Kiwa CMT Testing

BS3882 Topsoil Report

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Total House, Baker Brook Industrial Estate
Wigwam Lane
Hucknall
Nottinghamshire
NG15 7SH



Report Number 77429 / 59594 (20847)

Site:

Sleaford Sidings, Boston

Date: 7th June 2019

Trust
Quality
Progress

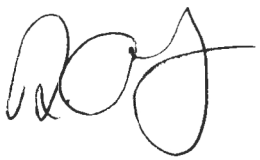
Kiwa CMT Testing

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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Assessment Checked By: **Russell Corbyn** **Environmental Consultant**		
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Issue Number and Date	**1**	**07.06.2019**

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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:

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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.

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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

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Appendix 2

Client Sampling Certificates

None Provided.

Appendix 3

Certificates of Analysis

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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										
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										
											LOD/LOR	Units	Method No.
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

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Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-4	5-8											
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) #	0.2136	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

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JE Job No.: 19/8374

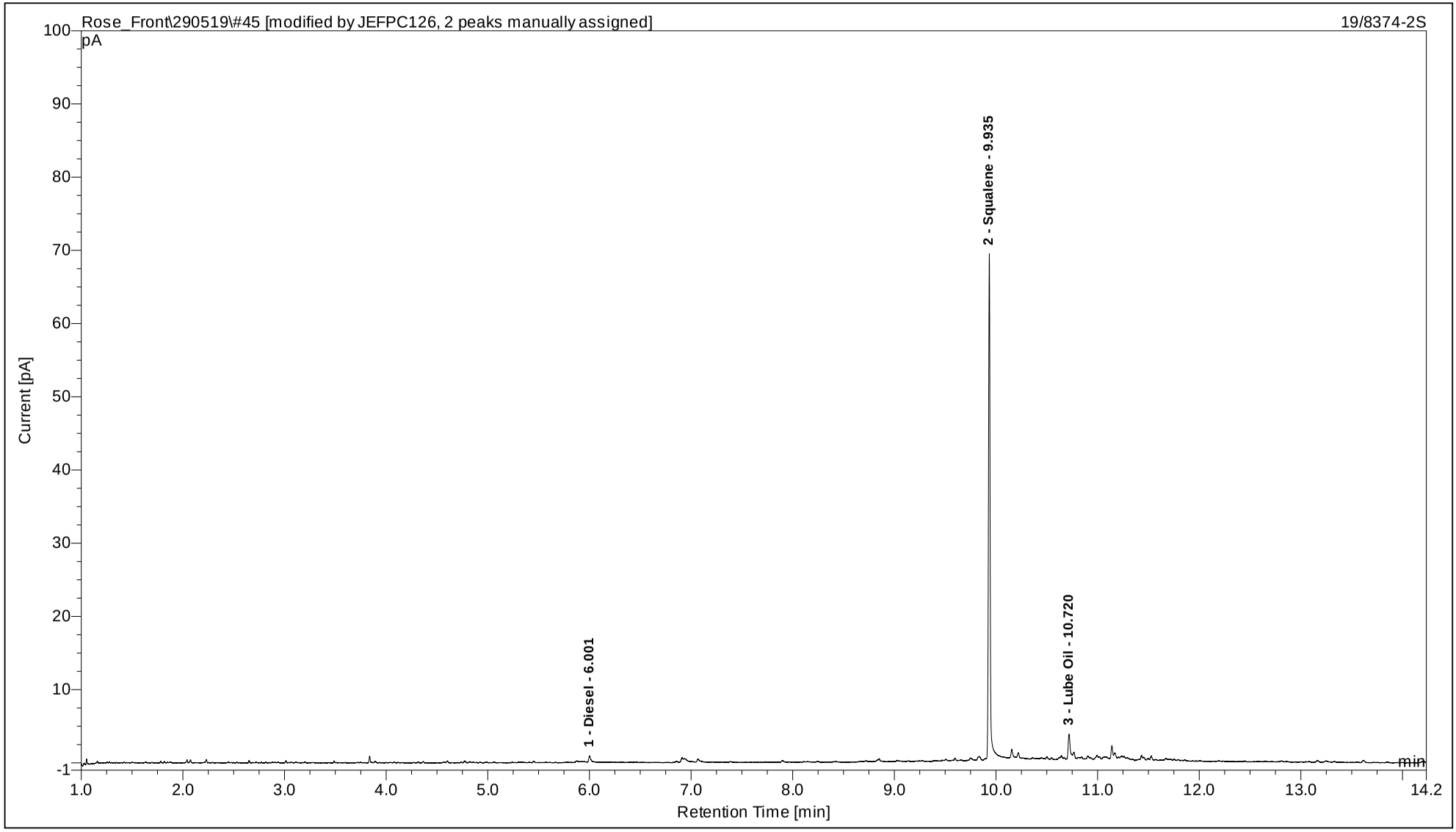
Report : Solid

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

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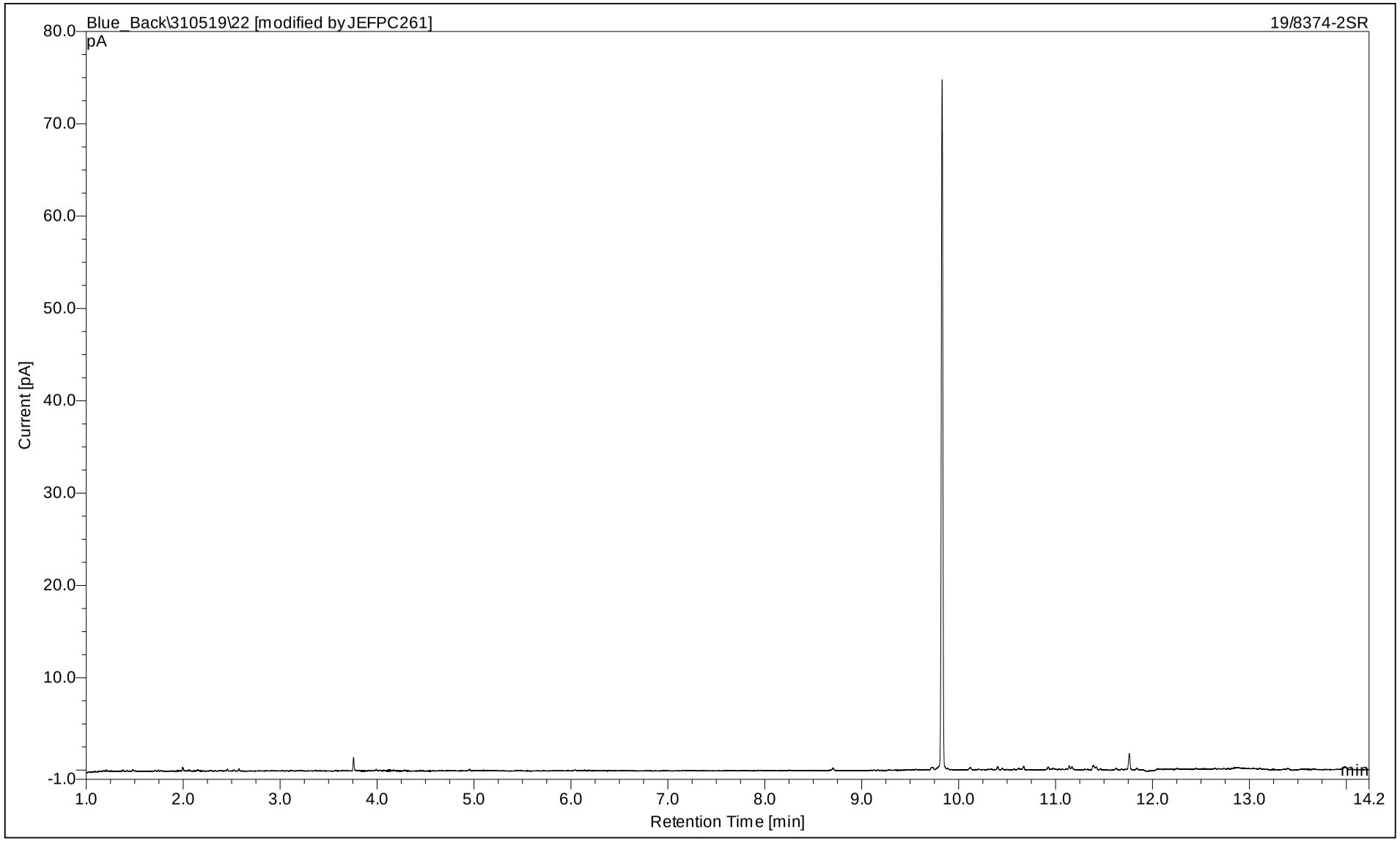
J E Sample No.	1-4	5-8									LOD/LOR	Units	Method No.
Sample ID	59594/1	59594/2											
Depth													
COC No / misc													
Containers	V J T	V J T											
Sample Date	23/05/2019	23/05/2019											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	24/05/2019	24/05/2019											
Sulphide	<10	<10									<10	mg/kg	TM107/PM119
Thiocyanate	0.7	<0.6									<0.6	mg/kg	TM107/PM119
Electrical Conductivity @25C (5:1 ext)	593	661									<10	uS/cm	TM76/PM58
Elemental Sulphur	5	6									<1	mg/kg	TM108/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

