



Tier 2 Geoenvironmental and Geotechnical Report

Site: Proposed Residential Development
at Coverack Road, Newport

Prepared For: Hedyn, TM Webber & CJB Hill

Issue Date: April 2025

Job No: 17905

REPORT TITLE : **Tier 2 Geoenvironmental and Geotechnical Report: Proposed Residential Development at Coverack Road, Newport**

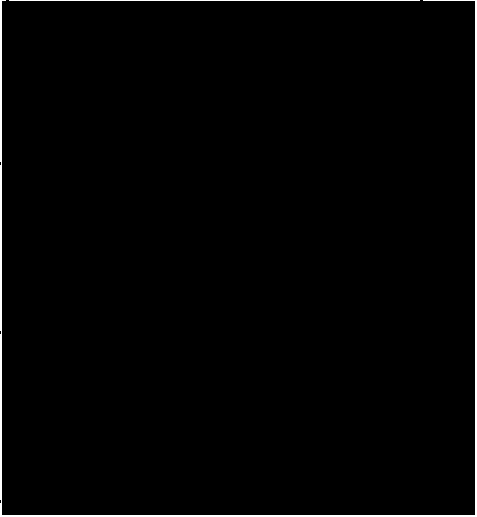
JOB NUMBER : **17905**

ISSUE DATE : **April 2025**

REPORT REFERENCE : **T2-GGR-070425-17905-02**

Document Revision Record

Issue No.	Date	Revision Details	Initials
1	07/04/2025	Draft	SW
2	23/04/2025	Correction to proposed development details and additional comments regarding the use of soakaways	SW

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Executive Summary

Site Location and Proposed Development	Hedyn, TM Webber & CJG Hill (the Client) is proposing the construction of a new residential development at land to the north of Coverack Road in Newport, NP19 0DH. The proposed development will consist of a five storey building containing 40No. flats, 32 car parking spaces, soft landscaping and bio diverse landscaping for SuDS compliance.				
Ground Conditions	Depth (m)			Thickness (m)	Stratum
	0.00-	-	0.05	0.05	ASPHALT/CONCRETE/COMPACTED GRAVEL
	0.05	-	3.00/3.20	2.95/3.15	MADE GROUND Dark brown variably ashy sandy GRAVEL of flint and fragments of brick, concrete, asphalt
	3.00/4.00	-	6.50/7.50	3.50/4.50	Soft to firm brown and greyish brown slightly sandy slightly gravelly silty CLAY with lenses of loose dark greyish brown slightly silty sandy variably clayey GRAVEL (TIDAL FLAT DEPOSITS)
	6.50/7.50	-	14.15/15.5	7.15/8.0	Very soft to soft silty slightly gravelly CLAY (TIDAL FLAT DEPOSITS)
	14.15/15.5	-	19.00/20.00	4.50/5.85	Dark blueish grey slightly silty slightly clayey GRAVEL gravelly SAND/soft dark blueish grey slightly sandy slightly silty gravelly CLAY (POSSIBLE RIVER TERRACE DEPOSITS)
	19.00/20.00		>21.00/>22.70	Unconfirmed	Very dense dark reddish brown mottled grey slightly clayey slightly silty sandy GRAVEL with abundant cobble content of mudstone and sandstone. (POSSIBLE ST MAUGHANS GROUP)
Contamination of Concern	Location	Depth	Contaminant		Source
	BH01	0.3	Lead, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)Anthracene		Made ground
	BH01	1.0-1.5	Dibenz(a,h)Anthracene		Made ground
	BH01	2.0-2.5	Arsenic		Made ground
	BH01	0.3	Arsenic, lead, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)Anthracene		Made ground
	BH02	3.2-3.3	Arsenic, lead		Made ground
	BH03	0.05-0.2	Dibenz(a,h)Anthracene, Aliphatic C10-C12, Aliphatic C12-C16		Made ground
	WS03	0.3	Dibenz(a,h)Anthracene		Made ground
	ST01	0.4	Naphthalene, Dibenz(a,h)Anthracene		Made ground/demolition rubble
	ST02	0.4	Arsenic, Naphthalene, Dibenz(a,h)Anthracene		Made ground/demolition rubble
	ST03	0.4	Naphthalene, Dibenz(a,h)Anthracene		Made ground/demolition rubble
	ST04	0.4	Dibenz(a,h)Anthracene		Made ground/demolition rubble
Ground Gas Risk Assessment	Assessing all lines of evidence thus far, it is considered that a potential pollution linkage does not exist. Upon completion of gas monitoring, these conclusions will be reviewed, and if necessary amended.				
Foundation Solution	Due to the proximity of the site to George Street Bridge, a driven pre-cast reinforced concrete piled foundation is unlikely to be appropriate. A bored or CFA pile is likely to be used. The piles should be founded within the underlying sandstone bedrock.				
	For a 300mm diameter bored pile founded within the competent mudstone a safe allowable working load of up to 400kN should be achievable. Piles are likely to be around 23m in length. The piling contractor and warranty provider are likely to require coring of at least 5m into the competent bedrock to confirm pile lengths and capacity.				
	The estimated working pile loads, pile type and lengths are given for guidance only and should be confirmed by a specialist piling contractor and it may be prudent to test drive/install piles at selected locations. Significant allowances should be made by the piling contractor for dealing with the dense to very dense granular deposits, containing cobbles and boulders above the bedrock.				
Recommended Further Works	To inform pile design, 3No. boreholes should be drilled by rotary percussive method with the objective of coring at least 5m into competent St Maughan's Group bedrock. Standard penetration tests should be carried out at regular intervals within the bedrock, and core samples tested for unconfined compressive strength and point load.				

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Drawing 01 Exploratory Hole Layout

SECTION 1 Introduction & Proposed Development

1.1 Background

Hedyn, TM Webber & CJG Hill (the Client) is proposing the construction of a new residential development at land to the north of Coverack Road in Newport, NP19 0DH. The proposed development will consist of a five storey building containing 40No. flats, 32 car parking spaces, soft landscaping and biodiverse landscaping for SuDS compliance. The proposed layout can be seen in **Figure 1.1**.



Figure 1.1 Proposed Site Layout

Kennedy James Griffiths (KJG) are the Architects for the project.

TFW Group Ltd (Terra Firma) have been commissioned by the Client to undertake a Tier 2 Geotechnical and Geoenvironmental Investigation and report for the site.

A Tier 1 (Desk Study) including a Preliminary Geoenvironmental and Geotechnical Assessment was completed by Terra Firma. The findings of the Tier 1 Assessment are summarised in Section 2 of this report.

This report contains a Tier 2 assessment (Site Investigation) including a Generic Quantitative Geoenvironmental Risk Assessment and Geotechnical Ground Investigation.

1.2 Objectives

Land Contamination Risk Management (LCRM) guidance provided by the Environment Agency advocates using a tiered approach. This comprises Tier 1; the Preliminary Risk Assessment, Tier 2; the Generic Quantitative Risk Assessment and Tier 3; the Detailed Quantitative Risk Assessment. As each tier is completed a decision is made whether it is necessary to advance to the next tier.

In addition to LCRM, geotechnical aspects of the development also need to be considered and are approached in a similar manner, with the risks identified in the preliminary assessment, and then investigated through subsequent phases of investigation.

1.2.1 Tier 2

The main objectives of the Tier 2 Generic Quantitative Geoenvironmental Risk Assessment programme are:

- investigate the potential human health and environmental liabilities at the site associated with any contamination; and
- provide a summary of the human health and environmental conditions at the site, together with any necessary further intrusive works and / or remediation works to render the site fit for its intended use.

The main objectives of the Geotechnical Site Investigation are:

- investigate the type, strength and bearing characteristics of the shallow superficial and underlying solid geology;
- provide engineering foundation and floor slab recommendations for the proposed development;
- provide infiltration rates and stormwater drainage viability; and
- provide recommendations regarding any other geotechnical aspects pertaining to the development.

In order to achieve the above objectives, Terra Firma carried out an assessment programme a review of existing data, followed by a field investigation to collect geotechnical and geoenvironmental data from selected locations.

The scope of the works including the schedule for in-situ and laboratory testing was determined by Terra Firma.

1.3 Geotechnical Category

In accordance with BS EN 1997-1:2004+A1:2013, the proposed development comprises the following geotechnical category:

Geotechnical Category 2: conventional types of structures and foundation with no exceptional risk of difficult soil or loading conditions (e.g., spread, raft & pile foundations; retaining structures; excavations; earthworks and ground anchors).

1.4 Information Sources

The following sources of information have been referenced in support of this assessment:

- Client provided information, plans etc. (**Figure 1.1**); and

- Tier 1 Assessment (Report reference T1-GGR-070325-17905-01).

1.5 Roles & Responsibilities

Table 1.1 Roles and Responsibilities

Role	Organisation	Contact Details
Client/Developer	Hedyn, TM Webber & CJG Hill	Josh Guy - 07704664797
Geotechnical/Geoenvironmental Consultant	Terra Firma Group Ltd	02920 735354
Architect	Kennedy James Griffiths	info@ysprojects.co.uk
Local Authority	Newport City Council	01633 656656

1.6 Limitations & Exceptions of Investigation

The Client has requested that a Tier 2 Geoenvironmental and Geotechnical Report (GGR) be undertaken to enable the outlined main objectives.

The GGR was conducted, and this report has been prepared for the sole internal reliance of the Client and their design and construction team. This report shall not be relied upon or transferred to any other parties without the express written authorisation of TFW Group Ltd. If an unauthorised third party comes into possession of this report, they rely on it at their peril and the authors owe them no duty of care and skill. The report represents the findings and opinions of experienced geoenvironmental and geotechnical consultants. TFW Group Ltd does not provide legal advice and the advice of lawyers may be required.

The subsurface geological profiles, any contamination and other plots are generalised by necessity and have been based on the information found at the locations of the exploratory holes and depths sampled and tested.

Human health and environmental risk assessment outcomes may not take into account the potential for the creation of new contaminant linkages as a result of variation to the proposed development and recommended engineering solutions. It is therefore imperative that the Client engages a geoenvironmental consultant to re-visit the conceptual site model and potential risks upon completion of final designs, prior to development.

Whilst this report assesses the suitability of soils in respect to human health and the environment, it is beyond the scope of this report to determine the legal status of imported and re-used soils/aggregates. It is the responsibility of the Client to confirm imported and re-used soils/aggregates have reached 'Non-Waste' status.

The investigation was limited by the following site constraints:

- the presence of a soil stockpile at the south of the site.

1.7 Quality Assurance

The quality, health, safety and environmental aspects of the assessment comply with Terra Firma business management system which is UKAS accredited and complies with the requirements of BS EN ISO 9001:2015, BS EN ISO 14001:2015 and BS EN ISO 45001:2018 standards.

SECTION 2 Tier 1 Assessment

The site has been the subject of a previous Tier1 Geoenvironmental & Geotechnical (desk study) Report:

- *Terra Firma, Tier 1 Geoenvironmental & Geotechnical Report T1-GGR-240325-17905-01 dated March 2025.*

The salient points of the Tier 1 Assessment are summarised in **Section 2.1**.

2.1 Summary of Tier 1 Assessment

The findings of the Tier 1 Assessment are summarised in **Table 2.1**.

Table 2.1 Summary of Tier 1 Assessment

Site Location and Proposed Development	<i>Hedyn, TM Webber & CJG Hill (the Client) is proposing the construction of a new residential development at land to the north of Coverack Road in Newport, NP19 0DH. The proposed development will consist of a five storey building containing 40No. flats, 109 car parking spaces, soft landscaping and bio diverse landscaping for SuDS compliance.</i>	
Site History	<i>The site has previously been occupied by a wharf, several buildings, a paint mill, depot, railway lines, and a tank.</i>	
Geology	<i>Tidal Flat Deposits are recorded above granular deposits over St Maughan's Group. Made ground is anticipated above the natural deposits.</i>	
Radon	<i>No radon protective measures are required for new developments constructed at ground level on the investigation site.</i>	
Anticipated Ground Conditions	Stratum	Base Depth (m)
	<i>Made ground</i>	<i>4.3-5.4</i>
	<i>Tidal Flat Deposits (firm becoming soft grey CLAY)</i>	<i>14.3-14.8</i>
	<i>Firm grey gravelly CLAY</i>	<i>16.1-16.3 (intermittent)</i>
	<i>Sand & gravel with cobbles</i>	<i>20.2-20.9</i>
	<i>St Maughan's Group</i>	<i>>20.2</i>
Potential Contamination of Concern	<i>Metals, metalloids, PAH, petroleum hydrocarbons, VOCs, and SVOCs</i>	
Anticipated Foundation Solution	<i>Based upon the desk study information, it is likely that a piled foundation will be necessary for the site.</i>	
Recommended Further Works	<i>It is recommended that an intrusive investigation is undertaken to inspect the ground conditions, to take soil samples for laboratory chemical and geotechnical testing; to install groundwater monitoring wells within the underlying shallow aquifer and to install shallow ground gas and vapour monitoring wells.</i>	
	<i>It is perceived a combination of dynamically sampled boreholes and cable percussive boreholes will be suitable to investigate the site.</i>	
	<i>Soils and groundwater should be tested for a broad suite of potential contaminants.</i>	
	<i>It is recommended that 3No dedicated shallow gas wells be installed within made ground with the response zone situated above groundwater level. The purpose of the gas well is to test made ground soils for potential on-site derived ground gas and vapour contamination and as a potential migration route for off-site ground gasses.</i>	

Installations should be tested for carbon dioxide, methane, oxygen, hydrogen sulphide and carbon monoxide using a suitable gas analyser. Atmospheric pressure and gas flow should also be recorded. In addition, the installations should be monitored for volatile organic compounds (VOC) using photo-ionisation detector with a 10.6eV lamp.

