REFA
Geotechnical, Civil & Structural Engineers

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9th October 2025
Our Ref: SCB/22094/04/A

SUPPLEMENTARY INVESTIGATIONS AT WREXHAM ROAD, RHYOSTYLLEN - NATIONAL TRUST - WOODLAND

Dear Mr. Andy Davies

Further to your recent instructions we have now undertaken a supplementary phase of ground investigations at this site to obtain samples for chemical analysis within the National Trust woodland

1.0 Introduction

As part of the wider development of the area, it is proposed to develop a footpath/ cycleway through the area of land south of the Wrexham Road residential site. The footpath/ cycleway's route extends through an area belonging to the National Trust. The focus of the investigations have been targeted to the National Trust's area of land and the proposed route comprises of a 3.50m wide footpath/ cycleway and adjoining soft landscaping area, as shown on appended National Trust Line Path drawing, 22094/ 104/ 3 Rev D.

The Local Authority have placed a pre- commencement condition on the area stipulating a targeted ground investigation be carried out due the potential of contamination within this area. The northern most section of the route within the National Trusts area, runs through a now demolished former sewage treatment works. The sewage treatment works was dated approximately from the early 1900's and demolished/ removed by the 1990's. In addition, Bersham Colliery was also present adjacent to the western boundary of the national trusts land. Due to the potential of contamination from these sources, REFA Consulting Engineers have since conducted a targeted programme of investigations for the proposed route within this area. The investigations were designed to allow for a chemical assessment of the existing material to be made and assess its potential for reuse within the final development.

2.0 Investigations

REFA Consulting Engineers attended site on the 5th August 2025 to undertake a series of machine excavated trial pits to investigate the ground conditions for the proposed footpath and soft landscaping area within the National Trust parcel of the woodland.

The positions of the trial pits are shown on the appended on the Supplementary Investigation Location Plan- National Trust, 22094/16A. Ground conditions have been reported and collated in a series of trial pit journals which are appended to this report for reference.

A brief summary of the ground conditions is given below.

- The machine excavated positions initially recorded a Made Ground strata, (reworked topsoil), comprising of a dark grey slightly gravelly slightly sandy silty clay with frequent roots and rootlets and localised concrete, slay, brick and siltstone cobble content between 0.45m and 0.75m below ground level. Gravel included slag, brick and limestone pea type gravel as recorded within TP204, T205 and TP207.
- The underlying natural strata predominantly comprises of a friable firm orangish brown slightly sandy silty clay. TP201 recorded localised yellowish brown gravelly fine to coarse sand.

3.0 LABORATORY ANALYSIS

A total of five (5 No.) samples of Made Ground encountered during these investigations have been retained for chemical analyses. Generally, these samples relate to the shallow ground conditions located within the site. These samples are considered to be representative of the ground conditions within the site and form a basis for assessment of their potential for reuse within a public open space type environment.

All samples obtained from this site were considered to be subject to a programme of PAH and metals analyses. Accordingly, all samples have been placed into a 500ml wide necked brown glass jar. All soil samples have been stored in cool boxes at temperatures of approximately 4º (+ or - 2ºC) until delivery to the selected laboratory. All sample containers were marked with the site address, trial pit number, depth and date of sampling. All samples have been tested within the specified handling period to accord with the sampling protocol presented by Element.

All samples selected for chemical analyses have been returned to Element Laboratories who are an MCERTS and UKAS accredited laboratory facility. Each sample has been subject to a range of chemical analyses to determine the concentrations of a wide range of common contaminants applicable to the former use of this site and the materials present. Details of the analysis programme are shown in table 1 below. Confirmation of the UKAS and MCERTS accreditations for each test is indicated within the results which are appended to this report.

Table 1: Chemical Testing Schedule

Analysis	Determinands	No. of Samples
Metals	Arsenic, Cadmium, Chromium total, Copper, Lead, Mercury, Nickel, Selenium, Zinc	5
Organics 1	PAH – USEPA 16 suite, Phenol	5
Inorganics	Cyanide, Soluble Sulphates, Sulphide, pH, TOC	5
Asbestos	Asbestos Screen	5
Hydrocarbons	TPH (CWG), BTEX, MTBE	3
Bacteria	E. Coli and Total Coliforms	2

The samples were obtained from the Made Ground deposits across the site. Tables 2 – 9 have been prepared as a summary of the laboratory analyses depending upon the class of analyses undertaken. The test results have been compared to the adopted assessment criteria, relating to a proposed **public open space.**

Metals & Inorganics

Table 2 indicates the range of contaminants that were analysed and their respective assessment criteria. No samples have recorded exceedances when compared to there respected assessment criteria.

As part of the analysis five (5 No.) samples were submitted for asbestos screening, all consisting of Made Ground material. Asbestos was identified within four (4 No.) samples and have been subjected to gravimetric quantification. A breakdown of type of asbestos and mass is presented within Table 3 below. Based on the results of the asbestos analysis, it is considered that the existing Made Ground is unsuitable for retention due to the presence of asbestos within this material.

Table 2: Summary of Contamination Analysis: Metals & Inorganics

	No. of Samples	Range of Values (mg/kg)	Assessment Criteria (mg/kg)	No. of Samples Failing	Locations
Arsenic	5	4.2 – 12.4	79[3]	0	-
Cadmium	5	0.7 – 4.7	120[3]	0	-
Chromium (total)	5	39.2 – 62.9	1500[3]	0	-
Copper	5	50 - 201	12000[3]	0	-
Lead	5	103 - 392	630[1]	0	-
Mercury	5	0.2 – 1.2	120[3]	0	-
Nickel	5	6.6 – 37.9	230[3]	0	-
Selenium	5	1 – 5	1100[4]	0	-
Zinc	5	4292 - 1346	81,000[3]	0	-
Total Cyanide	5	<0.5 – 1.7	34.0[2]	0	-
Phenol	5	<0.15 – 0.25	690[3]	0	-
pH	5	6.09 – 7.39	-	0	-
SOM	5	6.896 – 18.67	-	0	-
SO_4 (2:1)	5	<0.0015 – 0.0823	0.5[4]	0	-
TOC %	5	4.00 – 10.83	-	0	-
Asbestos	5	NAD	Present/Absent	4	TP201 – 0.30m, TP203- 0.40m, TP204- 0.30m, TP205- 0.40m

