multipurpose Topsoil.

Textural Classification and Stones Content

6.15 The textural classification of both samples is shown to be a **SANDY SILT LOAM** and falls within the BS3882 parameters noted in Appendix 4.

6.16 Provided the physical condition of the material is maintained then the topsoil material should be suitable for all general landscaping purposes.

6.17 Such soils (in the natural state) generally have a healthy balance of water retention and drainage. However, they are prone to structural degradation/damage that may reduce or restrict this property. The structural integrity is most often compromised by the handling of the topsoil, this is enhanced when the soil material is plastic in its consistency. Such damage to the topsoil will likely reduce its propensity to drain and aerate.

Particle Size of Aggregate	Threshold	Value in Sample	
		59594/1	59594/2
>50mm	0%	0%	0%
>20mm	<10%	2%	0%
>2mm	<30%	4%	5%

Table 6.3 Coarse Fragment Content

6.18 The coarse fragment content is compliant with the requirements of BS3882:2015.

6.19 The transport, handling and trafficking of topsoils are extremely important subjects and the mishandling of topsoil can have a severe detrimental impact on its performance. Soils should be transported and handled in accordance with the *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites* (DEFRA, 2009).

6.20 Following this Code of Practice will maintain the performance of the topsoil, any variation from this will lead to a significant loss of functionality of the original topsoil.

7.0 Conclusion

7.1 Sample 59594/1 is compliant with **BS3882:2015** and is classified as a **MULTIPURPOSE TOPSOIL**.

7.2 Sample 59594/2 is compliant with **BS3882:2015** and is classified as a **MULTIPURPOSE TOPSOIL**.

7.3 The topsoil represented by the samples would be considered suitable for general landscape purposes, provided that the topsoil is transported and handled in accordance with the *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites* (DEFRA, 2009).

8.0 Recommendations

8.1 The physical condition of the soil requires maintaining during all phases of soil handling (e.g. scraping back, stockpiling, relaying, cultivating and planting).

8.2 It is recommended to handle the soil when dry and non-plastic (friable).

8.3 It is necessary to avoid:

- Excessive handling (i.e. handle as few times as possible);
- Unnecessary trafficking/oversized machinery;
- Handling when wet/waterlogged;
- Handling during rainfall;
- Handling after rainfall (it is recommended that if >10mm rainfall in 24hrs then all handling operations should be stopped for at least one day or until the material is friable again);
- Handling when frozen or snow covered;

8.4 The stockpiling of soils should be avoided wherever possible.

8.5 If the material is stockpiled then certain measures should be taken to reduce any loss of integrity:

- Stockpile in relatively loose heaps with the surface firmed and shaped so as to shed water;
- This should be engineered to prevent any muddy water entering into watercourses;
- The siting of the stockpile should be suitably prepared (removal of rubbish or other detrimental materials);
- Topsoil stockpiles and subsoil stockpiles should be clearly separated;
- If the stockpile is to be stored for >6 months then it should be sown with a grass/legume seed mixture to maintain its structure and aeration, to minimize any weed colonisation and to stabilise the stockpile.

9.0 Limitations

9.1 This report is prepared on behalf of the client and should only be used by the client and its contractors/subcontractors.

9.2 The use or assignment of this report, either in its entirety or in any part, is expressly prohibited unless payment is received by Kiwa CMT within the agreed credit period.

9.3 The report is produced solely for the benefit of The Client and their professional advisors, no liability is accepted for any reliance placed upon it by any other party unless expressly agreed in writing with Kiwa CMT Testing.

9.4 The copyright of this report and relating documents prepared by Kiwa CMT are owned by them. No such report plan or document may be produced, published or altered without the written permission of Kiwa CMT Testing.

9.5 The report and opinions have been prepared for the specific purpose stated within the document. The recommendations should not be extrapolated for other uses on or adjacent to the site or for other schemes without reference and agreement in writing with Kiwa CMT Testing. Opinions and interpretations are not covered by Kiwa CMT scope of UKAS accreditation.

9.6 The report will be based on observations, environmental conditions and information (such as physical conditions within boreholes, monitoring results and chemical analyses) that are by their nature interpretative and interpolated. Variations are likely to be present appertaining to the site which may not be revealed by documentation and/or investigation and which, subsequently, may not be taken into account.

9.7 Whilst the report may express an opinion on the nature of environmental conditions provided by GIS databases and written, anecdotal, published and pictorial (cartographic, photographic, etc.) there can be no liability for accuracy accepted by Kiwa CMT Testing.

9.8 If sampled by Kiwa CMT Testing then the sampling will be carried out with the relevant care and diligence in order to obtain a representative sample of the material.

9.9 If the sample is supplied then Kiwa CMT Testing have had little to no control over the sampling and it is assumed that the client has provided Kiwa CMT Testing with a representative sample of the bulk material. Kiwa CMT Testing cannot be held accountable for third party sampling and always recommend independent sampling. Where Kiwa CMT Testing have recommended particular investigative techniques, to be supplied by the client/3rd party, and these have not been adhered to, Kiwa CMT Testing do not take responsibility for misrepresentation of the materials.

9.10 Samples are stored in suitable containers for the various requirements of testing.

9.11 Unless otherwise directed Kiwa CMT Testing will assume a normal scenario for the composition of the material and no consideration is given to specialist contamination unless we are aware (e.g. via provided documentation, desk study, other intrusive works, etc.) that due consideration is required for deviation from the normal expected mineralogical content of soil.

9.12 The assessment is carried out on the analytical results that are presented in the appendices. It is assumed that the results are representative, or as representative as possible, of the material analysed. Results may not be representative where the material may be significantly heterogeneous in nature.

9.13 Assessment is not solely based on chemical criteria and further assessment of the material is likely to occur at the point of use, including visual observation and possibly the employment of validation testing.

Kiwa CMT Testing

9.14 All analysis is carried out in a UKAS and MCERTS accredited laboratory 4225 that comply to ISO 17025. All records are retained in our system and are available upon request.

9.15 Ground/stockpile conditions are highly variable and although Kiwa CMT Testing make best efforts to obtain representative samples there is always a possibility of uncovering contamination previously identified. If this is the case then further testing is likely to be required on any previously undiscovered materials, e.g. such as asbestos, oil contamination, liquids, etc. This report does not include, or account for, such unidentified contamination and any additional materials will require characterising and assessing and are not covered by this report.

Appendix 1

Site Plan and Approximate Sampling Locations

Kiwa CMT Testing

Appendix 2

Client Sampling Certificates

None Provided.

Appendix 3

Certificates of Analysis

Kiwa CMT Testing

Client Name: Kiwa CMT Testing
Reference: 59594
Location: Sleaford Sidings
Contact: Brandon Fairweather
JE Job No.: 19/8374

Report : Solid

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

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-4	5-8									LOD/LOR	Units	Method No.
Sample ID	59594/1	59594/2											
Depth													
COC No / misc													
Containers	V J T	V J T											
Sample Date	23/05/2019	23/05/2019											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	24/05/2019	24/05/2019											
Antimony	1	<1									<1	mg/kg	TM30/PM15
Arsenic #	11.8	11.1									<0.5	mg/kg	TM30/PM15
Barium #	76	79									<1	mg/kg	TM30/PM15
Cadmium #	0.1	0.1									<0.1	mg/kg	TM30/PM15
Chromium #	36.0	33.6									<0.5	mg/kg	TM30/PM15
Copper #	21	25									<1	mg/kg	TM30/PM15
Lead #	18	18									<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1									<0.1	mg/kg	TM30/PM15
Nickel #	19.0	17.7									<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1									<1	mg/kg	TM30/PM15
Total Sulphate as SO4 BRE	0.13	0.11									<0.01	%	TM50/PM29
Vanadium	33	32									<1	mg/kg	TM30/PM15
Water Soluble Boron #	2.2	2.4									<0.1	mg/kg	TM74/PM32
Zinc #	68	68									<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03									<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05									<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	0.04									<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.04	0.08									<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	0.07									<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	0.07									<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	0.06									<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	0.11									<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	0.06									<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6									<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	0.08									<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	0.03									<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	90	90									<0	%	TM4/PM8
EPH (C8-C40) #	210	185									<30	mg/kg	TM5/PM8

Kiwa CMT Testing

Client Name: Kiwa CMT Testing
Reference: 59594
Location: Sleaford Sidings
Contact: Brandon Fairweather
JE Job No.: 19/8374