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



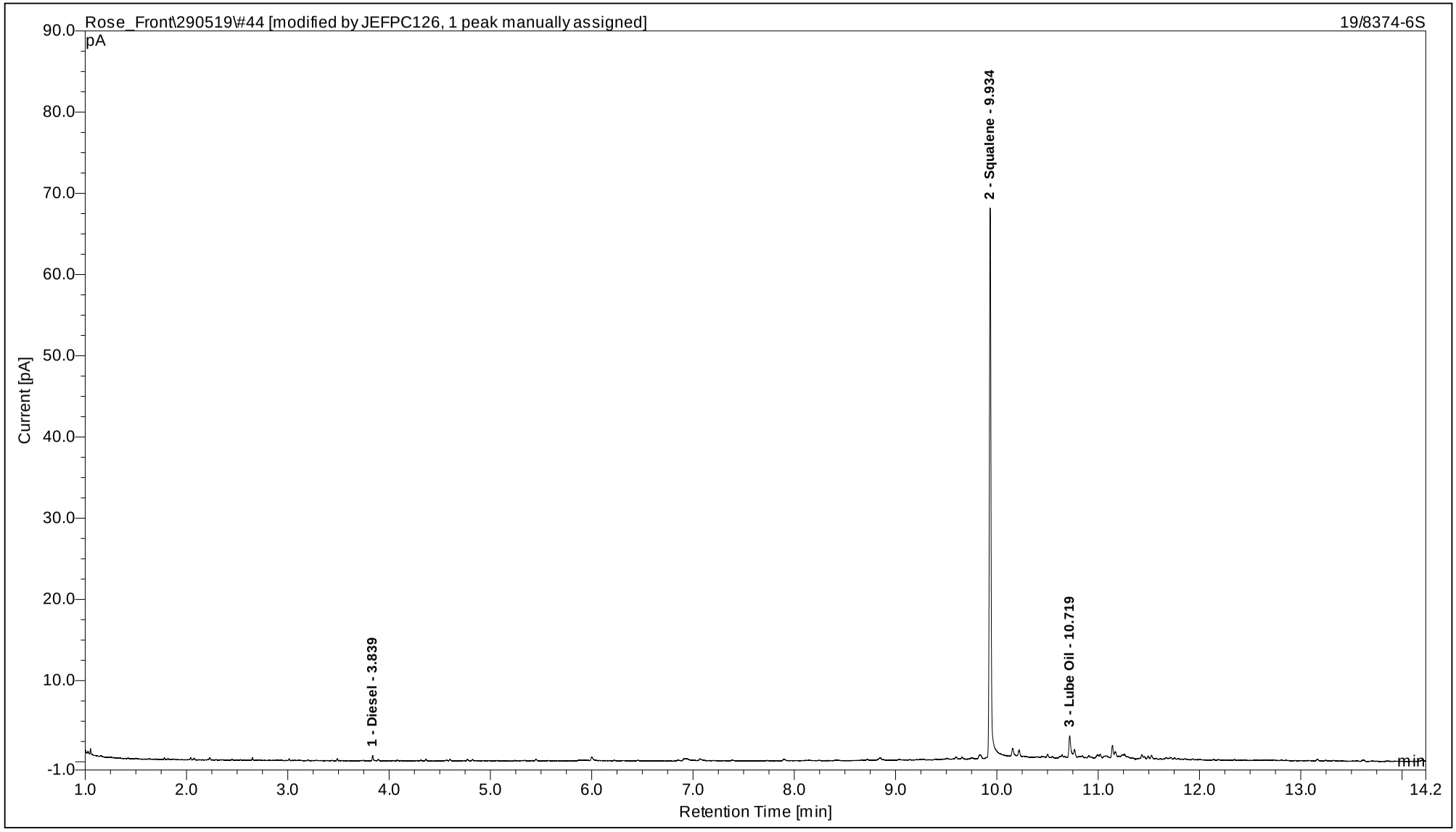
Kiwa CMT Testing

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



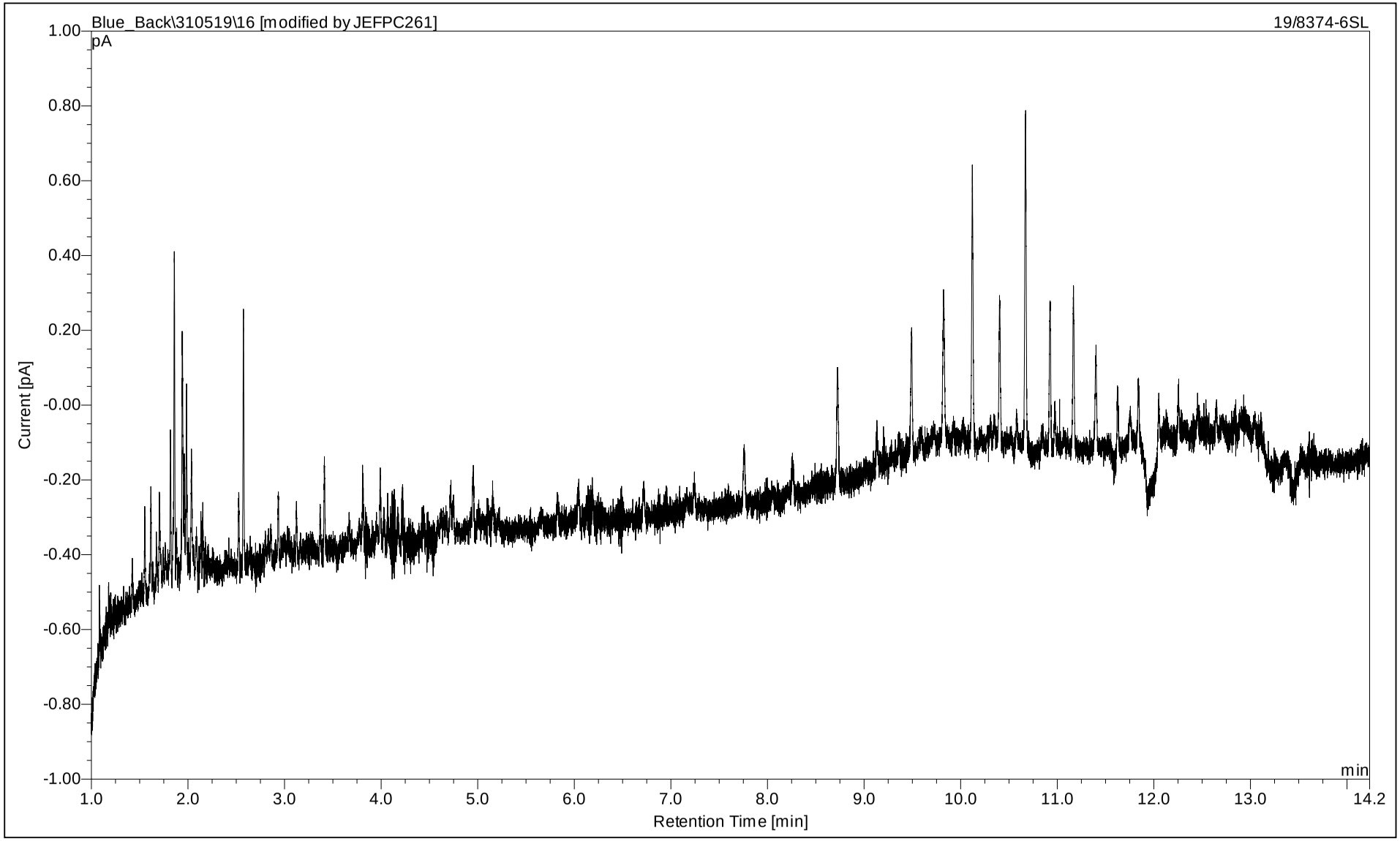