1 DEFRA : SP1010 : Category 4 Screening Levels
2 Atkins Atrisk SSV open space (1% SOM)
3 LQM and CIEH S4UL's for Human Health Risk Assessment (Registration No. S4UL 3265) POS near residential housing (2.5% SOM)
4 BRE Special Digest 1:2005 DS-1 ND – None Detected

Table 3: Asbestos Screen Results

Position	Asbestos Type	Mass (%)
TP201- 0.30m	Chrysotile	<0.001
TP203- 0.40m	Chrysotile Amosite	<0.001
TP204- 0.30m	Chrysotile	0.005
TP205- 0.45m	Chrysotile	0.001

Speciated PAH

The soil samples retained from the site investigation have been subject to a programme of analyses which have assessed the concentrations of the individual constituents of the polycyclic aromatic hydrocarbon series.

A summary of these results is shown in table 4. The assessment criteria utilised are based upon the presence of 2.5% soil organic matter within the samples generally. Reference to the tests results does however show more variable soil organic matter content. Assessment of table 4 has indicated no elevated PAH factions when compared to their respected assessment criteria.

Table 4: Summary of Contamination Analysis: Organics: PAH USEPA 16 Suite

	No. of Samples	Range of Values (mg/kg)	Assessment Criteria[1] (mg/kg)	No. of Samples Failing	Locations
Naphthalene	5	0.21 – 1.96	4900	0	-
Acenaphthylene	5	0.03 – 0.19	15000	0	-
Acenaphthene	5	<0.05 – 0.10	15000	0	-
Fluorene	5	<0.04 – 0.15	9900	0	-
Phenanthrene	5	0.29 – 1.82	1300	0	-
Anthracene	5	0.08 – 0.44	74000	0	-
Fluoranthene	5	0.21 – 2.57	3100	0	-
Pyrene	5	0.18 – 1.98	7400	0	-
Benzo{a}anthracene	5	0.15 – 1.40	29.0	0	-
Chrysene	5	0.16 – 1.74	57.0	0	-
Benzo{a}pyrene	5	0.18 – 1.90	10.0[2]	0	-
Indeno{123-cd}pyrene	5	0.17 – 1.85	82.0	0	-
Dibenz{ah}anthracene	5	<0.04 – 0.44	0.57	0	-
Benzo{ghi}perylene	5	0.21 – 1.78	640	0	-
Benzo{b}fluoranthene	5	0.25 – 2.97	7.2	0	-
Benzo{k}fluoranthene	5	0.10 – 1.16	190	0	-

[1] LQM & CIEH S4UL's for human health risk assessment (Registration No. S4UL 3265) – POS near residential housing (2.5% SOM)
[2] DEFRA : SP1010 : Category 4 Screening Levels

TOTAL PETROLEUM HYDROCARBONS TPH (CWG)

A further four (4 No.) samples were selected for a programme of TPH (CWG) analysis. Table 5 has indicated no elevated TPH results and therefore no remediation is required in terms of TPH factions.

Table 5: Summary of Contamination Analysis: Organics: TPH (CWG) Suite

	No. of Samples	Range of Values mg/kg	Assessment* Criteria mg/kg	No. of Samples Failing	Notes
Aliphatic EC> 5 - 6	3	<0.1	590000	0	-
Aliphatic EC> 6 - 8	3	<0.1	610000	0	-
Aliphatic EC> 8 - 10	3	<0.1	13000	0	-
Aliphatic EC> 10 - 12	3	<0.2	13000	0	-
Aliphatic EC> 12 - 16	3	<4	13000	0	-
Aliphatic EC> 16 - 35	3	14 – 137	250000	0	-
Aliphatic EC> 35 - 44	3	<7 - 26	250000	0	-
Aromatic EC> 5 - 7	3	<0.1	56000	0	-
Aromatic EC> 7 - 8	3	<0.1	56000	0	-
Aromatic EC> 8 - 10	3	<0.1	5000	0	-
Aromatic EC> 10 - 12	3	<0.2	5000	0	-
Aromatic EC> 12 - 16	3	<4 – 20	5100	0	-
Aromatic EC> 16 - 21	3	<7 – 39	3800	0	-
Aromatic EC> 21 - 35	3	76 – 192	3800	0	-
Aromatic EC> 35 - 44	3	65 - 135	3800	0	-

*Criteria values based upon LQM & CIEH S4UL's for human health risk assessment (Registration No. S4UL 3265) – POS near residential housing (2.5% SOM)

BTEX

The hydrocarbon analysis was extended to the BTEX range and all concentrations are below the assessment criteria levels, and therefore no remediation is required in terms of BTEX factions.

Table 6: Summary of Contamination Analysis: Organics: BTEX Suite

	No. of Samples	Range of Values (mg/kg)	Assessment* Criteria (mg/kg)	No. of Samples Failing	Notes
Benzene	3	<0.005	72.0	0	
Toluene	3	0.024 – 0.037	56000	0	
EthylBenzene	3	<0.005	24000	0	
M/PXylenes	3	<0.005	42000	0	
O - Xylene	3	<0.005	42000	0	
Methyl tert–Butyl Ether	3	<0.005	85500[1]	0	

Criteria values based upon LQM & CIEH S4UL's for human health risk assessment (Registration No. S4UL 3265) – POS near residential housing (2.5% SOM)
[1]Atkins Atrisk SSV open sapce (1% SOM)

Bacteria

The historic locations of the sewage treatment works have been overlayed onto the Supplementary Investigation Location Plan- National Trust, 22094/16A. Position TP204 was placed in an area closest to the suspected filter beds associated with the works and TP207 was placed close to suspected circular water treatment centre. Samples of the Made Ground were tested for Total Coliforms and Escherichia Coli to assess the risk from historic sewage treatment plant within this area. E. Coli was recorded at levels between 40 and 60 cfu/g and total coliforms were recorded at 270 and 1990 cfu/g.