Report : Solid

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

J E Sample No.	1-4	5-8									LOD/LOR	Units	Method No.
Sample ID	59594/1	59594/2											
Depth													
COC No / misc													
Containers	V J T	V J T											
Sample Date	23/05/2019	23/05/2019											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	24/05/2019	24/05/2019											
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4									<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	<19									<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4									<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19									<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38									<38	mg/kg	TM5/TM36/PM8/PM12/PM16
GRO (>C4-C8) #	<100	<100									<100	ug/kg	TM36/PM12
GRO (>C8-C12) #	<100	<100									<100	ug/kg	TM36/PM12
GRO (>C4-C12) #	<100	<100									<100	ug/kg	TM36/PM12
MTBE #	<5	<5									<5	ug/kg	TM31/PM12
Benzene #	<5	<5									<5	ug/kg	TM31/PM12
Toluene #	<5	<5									<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5									<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5									<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5									<5	ug/kg	TM31/PM12
Phenol #	<0.01	<0.01									<0.01	mg/kg	TM26/PM21
Natural Moisture Content	18.7	21.0									<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3									<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.2138	0.2142									<0.0015	g/l	TM38/PM20
Free Cyanide	<0.5	<0.5									<0.5	mg/kg	TM89/PM45
Total Cyanide #	<0.5	<0.5									<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	2.26	1.91									<0.02	%	TM21/PM24
Organic Matter	3.9	3.3									<0.2	%	TM21/PM24

Please see attached notes for all abbreviations and acronyms

Kiwa CMT Testing

Client Name: Kiwa CMT Testing
Reference: 59594
Location: Sleaford Sidings
Contact: Brandon Fairweather
JE Job No.: 19/8374

Report : Solid

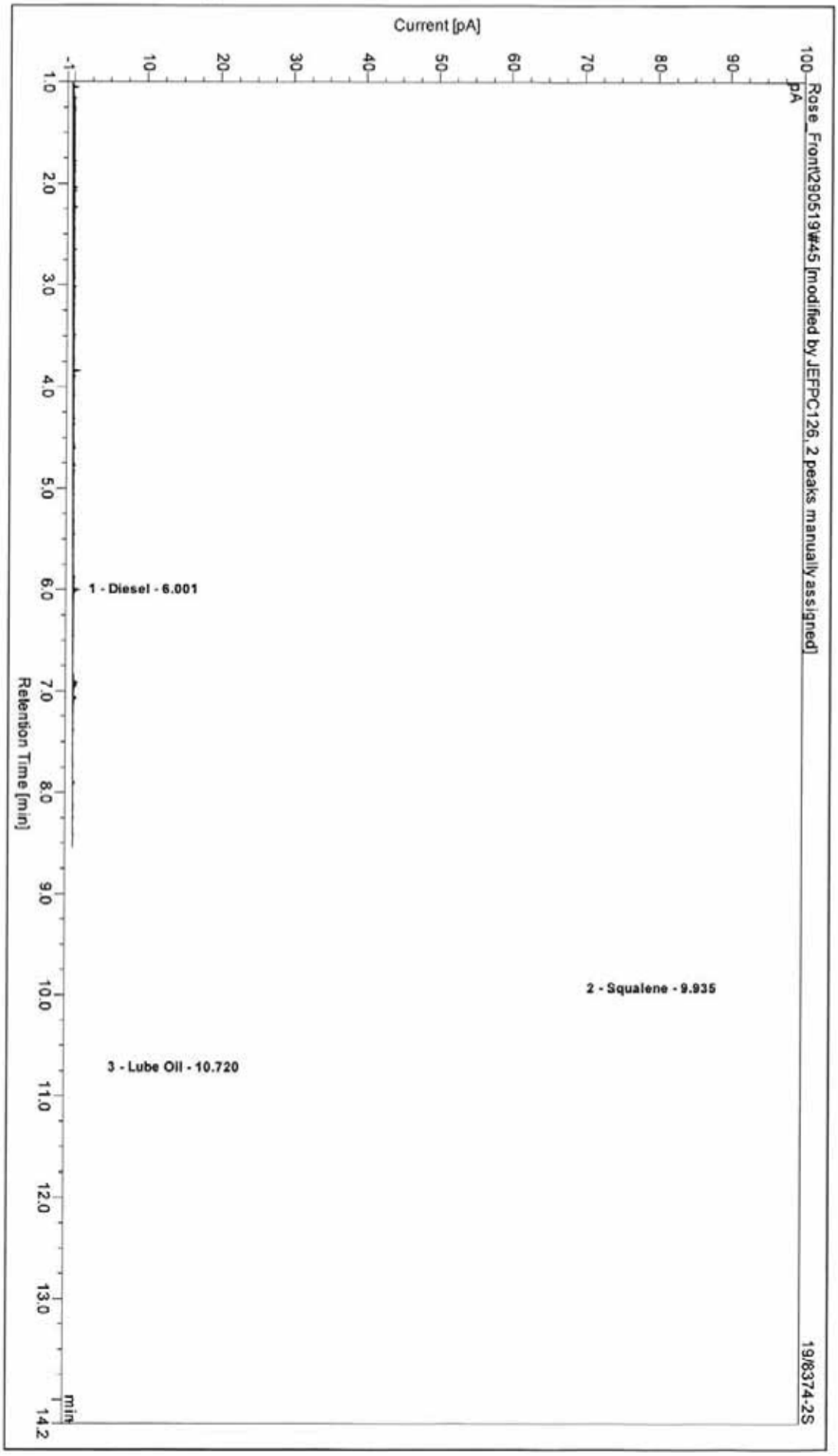
Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-4	5-8									LOD/LOR	Units	Method No.
Sample ID	59594/1	59594/2											
Depth													
COC No / misc													
Containers	V J T	V J T											
Sample Date	23/05/2019	23/05/2019											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	24/05/2019	24/05/2019											
Sulphide	<10	<10									<10	mg/kg	TM107/PM119
Thiocyanate	0.7	<0.6									<0.6	mg/kg	TM107/PM119
Electrical Conductivity @20C (1:1 ext)	593	661									<10	uS/cm	TM76/PM68
Elemental Sulphur	5	6									<1	mg/kg	TM106/PM114
Kjeldahl Nitrogen	0.28	0.25									<0.01	%	TM125/PM0
Loss on Ignition #	12.0	10.6									<1.0	%	TM22/PM0
pH #	7.82	7.88									<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