SECTION 3 Field Investigation

3.1 Site Works

A geotechnical and geoenvironmental site investigation comprising 3No. cable percussive boreholes, 3No. windowless sampler boreholes, and 4No. hand excavated trial pits into the soil stockpile was undertaken between the 2nd and 14th of February 2025.

The fieldwork was supervised by Terra Firma, who logged the exploratory holes to the requirements of BS 5930:2015+A1:2020. The proposed locations of the exploratory holes were determined by Terra Firma in general accordance with BS 10175:2011+A2:2017 in order to assess/confirm the findings of the preliminary conceptual site model.

Hand excavated trial pits referenced HP01 to HP04, were excavated into the soil stockpile located at the south of the site to retrieve soil samples for environmental testing.

Boreholes referenced WS01 to WS03, were formed using a Terrier 2000 rig. Dynamic sampling techniques were employed from surface to produce a continuous disturbed sample.

Standard penetration tests (SPT) were carried out at regular intervals in general accordance with BS1377: Part 9:1990:3.3. SPT results summarised as N values are presented on the borehole log.

Boreholes were monitored for groundwater ingress as drilling proceeded.

Representative disturbed samples were taken and retained in airtight containers for environmental and geotechnical testing.

Boreholes reference BH01 to BH03 were formed using a light cable tool (shell and auger) drilling rig. Boreholes were advanced from surface using 200mm tools and casing with the occasional use of a heavy chisel to assist boring.

Standard penetration tests (SPT) were carried out at regular intervals in general accordance with BS1377: Part 9:1990:3.3. SPT results summarised as N values are presented on the borehole log.

Representative disturbed samples were taken and retained in airtight containers for environmental and geotechnical testing.

Boreholes were monitored for groundwater ingress as drilling proceeded.

The boreholes were terminated in in-situ hard strata after a minimum of 1hours chiselling for a nominal penetration.

On completion, boreholes were installed with slotted standpipes consisting of a 50mm ID HDPE slotted tube set in a granular filter zone and sealed above with a bentonite plug. Installations were protected at surface with an upstanding/flush cover. Full installation details are recorded on the relevant logs.

Exploratory hole logs are presented in **Annex A**, and their locations are shown on **Drawing 01**.

3.2 Ground Conditions

The ground conditions encountered by the exploratory holes can in general be summarised as shown in **Table 3.1**.

Table 3.1 Summary of Typical Ground Conditions

Depth (m)			Thickness (m)	Stratum
0.00-	-	0.05	0.05	ASPHALT/CONCRETE/COMPACTED GRAVEL
0.05	-	3.00/3.20	2.95/3.15	MADE GROUND Dark brown variably ashy sandy GRAVEL of flint and fragments of brick, concrete, asphalt
3.00/4.00	-	6.50/7.50	3.50/4.50	Soft to firm brown and greyish brown slightly sandy slightly gravelly silty CLAY with lenses of loose dark greyish brown slightly silty sandy variably clayey GRAVEL (TIDAL FLAT DEPOSITS)
6.50/7.50	-	14.15/15.5	7.15/8.0	Very soft to soft silty slightly gravelly CLAY (TIDAL FLAT DEPOSITS)
14.15/15.5	-	19.00/20.00	4.50/5.85	Dark blueish grey slightly silty slightly clayey GRAVEL gravelly SAND/soft dark blueish grey slightly sandy slightly silty gravelly CLAY (POSSIBLE RIVER TERRACE DEPOSITS)
19.00/20.00		>21.00/>22.70	Unconfirmed	Very dense dark reddish brown mottled grey slightly clayey slightly silty sandy GRAVEL with abundant cobble content of mudstone and sandstone. (POSSIBLE ST MAUGHANS GROUP)

3.3 Groundwater

Groundwater information recorded during the site investigation period is summarised in **Table 3.2**.

Table 3.2 Groundwater Summary

Location	Depth (m)	Details
BH01	4.00	Rose to 3.85 after 20minutes. Slow seepage.
BH02	10.00	Rose to 7.40 after 20minutes. Medium inflow.
BH02	15.00	Rose to 9.40 after 20minutes. Fast inflow.
BH03	15.30	Rose to 12.40 after 20minutes. Medium inflow.

3.4 Stability & Obstructions

Windowless sample boreholes remained stable and vertical during drilling.

3.5 Installation Well Construction

Groundwater and gas well locations were selected on a non-targeted basis to characterise the groundwater and gas contamination status of the site. A regular triangular pattern was adopted.

Groundwater and gas installation well construction details are summarised in **Table 3.3**.

Table 3.3 Installation Well Summary

Location	Response Zone		Stratum
	From (m)	To (m)	

BH01	14.5	20.5	River Terrace Deposits & St Maughans Group
BH02	7.0	10.0	Tidal Flat Deposits
BH03	15.5	19.0	River Terrace Deposits
WS01	1.0	4.0	Made Ground
WS02	1.0	4.0	Made Ground
WS03	1.0	3.0	Made Ground

The installations were tested for carbon dioxide, methane, oxygen, hydrogen sulphide and carbon monoxide using a gas analyser GA2000/5000. Atmospheric pressure and gas flow were also recorded.

The installations were also monitored for volatile organic compounds (VOC) using photo-ionisation detector with a 10.6eV lamp.

Monitoring readings are presented in **Annex B**.

3.6 Laboratory Chemical Testing

3.6.1 Sampling Strategy

Soil and groundwater sampling locations were selected on both a targeted basis to investigate suspected sources of contamination or potential contamination migration pathways and a non-targeted basis to characterise the contamination status of the site. A triangular and herringbone sampling pattern was adopted for the groundwater and soil respectively.

Sample locations, depths and suspected/known contamination source targets are summarised in **Table 3.4**:

Table 3.4 Sample Locations and Targets

Location	Depth (m)	Type	Contamination Targets
BH01	0.3	Soil	S1, S2, S3
BH01	1.0-1.5	Soil	S1, S2, S3
BH01	2.5-3.0	Soil	S1, S2, S3
BH02	0.3	Soil	S1, S2, S3
BH02	3.2-3.3	Soil	S1, S2, S3
BH03	0.05-0.2	Soil	S1, S2, S3
BH03	1.5-2.0	Soil	S1, S2, S3
WS02	0.3	Soil	S1, S2, S3
WS03	0.3	Soil	S1, S2, S3
ST01	0.4	Soil	S2, S3
ST02	0.4	Soil	S2, S3
ST03	0.4	Soil	S2, S3
ST04	0.4	Soil	S2, S3
BH01	-	Groundwater	S2, S3
BH02	-	Groundwater	S2, S3
BH03	-	Groundwater	S2, S3

3.6.2 Sample Analysis

During the site investigation works soil samples were collected and despatched under a chain of custody to the accredited laboratories of Eurofins Chemtest for chemical analysis.

The laboratory test results certificates may be found in **Annex C**.

3.7 Waste Classification

Waste classification of a soil stockpile located at the west corner of the site has been carried out in accordance with Technical Guidance WM3. The stockpile fails inert chemical criteria.

A copy of the waste classification is presented in **Annex D**.

SECTION 4 Evaluation of Geoenvironmental Analytical Results

4.1 Assessment Methodology

4.1.1 Soils

An assessment of the analytical results has been made with comparison with the following generic assessment criteria with preference in most onerous order:

- Land Quality Management (LQM) and the Chartered Institute of Environmental Health (CIEH) Suitable 4 Use Levels (S4UL) (Nathanail, CP *et al.*:2015);
- Category 4 Screening Levels (C4SL) provided by the Department for Environment, Food and Rural Affairs (DEFRA:2014);
- Soil Guideline Values (SGV) by the Environment Agency (2009);
- Generic Assessment Criteria (GAC) provided by EIC/AGS/CL:AIRE (2010); and
- Generic Assessment Criteria (GAC) derived in-house.

In the absence of generic assessment criteria, the laboratory limit of detection has been used for comparison, in order to establish the presence/absence of determinants and for initial screening purposes.

A value of 1% SOM has been adopted for the site when assessing appropriate threshold values for analysed determinants.

We are currently waiting for the complete soil laboratory chemical test results. On receipt of these results, the report will be re-issued.

4.1.2 Controlled Waters

In the case of groundwater and/or leachate, analytical results have been compared with available published guidelines in the Water Framework Direction (Standards and Classification) Directions (England and Wales) 2015 and the Water Supply (Water Quality) Regulations 2016.

In the absence of any published guideline, a conservative threshold is suggested.

The groundwater monitoring is currently being undertaken and the groundwater laboratory chemical test results have not been reported. On receipt of these results, the report will be updated and re-issued.

4.2 Soil Test Results

A summary of the chemical test results which include the regulatory soil guideline values used in a **residential setting without plant uptake** are given in the following tables. The complete results can be found in **Annex C**.

4.2.1 Inorganics

Nine samples from the in-situ soil were tested for a standard suite of inorganics, pH and organic matter. The results are summarised in **Table 4.1**.

Table 4.1 Summary of Soil Chemical Test Results – Inorganics

Determinant	Threshold Value	Source	Measured Concentrations (mg/kg)	Number of Exceedances
-------------	-----------------	--------	---------------------------------	-----------------------

	(mg/kg)		Minimum	Maximum	
Arsenic	40	LQM/CIEH	12	270	3
Cadmium	85	LQM/CIEH	0.14	6.2	0
Chromium III	910	LQM/CIEH	13	42	0
Chromium VI	6	LQM/CIEH	<0.50	<0.50	0
Copper	7100	LQM/CIEH	40	1700	0
Lead	310	C4SL	33	830	3
Mercury (inorganic)	56	LQM/CIEH	<0.05	1.6	0
Nickel	180	LQM/CIEH	12	58	0
Selenium	430	LQM/CIEH	0.26	1.5	0
Zinc	40000	LQM/CIEH	67	1900	0
Cyanide	-	-	<0.50	<0.50	-
Boron	11000	LQM/CIEH	<0.4	0.76	0
Phenol	120	LQM/CIEH	<0.1	<0.1	0
Organic Matter (%)	-	-	0.4	9.9	-
pH	-	-	7.9	8.8	-
Notes: - No available guideline					

Four samples from the stockpile were tested for a standard suite of inorganics, pH and organic matter. The summarised results are in **Table 4.2**.

Table 4.2 Summary of Soil Chemical Test Results – Inorganics

Determinant	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Arsenic	40	LQM/CIEH	4.8	43	1
Cadmium	85	LQM/CIEH	0.56	1.2	0
Chromium III	910	LQM/CIEH	17	35	0
Chromium VI	6	LQM/CIEH	<0.50	<0.50	0
Copper	7100	LQM/CIEH	35	86	0
Lead	310	C4SL	12	270	0
Mercury (inorganic)	56	LQM/CIEH	0.09	0.89	0
Nickel	180	LQM/CIEH	12	51	0
Selenium	430	LQM/CIEH	<0.25	1.2	0
Zinc	40000	LQM/CIEH	38	370	0
Cyanide	-	-	<0.50	<0.50	-
Boron	11000	LQM/CIEH	0.46	1.1	0
Phenol	120	LQM/CIEH	<0.1	<0.1	0
Organic Matter (%)	-	-	2.3	2.8	-
pH	-	-	7.7	8.2	-
Notes: - No available guideline					

4.2.2 Organics

Nine samples from the in-situ soil were tested for speciated polycyclic aromatic hydrocarbons (PAH). The results are summarised in **Table 4.3**.