Table 9: Summary of Contamination Analysis: Coliform Testing

	No. of Samples	Range of Values (cfu/g)	Assessment* Criteria	No. of Samples Failing	Notes
Total Coliforms	2	270 - 1990	Present/ Absent	2	TP204- 0.30m TP207- 0.40m
Escherichia Coli	2	40 - 60	Present/ Absent	2	TP204- 0.30m TP207- 0.40m

4.0 Recommendations

Following this phase of investigations, four (4 No.) positions have recorded asbestos within the Made Ground at levels ranging between <0.001% and 0.005%. In addition, the positions targeted for E-Coli and Total Coliform have both indicated elevations within these contaminants. As such a capping detail is required to provide a minimum 450mm cover system over the affected area.

Starting from TP201 levels of the proposed grass verge and cycleway/ footpath, approximate width 3.50m, are to be raised by au minimum 450mm. The design is to incorporate a geotextile membrane at the base (ground level) and incorporate two layers of Cellweb design, each layer being 200mm thick.

A 25mm overfill Leca layer will be placed with 75mm Breedon gravel aggregate to finish which will be compacted to 50mm. Within the 0.50m grass verge area, a 75mm topsoil finish will be placed. See appended indicative stacked Cellweb design.

This design has been formed in conjunction with NCLOG Guidance 'A Regulator's Guide to cover Systems and their Verification', Section 5.10.2, *Engineered Tree Root Protection with Cover System'* The purpose of the design is to provide protection to the root system of the trees within the National Trust woodland area whilst also providing a safe 450mm capping layer over the contaminated reworked topsoil strata.

Within the 0.50m area either side of the roadway, a minimum 75mm topsoil layer will placed. Upon installation of the capping material, the area will need validating by an independent third party. Nominal spot checks should be carried out along the route, the frequency of which should be agreed by the Local Authority prior to validation.

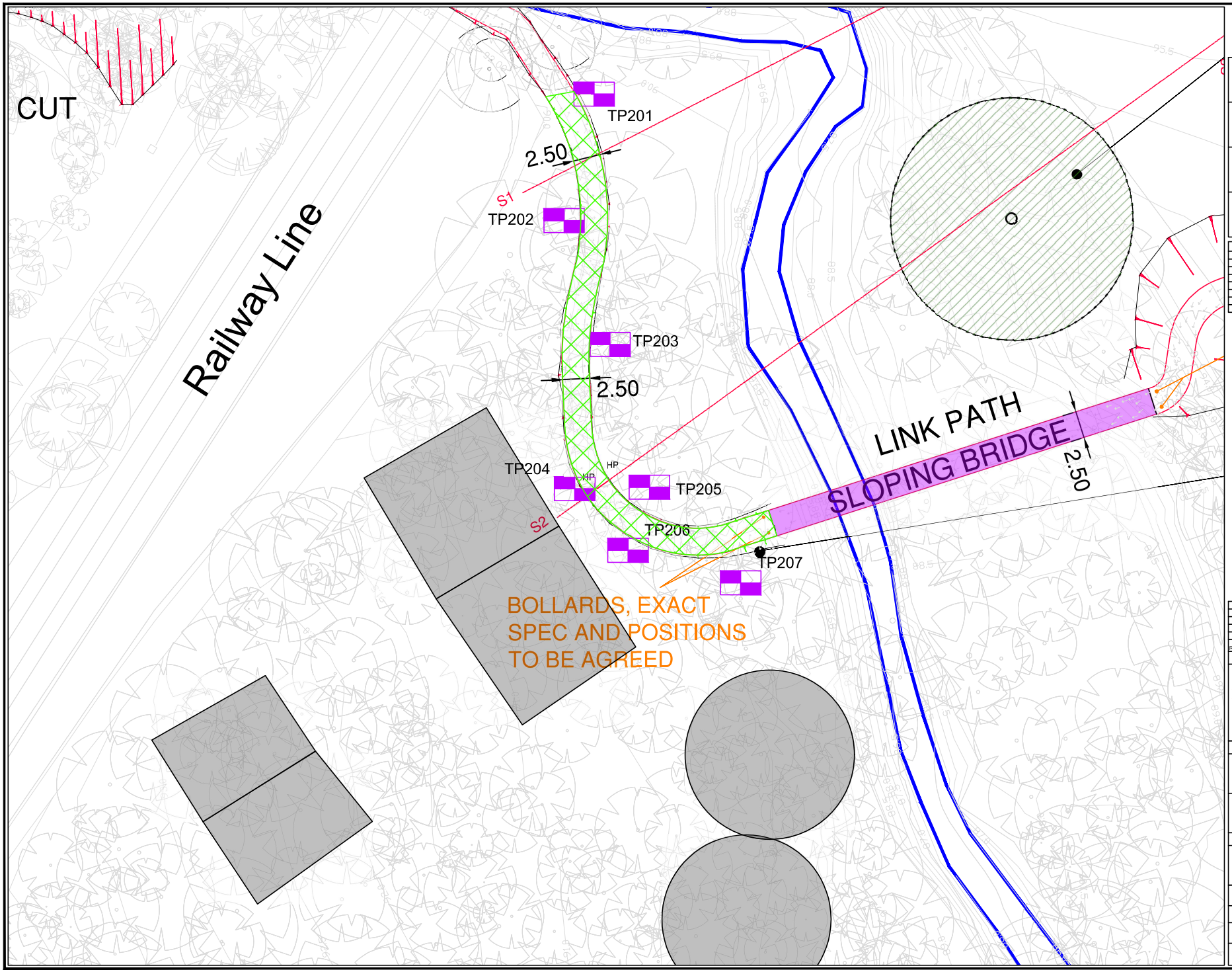
We trust that this is satisfactory for your current requirements. Please do not hesitate to contact the undersigned should you have any queries.

