

Gellinudd Care Home, Swansea

Ground Investigation Report



Report for:

Rhodos Properties (No 14) Ltd

Reference:

P1188/CC-1206

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EXECUTIVE SUMMARY

Site Setting		
Site description and current land use	The site is an irregularly shaped parcel of land occupied by the now vacant Gellinudd Hospital along with associated car park and soft landscaping. The site measures approximately 77m north to south at its longest point and 42m east to west at its widest, covering 0.21ha.	
Environmental setting	Geology	The site is indicated to be underlain by the South Wales Coal Measures Formation. Superficial deposits are not indicated to be present, but nearby Glacial Till is recorded.
	Hydrology and hydrogeology	Secondary A Aquifer. There are no licensed abstractions within 500m of the site. The site is not located within a Source Protection Zone. The nearest surface water feature is an unnamed stream culverted along the southern boundary. The majority of the site is located in a Flood Risk Zone 1, however part of the southern boundary is located within a Flood Risk Zone 2/3. Therefore, a Flood Risk Assessment will be required to support proposed redevelopment.
	Mining	The site is located within an area of historical coal mining.
	Radon	Low risk. Protection measures are not required.
	UXO	Low risk.
Site history	From the time of the earliest maps available in 1878 the site is shown to comprise predominantly agricultural land. By 1918 an isolation hospital had been constructed on site with four separate buildings, access tracks and soft landscaping. The site had remained relatively unchanged until 1994 whereby the buildings on site had been replaced by the present-day layout, marked as ‘Gellinudd Hospital’.	
Areas of potential concern at desk study stage	On-site	- Made ground associated with previous site development/historical use. - Gas generation from potential underground coal mine workings.
	Off-site	Historical former surface working located between 50m to 150m of the site which may have been infilled (low risk).
Phase 2 Ground Investigation		
Ground conditions	Made ground was encountered within all exploratory holes to a maximum depth of 0.8m. The made ground was comprised of dark grey sandy gravel. Residual soil of the weathered Swansea Member was encountered beneath the made ground in all of the exploratory holes. Within the majority of the exploratory holes this was encountered as firm, becoming stiff, sandy gravelly clay. Residual soils were proven to a maximum depth of 2.4 and 2.5m and found to be underlain by grey sandstone. With the exception of made ground, no visible or olfactory evidence of significant contamination was encountered during the ground investigation.	
Groundwater	Groundwater was encountered within all the boreholes at depths between 0.80 to 3.55m. Ground gas and water monitoring is currently on-going.	
Principal Findings and Conclusions		
Human health and plant growth	All soil concentrations in topsoil and natural soils were recorded below adopted human health and phytotoxic screening criteria. However made ground is considered physically unsuitable to remain at shallow depth within areas of soft landscaping.	
Controlled waters	The risk to Controlled Waters is considered to be low.	
Gas protection	Based on the results of the monitoring visits the risk posed by ground gases is considered to be low. The site is classified as Characteristic Situation 1.	
Potable supply pipework	Upgraded water supply pipework should be utilised if installed within the made ground.	
Waste	The made ground and natural soils are classified as non-hazardous waste.	

Engineering design	The cohesive soils have shown to be of low volume change potential and as a result will be susceptible to the influence of trees. Sulphate testing of selected soil samples indicates that a suitable design mix for concrete for buried structures is likely to be DS-1 AC-1. Sandstone was encountered to a maximum depth of 30m with no evidence of either coal seams or historic mine workings. As such, the risk to the proposed development from historic mine workings is considered to be low. It is recommended that if traditional shallow strip foundations are placed at a minimum depth of 0.75m within the natural residual soils they may be designed for an allowable bearing capacity of 100kPa. In the location of the proposed buildings in the western area of the site grey sandstone was encountered at 1.0 – 1.2m depth. Should foundations be placed entirely within the grey sandstone they may be designed for a higher allowable bearing capacity of 225kPa. Soakaways are unlikely to offer a viable method of surface water drainage.	
Considerations and Recommendations for Further Work		
Considerations	Gas and groundwater monitoring is ongoing, and this report will be updated following the completion of a further four visits.	
Recommendations	Human health/ plant growth	Made ground is considered physically unsuitable to remain within areas of soft landscaping. A Remediation Strategy may be required to detail the remedial requirements following finalisation of the development layout plan.
	Engineering	- An arboricultural survey in the vicinity of proposed buildings is recommended to fully assess the risk posed by shrink and heave in underlying cohesive soils. - The gradational boundary between residual soil and bedrock may be difficult to determine by the groundworker in practice. As such, should any uncertainty remain, foundation excavations should be inspected by a qualified engineering geologist prior to pouring concrete.
	General	- A Flood Risk Assessment will be required in support of redevelopment of the site. - Consult the statutory water provider regarding suitable water supply pipework requirements. - Provide the relevant regulatory authorities with a copy of this report to confirm that they are in agreement with the report findings. - Remain vigilant for visible and olfactory signs of contamination associated with made ground post demolition of the existing buildings. - On-site monitoring wells should be protected from damage until such time as gas and groundwater monitoring has been completed and conclusions/recommendations within this report are agreed with the regulators. Monitoring installations should then be decommissioned in accordance with NRW guidelines.

CONTENTS

1	INTRODUCTION	1
1.1	CONTRACT DETAILS	1
1.2	PROPOSED DEVELOPMENT	1
1.3	PREVIOUS REPORTS	1
1.4	OBJECTIVES	1
1.5	SCOPE OF WORKS	1
1.6	REPORT LIMITATIONS	2
2	SITE INFORMATION	3
2.1	SITE LOCATION	3
2.2	SITE DESCRIPTION	3
2.3	ENVIRONMENTAL SETTING	4
3	PRELIMINARY CONCEPTUAL SITE MODEL.....	5
3.1	BACKGROUND	5
3.2	POTENTIAL CONTAMINATION SOURCES	5
3.3	EXPOSURE PATHWAYS	5
3.4	POTENTIAL RECEPTORS	5
3.5	PRELIMINARY QUALITATIVE RISK ASSESSMENT	6
3.6	SUMMARY OF GEOHAZARDS	9
4	SCOPE OF WORK.....	10
4.1	SUMMARY OF FIELDWORK	10
4.2	ENVIRONMENTAL MONITORING	10
4.3	TOPOGRAPHICAL SURVEY	10
4.4	SOIL SAMPLING	10
5	SUMMARY OF GROUND CONDITIONS	11
5.1	ENCOUNTERED STRATA	11
5.2	EVIDENCE OF CONTAMINATION	12
5.3	BELOW GROUND STRUCTURES AND OBSTRUCTIONS	12
5.4	GROUNDWATER	12
6	SUMMARY OF LABORATORY ANALYSES.....	13
6.1	GEOTECHNICAL TESTING	13
6.2	CHEMICAL TESTING	13
7	HUMAN HEALTH AND PHYTOTOXIC RISK ASSESSMENT.....	14
7.1	INTRODUCTION	14
7.2	DETERMINATION OF AVERAGING AREAS/ZONES	14
7.3	HUMAN HEALTH SCREENING ASSESSMENT	14
7.4	PHYTOTOXIC SCREENING ASSESSMENT	14
7.5	DISCUSSION	15
8	CONTROLLED WATERS RISK ASSESSMENT	16
8.1	OVERVIEW OF HYDROGEOLOGICAL SETTING	16
8.2	RISK EVALUATION	16
9	GAS/VAPOUR RISK ASSESSMENT	17
9.1	OVERVIEW OF CONCEPTUAL MODEL	17
9.2	GROUND GAS/VAPOUR MONITORING RESULTS	17
9.3	GAS SCREENING VALUES	17
9.4	DISCUSSION AND RISK EVALUATION	19
10	POTABLE SUPPLY PIPEWORK RISK ASSESSMENT	20
11	REFINED CONCEPTUAL SITE MODEL.....	21

11.1	OVERVIEW	21
11.2	SOURCES	21
11.3	RISK EVALUATION	21
12	PRELIMINARY WASTE ASSESSMENT	24
12.1	WASTE HIERARCHY	24
12.2	ON-SITE RE-USE OF MATERIALS	24
12.3	WASTE DISPOSAL TO LANDFILL	24
12.4	RECOMMENDATIONS	25
13	COMMENTS ON ENGINEERING DESIGN	27
13.1	GENERAL	27
13.2	SUMMARY OF GEOTECHNICAL PARAMETERS	27
13.3	CONSTRUCTION CONSIDERATIONS	28
13.4	MINING	29
13.5	PRELIMINARY FOUNDATION RECOMMENDATIONS	30
13.6	DRAINAGE	31
14	CONSIDERATIONS AND RECOMMENDATIONS	32
14.1	CONSIDERATIONS	ERROR! BOOKMARK NOT DEFINED.
14.2	RECOMMENDATIONS FOR FURTHER WORK	32

APPENDICES

A	DRAWINGS
B	PHOTOGRAPHS
C	EXPLORATORY LOGS
D	GEOTECHNICAL RESULTS
E	CHEMICAL RESULTS AND SCREENING ASSESSMENT
F	GAS MONITORING RECORDS
G	HAZWASTE REPORT
H	INFILTRATION RESULTS

1 INTRODUCTION

1.1 Contract Details

Following instruction from Rhodos Properties (No 14) Ltd (the 'client'), this report presents the results of a Ground Investigation undertaken for a proposed residential development at Gellinudd Care Home, near Pontadawe (the 'Site').

1.2 Proposed Development

Information presented to T&P Regeneration Ltd (T&P) indicates that the proposed development is intended to comprise the construction of 2N° single storey buildings split into four residential units with associated areas of communal soft landscaping with hard landscaped access and parking. A development layout plan is included in Appendix A although it is understood this may be subject to change following completion of master planning.

1.3 Previous Reports

A Desk Study and Coal Mining Risk Assessment was previously completed for the site by a third party¹. Pertinent information from this report has been considered within this assessment and is summarised where relevant. Where possible, copies of this report should be made available to the reader.

1.4 Objectives

The purpose of the assessment is to establish the environmental and geotechnical conditions of the site to support a future development. This report also considers the likely foundation options appropriate to the proposed development, along with requirements for any related ground improvement works and/or remediation considered necessary to mitigate potentially unacceptable risks resulting from current and/or or historical land uses.

1.5 Scope of Works

The scope of works to fulfil the purpose of the assessment has included the following:

- Review of third party desk study and coal mining report.
- Site walkover;
- Review of site-specific environmental database information, where available, and publicly available information;
- Development of a preliminary site conceptual model and environmental risk assessment based on previous desk study information;
- Intrusive ground investigation comprising trial pitting and open-hole rotary drilling;
- Collection of soil samples for chemical and geotechnical laboratory analysis;
- Groundwater and ground gas monitoring visits;
- Assessment of chemical and geotechnical test results;
- Refinement of conceptual site model and update to environmental risk assessment; and,
- Presentation of geotechnical information to assist with foundation design.

¹ Phase 1 Desk Study & Coal Mining Risk Assessment Report: Proposed Residential Development, Lon Catwg, Gellinudd, Pontardawe, Rhos, Swansea. Terra Firma. February 2024.

1.6 Report Limitations

The recommendations, interpretations and conclusions of this report are based on the historical and current site conditions reported by database and mapping sources as supplemented with information gathered during on-site visits. No responsibility can be accepted for the accuracy of third-party information including reference data contained within site specific database reports. Due to the inherent variability of ground conditions between exploratory hole positions, these conditions can only be interpreted and are accurate only for the date of the investigation works.

2 SITE INFORMATION

2.1 Site Location

Site location information is summarised in Table 2.1. A Site Location Plan is presented within Appendix A.

Table 2.1 Site Location Information

Information	Description
Full postal address	Lon Catwg, Gellinudd, Pontardawe, Rhos, Swansea. SA8 3DX.
National Grid Reference (NGR)	273640, 204320

2.2 Site Description

A site walkover was undertaken by T&P on 21st May 2024. A summary of pertinent site information gathered during the survey is provided in Table 2.2. A selection of photographs is provided within Appendix B.

Table 2.2 Summary of Site Information

Information	Description	
Site access	The site is accessed via a double vehicular gate located off the adjacent Lon Catwg Road, which runs parallel to the southern boundary.	
Site description including current site use and dimensions/area (ha)	The site is an irregularly shaped parcel of land occupied by the now vacant Gellinudd Hospital along with associated car park and soft landscaping. The site measures approximately 77m north to south at its longest point and 42m east to west at its widest, covering 0.21ha.	
Site elevation and topography	The site elevation ranges between 103 and 105 metres Above Ordnance Datum (mAOD) and is generally level with a gentle slope (1-2°) down towards the south.	
Ground cover (%)	The site ground cover comprises: - Soft landscaping (grass/planting) - 35% - Hard landscaping (tarmacadam/concrete) - 45% - Buildings - 20%	
Site boundaries	North	The site boundary is marked by a 1.8m wire mesh fencing to northwest and mature hedgerow and trees to the northeast.
	South	1.5m stone brick wall with an overgrown hedgerow.
	East	
	West	The western boundary comprises the vacant buildings of the Gellinudd Hospital.
Surrounding land uses	North	A woodland area is present adjacent to the northern site boundary with residential housing beyond.
	South	The site is bounded by Lon Catwg Road to the south and residential housing to the south and east.
	East	
	West	The land to the west of the site comprises a forested area.

2.3 Environmental Setting

Pertinent environmental information within the available third-party Desk Study report has been reviewed and is summarised in Table 2.3.

Table 2.3 Summary of Site Setting from Desk Study Information

Information	Description
Site history	From the time of the earliest maps available in 1878 the site is shown to comprise predominantly agricultural land, with a footpath crossing the north-western boundary and woodland to the immediate west. The wider surrounding area comprises mostly agricultural land, with the village of Gellinudd to the east. A stream is shown to the west which branches to flow north and south of the site, crossing the south-eastern boundary. By 1918 an isolation hospital had been constructed on site with four separate buildings, access tracks and soft landscaping. The stream crossing the southeast of the site is now culverted. An 'old quarry' is marked approximately 50m to the south and a quarry excavation shown 150m northeast. By 1965, both quarries are no longer identified and assumed to be infilled. An additional quarry is shown approximately 200m south-east of the site in 1942 which is listed as a disused tip by 1974 and as Cwmnathllych Farm by 1978. The site had remained relatively unchanged until 1994 whereby the buildings on site had been replaced by the present-day layout, marked as 'Gellinudd Hospital'. Phases of residential development in the wider surrounding area have encompassed the east, north and south of the site with the culvert extended beneath them.
Geology	The site is indicated to be underlain by the South Wales Coal Measures Formation. Superficial deposits are not indicated to be present, but nearby Glacial Till is recorded.
Mining and geotechnical hazards	A number of mining related entries have been recorded near to the site, the closest being Gelli-Geiros opencast sandstone mine, 55m to the south. Underground coal mining at Ty'N-y-Graig was recorded 231m to the southwest, as a result a Coal Authority Consultants Coal Mining Report was obtained within the previous Desk Study to assess the risk posed to the site from historical coal mining. The Coal Authority Report had no record of past underground mining or recorded spine roadways at shallow depth. Furthermore, the report concluded there are no probable unrecorded shallow workings beneath the site. However, the report also stated an unnamed coal seam outcrop is present within the site boundary, in addition, the Swansea No.3 is outcropping 25m west of site in a north-south direction. The Swansea No.3 seam is shown to outcrop along strike up to 250m north of site.
Hydrology and hydrogeology	The underlying bedrock geology is classified as a Secondary A Aquifer. The site is not located within a groundwater Source Protection Zone. There are no licensed surface water or groundwater abstractions within 500m of the site. The nearest surface water feature is located on site and comprises a small stream, now culverted, which crosses the southeastern corner and drains eventually into the river Tawe some 300m west. The topography of the site slopes down towards to the south. Surface water is likely to drain in this direction.
Environmental designations	There is ancient woodland located 210m to the southwest. No other environmentally sensitive areas are located within 250m of the site.
Radon	No radon protection measures are required.
Background soil geochemistry	The site is not located within an area of naturally elevated metalliferous elements.
Flood risk	The majority of the site is located in a Flood Risk Zone 1, however part of the southern boundary is located within a Flood Risk Zone 2/3. Therefore, a Flood Risk Assessment will be required to support redevelopment.
UXO	The site is located in a low UXO risk area.
Areas of Potential Concern	- On-site made ground associated with previous site development/ past site use. - On-site potential coal mine workings. - Off-site infilled surface workings.

3 PRELIMINARY CONCEPTUAL SITE MODEL

3.1 Background

A risk assessment has been carried out under the governing terms set by Part 2A of the Environmental Protection Act 1990, statutory guidance entitled 'Contaminated Land Statutory Guidance (April 2012)' and in accordance with UK's risk assessment framework².

The conceptual site model for the site has been developed with consideration of national guidance³ which provides a framework for risk estimation and evaluation of plausible source-pathway-receptor linkages identified in the context of a proposed residential development.

3.2 Potential Contamination Sources

Potential on- and off-site sources of contamination have been identified in consideration of the review of previous reports as summarised in Section 2, in the context of on- and off-site current/historical activities. Potential contaminant sources identified within a 250m radius of the site are detailed in Table 3.1 and are presented in the APC plan in Appendix A.

Based upon the identified sources, the following potential contaminants have been identified:

- Metals.
- Hydrocarbons.
- Asbestos.
- Ground gases and vapours.
- Very low potential for organic wastes/pathogens from unrecorded burials associated with the sites past use as an isolation hospital.

3.3 Exposure Pathways

With consideration of the site setting and proposed development, potentially active exposure pathways are included in Table 3.1. The following pathways have been discounted from further consideration:

- Oral ingestion including vegetable uptake – No private residential gardens or allotment areas are proposed.

3.4 Potential Receptors

Identified receptors pertinent to the current site setting and future proposed development are included in Table 3.1. The following receptors have been discounted from further consideration:

- Construction workers – it is considered that risks during the construction works will be managed appropriately to mitigate short term risks through measures such as use of Personal Protective Equipment (PPE), hygiene practices and other on-site controls as outlined in their Construction Phase Health and Safety Plan and method statements/risk assessments.
- Current site users – in the context of the proposed development for the site, future residents represent a more sensitive receptor than current site users, and as such, consideration of potential risks to future residents will be suitably protective of current site users. As such, current site users will not be considered separately within have been identified.

² Land contamination risk management - <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>.

³ Annex 4 - Guidance for the Safe Development of Housing on land Affected by Contamination R&D66. NHBC. 2008.

3.5 Preliminary Qualitative Risk Assessment

Table 3.1 highlights the source-pathway-receptor relationships or “contaminant linkages” that may potentially be active in consideration of both the site’s current use and proposed future use. Those contaminant linkages assessed as low or very low risk at this stage will not be considered further.