Table 4.3 Summary of Soil Chemical Test Results – Speciated PAH

Determinant	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Naphthalene	2.3	LQM/CIEH	<0.10	2.0	0
Acenaphthylene	2900	LQM/CIEH	<0.10	3.4	0
Acenaphthene	3000	LQM/CIEH	<0.10	3.7	0
Fluorene	2800	LQM/CIEH	<0.10	2.3	0
Phenanthrene	1300	LQM/CIEH	<0.10	8.4	0
Anthracene	31000	LQM/CIEH	<0.10	2.8	0
Fluoranthene	1500	LQM/CIEH	<0.10	31	0
Pyrene	3700	LQM/CIEH	<0.10	38	0
Benzo(a)anthracene	11	LQM/CIEH	<0.10	18	1
Chrysene	30	LQM/CIEH	<0.10	18	0
Benzo(b)fluoranthene	3.9	LQM/CIEH	<0.10	28	2
Benzo(k)fluoranthene	110	LQM/CIEH	<0.10	13	0
Benzo(a)pyrene	3.2	LQM/CIEH	<0.10	21	2
Indeno(123cd)pyrene	45	LQM/CIEH	<0.10	14	0
Dibenzo(ah)anthracene	0.31	LQM/CIEH	<0.10	4.9	5
Benzo(ghi)perylene	360	LQM/CIEH	<0.10	14	0
Total PAH	-	-	<2.0	220	-
Notes: Thresholds based on 1.0% soil organic matter - No available guidelines					

Four samples from the stockpile were tested for speciated polycyclic aromatic hydrocarbons (PAH). The summarised results are in **Table 4.4**.

Table 4.4 Summary of Soil Chemical Test Results – Speciated PAH

Determinant	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Naphthalene	2.3	LQM/CIEH	0.57	2.9	3
Acenaphthylene	2900	LQM/CIEH	0.23	0.42	0
Acenaphthene	3000	LQM/CIEH	0.38	0.95	0
Fluorene	2800	LQM/CIEH	0.21	0.50	0
Phenanthrene	1300	LQM/CIEH	1.6	3.0	0
Anthracene	31000	LQM/CIEH	0.44	0.85	0
Fluoranthene	1500	LQM/CIEH	0.28	4.0	0
Pyrene	3700	LQM/CIEH	0.29	3.6	0
Benzo(a)anthracene	11	LQM/CIEH	1.8	2.2	0
Chrysene	30	LQM/CIEH	2.5	3.1	0
Benzo(b)fluoranthene	3.9	LQM/CIEH	2.4	3.4	0
Benzo(k)fluoranthene	110	LQM/CIEH	0.84	1.4	0
Benzo(a)pyrene	3.2	LQM/CIEH	1.7	2.4	0
Indeno(123cd)pyrene	45	LQM/CIEH	1.2	1.9	0
Dibenzo(ah)anthracene	0.31	LQM/CIEH	0.39	0.91	4

Benzo(ghi)perylene	360	LQM/CIEH	1.3	2.0	0
Total PAH	-	-	24	31	-

Notes:

Thresholds based on 1.0% soil organic matter

- No available guidelines

Nine samples from the in-situ soil were tested for petroleum hydrocarbon. The results are summarised in **Table 4.5**.

Table 4.5 Summary of Soil Chemical Test Results – Petroleum Hydrocarbons

Determinant	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Aliphatic					
PH C5 – C6 Ali	42	LQM/CIEH	<0.05	<0.05	0
PH C6 – C8 Ali	100	LQM/CIEH	<0.1	<0.1	0
PH C8 – C10 Ali	27	LQM/CIEH	<0.05	<0.05	0
PH C10 – C12 Ali	130	LQM/CIEH	<2.0	1100	1
PH C12 – C16 Ali	1100	LQM/CIEH	<1.0	2400	1
PH C16 – C21 Ali	65000*	LQM/CIEH	<2.0	130	0
PH C21 – C35 Ali	65000*	LQM/CIEH	<3.0	14	0
PH C35 – C44 Ali	65000	LQM/CIEH	<10	<10	0
Aromatic					
PH C5 – C7 Arom	370	LQM/CIEH	<0.05	<0.05	0
PH C7 – C8 Arom	860	LQM/CIEH	<0.05	<0.05	0
PH C8 – C10 Arom	47	LQM/CIEH	<0.05	<0.05	0
PH C10 – C12 Arom	250	LQM/CIEH	<1.0	170	0
PH C12 – C16 Arom	1800	LQM/CIEH	<1.0	77	0
PH C16 – C21 Arom	1900	LQM/CIEH	<2.0	200	0
PH C21 – C35 Arom	1900	LQM/CIEH	11	1300	0
PH C35 – C44 Arom	1900	LQM/CIEH	2.2	990	0

Notes:

PH – Petroleum Hydrocarbon

Ali – Aliphatic

Arom – Aromatic

Thresholds based on 1.0% soil organic matter

* – Ali C16-21 and C21-C35 based on criteria for Ali EC >16-35

Four samples from the stockpile were tested for petroleum hydrocarbon. The summarised results are shown in **Table 4.6**.

Table 4.6 Summary of Soil Chemical Test Results – Petroleum Hydrocarbons

Determinant	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Aliphatic					
PH C5 – C6 Ali	42	LQM/CIEH	<0.05	<0.05	0
PH C6 – C8 Ali	100	LQM/CIEH	<0.1	<0.1	0
PH C8 – C10 Ali	27	LQM/CIEH	<0.05	<0.05	0
PH C10 – C12 Ali	130	LQM/CIEH	<2.0	<2.0	0

PH C12 – C16 Ali	1100	LQM/CIEH	<1.0	2.3	0
PH C16 – C21 Ali	65000*	LQM/CIEH	<2.0	2.9	0
PH C21 – C35 Ali	65000*	LQM/CIEH	4.0	12	0
PH C35 – C44 Ali	65000	LQM/CIEH	<10	<10	0
Aromatic					
PH C5 – C7 Arom	370	LQM/CIEH	<0.05	<0.05	0
PH C7 – C8 Arom	860	LQM/CIEH	<0.05	<0.05	0
PH C8 – C10 Arom	47	LQM/CIEH	<0.05	<0.05	0
PH C10 – C12 Arom	250	LQM/CIEH	<1.0	2.2	0
PH C12 – C16 Arom	1800	LQM/CIEH	<1.0	8.6	0
PH C16 – C21 Arom	1900	LQM/CIEH	8.3	120	0
PH C21 – C35 Arom	1900	LQM/CIEH	13	260	0
PH C35 – C44 Arom	1900	LQM/CIEH	5.4	18	0
Notes: PH – Petroleum Hydrocarbon Ali – Aliphatic Arom – Aromatic Thresholds based on 1.0% soil organic matter * – Ali C16-21 and C21-C35 based on criteria for Ali EC >16-35					

Five samples from the in-situ soil were tested for BTEX and MTBE. The results are summarised in **Table 4.7**.

Table 4.7 Summary of Soil Chemical Test Results – BTEX & MTBE

Determinant	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Benzene	0.38	LQM/CIEH	<0.001	<0.001	0
Toluene	880	LQM/CIEH	<0.001	<0.001	0
Ethylbenzene	83	LQM/CIEH	<0.001	<0.001	0
o- xylene	88	LQM/CIEH	<0.001	0.0015	0
m- xylene	82	LQM/CIEH	<0.001	0.0025	0
p- xylene	79	LQM/CIEH	<0.001	0.0025	0
MTBE	-	-	<0.001	<0.001	-
Notes: - No available guideline					

4.2.3 VOCs and SVOCs

Five samples of the in-situ soils were tested for VOCs and SVOCs. The soil chemical testing did not record any volatile organic compounds above laboratory detection limits apart from 1,2,4 Trimethylbenzene and 1,3,5 Trimethylbenzene. Noteworthy VOCs are summarised in **Table 4.8**.

There are no published generic assessment criteria for either compound in the UK. However, a residential soil screening level is published by USEPA (United States Environmental Protection Authority). These screening levels are 300mg/kg and 270mg/kg respectively. The concentrations for both compounds identified in BH03 at 0.05-0.2m depth fall well below these screening levels. It is therefore considered that the recorded concentrations do not pose a significant risk to the human health of the future residents.

Table 4.8 Summary of Soil Chemical Test Results – Noteworthy VOC & SVOC

Determinant	Measured Concentrations (mg/kg)	
	Minimum	Maximum
1,2,4 Trimethylbenzene	<0.001	0.0038
1,3,5 Trimethylbenzene	<0.001	0.0026

At the time of writing, the test results for semi-volatile organic compounds had not been received due to severe delays caused by machine failure. Following receipt of the results the report will be re-issued.

4.2.4 Asbestos Testing

All thirteen soil samples from both the in-situ soil and stockpile were scheduled for asbestos screening. Asbestos was not detected.

4.3 Groundwater Test Results

Six groundwater samples are to be obtained by two rounds of groundwater monitoring. Samples will be collected from boreholes BH01 to BH03. The groundwater testing is ongoing, and this report will be re-issued following receipt of the results.

SECTION 5 Ground Gas Risk Assessment

The following detailed ground gas risk assessment is prepared with reference to information sources identified during the Tier 1 assessment, as well as encountered ground conditions and quantitative data obtained during subsequent phases of site investigation. Where possible, consideration has also been given to the proposed development and its potential influence on ground gas risk.

5.1 Gas Risk Characterisation

5.1.1 Gas Sources

Potential sources of ground gas that have been identified during this study, along with an interpretation of the gas generation potential and lateral migration potential (Wilson S *et al.*:2009) respectively, are as follows:

- made ground soils with low degradable organic content (<5%) – very low – negligible;
- landfill 1945 to mid-1960s – low to moderate – variable;

5.1.2 Gas Migration Pathways

The potential for gas migration pathways is a factor of the prevailing geology and hydrogeology conditions encountered at the site and surrounding areas. Furthermore, potential gas migration pathways need not be natural, and may comprise artificial conduits such as buried utility pipes, stone columns, piles, boreholes, as well as mining related features.

Potential gas migration pathways identified as part of this study include:

P9 - Horizontal and vertical migration of ground gasses and vapours

5.1.3 Receptors

Potential receptors identified as part of this study include:

R2 – Future site users (residents)

5.1.4 Driving Forces

Pressure Driven Flow

Also known as advective flow. Pressure driven gas flow is typically the dominant force in most high-risk scenarios, driven by a differential pressure gradient between the source and receptor. The potential for, and effect of, falling atmospheric pressure, fluctuating groundwater levels, seasonal thermal gradients or confined gas generating sources, should be considered in this context.

Diffusive Flow

Diffusion is dependent on a concentration gradient of gas between two areas, where a high concentration area flows towards a lower concentration area. This scenario only presents a risk when gas migration is sustainable due to there being a constant source of gas able to maintain a constant concentration gradient. In tandem with pressure driven flow, diffusive flow may have a significant influence on overall gas risk, particularly when large void spaces have accumulated hazardous gas diffusively over a long time frame, which is then subsequently expelled suddenly under a pressure driven event.

5.2 Volatile Gasses

Previous land uses on site could be a source of hydrocarbons and VOCs/SVOCs. Therefore, a PID was used to monitor the ground gas monitoring wells for volatile organic compounds. The PID monitoring is currently being carried out and recommendations regarding the risk to receptors from the inhalation of vapours will be provided in a re-issued report following completion of monitoring.

5.3 Gas Screening Value

Three ground gas monitoring wells were installed in WS01, WS02, and WS03. Installation details are shown on the relevant log.

One round of gas monitoring has been carried out to date. The installations were tested for carbon dioxide, methane, oxygen, carbon monoxide and hydrogen sulphide using a Gas Analyser GA5000.

Recorded gas concentrations are summarised in **Table 5.1**.

Table 5.1 Measured Gas Concentration Summary

Gas	Minimum (% V/V)	Maximum (% V/V)
Methane	0.0	0.0
Carbon Dioxide	1.0	2.2
Oxygen	11.1	18.4

Methane levels did not peak above 0.0% V/V. Carbon dioxide levels varied between 11.1% and 18.4% V/V. Oxygen concentrations varied between 11.1% and 18.4% V/V.

The gas flow rate from the boreholes was also assessed, a maximum flow rate of 0.0l/hr was recorded.

Based on the gas monitor's limit of detection for the flow rate of 0.1 l/hr and the highest recorded carbon dioxide concentration of 2.2%, a gas screening value of 0.0022 l/hr is calculated, as follows:

$$(2.2/100) \times 0.1 = 0.0022\text{l/hr}$$

When monitoring results are compared with BS8576:2013, the site is preliminarily classified as 'gas characteristic situation 1' (CS1).

Sites classified as CS1 require no special ground gas protection measures to be incorporated within the construction.

The monitoring results to date along with the gas analyser calibration certificate are presented in **Annex B**.

5.4 Conclusion

Assessing all lines of evidence thus far, it is considered that a potential pollution linkage does not exist.

Upon completion of gas monitoring, these conclusions will be reviewed, and if necessary amended.

SECTION 6 Generic Quantitative Risk Assessment

6.1 Contaminants of Concern

Contaminants of concern identified as part of the investigation are summarised in **Table 6.1**, along with an interpretation of the likely contamination source. Where applicable, the contaminant, source relationship is based on the inferences made in the preliminary conceptual site model.