Yours sincerely,

[redacted]

Stephen Boot BSc. (Hons) FGS
Senior Geoenvironmental Engineer

Appendices - *Supplementary Investigation Location Plan- National Trust- 22094/16A*
TP201- TP207- Trial Pit Logs
Element Chemical Results
National Trust Link Path- 22094/ 104/ 3 Rev D
Cellweb Standard detail design



KEY

	Machine Excavated Trial Pit
	Historical Tanks Based on 1:10560 OS Historical Map, 1964
	Historical Building Based on 1:10560 OS Historical Map, 1964
	Area of Stacked Cellweb Design

COORDINATES

Reference	Easting	Northing
TP201	331683.43	348398.94
TP202	331680.63	348387.13
TP203	331684.90	348375.58
TP204	331681.61	348362.13
TP205	331688.59	348362.27
TP206	331686.60	348356.35
TP207	331697.12	348353.35

INFO

Rev.	Description	By	Date
A	Added coordinates for trial pit locations	AW	01.08.25

Revision History

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Drawing

Supplementary Investigation Location Plan - National Trust

Sheet Size	Scale at Sheet Size	Date	Drawn By	Checked By
A3	nts	20/06/2025	AB	

Project Number	Drawing Number	Current Revision
22094	22094/16	A

TRIAL PIT RECORD

Pit ID: **TP201**

Project Name: Wrexham Road, Rhostyllen, Wrexham	Client: SG Estates Ltd	Date: 05/08/2025
Location: Wrexham Road, Rhostyllen, Wrexham	Logged by: SCB	
Project No. : 22094	Crew Name:	Equipment: 2.5 tonne excavator

Log Status	Location Type	Level	Approved By	Scale	Page Number
FINAL	TP (Photos)		SCB	1:37	Sheet 1 of 1

Legend	Water Strikes	Sample and In Situ Testing			Stratum Description	Depth (m)	Level (m)
		Depth (m)	Type	Results			
		0.30	ES		MADE GROUND: dark grey slightly gravelly slightly Sandy silty clay with occasional rootlets. Gravel is sa fine to medium of siltstone and occasional brick		
					concrete blocks associated with buried fence at 0.10m	0.45	
					Yellowish brown gravelly fine to coarse sand. Gravel is subrounded fine to medium of siltstone and quartz.	0.60	
					End of Trial Pit at 0.60m		

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Trial Pit Photographs



TP201 Excavation



TP201 Spoil

Dimensions		Trench Support and Comments		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks

Key:
ES - Environmental Sample
D - Small Disturbed Sample
B - Bulk Disturbed Sample
PID - Photo-ionisation Detector

Remarks:

Position completed at 0.60m following confirmation of natural strata.

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TRIAL PIT RECORD

Pit ID
TP202

Project Name: Wrexham Road, Rhostyllen, Wrexham	Client: SG Estates Ltd	Date: 05/08/2025
Location: Wrexham Road, Rhostyllen, Wrexham	Logged by: SCB	
Project No. : 22094	Crew Name:	Equipment: 2.5 tonne excavator

Log Status	Location Type	Level	Approved By	Scale	Page Number
FINAL	TP (Photos)		SCB	1:37	Sheet 1 of 1

Legend	Water Strikes	Sample and In Situ Testing			Stratum Description	Depth (m)	Level (m)
		Depth (m)	Type	Results			
		0.20	ES		MADE GROUND: dark grey slightly gravelly slightly sandy silty clay with frequent roots and rootlets and low brick cobble content, Gravel is subangular fine to coarse of brick and siltstone		
					Friable firm orangish brown slightly sandy silty CLAY	0.50	
					End of Trial Pit at 0.60m	0.60	

0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5

Trial Pit Photographs



TP202 Excavation



TP202 Spoil

Dimensions		Trench Support and Comments		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks

Key:
ES - Environmental Sample
D - Small Disturbed Sample
B - Bulk Disturbed Sample
PID - Photo-ionisation Detector

Remarks:
Position completed at 0.60m following confirmation of natural strata.

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TRIAL PIT RECORD

Pit ID
TP203

Project Name: Wrexham Road, Rhostyllen, Wrexham	Client: SG Estates Ltd	Date: 05/08/2025
Location: Wrexham Road, Rhostyllen, Wrexham	Logged by: SCB	
Project No. : 22094	Crew Name:	Equipment: 2.5 tonne excavator

Log Status	Location Type	Level	Approved By	Scale	Page Number
FINAL	TP (Photos)		SCB	1:37	Sheet 1 of 1

Legend	Water Strikes	Sample and In Situ Testing			Stratum Description	Depth (m)	Level (m)
		Depth (m)	Type	Results			
		0.40	ES		MADE GROUND: dark grey slightly gravelly slightly sandy silty clay with frequent rootlets. Gravel is subangular fine to medium of siltstone and occasional brick	0.45	
					Friable firm orangish brown slightly sandy silty CLAY	0.60	
					End of Trial Pit at 0.60m		

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Trial Pit Photographs



TP203- Excavation



TP203-Spoil

Dimensions		Trench Support and Comments			Key:
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	ES - Environmental Sample D - Small Disturbed Sample B - Bulk Disturbed Sample PID - Photo-ionisation Detector

Remarks:

Position completed at 0.60m following confirmation of natural strata.