Table 3.1 Summary of Source-Pathway-Receptor Relationships

APC N°	Source	Pathway (s)	Receptor	Consequence	Probability	Risk*	Comment
1	<u>On-site</u> Made ground associated with previous development/ historical site use and rerouting of stream.	Oral ingestion	Future residents and maintenance workers	Medium	Low likelihood	Moderate/Low	-
		Dermal contact	Future residents and maintenance workers	Medium	Low likelihood	Moderate/Low	-
		Dust migration/inhalation	Future residents, maintenance workers and off-site residents/workers	Medium	Low likelihood	Moderate/Low	-
		Gas / vapour inhalation/explosion	Future residents and maintenance workers	Medium	Low likelihood	Moderate/Low	-
		Permeation into drinking water supplies	Future residents	Medium	Low likelihood	Moderate/Low	-
		Leaching/dissolution with vertical migration to groundwater	Groundwater	Medium	Low likelihood	Moderate/Low	-
		Leaching/dissolution with vertical migration to groundwater, and lateral migration in groundwater	Surface water	Medium	Low likelihood	Moderate/Low	-
		Overland flow	Surface water	Medium	Low likelihood	Moderate/Low	-
		Migration via existing service trenches	Groundwater/surface water	Medium	Low likelihood	Moderate/Low	-
		Leaching/dissolution with vertical migration to groundwater, lateral migration in groundwater and subsequent volatilisation	Future residents, maintenance workers and off-site residents/workers	Medium	Low likelihood	Moderate/Low	-
		Uptake via root system	On-site flora	Medium	Low likelihood	Moderate/Low	-

APC N°	Source	Pathway (s)	Receptor	Consequence	Probability	Risk*	Comment
2	<u>On-site</u> Gas generation from potential underground coal mine workings.	Gas inhalation	Future residents and maintenance workers	Medium	Low likelihood	Moderate/Low	-
3	<u>Off-site</u> Potentially infilled former surface workings located 50m south and 200m south-east.	Lateral dust migration	Future residents	Medium	Unlikely	Low	Ground cover likely to limit potential for dust generation.
		Lateral gas/vapour migration and inhalation	Future residents	Medium	Unlikely	Low	Given the localised nature of the workings, distance from site and age since infilling, it is unlikely a plausible pathway exists.
		Leaching/dissolution with vertical migration to groundwater, lateral migration in groundwater with subsequent volatilisation and inhalation	Future residents and maintenance workers	Medium	Unlikely	Low	
		Leaching/dissolution with vertical migration to groundwater, lateral migration in groundwater with subsequent vegetable uptake/direct contact	Future residents	Medium	Unlikely	Low	
		Leaching/dissolution with vertical migration to groundwater, lateral migration in groundwater with permeation into drinking water supplies	Future residents	Medium	Unlikely	Low	

**Where multiple receptors exist the risk classification is based on most sensitive receptor for conservatism.*

3.6 Summary of Geohazards

Based on information presented within Section 2 and the anticipated geology beneath the site, the following geohazards have been identified which require further consideration:

- Potential for shrink-swell behaviour of residual clay soil of the weathered South Wales Coal Measures;
- Presence of mature trees and hedgerows along the northeastern boundary of the site;
- Possible made ground of unknown composition which is unlikely to be a suitable founding stratum for new buildings/structures;
- Attack of buried concrete by aggressive ground conditions (sulphate rich soils); and,
- Potential for shallow historical coal mining.

4 SCOPE OF WORK

4.1 Summary of Fieldwork

An intrusive ground investigation was undertaken on 21st and 22nd May 2024 and is summarised in Table 4.1.

Table 4.1 Summary of Exploratory Locations

Hole ID	Exploratory Location Type	Investigation Method	Depth (mbgl)		Comment
			Min	Max	
TP01 – TP03	Trial Pit	Wheeled JCB-3CX backhoe excavator	1.70	2.50	Infiltration testing undertaken within all trial pits.
BH01 – BH03	Borehole	Open-hole drilling	25.00	30.00	Investigation of the potential for shallow mine workings.

All holes were logged in accordance with BS5930⁴.

An exploratory hole location plan is presented within Appendix A and the exploratory hole logs are presented as Appendix C.

Due to the presence of hardstanding across the development area trial pits were carried out in areas of soft landscaping in the east of the site. One borehole was positioned beneath each of the proposed buildings with an additional hole placed in the eastern area of the site.

4.2 Environmental Monitoring

Monitoring wells were installed to assess ground gases from potential on-/off-site sources. Measurements of ground gases have been recorded on 2N^o monitoring visits to date which were completed at weekly intervals. An additional 2N^o monitoring visits will be undertaken following issue of this report, the results of which will be presented in an updated version.

Full details of monitoring installations are provided on exploratory logs included in Appendix C. Discussion on ground gas monitoring results is provided in later sections of this report.

4.3 Topographical Survey

Location and level data was recorded for exploratory locations and is presented on the survey drawing (provided electronically only). Coordinates and level information is provided on the exploratory hole logs in Appendix C.

4.4 Soil Sampling

Representative soil samples were collected for geotechnical and environmental analysis at appropriate intervals during the investigation, in line with the client's supervising engineer's instruction, and in general accordance with requirements of BS5930, BS18400 and other UK standards as relevant.

⁴ BS 5930:2015+A1:2020. Code of Practice for Ground Investigations. 2020.

5 SUMMARY OF GROUND CONDITIONS

5.1 Encountered Strata

The geological sequence encountered during the ground investigation is summarised in Table 5.1 and described further in the following sub-sections. Ground conditions were found to broadly correspond with published geological information. Exploratory logs are included in Appendix C.

Table 5.1 Summary of Ground Conditions

Stratum	Top depth range (mbgl)	Base depth range (mbgl)	Exploratory holes	Area of site	General description/ comments
Made ground	0.00	0.20	TP03	East	Reworked Topsoil: Dark brown sandy gravelly CLAY.
	0.00	0.05 – 0.10	BH01 – BH03, TP01 & TP02	General	Tarmacadam
	0.05 – 0.10	0.40 – 0.80	All holes	General	Dark grey sandy GRAVEL with anthropogenic inclusions
Swansea Member	0.40 – 0.60	1.00 – 2.50	All holes	General	Firm becoming stiff sandy gravelly CLAY
	0.60 – 1.40	1.50 – 2.40	TP01 & TP02	General	Orangish brown clayey gravelly SAND/sandy GRAVEL.
	1.00 – 2.40	>30m base not proven	BH01 – BH03, TP01 & TP02	East	Grey SANDSTONE

5.1.1 Made ground

A reworked topsoil was only encountered in one location, TP03, located in an area of soft landscaping in the eastern area of the site.

Beneath the hardstanding (or topsoil in TP03) made ground was encountered within all exploratory holes to a maximum depth of 0.8m. The made ground was comprised of dark grey sandy gravel. The gravel included anthropogenic material including concrete, asphalt, brick and timber along with limestone.

5.1.2 Bedrock Geology – Swansea Member

Residual soil of the weathered Swansea Member (part of the South Wales Coal Measures) was encountered beneath the made ground in all of the exploratory holes. Within the majority of the exploratory holes this was encountered as firm, becoming stiff, sandy gravelly clay. Directly beneath the made ground in TP01 and beneath the clay in TP02, the weathered Swansea Member was encountered as a clayey granular soil.

Residual soils were proven to a maximum depth of 2.4 and 2.5m within TP02 and TP03 with the angular nature of the granular clasts indicating that the material is derived from the parent rock unit and is not a fluvial deposit. Nevertheless, small streams are present to both the north and the south of the site and, as such, the possibility of unrecorded fluvial material cannot be entirely discounted.

Grey sandstone (Driller's Description) bedrock of the Swansea Member was encountered beneath the residual soil and proven to a maximum depth of 30m. It is important to note, no coal seams, voids or other evidence of historic mine workings were encountered.

5.2 Evidence of Contamination

With the exception of the made ground encountered across the site, no significant visible or olfactory evidence of any contamination was noted during the ground investigation.

5.3 Below Ground Structures and Obstructions

No below ground structures or obstructions were encountered during the ground investigation.

5.4 Groundwater

Groundwater was encountered within all the boreholes at depths between 0.80 to 3.55m.

Groundwater levels were recorded during 2N° subsequent monitoring visits (to date). Recorded groundwater elevation data is summarised in Table 5.2. This report will be updated following completion of the monitoring programme.

Table 5.2 Summary of Groundwater Elevation Data

Monitoring Well ID	Screened Geological Unit	02/06/24		15/06/24	
		mAOD*	mbgl	mAOD*	mbgl
BH01	Swansea Member	98.00	3.50	99.52	1.98
BH02	Swansea Member	98.86	2.50	99.05	2.31
BH03	Swansea Member	97.87	3.83	97.70	4.00

6 SUMMARY OF LABORATORY ANALYSES

6.1 Geotechnical Testing

The geotechnical testing deemed necessary to adequately characterise the site from a geotechnical perspective in the context of the proposed development is summarised in Table 6.1.

Samples from the investigation were forwarded to a UKAS accredited laboratory. Complete results are provided in Appendix D.

Table 6.1 Summary of Geotechnical Testing

Test	Notes	Quantity
Moisture content	-	3 soils
Atterberg limits	-	3 soils
Geochemical analysis BRE SD1 Suite	pH, sulphur, chloride, nitrate, 2:1 water soluble sulphate, magnesium, total sulphate	4 soils

6.2 Chemical Testing

The soil testing deemed necessary to characterise the site from a contamination perspective in the context of the conceptual site model and proposed development is summarised in Table 6.2.

Samples from the investigation were forwarded to a UKAS and MCERTS accredited laboratory. Complete chemical results are provided in Appendix E.

Table 6.2 Summary of Chemical Testing

Test type	Notes	Quantity
<i>Soils</i>		
Arsenic, Boron, Beryllium, Cadmium, Chromium, Lead, Mercury, Nickel, Copper, Zinc, Selenium, Vanadium, Phenols and US EPA 16 Polycyclic Aromatic Hydrocarbons.	-	5 soils
Asbestos screening/ID	-	2 soils

7 HUMAN HEALTH AND PHYTOTOXIC RISK ASSESSMENT

7.1 Introduction

A human health generic quantitative risk assessment (GQRA) has been undertaken in accordance with the UK regulatory framework and current guidance on assessment of risks presented by land affected by contamination⁵.

When considering phytotoxic risks, contaminants selected are those listed within Annex 3 of 'Guidance for the Safe Development of Housing on Land Affected by Contamination. R&D66: 2008 Volume 2' as being 'phytotoxic'.

Where available, assessment values have been chosen based on the criteria within (in priority order) SGV Documents, ICRCL 59/83 phytotoxic threshold levels, Dutch RIVM Serious Risk Concentrations (SRC) for ecological receptors (amended for a UK soil of 10% clay and 2% soil organic matter) and US EPA Soil Screening Levels for plants.

7.2 Determination of Averaging Areas/Zones

For the purposes of investigation and assessment a site can be divided into zones based on historical uses or proposed end use. These zones can be further divided into averaging areas, which can be used to assess different soil types or different potential exposure pathways etc. for the purposes of risk evaluation. Each averaging area can be considered independently for human health exposure assessment.

Based upon the proposed end use of the site and the findings of the ground investigation it is proposed that a single zone with two averaging areas is appropriate for the site as follows:

- Site wide – natural soils.
- Site wide – reworked topsoil/made ground.

7.3 Human Health Screening Assessment

For each zone/averaging area, the analytical data has been evaluated directly against adopted screening levels⁶ for a 'public open space – residential (POSresi) end use. A copy of the screening assessment is included in Appendix E.

All contaminant concentrations were found to be below the adopted screening level. Asbestos was not identified within the made ground samples analysed.

7.4 Phytotoxic Screening Assessment

All contaminant concentrations were found to be below adopted phytotoxic screening levels. A copy of the screening assessment is included in Appendix E.

⁵ Environmental Protection Act 1990.

Contaminated Land Statutory Guidance (April 2012).

Land contamination risk management - <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>.

⁶ The LQM/CIEH S4ULs for Human Health Risk Assessment. 2015.

SP1010 – Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination. CL:AIRE. 2013.

7.5 Discussion

All tested contaminants in the made ground, topsoil and natural soils were found to be below the adopted human health and phytotoxic screening levels.

However, made ground was found to include numerous anthropogenic materials such as concrete, brick, plastic and asphalt and therefore unlikely to provide a favourable growth medium for future planting. As such, a suitable thickness of topsoil (anticipated to be in the order of 300mm) should be provided as a growth medium in areas of proposed planting in accordance with recommendations from a specialist landscaping consultant.

A Remedial Strategy should be produced to detail the final requirements as necessary once the development layout and landscaping plans are finalised.

8 CONTROLLED WATERS RISK ASSESSMENT

8.1 Overview of Hydrogeological Setting

The underlying South Wales Coal Measures Formation is designated as a Secondary A Aquifer. The site is not recorded to lie within an SPZ and nor are there any licensed abstraction recorded within a 500m radius.

The nearest surface water feature located on site comprises a small stream, which is culverted beneath its southeastern corner and drains into the river Tawe some 300m west.

Groundwater flow is interpreted to be towards the south with consideration of topography and local surface water features.

It is considered possible that groundwater within the underlying Secondary A aquifer may be in hydraulic connectivity with nearby surface water features.

On the basis of the above, the sensitive Controlled Waters receptors relating to the site are considered to be:

- Groundwater in South Wales Coal Measures Formation; and,
- Unnamed culverted stream on site.

8.2 Risk Evaluation

The ground investigation identified site wide made ground typically comprising a dark grey sandy gravel, with gravel of limestone, concrete asphalt and brick to a maximum thickness of 0.80mbgl.

Although made ground was encountered within each hole, no significant visual or olfactory evidence of gross contamination was observed.

As such, while a contaminant migration pathway may be present between the made ground and underlying groundwater/surface water, the risk to controlled waters is considered to be acceptably low owing to the lack of identified contamination or an observed significant vertical leaching pathway. In addition, it is considered likely that much of the made ground will be covered by buildings/hardstanding which will limit infiltration and further decrease the likelihood of leaching.

No further work is considered to be required, although a watching brief for unexpected contamination should be maintained during demolition and groundworks construction phases.

9 GAS/VAPOUR RISK ASSESSMENT

9.1 Overview of Conceptual Model

Through the development of the preliminary conceptual model, the following potential sources of ground gas/vapour have been identified:

- Made ground associated with former on-site development.
- Gas generation from potential underground coal mine workings.

The ground investigation identified made ground which was comprised slightly sandy gravel with occasional brick and concrete. No significant organic or putrescible material was encountered. In consideration of the ground investigation findings, no additional potential sources of ground gas have been identified on-site.

9.2 Ground Gas/Vapour Monitoring Results

Six ground gas monitoring visits will be undertaken over a three-month period between June and August 2024, utilising wells installed within BH01-BH03, the results of the visits are summarised in Table 9.1. The full monitoring results are included in Appendix F.

9.3 Gas Screening Values

Guideline gas screening values (GSV) for methane and carbon dioxide concentrations recorded at the site can be considered in accordance with CIRIA 665⁷, BS8485⁸ and NHBC guidance⁹ using the following equation:

$$Q_{hg} = (C_{hg}/100) \times q$$

Where:

- 'Q_{hg}' is the hazardous gas flow rate.
- 'C_{hg}' is the gas concentration measured as a percentage.
- 'q' is the peak flow rate.

This calculation is undertaken separately for both carbon dioxide and methane.

On the basis of the above, the maximum Q_{hg}, has been adopted as the GSV for each gas as detailed within Table 9.1. For conservatism, where no gas flow was detected the gas detector limit of 0.1l/hr has been employed in the calculation.

⁷ Assessing risks posed by hazardous ground gases for buildings. CIRIA C665. 2007.

⁸ Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings. BS8485:2015+A1:2019

⁹ Hazardous ground gas – an essential guide for housebuilders. NHBC. April 2023.

Table 9.1 Summary of Gas Monitoring Results

Date	Atmospheric Pressure (mB) and Preceding 24hr Trend	Maximum Gas Flow Rate ¹ (l/h)		Peak Concentration ² (% by vol)		Minimum Concentration ² (% by vol)	Peak Concentration (ppm)			Comments
		Steady	Peak	Methane	Carbon Dioxide	Oxygen	Carbon Monoxide ³	Hydrogen Sulphide ³	VOC ⁴	
General Site (BH01 – BH03)										
02/06/2024	1016 (steady)	<0.1	<0.1	0.1	0.5	18.1	2	<1	1.4	-
15/06/2024	987 (rising)	<0.1	<0.1	0.1	4.1	13.6	1	<1	0.7	-
30/06/2024	1003	0.2	0.2	1.0	2.7	16.0	1	1	1.3	-
14/07/2024	998 (steady)	<0.1	<0.1	0.2	1.9	17.7	1	1	-	BH02 was inaccessible during the visit.
27/07/2024	1001 (falling)	<0.1	<0.1	0.4	3.2	12.6	1	<1	0.2	-
11/08/2024	1004 (falling)	<0.1	<0.1	0.3	4.5	13.1	1	1	1.4	-
Maximum (unless stated)		<0.1	<0.1	0.4	4.5	12.6 (minimum)	2	1	1.4	-
GSV		n/a	n/a	0.002	0.009	n/a	n/a	n/a	n/a	-
¹ Instrument detection level – 0.1l/h										
² Instrument detection level – 0.1%										
³ Instrument detection level – 1ppm										
⁴ Instrument detection level – 0.1ppm										

9.4 Discussion and Risk Evaluation

In consideration of the site conceptual model, made ground associated with former on-site development and potential underground coal mine workings were identified as potential on-site sources of ground gas.

During the ground investigation made ground was encountered to a maximum depth of 0.50mbgl, which was found to comprise slightly sandy gravel with occasional brick and concrete. No significant organic or putrescible material was encountered. No evidence of underground coal mine workings was encountered within the 30m boreholes. No other potential sources of ground gas were identified during the investigation.

During the 6N^o monitoring visits flow rates within the wells were consistently recorded below the limit of detection, with the exception of a flow rate of 0.2 l/hr recorded within BH01 during visit 3. Carbon dioxide concentrations were recorded to range from <0.1 to 4.5 (%v/v). Methane concentrations were recorded to range from <0.1 to 1.0 (%v/v) with the maximum peak concentration of 1.0 (%v/v) noted to have fallen to a steady concentration of <0.1 (%v/v) within 4 minutes. Additionally, the maximum methane concentration of 1.0 (%v/v), which was recorded within BH02 on the third visit, was recorded to have dropped to a peak concentration of 0.2 (%v/v) by visit 6, within the same borehole.

Based upon the calculated GSVs and gas concentrations recorded, and in accordance with current British Standards, CIRIA and NHBC Guidance, Characteristic Situation 1 (CS1) is considered suitable for the site. In consideration of the above results and the site conceptual model, it is considered that ground gases present a low risk to future residents. As such, no ground gas protection measures are required in future development.

In addition, the site is in a low-risk radon area. Therefore, radon protection measures are not considered necessary for any new development.

10 POTABLE SUPPLY PIPEWORK RISK ASSESSMENT

Water industry guidance¹⁰ states that only organic contaminants pose a potential risk to plastic pipe materials. The UKWIR report provides threshold values for polyethylene (PE) and polyvinyl chloride (PVC) pipes for the organic contaminants of concern. The results are summarised in Table 10.1 with exceedances highlighted in **bold**.

Table 10.1 Summary of Soil Screening Against UKWIR Criteria

Determinant	Pipe material Generic Assessment Criteria (mg/kg)		Min (mg/kg)	Max (mg/kg)
	PE	PVC		
Extended VOC suite ²	0.5	0.125	3.5	0.4
BTEX + MTBE ¹	0.1	0.03	-	-
SVOCs TIC by purge and trap or head space and GC-MS with TIC (aliphatic and aromatic C ₅ -C ₁₀) ¹	2	1.4	-	-
Phenols ¹	2	0.4	<1	<1
Cresols and chlorinated phenols ^{1 3}	2	0.04	-	-
Mineral oil C ₁₁ -C ₂₀ ¹	10	Suitable	-	-
Mineral oil C ₂₁ – C ₄₀ ¹	500	Suitable	-	-
Corrosive (conductivity, redox and pH) ¹	Suitable	Suitable	-	-

1. Determinant not tested.

2. Based upon recorded BaP concentrations.

3. Total Monohydric Phenols – Limit of Detection (LOD) is 5.0mg/kg. All speciated phenols are below LOD of 1.0mg/kg.

Given no visual or olfactory evidence of hydrocarbon or solvent based contamination was encountered on-site during the ground investigation, most of the determinants of concern in relation to water supply pipework were not tested.