Kiwa CMT Testing

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



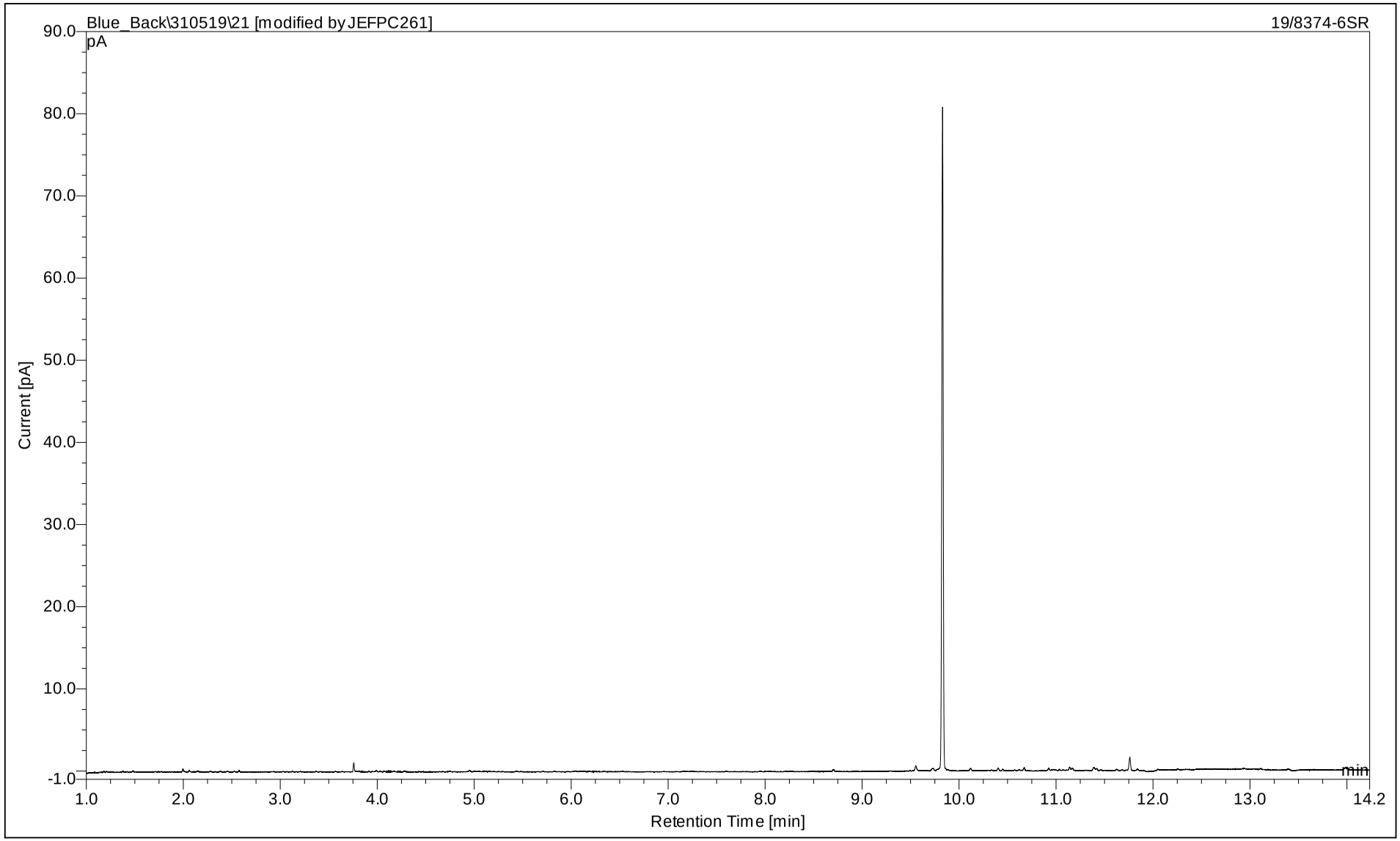
Kiwa CMT Testing

Client Name:	Kiwa CMT Testing	**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	**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

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

J E Job No.	Batch	Sample ID	Depth	J E 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

