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By Email: dave.earl@csg.co.uk

6th July 2018

Subject: Environmental Assessment, Former Saxon Recycling, Station Road East, Whittlesford

EPS Ref: UK18.4087

Dear Dave,

As you will be aware, EPS were recently commissioned by yourselves to undertake a ground investigation at the former Saxon Recycling premises, Station Road East, Whittlesford (*'the site'*).

The aim of these works was to undertake an environmental investigation following reports of a potential spillage of contaminants that was discovered during works to surrender an operating license for the premises.

The scope of works included:

- Drilling of five boreholes to depths of 3.0m below ground level (bgl)
- In-situ testing using a photo-ionisation detector
- Environmental laboratory testing

Limitations and Constraints

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

No investigation method is capable of completely identifying all the ground conditions that might be present beneath a site. Where outlined in our report, we have examined the ground beneath a site by constructing a number of boreholes / trial pits to recover soil samples. The locations of these excavations and sampling points are considered to be representative of the condition of the whole site subsurface. However, it should be appreciated that ground conditions are naturally variable. For this reason, it is possible that samples collected during the investigation may not represent the conditions across the entire site.



The investigation was carried out to assess the ground conditions beneath the site. An assessment of the impact of contamination and undertaking a desk study did not form part of the brief for the investigations undertaken.

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

The report has been prepared for the client(s) listed on the first page and has been subject to standard internal EPS review procedures.

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 prior 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.

Background Information

It is understood that during clean-up of the premises, prior to surrender of the license to recycle print at the premises, a sump area used for collecting liquids, adjacent to the western building elevation, was noted to have potentially been leaking. The sump area had previously been used to collect wastes from the print removal process which used primarily compounds such as ammonia and silver.

When the potential leak was noted, a section of the floor slab was broken out along the western wall to attempt to assess the extent of any spill, revealing an ammonia odour. During this operation, a darker stained area was also noted that appeared to have a hydrocarbon type odour.

A review of on-line historical information suggests that the building(s) have been present since at least the late 1970s/early 1980s, although the use of these at the time is not clear.

Site Location

The site is located within Lion Works Business Park, which lies to the north of Station Road East, Whittlesford, Cambridgeshire.

At the time of the investigation, the site was undergoing a clean-up operation following closure of the former Saxon Recycling operation. The building formed part of a series of linked structures, occupied by different businesses and had been generally cleared, leaving a concrete floor slab exposed. Along the western wall part of the concrete slab had been broken out.

The site was bounded by industrial/commercial premises to north and south, with a car park to the east and a railway line to the west.

Summary of Investigations

The site works on which this report is based were undertaken on 14th June 2018 and consisted of the drilling of five window sampler boreholes (WS1 to WS5), using a percussive window sampling rig, to a maximum depth of 3.0m.

The results of this work in the form of borehole logs are attached in Appendix A with a borehole location plan shown in Appendix B and results of the chemical laboratory testing in Appendix C.

Borehole Location Rationale

Borehole Number	Rationale
WS1	Target area where 'sump' was known to have been present
WS2	Internal borehole to assess lateral contamination spread.
WS3	Internal borehole to assess lateral contamination spread.
WS4	External borehole to assess lateral contamination spread
WS5	Target area of potential hydrocarbon spillage and also further delineate contamination spread.

Ground Conditions

Geological maps of the area indicate that the ground conditions are likely to comprise River Terrace Deposits (Sands & Gravels) underlain by the Holywell Nodular Chalk Formation (Chalk). The chalk in the area is considered as a principle aquifer, with the site lying within a source protection zone II (total catchment area) for the protection of groundwater resources.

Ground conditions encountered during the intrusive investigation are briefly summarised as follows:

- Made Ground
- River Terrace Deposits

Site specific borehole logs are included as Appendix A and give descriptions and depths of strata encountered. A summary of the strata encountered across the site is provided below.

Geological Strata	Maximum Depth to Base of Strata (m bgl)	Range of Strata Thickness (m)
Made Ground	2.20	1.10 – 2.20
River Terrace Deposits	Not Proven	Not Proven

Made Ground

Made Ground (fill) was recorded in all of the boreholes and can be separated in to two distinct layers.