Table 6.1 Contaminants of Concern

Location	Depth	Contaminant	Source
BH01	0.3	Lead, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)Anthracene	Made ground
BH01	1.0-1.5	Dibenz(a,h)Anthracene	Made ground
BH01	2.0-2.5	Arsenic	Made ground
BH01	0.3	Arsenic, lead, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)Anthracene	Made ground
BH02	3.2-3.3	Arsenic, lead	Made ground
BH03	0.05-0.2	Dibenz(a,h)Anthracene, Aliphatic C10-C12, Aliphatic C12-C16	Made ground
WS03	0.3	Dibenz(a,h)Anthracene	Made ground
ST01	0.4	Naphthalene, Dibenz(a,h)Anthracene	Made ground/demolition rubble
ST02	0.4	Arsenic, Naphthalene, Dibenz(a,h)Anthracene	Made ground/demolition rubble
ST03	0.4	Naphthalene, Dibenz(a,h)Anthracene	Made ground/demolition rubble
ST04	0.4	Dibenz(a,h)Anthracene	Made ground/demolition rubble

6.2 Contaminant Linkages

Based on the findings of the intrusive site investigation and identified contaminants, the preliminary conceptual site model has been revised. Remaining contaminant linkages are tabulated in the refined conceptual site model **Table 6.2**. Identified contaminant linkages may require further investigation, detailed risk assessment and appropriate mitigation or remedial measures.

Table 6.2 Refined Conceptual Site Model

Source	Pathway	Receptor
S1 – Demolition waste	P1 - Direct soil and dust ingestion P3 - Plant uptake & consumption of home grown produce P4 - Dermal contact Inhalation of dust and vapours	R1 - Construction and maintenance workers R2 - Future site users (residents) R3 - Passers-by or neighbouring site users
S2 – Past on site industries	P5 - Vertical migration of leachates/liquid	R4 – Groundwater R5 – Surface waters

	contaminants (unsaturated zone) P6 - Horizontal and vertical migration of contaminants (saturated zone) P7 - Artificial contaminant pathway (borehole, pile, excavation etc) P8 - Surface run-off	
S3 – Made ground	P1 - Direct soil and dust ingestion P3 - Plant uptake & consumption of home grown produce P4 - Dermal contact Inhalation of dust and vapours	R1 - Construction and maintenance workers R2 - Future site users (residents) R3 - Passers-by or neighbouring site users

6.3 Conclusions of the Generic Quantitative Risk Assessment

The soil laboratory chemical test results obtained to date suggest there is a potential source-pathway-linkage that will need to be broken or significantly reduced to reduce the risk to receptors.

Given the recorded type and concentrations of contamination, it is likely that a Stage 2 Options Appraisal and Remediation Strategy can be carried out without needing to advance to a Tier 3 assessment.

Following receipt of the final soil laboratory chemical test results, PID and ground gas monitoring, and the groundwater laboratory chemical test results, recommendations relating to a Stage 2 Options Appraisal and Remediation Strategy and whether a Tier 3 assessment is required will be provided.

SECTION 7 Laboratory Geotechnical Testing Results Analysis

Laboratory geotechnical testing results are summarised in the following sections and presented in their entirety in **Annex C**.

7.1.1 Concrete Classification Testing

Five samples were subject to testing for concrete classification in accordance with BRE SD1:2015. The results are summarised in **Table 7.1**

Table 7.1 BRE SD1 Testing Summary

Location	Depth (m)	2:1 Water/Soil Extract		Total Sulphur (%)	pH	Total Potential Sulphate (%)	Oxidisable Sulphides (%)
		SO ₄ (mg/l)	Mg (mg/l)				
BH01	1.0-1.5	<10	40	0.03	8.0	0.09	0.069
BH01	2.5-3.0	19	72	0.03	8.5	0.09	0.048
BH02	3.2-3.3	34	39	0.06	8.2	0.18	0.122
BH03	0.05-0.2	97	100	0.36	8.0	1.08	0.960
BH03	1.5-2.0	<10	100	0.02	8.8	0.06	0.043

Notes:

The following stoichiometric equation was employed to determine the Total Potential Sulphate (TPS). $TPS (\% \text{ as } SO_4) = 3.0 \times \text{Total Sulphur (TS \% as S)}$.

The amount of Oxidisable Sulphides (OS as %SO₄) has been conservatively calculated by the following equation. $OS = TPS - \text{Acid Soluble Sulphate (AS)}$.

Based on results obtained, the characteristic values are provided below.

Sulphate (2:1 Water Soluble) as SO₄: 97mg/l
 pH: 8.0
 Total Potential Sulphate (TPS): 1.08%

The initial classification for the site based on sulphate (2:1 Water Soluble) as SO₄ is Design Sulphate (DS) Class DS-1. The Aggressive Chemical Environment for Concrete (ACEC) Class for the site based on sulphate (2:1 Water Soluble) as SO₄, mobile water and pH is AC-1.

However, due to the potential presence of sulphides (e.g. pyrite/ gypsum) additional consideration is required.

A significant number of samples contained oxidisable sulphides of greater than 0.3%, signifying the likely presence of sulphides. Therefore, the TPS concentrations need to be considered in this assessment.

The DS class for the site base on the TPS is DS-3.

With comparison of the highest TPS to table C2 these soils fall into DS-3. The ACEC Class for the site based on TPS, mobile water and pH is AC-3.

As the water soluble sulphate concentration is below 3000mg/l an additional consideration for the level of magnesium is not required.

Based on the above assessment the DS Class for the site is determined as DS-3, and the ACEC Class is AC-3.

SECTION 8 Engineering Recommendations

8.1 Preparation of Site

Allowances should be made for the removal of buried structures. Remaining structures, including foundations, and associated areas of hard standing over granular sub-base materials must be stripped and removed from beneath the proposed development area.

Any deleterious materials must be removed by a suitably qualified person and disposed of at an appropriately licenced landfill. Precautions must be in place to prevent any contamination of the soils on site during the removal process.

Areas of vegetation including all roots must be stripped and removed from beneath the proposed development site.

Allowances should be made for any temporary/permanent support works to any existing adjacent structure necessary as a result of the proposed works.

Contingencies should be made for the protection/diversion of any underground/overhead services present beneath/above the site brought about as a result of the proposed works.

Any reduced levels should be brought up to the required levels with suitable inert mainly granular materials. Department for Transport (DfT) type 2 sub-base or similar should be used and compacted in layers to the requirements of the Specification for Highway Works.

Allowances must also be made for the excavation of any soft spots/areas and their replacement with well compacted imported granular materials.

In accordance with EC Regulation 1272/2008 (Ref) and Environment Agency Guidance WM3 soils and other materials destined for off-site disposal must be classified on the basis of their hazard phrases prior to disposal. Soils are classified as a mirror entry waste and must be classified on the basis of their specific chemical properties. Terra Firma offer this service if required.

8.2 Foundation & Floor Slab Solution

The proposed development is likely to comprise the construction of five storey building containing 40No. flats.

Due to the thick made ground and very soft underlying tidal flat deposits traditional foundations will not be suitable for the new development as these would lead to high and unacceptable total and differential settlements.

Due to the proximity of the site to George Street Bridge, a driven pre-cast reinforced concrete piled foundation is unlikely to be appropriate. A bored or CFA pile is likely to be used.

The piles should be founded within the underlying sandstone bedrock.

For a 300mm diameter bored pile founded within the competent mudstone a safe allowable working load of up to 400kN should be achievable. Piles are likely to be around 23m in length. The piling contractor and warranty provider is likely to require coring of at least 5m into the competent bedrock.

The estimated working pile loads, pile type and lengths are given for guidance only and should be confirmed by a specialist piling contractor and it may be prudent to test drive/install piles at selected locations.

Significant allowances should be made by the piling contractor for dealing with the dense to very dense granular deposits, containing cobbles and boulders above the bedrock.

The piling contractor and the warranty provider are likely to require at least 5m coring of competent bedrock to confirm the pile depth.

For the above size and type of pile(s) founded within the competent dense gravels, the total settlements should not exceed 10mm, with differential movements between adjacent piles being less than half this value.

Allowances should be made for the removal of any 'soft spots' and their replacement with well-compacted granular materials. Department for Transport (DfT) Type 2 materials or similar could be used and should be compacted in layers to the specification for Highway Works.

All foundation formations should be inspected by a suitably qualified Geotechnical Engineer before being concreted.

Current building control regulations require that where infilled ground is present to depths in excess of 600mm or where the sub-stratum is variable in terms of the structure and settlement potential or where clay soils are present within the influence of existing or proposed trees, a suspended floor slab is required.

In this instance, given the presence of made ground exceeding 600mm thickness, and the underlying soft clay soils the use of a suspended floor slab would be required. Alternatively, the floor slab can be piled.

8.3 Excavations & Formations

Most of the shallow excavations will be possible with normal soil excavating machinery. Allowances for a breaker attachment will be required when dealing with areas of hard standing and buried obstructions.

Shallow perched water and groundwater flows were not encountered during the investigation. Any water inflows together with rainwater infiltration should be dealt with by conventional pumping techniques. However, it should be noted that during times of heavy rainfall a higher water table will be encountered.

The sides of any excavations deeper than 1.20m, or shallower if unstable, should be supported by planking and strutting or other proprietary means.

The sub-formations/formations are likely to be susceptible to loosening, softening and deterioration by exposure to weather (rain, frost and drying conditions), the action of water (flood water or removal of groundwater) and site traffic.

Formations should never be left unprotected and continuously exposed to rain causing degradation, or left exposed/uncovered overnight, unless permitted by a qualified engineer.

Construction plant and other vehicular traffic should not be operated on unprotected formations.

As a minimum the formation/excavation surfaces must be protected by blinding concrete immediately after exposure.

Allowances should be made for the removal of soft spots/areas and their replacement with well compacted granular materials.

Allowances should also be made for special precautions to prevent formation deterioration in addition to the above.

8.4 Protection of Buried Concrete

When the results are compared with Table C2 of BRE Digest 1:2005, it indicates that buried concrete should generally conform to DS-3, AC-3.

8.5 Access Roads & Car Parking Areas

For car parking and road areas, formations within the in-situ natural soils a California Bearing Ration (CBR) value of 2% is likely to be possible for design purposes.

Allowances should be made for the removal of any 'soft spots/areas' and their replacement with well-compacted granular materials as previously described.

Please note that the Local Council / Highways Authority may require in-situ CBR testing to be undertaken before a road is adopted. In-situ CBR testing should be performed following earthworks to verify the performance of the engineered fill.

8.6 Storm Water Drainage

Soakaway testing was not carried out at the site. However, given the depth of made ground and the potential for mobilising contamination, it is unlikely traditional soakaway drainage would be suitable for the proposed development.

SECTION 9 Recommended Further Work

To inform pile design, 3No. boreholes should be drilled by rotary percussive method with the objective of coring at least 5m into competent St Maughan's Group bedrock. Standard penetration tests should be carried out at regular intervals within the bedrock, and core samples tested for unconfined compressive strength and point load.