Soil concentrations of benzo(a)pyrene (BaP) have been found to be endemically elevated across the site within made ground. As such, upgraded water supply pipework should be utilised if installed within the made ground.

¹⁰ Guidance for the selection of water supply pipes to be used in brownfield sites (UK Water Industry Research Limited (UKWIR) - Ref: 10/WM/03/21) - 2010

11 REFINED CONCEPTUAL SITE MODEL

11.1 Overview

Following completion of the ground investigation, collection and interrogation of site data with consideration of the outcome of generic quantitative risk assessment discussed in preceding sections of this report, the conceptual site model has been revised.

11.2 Sources

Further to completion of the ground investigation, the sources identified within the preliminary conceptual model to require further consideration include:

- On-site made ground associated with existing previous development/ historical site use and rerouting of stream.

No further potential sources of impact were identified during the subsequent ground investigation works.

Further to completion of ground investigation, the following source identified within the preliminary conceptual model were found to be absent on-site and have therefore been discounted from further consideration:

- Potential underground coal mine workings. No coal was encountered within the logs.

11.3 Risk Evaluation

Those SPRs identified within Section 3.1 as presenting a moderate/low or moderate risk have been further interrogated in accordance with UK national guidance and regulatory framework¹¹ following completion of ground investigation and risk assessment. Table 11.1 presents the revised SPRs with associated classification of risk as appropriate following re-evaluation of risks.

¹¹ Annex 4 - Guidance for the Safe Development of Housing on land Affected by Contamination R&D66: 2008.
Land contamination risk management - <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>.

Table 11.1 Revised Source-Pathway-Receptor Relationships

APC N°	Source	Pathway (s)	Receptor	Consequence	Probability	Risk*	Comment
1	<u>On-site</u> Made ground associated with previous development/historical site use and rerouting of stream.	Oral ingestion	Future residents and maintenance workers	Medium	Unlikely	Low	No significant visual or olfactory evidence of contamination observed. All COPC were found to be below adopted screening levels.
		Dermal contact	Future residents and maintenance workers	Medium	Unlikely	Low	
		Dust migration/inhalation	Future residents, maintenance workers and off-site residents/workers	Medium	Unlikely	Low	
		Gas / vapour inhalation/explosion	Future residents and maintenance workers	Medium	Unlikely	Low	Characteristic Situation 1.
		Permeation into drinking water supplies	Future residents	Medium	Low likelihood	Moderate/Low	Upgraded water supply pipework will be required.
		Leaching/dissolution with vertical migration to groundwater	Groundwater	Medium	Unlikely	Low	No significant visual or olfactory evidence of contamination observed. Lack of vertical leaching pathway observed.
		Leaching/dissolution with vertical migration to groundwater, and lateral migration in groundwater	Surface water	Medium	Unlikely	Low	
		Overland flow	Surface water	Medium	Unlikely	Low	
		Migration via existing service trenches	Groundwater/surface water	Medium	Unlikely	Low	
		Leaching/dissolution with vertical migration to groundwater, lateral migration in groundwater and subsequent volatilisation	Future residents, maintenance workers and off-site residents/workers	Medium	Unlikely	Low	All COPC were found to be below adopted screening levels.
		Uptake via root system	On-site flora	Medium	Unlikely	Low	

APC N°	Source	Pathway (s)	Receptor	Consequence	Probability	Risk*	Comment
2	<u>On-site</u> Gas generation from potential underground coal mine workings.	Gas inhalation	Future residents and maintenance workers	Medium	Unlikely	Low	No evidence of mine workings encountered within 30m boreholes.

**Where multiple receptors exist the risk classification is based on most sensitive receptor for conservatism.*

12 PRELIMINARY WASTE ASSESSMENT

12.1 Waste Hierarchy

In line with the requirements of the Waste Framework Directive, the principles of the “waste hierarchy” should be applied to management options for on-site generated wastes, giving priority to the prevention of waste in the first instance, before considering re-use, recycling, recovery and lastly disposal. Principal considerations are set out in subsequent sections, although it is recommended that advice of a geo-environmental/waste specialists is sought at an early stage in the development process to ensure opportunities for minimisation of waste volumes are maximised.

12.2 On-site Re-Use of Materials

It may be possible to demonstrate through application of the CL: AIRE Definition of Waste Code of Practice (DoW CoP) that site won excavated soils are not classified as waste, and in doing so, permit this material to be re-used as part of proposed site redevelopment works. The DoW CoP may also apply to source segregated material arising from demolition activities. In determining the suitability of this approach, early consideration should be given to being able to demonstrate a specific planning requirement for the re-use of the excavated material. It is noted this approach cannot be applied retrospectively.

It should be noted that on-site re-use of “uncontaminated soil or other naturally occurring material” excavated as part of construction works for the purposes of construction is excluded from waste regulation.

Alternative mechanisms for on-site re-use of soils or aggregate may also be appropriate, on a site-specific basis, depending on the volume/nature of the materials, and their intended use, such as:

- Waste exemptions under the Environmental Permitting (England and Wales) Regulations 2010, which are operations which are exempt from requiring permits, providing certain conditions are met. This typically applies to small volumes of non-hazardous soils although may also apply to other material types.
- Environmental permit under the Environmental Permitting (England and Wales) Regulations 2010 (standard or bespoke depending on the material and the activity).
- WRAP Aggregates Quality protocol¹² for the production and use of aggregates from inert waste, providing certain criteria are met.

12.3 Waste Disposal to Landfill

When waste is intended for disposal at a suitably licensed landfill site it is necessary for the waste producer (i.e. the developer or consultant on their behalf) to have completed a basic waste characterisation assessment, including:

- Description of the waste;
- List of Waste (LoW) code or codes if mixed waste;
- Determine the chemical composition to identify if waste has hazardous properties or Persistent Organic Pollutants (POPs) are present;
- Determination of hazardous properties;
- Waste Acceptance Criteria (WAC) testing (if required) to determine landfill acceptance.

¹² Aggregates from inert waste. End of waste criteria for the production of aggregates from inert waste. WRAP.

Relevant information on the above can be found in WM3¹³ and is discussed further in the context of ground investigation findings in subsequent sections.

It should be noted that alternative off-site disposal routes may be available, such as recycling/treatment facilities and that in these instances, waste classification would not be appropriate. Instead, it will be necessary to confirm with the destination facility that the material complies with their permit criteria. Further testing in addition to the available ground investigation data may be required by them.

12.3.1 Waste Classification

A preliminary waste classification exercise has been undertaken with reference to available ground investigation data. Hazardous properties of the soils have been assessed using the HazWaste program. A copy of the HazWaste report is included in Appendix G.

All results have been assessed as **non-hazardous**.

12.3.2 Landfill Waste Acceptance

If a waste classification assessment determines that disposal to landfill is the appropriate option for the waste then WAC testing must be undertaken for wastes destined for inert, stable non-reactive hazardous or hazardous classes of landfill. WAC testing may not be required if the material falls into the list of waste material identified in The Landfill Directive assumed to fulfil the criteria for inert waste, as detailed in Article 2(e) of the Landfill Directive. This includes soils and stone with an EWC code 17 05 04 but excludes topsoil, peat and soil from contaminated sites. Additionally, if waste has been classified as non-hazardous and is going to be disposed of to a non-hazardous landfill rather than an inert non-hazardous landfill then WAC testing may not be required. In all cases consultation with the receiving facility to confirm testing and acceptance of waste classification prior to disposal is advised.

12.3.3 Landfill Tax

Unless specifically exempt landfill tax applies to disposal of material at a landfill that's covered by a permit under specific environmental legislation and at any unauthorised waste site. Currently this tax rate is set at £103.70/tonne (2024/2025).

There are some circumstances where material placed within a landfill cell is exempted from the charge to Landfill Tax, including use of material for creation of capping, drainage or otherwise meets conditions of other Landfill Tax exemptions e.g. dredgings, mining and quarrying materials.

A lower rate of landfill tax set at £3.30/tonne does apply to less polluting material listed in the landfill tax (qualifying material) order 2011¹⁴, including naturally occurring rocks and soils, excluding topsoil (group 1) and ceramic or concrete (group 2).

12.4 Recommendations

- Waste management options should be considered in line with the Waste Hierarchy, with priority placed on prevention, re-use, recycling and recovery in order to reduce off-site disposal volumes. Sorting and segregation of excavated soils/materials may also enable reduction in off-site disposal volumes.
- In the event that off-site disposal of surplus excavated soils to landfill is intended, chemical results should be supplied to the receiving facility to confirm they will be able to accept the

¹³ Guidance on the classification and assessment of waste - Technical Guidance WM3. Environment Agency 2015.

¹⁴ Landfill Tax (Qualifying Material) Order 2011 can be found at <http://www.legislation.gov.uk/ukSI/2011/1017/contents/made>

material. Supplementary testing may be required by the receiving facility, including WAC testing, to confirm the preliminary waste characterisation assessment and to ensure WM3 requirements have been met.

- Should on-site made ground be intended for re-use within the proposed development, it may be possible to demonstrate this material is not waste through preparation of a Materials Management Plan (MMP) to fulfil the requirements of the CL:AIRE DoW CoP. It is recommended that soil re-use opportunities are considered in the context of the development earthworks strategy, cut/fill and remedial strategy (if appropriate) with input from a specialist geoenvironmental consultant.

13 COMMENTS ON ENGINEERING DESIGN

13.1 General

Eurocode 7 (Section 2)¹⁵ advocates the use of geotechnical categorisation of the proposed structures to establish the design requirements. Information presented to T&P indicates that the proposed development is to comprise 4N° single storey residential dwellings in two blocks with associated areas of communal soft landscaping and hard landscaped access and parking. It has been assumed that the dwellings will be of masonry construction with line loads of between 50-70kN/m.

In consideration of the available information on the development proposals, for the purposes of this investigation the proposed structures have been classified as follows:

- Geotechnical category 1: Small and relatively simple buildings (houses) with strip or piled foundations, roads, pavements, car parks, retaining walls below 2m, small excavations for drainage works, with the proposed housing development considered to be within this category.

13.2 Summary of Geotechnical Parameters

Stratum thicknesses and geotechnical parameters for the strata encountered in the investigation are summarised in the following sections. The level of confidence in the derived parameters is provided in Table 13.1.

Table 13.1 Confidence Levels

Key	Description
value	High level of confidence - based on information from investigation.
value	Medium level of confidence - based on published data.
value	Low level of confidence – more data required if parameter to be used in design.

13.2.1 Made Ground

The thickness of the made ground is described in Table 13.2.

Table 13.2 Summary of Geotechnical Parameters

Parameter	Units	Min	Max	Design	Comments
Top Depth	mbgl	GL	0.20	GL	Made Ground was found to vary in thickness across the site and may be deeper elsewhere.
Base Depth	mbgl	0.40	0.80	0.80	
Thickness	m	0.40	0.60	0.50	
Water soluble sulphate (SO42-)	mg/l	21	44	44	-
Note: The variability of the Made Ground strata is such that derivation of geotechnical parameters is considered to be generally inappropriate and potentially misleading.					

13.2.2 Swansea Member – Residual Soil

The design thicknesses and geotechnical parameters for use in the residual soil of the Swansea Member are described in

¹⁵ BS EN 1997 – Part 2. Geotechnical Design.

Table 13.3.

Table 13.3 Summary of Geotechnical Parameters – Swansea Member (Residual Soil)

Parameter	Units	Min	Max	Design	Comments
Top Depth	mbgl	0.40	0.60	0.50	-
Base Depth	mbgl	1.00	2.40	1.50	-
Thickness	m	0.40	2.00	1.00	-
Moisture Content	%	10.6	23.5	20	-
Liquid Limit	%	27	53	40	-
Plastic Limit	%	15	28	22	-
Plasticity Index	-	12	25	20	-
% passing 425µm sieve	%	45	71	60	-
Modified Plasticity Index	-	5.4	15	15	Based on current NHBC guidance, results are indicative of soils of a low volume change potential.
pH	-	7.6	7.9	-	
Water soluble sulphate (SO42-)	mg/l	12	30	30	DS-1 AC-1 (Ref = BRE Special Digest 1).
Acid soluble sulphate (SO42-)	%	0.016	0.043	0.043	
Total Sulphur	%	0.005	0.019	0.19	
Total Potential Sulphate	%	0.015	0.057	0.057	

13.2.3 Swansea Member (Bedrock)

The design thicknesses and geotechnical parameters for use in the bedrock of the Swansea Member are described in Table 13.4.

Table 13.4 Summary of Geotechnical Parameters – Swansea Member (bedrock)

Parameter	Units	Min	Max	Design	Comments
Top Depth	mbgl	1.00	2.40	1.50	-
Base Depth	mbgl	>25.0	>30.0	8.95	Base not proven
Thickness	m	>28.7	>29.0	6.40	Thickness not proven

13.3 Construction Considerations

13.3.1 Subsurface Concrete

Based on the pH values, water soluble sulphate and SD1 suite concentrations recorded by the chemical and geotechnical laboratory analysis, together with the calculated oxidisable

sulphide¹⁶, a DS-1 AC-1 design mix concrete should be suitable for buried structures placed within the shallow soils when compared against the BRE¹⁷ assessment levels.

13.3.2 Floor Slabs

Due to the thickness of made ground across the site (typically >0.6m) it is advised that proprietary suspended ground floor slabs are utilised on site (designed with a minimum 200mm void based upon NHBC guidance) reflecting the granular nature of the soils. Any soft spots or oversize material within the made ground should be removed and replaced with compacted granular fill.

Furthermore, the underlying cohesive soils are of low volume change potential which also requires that floor slabs should be designed with a minimum 200mm void based upon NHBC guidance.

13.3.3 Groundwater

While groundwater strikes were recorded in the boreholes, significant ingress was not recorded within the trial pits. On subsequent monitoring visits, groundwater was generally encountered at a depth of >2.0m below ground level. As such, significant groundwater ingress is not expected within foundation or drainage excavations.

Where groundwater ingress is encountered it is likely to be restricted to shallow seepage which will be adequately dealt with via conventional methods such as sump pumping.

13.3.4 Deep Excavations

Although superficial deposits were generally found to be stable during the intrusive ground investigation, personnel entry into any excavations should be avoided where possible. However, if entry into excavations is required, the excavation sides should be adequately shored and supported or battered back to a safe angle in accordance with appropriate temporary works design.

13.3.5 Buried Utilities

It is recommended that existing live services are accurately located by careful hand digging and liaison undertaken with the utility companies with regard to any required works in these areas. The services should be clearly marked and taken into account in the construction design process.

13.4 Mining

As highlighted in the previous desk study, there is possible hazard associated with unrecorded historic mine working beneath the site which presents a possible risk to future development.

The existing information suggests that a commercially viable seam variously known as the Graigola seam, Swansea 3ft, Golden Seam or Swansea No3 seam outcrops to the west of the site and dips east beneath the site. The distance of the outcrop from the site is complicated by the Duffryn Fault however, it is believed to outcrop approximately 25 – 75m away.

A further coal seam known as the Tir Edmond or Little Coal Seam is described within the previous report as possibly outcropping in the eastern area of the site and dipping east.

¹⁷ BRE Special Digest 1:2005 – Third edition – Concrete in aggressive ground.

However, a further review of the available geological map indicates that this coal seam likely outcrops off-site to the east.

Given the above, two boreholes (BH01 and BH03) were positioned beneath the building footprints in the western area of site as this is where the Craigola seam, if present, would be at the shallowest depth. BH02 was positioned in the eastern area of the site as this is where it would be most likely to encounter the Tir Edmond Seam if it does indeed outcrop within the site boundary.

Within all the boreholes uninterrupted sandstone was encountered beneath the superficial deposits to a maximum depth of 30m with no evidence of either coal seams or historic mine workings. As such, the risk to the proposed development from historic mine workings is considered to be low.

13.5 Preliminary Foundation Recommendations

13.5.1 *Building Near Trees*

The cohesive soils beneath the site have been found to be of low volume change potential. Based upon the volume change potential and in accordance with NHBC guidelines the minimum founding depth of traditional foundations would be 0.75mbgl. At this stage due to the low volume change potential, it is unlikely that void formers will be required in the design of traditional shallow strip foundations. The impact of any new planting associated with future potential development of the site should also take into account the volume change potential of the soils.

Due to the low volume change potential of the soils, foundations will be susceptible to the influence of trees. It is recommended the findings of this report are considered in conjunction with an arboricultural survey and the recommendations given by the NHBC regarding the over deepening of foundations in the vicinity of trees.

13.5.2 *Foundation Options*

Beneath the made ground, ground conditions are generally consistent with a weathering profile of the bedrock geology of the Swansea Member (part of the South Wales Coal Measures).

In the location of the proposed buildings in the western area of the site grey sandstone was encountered at 1.0 – 1.2m depth. Should foundations be placed entirely within the grey sandstone they may be designed for an allowable bearing capacity of 225kPa.

Where the residual soil is recovered as clay it is generally described as firm (or better) hand shear vane testing at shallow depth yielded a shear strength of 45kPa.

Where granular soils were encountered it is also considered likely that these are a residual soil resulting from weathering of the underlying parent rock and, as such, likely to be at least of medium dense relative density.

Given the above, it is recommended that if traditional shallow strip foundations are placed at a minimum depth of 0.75m within the natural residual soils may be designed for an allowable bearing capacity of 100kPa. Where foundations span between cohesive and granular soils mesh reinforcement should be utilised to reduce the likelihood of differential settlement. Should areas of deeper made ground be encountered foundations should be deepened until natural soils are encountered.

Prior to utilising the above approach, it may be prudent to carry out further investigation of the granular deposits to confirm their relative density as this may demonstrate a higher bearing capacity is achievable.

13.6 Drainage

13.6.1 Summary of Infiltration Testing

Infiltration testing was undertaken within 3N° trial pits (TP01 – TP03) at approximate assumed deep soakaway formation level (i.e. 2m below existing levels) to assess the viability of using traditional soakaway drainage within the proposed redevelopment. Graphical representations of the data are contained within Appendix H.

The trial pits were positioned as per the exploratory hole location plan contained within Appendix A. Infiltration tests were not completed in areas of the site where made ground was encountered.

The infiltration testing and subsequent calculation of soil infiltration rates were carried out in general accordance with the methodologies detailed within BRE 365¹⁸.

13.6.2 Soil Infiltration Rate Calculations

The infiltration rates (F) have been calculated in accordance with BRE 365. A summary of the results of the infiltration tests and calculated infiltration rates is provided in Table 13.5.

Table 13.5 Summary of Calculated Infiltration Rates

Exploratory Location	Date	Total Measured Water Level Change (m)	Time Period (mins)	Calculated Infiltration Rate (m/s)	Design Infiltration Rate (m/s)
TP01	21/05/2024	0.25	360	4.68E-06	N/A
TP02	21/05/2024	-	300	-	
TP03	21/05/2024	-	240	-	

13.6.3 Discussion

Based upon the test results and site observations it is considered that traditional soakaways are unlikely to offer an effective solution for surface water discharge and recourse to alternative options, such as utilising the existing drainage network, is recommended.