From the surface to roughly 0.20m the Made Ground consisted of a gravelly sand with fragments of brick and flint and this is considered likely to represent subbase materials upon which the floor slab was constructed. Beneath this, the Made Ground typically comprised soft to firm gravelly clays.

Both petroleum and ammonia odours were noted throughout the Made Ground in a number of the boreholes, with the odours being most prevalent in boreholes WS1 and WS5.

River Terrace Deposits

River Terrace Deposits were encountered below the Made Ground in all of the boreholes. An upper layer of gravelly clay was noted in both WS4 and WS5, but beneath this and in all the other boreholes, these materials typically consisted of sands and gravels.

An ammonia odour was noted in WS5, but other than this, no visual or olfactory impact of contamination was noted in this strata.

Groundwater

Groundwater was not recorded in any of the boreholes although moisture was noted at the base of borehole WS5.

Laboratory Analysis

Results of the environmental testing are included as Appendix C and the key results are summarised below.

Contaminant	No. of Samples	No of Detections	Range of Detections (mg/kg)		Highest Location & Depth (m bgl)
			Min	Max	
Silver	9	6	1	419	WS01 (0.90)
TPH (Aliphatic C5-C6)	4	1	0.5		WS05 (0.30)
TPH (Aliphatic C6-C8)	4	1	0.7		WS05 (0.30)
TPH (Aliphatic C8-C10)	4	2	10.4	171	WS01 (0.90)
TPH (Aliphatic C10-C12)	4	1	4924.1		WS01 (0.90)
TPH (Aliphatic C12-C16)	4	1	668		WS01 (0.90)
TPH (Aliphatic C16-C21)	4	-	-	-	-
TPH (Aliphatic C21-C35)	4	1	39		WS01 (0.90)
Total Aliphatics	4	1	5802		WS01 (0.90)
TPH (Aromatics C5-C7)	4	-	-	-	-
TPH (Aromatics C7-C8)	4	-	-	-	-
TPH (Aromatics C8-C10)	4	2	0.2	2.2	WS01 (0.90)
TPH (Aromatics C10-C12)	4	2	12.2	618.7	WS01 (0.90)
TPH (Aromatics C12-C16)	4	2	8	72	WS01 (0.90)
TPH (Aromatics C16-C21)	4	2	33	40	WS05 (0.30)

TPH (Aromatics C21-C35)	4	2	171	207	WS01 (0.90)
Total Aromatics	4	2	231	933	WS01 (0.90)
MTBE	9	-	-	-	-
Benzene	9	-	-	-	-
Toluene	9	-	-	-	-
Ethylbenzene	9	2	0.008	0.412	WS01 (0.90)
m/p-Xylene	9	2	0.051	1.834	WS01 (0.90)
o-Xylene	9	1	0.147		WS05 (0.30)
Ammoniacal Nitrogen	9	6	12.4	1826.1	WS05 (0.30)

Notes: - Contaminant not found above laboratory detection limits

Contamination Assessment

In assessing the potential impacts to human health and environmental receptors associated with the levels of contamination recorded it is important to note the background upon which the evaluation of risks is undertaken;

- It is intended to surrender an operating license for the site
- Source of contamination has been removed
- Building appears to have been used for industrial uses for a number of years

Petroleum Hydrocarbons

Whilst levels of total petroleum hydrocarbons (TPH) have been recorded of up to 6735 mg/kg, this seems to be mainly concentrated in the C10 to C12 carbon chain and the laboratory test results suggests that the source of this is likely to be degraded kerosene, suggesting a historical spillage, particularly as no evidence of a fuel tank or other source associated with petroleum hydrocarbons were reported in this location.

Ammonia

Concentrations of ammoniacal nitrogen (an indicator for the presence of ammonia and ammonium) have been recorded at up to 1,826.1mg/kg, with boreholes WS01 and WS05 both showing some detectable levels of ammoniacal nitrogen.