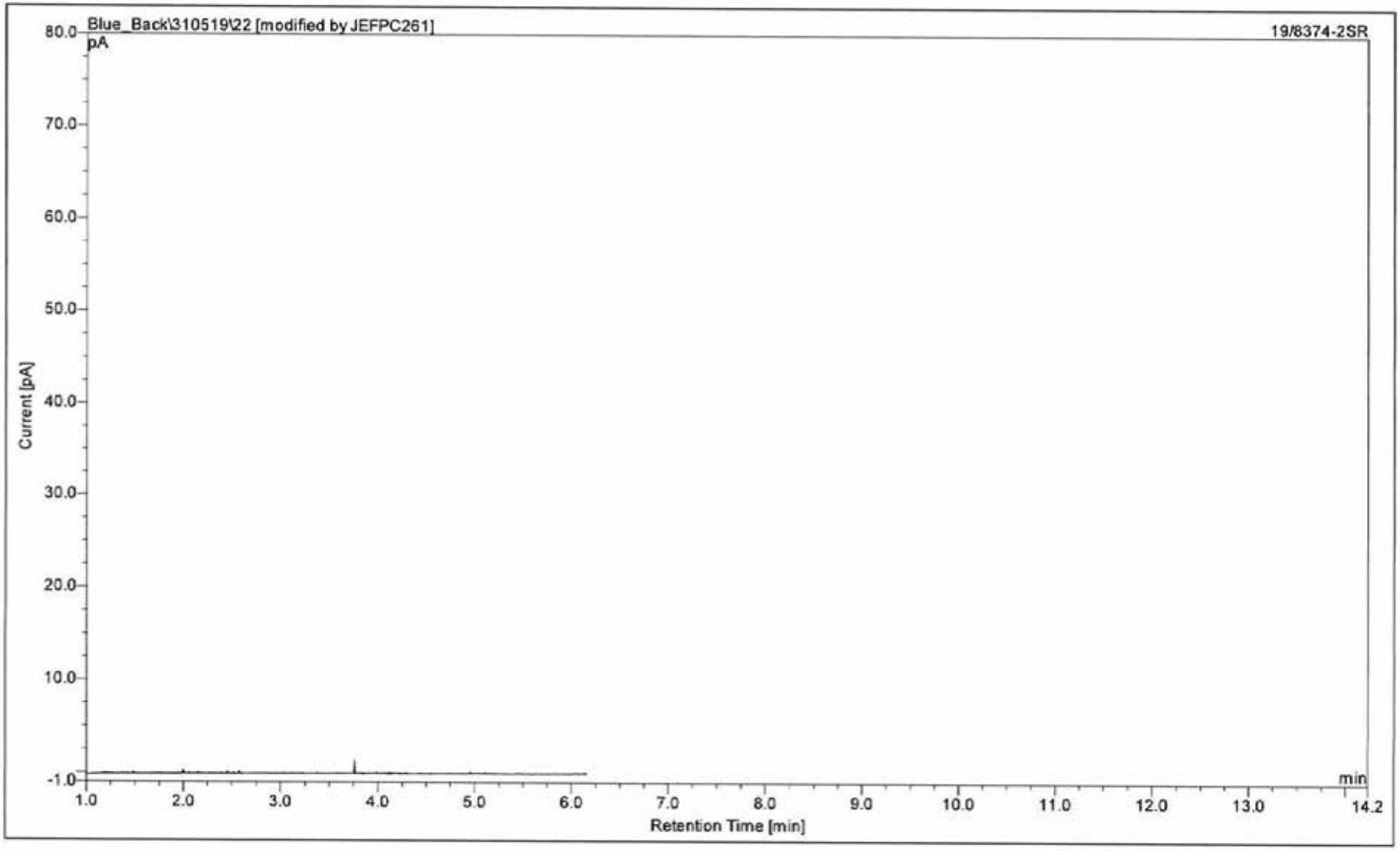
Kiwa CMT Testing

Client Name:	Kiwa CMT Testing	**JE Job No.:**	19/8374
Reference:	59594	**JE Sample No.:**	2
Location:	Sleaford Sidings	**Sample Identity:**	59594/1
Contact:	Brandon Fairweather	**Depth:**	
		Matrix:	Solid



Client Name:	Kiwa CMT Testing
Reference:	59594
Location:	Sleaford Sidings
Contact:	Brandon Fairweather

JE Job No.:	19/8374
JE Sample No.:	2
Sample Identity:	59594/1
Depth:	
Matrix:	Solid