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TRIAL PIT RECORD

Pit ID
TP204

Project Name: Wrexham Road, Rhostyllen, Wrexham	Client: SG Estates Ltd	Date: 05/08/2025
Location: Wrexham Road, Rhostyllen, Wrexham	Logged by: SCB	
Project No. : 22094	Crew Name:	Equipment: 2.5 tonne excavator

Log Status	Location Type	Level	Approved By	Scale	Page Number
FINAL	TP (Photos)		SCB	1:37	Sheet 1 of 1

Legend	Water Strikes	Sample and In Situ Testing			Stratum Description	Depth (m)	Level (m)
		Depth (m)	Type	Results			
		0.30	ES		MADE GROUND: dark grey gravelly clayey fine to coarse sand with low brick cobble content, Gravel is subangular fine to coarse of brick, limestone pea type gravel and slag		
					Friable firm orangish brown slightly sandy silty CLAY	0.50	
					End of Trial Pit at 0.60m	0.60	

0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5

Trial Pit Photographs



TP204- Excavation



TP204- Spoil

Dimensions		Trench Support and Comments			Key:
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	ES - Environmental Sample D - Small Disturbed Sample B - Bulk Disturbed Sample PID - Photo-ionisation Detector

Remarks:

Position completed at 0.60m following confirmation of natural strata.

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Company Number: 02436911

TRIAL PIT RECORD

Pit ID
TP205

Project Name: Wrexham Road, Rhostyllen, Wrexham	Client: SG Estates Ltd	Date: 05/08/2025
Location: Wrexham Road, Rhostyllen, Wrexham	Logged by: SCB	
Project No. : 22094	Crew Name:	Equipment: 2.5 tonne excavator

Log Status	Location Type	Level	Approved By	Scale	Page Number
FINAL	TP (Photos)		SCB	1:37	Sheet 1 of 1

Legend	Water Strikes	Sample and In Situ Testing			Stratum Description	Depth (m)	Level (m)
		Depth (m)	Type	Results			
		0.45	ES		MADE GROUND: dark grey slightly gravelly slightly sandy silty clay with frequent roots and rootlets, gravel is subangular to subrounded fine to medium concrete siltstone and pest gravel type limestone		
					Friable firm light brown slightly sandy silty CLAY	0.60	
					End of Trial Pit at 0.80m	0.80	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Trial Pit Photographs



TP205- Excavation



TP205- Spoil

Dimensions		Trench Support and Comments			Key:
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	ES - Environmental Sample D - Small Disturbed Sample B - Bulk Disturbed Sample PID - Photo-ionisation Detector

Remarks:

Position completed at 0.80m following confirmation of natural strata.

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TRIAL PIT RECORD

Pit ID
TP206

Project Name: Wrexham Road, Rhostyllen, Wrexham	Client: SG Estates Ltd	Date: 05/08/2025
Location: Wrexham Road, Rhostyllen, Wrexham	Logged by: SCB	
Project No. : 22094	Crew Name:	Equipment: 2.5 tonne excavator

Log Status	Location Type	Level	Approved By	Scale	Page Number
FINAL	TP (Photos)		SCB	1:37	Sheet 1 of 1

Legend	Water Strikes	Sample and In Situ Testing			Stratum Description	Depth (m)	Level (m)
		Depth (m)	Type	Results			
		0.30	ES		MADE GROUND: dark grey slightly gravelly slightly sandy silty clay with frequent roots and rootlets and low slag cobble content, Gravel is subangular fine to coarse of slag, brick and siltstone		
					Friable firm light brown sandy silty CLAY	0.60	
					End of Trial Pit at 0.70m	0.70	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Trial Pit Photographs



TP206- Excavation



TP206- Spoil

Dimensions		Trench Support and Comments		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks

Key:
ES - Environmental Sample
D - Small Disturbed Sample
B - Bulk Disturbed Sample
PID - Photo-ionisation Detector

Remarks:
Position completed at 0.70m following confirmation of natural strata.

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Company Number: 02436911

TRIAL PIT RECORD

Pit ID
TP207

Project Name: Wrexham Road, Rhostyllen, Wrexham	Client: SG Estates Ltd	Date: 05/08/2025
Location: Wrexham Road, Rhostyllen, Wrexham	Logged by: SCB	
Project No. : 22094	Crew Name:	Equipment: 2.5 tonne excavator

Log Status	Location Type	Level	Approved By	Scale	Page Number
FINAL	TP (Photos)		SCB	1:37	Sheet 1 of 1

Legend	Water Strikes	Sample and In Situ Testing			Stratum Description	Depth (m)	Level (m)
		Depth (m)	Type	Results			
		0.40	ES		MADE GROUND: dark grey slightly gravelly slightly sandy silty clay with freq roots and rootlets, and occasional siltstone cobble content. Gravel is subangular to subrounded fine to coarse siltstone and occasional, brick slag and limestone pea type gravel.		
					Friable firm orangish brown slightly sandy silty CLAY	0.70	
					End of Trial Pit at 0.90m	0.90	

0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5

Trial Pit Photographs



TP207- Spoil



TP207- Excavation

Dimensions		Trench Support and Comments			Key:
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	ES - Environmental Sample D - Small Disturbed Sample B - Bulk Disturbed Sample PID - Photo-ionisation Detector

Remarks:

Position completed at 0.90m following confirmation of natural strata.

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Attention :	Stephen Boot
Date :	20th August, 2025
Your reference :	22094
Our reference :	Test Report 25/12919 Batch 1
Location :	Wrexham Road, Wrexham
Date samples received :	7th August, 2025
Status :	Final Report
Issue :	202508201335

Five samples were received for analysis on 7th August, 2025 of which five were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

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

Scope 1&2 emissions - 19.548 kg of CO2

Scope 1&2&3 emissions - 46.197 kg of CO2

[redacted]

Phil Sommerton BSc
Senior Technical Account Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Robert E Fry & Associates Ltd
Reference: 22094
Location: Wrexham Road, Wrexham
Contact: Stephen Boot
EMT Job No: 25/12919