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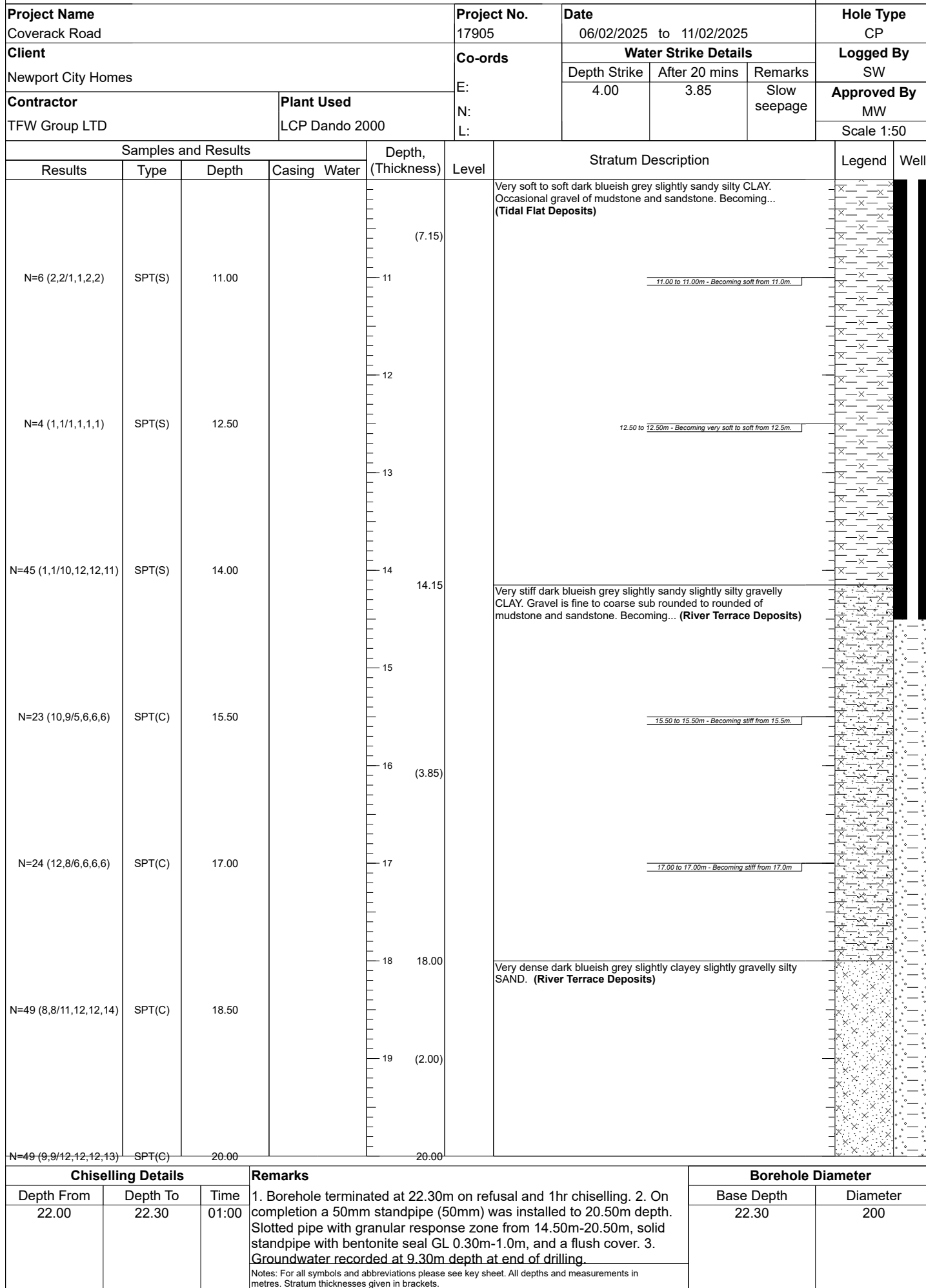
in BS8332:2015 (Ref) and BS8601:2013

EC Regulation 1272/2008 and Environment Agency Guidance WM3

ANNEX A
Exploratory Hole Logs

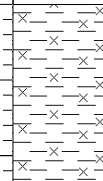
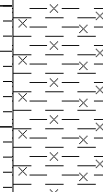
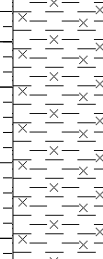
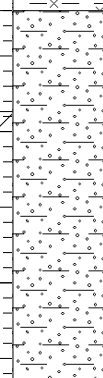
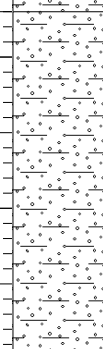
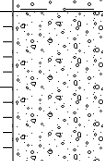


Chiselling Details			Remarks	Borehole Diameter	
Depth From	Depth To	Time		Base Depth	Diameter
22.00	22.30	01:00	1. Borehole terminated at 22.30m on refusal and 1hr chiselling. 2. On completion a 50mm standpipe (50mm) was installed to 20.50m depth. Slotted pipe with granular response zone from 14.50m-20.50m, solid standpipe with bentonite seal GL 0.30m-1.0m, and a flush cover. 3. <u>Groundwater recorded at 9.30m depth at end of drilling.</u> Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.	22.30	200



Chiselling Details			Remarks	Borehole Diameter	
Depth From	Depth To	Time		Base Depth	Diameter
22.00	22.30	01:00		22.30	200

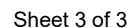
Chiselling Details			Remarks	Borehole Diameter	
Depth From	Depth To	Time		Base Depth	Diameter
19.10	19.50	01:00	1. Borehole terminated 21.0m on refusal and 1hr of chiselling . 2. On completion a 50mm standpipe (50mm) was installed to 10.60m depth. Slotted pipe with granular response zone from 7.00m-10.6 0m, solid standpipe with bentonite seal GL 0.30m-1.0m, and a flush cover. Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.	21.00	200
19.50	20.00	01:00			
21.00	21.50	01:00			

				Consulting Geotechnical, Geo-Environmental Engineers & Site Investigation Contractors Phone: 033 022 36380 Email: hello@tfwgroup.co.uk				Cardiff Office 5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA				Exeter Office The Slate Barn Lower Lowley Dunsford Exeter EX6 7BP		Portsmouth Office Technopole Kingston Crescent North End Portsmouth PO2 8FA		Borehole No. BH02 Sheet 2 of 3	
Project Name Coverack Road						Project No. 17905		Date 02/02/2025 to 06/02/2025				Hole Type CP					
Client Newport City Homes						Co-ords E: N: L:		Water Strike Details				Logged By SW					
Contractor TFW Group LTD								Plant Used LCP Dando 2000		Depth Strike 10.00 15.00		After 20 mins 7.40 9.40		Remarks Medium Fast		Approved By MW	
														Scale 1:50			
Samples and Results					Depth, (Thickness)	Level	Stratum Description						Legend	Well			
Results	Type	Depth	Casing	Water													
N=0 (1,0/0,0,0,0)	SPT(S)	11.20			(7.50)		Very soft to soft dark blueish grey slightly sandy silty CLAY. Occasional gravel of mudstone (Tidal Flat Deposits) 11.20 to 11.20m - Becoming very soft from 11.2m.										
					11												
N=6 (1,1/1,1,2,2)	SPT(S)	12.70			12		12.70 to 12.70m - Becoming soft from 12.7m.										
					13												
N=34 (4,6/8,10,7,9)	SPT(S)	14.20			14	14.20	Dense dark blueish grey slightly silty clayey GRAVEL of mudstone and sandstone. Occasional cobble, gravel is fine to coarse sub rounded to rounded (River Terrace Deposits)										
					15												
N=29 (5,7/6,6,9,8)	SPT(C)	16.70			(2.50)	16.70	Dense dark blueish grey slightly silty clayey GRAVEL of mudstone and sandstone. Abundant cobble, gravel is fine to coarse sub rounded to rounded (River Terrace Deposits)										
					16												
N=40 (7,9/11,12,9,8)	SPT(C)	18.20			(3.30)		Very dense reddish brown mottled grey slightly clayey slightly silty sandy GRAVEL. With abundant cobble content of mudstone and sandstone (St Maughans Formation)										
					17												
50 (8,12/50 for 225mm)	SPT(C)	19.00			19												
					20												
					20.00												
Chiselling Details			Remarks						Borehole Diameter								
Depth From	Depth To	Time	1. Borehole terminated 21.0m on refusal and 1hr of chiselling . 2. On completion a 50mm standpipe (50mm) was installed to 10.60m depth. Slotted pipe with granular response zone from 7.00m-10.6 0m, solid standpipe with bentonite seal GL 0.30m-1.0m, and a flush cover.						Base Depth		Diameter						
19.10	19.50	01:00							21.00		200						
19.50	20.00	01:00	Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.														
21.00	21.50	01:00															

Chiselling Details			Remarks	Borehole Diameter	
Depth From	Depth To	Time		Base Depth	Diameter
19.10	19.50	01:00	1. Borehole terminated 21.0m on refusal and 1hr of chiselling . 2. On completion a 50mm standpipe (50mm) was installed to 10.60m depth. Slotted pipe with granular response zone from 7.00m-10.6 0m, solid standpipe with bentonite seal GL 0.30m-1.0m, and a flush cover.	21.00	200
19.50	20.00	01:00			
21.00	21.50	01:00			
			Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.		

				Consulting Geotechnical, Geo-Environmental Engineers & Site Investigation Contractors				Cardiff Office 5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA				Exeter Office The Slate Barn Lower Lowley Dunsford Exeter EX6 7BP				Portsmouth Office Technopole Kingston Crescent North End Portsmouth PO2 8FA				Borehole No. BH03 Sheet 1 of 3	
Project Name Coverack Road								Project No. 17905		Date 02/02/2025 to 06/02/2025						Hole Type CP					
Client Newport City Homes								Co-ords E: N: L:		Water Strike Details						Logged By SW					
Contractor TFW Group LTD										Plant Used LCP Dando 2000		Depth Strike 15.30		After 20 mins 12.40		Remarks Medium seepage		Approved By MW			
																Scale 1:50					
Samples and Results				Depth, (Thickness)		Level	Stratum Description						Legend	Well							
Results	Type	Depth	Casing	Water																	
N=4 (1,1/1,1,1,1)	SPT(S)	1.20			(0.05)		CONCRETE (Made Ground) Dark brown sandy GRAVEL. Gravel of angular and sub-angular brick, concrete, tarmac, ash and clinker. (Made Ground)														
					0.05																
					(0.50)																
N=4 (2,2/1,1,1,1)	SPT(C)	2.00			0.55		Loose organish brown sandy GRAVEL. Gravel is angular and sub angular of flint, possible infill (Made Ground)														
					1																
					(1.95)																
N=8 (3,2/2,2,2,2)	SPT(C)	3.00			2.50		Soft dark blueish grey slightly sandy slightly gravelly silty CLAY. Gravel of brick fragments and concrete (Made Ground)														
					(0.50)																
					3																
N=9 (3,2/2,1,3,3)	SPT(S)	4.00			3.00		Soft to firm becoming firm with depth light brown slightly sandy slightly gravelly silty CLAY. Occasional pocket of siltstone, gravel round to subrounded of mudstone and sandstone (Tidal Flat Deposits)														
					4																
					4.00 to 4.00m - Becoming soft from 4.0m.																
N=4 (2,2/1,1,1,1)	SPT(S)	5.00			5		5.00 to 5.00m - Becoming very soft to soft from 5.0m.														
					(4.50)																
					6																
N=8 (1,1/2,2,2,2)	SPT(S)	6.50			6		6.50 to 6.50m - Becoming soft to firm from 6.5m.														
					7																
					7.50																
N=7 (1,1/1,2,2,2)	SPT(S)	8.00			8		Soft silty CLAY. Occasional gravel of mudstone and sandstone (Tidal Flat Deposits)														
					9																
					9.50																
N=10 (1,1/2,2,3,3)	SPT(S)	9.50			9		9.50 to 9.50m - Becoming firm from 9.5m.														
					10																
					10.50																
Chiselling Details			Remarks						Borehole Diameter												
Depth From	Depth To	Time	1. Borehole terminated 22.70m on refusal and 1hr of chiselling. 2. On completion a 50mm standpipe (50mm) was installed to 19.0m depth. Slotted pipe with granular response zone from 15.50m-19.00m, solid standpipe with bentonite seal GL 0.30m-1.0m, and a flush cover.						Base Depth		Diameter										
15.40	16.00	01:00							22.70		200										
22.50	22.70	01:00																			
			Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.																		

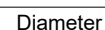
		Consulting Geotechnical, Geo-Environmental Engineers & Site Investigation Contractors		Cardiff Office 5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA		Exeter Office The Slate Barn Lower Lowley Dunsford Exeter EX6 7BP		Portsmouth Office Technopole Kingston Crescent North End Portsmouth PO2 8FA		Borehole No. BH03 Sheet 2 of 3					
Project Name Coverack Road				Project No. 17905		Date 02/02/2025 to 06/02/2025				Hole Type CP					
Client Newport City Homes				Co-ords E: N: L:		Water Strike Details				Logged By SW					
Contractor TFW Group LTD						Plant Used LCP Dando 2000		Depth Strike 15.30		After 20 mins 12.40		Remarks Medium seepage			
										Approved By MW					
										Scale 1:50					
Samples and Results				Depth, (Thickness)		Level		Stratum Description				Legend		Well	
Results		Type		Depth		Casing Water									
N=9 (1,1/2,2,2,3)		SPT(S)		11.00											
N=9 (1,1/2,2,2,3)		SPT(S)		12.50											
N=6 (2,2/1,1,2,2)		SPT(S)		14.00											
50 (12,12/50 for 150mm)		SPT(S)		15.50											
N=39 (9,10/10,10,9,10)		SPT(C)		17.00											
N=38 (8,9/9,9,10,10)		SPT(C)		18.50											
N=43 (7,9/9,11,11,12)		SPT(C)		20.00											
Chiselling Details				Remarks				Borehole Diameter							
Depth From		Depth To		Time		1. Borehole terminated 22.70m on refusal and 1hr of chiselling. 2. On completion a 50mm standpipe (50mm) was installed to 19.0m depth. Slotted pipe with granular response zone from 15.50m-19.00m, solid standpipe with bentonite seal GL 0.30m-1.0m, and a flush cover.				Base Depth		Diameter			
15.40		16.00		01:00						22.70		200			
22.50		22.70		01:00											
				Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.											