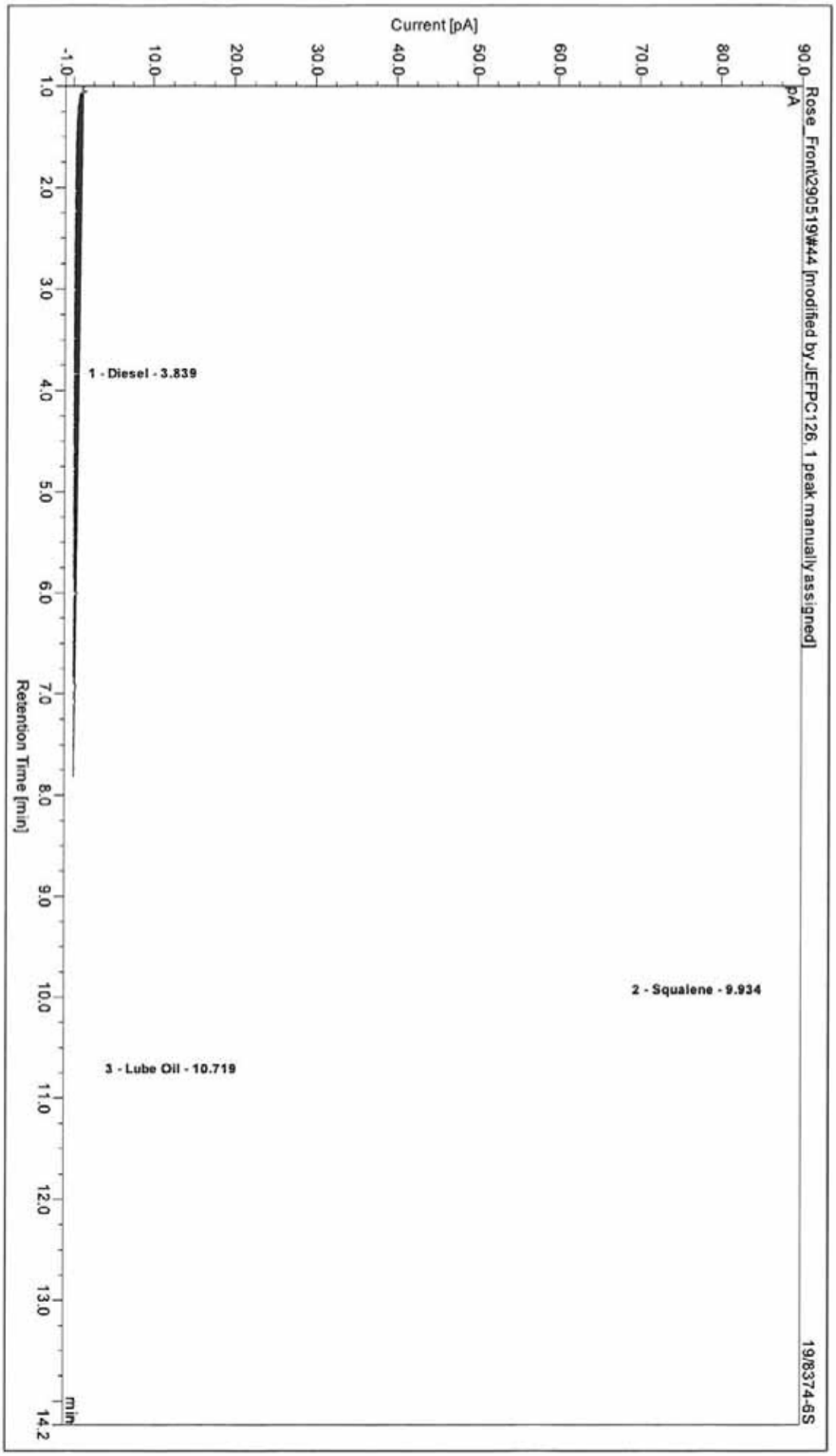


Kiwa CMT Testing

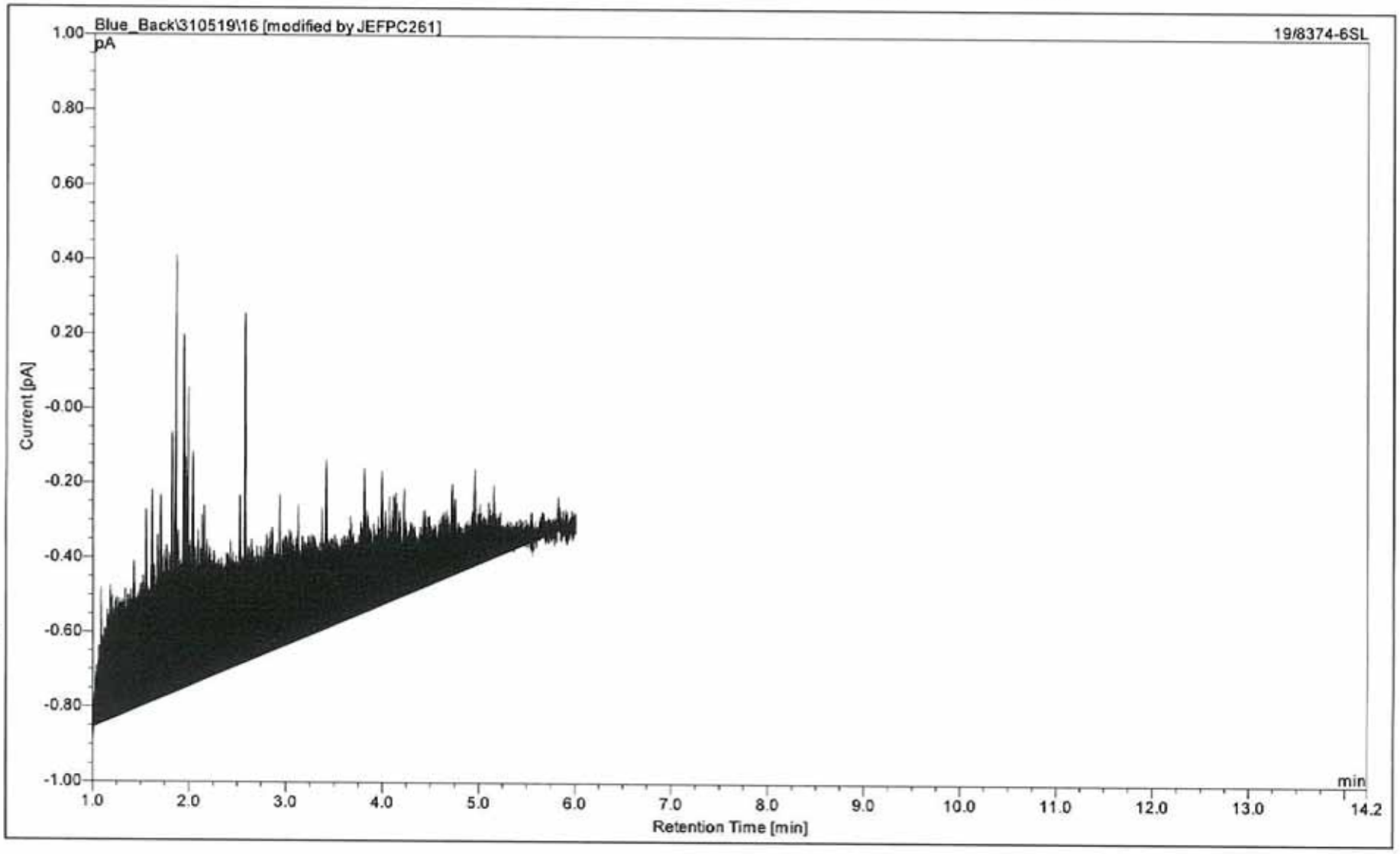
Kiwa CMT Testing

Client Name: Kiwa CMT Testing
Reference: 59594
Location: Sleaford Sidings
Contact: Brandon Fairweather

JE Job No.: 19/8374
JE Sample No.: 6
Sample Identity: 59594/2
Depth:
Matrix: Solid



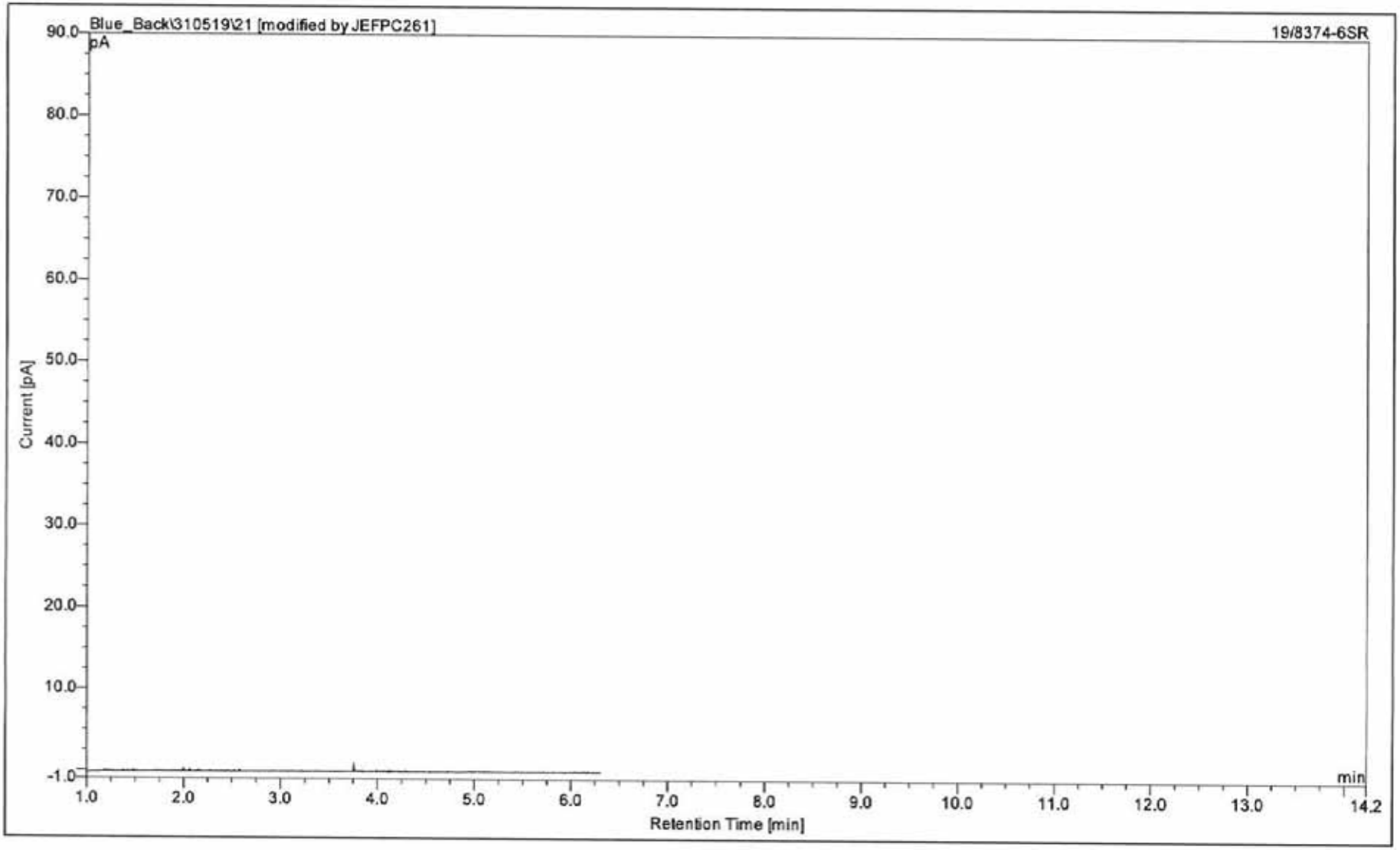
Client Name:	Kiwa CMT Testing	**JE Job No.:**	19/8374
Reference:	59594	**JE Sample No.:**	6
Location:	Sleaford Sidings	**Sample Identity:**	59594/2
Contact:	Brandon Fairweather	**Depth:**	
		Matrix:	Solid



Kiwa CMT Testing

Client Name:	Kiwa CMT Testing
Reference:	59594
Location:	Sleaford Sidings
Contact:	Brandon Fairweather

JE Job No.:	19/8374
JE Sample No.:	6
Sample Identity:	59594/2
Depth:	
Matrix:	Solid



Kiwa CMT Testing

Kiwa CMT Testing

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/8374	1	59594/1		3	28/05/2019	**General Description (Bulk Analysis)**	Soil/Stones
					28/05/2019	**Asbestos Fibres**	NAD
					28/05/2019	**Asbestos ACM**	NAD
					28/05/2019	**Asbestos Type**	NAD
					28/05/2019	**Asbestos Level Screen**	NAD
19/8374	1	59594/2		7	28/05/2019	**General Description (Bulk Analysis)**	Soil/Stones
					28/05/2019	**Asbestos Fibres**	NAD
					28/05/2019	**Asbestos ACM**	NAD
					28/05/2019	**Asbestos Type**	NAD
					28/05/2019	**Asbestos Level Screen**	NAD

Client Name: Kiwa CMT Testing
Reference: 59594
Location: Sleaford Sidings
Contact: Brandon Fairweather

JE Job No.	Batch	Sample ID	Depth	JE Sample No.	Analysis	Reason
No deviating sample report results for job 19/8374						

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.

Kiwa CMT Testing

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 19/8374

SOILS

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.

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. 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.

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.

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.

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

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 UKAS requirement 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.