Risk Evaluation

The site is underlain by River Terrace Deposits with Holywell Nodular Chalk Formation reported at depth. In addition, the site lies within a groundwater source protection zone, suggesting that the groundwater beneath the site is of some resource value. However, in order for the groundwater to become contaminated mobile contamination must be present within the subsurface, which is capable of migrating downwards towards the groundwater.

Although contamination relating to petroleum hydrocarbons have been measured in soils beneath the site, the primary contaminant mass relates to the heavy end (limited mobility) TPH fractions. Also, the majority of contaminant mass (sum TPH of 6,735mg/kg) was present within soils sampled from WS01 at 0.9m. Significant reduction was observed with depth, with concentration of TPH measured at less than laboratory detection limits within soils sampled from the same location but at greater depth (2.4m). In addition to TPH, ethylbenzene and xylenes were also measured at concentrations above laboratory detection limits at the shallower depths. However, similarly to TPH the concentrations dropped to below laboratory detection limits by 2.4m. Given that the contamination is only present at shallower depth and there is no evidence of it migrating downwards towards groundwater, the risks to groundwater within the chalk principal aquifer are not considered significant.

Similarly, ammoniacal nitrogen was measured at concentrations above laboratory detection limits in shallow soils with the maximum concentration measured at 1,826.1mg/kg (WS05 0.3m). An order of magnitude reduction is noted by 1.2m where concentrations of 426.7mg/kg were measured. At a depth of 2.4m concentrations of ammoniacal nitrogen were measured at 37.2mg/kg indicating that within the 2m of unsaturated soils attenuation of up to two orders of magnitude were observed. Applying that logic, it would be reasonable to expect that by approximately 3.5m concentrations of ammoniacal nitrogen would drop to levels below laboratory detection limits.

In terms of risks to human health and as the site is to continue as a commercial property, which comprises a warehouse, the risks from the identified contamination is unlikely to result in significant risk via pathway of vapour inhalation. This is primarily due to a significant dilution expected within commercial warehouses and also due to the fact that the majority of the contaminants identified beneath the site exhibit low volatility in the environment.

Conclusions and Recommendations

On the basis of the above information, the levels of contaminants recorded are not considered to pose an unacceptable risk to either human or environmental receptors, particularly as the source of the contamination has been removed and the levels of contamination will continue to decrease over time.

All construction workers operating at the site should be advised of the potential for exposure to and contact with volatile contaminants in the subsurface of the site. Appropriate health and safety precautions should also be adopted during any excavation works to avoid exposure to soils. Reference should be made to the following HSE document: *Protection of Workers and the General Public during Development of Contaminated Land*.

Should any further palpable evidence of unexpected contamination be encountered during the works, it should be reported to EPS so that an appropriate assessment can be made.

Enclosed

The following information is enclosed with this report:

- Appendix A Site Specific Borehole Logs
- Appendix B Borehole Location Plan
- Appendix C Chemical Analysis Results

We trust that the above is clear, but if you have any questions, please don't hesitate to ask.

Yours Sincerely,



Daryl Powell
On behalf of **EPS**



Steve Bullock
On behalf of **EPS**

APPENDIX A

Site Specific Borehole Logs



Borehole Log

Borehole No.

WS01

Sheet 1 of 1

Project Name: Former Saxon Recycling Plant

Project No.
UK18.4087

Co-ords: -

Hole Type
WLS

Location: Station Road East, Whittlesford, CB22 4WL

Level:

Scale
1:15

Client: Cleansing Services Group

Dates: 15/06/2018 - 14/06/2018

Logged By
Daryl Bowler

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20		MADE GROUND: Reddish brown gravelly SAND with brick, concrete and flint gravel with rare chalk.	
				PID=3	0.40		MADE GROUND: Dark blackish brown CLAY with slight petroleum odour and frequent black material and flint gravel.	
				PID=4			Soft black sandy slightly gravelly CLAY with frequent black material and a strong petroleum odour.	
				PID=154				
				PID=56				
				PID=13				
				PID=32		1.90		
				PID=1				Light yellow slightly clayey SAND and GRAVEL with coarse angular black flint and fine to medium subangular chalk.
				PID=0				
				PID=0		3.00		
End of borehole at 3.00 m								

Remarks





Borehole Log

Borehole No.