Furthermore, note that during testing within TP01, the water level within the trial pit rose by 0.09m over the course of the test. This is likely due to groundwater seepage as noted within the boreholes.

¹⁸ Soakaway Design BRE Digest DG-365 (2016).

14 RECOMMENDATIONS

14.1 Recommendations for Further Work

14.1.1 Human Health/Plant Growth

- All COPC were found to be below adopted screening levels. However, made ground is considered physically unsuitable to remain within areas of soft landscaping. A Remediation Strategy may be required to detail the remedial requirements following finalisation of the development layout plan.

14.1.2 Potable Water Supply Pipework

- Elevated contaminants within the made ground with respect to the UKWIR guidelines indicate that upgraded water supply pipework will likely be required for any services installed in the made ground. The statutory water provider should be consulted regarding suitable water supply pipework requirements.

14.1.3 Engineering

- It may be prudent to carry out an arboricultural survey in the vicinity of proposed buildings to fully assess the risk posed by shrink and heave in underlying cohesive soils.
- Should foundations be placed within material assumed to be residual soils of the weathered Swansea Member, it may be prudent to confirm the relative density and depositional origin of this material as this may demonstrate a higher bearing capacity is achievable reducing potential foundation design requirements.
- The gradational boundary between residual soil and bedrock may be difficult to determine by the groundwater in practice. As such, should any uncertainty remain, foundation excavations should be inspected by a qualified engineering geologist prior to pouring concrete.

14.1.4 General

- The site is located within a Flood Risk Zone 2. As such, a Flood Risk Assessment will be required to support future development.
- Discussions should be held with local landfill/soil waste treatment facilities to agree material classification/pre-treatment required for any soils to be disposed off-site as a result of proposed construction works.
- Ground workers should remain vigilant for visible and olfactory signs of contamination following demolition of on-site buildings.
- On-site monitoring wells should be protected from damage until such time as conclusions/recommendations within this report are agreed with the regulators. Monitoring installations should then be decommissioned in accordance with Environment Agency guidelines.
- A site-specific health and safety plan should be prepared to inform on risks posed from the previous site use and mitigations for ground workers developing the site e.g. requirements for appropriate PPE, hygiene practices, environmental monitoring and requirements for mitigation measures during construction works.
- A copy of this report should be provided to the relevant regulatory authorities to confirm that they are in agreement with the report findings.

Appendix A – Drawings

— Site Boundary



Base Map
Company: Bing Maps Autodesk Licence
DWG Title: -
DWG Number: -
Date: -

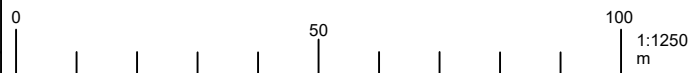
Drawn	Checked	Amendment	Date	Rev.
CB3 Consult Ltd				
Gellinudd Care Home, Gellinudd				
Site Location Plan				
Scale	Date	Drawn by	Check by	Rev.
1:1250@A4	28/05/24	HL	RG	-

T&P

Regen

Unit 5, Septimus, Hawkfield Buisness Park,
Bristol, BS14 0BN
Tel: 0117 927 7756
Email: Info@TP-regen.co.uk

Rev.	Drawing No.
-	P1188-01-001



- Site Boundary
- T&P Investigation**
- Trial Pit Locations
(TP01 - TP03)
- Cable Percussive Locations
(BH01 - BH03)



Base Map
Company: Bing Maps Autodesk Licence
DWG Title: -
DWG Number: -
Date: -

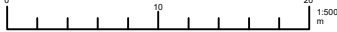
Drawn	Checked	Amendment	Date	Rev.
CB3 Consult Ltd				
Gellinudd Care Home, Gellinudd				
Exploratory Hole Location Plan				
Scale	Date	Drawn by	Check by	Rev.
1:500@A3	28/05/24	HL	RG	-

T&P

Regen

Unit 5, Septimus, Hawkfield Buisness Park,
Bristol, BS14 0BN
Tel: 0117 927 7756
Email:Info@TP-regen.co.uk

Drawing No.	
P1188-01-002	



Appendix B – Photographs



PLATE 01 – Site Entrance – Looking North.



PLATE 02 – Site Entrance – Looking South.



PLATE 03 – Site Overview – Looking North.



PLATE 04 – Site Overview – Looking East.



PLATE 05 – Site Entrance – Looking South.



PLATE 06 – Site Overview – Looking West.



PLATE 07 – Trial Pit Excavation – TP01.



PLATE 08 – Trial Pit Spoil – TP01.



PLATE 09 – Trial Pit Excavation – TP02.



PLATE 10 – Trial Pit Spoil – TP02.



PLATE 11 – Trial Pit Excavation – TP03.



PLATE 12 – Trial Pit Spoil – TP03.

Appendix C – Exploratory Logs

Contract Name: Gellinudd Care Home			Client: Squirrel Wood Properties		Borehole ID: BH01
Contract Number: P1188 / CC-1206	Date Started: 21/05/2024	Logged By: RG	Checked By: SH	Status: FINAL	
Easting: 273648.60	Northing: 204343.90	Ground Level: 101.50mOD	Plant Used: KLEMM KR802-2 X 5		Sheet 2 of 3
				Scale: 1:50	

Weather: Clear

Termination: Engineers Instruction

Samples & In Situ Testing				Boring Progress			Strata Details				Groundwater	
Depth	Sample ID	Windowless Sample Recovery	Test Result	Depth	Duration	Flush Returns	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill / Installation
								(28.80)		Grey SANDSTONE. (SWANSEA MEMBER)	11	
											12	
											13	
											14	
											15	
											16	
											17	
											18	
											19	
											20	

Sample Key: B = Bulk Disturbed D = Small Disturbed U = Undisturbed Open-Drive W = Water G = Gas ES = Environmental Soil EW = Environmental Water

Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth	Dia (mm)	Groundwater encountered at 3.55mbgl.					
					30.00	110	1.20	125						
Flush Information					Installation				Water Strikes					
Top (m)	Base (m)	Flush Type	Return	Flush Colour	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
					0.00	1.40	PLAIN	63	3.55	1.20		0	2.00	Moderate ingress.
					1.40	10.00	SLOTTED	63						
T&P Regeneration RO Template										Issue Number: 1		Issue Date: June 2016		

T&P Regen www.tandpregeneration.co.uk		Contract Name: Gellinudd Care Home			Client: Squirrel Wood Properties			Borehole ID: BH01						
		Contract Number: P1188 / CC-1206		Date Started: 21/05/2024	Logged By: RG	Checked By: SH	Status: FINAL		Sheet 3 of 3					
Rotary Open Hole Borehole Log		Easting: 273648.60		Northing: 204343.90		Ground Level: 101.50mOD		Plant Used: KLEMM KR802-2 X 5		Scale: 1:50				
Weather: Clear				Termination: Engineers Instruction										
Samples & In Situ Testing				Boring Progress				Strata Details				Groundwater		
Depth	Sample ID	Windowless Sample Recovery	Test Result	Depth	Duration	Flush Returns	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill / Installation		
										Grey SANDSTONE. (SWANSEA MEMBER)				
											21			
											22			
											23			
											24			
				18.00m to 30.00m	17:00	80%					25			
											26			
											27			
											28			
											29			
							71.50	30.00			30			
										End of Borehole at 30.00m				
Sample Key: B = Bulk Disturbed D = Small Disturbed U = Undisturbed Open-Drive W = Water G = Gas ES = Environmental Soil EW = Environmental Water														
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth	Dia (mm)	Groundwater encountered at 3.55mbgl.					
21-05-2024	17:00	30.00	1.20	3.55	30.00	110	1.20	125						
Flush Information					Installation				Water Strikes					
Top (m)	Base (m)	Flush Type	Return	Flush Colour	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
					0.00	1.40	PLAIN	63	3.55	1.20		0	2.00	Moderate ingress.
					1.40	10.00	SLOTTED	63						
T&P Regeneration RO Template													Issue Number: 1	Issue Date: June 2016

Contract Name: Gellinudd Care Home			Client: Squirrel Wood Properties		Borehole ID: BH02
Contract Number: P1188 / CC-1206	Date Started: 22/05/2024	Logged By: RG	Checked By: SH	Status: FINAL	
Easting: 273669.50	Northing: 204320.10	Ground Level: 101.36mOD	Plant Used: KLEMM KR802-2 X 5		Sheet 1 of 3
			Termination: Engineers Instruction		Scale: 1:50

Samples & In Situ Testing				Boring Progress			Strata Details				Groundwater	
Depth	Sample ID	Windowless Sample Recovery	Test Result	Depth	Duration	Flush Returns	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill / Installation
							101.31	0.05 (0.35)		MADE GROUND: ASPHALT.		
							100.96	0.40 (0.60)		MADE GROUND: Dark grey sandy GRAVEL. Gravel is angular fine to coarse of concrete, asphalt, brick, plastic, timber and sandstone.		
							100.36	1.00		Firm light brown mottled grey slightly sandy CLAY. (SWANSEA MEMBER) Grey SANDSTONE. (SWANSEA MEMBER)	1	
											2	
											3	
											4	
											5	
											6	
											7	
											8	
											9	
											10	

Sample Key: B = Bulk Disturbed D = Small Disturbed U = Undisturbed Open-Drive W = Water G = Gas ES = Environmental Soil EW = Environmental Water														
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks: Groundwater encountered at 0.8mbgl.					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth	Dia (mm)						
22-05-2024	00:00	0.00	1.00	0.80	25.00	110	1.00	125						
Flush Information					Installation				Water Strikes					
Top (m)	Base (m)	Flush Type	Return	Flush Colour	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
1.00	25.00	Water	70% - 90%	Grey	0.00 1.00	1.00 10.00	PLAIN SLOTTED	63 63	0.80	1.00		0	2.00	Moderate ingress.
T&P Regeneration RO Template										Issue Number: 1			Issue Date: June 2019	

Rotary Open Hole
Borehole Log

Contract Name:

Gellinudd Care Home

Client:

Squirrel Wood Properties

Borehole ID:

BH03

Contract Number:

P1188 / CC-1206

Date Started:

22/05/2024

Logged By:	
------------	--

RG

Checked By:

SH

Status:

FINAL

Sheet 1 of 3

Easting:

273652.70

Northing:	
-----------	--

204328.80

Ground Level:

101.07mOD

Plant Used:

KLEMM KR802-2 X 5

Scale:

1:50

Weather: Clear

Termination: Engineers Instruction

Samples & In Situ Testing				Boring Progress			Strata Details					Groundwater					
Depth	Sample ID	Windowless Sample Recovery	Test Result	Depth	Duration	Flush Returns	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill / Installation					
							101.02	0.05		MADE GROUND: ASPHALT.	1						
							(0.35)	MADE GROUND: Dark grey sandy GRAVEL. Gravel is angular fine to coarse of concrete, asphalt, brick, and sandstone.									
							100.67	0.40		Firm light brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular fine to coarse of sandstone. (SWANSEA MEMBER)							
				1.30m to 18.00m	17:00	70%		99.77	1.30		Grey gravel of SANDSTONE. (SWANSEA MEMBER)	2					
								99.57	1.50		Grey SANDSTONE. (SWANSEA MEMBER)						
																	3
																	4
																	5
																	6
												7					
												8					
												9					
										10							

Sample Key: B = Bulk Disturbed D = Small Disturbed U = Undisturbed Open-Drive W = Water G = Gas ES = Environmental Soil EW = Environmental Water

Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks: Groundwater encountered at 2.08mbgl.					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth	Dia (mm)						
22-05-2024	15:00	0.00	1.30		30.00	110	1.30	125						
Flush Information					Installation				Water Strikes					
Top (m)	Base (m)	Flush Type	Return	Flush Colour	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
1.30	30.00	Water	70% - 90%	Grey	0.00	1.30	PLAIN	63	1.10	1.30		0	2.00	Moderate ingress.
					1.30	10.00	SLOTTED	63						
T&P Regeneration RO Template										Issue Number: 1		Issue Date: June 2019		



1:50

Plant Used:	KLEMM KR802-2 X 5
-------------	-------------------

Termination: Engineers Instruction

$$(28.50)$$

Groundwater encountered at 2.08mbql.

Groundwater encountered at 2.08mbgl.

T&P Regeneration RO Template	Issue Number: 1	Issue Date: June 2016
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T&P Regen www.tandpregeneration.co.uk	Contract Name: Gellinudd Care Home		Client: Squirrel Wood Properties			Trial Pit ID: TP01		
	Contract Number: P1188 / CC-1206	Date Started: 21/05/2024	Logged By: RG	Checked By: SH	Status: FINAL	Sheet 1 of 1		
	Easting: 273652.80	Northing: 204348.40	Ground Level: 101.44mOD	Plant Used: JCB 3CX		Scale: 1:25		
Trial Pit Log								
Weather: Clear		Termination: Refusal on Limestone			Stability: Stable			
Samples & In Situ Testing			Strata Details				Water	Backfill
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		
0.15 0.15 - 0.25 0.15 - 0.25	ES D1 ES1		101.34	0.10 (0.50)		MADE GROUND: ASPHALT. MADE GROUND: Dark grey sandy GRAVEL. Gravel is angular fine to coarse of concrete, asphalt, brick, plastic, timber and sandstone.		
0.60 - 0.70 0.70 - 0.80 0.70 - 0.80	ES2 B1 D2		100.84	0.60 (0.90)		Dark brown slightly gravelly clayey SAND. Gravel is subangular fine to coarse of sandstone. (SWANSEA MEMBER)	1	
1.60 - 1.70	D3		99.94 99.74	1.50 1.70		Extremely weak grey SANDSTONE. (SWANSEA MEMBER)		
End of Trial Pit at 1.70m							2	
							3	
							4	
							5	
Sample Key: B = Bulk Disturbed D = Small Disturbed U = Undisturbed Open-Drive W = Water G = Gas ES = Environmental Soil EW = Environmental Water								
Remarks: Groundwater not encountered.					Dimensions:			
					Length: 2.40m		Orientation: °	
					Width: 0.90m			
					Groundwater Details			
					Depth encountered (m)		Remarks	
T&P Regeneration TP Template Issue Number: 1 Issue Date: June 2016								

T&P Regen www.tandpregeneration.co.uk	Contract Name: Gellinudd Care Home		Client: Squirrel Wood Properties			Trial Pit ID: TP02			
	Contract Number: P1188 / CC-1206	Date Started: 21/05/2024	Logged By: RG	Checked By: SH	Status: FINAL	Sheet 1 of 1			
	Easting: 273663.80	Northing: 204331.00	Ground Level: 101.38mOD	Plant Used: JCB 3CX		Scale: 1:25			
Trial Pit Log									
Weather: Clear			Termination: Refusal on Limestone			Stability: Stable			
Samples & In Situ Testing			Strata Details					Water	Backfill
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description			
0.10 - 0.20 0.10 - 0.20	D1 ES1	HV 0.50m, 45 / 12kPa	101.28	0.10		MADE GROUND: ASPHALT.	1		
				(0.35)		MADE GROUND: Dark grey GRAVEL. Gravel is angular fine to coarse of sandstone.			
0.60 0.60 - 0.70 0.60 - 0.70	ES D2 ES2		100.93	0.45		Firm light brown mottled grey slightly sandy CLAY. (SWANSEA MEMBER)			
				(0.95)					
1.30 - 1.40	D3		99.98	1.40		Orangish brown very gravelly SAND. Gravel is subangular fine to coarse of sandstone. (SWANSEA MEMBER)	2		
				(0.60)					
			99.38	2.00		Brown very clayey very sandy GRAVEL. Gravel is subangular fine to coarse of sandstone. (SWANSEA MEMBER)	3		
				(0.40)					
2.30 - 2.40	D4		98.98	2.40		End of Trial Pit at 2.40m	4		
							5		
Sample Key: B = Bulk Disturbed D = Small Disturbed U = Undisturbed Open-Drive W = Water G = Gas ES = Environmental Soil EW = Environmental Water									
Remarks: Groundwater not encountered.						Dimensions:			
						Length: 2.30m			
						Width: 0.90m			
						Orientation: °			
						Groundwater Details			
						Depth encountered (m)	Remarks		
						T&P Regeneration TP Template Issue Number: 1 Issue Date: June 2016			

T&P Regen www.tandpregeneration.co.uk	Contract Name: Gellinudd Care Home		Client: Squirrel Wood Properties			Trial Pit ID: TP03		
	Contract Number: P1188 / CC-1206	Date Started: 21/05/2024	Logged By: RG	Checked By: SH	Status: FINAL	Sheet 1 of 1		
	Easting: 273677.00	Northing: 204316.20	Ground Level: 101.73mOD	Plant Used: JCB 3CX		Scale: 1:25		
Trial Pit Log								
Weather: Clear		Termination: Engineers Instruction			Stability: Stable			
Samples & In Situ Testing			Strata Details				Water	Backfill
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		
0.10 0.10 - 0.20	ES ES1		101.53	0.20		Dark brown slightly sandy slightly gravelly CLAY. (TOPSOIL)		
0.60 0.60 - 0.70	ES ES2			(0.60)		MADE GROUND: Dark grey sandy GRAVEL. Gravel is angular fine to coarse of concrete, asphalt, brick, timber and sandstone.		
0.90 0.90 - 1.00 0.90 - 1.00	ES D1 ES3		100.93	0.80		Very stiff light brown mottled grey slightly sandy slightly gravelly friable CLAY. Gravel is angular fine to coarse of sandstone. (SWANSEA MEMBER)	1	
1.80 - 1.90	D2			(1.70)				2
2.40 - 2.50	D3		99.23	2.50		End of Trial Pit at 2.50m		
							3	
							4	
							5	
Sample Key: B = Bulk Disturbed D = Small Disturbed U = Undisturbed Open-Drive W = Water G = Gas ES = Environmental Soil EW = Environmental Water								
Remarks: Groundwater not encountered.						Dimensions:		
						Length: 2.40m		
						Width: 1.00m		
						Orientation: °		
						Groundwater Details		
						Depth encountered (m)	Remarks	
						T&P Regeneration TP Template Issue Number: 1 Issue Date: June 2016		

Appendix D – Geotechnical Results



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3.14, 5.5, Fall Cone Method, 1 Pt Test, BS 1377-2:2022,
cl 5.3, 6

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: T&P Regeneration
Client Address: Unit 5, Septimus,
Hawkfield Business Park, BS14 0BN

Contact: Rachel Gilbert
Site Address: Gellinudd Care Home

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: P1188
Job Number: 24-021831-1
Date Sampled: 21/05/2024
Date Received: 24/05/2024
Date Tested: 05/06/2024
Sampled By: Not Given