Kiwa CMT Testing

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.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental 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

ANALYTICAL REPORT

Report Number	**56751-19**	**K920**	**JANET JONES**	**Client 8374**
Date Received	**28-MAY-2019**		**JONES ENVIRONMENTAL LAB**	
Date Reported	**03-JUN-2019**		**UNIT 3 DEESIDE**	
Project	**JEL 166415**		**ZONE 3**	
Reference	**8374**		**DEESIDE IND EST**	
Order Number	**E208N19000950**		**DEESIDE CH5 2UA**	

Laboratory Reference		**SOIL437854**	**SOIL437855**
Sample Reference		**4**	**8**
Determinand	**Unit**	**SOIL**	**SOIL**
pH water [1:2.5]		7.8	7.8
Available Phosphorus (Index)	mg/l	50.4 (4)	39.6 (3)
Available Potassium (Index)	mg/l	526 (4)	438 (4)
Available Magnesium (Index)	mg/l	74.0 (2)	78.3 (2)
Available Sodium	mg/l	42.0	44.5
Available Calcium	mg/l	1830	1680
Exchangeable Sodium Percentage	%	1.6	1.9
Total Nitrogen	% w/w	0.292	0.251
Neutralising Value as CaCO3 eq.	% w/w	5.0	7.8
Neutralising Value as CaO eq.	% w/w	2.8	4.4
Total Copper	mg/kg	23.0	29.4
Total Zinc	mg/kg	66.5	73.9
Total Nickel	mg/kg	18.0	17.4
Total Carbon	% w/w	3.15	3.08
Carbon:Nitrogen Ratio	:1	10.8	12.3

Notes

Analysis Notes

The sample submitted was of adequate size to complete all analysis requested.
The results as reported relate only to the item(s) submitted for testing.
The results are presented on a dry matter basis unless otherwise stipulated.

Document Control

This test report shall not be reproduced, except in full, without the written approval of the laboratory.

ANALYTICAL NOTES

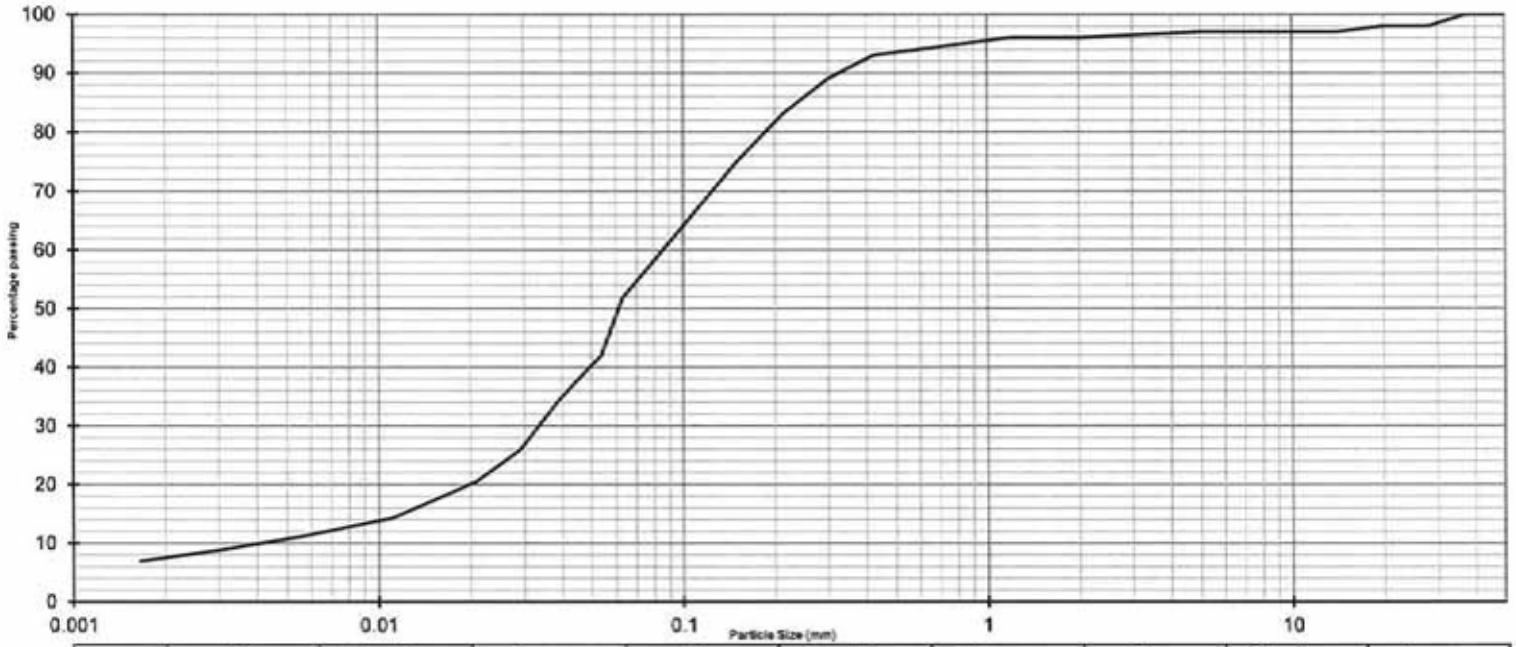
Report Number	56751-19	K920	JANET JONES	Client 8374
Date Received	28-MAY-2019		JONES ENVIRONMENTAL LAB	
Date Reported	03-JUN-2019		UNIT 3 DEESIDE	
Project	JEL 166415		ZONE 3	
Reference	8374		DEESIDE IND EST	
Order Number	E208N19000950		DEESIDE CH5 2UA	

Notes	
Reported by	*Myles Nicholson* Natural Resource Management, a trading division of Cawood Scientific Ltd. Coopers Bridge, Braziers Lane, Bracknell, Berkshire, RG42 6NS Tel: 01344 886338 Fax: 01344 890972 email: enquiries@nrm.uk.com

Particle Size Distribution

Client: Total Aggregates
Site: Sleaford Sidings
Sample ref: 59594/1
Sampling cert.: None
Lab ref.: 59594
Date Tested: 03-04/06/2019
Sampled by: KCMT
Source: Site
Sample size: 2kg
Description Dark brown slightly gravelly, slightly clayey SAND LOAM.

Sieve Size (mm)	% Passing
50	100
37.5	100
28	98
20	98
14	97
10	97
6.3	97
5.0	97
2.0	96
1.18	96
0.600	94
0.425	93
0.300	89
0.212	83
0.150	75
0.063	51.8
0.0537	42.0
0.0394	34.6
0.0290	25.8
0.0210	20.5
0.0111	14.3
0.0056	11.2
0.0028	8.6
0.0016	6.9



	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse
CLAY	SILT			SAND			GRAVELS		

% Organic Material Destroyed: 6.5
Visible Contaminants % >2mm None
% of which are plastics: None
% of which are man-made sharps: None
Test carried out in accordance with **BS ISO 11277:2009**