WS02

Sheet 1 of 1

Project Name: Former Saxon Recycling Plant

Project No.
UK18.4087

Co-ords: -

Hole Type
WLS

Location: Station Road East, Whittlesford, CB22 4WL

Level:

Scale
1:15

Client: Cleansing Services Group

Dates: 15/06/2018 - 14/06/2018

Logged By
Daryl Bowell

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20		MADE GROUND: Reddish brown gravelly SAND with brick, concrete, flint gravel and rare chalk.	
				PID=2			MADE GROUND: Blackish dark brown very sandy gravelly CLAY with frequent black material.	
				PID=0				
						0.80		<u>Brick and black gravel layer...</u>
				PID=0			MADE GROUND: Brownish grey with black mottling gravelly CLAY with coarse chalk and rare black gravel.	
						1.00		
						1.10		MADE GROUND: Brownish yellow very sandy slightly gravelly CLAY with coarse flint gravel.
				PID=0			MADE GROUND: Soft to firm brown sandy slightly gravelly CLAY with fine flint gravel.	
				PID=0				
				PID=0				
				PID=6		2.10		
						2.20		Blackish brown sandy gravelly CLAY with frequent chalk and flint gravel with brick fragments and a slight odour.
		PID=0				Light yellow SAND and GRAVEL with medium chalk and coarse angular flint gravel.		
				2.50		Light yellow SAND and GRAVEL with fine subrounded chalk.		
		PID=0						
				2.90		Stiff gravelly CLAY with coarse flints.		
				3.00		----- End of borehole at 3.00 m		

Remarks





Borehole Log

Borehole No.

WS03

Sheet 1 of 1

Project Name: Former Saxon Recycling Plant

Project No.
UK18.4087

Co-ords: -

Hole Type
WLS

Location: Station Road East, Whittlesford, CB22 4WL

Level:

Scale
1:15

Client: Cleansing Services Group

Dates: 15/06/2018 - 14/06/2018

Logged By
Daryl Bowell

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20		MADE GROUND: Brick and crushed concrete aggregate.	
				PID=0			MADE GROUND: Very soft to soft dark brownish black gravelly CLAY with frequent black material, rare chalk and fine brick gravel with rare glass fragments. <i>Slight petroleum odour.</i>	
				PID=0			<i>Moderate petroleum odour.</i>	
				PID=0		1.10		Brown sandy GRAVEL with crushed concrete and fine brick.
				PID=0		1.20		Soft to firm brown sandy slightly slightly gravelly CLAY. <i>Darker colouration.</i>
				PID=0				<i>Darker colouration.</i>
				PID=0		1.90		Very gravelly CLAY with chalk gravel.
				PID=0		2.00		Soft brown mottled black gravelly CLAY with concrete gravel.
				PID=0		2.20		Light yellow slightly clayey sandy GRAVEL with coarse angular black flint and fine to medium subangular chalk. Moist.
				PID=0		3.00		End of borehole at 3.00 m

Remarks





Borehole Log

Borehole No.

WS04

Sheet 1 of 1

Project Name: Former Saxon Recycling Plant

Project No.
UK18.4087

Co-ords: -

Hole Type
WLS

Location: Station Road East, Whittlesford, CB22 4WL

Level: 1.30

Scale
1:15

Client: Cleansing Services Group

Dates: 15/06/2018 - 14/06/2018

Logged By
Daryl Bowell

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.11	1.19		Concrete Hardstanding	
								MADE GROUND: Orange gravelly SAND with flint gravel and concrete fragments.	
				PID=0		0.70	0.60		MADE GROUND: Very dark brown gravelly SAND with fine black material and infrequent medium flint gravel and concrete fragments.
				PID=0		1.20	0.10		Medium brown slightly gravelly sandy CLAY with coarse, angular flint.
				PID=0		1.90	-0.60		Yellow SAND and GRAVEL with medium flint and chalk gravel.
				PID=0				Refused at 2.5m...	
					2.50	-1.20		End of borehole at 2.50 m	

1

2

3

Remarks





Borehole Log

Borehole No.