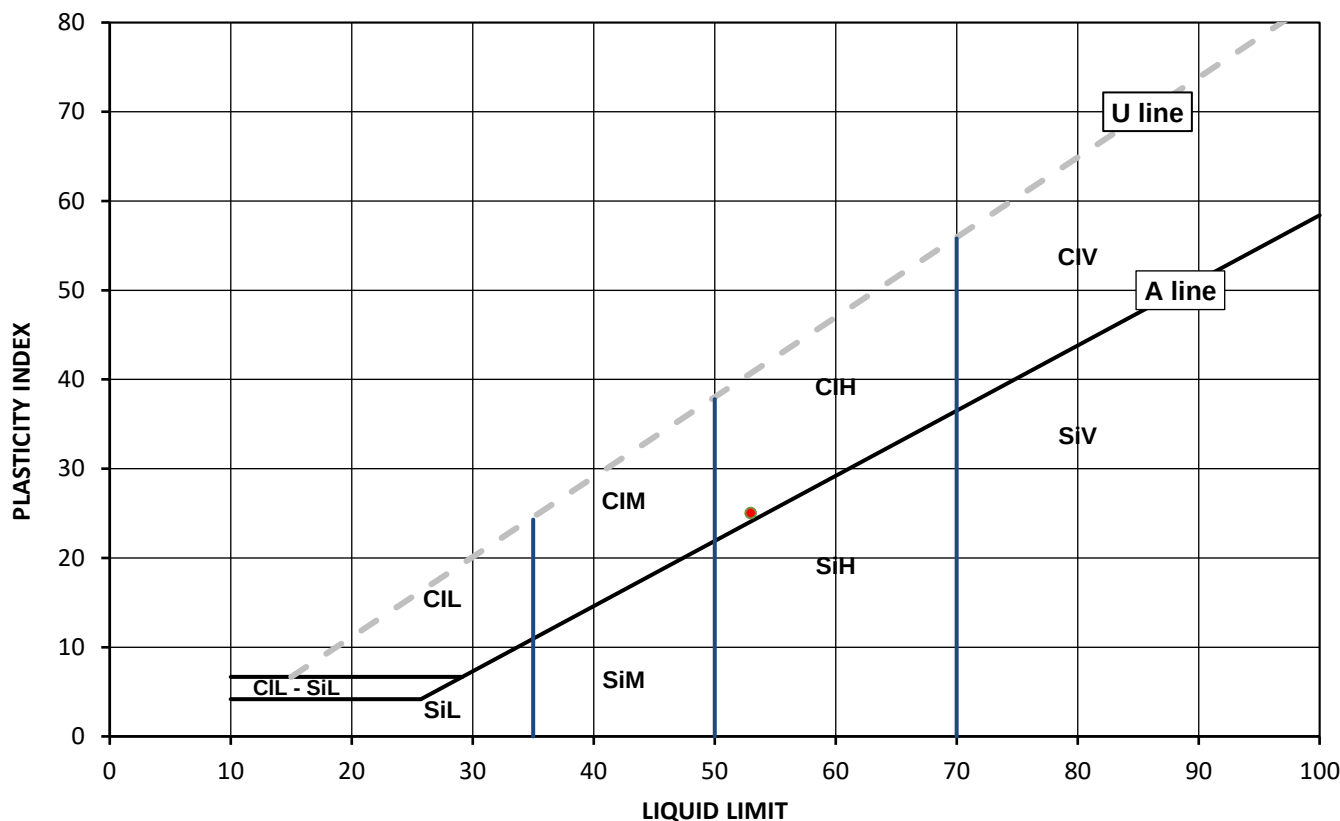
Test Results:

Laboratory Reference: 211136
Hole No.: TP01
Sample Reference: 2
Sample Description: Orangish brown gravelly slightly sandy silty CLAY

Depth Top [m]: 0.70
Depth Base [m]: 0.80
Sample Type: D

Sample Preparation: Tested after washing to remove >0.425 mm;
Cone Type: 80g/30deg

As Received Water Content [W] %	Corrected Liquid Limit [WL] %	Correlation Factor	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity index [IL] % #	Consistency index [IC] % #	% Passing 425µm BS Test Sieve
23.5	53	1.000	28	25	-0.16	1.16	60



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
		50 to 70
		exceeding 70
		append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1: 2014; Correlation Factor by Clayton C.R.I and Jukes A.W (1978); # Non accredited

Remarks:

Signed:

Monika Siewior

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3.14, 5.5, Fall Cone Method, 1 Pt Test, BS 1377-2:2022,
cl 5.3, 6

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: T&P Regeneration
Client Address: Unit 5, Septimus,
Hawkfield Business Park, BS14 0BN

Contact: Rachel Gilbert
Site Address: Gellinudd Care Home

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: P1188
Job Number: 24-021831-1
Date Sampled: 21/05/2024
Date Received: 24/05/2024
Date Tested: 05/06/2024
Sampled By: Not Given

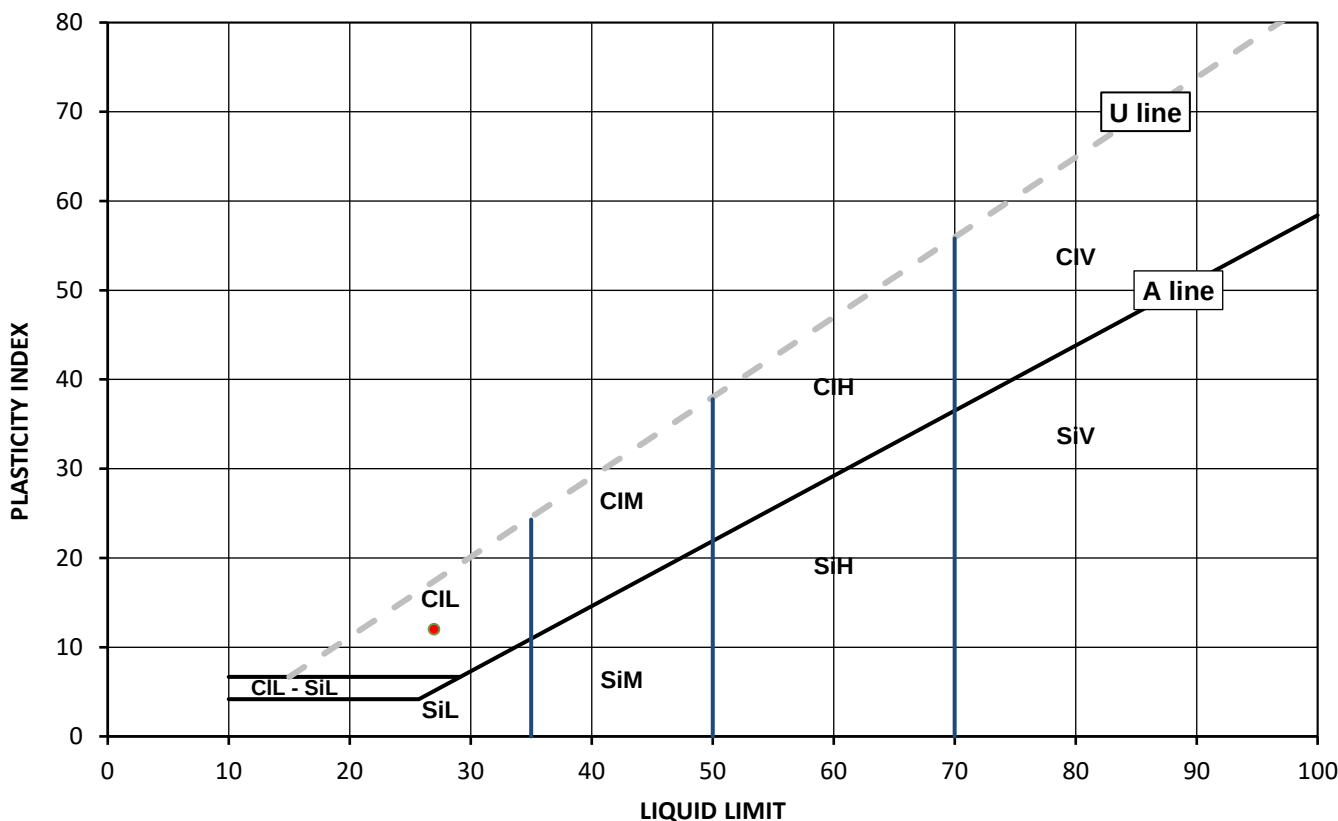
Test Results:

Laboratory Reference: 211137
Hole No.: TP02
Sample Reference: 3
Sample Description: Yellowish brown gravelly very sandy CLAY

Depth Top [m]: 1.30
Depth Base [m]: 1.40
Sample Type: D

Sample Preparation: Tested after washing to remove >0.425 mm;
Cone Type: 80g/30deg

As Received Water Content [W] %	Corrected Liquid Limit [WL] %	Correlation Factor	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity index [IL] % #	Consistency index [IC] % #	% Passing 425µm BS Test Sieve
11.5	27	1.002	15	12	-0.25	1.25	45



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
		50 to 70
		exceeding 70
		append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1: 2014; Correlation Factor by Clayton C.R.I and Jukes A.W (1978); # Non accredited

Remarks:

Signed:

Monika Siewior

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3.14, 5.5, Fall Cone Method, 1 Pt Test, BS 1377-2:2022,
cl 5.3, 6

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: T&P Regeneration
Client Address: Unit 5, Septimus,
Hawkfield Business Park, BS14 0BN

Contact: Rachel Gilbert
Site Address: Gellinudd Care Home

Client Reference: P1188
Job Number: 24-021831-1
Date Sampled: 21/05/2024
Date Received: 24/05/2024
Date Tested: 05/06/2024
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

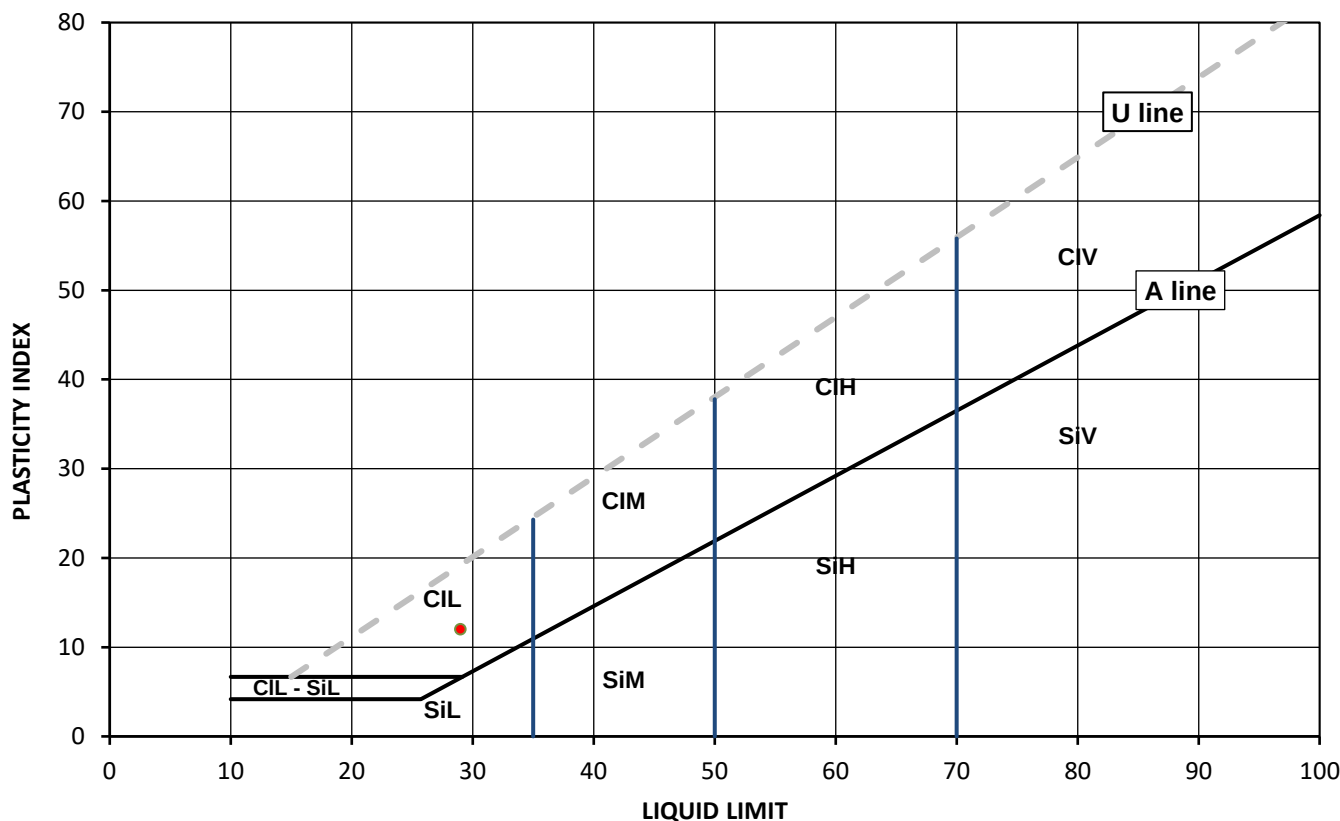
Test Results:

Laboratory Reference: 211138
Hole No.: TP03
Sample Reference: 3
Sample Description: Brown slightly gravelly very sandy CLAY

Depth Top [m]: 2.40
Depth Base [m]: 2.50
Sample Type: D

Sample Preparation: Tested after washing to remove >0.425 mm;
Cone Type: 80g/30deg

As Received Water Content [W] %	Corrected Liquid Limit [WL] %	Correlation Factor	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity index [IL] % #	Consistency index [IC] % #	% Passing 425µm BS Test Sieve
10.6	29	0.984	17	12	-0.50	1.50	71



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L Low	50 to 70
	M Medium	exceeding 70
	H High	append to classification for organic material (eg CIHO)
	V Very high	
	O Organic	

Note: Water Content by BS EN 17892-1: 2014; Correlation Factor by Clayton C.R.I and Jukes A.W (1978); # Non accredited

Remarks:

Signed:

Monika Siewior

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

Tested in Accordance with:

BS EN ISO 17892-12:2018+A2:2022, cl 5.3.14, 5.5, Fall Cone Method, 1 Pt Test, BS 1377-2:2022, cl 5.3, 6. Correlation Factor by Clayton C.R.I and Jukes A.W (1978). W by BS EN 17892-1:2014.

Client Reference: P1188

Job Number: 24-021831-1

Date Sampled: 21/05/2024

Date Received: 24/05/2024

Date Tested: 05/06/2024

Sampled By: Not Given

4041

Client: T&P Regeneration

Client Address: Unit 5, Septimus,
Hawkfield Business Park, BS14 0BN

Contact: Rachel Gilbert

Site Address: Gellinudd Care Home

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	W	Liquid & Plastic Limit								Density		
		Reference	Depth Top	Depth Base	Type				% Passing 425um	WL*	Correlation Factor	Wp	Ip	Cone type	Sample Preparation	bulk	dry	PD	
			m	m					%	%		%	%			Mg/m3	Mg/m3	Mg/m3	
211136	TP01	2	0.70	0.80	D	Orangish brown gravelly slightly sandy silty CLAY	Atterberg 1 Point	23.5	60	53	1.000	28	25	80g/30 deg	W				
211137	TP02	3	1.30	1.40	D	Yellowish brown gravelly very sandy CLAY	Atterberg 1 Point	11.5	45	27	1.002	15	12	80g/30 deg	W				
211138	TP03	3	2.40	2.50	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	10.6	71	29	0.984	17	12	80g/30 deg	W				

Note: # Non accredited; NP - Non plastic; N - Tested in natural condition, R - Tested after >0.425mm removed by hand, W - Tested after washing to remove >425mm; * - One point liquid limit corrected as per the report Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Comments:

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Signed:

Monika Siewior

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd



T&P Regeneration
Unit 5
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e: reception@i2analytical.com

Analytical Report Number : 24-021832

Project / Site name:	Gellinudd Care Home	Samples received on:	24/05/2024
Your job number:	P1188	Samples instructed on/ Analysis started on:	29/05/2024
Your order number:	19183	Analysis completed by:	06/06/2024
Report Issue Number:	1	Report issued on:	06/06/2024
Samples Analysed:	4 soil samples		

Signed: 

Joanna Szwagrak
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 24-021832
Project / Site name: Gellinudd Care Home
Your Order No: 19183

Lab Sample Number				211139	211140	211141	211142
Sample Reference				TP01	TP01	TP02	TP03
Sample Number				2	3	3	3
Depth (m)				0.70-0.80	1.60-1.70	1.30-1.40	2.40-2.50
Date Sampled				21/05/2024	21/05/2024	21/05/2024	21/05/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1	84.4	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	2.6	10	10
Total mass of sample received	kg	0.1	NONE	0.3	1	0.5	0.5

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	7.8	7.9	7.9	7.6
Total Sulphate as SO ₄	%	0.005	MCERTS	0.043	0.016	0.019	0.02
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	17	12	15	30
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	8.56	6.18	7.44	14.8
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	1	0.5	1.6	< 0.5
Total Sulphur	mg/kg	50	MCERTS	180	< 50	< 50	190
Total Sulphur	%	0.005	MCERTS	0.018	< 0.005	< 0.005	0.019
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0

Heavy Metals / Metalloids

Magnesium (leachate equivalent)	mg/l	2.5	NONE	< 2.5	< 2.5	< 2.5	< 2.5
Magnesium (water soluble)	mg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 24-021832

Project / Site name: Gellinudd Care Home

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
211139	TP01	2	0.70-0.80	Brown loam with gravel and vegetation
211140	TP01	3	1.60-1.70	Brown loam and sand with vegetation and stones
211141	TP02	3	1.30-1.40	Brown clay and sand with gravel
211142	TP03	3	2.40-2.50	Brown clay and sand with gravel

Analytical Report Number : 24-021832
Project / Site name: Gellinudd Care Home

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078B	W	NONE
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Appendix E – Chemical Results and Screening Assessment



T&P Regeneration
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Analytical Report Number : 24-021715

Project / Site name:	Gellinudd Care Home	Samples received on:	24/05/2024
Your job number:	P1188	Samples instructed on/ Analysis started on:	28/05/2024
Your order number:	19183	Analysis completed by:	05/06/2024
Report Issue Number:	1	Report issued on:	05/06/2024
Samples Analysed:	5 soil samples		

Signed: _____

Anna Goc
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 24-021715
 Project / Site name: Gellinudd Care Home
 Your Order No: 19183

Lab Sample Number				210635	210636	210637	210638	210639
Sample Reference				TP01	TP02	TP03	TP03	TP03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.15-0.25	0.60-0.70	0.10-0.20	0.60-0.70	0.90-1.00
Date Sampled				21/05/2024	21/05/2024	21/05/2024	21/05/2024	21/05/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Stone Content	%	0.1	NONE	36.6	< 0.1	< 0.1	< 0.1	2
Moisture Content	%	0.01	NONE	7.4	19	16	9	11
Total mass of sample received	kg	0.1	NONE	0.5	0.4	0.4	0.5	0.2

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.2	7.5	7.9	8.2	7.9
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	21	36	12	16	44
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	10.6	17.9	5.91	7.76	22
Organic Matter (automated)	%	0.1	MCERTS	3.4	1.1	4.9	2.7	0.8
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2	0.6	2.8	1.5	0.4

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.12	0.2	0.12
Acenaphthylene	mg/kg	0.05	MCERTS	0.12	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.13	0.12	0.51	0.58	0.82
Fluorene	mg/kg	0.05	MCERTS	0.18	0.12	0.57	0.61	0.85
Phenanthrene	mg/kg	0.05	MCERTS	1	1.1	5.5	5.8	8.8
Anthracene	mg/kg	0.05	MCERTS	0.23	0.25	1.3	1.3	2.1
Fluoranthene	mg/kg	0.05	MCERTS	2.2	1.1	5.4	6.3	9.8
Pyrene	mg/kg	0.05	MCERTS	1.9	0.94	4.6	5.3	8.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.1	0.45	2	2.4	3.9
Chrysene	mg/kg	0.05	MCERTS	1.3	0.5	2.5	2.6	4.2
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	1.6	0.45	2.1	2.2	3.9
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.57	0.19	< 0.05	1.1	1.5
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.1	0.4	2	2.1	3.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.85	0.19	0.94	1.1	1.7
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.27	< 0.05	0.27	0.28	0.46
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.9	0.21	0.99	1.2	1.8