Report : Solid

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

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-3	4-5	6-9	10-11	12-15							
Sample ID	TP201	TP203	TP204	TP205	TP207							
Depth	0.30	0.40	0.30	0.45	0.40							
COC No / misc												
Containers	V J T	J T	V J T	J T	V J T							
Sample Date	05/08/2025	05/08/2025	05/08/2025	05/08/2025	05/08/2025							
Sample Type	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1							
Date of Receipt	07/08/2025	07/08/2025	07/08/2025	07/08/2025	07/08/2025							
											LOD/LOR	Units	Method No.
Arsenic #	9.2	8.1	4.2	12.1	12.4						<0.5	mg/kg	TM30/PM15
Cadmium #	1.5	4.2	4.7	2.7	0.7						<0.3	mg/kg	TM30/PM15
Chromium #	39.2	43.4	43.8	62.9	40.3						<0.5	mg/kg	TM30/PM15
Copper #	60	201	71	153	50						<1	mg/kg	TM30/PM15
Lead #	160	392	103	243	144						<5	mg/kg	TM30/PM15
Mercury #	0.2	1.1	0.2	1.2	0.3						<0.1	mg/kg	TM30/PM15
Nickel #	17.4	18.3	6.6	37.9	18.0						<0.7	mg/kg	TM30/PM15
Selenium #	2	5	4	2	1						<1	mg/kg	TM30/PM15
Zinc #	1346	722	824	901	292						<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	0.29	1.08	0.31	1.96	0.21						<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.06	0.19	0.05	0.17	0.03						<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	0.10	<0.05	0.21	<0.05						<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	0.13	<0.04	0.15	<0.04						<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.59	1.82	0.37	1.83	0.29						<0.03	mg/kg	TM4/PM8
Anthracene #	0.12	0.44	0.08	0.37	0.04						<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.87	2.57	0.40	1.87	0.21						<0.03	mg/kg	TM4/PM8
Pyrene #	0.85	1.98	0.35	1.48	0.18						<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.56	1.40	0.29	0.98	0.15						<0.06	mg/kg	TM4/PM8
Chrysene #	0.69	1.74	0.27	1.26	0.16						<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	1.21	4.13	0.62	2.58	0.35						<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.64	1.90	0.36	1.35	0.18						<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.49	1.85	0.31	1.29	0.17						<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.13	0.44	0.07	0.26	<0.04						<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.47	1.78	0.32	1.27	0.21						<0.04	mg/kg	TM4/PM8
PAH 16 Total	7.0	21.6	3.8	17.0	2.2						<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.87	2.97	0.45	1.86	0.25						<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.34	1.16	0.17	0.72	0.10						<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	87	96	96	92	78						<0	%	TM4/PM8
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1 SV	-	<0.1 SV	-	<0.1 SV						<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	0.1 SV	-	<0.1 SV	-	<0.1 SV						<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1 SV	-	<0.1 SV	-	<0.1 SV						<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	-	<0.2	-	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	-	<4	-	<4						<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	-	<7	-	<7						<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	32	-	137	-	14						<7	mg/kg	TM5/PM8/PM16
>C35-C44 (EH_CU_1D_AL)	13	-	26	-	<7						<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-44 (EH_CU+HS_1D_AL)	45	-	163	-	<26						<26	mg/kg	TM5/TM36/PM8/PM12/PM16

Client Name: Robert E Fry & Associates Ltd
Reference: 22094
Location: Wrexham Road, Wrexham
Contact: Stephen Boot
EMT Job No: 25/12919

Report : Solid

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

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-3	4-5	6-9	10-11	12-15						LOD/LOR	Units	Method No.
Sample ID	TP201	TP203	TP204	TP205	TP207								
Depth	0.30	0.40	0.30	0.45	0.40								
COC No / misc													
Containers	V J T	J T	V J T	J T	V J T								
Sample Date	05/08/2025	05/08/2025	05/08/2025	05/08/2025	05/08/2025								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	07/08/2025	07/08/2025	07/08/2025	07/08/2025	07/08/2025								
TPH CWG													
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1 SV	-	<0.1 SV	-	<0.1 SV						<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1 SV	-	<0.1 SV	-	<0.1 SV						<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1 SV	-	<0.1 SV	-	<0.1 SV						<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	-	<0.2	-	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	-	20	-	<4						<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	-	39	-	<7						<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	96	-	192	-	76						<7	mg/kg	TM5/PM8/PM16
>EC35-EC44 (EH_CU_1D_AR)	117	-	135	-	65						<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-44 (EH_CU+HS_1D_AR)	213	-	386	-	141						<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-44) (EH_CU+HS_1D_Total)	258	-	549	-	141						<52	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5 SV	-	<5 SV	-	<5 SV						<5	ug/kg	TM36/PM12
Benzene #	<5 SV	-	<5 SV	-	<5 SV						<5	ug/kg	TM36/PM12
Toluene #	37 SV	-	24 SV	-	25 SV						<5	ug/kg	TM36/PM12
Ethylbenzene #	<5 SV	-	<5 SV	-	<5 SV						<5	ug/kg	TM36/PM12
m/p-Xylene #	<5 SV	-	<5 SV	-	<5 SV						<5	ug/kg	TM36/PM12
o-Xylene #	<5 SV	-	<5 SV	-	<5 SV						<5	ug/kg	TM36/PM12
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15	0.25						<0.15	mg/kg	TM26/PM21B
Natural Moisture Content	17.1	16.6	19.1	14.2	8.6						<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	14.6	14.2	16.0	12.5	7.9						<0.1	%	PM4/PM0
Sulphate as SO4 (2:1 Ext) #	0.0229	0.0642	0.0540	0.0474	0.0164						<0.0015	g/l	TM38/PM20
Total Cyanide #	<0.5	1.6	<0.5	1.7	<0.5						<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	7.28	10.26	3.42	10.83	4.00						<0.02	%	TM21/PM24
Sulphide	<10	<10	<10	<10	<10						<10	mg/kg	TM107/PM45
Escherichia Coli*	-	-	60	-	40							cfu/g	Subcontracted
pH #	7.26	6.09	7.39	6.44	7.24						<0.01	pH units	TM73/PM11
Total Coliforms*	-	-	1990	-	270							cfu/g	Subcontracted

Client Name: Robert E Fry & Associates Ltd
Reference: 22094
Location: Wrexham Road, Wrexham
Contact: Stephen Boot