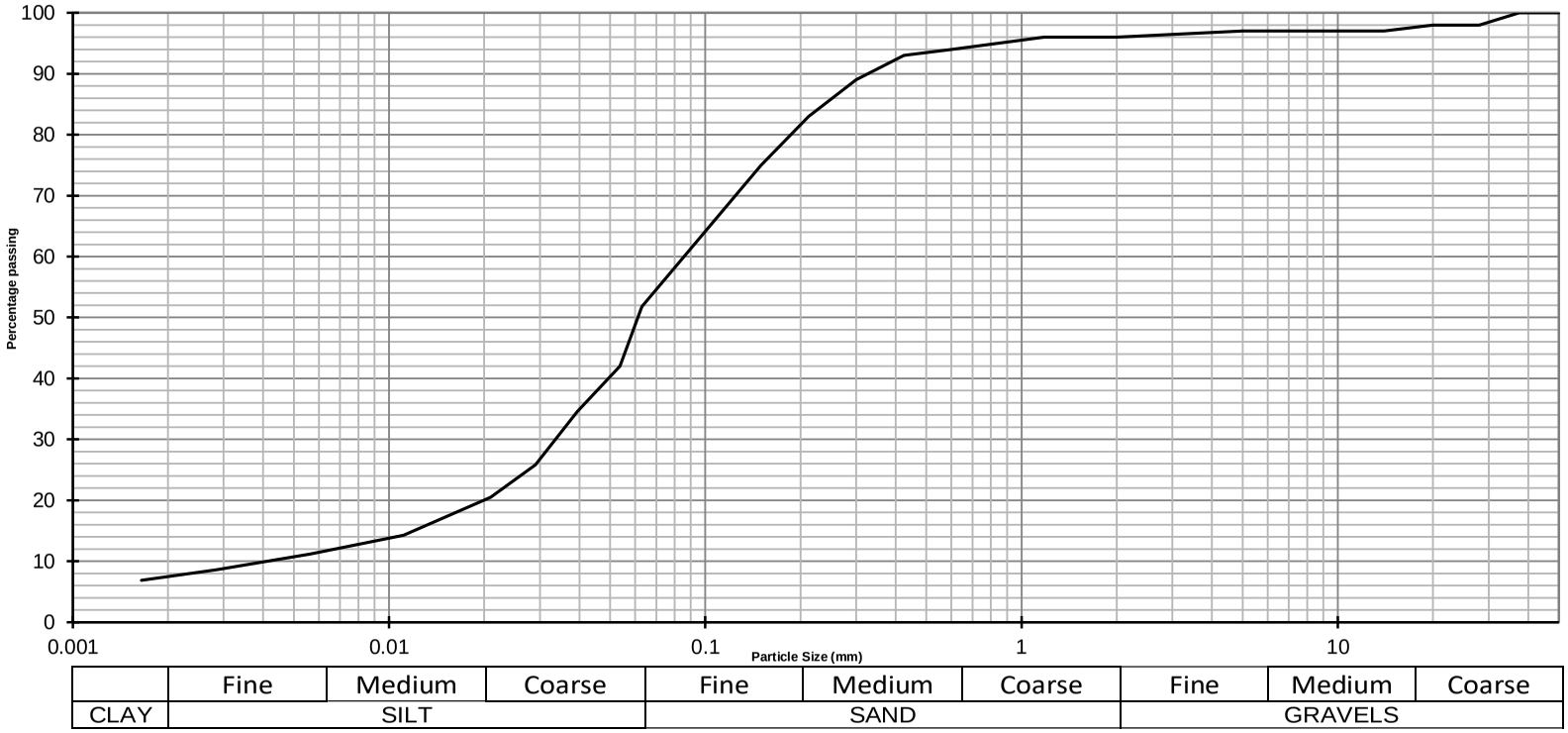
Myles Nicholson

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
Sample size: 2kg
Description Dark brown slightly gravelly, slightly clayey SAND LOAM.
Sampled by: KCMT
Source: Site