Textural Classification: Sandy Silt Loam

Signed By: A. Fell
Geo-Environmental Technician

Kiwa CMT Testing

Particle Size Distribution

Client: Total Aggregates

Site: Sleaford Sidings

Sample ref: 59594/2

Sampling cert.: None

Lab ref.: 59594

Date Tested: 03-04/06/2019

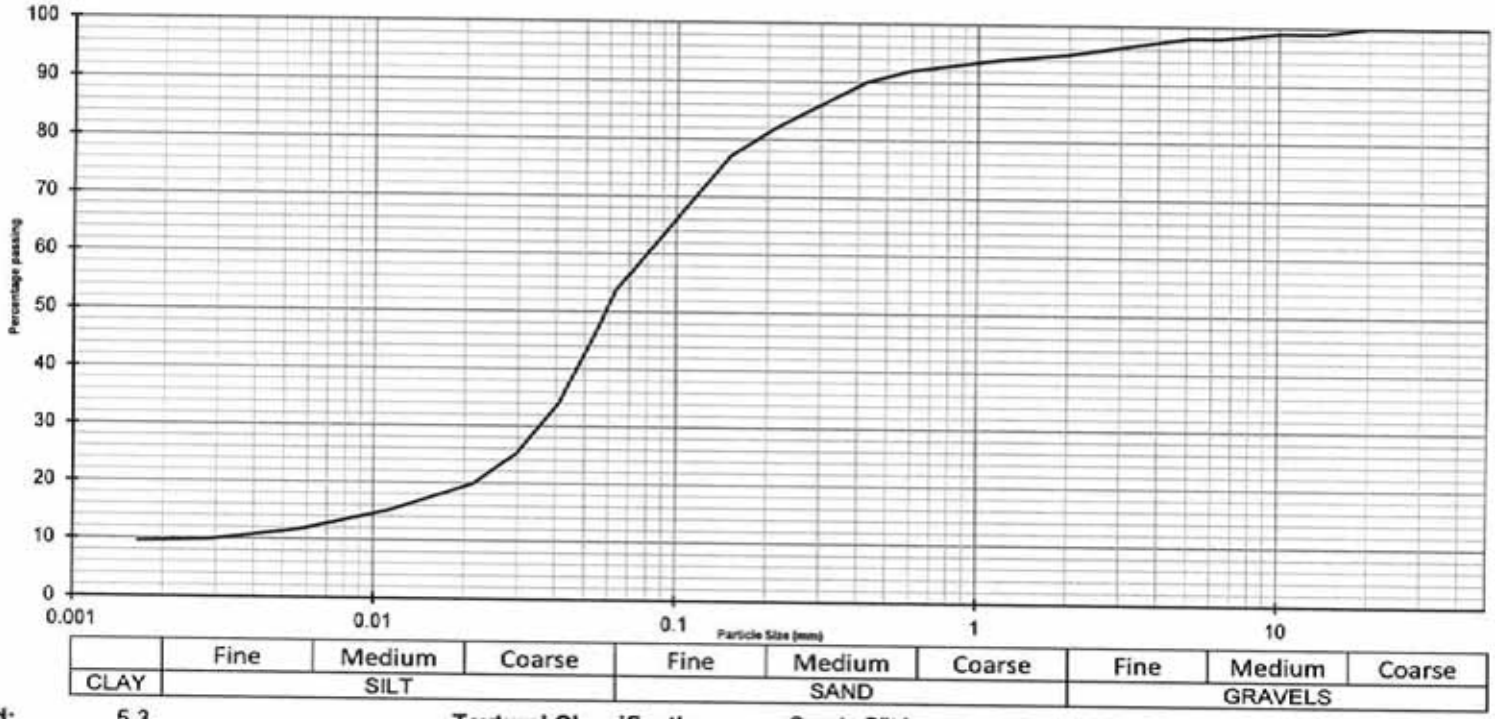
Sample size: 2kg

Description Dark brown slightly clayey, slightly gravelly SAND LOAM.

Sampled by: KCMT

Source: Site

Sieve Size (mm)	% Passing
50	100
37.5	100
28	100
20	100
14	99
10	99
6.3	98
5.0	98
2.0	95
1.18	94
0.600	92
0.425	90
0.300	86
0.212	82
0.150	77
0.063	53.6
0.0554	47.3
0.0410	34.1
0.0298	25.2
0.0214	19.9
0.0112	15.1
0.0057	11.7
0.0029	9.8
0.0016	9.5



% Organic Material Destroyed: 5.3

Visible Contaminants % >2mm None

% of which are plastics: None

% of which are man-made sharps: None

Test carried out in accordance with **BS ISO 11277:2009**

Textural Classification: Sandy Silt Loam

Signed By: A. Fell
Geo-Environmental Technician

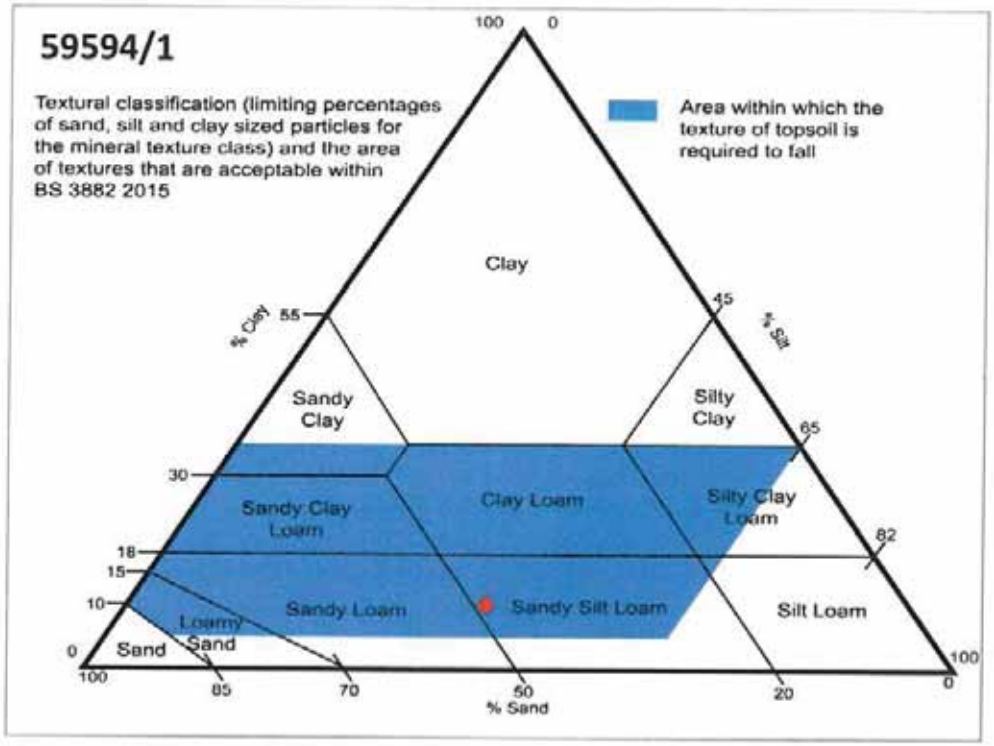
Kiwa CMT Testing

Appendix 4

Textural Classification Chart

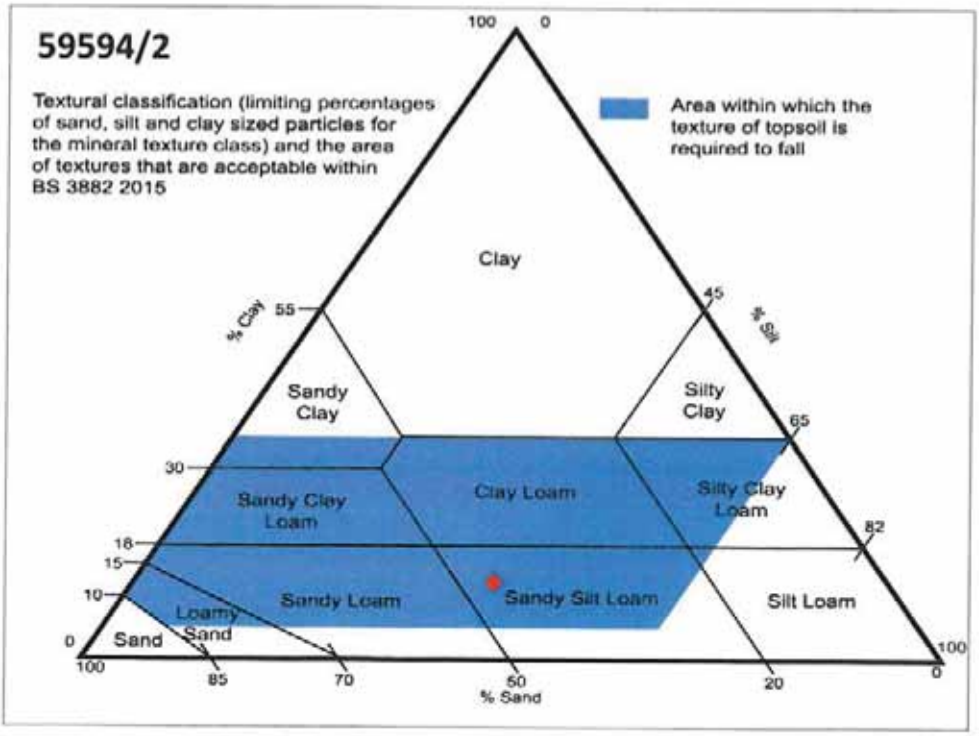
Kiwa CMT Testing

BS 3882 TEXTURAL CLASSIFICATION CHART



The topsoil material is classified as a Sandy Silt Loam and falls within the BS3882:2015 envelope.

BS 3882 TEXTURAL CLASSIFICATION CHART



The topsoil material is classified as a Sandy Silt Loam and falls within the BS3882:2015 envelope.