Chiselling Details			Remarks	Borehole Diameter	
Depth From	Depth To	Time		Base Depth	Diameter
15.40	16.00	01:00	1. Borehole terminated 22.70m on refusal and 1hr of chiselling. 2. On completion a 50mm standpipe (50mm) was installed to 19.0m depth. Slotted pipe with granular response zone from 15.50m-19.00m, solid standpipe with bentonite seal GL 0.30m-1.0m, and a flush cover.	22.70	200
22.50	22.70	01:00			
			Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.		

		Consulting Geotechnical, Geo-Environmental Engineers & Site Investigation Contractors		Cardiff Office 5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA		Exeter Office The Slate Barn Lower Lowley Dunsford Exeter EX6 7BP		Portsmouth Office Technopole Kingston Crescent North End Portsmouth PO2 8FA		Borehole No. WS01 Sheet 1 of 1	
Project Name Coverack Road				Project No. 17905		Date 14/02/2025 to 14/02/2025				Hole Type WS	
Client Newport City Homes				Co-ords E: N: L:		Water Strike Details				Logged By SW	
Contractor TFW Group Ltd						Plant Used Dando Terrier 2002				Approved By MW	
								Scale 1:50			
Samples and Results			Depth, (Thickness)	Level	Stratum Description					Legend	Well
Results	Type	Depth									
N=16 (3,2/4,4,4,4)	SPT(C)	1.00	(0.05)	1	Concrete (Made Ground)						
			0.05		Dark brown sandy GRAVEL. Gravel of angular and sub-angular brick, concrete and tarmac. (Made Ground)						
			(0.42)								
			0.47		Medium dense dark brownish black sandy ashy GRAVEL. Gravel of angular and sub-angular brick, concrete, tarmac, ash and clinker. (Made Ground)						
			(0.83)								
			1.30		Loose brownish orange slightly clayey sandy GRAVEL. Gravel is angular and sub angular of flint and brick (Made Ground)						
N=0 (1,0/0,0,0,0)	SPT(C)	2.00	2								
				(2.80)							
					3						
N=0 (1,1/0,0,0,0)	SPT(C)	3.00	3								
				4							
					N=9 (1,5/3,2,2,2)	SPT(C)	4.00	4			
4.10											
	(0.30)	Soft to firm brown slightly sandy gravelly CLAY. Gravel is fine to coarse sub rounded to sub angular of mudstone and brick fragments (Made Ground)									
			4.40								
			(0.60)		Soft dark greyish brown slightly sandy slightly silty gravelly CLAY. Occasional cobble content, gravel is fine to coarse rounded to sub rounded of mudstone. (Tidal Flat Deposits)						
			5								
N=9 (1,1/1,2,3,3)	SPT(C)	5.00	5	End of Borehole at 5.00m							
				6							
Remarks											
1] On completion a 50mm standpipe (50mm) was installed to 5.0m depth. Slotted pipe with granular response zone from 1.0m-5.0m, solid standpipe with bentonite seal GL-1.0m, and a flush cover. 2] No groundwater inflows recorded.										Borehole Diameter	
										Base Depth	Diameter
Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.											

Remarks	Borehole Diameter	
	Base Depth	Diameter
1] On completion a 50mm standpipe (50mm) was installed to 5.0m depth. Slotted pipe with granular response zone from 1.0m-5.0m, solid standpipe with bentonite seal GL-1.0m, and a flush cover. 2] No groundwater inflows recorded.		
Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.		



ANNEX B
Ground Gas & PID Monitoring Results



Page 1 of 2

ANNEX C
Laboratory Soil Chemical Test Results





Final Report

Report No.: 25-04653-1

Initial Date of Issue: 03-Mar-2025

Re-Issue Details:

Client Terra Firma

Client Address: 5 Deryn Court
Wharfedale Road
Pentwyn
Cardiff
CF23 7HA

Contact(s): s.williams@tfwgroup.co.uk

Project Coverack Road

Quotation No.: **Date Received:** 11-Feb-2025

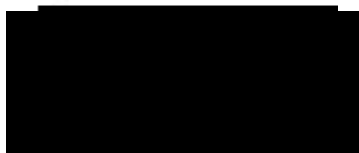
Order No.: 17905 **Date Instructed:** 11-Feb-2025

No. of Samples: 5

Turnaround (Wkdays): 10 **Results Due:** 24-Feb-2025

Date Approved: 03-Mar-2025

Approved By:



Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: Coverack Road

Client: Terra Firma		Chemtest Job No.: 25-04653					25-04653	25-04653	25-04653	25-04653
Quotation No.:		Chemtest Sample ID.: 1930561					1930562	1930563	1930564	1930565
Order No.: 17905		Client Sample Ref.:					1	1	1	1
		Client Sample ID.:					BH02	BH03	BH01	BH01
		Sample Location:					BH02	BH03	BH01	BH01
		Sample Type:					SOIL	SOIL	SOIL	SOIL
		Top Depth (m):					3.2	0.05	2.5	1.0
		Bottom Depth (m):					3.3	0.20	3	1.5
		Date Sampled:					07-Feb-2025	07-Feb-2025	07-Feb-2025	07-Feb-2025
		Time Sampled:					12:00	12:00	12:00	12:00
		Asbestos Lab:					DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD					
ACM Type		N	2192		N/A	-	-	-	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage		U	2192		N/A	-	-	-	-	-
Moisture		N	2030	%	0.020	14	7.9	9.5	10	11
Soil Colour		N	2040		N/A	Black	Black	Brown	Brown	Brown
Other Material		N	2040		N/A	Stones	Stones	Stones	Stones	Stones
Soil Texture		N	2040		N/A	Sand	Sand	Clay	Sand	Sand
Total Potential Sulphate as SO4		N	2175	%	0.030	0.18	1.1	0.090	0.090	0.060
pH at 20C		M	2010		4.0	8.2	8.0	8.5	8.8	8.0
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	0.60	0.57	0.76	< 0.40	0.42
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	0.034	0.097	0.019	< 0.010	< 0.010
Total Sulphur		U	2175	%	0.010	0.060	0.36	0.030	0.030	0.020
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Magnesium (Extractable)		N	2400	mg/l	2.0	39	100	72	40	100
Sulphate (Acid Soluble)		U	2430	%	0.010	0.058	0.12	0.042	0.021	0.017
Arsenic		M	2455	mg/kg	0.5	88	12	270	28	7.1
Cadmium		M	2455	mg/kg	0.10	2.8	0.80	0.44	0.33	0.14
Chromium		M	2455	mg/kg	0.5	34	17	18	13	27
Mercury Low Level		N	2450	mg/kg	0.05	1.6	0.14	0.06	< 0.05	0.07
Copper		M	2455	mg/kg	0.50	220	790	300	55	53
Nickel		M	2455	mg/kg	0.50	51	23	23	15	12
Lead		M	2455	mg/kg	0.50	450	230	61	33	45
Selenium		M	2455	mg/kg	0.25	1.5	0.82	0.39	0.26	0.55
Zinc		M	2455	mg/kg	0.50	1900	230	120	490	67
Chromium (Trivalent)		N	2490	mg/kg	1.0	34	17	18	13	27
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	0.14	0.12	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	6.5	1100	< 2.0	< 2.0	7.2
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	4.3	2400	< 1.0	< 1.0	28

Results - Soil

Project: Coverack Road

Client: Terra Firma		Chemtest Job No.:		25-04653	25-04653	25-04653	25-04653	25-04653
Quotation No.:		Chemtest Sample ID.:		1930561	1930562	1930563	1930564	1930565
Order No.: 17905		Client Sample Ref.:		1	1	1	1	1
		Client Sample ID.:		BH02	BH03	BH01	BH01	BH03
		Sample Location:		BH02	BH03	BH01	BH01	BH03
		Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):		3.2	0.05	2.5	1.0	1.5
		Bottom Depth (m):		3.3	0.20	3	1.5	2.0
		Date Sampled:		07-Feb-2025	07-Feb-2025	07-Feb-2025	07-Feb-2025	07-Feb-2025
		Time Sampled:		12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD			
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	4.5	130	< 2.0
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	6.3	< 3.0	5.0
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	22	3600	7.0
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	22	3600	< 10
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	1.7	170	< 1.0
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	2.2	77	< 1.0
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	< 2.0	200	32
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	11	1300	14
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	2.4	990	9.2
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	16	1800	47
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	18	2800	56
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	37	5400	53
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	40	6400	63
Naphthalene		M	2700	mg/kg	0.10	2.0	< 0.10	< 0.10
Acenaphthylene		M	2700	mg/kg	0.10	0.25	< 0.10	< 0.10
Acenaphthene		M	2700	mg/kg	0.10	0.52	< 0.10	< 0.10
Fluorene		M	2700	mg/kg	0.10	0.43	< 0.10	< 0.10
Phenanthrene		M	2700	mg/kg	0.10	0.91	0.82	0.15
Anthracene		M	2700	mg/kg	0.10	0.19	0.79	< 0.10
Fluoranthene		M	2700	mg/kg	0.10	0.56	1.1	0.15
Pyrene		M	2700	mg/kg	0.10	0.63	1.5	0.69
Benzo[a]anthracene		M	2700	mg/kg	0.10	0.38	0.97	0.29
Chrysene		M	2700	mg/kg	0.10	0.56	1.1	0.26
Benzo[b]fluoranthene		M	2700	mg/kg	0.10	0.24	2.3	0.19
Benzo[k]fluoranthene		M	2700	mg/kg	0.10	0.36	1.2	0.21
Benzo[a]pyrene		M	2700	mg/kg	0.10	0.33	0.81	0.19
Indeno(1,2,3-c,d)Pyrene		M	2700	mg/kg	0.10	0.14	1.7	< 0.10
Dibenz(a,h)Anthracene		M	2700	mg/kg	0.10	< 0.10	0.55	< 0.10
Benzo[g,h,i]perylene		M	2700	mg/kg	0.10	0.28	3.3	0.12

Results - Soil

Project: Coverack Road

Client: Terra Firma		Chemtest Job No.:						25-04653	25-04653	25-04653	25-04653	25-04653
Quotation No.:		Chemtest Sample ID.:						1930561	1930562	1930563	1930564	1930565
Order No.: 17905		Client Sample Ref.:						1	1	1	1	1
		Client Sample ID.:						BH02	BH03	BH01	BH01	BH03
		Sample Location:						BH02	BH03	BH01	BH01	BH03
		Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):						3.2	0.05	2.5	1.0	1.5
		Bottom Depth (m):						3.3	0.20	3	1.5	2.0
		Date Sampled:						07-Feb-2025	07-Feb-2025	07-Feb-2025	07-Feb-2025	07-Feb-2025
		Time Sampled:						12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:						DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD							
Total Of 16 PAH's		M	2700	mg/kg	2.0	7.8		16		2.3	21	< 2.0
Total Phenols		M	2920	mg/kg	0.10	< 0.10		< 0.10		< 0.10	< 0.10	< 0.10
Organic Matter BS1377		N	2930	%	0.10	4.2		9.9		1.5	0.40	1.6

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2400	Cations	Cations	ICP-MS	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.	
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection	
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)	
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	
2930	Organic Matter	Organic Matter	Acid Dichromate digestion/Titration	

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

NEW_ASB	Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL
DURHAM	Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

As a result of any of the below deviations applying, the test results may be unreliable

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - The required amount of sample for analysis was not received

H - Appropriate cooling measures were not taken for sample transportation

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Report Information

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

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 - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com



Final Report

Report No.: 25-05787-1

Initial Date of Issue: 05-Mar-2025

Re-Issue Details:

Client Terra Firma

Client Address: 5 Deryn Court
Wharfedale Road
Pentwyn
Cardiff
CF23 7HA

Contact(s): s.williams@tfwgroup.co.uk

Project Coverack Stockpile

Quotation No.: **Date Received:** 19-Feb-2025

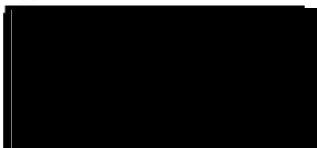
Order No.: 17905 - ST **Date Instructed:** 19-Feb-2025

No. of Samples: 4

Turnaround (Wkdays): 5 **Results Due:** 25-Feb-2025

Date Approved: 05-Mar-2025

Approved By:



Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: Coverack Stockpile

Client: Terra Firma		Chemtest Job No.:		25-05787	25-05787	25-05787	25-05787
Quotation No.:		Chemtest Sample ID.:		1934986	1934987	1934988	1934990
Order No.: 17905 - ST		Client Sample Ref.:		2	2	2	2
		Client Sample ID.:		ST01	ST02	ST03	ST04
		Sample Location:		ST01	ST02	ST03	ST04
		Sample Type:		SOIL	SOIL	SOIL	SOIL
		Top Depth (m):		0.4	0.40	0.40	0.40
		Date Sampled:		14-Feb-2025	14-Feb-2025	14-Feb-2025	14-Feb-2025
		Time Sampled:		12:00	12:00	12:00	12:00
		Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
ACM Type		N	2192		N/A	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage		U	2192		N/A	-	-
Moisture		N	2030	%	0.020	11	7.7
Soil Colour		N	2040		N/A	Brown	Brown
Other Material		N	2040		N/A	Stones and Roots	Stones and Roots
Soil Texture		N	2040		N/A	Clay	Sand
pH at 20C		M	2010		4.0	7.7	7.8
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	0.61	0.46
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50
Sulphate (Acid Soluble)		U	2430	%	0.010	0.13	0.066
Arsenic		M	2455	mg/kg	0.5	20	43
Cadmium		M	2455	mg/kg	0.10	0.56	1.2
Chromium		M	2455	mg/kg	0.5	17	35
Mercury Low Level		N	2450	mg/kg	0.05	0.18	0.89
Copper		M	2455	mg/kg	0.50	49	86
Nickel		M	2455	mg/kg	0.50	19	37
Lead		M	2455	mg/kg	0.50	170	270
Selenium		M	2455	mg/kg	0.25	0.50	1.2
Zinc		M	2455	mg/kg	0.50	190	370
Chromium (Trivalent)		N	2490	mg/kg	1.0	17	35
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	< 2.0
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	2.3	< 1.0
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	2.9	< 2.0
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	9.6	9.3
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	< 10
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	16	11
						15	6.7

Results - Soil

Project: Coverack Stockpile

Client: Terra Firma		Chemtest Job No.:		25-05787	25-05787	25-05787	25-05787
Quotation No.:		Chemtest Sample ID.:		1934986	1934987	1934988	1934990
Order No.: 17905 - ST		Client Sample Ref.:		2	2	2	2
		Client Sample ID.:		ST01	ST02	ST03	ST04
		Sample Location:		ST01	ST02	ST03	ST04
		Sample Type:		SOIL	SOIL	SOIL	SOIL
		Top Depth (m):		0.4	0.40	0.40	0.40
		Date Sampled:		14-Feb-2025	14-Feb-2025	14-Feb-2025	14-Feb-2025
		Time Sampled:		12:00	12:00	12:00	12:00
		Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	16	18
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	2.2	< 1.0
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	8.6	< 1.0
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	120	8.3
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	260	13
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	18	5.4
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	390	21
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	410	27
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50	< 0.50
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	410	28
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	420	45
Naphthalene		M	2700	mg/kg	0.10	2.9	0.57
Acenaphthylene		M	2700	mg/kg	0.10	0.41	0.23
Acenaphthene		M	2700	mg/kg	0.10	0.92	0.38
Fluorene		M	2700	mg/kg	0.10	0.50	0.21
Phenanthrene		M	2700	mg/kg	0.10	2.1	1.6
Anthracene		M	2700	mg/kg	0.10	0.44	0.53
Fluoranthene		M	2700	mg/kg	0.10	2.8	2.9
Pyrene		M	2700	mg/kg	0.10	3.0	2.9
Benzo[a]anthracene		M	2700	mg/kg	0.10	1.8	1.9
Chrysene		M	2700	mg/kg	0.10	2.5	2.8
Benzo[b]fluoranthene		M	2700	mg/kg	0.10	2.4	3.4
Benzo[k]fluoranthene		M	2700	mg/kg	0.10	0.84	1.4
Benzo[a]pyrene		M	2700	mg/kg	0.10	1.7	2.0
Indeno(1,2,3-c,d)Pyrene		M	2700	mg/kg	0.10	1.2	1.5
Dibenz(a,h)Anthracene		M	2700	mg/kg	0.10	0.41	0.48
Benzo[g,h,i]perylene		M	2700	mg/kg	0.10	1.3	1.6
Total Of 16 PAH's		M	2700	mg/kg	2.0	25	24
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10
Organic Matter BS1377		N	2930	%	0.10	2.8	2.3

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.	
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection	
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)	
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8–C10 Aromatics: >C5–C7,>C7–C8,>C8–C10	Water extraction / Headspace GCxGC FID detection	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and Trimethylphenols Note: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	
2930	Organic Matter	Organic Matter	Acid Dichromate digestion/Titration	

Report Information

Key

U	UKAS accredited
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N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

NEW_ASB	Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL
DURHAM	Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

As a result of any of the below deviations applying, the test results may be unreliable

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - The required amount of sample for analysis was not received

H - Appropriate cooling measures were not taken for sample transportation

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Report Information

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

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 - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com



Final Report

Report No.: 25-06989-1

Initial Date of Issue: 14-Mar-2025

Re-Issue Details:

Client Terra Firma

Client Address: 5 Deryn Court
Wharfedale Road
Pentwyn
Cardiff
CF23 7HA

Contact(s): s.williams@tfgroup.co.uk

Project Coverack Stockpile

Quotation No.: **Date Received:** 28-Feb-2025

Order No.: 17905-ST **Date Instructed:** 28-Feb-2025

No. of Samples: 2

Turnaround (Wkdays): 7 **Results Due:** 10-Mar-2025

Date Approved: 14-Mar-2025

Approved By:



Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: Coverack Stockpile

Client: Terra Firma		Chemtest Job No.:				25-06989	25-06989
Quotation No.:		Chemtest Sample ID.:				1940184	1940185
Order No.: 17905-ST		Client Sample Ref.:				2	2
		Client Sample ID.:				ST01	ST01
		Sample Location:				ST01	ST04
		Sample Type:				SOIL	SOIL
		Top Depth (m):				0.4	0.4
		Date Sampled:				14-Feb-2025	14-Feb-2025
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Moisture		N	2030	%	0.020	9.1	9.0

Results - 2 Stage WAC

Project: Coverack Stockpile

Chemtest Job No: 25-06989 Chemtest Sample ID: 1940184 Sample Ref: 2 Sample ID: ST01 Sample Location: ST01 Top Depth(m): 0.4 Bottom Depth(m): Sampling Date: 14-Feb-2025							Landfill Waste Acceptance Criteria						
			Limits										
			Inert Waste Landfill				Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill					
Determinand	SOP	Accred.							Units				
Total Organic Carbon	2625	M							%				
Loss On Ignition	2610	M							%				
Total BTEX	2760	M							mg/kg				
Total PCBs (7 Congeners)	2815	M							mg/kg				
TPH Total WAC	2670	M							mg/kg				
Total (Of 17) PAH's	2800	N		mg/kg									
pH at 20C	2010	M											
Acid Neutralisation Capacity	2015	N	mol/kg										
Eluate Analysis							2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic	1455	U	0.0021	0.0005	0.0042	0.0077	0.5	2	25				
Barium	1455	U	0.16	0.20	0.32	1.9	20	100	300				
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5				
Chromium	1455	U	0.026	0.0097	0.052	0.12	0.5	10	70				
Copper	1455	U	0.21	0.026	0.41	0.33	2	50	100				
Mercury	1455	U	0.00020	0.00007	0.00039	0.00090	0.01	0.2	2				
Molybdenum	1455	U	0.016	0.0049	0.031	0.066	0.5	10	30				
Nickel	1455	U	0.0041	0.0009	0.0082	0.014	0.4	10	40				
Lead	1455	U	0.0011	0.0007	0.0022	0.0080	0.5	10	50				
Antimony	1455	U	0.0013	< 0.0005	0.0027	0.0021	0.06	0.7	5				
Selenium	1455	U	0.0019	0.0008	0.0038	0.0095	0.1	0.5	7				
Zinc	1455	U	0.006	0.003	0.012	0.038	4	50	200				
Chloride	1220	U	15	5.8	30	73	800	15000	25000				
Fluoride	1220	U	0.43	0.51	< 1.0	5.0	10	150	500				
Sulphate	1220	U	18	14	36	150	1000	20000	50000				
Total Dissolved Solids	1020	N	1200	1300	2500	13000	4000	60000	100000				
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-				
Dissolved Organic Carbon	1610	U	27	5.2	53	86	500	800	1000				

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	8.2
WAC Sample Weight	[E] 574.0

Leachate Test Information	
Leachant volume 1st extract/l	0.334
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.279

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: Coverack Stockpile

Chemtest Job No: 25-06989							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1940185							Limits			
Sample Ref: 2							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: ST01										
Sample Location: ST04										
Top Depth(m): 0.4										
Bottom Depth(m): 0.4										
Sampling Date: 14-Feb-2025										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				4.1	3	5	6
Loss On Ignition	2610	M	%				7.2	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				290	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg				18	100	--	--
pH at 20C	2010	M					8.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.012	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0089	0.015	0.018	0.14	0.5	2	25	
Barium	1455	U	0.072	0.078	0.14	0.77	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.0022	0.0021	0.0044	0.021	0.5	10	70	
Copper	1455	U	0.0042	0.0033	0.0084	0.0065	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.012	0.0053	0.023	0.062	0.5	10	30	
Nickel	1455	U	0.0016	< 0.0005	0.0032	0.0024	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	0.0031	0.0034	0.0061	0.033	0.06	0.7	5	
Selenium	1455	U	0.0010	0.0014	0.0020	0.013	0.1	0.5	7	
Zinc	1455	U	0.006	0.012	0.011	0.11	4	50	200	
Chloride	1220	U	12	11	24	110	800	15000	25000	
Fluoride	1220	U	0.32	0.30	< 1.0	3.0	10	150	500	
Sulphate	1220	U	30	20	60	220	1000	20000	50000	
Total Dissolved Solids	1020	N	150	100	300	1100	4000	60000	100000	
Phenol Index	1920	U	< 0.030	0.033	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	5.4	2.6	< 50	< 50	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	9.7
WAC Sample Weight	[E] 631.0

Leachate Test Information	
Leachant volume 1st extract/l	0.331
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.270

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1940184	2	ST01	ST01	14-Feb-2025	E	Amber Glass 250ml
1940184	2	ST01	ST01	14-Feb-2025	E	Plastic Tub 500g
1940185	2	ST01	ST04	14-Feb-2025	E	Amber Glass 250ml
1940185	2	ST01	ST04	14-Feb-2025	E	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters	Conductivity Meter	TE LE SW GW
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.	RE PW PL LE DW GW
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).	RE PW PL SW DW GW
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation	PL SW GW
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.	
2010	pH Value of Soils	pH at 20°C	pH Meter	
2015	Acid Neutralisation Capacity	Acid Reserve	Titration	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS. Reported PCB 101 results may contain contributions from PCB 90 due to inseparable chromatography.	
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge	
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge	

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N	Unaccredited
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<	"less than"
>	"greater than"
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Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

NEW_ASB	Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL
DURHAM	Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

As a result of any of the below deviations applying, the test results may be unreliable

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - The required amount of sample for analysis was not received

H - Appropriate cooling measures were not taken for sample transportation

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Report Information

Water Sample Category Key for Accreditation

DW - Drinking Water
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PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

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 - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

ANNEX D
Waste Classification



Our Ref: DE/17905/WASTE

Your Ref:

Contact: David Emanuel

7th April 2024

Hedyn, TM Webber & CJG Hill

For the attention of Mr Josh Guy

Dear Josh,

SOIL WASTE CLASSIFICATION OF STOCKPILED SOILS: COVERACK ROAD, NEWPORT

TFW Group Limited has been retained by Hedyn, TM Webber & CJG Hill to classify stockpiled soil at their site off Coverack Road, Newport.

On 14th February 2025, 4 No. samples were collected from the stockpile and subject to Total Analysis. Full 2 Stage WAC Analysis was performed on 2 No. of the samples. Soil chemical test results are provided in **Annex A**.

On the basis of the soil chemical test results, the soil was classified based on the identified Hazards as defined in accordance with waste classification algorithms detailed in Environment Agency publication WM3 (V1.1. 2018).

Representative compounds were selected for the detected elements for waste classification. Where necessary, appropriate factors were employed to account for discrepancies between elemental and molecular concentrations.

No asbestos was detected during screening.

TPH was recorded up to 420 mg/kg during TPH Analysis. Free product was not observed and the potential for HP 3 is therefore omitted from the assessment.

A summary of the soil classification is presented in **Table 1**.

Table 1 Summary of Classification

Location	Sample	Soil Type	Waste Classification	EWC Code	Additional Comments
ST01	0.4	Made Ground	Non-Hazardous	17 05 04	-
ST02	0.4	Made Ground	Non-Hazardous	17 05 04	-
ST03	0.4	Made Ground	Non-Hazardous	17 05 04	-
ST04	0.4	Made Ground	Non-Hazardous	17 05 04	-

Two samples were submitted for WAC analysis. An appraisal of the WAC results is presented in **Table 2**.