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



% 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

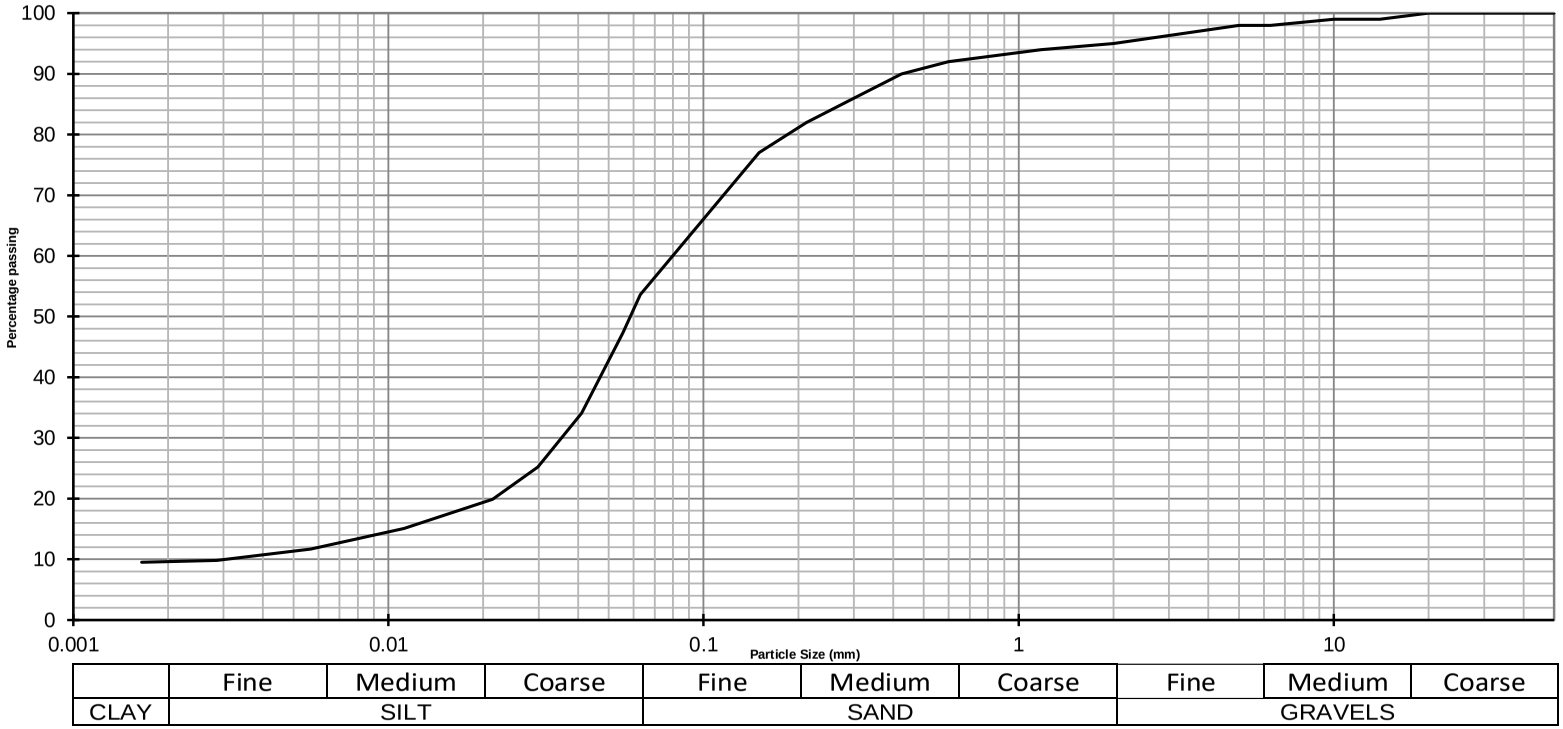
Signed By: A. Fell
Geo-Environmental Technician