Appendix 5

GAC Tables

Kiwa CMT Testing

Substance	Residential & Home Grown	Residential No Home Grown	Allotments	Commercial	Public Open Space 1 (Resi)	Public Open Space 2 (Park)	Reference
Arsenic	37	40	49	640	79	170	C4SL
Arsenic (Inorganic)	37	40	43	640	79	170	S4UL
Beryllium	1.7	1.7	35	12	2.2	63	S4UL
Boron	290	11000	45	240000	21000	46000	S4UL
Cadmium	22	150	3.9	410	220	880	C4SL
Cadmium	11	85	1.9	190	120	532	S4UL
Chromium VI	21	21	170	49	21	250	C4SL
Chromium VI	6	6	1.8	33	7.7	220	S4UL
Chromium III	910	910	18000	8600	1500	33000	S4UL
Copper	2400	7100	520	68000	12000	44000	S4UL
Lead	200	310	80	2300	630	1300	C4SL
Mercury (Inorganic)	40	56	19	1100	120	140	S4UL
Mercury (Elemental)	1.2	1.2	21	58 (28.5 vap)	16	30 (25.8)	S4UL
Mercury (methyl)	11	15	6	320	40	68	S4UL
Nickel	180	180	230	980	230	3400	S4UL
Selenium	250	430	88	12000	1100	1800	S4UL
Vanadium	410	1200	91	9000	2000	5000	S4UL
Zinc	3700	40000	620	730000	81000	170000	S4UL

Substance	Residential & Hone Grown	Residential No Home Grown	Allotments	Commercial	Public Open Space 1 (Resi)	Public Open Space 2 (Park)	% SOM	Reference
Benzene	0.87	3.3	0.18	98	140	230		C4SL
Benzene	0.087	0.38	0.017	27	72	90	1	S4UL
	0.17	0.7	0.034	47	72	100	2.5	
	0.37	1.4	0.075	90	73	110	6	
Toluene	130	880	22	56000 (869 vap)	56000	87000 (869 vap)	1	S4UL
	290	1900	51	110000 (1920 vap)	56000	95000 (1920 vap)	2.5	
	660	3900	120	180000 (4360 vap)	56000	100000 (4360 vap)	6	
Ethylbenzene	47	83	16	5700 (518 vap)	24000	17000 (518 vap)	1	S4UL
	110	190	39	13000 (1220 vap)	24000	22000 (1220 vap)	2.5	
	260	440	91	27000 (2840 vap)	25000	27000 (2840 vap)	6	
Xylenes	56	79	28	5900	41000	17000	1	S4UL
	130	180	67	14000	42000	23000	2.5	
	310	430	160	30000	43000	31000	6	

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Kiwa CMT Testing

Substance	Residential & Hone Grown	Residential No Home Grown	Allotments	Commercial	Public Open Space 1 (Resi)	Public Open Space 2 (Park)	% SOM	Reference
Acenaphthene	210	3000	34	84000	15000	29000	1	S4UL
	510	4700	85	97000	15000	30000	2.5	
	1100	6000	200	100000	15000	30000	6	
Acenaphthylene	170	2900	28	83000	15000	29000	1	S4UL
	420	4600	69	97000	15000	30000	2.5	
	920	6000	160	100000	15000	30000	6	
Anthracene	2400	31000	380	520000	74000	150000	1	S4UL
	5400	35000	950	540000	74000	150000	2.5	
	11000	37000	2200	540000	74000	150000	6	
Benz(a)anthracene	7.2	11	2.9	170	29	49	1	S4UL
	11	14	6.5	170	29	56	2.5	
	13	15	13	180	29	62	6	
Benzo(a)pyrene	2.2	3.2	0.97	35	5.7	11	1	S4UL
	2.7	3.2	2	35	5.7	12	2.5	
	3	3.2	3.5	36	5.7	13	6	
Benzo(a)pyrene	5	5.3	5.7	77	10	21		C4SL
Benzo(b)fluoranthene	2.6	3.9	0.99	44	7.1	13	1	S4UL
	3.3	4	2.1	44	7.2	15	2.5	
	3.7	4	3.9	45	7.2	16	6	
Benzo(ghi)perylene	320	360	290	3900	640	1400	1	S4UL
	340	360	470	4000	640	1500	2.5	
	350	360	640	4000	640	1600	6	
Benzo(k)fluoranthene	77	110	37	1200	190	370	1	S4UL
	93	110	75	1200	190	410	2.5	
	100	110	130	1200	190	440	6	
Chrysene	15	30	4.1	350	57	93	1	S4UL
	22	31	9.4	350	57	110	2.5	
	27	32	19	350	57	120	6	
Dibenz(ah)anthracene	0.24	0.31	0.14	3.5	0.57	1.1	1	S4UL
	0.28	0.32	0.27	3.6	0.57	1.3	2.5	
	0.3	0.32	0.43	3.6	0.58	1.4	6	
Fluoranthene	280	1500	52	23000	3100	6300	1	S4UL
	560	1600	130	23000	3100	6300	2.5	
	890	1600	290	23000	3100	6300	6	
Fluorene	170	2800	27	63000	9900	20000	1	S4UL
	400	3800	67	68000	9900	20000	2.5	
	860	4500	160	71000	9900	20000	6	
Indeno(123cd)pyrene	27	45	9.5	500	82	150		S4UL
	36	46	21	510	82	170		
	41	46	39	510	82	180		
Napthalene	2.3	2.3	4.1	190	4900	1200	1	S4UL
	5.6	5.6	10	460	4900	1900	2.5	
	13	13	24	1100	4900	3000	6	
Phenathrene	95	1300	15	22000	3100	6200	1	S4UL
	220	1500	38	22000	3100	6200	2.5	
	440	1500	90	23000	3100	6300	6	
Pyrene	620	3700	110	54000	7400	15000	1	S4UL
	1200	3800	270	54000	7400	15000	2.5	
	2000	3800	620	54000	7400	15000	6	
Coal Tar (BaP surrogate)	0.79	1.2	0.32	15	2.2	4.4	1	S4UL
	0.98	1.2	0.67	15	2.2	4.7	2.5	
	1.1	1.2	1.2	15	2.2	4.8	6	

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TPH BAND	Residential & Hone Grown	Residential No Home Grown	Allotments	Commercial	Public Open Space 1 (Resi)	Public Open Space 2 (Park)	% SOM	Reference
Aliphatic	42	42	730	3200	570000	95000	1	S4UL
EC>5-6	78	78	1700	5900	590000	130000	2.5	
	160	160	3900	12000	600000	180000	6	
	100	100	2300	7800	600000	150000	1	S4UL
EC>6-8	230	230	5600	17000	610000	220000	2.5	
	530	530	13000	40000	620000	320000	6	
	27	27	320	2000	13000	14000	1	S4UL
EC>8-10	65	65	770	48000 (190 vap)	13000	18000 (190 vap)	2.5	
	150	150	1700	11000 (451 vap)	13000	21000 (451 vap)	6	
	130 (48 vap)	130 (48 vap)	2200	9700	13000	21000	1	S4UL
EC>10-12	330 (118 vap)	330 (118 vap)	4400	23000 (118 vap)	13000	23000 (118 vap)	2.5	
	760 (283 vap)	770 (283 vap)	7300	47000 (283 vap)	13000	24000 (283 vap)	6	
	1100	1100	11000	59000	13000	25000	1	S4UL
EC>12-16	2400	2400	13000	82000	13000	25000	2.5	
	4300	4400	13000	90000	13000	26000	6	
	65000	65000	260000	1600000	250000	450000	1	S4UL
EC>16-35	92000	92000	270000	1700000	250000	480000	2.5	
	110000	110000	270000	1800000	250000	490000	6	
	65000	65000	260000	1600000	250000	450000	1	S4UL
EC>35-44	92000	92000	270000	1700000	250000	480000	2.5	
	110000	110000	270000	1800000	250000	490000	6	
Aromatic	70	370	13	26000	56000	76000	1	S4UL
EC>5-7	140	690	27	46000	56000	84000	2.5	
	300	1400	57	86000	56000	92000	6	
	130	860	22	56000 (869 vap)	56000	87000 (869 vap)	1	S4UL
EC>7-8	290	1800	51	110000	56000	95000	2.5	
	660	3900	120	180000 (4360 vap)	56000	100000 (4360 vap)	6	
	34	47	8.6	3500 (613 vap)	5000	9200	1	S4UL
EC>8-10	83	110	21	8100 (1500 vap)	5000	9700	2.5	
	190	270	51	17000 (3580 vap)	5000	10000	6	
	74	250	13	16000	5000	10000	1	S4UL
EC>10-12	180	590	31	28000	5000	10000	2.5	
	380	1200	74	34000	5000	10000	6	
	140	1800	23	36000	5100	7600	1	S4UL
EC>12-16	330	2300	57	37000	5100	7700	2.5	
	660	2500	130	38000	5000	7800	6	
Aromatic	260	1900	46	28000	3800	7800	1	S4UL
EC>16-21	540	1900	110	28000	3800	7800	2.5	
	930	1900	260	28000	3800	7900	6	
	1100	1900	370	28000	3800	7800	1	S4UL
EC>21-35	1500	1900	820	28000	3800	7800	2.5	
	1700	1900	1600	28000	3800	7900	6	
	1100	1900	370	28000	3800	7800	1	S4UL
EC>35-44	1500	1900	820	28000	3800	7800	2.5	
	1700	1900	1600	28000	3800	7900	6	
Aliphatic+Aromatic	1600	1900	1200	28000	3800	7800	1	S4UL
EC>44-70	1800	1900	2100	28000	3800	7800	2.5	
	1900	1900	3000	28000	3800	7900	6	

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Appendix 6

Information

Kiwa CMT Testing
Information Sheet

Description of the Material

Naturally Occurring Topsoil is the product of dynamic chemical, physical and biological processes acting on weathered mineral matter.