Note:

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

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

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

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
25/12919	1	TP201	0.30	3	Catherine Coles	13/08/2025	**General Description (Bulk Analysis)**	brown soil,stone
					Catherine Coles	13/08/2025	**Asbestos Fibres**	Fibre Bundles
					Catherine Coles	13/08/2025	**Asbestos ACM**	NAD
					Catherine Coles	13/08/2025	**Asbestos Type**	Chrysotile
					Catherine Coles	18/08/2025	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					Catherine Coles	18/08/2025	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					Catherine Coles	18/08/2025	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
25/12919	1	TP203	0.40	5	Michael Reilly	13/08/2025	**General Description (Bulk Analysis)**	Brown soil, stones
					Michael Reilly	13/08/2025	**Asbestos Fibres**	Fibre Bundles
					Michael Reilly	13/08/2025	**Asbestos Fibres (2)**	Fibre Bundles
					Michael Reilly	13/08/2025	**Asbestos ACM**	NAD
					Michael Reilly	13/08/2025	**Asbestos ACM (2)**	NAD
					Michael Reilly	13/08/2025	**Asbestos Type**	Chrysotile
					Michael Reilly	13/08/2025	**Asbestos Type (2)**	Amosite
					Michael Reilly	20/08/2025	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					Michael Reilly	20/08/2025	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					Michael Reilly	20/08/2025	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
25/12919	1	TP204	0.30	9	Kieran Hubbard	13/08/2025	**General Description (Bulk Analysis)**	brown soil
					Kieran Hubbard	13/08/2025	**Asbestos Fibres**	Fibre Bundles
					Kieran Hubbard	13/08/2025	**Asbestos ACM**	NAD
					Kieran Hubbard	13/08/2025	**Asbestos Type**	Chrysotile
					Anthony Carman	18/08/2025	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					Anthony Carman	18/08/2025	**Total Detailed Gravimetric Quantification (% Asb)**	0.005 (mass %)
					Anthony Carman	18/08/2025	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	0.005 (mass %)
25/12919	1	TP205	0.45	11	Kieran Hubbard	13/08/2025	**General Description (Bulk Analysis)**	brown soil
					Kieran Hubbard	13/08/2025	**Asbestos Fibres**	Fibre Bundles
					Kieran Hubbard	13/08/2025	**Asbestos ACM**	NAD
					Kieran Hubbard	13/08/2025	**Asbestos Type**	Chrysotile
					Anthony Carman	18/08/2025	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					Anthony Carman	18/08/2025	**Total Detailed Gravimetric Quantification (% Asb)**	0.001 (mass %)
					Anthony Carman	18/08/2025	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	0.001 (mass %)
25/12919	1	TP207	0.40	15	Kieran Hubbard	13/08/2025	**General Description (Bulk Analysis)**	brown soil
					Kieran Hubbard	13/08/2025	**Asbestos Fibres**	NAD
					Kieran Hubbard	13/08/2025	**Asbestos Fibres (2)**	NAD
					Kieran Hubbard	13/08/2025	**Asbestos ACM**	NAD

Client Name: Robert E Fry & Associates Ltd
Reference: 22094
Location: Wrexham Road, Wrexham
Contact: Stephen Boot

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
25/12919	1	TP207	0.40	15	Kieran Hubbard	13/08/2025	**Asbestos ACM (2)**	NAD
					Kieran Hubbard	13/08/2025	**Asbestos Type**	NAD
					Kieran Hubbard	13/08/2025	**Asbestos Type (2)**	NAD

Element Materials Technology

Notification of Deviating Samples

Client Name: Robert E Fry & Associates Ltd
Reference: 22094
Location: Wrexham Road, Wrexham
Contact: Stephen Boot

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 25/12919						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

Please include all sections of this report if it is reproduced

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 25/12919

SOILS and ASH

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

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

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

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

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

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

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

Where Mineral Oil 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 is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
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

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 25/12919

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 degrees Celsius or 105 degrees Celsius. 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
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/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
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.	PM24	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 degrees Celsius. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

EMT Job No: 25/12919

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013l	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 Second edition (2021)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		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		AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.			AR	Yes
TM131	Quantification of Asbestos Fibres and ACM based on HSG 248 Second edition:2021, HSG 264 Second edition:2012, HSE Contract Research Report No.83/1996, MDHS 87:1998, WM3 1st Edition v1.1:2018	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	Yes
Subcontracted	See attached subcontractor report for accreditation status and provider.						Yes

EXACT
OSITIONS
ED

Bridge

Railway Line

TREE OF SIGNIFICANT MERIT

RED - AREAS OF CUT

BOLLARDS, EXACT
SPEC AND POSITIONS
TO BE AGREED

GREEN - AREAS OF FILL

LINK ROUTE

LINK PATH

2.50

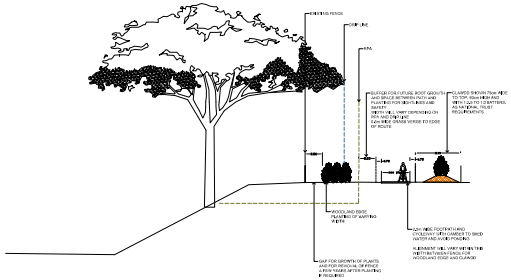
BOLLARDS, EXACT
SPEC AND POSITIONS
TO BE AGREED

CLAWDD 1

CLAWDD 1

CLAWDD 2

100mm PERFORATED LAND DRAINAGE PIPES TO BE LAID AT CIRCA. 10m CENTRES ACROSS PATHS & CLAWDDS AT 90° TO REDUCE RISK OF PONDING EXACT LOCATIONS TO BE DETERMINED ON SITE TO SUIT TOPOGRAPHY



D	BOLLARDS ADDED TO EACH END OF BRIDGES	RF	010320
C	AMENDED FOR PLANNING APPLICATION	RF	020620
B	TO NEW PATH ALIGNMENT CLAWDD ADDED	GWH	0320
A	REVISED FOR CLIENT	GWH	190320
rev	Revision details	Ready	Date