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	13.4	6.08	28.7	33.1	51.7
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Analytical Report Number: 24-021715
 Project / Site name: Gellinudd Care Home
 Your Order No: 19183

Lab Sample Number				210635	210636	210637	210638	210639
Sample Reference				TP01	TP02	TP03	TP03	TP03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.15-0.25	0.60-0.70	0.10-0.20	0.60-0.70	0.90-1.00
Date Sampled				21/05/2024	21/05/2024	21/05/2024	21/05/2024	21/05/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	8.9	62	22	9
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.35	0.33	0.62	0.52	0.82
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.2	< 0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	19	16	19	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25	7.6	110	29	17
Lead (aqua regia extractable)	mg/kg	1	MCERTS	83	9	89	46	12
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	14	22	18	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1	< 1.0	1.4	< 1.0	1.3
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	17	24	28	19	25
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	100	28	200	72	49

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



Analytical Report Number : 24-021715

Project / Site name: Gellinudd Care Home

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
210635	TP01	None Supplied	0.15-0.25	Brown sand with vegetation and stones
210636	TP02	None Supplied	0.60-0.70	Brown sandy clay
210637	TP03	None Supplied	0.10-0.20	Brown sand with vegetation
210638	TP03	None Supplied	0.60-0.70	Brown sand with gravel
210639	TP03	None Supplied	0.90-1.00	Brown sand with gravel and stones

Analytical Report Number : 24-021715
Project / Site name: Gellinudd Care Home

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

T&P Regeneration
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Analytical Report Number : 24-021715

Replaces Analytical Report Number: 24-021715, issue no. 1
Additional analysis undertaken.
Asbestos screen added to samples 210635 & 210638 as per clients request

Project / Site name:	Gellinudd Care Home	Samples received on:	24/05/2024
Your job number:	P1188	Samples instructed on/ Analysis started on:	28/05/2024
Your order number:	19183	Analysis completed by:	21/06/2024
Report Issue Number:	2	Report issued on:	26/06/2024
Samples Analysed:	5 soil samples		

Signed: 

Joanna Szwagrak
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

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soils - 4 weeks from reporting
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Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 24-021715
Project / Site name: Gellinudd Care Home
Your Order No: 19183

Lab Sample Number	210635	210636	210637	210638	210639
Sample Reference	TP01	TP02	TP03	TP03	TP03
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.15-0.25	0.60-0.70	0.10-0.20	0.60-0.70	0.90-1.00
Date Sampled	21/05/2024	21/05/2024	21/05/2024	21/05/2024	21/05/2024
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Stone Content	%	0.1	NONE	36.6	< 0.1	< 0.1	< 0.1	2
Moisture Content	%	0.01	NONE	7.4	19	16	9	11
Total mass of sample received	kg	0.1	NONE	0.5	0.4	0.4	0.5	0.2

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	-	-	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	KWB	-	-	KWB	-

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.2	7.5	7.9	8.2	7.9
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	21	36	12	16	44
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	10.6	17.9	5.91	7.76	22
Organic Matter (automated)	%	0.1	MCERTS	3.4	1.1	4.9	2.7	0.8
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2	0.6	2.8	1.5	0.4

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.12	0.2	0.12
Acenaphthylene	mg/kg	0.05	MCERTS	0.12	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.13	0.12	0.51	0.58	0.82
Fluorene	mg/kg	0.05	MCERTS	0.18	0.12	0.57	0.61	0.85
Phenanthrene	mg/kg	0.05	MCERTS	1	1.1	5.5	5.8	8.8
Anthracene	mg/kg	0.05	MCERTS	0.23	0.25	1.3	1.3	2.1
Fluoranthene	mg/kg	0.05	MCERTS	2.2	1.1	5.4	6.3	9.8
Pyrene	mg/kg	0.05	MCERTS	1.9	0.94	4.6	5.3	8.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.1	0.45	2	2.4	3.9
Chrysene	mg/kg	0.05	MCERTS	1.3	0.5	2.5	2.6	4.2
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	1.6	0.45	2.1	2.2	3.9
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.57	0.19	< 0.05	1.1	1.5
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.1	0.4	2	2.1	3.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.85	0.19	0.94	1.1	1.7
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.27	< 0.05	0.27	0.28	0.46
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.9	0.21	0.99	1.2	1.8

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	13.4	6.08	28.7	33.1	51.7
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Analytical Report Number: 24-021715
 Project / Site name: Gellinudd Care Home
 Your Order No: 19183

Lab Sample Number	210635	210636	210637	210638	210639
Sample Reference	TP01	TP02	TP03	TP03	TP03
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.15-0.25	0.60-0.70	0.10-0.20	0.60-0.70	0.90-1.00
Date Sampled	21/05/2024	21/05/2024	21/05/2024	21/05/2024	21/05/2024
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	8.9	62	22	9
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.35	0.33	0.62	0.52	0.82
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.2	< 0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	19	16	19	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25	7.6	110	29	17
Lead (aqua regia extractable)	mg/kg	1	MCERTS	83	9	89	46	12
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	14	22	18	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1	< 1.0	1.4	< 1.0	1.3
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	17	24	28	19	25
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	100	28	200	72	49

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 24-021715
Project / Site name: Gellinudd Care Home

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
210635	TP01	None Supplied	0.15-0.25	Brown sand with vegetation and stones
210636	TP02	None Supplied	0.60-0.70	Brown sandy clay
210637	TP03	None Supplied	0.10-0.20	Brown sand with vegetation
210638	TP03	None Supplied	0.60-0.70	Brown sand with gravel
210639	TP03	None Supplied	0.90-1.00	Brown sand with gravel and stones

Analytical Report Number : 24-021715
Project / Site name: Gellinudd Care Home

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS
Asbestos types if id possitive	In-house method	In-house method		D	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

End Use Scenario	SOM	Code	(All)
Public open space - Residential	1.0%	Code2	(All)
		St. Ref	(All)

P1188
HUMAN HEALTH
ASSESSMENT



Min	Max	Count	No. of	Screen	Location ID			TP01	TP02	TP03		
Value	Value	Values	Exceed	Level	Depth Top and Base (m)			0.15	0.6	0.1	0.6	0.9
(mg/kg)	(mg/kg)		-	(mg/kg)	Ref.	Group	Contaminant Reported	0.25	0.7	0.2	0.7	1
8.90	62.00	5	-	79	1.01	Heavy Metals	Arsenic	13.00	8.90	62.00	22.00	9.00
0.33	0.82	5	-	2.2	1.02	Heavy Metals	Beryllium	0.35	0.33	0.62	0.52	0.82
0.20	0.20	5	-	220	1.03	Heavy Metals	Cadmium	0.20	0.20	0.20	0.20	0.20
16.00	20.00	5	-	1500	1.04	Heavy Metals	Chromium	20.00	19.00	16.00	19.00	18.00
9.00	89.00	5	-	630	1.05	Heavy Metals	Lead	83.00	9.00	89.00	46.00	12.00
0.30	0.30	5	-	120	1.06	Heavy Metals	Mercury	0.30	0.30	0.30	0.30	0.30
14.00	24.00	5	-	230	1.07	Heavy Metals	Nickel	16.00	14.00	22.00	18.00	24.00
1.00	1.40	5	-	1100	1.08	Heavy Metals	Selenium	1.00	1.00	1.40	1.00	1.30
17.00	28.00	5	-	2000	1.09	Heavy Metals	Vanadium	17.00	24.00	28.00	19.00	25.00
0.20	0.20	5	-	21000	2.01	Inorganics	Water Soluble Boron	0.20	0.20	0.20	0.20	0.20
1.80	1.80	5	-	21	2.02	Inorganics	Hexavalent Chromium	1.80	1.80	1.80	1.80	1.80
7.60	110.00	5	-	12000	3.01	Phytotoxic Metals	Copper	25.00	7.60	110.00	29.00	17.00
28.00	200.00	5	-	81000	3.02	Phytotoxic Metals	Zinc	100.00	28.00	200.00	72.00	49.00
1.00	1.00	5	-	760	4.01	Phenols	Phenol	1.00	1.00	1.00	1.00	1.00
0.05	0.20	5	-	11000	5.01	PAHs	Naphthalene	0.05	0.05	0.12	0.20	0.12
0.05	0.12	5	-	15000	5.02	PAHs	Acenaphthylene	0.12	0.05	0.05	0.05	0.05
0.12	0.82	5	-	15000	5.03	PAHs	Acenaphthene	0.13	0.12	0.51	0.58	0.82
0.12	0.85	5	-	9900	5.04	PAHs	Fluorene	0.18	0.12	0.57	0.61	0.85
1.00	8.80	5	-	3100	5.05	PAHs	Phenanthrene	1.00	1.10	5.50	5.80	8.80
0.23	2.10	5	-	74000	5.06	PAHs	Anthracene	0.23	0.25	1.30	1.30	2.10
1.10	9.80	5	-	3100	5.07	PAHs	Fluoranthene	2.20	1.10	5.40	6.30	9.80
0.94	8.30	5	-	7400	5.08	PAHs	Pyrene	1.90	0.94	4.60	5.30	8.30
0.45	3.90	5	-	29	5.09	PAHs	Benzo[a]anthracene	1.10	0.45	2.00	2.40	3.90
0.50	4.20	5	-	57	5.10	PAHs	Chrysene	1.30	0.50	2.50	2.60	4.20
0.45	3.90	5	-	7.1	5.11	PAHs	Benzo[b]fluoranthene	1.60	0.45	2.10	2.20	3.90
0.05	1.50	5	-	190	5.12	PAHs	Benzo[k]fluoranthene	0.57	0.19	0.05	1.10	1.50
0.40	3.50	5	-	10	5.13	PAHs	Benzo[a]pyrene	1.10	0.40	2.00	2.10	3.50
0.19	1.70	5	-	82	5.14	PAHs	Indeno[1,2,3-cd]pyrene	0.85	0.19	0.94	1.10	1.70
0.05	0.46	5	-	0.57	5.15	PAHs	Dibenz[a,h]anthracene	0.27	0.05	0.27	0.28	0.46
0.21	1.80	5	-	640	5.16	PAHs	Benzo[ghi]perylene	0.90	0.21	0.99	1.20	1.80

End Use Scenario
Phytotoxic

Code	(All)
Code2	(All)
St. Ref	(All)

P1188

PHYTOTOXIC

REPORT



Min Value	Max Value	Count Values	No. of Exceed - ances	Screen Level	Location ID			TP01	TP02	TP03			
					Depth Top and Base			0.15	0.6	0.1	0.6	0.9	
					Ref.	Group	Contaminant Reported	0.25	0.7	0.2	0.7	1	
0.20	0.20	5	-	8	1.03	Heavy Metals	Cadmium	0.20	0.20	0.20	0.20	0.20	
16.00	20.00	5	-	154	1.04	Heavy Metals	Chromium	20.00	19.00	16.00	19.00	18.00	
0.30	0.30	5	-	28	1.06	Heavy Metals	Mercury	0.30	0.30	0.30	0.30	0.30	
14.00	24.00	5	-	70	1.07	Heavy Metals	Nickel	16.00	14.00	22.00	18.00	24.00	
1.00	1.40	5	-	10	1.08	Heavy Metals	Selenium	1.00	1.00	1.40	1.00	1.30	
0.20	0.20	5	-	3	2.01	Inorganics	Water Soluble Boron	0.20	0.20	0.20	0.20	0.20	
7.60	110.00	5	-	130	3.01	Phytotoxic Metals	Copper	25.00	7.60	110.00	29.00	17.00	
28.00	200.00	5	-	300	3.02	Phytotoxic Metals	Zinc	100.00	28.00	200.00	72.00	49.00	

Geology Code	(All)
Geology Code2	(All)
Stratum Reference	(All)

P1188
NO ASBESTOS TESTING
RESULTS AVAILABLE



Appendix F – Gas Monitoring Records

GAS MONITORING RECORD

Job No: CC-J-1206
Visit No: 1 of 6
Operator: YM
Project Manager: JO

[illegible]

ND - Not detected

METEOROLOGICAL AND SITE INFORMATION:

State of ground:	Dry	Moist	Wet	Frozen
Wind:	Calm	Light	Moderate	
Cloud cover:	None	Slight	Cloudy	
Precipitation:	None	Slight	Moderate	
Time monitoring performed:	Start	10:30	End	12:30
Barometric pressure (mbar):	Start	1016	End	1016
Pressure trend (preceding 3 days):	Falling	Steady	Rising	
Air temperature (degrees C):	Before	15	After	15

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter:	Geotech G5000 - G506276			
Gas range:	CH ₄	0 - 100%	CO ₂ :	0 - 100%
	H ₂ S	0 - 50ppm	CO:	0 -500ppm
Gas flow range:	0-200 l/hr			
Date of last calibration:	14/06/2024			
Date of next calibration:	14/06/2025			

PID:	Mini Rae Lite
Calibrated range:	0-99 ppm
Calibration gas:	Isobutylene
Response time:	2 seconds
Accuracy:	0.1 ppm
Date of last calibration:	26/10/2023
Date of next calibration:	01/11/2024

GAS MONITORING RECORD

Job No: CC-J-1206
Visit No: 2 of 6
Operator: YM
Project Manager: JO

[illegible]

ND - Not detected

METEOROLOGICAL AND SITE INFORMATION:

State of ground:	Dry	Moist	Wet	Frozen
Wind:	Calm	Light	Moderate	
Cloud cover:	None	Slight	Cloudy	
Precipitation:	None	Slight	Moderate	
Time monitoring performed:	Start	15:00	End	16:00
Barometric pressure (mbar):	Start	987	End	987
Pressure trend (preceding 3 days):	Falling	Steady	Rising	
Air temperature (degrees C):	Before	13	After	13

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground Gas meter:	Geotech G5000 - G506276		
Gas range:	CH₄	0 - 100%	CO₂: 0 - 100%
	H₂S	0 - 50ppm	CO: 0 -500ppm
Gas flow range:	0-200 l/hr		
Date of last calibration:	14/06/2024		
Date of next calibration:	14/06/2025		

PID:	Mini Rae Lite
Calibrated range:	0-99 ppm
Calibration gas:	Isobutylene
Response time:	2 seconds
Accuracy:	0.1 ppm
Date of last calibration:	26/10/2023
Date of next calibration:	01/11/2024

GAS MONITORING RECORD

Client: Rhodos Properties (No 14) Ltd
Site: Gellinudd Care Home
Date: 30/06/2024

Job No: CC-J-1206
Visit No: 3 of 6
Operator: YM
Project Manager: JO

[illegible]

ND - Not detected

METEOROLOGICAL AND SITE INFORMATION:

State of ground:	Dry	Moist	Wet	Frozen
Wind:	Calm	Light	Moderate	
Cloud cover:	None	Slight	Cloudy	
Precipitation:	None	Slight	Moderate	
Time monitoring performed:	Start	15:00	End	16:00
Barometric pressure (mbar):	Start	10:03	End	10:03
Pressure trend (preceding 3 days):	Falling	Steady	Rising	
Air temperature (degree C):	Before		After	

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter:	Geotech G5000 - G506276			
Gas range:	CH₄	0 - 100%	CO₂:	0 - 100%
	H₂S	0 - 50ppm	CO:	0 -500ppm
Gas flow range:	0-200 l/hr			
Date of last calibration:	14/06/2024			
Date of next calibration:	14/06/2025			

PID:	Mini Rae Lite
Calibrated range:	0-99 ppm
Calibration gas:	Isobutylene
Response time:	2 seconds
Accuracy:	0.1 ppm
Date of last calibration:	26/10/2023
Date of next calibration:	01/11/2024

GAS MONITORING RECORD

Job No: CC-J-1206
Visit No: 4 of 6
Operator: YM
Project Manager: JO

[illegible]

ND - Not detected

METEOROLOGICAL AND SITE INFORMATION:

State of ground:	Dry	Moist	Wet	Frozen
Wind:	Calm	Light	Moderate	
Cloud cover:	None	Slight	Cloudy	
Precipitation:	None	Slight	Moderate	
Time monitoring performed:	Start	15:00	End	16:00
Barometric pressure (mbar):	Start	998	End	998
Pressure trend (preceding 3 days):	Falling	Steady	Rising	
Air temperature (degrees C):	Before		After	

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground Gas meter:	Geotech G5000 - G506276		
Gas range:	CH₄	0 - 100%	CO₂: 0 - 100%
	H₂S	0 - 50ppm	CO: 0 -500ppm
Gas flow range:	0-200 l/hr		
Date of last calibration:	14/06/2024		
Date of next calibration:	14/06/2025		

PID:	Mini Rae Lite
Calibrated range:	0-99 ppm
Calibration gas:	Isobutylene
Response time:	2 seconds
Accuracy:	0.1 ppm
Date of last calibration:	26/10/2023
Date of next calibration:	01/11/2024

GAS MONITORING RECORD

Job No: CC-J-1206
Visit No: 5 of 6
Operator: YM
Project Manager: JO

[illegible]

ND - Not detected

METEOROLOGICAL AND SITE INFORMATION:

State of ground:	Dry	Moist	Wet	Frozen
Wind:	Calm	Light	Moderate	
Cloud cover:	None	Slight	Cloudy	
Precipitation:	None	Slight	Moderate	
Time monitoring performed:	Start	15:00	End	16:00
Barometric pressure (mbar):	Start	1001	End	1001
Pressure trend (preceding 3 days):	Falling	Steady	Rising	
Air temperature (degrees C):	Before		After	

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter:	Geotech GS000 - G506276		
Gas range:	CH₄	0 - 100%	CO₂: 0 - 100%
	H₂S	0 - 50ppm	CO: 0 -500ppm
Gas flow range:	0-200 l/hr		
Date of last calibration:	14/06/2024		
Date of next calibration:	14/06/2025		

PID:	Mini Rae Lite
Calibrated range:	0-99 ppm
Calibration gas:	Isobutylene
Response time:	2 seconds
Accuracy:	0.1 ppm
Date of last calibration:	26/10/2023
Date of next calibration:	01/11/2024

GAS MONITORING RECORD

Job No: CC-J-1206
Visit No: 6 of 6
Operator: YM
Project Manager: JO

[illegible]

ND - Not detected

METEOROLOGICAL AND SITE INFORMATION:

State of ground:	Dry	Moist	Wet	Frozen
Wind:	Calm	Light	Moderate	
Cloud cover:	None	Slight	Cloudy	
Precipitation:	None	Slight	Moderate	
Time monitoring performed:	Start	15:00	End	16:00
Barometric pressure (mbar):	Start	1004	End	1004
Pressure trend (preceding 3 days):	Falling	Steady	Rising	
Air temperature (degrees C):	Before		After	

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground Gas meter:	Geotech G5000 - G506276		
Gas range:	CH₄	0 - 100%	CO₂: 0 - 100%
	H₂S	0 - 50ppm	CO: 0 -500ppm
Gas flow range:	0-200 l/hr		
Date of last calibration:	14/06/2024		
Date of next calibration:	14/06/2025		

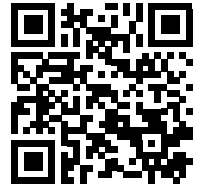
PID:	Mini Rae Lite
Calibrated range:	0-99 ppm
Calibration gas:	Isobutylene
Response time:	2 seconds
Accuracy:	0.1 ppm
Date of last calibration:	26/10/2023
Date of next calibration:	01/11/2024

Appendix G – HazWaste Report

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



18Q7A-ARJQ2-VIL5O

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Job name

Gellinudd Car Home

Description/Comments

Project

P1188/CC-1206

Site

Gellinudd Car Home

Classified by

Name: **Matthew Carr**
 Date: **18 Jun 2024 10:00 GMT**
 Telephone: **0117 927 7756**
 Company: **T&P Regeneration Ltd**
Unit 5, Septimus
Hawkfield Business Park
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BS14 0BN

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

CERTIFIED

Course

Hazardous Waste Classification

Date

09 Dec 2021

Next 3 year Refresher due by Dec 2024

Purpose of classification

2 - Material Characterisation

Address of the waste

Gellinudd Care Home

Post Code SA8 3DX

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Development of site.