WS05

Sheet 1 of 1

Project Name: Former Saxon Recycling Plant

Project No.
UK18.4087

Co-ords: -

Hole Type
WLS

Location: Station Road East, Whittlesford, CB22 4WL

Level:

Scale
1:15

Client: Cleansing Services Group

Dates: 15/06/2018 - 14/06/2018

Logged By
Daryl Bowell

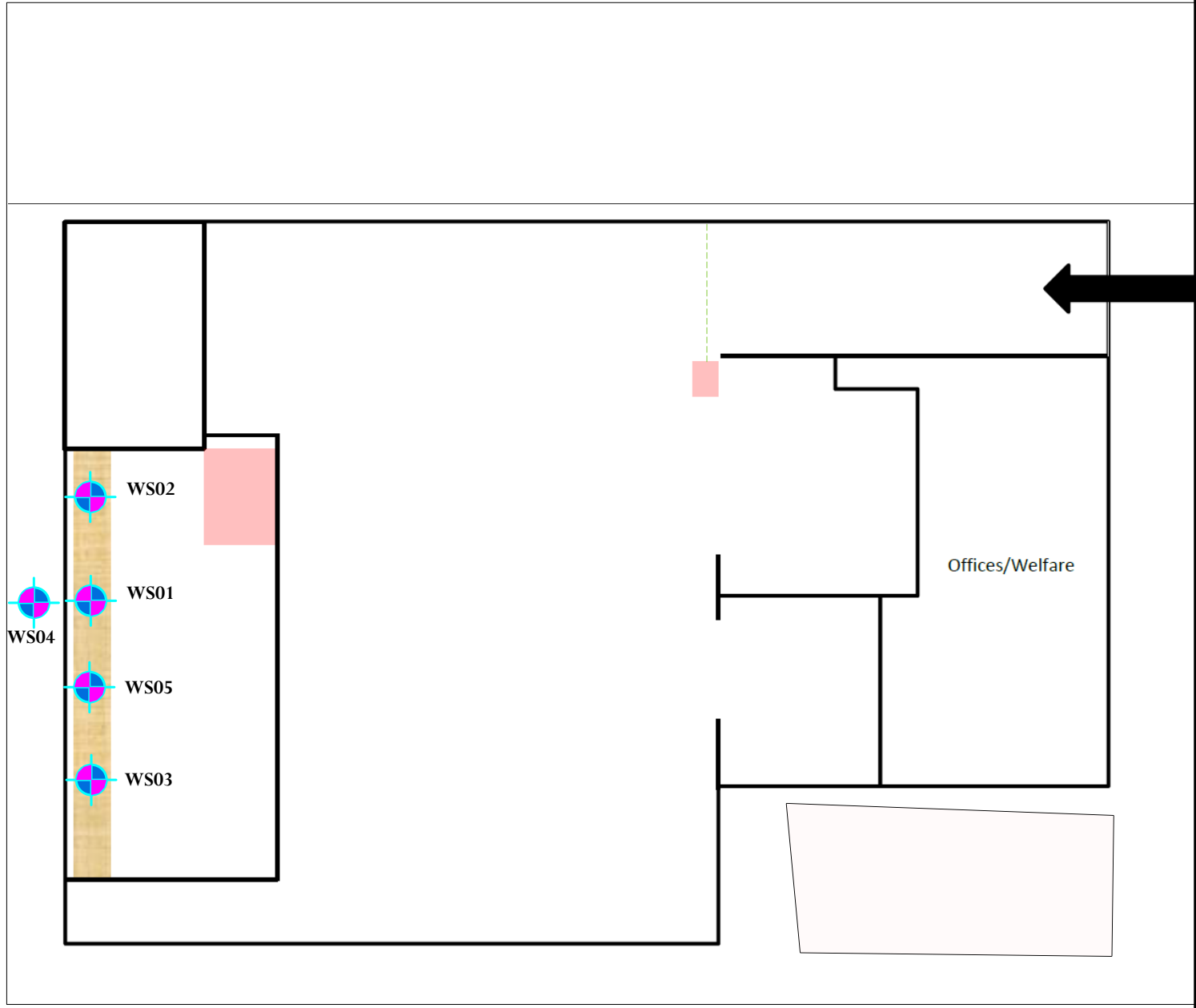
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20		MADE GROUND: Crushed brick sandy GRAVEL.	
				PID=487	0.30		MADE GROUND: White crushed concrete aggregate.	
					0.50		Made Ground: Dark brown sandy GRAVEL with flint and black gravel. <i>Slight ammonia odour.</i>	
				PID=22			Made Ground: Soft black gravelly CLAY with frequent black gravel and rare fine chalk.	
				PID=6				
					1.10		Brown sandy slightly gravelly CLAY with rare fine flint gravel. <i>Darker colouration and strong ammonia odour.</i>	
				PID=10				
				PID=2				
				PID=2				
				PID=12	2.10		Dark and light grey mottled SAND and GRAVEL with coarse flint and medium chalk gravel with a strong ammonia odour and moist in base.	
			PID=0					
			PID=0					
				3.00			End of borehole at 3.00 m	