Table 2 Summary of WAC Testing

Location	Sample	Soil Type	Comments
----------	--------	-----------	----------

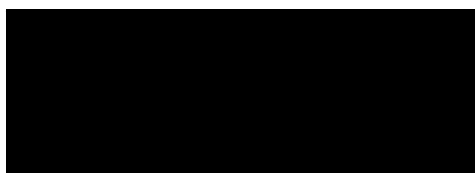
ST01	0.4	Made Ground	Fails Inert Chemical Criteria on account of elevated Total Organic Carbon and Total Dissolved Solids
ST04	0.4	Made Ground	Fails Inert Chemical Criteria on account of elevated Total Organic Carbon

The classifications do not include an assessment of invasive plant species.

If anomalous materials are encountered during excavation the classification should be revisited.

We trust that the above is to your satisfaction, however, if you have any queries or require any further information, please do not hesitate to contact us.

Yours sincerely
for: TFW Group Limited



David Emanuel

Enc.

Annex A – Soil Chemical Test Results

Annex A
Soil Chemical Test Results
25-05787-1
25-0689-1



Final Report

Report No.: 25-05787-1

Initial Date of Issue: 05-Mar-2025

Re-Issue Details:

Client Terra Firma

Client Address: 5 Deryn Court
Wharfedale Road
Pentwyn
Cardiff
CF23 7HA

Contact(s): s.williams@tfwgroup.co.uk

Project Coverack Stockpile

Quotation No.: **Date Received:** 19-Feb-2025

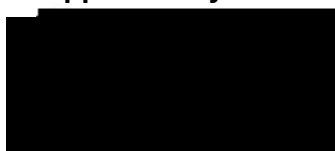
Order No.: 17905 - ST **Date Instructed:** 19-Feb-2025

No. of Samples: 4

Turnaround (Wkdays): 5 **Results Due:** 25-Feb-2025

Date Approved: 05-Mar-2025

Approved By:



Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: Coverack Stockpile

Client: Terra Firma		Chemtest Job No.:		25-05787	25-05787	25-05787	25-05787
Quotation No.:		Chemtest Sample ID.:		1934986	1934987	1934988	1934990
Order No.: 17905 - ST		Client Sample Ref.:		2	2	2	2
		Client Sample ID.:		ST01	ST02	ST03	ST04
		Sample Location:		ST01	ST02	ST03	ST04
		Sample Type:		SOIL	SOIL	SOIL	SOIL
		Top Depth (m):		0.4	0.40	0.40	0.40
		Date Sampled:		14-Feb-2025	14-Feb-2025	14-Feb-2025	14-Feb-2025
		Time Sampled:		12:00	12:00	12:00	12:00
		Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
ACM Type		N	2192		N/A	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage		U	2192		N/A	-	-
Moisture		N	2030	%	0.020	11	7.7
Soil Colour		N	2040		N/A	Brown	Brown
Other Material		N	2040		N/A	Stones and Roots	Stones and Roots
Soil Texture		N	2040		N/A	Clay	Sand
pH at 20C		M	2010		4.0	7.7	7.8
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	0.61	0.46
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50
Sulphate (Acid Soluble)		U	2430	%	0.010	0.13	0.066
Arsenic		M	2455	mg/kg	0.5	20	43
Cadmium		M	2455	mg/kg	0.10	0.56	1.2
Chromium		M	2455	mg/kg	0.5	17	35
Mercury Low Level		N	2450	mg/kg	0.05	0.18	0.89
Copper		M	2455	mg/kg	0.50	49	86
Nickel		M	2455	mg/kg	0.50	19	37
Lead		M	2455	mg/kg	0.50	170	270
Selenium		M	2455	mg/kg	0.25	0.50	1.2
Zinc		M	2455	mg/kg	0.50	190	370
Chromium (Trivalent)		N	2490	mg/kg	1.0	17	35
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	< 2.0
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	2.3	< 1.0
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	2.9	< 2.0
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	9.6	9.3
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	< 10
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	16	11

Results - Soil

Project: Coverack Stockpile

Client: Terra Firma		Chemtest Job No.:		25-05787	25-05787	25-05787	25-05787
Quotation No.:		Chemtest Sample ID.:		1934986	1934987	1934988	1934990
Order No.: 17905 - ST		Client Sample Ref.:		2	2	2	2
		Client Sample ID.:		ST01	ST02	ST03	ST04
		Sample Location:		ST01	ST02	ST03	ST04
		Sample Type:		SOIL	SOIL	SOIL	SOIL
		Top Depth (m):		0.4	0.40	0.40	0.40
		Date Sampled:		14-Feb-2025	14-Feb-2025	14-Feb-2025	14-Feb-2025
		Time Sampled:		12:00	12:00	12:00	12:00
		Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	16	18
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	2.2	< 1.0
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	8.6	< 1.0
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	120	8.3
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	260	13
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	18	5.4
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	390	21
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	410	27
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50	< 0.50
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	410	28
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	420	45
Naphthalene		M	2700	mg/kg	0.10	2.9	0.57
Acenaphthylene		M	2700	mg/kg	0.10	0.41	0.23
Acenaphthene		M	2700	mg/kg	0.10	0.92	0.38
Fluorene		M	2700	mg/kg	0.10	0.50	0.21
Phenanthrene		M	2700	mg/kg	0.10	2.1	1.6
Anthracene		M	2700	mg/kg	0.10	0.44	0.53
Fluoranthene		M	2700	mg/kg	0.10	2.8	2.9
Pyrene		M	2700	mg/kg	0.10	3.0	2.9
Benzo[a]anthracene		M	2700	mg/kg	0.10	1.8	1.9
Chrysene		M	2700	mg/kg	0.10	2.5	2.8
Benzo[b]fluoranthene		M	2700	mg/kg	0.10	2.4	3.4
Benzo[k]fluoranthene		M	2700	mg/kg	0.10	0.84	1.4
Benzo[a]pyrene		M	2700	mg/kg	0.10	1.7	2.0
Indeno(1,2,3-c,d)Pyrene		M	2700	mg/kg	0.10	1.2	1.5
Dibenz(a,h)Anthracene		M	2700	mg/kg	0.10	0.41	0.48
Benzo[g,h,i]perylene		M	2700	mg/kg	0.10	1.3	1.6
Total Of 16 PAH's		M	2700	mg/kg	2.0	25	24
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10
Organic Matter BS1377		N	2930	%	0.10	2.8	2.3

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.	
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection	
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)	
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8–C10 Aromatics: >C5–C7,>C7–C8,>C8–C10	Water extraction / Headspace GCxGC FID detection	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and Trimethylphenols Note: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	
2930	Organic Matter	Organic Matter	Acid Dichromate digestion/Titration	

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

NEW_ASB	Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL
DURHAM	Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

As a result of any of the below deviations applying, the test results may be unreliable

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - The required amount of sample for analysis was not received

H - Appropriate cooling measures were not taken for sample transportation

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Report Information

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

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 - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com



Final Report

Report No.: 25-06989-1

Initial Date of Issue: 14-Mar-2025

Re-Issue Details:

Client Terra Firma

Client Address: 5 Deryn Court
Wharfedale Road
Pentwyn
Cardiff
CF23 7HA

Contact(s): s.willaims@tfgroup.co.uk

Project Coverack Stockpile

Quotation No.: **Date Received:** 28-Feb-2025

Order No.: 17905-ST **Date Instructed:** 28-Feb-2025

No. of Samples: 2

Turnaround (Wkdays): 7 **Results Due:** 10-Mar-2025

Date Approved: 14-Mar-2025

Approved By:



Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: Coverack Stockpile

Client: Terra Firma		Chemtest Job No.:				25-06989	25-06989
Quotation No.:		Chemtest Sample ID.:				1940184	1940185
Order No.: 17905-ST		Client Sample Ref.:				2	2
		Client Sample ID.:				ST01	ST01
		Sample Location:				ST01	ST04
		Sample Type:				SOIL	SOIL
		Top Depth (m):				0.4	0.4
		Date Sampled:				14-Feb-2025	14-Feb-2025
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Moisture		N	2030	%	0.020	9.1	9.0

Results - 2 Stage WAC

Project: Coverack Stockpile

Chemtest Job No: 25-06989 Chemtest Sample ID: 1940184 Sample Ref: 2 Sample ID: ST01 Sample Location: ST01 Top Depth(m): 0.4 Bottom Depth(m): Sampling Date: 14-Feb-2025							Landfill Waste Acceptance Criteria			
			Limits							
			Inert Waste Landfill				Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill		
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				6.4	3	5	6
Loss On Ignition	2610	M	%				2.7	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				73	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg				21	100	--	--
pH at 20C	2010	M					8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.014	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0021	0.0005	0.0042	0.0077	0.5	2	25	
Barium	1455	U	0.16	0.20	0.32	1.9	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.026	0.0097	0.052	0.12	0.5	10	70	
Copper	1455	U	0.21	0.026	0.41	0.33	2	50	100	
Mercury	1455	U	0.00020	0.00007	0.00039	0.00090	0.01	0.2	2	
Molybdenum	1455	U	0.016	0.0049	0.031	0.066	0.5	10	30	
Nickel	1455	U	0.0041	0.0009	0.0082	0.014	0.4	10	40	
Lead	1455	U	0.0011	0.0007	0.0022	0.0080	0.5	10	50	
Antimony	1455	U	0.0013	< 0.0005	0.0027	0.0021	0.06	0.7	5	
Selenium	1455	U	0.0019	0.0008	0.0038	0.0095	0.1	0.5	7	
Zinc	1455	U	0.006	0.003	0.012	0.038	4	50	200	
Chloride	1220	U	15	5.8	30	73	800	15000	25000	
Fluoride	1220	U	0.43	0.51	< 1.0	5.0	10	150	500	
Sulphate	1220	U	18	14	36	150	1000	20000	50000	
Total Dissolved Solids	1020	N	1200	1300	2500	13000	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	27	5.2	53	86	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	8.2
WAC Sample Weight	[E] 574.0

Leachate Test Information	
Leachant volume 1st extract/l	0.334
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.279

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: Coverack Stockpile

Chemtest Job No: 25-06989							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1940185							Limits			
Sample Ref: 2							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: ST01										
Sample Location: ST04										
Top Depth(m): 0.4										
Bottom Depth(m): 0.4										
Sampling Date: 14-Feb-2025										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				4.1	3	5	6
Loss On Ignition	2610	M	%				7.2	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				290	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg				18	100	--	--
pH at 20C	2010	M					8.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.012	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0089	0.015	0.018	0.14	0.5	2	25	
Barium	1455	U	0.072	0.078	0.14	0.77	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.0022	0.0021	0.0044	0.021	0.5	10	70	
Copper	1455	U	0.0042	0.0033	0.0084	0.0065	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.012	0.0053	0.023	0.062	0.5	10	30	
Nickel	1455	U	0.0016	< 0.0005	0.0032	0.0024	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	0.0031	0.0034	0.0061	0.033	0.06	0.7	5	
Selenium	1455	U	0.0010	0.0014	0.0020	0.013	0.1	0.5	7	
Zinc	1455	U	0.006	0.012	0.011	0.11	4	50	200	
Chloride	1220	U	12	11	24	110	800	15000	25000	
Fluoride	1220	U	0.32	0.30	< 1.0	3.0	10	150	500	
Sulphate	1220	U	30	20	60	220	1000	20000	50000	
Total Dissolved Solids	1020	N	150	100	300	1100	4000	60000	100000	
Phenol Index	1920	U	< 0.030	0.033	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	5.4	2.6	< 50	< 50	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	9.7
WAC Sample Weight	[E] 631.0

Leachate Test Information	
Leachant volume 1st extract/l	0.331
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.270

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1940184	2	ST01	ST01	14-Feb-2025	E	Amber Glass 250ml
1940184	2	ST01	ST01	14-Feb-2025	E	Plastic Tub 500g
1940185	2	ST01	ST04	14-Feb-2025	E	Amber Glass 250ml
1940185	2	ST01	ST04	14-Feb-2025	E	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters	Conductivity Meter	TE LE SW GW
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.	RE PW PL LE DW GW
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).	RE PW PL SW DW GW
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation	PL SW GW
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.	
2010	pH Value of Soils	pH at 20°C	pH Meter	
2015	Acid Neutralisation Capacity	Acid Reserve	Titration	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS. Reported PCB 101 results may contain contributions from PCB 90 due to inseparable chromatography.	
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge	
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge	

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

NEW_ASB	Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL
DURHAM	Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

As a result of any of the below deviations applying, the test results may be unreliable

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - The required amount of sample for analysis was not received

H - Appropriate cooling measures were not taken for sample transportation

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Report Information

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

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 - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

DRAWINGS





0 10 20 m

Legend

17905

 Cable Percussive Boreholes

 Window Sample Boreholes

 17905 Site Boundary

PROJECT:

17905 - Coverack Road

DRAWING 01:

17905 - Map 01

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