Description of the specific process, sub-process and/or activity that created the waste

Waste created during the excavation of soils for development.

Description of the waste

Made ground and natural clay.

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	TP01--21052024-0.15		Non Hazardous		3
2	TP02--21052024-0.60		Non Hazardous		5
3	TP03--21052024-0.10		Non Hazardous		7
4	TP03--21052024-0.60		Non Hazardous		9
5	TP03--21052024-0.90		Non Hazardous		11

Related documents

#	Name	Description
1	24-021715_HWOL.hwol	i2 Analytical .hwol file used to populate the Job

Report

Created by: Matthew Carr

Created date: 18 Jun 2024 10:00 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	13
Appendix B: Rationale for selection of metal species	14
Appendix C: Version	15

Classification of sample: TP01--21052024-0.15

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP01--21052024-0.15	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
7.4%	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 7.4% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	monohydric phenols		P1186		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
2	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<LOD
	024-017-00-8									
3	pH		PH		8.2 pH		8.2 pH	8.2 pH		
4	boron { diboron trioxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
5	arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }			1	13 mg/kg		12.038 mg/kg	0.0012 %	✓	
	033-002-00-5									
6	beryllium { beryllium chloride }				0.35 mg/kg	8.868	2.874 mg/kg	0.000287 %	✓	
			7787-47-5							
7	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
	048-001-00-5									
8	copper { copper(II) carbonate – copper(II) hydroxide (1:1) }				25 mg/kg	1.74	40.276 mg/kg	0.00403 %	✓	
	029-020-00-8	235-113-6	12069-69-1							
9	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
	080-002-00-6									
10	nickel { nickel sulfide }				16 mg/kg	1.546	22.91 mg/kg	0.00229 %	✓	
	028-006-00-9	240-841-2 [1] 234-349-7 [2] - [3]	16812-54-7 [1] 11113-75-0 [2] 1314-04-1 [3]							
11	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	83 mg/kg		76.858 mg/kg	0.00769 %	✓	
	082-001-00-6									

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
12		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				1	mg/kg	1.405	1.301	mg/kg	0.00013 %	✓	
		034-002-00-8											
13		vanadium { divanadium pentaoxide; vanadium pentoxide }				17	mg/kg	1.785	28.102	mg/kg	0.00281 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
14		zinc { zinc sulphate }				100	mg/kg	2.469	228.657	mg/kg	0.0229 %	✓	
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
15		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
16		acenaphthylene				0.12	mg/kg		0.111	mg/kg	0.0000111 %	✓	
			205-917-1	208-96-8									
17		acenaphthene				0.13	mg/kg		0.12	mg/kg	0.000012 %	✓	
			201-469-6	83-32-9									
18		fluorene				0.18	mg/kg		0.167	mg/kg	0.0000167 %	✓	
			201-695-5	86-73-7									
19		phenanthrene				1	mg/kg		0.926	mg/kg	0.0000926 %	✓	
			201-581-5	85-01-8									
20		anthracene				0.23	mg/kg		0.213	mg/kg	0.0000213 %	✓	
			204-371-1	120-12-7									
21		fluoranthene				2.2	mg/kg		2.037	mg/kg	0.000204 %	✓	
			205-912-4	206-44-0									
22		pyrene				1.9	mg/kg		1.759	mg/kg	0.000176 %	✓	
			204-927-3	129-00-0									
23		benzo[a]anthracene				1.1	mg/kg		1.019	mg/kg	0.000102 %	✓	
		601-033-00-9	200-280-6	56-55-3									
24		chrysene				1.3	mg/kg		1.204	mg/kg	0.00012 %	✓	
		601-048-00-0	205-923-4	218-01-9									
25		benzo[a]pyrene; benzo[def]chrysene				1.1	mg/kg		1.019	mg/kg	0.000102 %	✓	
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				0.85	mg/kg		0.787	mg/kg	0.0000787 %	✓	
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				0.27	mg/kg		0.25	mg/kg	0.000025 %	✓	
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				0.9	mg/kg		0.833	mg/kg	0.0000833 %	✓	
			205-883-8	191-24-2									
29		chromium in chromium(III) compounds {  chromium(III) oxide (worst case) }				20	mg/kg	1.462	29.231	mg/kg	0.00292 %		
			215-160-9	1308-38-9									
30		benzo[bk]fluoranthene				2.17	mg/kg		2.009	mg/kg	0.000201 %	✓	
			[1] 205-911-9 [2] 205-916-6	[1] 205-99-2 [2] 207-08-9									
Total:											0.0461 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP02--21052024-0.60

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP02--21052024-0.60	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
19%	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 19% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	monohydric phenols				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
			P1186							
2	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<LOD
	024-017-00-8									
3	pH				7.5 pH		7.5 pH	7.5 pH		
			PH							
4	boron { diboron trioxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
5	arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }			1	8.9 mg/kg		7.209 mg/kg	0.000721 %	✓	
	033-002-00-5									
6	beryllium { beryllium chloride }				0.33 mg/kg	8.868	2.37 mg/kg	0.000237 %	✓	
			7787-47-5							
7	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
	048-001-00-5									
8	copper { copper(II) carbonate – copper(II) hydroxide (1:1) }				7.6 mg/kg	1.74	10.71 mg/kg	0.00107 %	✓	
	029-020-00-8	235-113-6	12069-69-1							
9	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
	080-002-00-6									
10	nickel { nickel sulfide }				14 mg/kg	1.546	17.535 mg/kg	0.00175 %	✓	
	028-006-00-9	240-841-2 [1] 234-349-7 [2] - [3]	16812-54-7 [1] 11113-75-0 [2] 1314-04-1 [3]							
11	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	9 mg/kg		7.29 mg/kg	0.000729 %	✓	
	082-001-00-6									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
	034-002-00-8										
13	vanadium { divanadium pentaoxide; vanadium pentoxide }				24 mg/kg	1.785	34.704 mg/kg	0.00347 %		✓	
	023-001-00-8	215-239-8	1314-62-1								
14	zinc { zinc sulphate }				28 mg/kg	2.469	56.004 mg/kg	0.0056 %		✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
15	naphthalene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
16	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		205-917-1	208-96-8								
17	acenaphthene				0.12 mg/kg		0.0972 mg/kg	0.00000972 %		✓	
		201-469-6	83-32-9								
18	fluorene				0.12 mg/kg		0.0972 mg/kg	0.00000972 %		✓	
		201-695-5	86-73-7								
19	phenanthrene				1.1 mg/kg		0.891 mg/kg	0.0000891 %		✓	
		201-581-5	85-01-8								
20	anthracene				0.25 mg/kg		0.203 mg/kg	0.0000203 %		✓	
		204-371-1	120-12-7								
21	fluoranthene				1.1 mg/kg		0.891 mg/kg	0.0000891 %		✓	
		205-912-4	206-44-0								
22	pyrene				0.94 mg/kg		0.761 mg/kg	0.0000761 %		✓	
		204-927-3	129-00-0								
23	benzo[a]anthracene				0.45 mg/kg		0.365 mg/kg	0.0000365 %		✓	
	601-033-00-9	200-280-6	56-55-3								
24	chrysene				0.5 mg/kg		0.405 mg/kg	0.0000405 %		✓	
	601-048-00-0	205-923-4	218-01-9								
25	benzo[a]pyrene; benzo[def]chrysene				0.4 mg/kg		0.324 mg/kg	0.0000324 %		✓	
	601-032-00-3	200-028-5	50-32-8								
26	indeno[123-cd]pyrene				0.19 mg/kg		0.154 mg/kg	0.0000154 %		✓	
		205-893-2	193-39-5								
27	dibenz[a,h]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
28	benzo[ghi]perylene				0.21 mg/kg		0.17 mg/kg	0.000017 %		✓	
		205-883-8	191-24-2								
29	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				19 mg/kg	1.462	27.77 mg/kg	0.00278 %			
		215-160-9	1308-38-9								
30	benzo[bk]fluoranthene				0.64 mg/kg		0.518 mg/kg	0.0000518 %		✓	
		[1] 205-911-9 [2] 205-916-6	[1] 205-99-2 [2] 207-08-9								
Total:									0.0176 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP03--21052024-0.10

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP03--21052024-0.10	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
16%	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	monohydric phenols				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
			P1186							
2	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<LOD
	024-017-00-8									
3	pH				7.9 pH		7.9 pH	7.9 pH		
			PH							
4	boron { diboron trioxide }				0.2 mg/kg	3.22	0.541 mg/kg	0.0000541 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
5	arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }			1	62 mg/kg		52.08 mg/kg	0.00521 %	✓	
	033-002-00-5									
6	beryllium { beryllium chloride }				0.62 mg/kg	8.868	4.618 mg/kg	0.000462 %	✓	
			7787-47-5							
7	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
	048-001-00-5									
8	copper { copper(II) carbonate – copper(II) hydroxide (1:1) }				110 mg/kg	1.74	160.757 mg/kg	0.0161 %	✓	
	029-020-00-8	235-113-6	12069-69-1							
9	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
	080-002-00-6									
10	nickel { nickel sulfide }				22 mg/kg	1.546	28.576 mg/kg	0.00286 %	✓	
	028-006-00-9	240-841-2 [1] 234-349-7 [2] - [3]	16812-54-7 [1] 11113-75-0 [2] 1314-04-1 [3]							
11	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	89 mg/kg		74.76 mg/kg	0.00748 %	✓	
	082-001-00-6									

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
12		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				1.4	mg/kg	1.405	1.652	mg/kg	0.000165 %	✓	
		034-002-00-8											
13		vanadium { divanadium pentaoxide; vanadium pentoxide }				28	mg/kg	1.785	41.988	mg/kg	0.0042 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
14		zinc { zinc sulphate }				200	mg/kg	2.469	414.842	mg/kg	0.0415 %	✓	
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
15		naphthalene				0.12	mg/kg		0.101	mg/kg	0.0000101 %	✓	
		601-052-00-2	202-049-5	91-20-3									
16		acenaphthylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-917-1	208-96-8									
17		acenaphthene				0.51	mg/kg		0.428	mg/kg	0.0000428 %	✓	
			201-469-6	83-32-9									
18		fluorene				0.57	mg/kg		0.479	mg/kg	0.0000479 %	✓	
			201-695-5	86-73-7									
19		phenanthrene				5.5	mg/kg		4.62	mg/kg	0.000462 %	✓	
			201-581-5	85-01-8									
20		anthracene				1.3	mg/kg		1.092	mg/kg	0.000109 %	✓	
			204-371-1	120-12-7									
21		fluoranthene				5.4	mg/kg		4.536	mg/kg	0.000454 %	✓	
			205-912-4	206-44-0									
22		pyrene				4.6	mg/kg		3.864	mg/kg	0.000386 %	✓	
			204-927-3	129-00-0									
23		benzo[a]anthracene				2	mg/kg		1.68	mg/kg	0.000168 %	✓	
		601-033-00-9	200-280-6	56-55-3									
24		chrysene				2.5	mg/kg		2.1	mg/kg	0.00021 %	✓	
		601-048-00-0	205-923-4	218-01-9									
25		benzo[a]pyrene; benzo[def]chrysene				2	mg/kg		1.68	mg/kg	0.000168 %	✓	
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				0.94	mg/kg		0.79	mg/kg	0.000079 %	✓	
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				0.27	mg/kg		0.227	mg/kg	0.0000227 %	✓	
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				0.99	mg/kg		0.832	mg/kg	0.0000832 %	✓	
			205-883-8	191-24-2									
29		chromium in chromium(III) compounds {  chromium(III) oxide (worst case) }				16	mg/kg	1.462	23.385	mg/kg	0.00234 %		
			215-160-9	1308-38-9									
30		benzo[bk]fluoranthene				2.1	mg/kg		1.764	mg/kg	0.000176 %	✓	
			[1] 205-911-9 [2] 205-916-6	[1] 205-99-2 [2] 207-08-9									
Total:											0.0833 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP03--21052024-0.60

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP03--21052024-0.60	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
9%	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 9% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	monohydric phenols				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
			P1186							
2	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<LOD
	024-017-00-8									
3	pH				8.2 pH		8.2 pH	8.2 pH		
			PH							
4	boron { diboron trioxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
5	arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }			1	22 mg/kg		20.02 mg/kg	0.002 %	✓	
	033-002-00-5									
6	beryllium { beryllium chloride }				0.52 mg/kg	8.868	4.196 mg/kg	0.00042 %	✓	
			7787-47-5							
7	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
	048-001-00-5									
8	copper { copper(II) carbonate – copper(II) hydroxide (1:1) }				29 mg/kg	1.74	45.913 mg/kg	0.00459 %	✓	
	029-020-00-8	235-113-6	12069-69-1							
9	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
	080-002-00-6									
10	nickel { nickel sulfide }				18 mg/kg	1.546	25.329 mg/kg	0.00253 %	✓	
	028-006-00-9	240-841-2 [1] 234-349-7 [2] - [3]	16812-54-7 [1] 11113-75-0 [2] 1314-04-1 [3]							
11	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	46 mg/kg		41.86 mg/kg	0.00419 %	✓	
	082-001-00-6									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg		<0.000141 %		<LOD
	034-002-00-8										
13	vanadium { divanadium pentaoxide; vanadium pentoxide }				19 mg/kg	1.785	30.866 mg/kg		0.00309 %	✓	
	023-001-00-8	215-239-8	1314-62-1								
14	zinc { zinc sulphate }				72 mg/kg	2.469	161.788 mg/kg		0.0162 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
15	naphthalene				0.2 mg/kg		0.182 mg/kg		0.0000182 %	✓	
	601-052-00-2	202-049-5	91-20-3								
16	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg		<0.000005 %		<LOD
		205-917-1	208-96-8								
17	acenaphthene				0.58 mg/kg		0.528 mg/kg		0.0000528 %	✓	
		201-469-6	83-32-9								
18	fluorene				0.61 mg/kg		0.555 mg/kg		0.0000555 %	✓	
		201-695-5	86-73-7								
19	phenanthrene				5.8 mg/kg		5.278 mg/kg		0.000528 %	✓	
		201-581-5	85-01-8								
20	anthracene				1.3 mg/kg		1.183 mg/kg		0.000118 %	✓	
		204-371-1	120-12-7								
21	fluoranthene				6.3 mg/kg		5.733 mg/kg		0.000573 %	✓	
		205-912-4	206-44-0								
22	pyrene				5.3 mg/kg		4.823 mg/kg		0.000482 %	✓	
		204-927-3	129-00-0								
23	benzo[a]anthracene				2.4 mg/kg		2.184 mg/kg		0.000218 %	✓	
	601-033-00-9	200-280-6	56-55-3								
24	chrysene				2.6 mg/kg		2.366 mg/kg		0.000237 %	✓	
	601-048-00-0	205-923-4	218-01-9								
25	benzo[a]pyrene; benzo[def]chrysene				2.1 mg/kg		1.911 mg/kg		0.000191 %	✓	
	601-032-00-3	200-028-5	50-32-8								
26	indeno[123-cd]pyrene				1.1 mg/kg		1.001 mg/kg		0.0001 %	✓	
		205-893-2	193-39-5								
27	dibenz[a,h]anthracene				0.28 mg/kg		0.255 mg/kg		0.0000255 %	✓	
	601-041-00-2	200-181-8	53-70-3								
28	benzo[ghi]perylene				1.2 mg/kg		1.092 mg/kg		0.000109 %	✓	
		205-883-8	191-24-2								
29	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				19 mg/kg	1.462	27.77 mg/kg		0.00278 %		
		215-160-9	1308-38-9								
30	benzo[bk]fluoranthene				3.3 mg/kg		3.003 mg/kg		0.0003 %	✓	
		[1] 205-911-9 [2] 205-916-6	[1] 205-99-2 [2] 207-08-9								
Total:									0.0396 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP03--21052024-0.90

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP03--21052024-0.90	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
11%	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	monohydric phenols				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
			P1186							
2	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<LOD
	024-017-00-8									
3	pH				7.9 pH		7.9 pH	7.9 pH		
			PH							
4	boron { diboron trioxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
5	arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }			1	9 mg/kg		8.01 mg/kg	0.000801 %	✓	
	033-002-00-5									
6	beryllium { beryllium chloride }				0.82 mg/kg	8.868	6.472 mg/kg	0.000647 %	✓	
			7787-47-5							
7	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
	048-001-00-5									
8	copper { copper(II) carbonate – copper(II) hydroxide (1:1) }				17 mg/kg	1.74	26.323 mg/kg	0.00263 %	✓	
	029-020-00-8	235-113-6	12069-69-1							
9	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
	080-002-00-6									
10	nickel { nickel sulfide }				24 mg/kg	1.546	33.029 mg/kg	0.0033 %	✓	
	028-006-00-9	240-841-2 [1] 234-349-7 [2] - [3]	16812-54-7 [1] 11113-75-0 [2] 1314-04-1 [3]							
11	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	12 mg/kg		10.68 mg/kg	0.00107 %	✓	
	082-001-00-6									

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
12		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				1.3	mg/kg	1.405	1.626	mg/kg	0.000163 %	✓	
		034-002-00-8											
13		vanadium { divanadium pentaoxide; vanadium pentoxide }				25	mg/kg	1.785	39.72	mg/kg	0.00397 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
14		zinc { zinc sulphate }				49	mg/kg	2.469	107.686	mg/kg	0.0108 %	✓	
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
15		naphthalene				0.12	mg/kg		0.107	mg/kg	0.0000107 %	✓	
		601-052-00-2	202-049-5	91-20-3									
16		acenaphthylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-917-1	208-96-8									
17		acenaphthene				0.82	mg/kg		0.73	mg/kg	0.000073 %	✓	
			201-469-6	83-32-9									
18		fluorene				0.85	mg/kg		0.757	mg/kg	0.0000757 %	✓	
			201-695-5	86-73-7									
19		phenanthrene				8.8	mg/kg		7.832	mg/kg	0.000783 %	✓	
			201-581-5	85-01-8									
20		anthracene				2.1	mg/kg		1.869	mg/kg	0.000187 %	✓	
			204-371-1	120-12-7									
21		fluoranthene				9.8	mg/kg		8.722	mg/kg	0.000872 %	✓	
			205-912-4	206-44-0									
22		pyrene				8.3	mg/kg		7.387	mg/kg	0.000739 %	✓	
			204-927-3	129-00-0									
23		benzo[a]anthracene				3.9	mg/kg		3.471	mg/kg	0.000347 %	✓	
		601-033-00-9	200-280-6	56-55-3									
24		chrysene				4.2	mg/kg		3.738	mg/kg	0.000374 %	✓	
		601-048-00-0	205-923-4	218-01-9									
25		benzo[a]pyrene; benzo[def]chrysene				3.5	mg/kg		3.115	mg/kg	0.000312 %	✓	
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				1.7	mg/kg		1.513	mg/kg	0.000151 %	✓	
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				0.46	mg/kg		0.409	mg/kg	0.0000409 %	✓	
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				1.8	mg/kg		1.602	mg/kg	0.00016 %	✓	
			205-883-8	191-24-2									
29		chromium in chromium(III) compounds {  chromium(III) oxide (worst case) }				18	mg/kg	1.462	26.308	mg/kg	0.00263 %		
			215-160-9	1308-38-9									
30		benzo[bk]fluoranthene				5.4	mg/kg		4.806	mg/kg	0.000481 %	✓	
			[1] 205-911-9 [2] 205-916-6	[1] 205-99-2 [2] 207-08-9									
Total:											0.0312 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non GB MCL determinands

monohydric phenols (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)