Remarks



APPENDIX B

Borehole Location Plan



Key:



Approximate Window Sampler Borehole Location

Image Reproduced From Drawing
Supplied By Client



Title: Borehole Location Plan

Project: Former Saxon Recycling,
Station Road East,
Whittlesford, CB22 4WL

Fig No: Appendix B

Scale:	NTS	
Drawn By:	DB	Approved By: SB
Job No:	UK18.4087	
Dwg No:	Saxon/0718/B	
Date:	July 2018	

APPENDIX C

Chemical Analysis Results



Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point
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CB23 6JN

Tel: +44 (0) 1244 833780

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Attention : Daryl Bowell
Date : 26th June, 2018
Your reference : UK18.4087
Our reference : Test Report 18/9421 Batch 1
Location : Former Saxon Recycling Plant, Whittlesford,
CB22 4WL
Date samples received : 16th June, 2018
Status : Final report
Issue : 1

Forty one samples were received for analysis on 16th June, 2018 of which nine 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.

Compiled By:

Phil Sommerton BSc

Project Manager

Client Name: EPS Ltd
Reference: UK18.4087
Location: Former Saxon Recycling Plant, Whittlesford, CB22 4WL
Contact: Daryl Bowell
JE Job No.: 18/9421

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

J E Sample No.	3	8	21	24	30	33	35	36	39			
Sample ID	WS01 ES3	WS01 ES8	WS05 ES9	WS03 ES3	WS03 ES9	WS04 ES3	WS04 ES5	WS05 ES1	WS05 ES4			
Depth	0.90	2.40	2.70	0.90	2.70	1.50	2.10	0.30	1.20			
COC No / misc												
Containers	J	J	J	J	J	J	J	J	J			
Sample Date	14/06/2018	14/06/2018	14/06/2018	14/06/2018	14/06/2018	14/06/2018	14/06/2018	14/06/2018	14/06/2018			
Sample Type	Clay	Sand	Sand	Clayey Sand	Sand	Clayey Sand	Sand	Sand	Clayey Sand			
Batch Number	1	1	1	1	1	1	1	1	1			
Date of Receipt	16/06/2018	16/06/2018	16/06/2018	16/06/2018	16/06/2018	16/06/2018	16/06/2018	16/06/2018	16/06/2018			
										LOD/LOR	Units	Method No.
Silver	419	1	10	3	<1	<1	<1	13	35	<1	mg/kg	TM30/PM15
Total Sulphate as SO4 ^{#M}	1970	322	404	3551 ^{AA}	127	125	110	37080 ^{AA}	3167	<50	mg/kg	TM50/PM29
TPH CWG												
Aliphatics												
>C5-C6 ^{#M}	<1.0 ^{AA}	<0.1	-	-	-	-	-	0.5	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 ^{#M}	<1.0 ^{AA}	<0.1	-	-	-	-	-	0.7	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	171.0 ^{AA}	<0.1	-	-	-	-	-	10.4	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 ^{#M}	4924.1	<0.2	-	-	-	-	-	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 ^{#M}	668	<4	-	-	-	-	-	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 ^{#M}	<7	<7	-	-	-	-	-	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 ^{#M}	39	<7	-	-	-	-	-	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	5802	<19	-	-	-	-	-	<19	<19	<19	mg/kg	TM5/PM8/PM16
Aromatics												
>C5-EC7 [#]	<1.0 ^{AA}	<0.1	-	-	-	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 [#]	<1.0 ^{AA}	<0.1	-	-	-	-	-	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 ^{#M}	2.2 ^{AA}	<0.1	-	-	-	-	-	0.2	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 [#]	618.7	<0.2	-	-	-	-	-	12.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 [#]	72	<4	-	-	-	-	-	8	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 [#]	33	<7	-	-	-	-	-	40	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 [#]	207	<7	-	-	-	-	-	171	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 [#]	933	<19	-	-	-	-	-	231	<19	<19	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics(C5-35)	6735	<38	-	-	-	-	-	231	<38	<38	mg/kg	TM5/PM8/PM16