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Drawing Stage		Drawing Status	
Draft		Comments	Tender
Issued	⊗	Information	Construction
		Approval	As Built

Client
S G ESTATES
LIMITED

Job title
WREXHAM ROAD
RHOSTYLLEN

Drawing title
NATIONAL TRUST
LINK PATH

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45 Bridgeman Terrace
Wrexham
LL11 1PT
Tel: (01978) 290200
Fax: (01978) 330816
CONSULTING ENGINEERS
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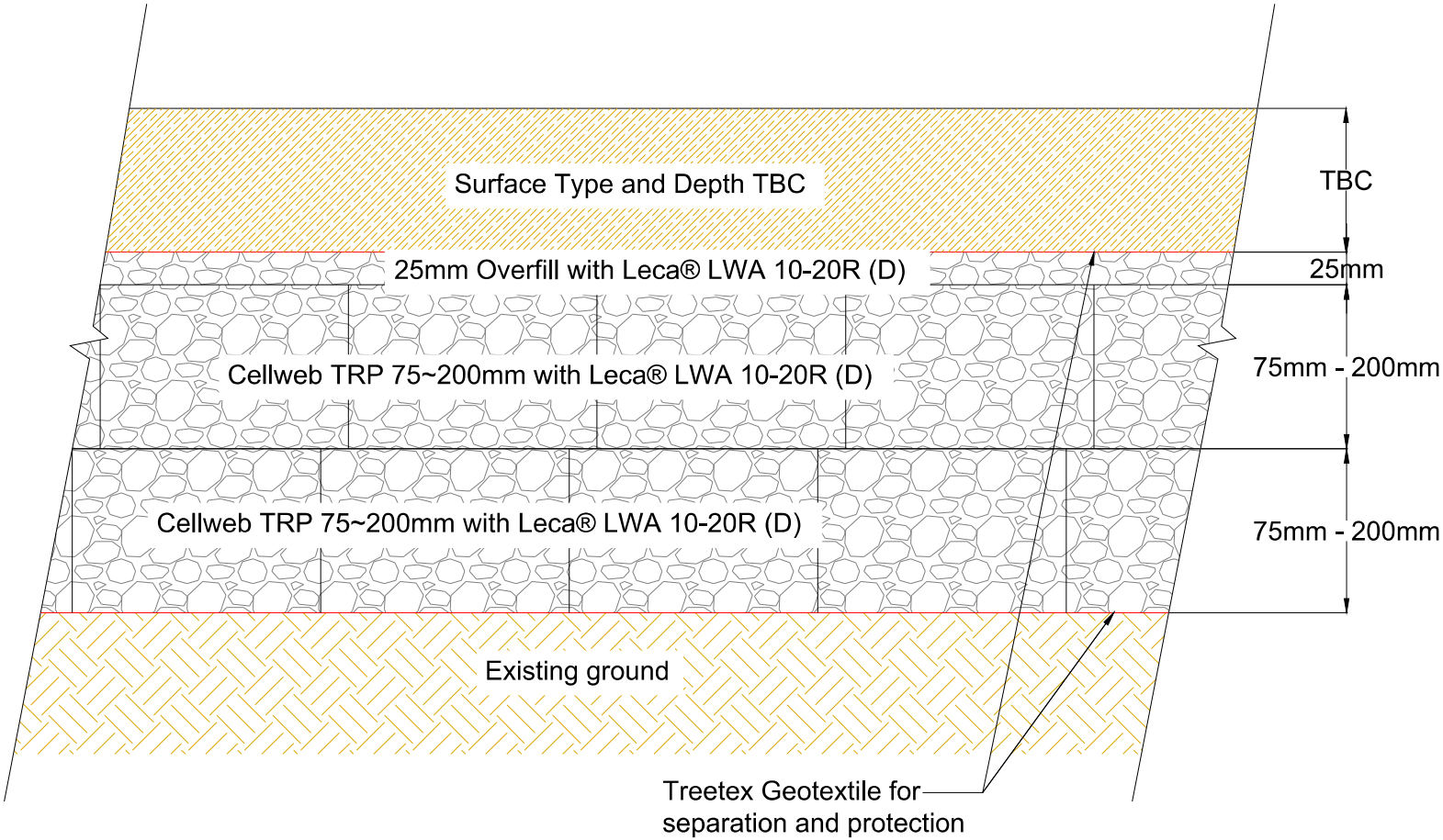
Date	Scale	Drawn
19.7.22	1/250	GWH

DRAWING No 22094/104/3 Rev D

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A0 SHEET

INDICATIVE CROSS SECTION PROPOSED CYCLEPATH WITH STACKED CELLWEB TRP INFILL LECA MATERIAL



Note: Extra considerations required in flood areas or areas susceptible to rising ground water. Please contact Geosynthetics Ltd. to discuss in more detail

DISCLAIMER: Any calculations produced by us for you are provided for your assistance only and do not constitute any warranty as to fitness for purpose of any of our products in respect of any specific construction. It is your responsibility to determine the suitability of our products within a particular construction.
Our calculations are based entirely on the information provided by you and/or any assumptions made by us in good faith. We shall not be liable to you, whether in contract, tort (including negligence), breach of statutory duty, or otherwise, for any loss arising in consequence of incorrect, inaccurate or incomplete information provided to us by you or arising as a consequence of reasonable assumptions made by us in good faith.Any advice (including any calculations) that we give to you in any form is provided solely for your own use and we shall not be liable to any third party, whether in contract, tort (including negligence), breach of statutory duty, or otherwise, for any loss arising as a result of or in connection with such advice.

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Project:	Description:	Drawn By:	Scale:	Date:	Checked By:
-	Cellweb 75~200mm Surface Standard Detail (LECA)	MM	NTS	23/08/2024	PGE
		Ref: ----	Version: -	Sheet: -	