Data source: CLP combined data

Data source date: 26 Mar 2019

Hazard Statements: Muta. 2; H341, Acute Tox. 3; H331, Acute Tox. 3; H311, Acute Tox. 3; H301, STOT RE 2; H373, Skin Corr. 1B; H314, Skin Corr. 1B; H314 >= 3 %, Skin Irrit. 2; H315 1 <= conc. < 3 %, Eye Irrit. 2; H319 1 <= conc. < 3 %, Aquatic Chronic 2; H411

pH (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

arsenic compounds, with the exception of those specified elsewhere in this Annex

GB MCL index number: 033-002-00-5

Description/Comments: Worst Case: IARC considers arsenic compounds Group 1; Carcinogenic to humans

Additional Hazard Statement(s): Carc. 1A; H350

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

beryllium chloride (CAS Number: 7787-47-5)

Description/Comments: Data from C&L Inventory Database; No entries in Registered Substances Database, IARC or Pesticide Properties Database

Data source: <http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=27264&HarmOnly=no?fc=true&lang=en>

Data source date: 02 Jun 2014

Hazard Statements: Acute Tox. 3; H301, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Skin Sens. 1; H317, Carc. 1B; H350, STOT RE 1; H372, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex

GB MCL index number: 048-001-00-5

Description/Comments: Worst Case: IARC considers cadmium compounds Group 1; Carcinogenic to humans

Additional Hazard Statement(s): Carc. 1A; H350

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

lead compounds with the exception of those specified elsewhere in this Annex (worst case)

GB MCL index number: 082-001-00-6

Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following MCL protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A

Additional Hazard Statement(s): Carc. 1A; H350

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H302, Acute Tox. 1; H330, Acute Tox. 1; H310, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315

acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Aquatic Chronic 2; H411

fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1; H400, Aquatic Chronic 1; H410

■ **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

■ **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Carc. 2; H351

■ **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 23 Jul 2015

Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **benzo[bk]fluoranthene** (EC Number: [1] 205-911-9 [2] 205-916-6, CAS Number: [1] 205-99-2 [2] 207-08-9)

Description/Comments: Combined data from harmonised entries in CLP for benzo[b] and benzo[k]fluoranthene; C&L Inventory Database

Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 02 Mar 2017

Hazard Statements: Carc. 1B; H350 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

Appendix B: Rationale for selection of metal species

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case.

boron {diboron trioxide}

Based upon material type it is considered to be the most likely worst case compound.

arsenic {arsenic compounds, with the exception of those specified elsewhere in this Annex}

Most likely based upon material type and environmental conditions.

beryllium {beryllium chloride}

Worst case.

cadmium {cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex}

Most likely based upon the material type and environmental conditions.

copper {copper(II) carbonate – copper(II) hydroxide (1:1)}

Based upon material type it is considered to be the most likely worst case compound.

mercury {inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex}

Based upon material type it is considered to be the most likely worst case compound.

nickel {nickel sulfide}

Based upon material type it is considered to be the most likely worst case compound.

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Based upon material type it is considered to be the most likely worst case compound.

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Based upon material type it is considered to be the most likely worst case compound.

vanadium {divanadium pentaoxide; vanadium pentoxide}

Based upon material type it is considered to be the most likely worst case compound.

zinc {zinc sulphate}

Based upon material type it is considered to be the most likely worst case compound.

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Worst case.

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.2.GB - Oct 2021**

HazWasteOnline Classification Engine Version: 2024.158.6092.11254 (06 Jun 2024)

HazWasteOnline Database: 2024.158.6092.11254 (06 Jun 2024)

This classification utilises the following guidance and legislation:

WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020

GB MCL List - version 1.1 of 09 June 2021

GB MCL List v2.0 - version 2.0 of 20th October 2023

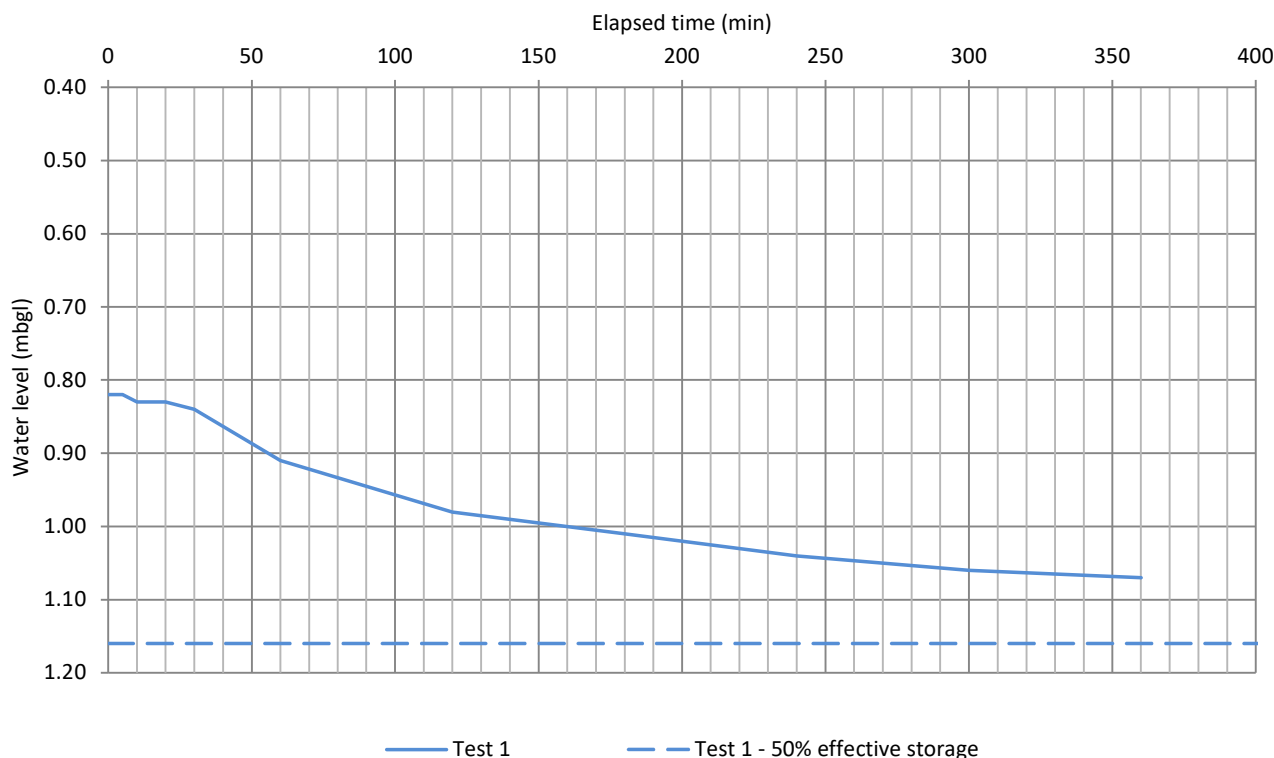
GB MCL List v3.0 - version 3.0 of 11th January 2024

GB MCL List v4.0 - version 4.0 of 2nd March 2024

Appendix H – Infiltration Results

Infiltration Test Results in Accordance with BRE Digest 365:2016

Project Name:		Gellinudd Care Home					Project ID:		P1188								
Client:		Squirrel Wood Properties															
Hole ID:		TP01		Test Date:		21/05/2024		Logged:		RG	Checked:		JD				
Test 1		Test 2		Test 3		Soakaway Dimensions:					Length (m)		2.40				
Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)						Width (m)					0.90	
											Test 1 - Depth (m)					1.50	
											Test 2 - Depth (m)						
											Test 3 - Depth (m)						
0	0.82																
1	0.82																
2	0.82										Test 1	Test 2	Test 3				
3	0.82					Depth to water at start of test (m)					0.82						
4	0.82					Depth to water at end of test (m)					1.07						
5	0.82					Total head drop (m)					0.25						
10	0.83					Depth to water at 75% level (m)					0.99						
20	0.83					Depth to water at 50% level (m)					1.16						
30	0.84					Depth to water at 25% level (m)					1.33						
60	0.91																
120	0.98					Base area of pit (m ²)					2.16						
180	1.01					Computed Internal Surface Area A _{p50} (m ²)					4.40						
240	1.04					Effective Storage Volume V _{p75-25} (m ³)					0.73						
300	1.06																
360	1.07					Elapsed time at 75% level (mins)					140						
						Elapsed time at 25% level (mins)					DNF						
						Total discharge during test					37%						
						50% discharge in 24 Hours					Yes						
						Soil infiltration rate <i>f</i> (m/s)					4.68E-06						
						Design soil infiltration rate <i>f</i> (m/s)					n/a (not BRE365 compliant)						



Remarks:

Where highlighted in red, calculations have been inferred from the graph.
"DNF" - Did Not Finish (Test did not reach 50% storage level)

Infiltration Test Results in Accordance with BRE Digest 365:2016

Project Name: Gellinudd Care Home

Project ID: P1188

Client: Squirrel Wood Properties

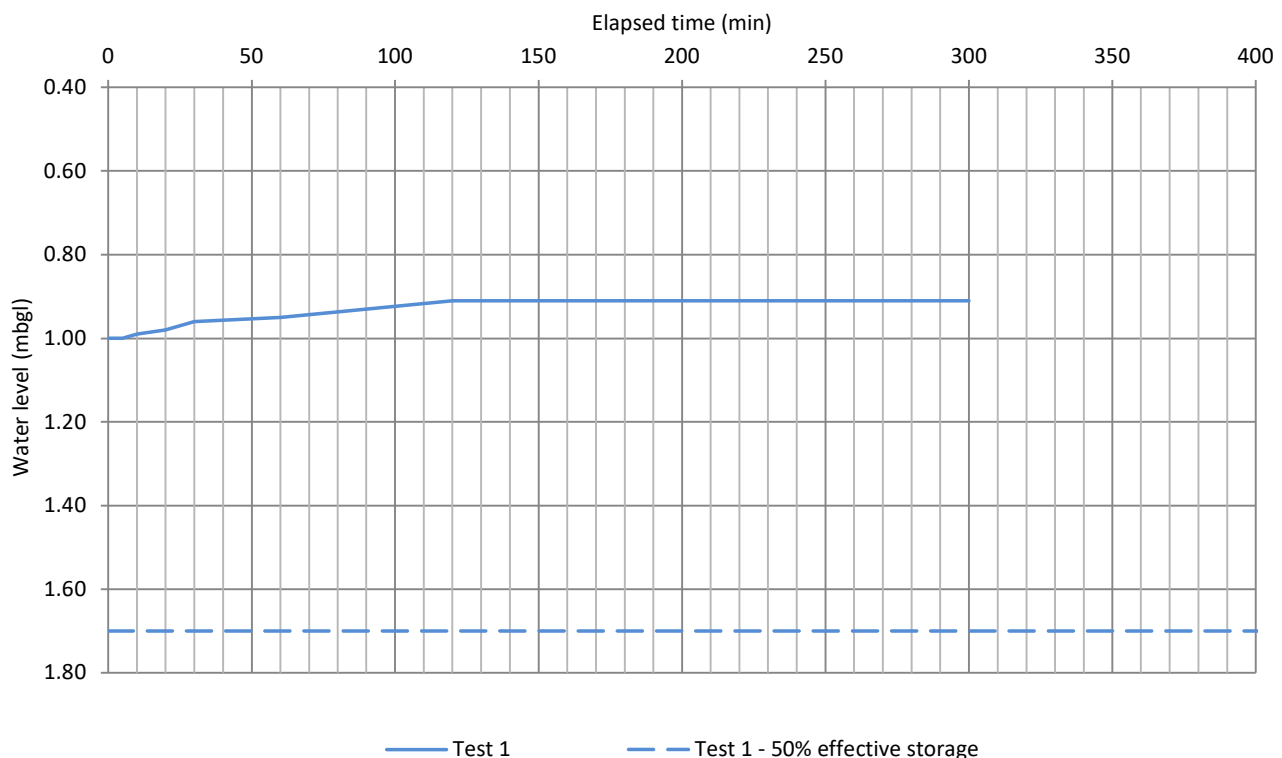
Hole ID: TP02

Test Date: 21/05/2024

Logged: RG

Checked: JD

Test 1		Test 2		Test 3		Soakaway Dimensions:		Length (m)		
Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)			Width (m)		
0	1.00							Test 1 - Depth (m)		
1	1.00							Test 2 - Depth (m)		
2	1.00							Test 3 - Depth (m)		
3	1.00							Test 1	Test 2	Test 3
4	1.00					Depth to water at start of test (m)		1.00		
5	1.00					Depth to water at end of test (m)		1.00		
6	1.00					Total head drop (m)		0.00		
7	0.99					Depth to water at 75% level (m)		1.35		
8	0.98					Depth to water at 50% level (m)		1.70		
9	0.96					Depth to water at 25% level (m)		2.05		
10	0.95									
11	0.91					Base area of pit (m ²)		2.07		
12	0.91					Computed Internal Surface Area A _{p50} (m ²)		6.55		
13	0.91					Effective Storage Volume V _{p75-25} (m ³)		1.45		
14	0.91									
15						Elapsed time at 75% level (mins)		DNF		
16						Elapsed time at 25% level (mins)		DNF		
17						Total discharge during test		0%		
18						50% discharge in 24 Hours		No		
19						Soil infiltration rate <i>f</i> (m/s)		n/a		
20						Design soil infiltration rate <i>f</i> (m/s)		n/a (Insufficient infiltration)		



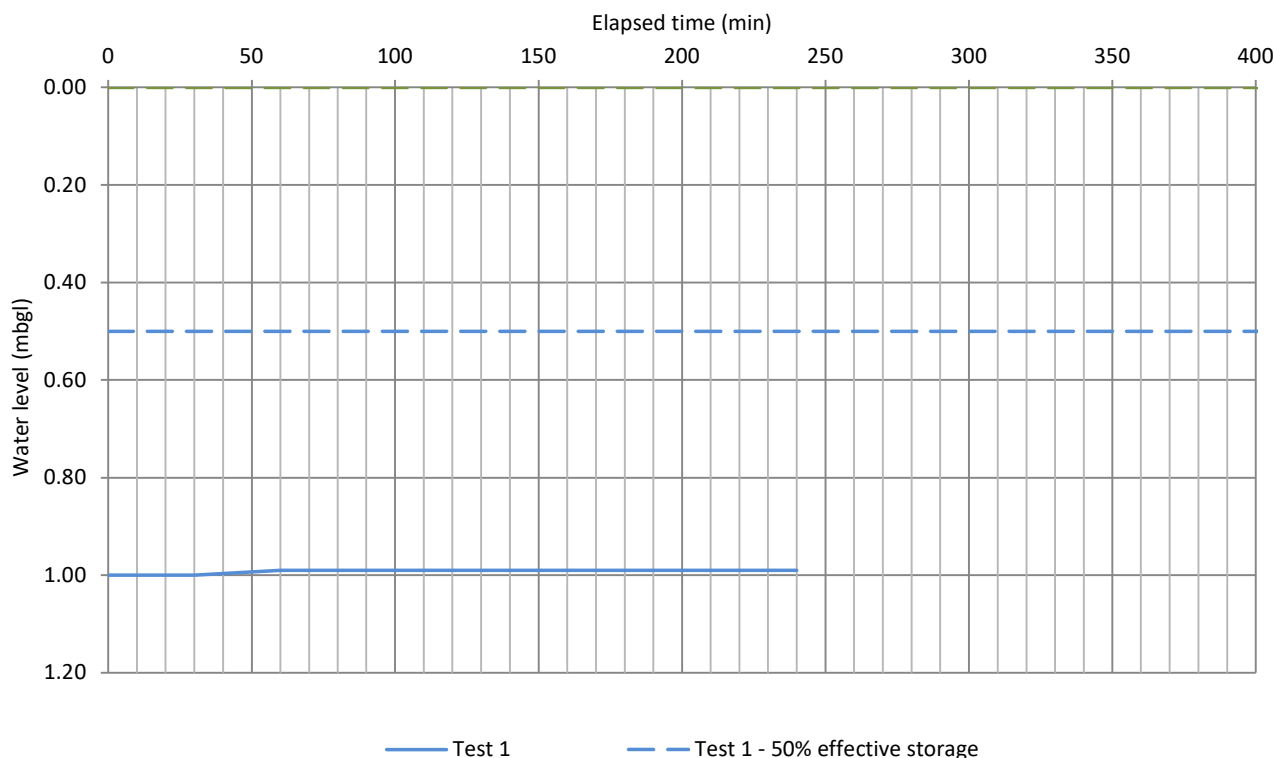
Remarks:

Where highlighted in red, calculations have been inferred from the graph.

"DNF" - Did Not Finish (Test did not reach 50% storage level)

Infiltration Test Results in Accordance with BRE Digest 365:2016

Project Name:		Gellinudd Care Home					Project ID:		P1188						
Client:		Squirrel Wood Properties													
Hole ID:		TP03		Test Date:		21/05/2024		Logged:		RG		Checked:		JD	
Test 1		Test 2		Test 3		Soakaway Dimensions: Length (m) Width (m) Test 1 - Depth (m) Test 2 - Depth (m) Test 3 - Depth (m)									
Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)										
0	1.00														
1	1.00														
2	1.00														
3	1.00							Test 1		Test 2		Test 3			
4	1.00					Depth to water at start of test (m)		1.00							
5	1.00					Depth to water at end of test (m)		1.00							
10	1.00					Total head drop (m)		0.00							
20	1.00					Depth to water at 75% level (m)		0.75							
30	1.00					Depth to water at 50% level (m)		0.50							
60	0.99					Depth to water at 25% level (m)		0.25							
120	0.99														
180	0.99					Base area of pit (m ²)		0.00							
240	0.99					Computed Internal Surface Area A _{p50} (m ²)		0.00							
						Effective Storage Volume V _{p75-25} (m ³)		0.00							
						Elapsed time at 75% level (mins)		1500							
						Elapsed time at 25% level (mins)		4500							
						Total discharge during test		1%							
						50% discharge in 24 Hours		No							
						Soil infiltration rate <i>f</i> (m/s)		n/a							
						Design soil infiltration rate <i>f</i> (m/s)		n/a (Insufficient infiltration)							



Remarks:

Where highlighted in red, calculations have been inferred from the graph.
 "DNF" - Did Not Finish (Test did not reach 50% storage level)