Kiwa CMT Testing

Particle Size Distribution

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

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



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

% Organic Material Destroyed: 5.3

Visible Contaminants % >2mm None

% of which are plastics: None

% of which are man-made sharps: None

Textural Classification: Sandy Silt Loam

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

Signed By: A. Fell
Geo-Environmental Technician

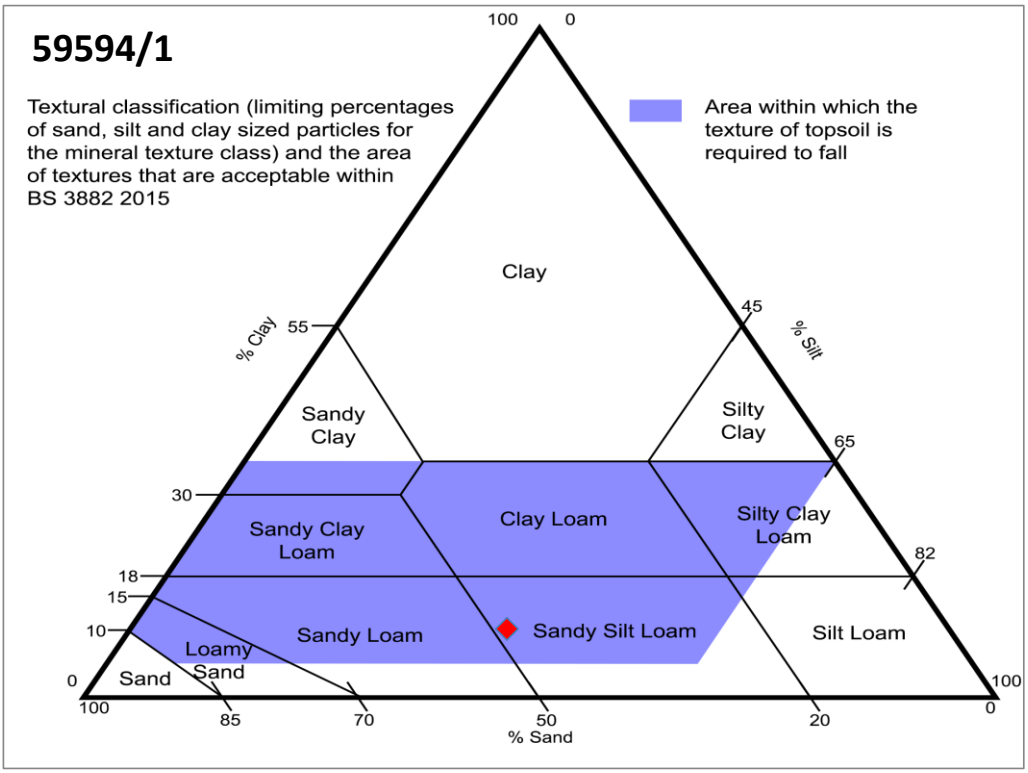
Kiwa CMT Testing

Appendix 4

Textural Classification Chart

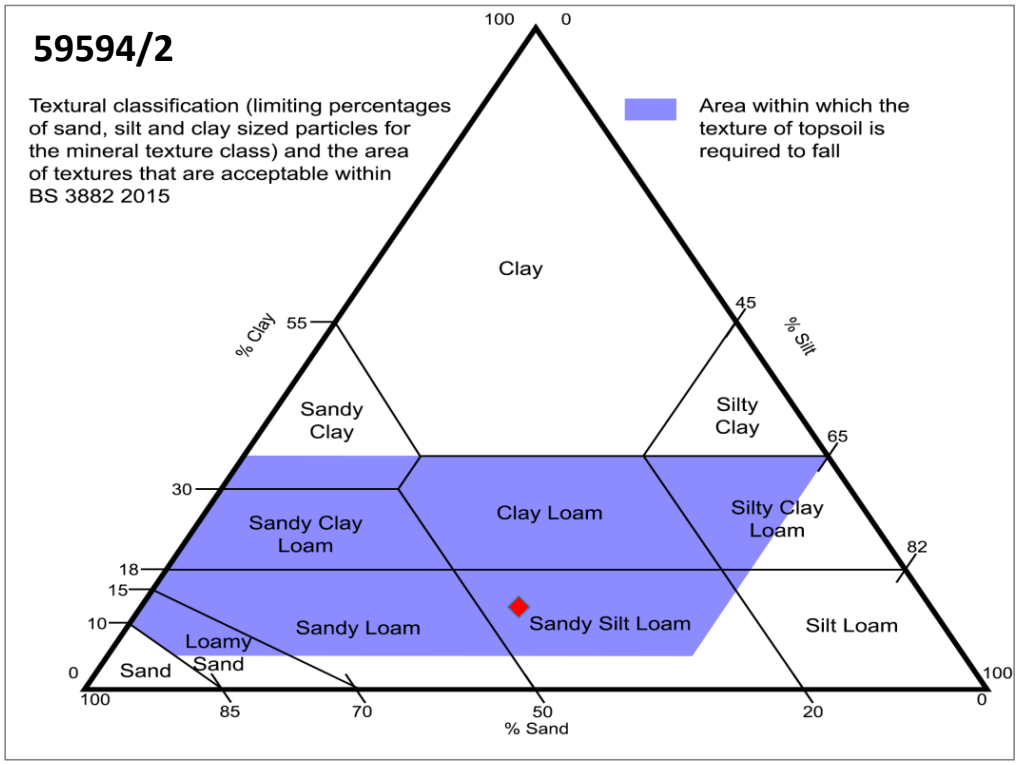
Kiwa CMT Testing

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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Kiwa CMT Testing

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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