MTBE [#]	<50 ^{AA}	<5	<5	<5 ^{SV}	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Benzene [#]	<50 ^{AA}	<5	<5	<5 ^{SV}	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Toluene [#]	<50 ^{AA}	<5	<5	<5 ^{SV}	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Ethylbenzene [#]	412 ^{AA}	<5	<5	<5 ^{SV}	<5	<5	<5	8	<5	<5	ug/kg	TM31/PM12
m/p-Xylene [#]	1834 ^{AA}	<5	<5	<5 ^{SV}	<5	<5	<5	51	<5	<5	ug/kg	TM31/PM12
o-Xylene [#]	<50 ^{AA}	<5	<5	<5 ^{SV}	<5	<5	<5	147	<5	<5	ug/kg	TM31/PM12
Natural Moisture Content	31.3	7.6	7.2	28.4	3.4	8.3	2.1	13.8	17.2	<0.1	%	PM4/PM0
Ammoniacal Nitrogen as NH4	202.6	12.4	37.2	121.3	<0.6	<0.6	<0.6	1826.1	426.7	<0.6	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) ^{#M}	0.3684	0.0215	0.1345	1.9345	0.0541	0.0095	0.0080	6.0168	1.4398	<0.0015	g/l	TM38/PM20
Free Cyanide	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	mg/kg	TM89/PM45
Total Cyanide ^{#M}	<0.5	<0.5	<0.5	1.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	mg/kg	TM89/PM45
Complex Cyanide	<0.5	<0.5	<0.5	1.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	mg/kg	TM89/PM45
Thiocyanate	2.1	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	1.5	<0.6	<0.6	mg/kg	TM107/PM119
Sample Type	Clay	Sand	Sand	Clayey Sand	Sand	Clayey Sand	Sand	Sand	Clayey Sand		None	PM13/PM0
Sample Colour	Dark Brown	Medium Brown	Medium Brown	Dark Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/9421

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 overestimate 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

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

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.

Please include all sections of this report if it is reproduced

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

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
AA	x10 Dilution

JE Job No: 18/9421

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	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 and BS1377.	PM0	No preparation is required.			AR	
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes	Yes	AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	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	
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM31	Modified USEPA 8015B. Determination of Methylterbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

JE Job No: 18/9421

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	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 the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	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.			AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	Dried and ground solid sample is boiled with dilute hydrochloric acid, the resulting liquor is then analysed.	Yes	Yes	AD	Yes
TM89	Modified USEPA method OIA-1667. 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 and Thiocyanate analysis.			AR	Yes
TM89	Modified USEPA method OIA-1667. 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 and Thiocyanate analysis.	Yes	Yes	AR	Yes
TM107	Determination of Thiocyanate by Skalar Continuous Flow Analyser	PM119	As received solid samples are extracted with 1M NaOH by orbital shaker for Sulphide and Thiocyanate analysis.			AR	Yes