Manufactured Topsoil is produced by combining mineral matter and organic matter (and where appropriate, fertilizer and lime) which is intended to perform the same functions as topsoil. Unless the material meets the *End of Waste Criteria* this material is likely to be classified as a blended waste material 19 12 12 and described as a manufactured topsoil from waste. The use of such a material would require an environmental permit or have a registered permit exemption.

Topsoils Manufactured from Waste Materials

All topsoils must conform to the requirements of Table 1, BS3882:2015 to be classified as a topsoil.

A topsoil analysis must include: particle size distribution by pipette/hydrometer method in line with the requirements of BS ISO 11277, pH, nutrient analysis (potassium, phosphate, magnesium, kjeldahl nitrogen), total organic carbon, a carbon : nitrogen ratio, Electrical Conductivity, carbonate percentage (if chalk), phytotoxic element analysis (zinc, copper, nickel), assessment for visible contaminants as well as man-made particles and sharps.

Topsoil must be analysed for contaminants that are detrimental to human health where required. This shows suitability for use. The results may be compared to Generic Assessment Criteria (GACs), Site Specific Assessment Criteria (SSAC) or some other criteria (e.g. local planning authority derived GAC for naturally elevated geology), or a combination of those.

Once the material has been placed for use there may be further requirement for validation/verification testing.

No topsoil may contain any aggressive or invasive plant species (e.g. Japanese Knotweed, Himalayan Balsam).

Storage, Handling, Placement, Operation and Structure of Topsoil

The need for correct storage and handling of topsoil is paramount with regard to its function. The structure of topsoil needs to be maintained as closely as possible to the original structure during transport, storage and placement.

Such operations should follow the guidance:

Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (DEFRA, 2009).

Appendix 7

Photographs



Figure 1 Photograph of the topsoil stockpile.



Figure 2 Photograph of the topsoil stockpile.

Appendix 8

General References

Kiwa CMT Testing
General References

British Standard 5930:2018 Code of Practice for Ground Investigations

British Standards (2015) BS 3882:2015 Specification for Topsoil

British Standards (2013) Specification for Subsoil and Requirements for Use

British Standards (2013) BS 10175:2011 + A1 2013 Investigation of Potentially Contaminated Sites – Code of Practice

British Standards (2013) BS EN 12579:2013 Soil Improvers and Growing Media – Sampling

British Standards (2013) BS 8576:2013 Guidance on Investigations for Ground Gas – Permanent Gases and Volatile Organic Compounds (VOCs)

British Standards (2019) BS 8485 (2015) + A1 (2019) Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings

CIRIA C735 (2014) Good Practice on the Testing and Verification of Protection Systems for Buildings Against Hazardous Ground Gases

CL:AIRE (2014) Development of category 4 screening levels (C4SL) for assessment of land affected by contamination

Classification, Labelling and Packaging of Substances and Mixtures Regulation (EC 1272/2008)

DEFRA (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites

Environment Agency (2002) Potential Contaminants for the Assessment of Land

Environment Agency (2004) Model Procedures for the Management of Contaminated Land (Contaminated Land Report 11)

Environment Agency (2009) SC05002/SR2 Human Health Toxicological Assessment of Contaminants in Soil

Environment Agency (2009) SC00521/SR3 Updated Technical Background to the CLEA Model

Environment Agency (2009) SC00521/SR4 CLEA Software (v1.04) Handbook

1st ATP – Regulation 790/2009/EC

2nd ATP – Regulation 286/2011/EC

3rd ATP – Regulation 618/2012/EU

4th ATP Regulation 487/2013/EU

Correction to 1st ATP – 758/2013/EU

5th ATP – Regulation 944/2013/EU

6th ATP – Regulation 605/2014/EU

7th ATP – Regulation 2015/1221/EU

8th ATP – Regulation 2016/918/EU

9th ATP – Regulation 2016/1179/EU

10th ATP – Regulation 2017/776/EU

List of Waste Decision 2002/532/EC

Nathanial, C.P., McCaffrey, C., Gillet, A.G., Ogden, R.C. and Nathanial, J.F. (2015) LQM/CIEH S4ULs for Human Health Risk Assessment. Land Quality Press. Nottingham.

PAS100 (2018) Specification for Composted Materials

POPs Regulation 2004 – Regulation 850/2004/EC

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1st ATP to POPs regulation – Regulation 756/2010/EU

2nd ATP to POPs regulation – Regulation 756/2010/EU

Revised List of Wastes 2014 – Decision 2014/955/EU

Waste Framework Directive (WFD) 2008/98/EC

Water UK (2014) Contaminated Land Assessment - Risk Assessment for Water Pipes in Land Potentially Affected by Contamination

Wilson S., Collins, F. and Lavery, R. (2018) Using Ternary Plots for Interpretation of Ground Gas Monitoring Results

WM3 Environment Agency (2018) Guidance on the classification and assessment of waste (v1.1 2018)

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APPENDIX D

Site Specific Borehole Logs

Borehole Log

Borehole No. **HA1**

Sheet 1 of 1

Project Name:	Plots 3 and 4, Land off Worlds End Road	Project No. UK18.4095d	Co-ords: -	Hole Type HA
Location:	Tydd St Mary		Level:	Scale 1:10
Client:	R K Wilson Builders		Dates: -	Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10 - 0.30	ES					TOPSOIL: Dark brown slightly clayey sandy silty material
					0.30			Soft dark orangish brown slightly gravelly sandy silty CLAY
					0.60			End of borehole at 0.60 m

Remarks
Groundwater not encountered

AGS

Borehole Log

Borehole No. **HA2**

Sheet 1 of 1

Project Name:	Plots 3 and 4, Land off Worlds End Road	Project No. UK18.4095d	Co-ords: -	Hole Type HA
Location:	Tydd St Mary		Level:	Scale 1:10
Client:	R K Wilson Builders		Dates: -	Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10 - 0.30	ES					TOPSOIL: Dark brown slightly clayey sandy silty material
					0.30			Soft dark orangish brown slightly gravelly sandy silty CLAY
					0.60			End of borehole at 0.60 m

Remarks
Groundwater not encountered

AGS

Borehole Log

Borehole No. **HA3**

Sheet 1 of 1

Project Name:	Plots 3 and 4, Land off Worlds End Road	Project No. UK18.4095d	Co-ords: -	Hole Type HA
Location:	Tydd St Mary		Level:	Scale 1:10
Client:	R K Wilson Builders		Dates: -	Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10 - 0.30	ES					TOPSOIL: Dark brown slightly clayey sandy silty material
					0.30			Soft dark orangish brown slightly gravelly sandy silty CLAY
					0.60			End of borehole at 0.60 m

Remarks
Groundwater not encountered

AGS

Borehole Log

Borehole No. **HA4**

Sheet 1 of 1

Project Name:	Plots 3 and 4, Land off Worlds End Road	Project No. UK18.4095d	Co-ords: -	Hole Type HA
Location:	Tydd St Mary		Level:	Scale 1:10
Client:	R K Wilson Builders		Dates: -	Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10 - 0.30	ES					TOPSOIL: Dark brown slightly clayey sandy silty material
					0.30			Soft dark orangish brown slightly gravelly sandy silty CLAY
					0.60			End of borehole at 0.60 m

Remarks
Groundwater not encountered

AGS

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