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GROUND INVESTIGATION REPORT

Pembroke Power Station, West Pennar, Pembroke SA71 5SS

JFR2796
02
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20 December 2023

rpsgroup.com

Document status

Version	Revision	Authored by	Reviewed by	Approved by	Review date
V01	R01	Patrick Roberts / Glynn Jones / Karen Dale	Paul Jeffery	Phil Thomas	20 December 2023
V02	R00	Karen Dale	Phil Thomas	Phil Thomas	19 March 2024

Approval for issue

Phil Thomas	Technical Director	20 December 2023

File Name

20231219_ JFR2796_Ground Investigation Report _V01_R01.docx

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EXECUTIVE SUMMARY

Section	Summary
Background	RPS Consulting Services Ltd (RPS) was commissioned by RWE Generation UK (RWE) to undertake an investigation and assessment to support the proposed development of a green hydrogen electrolyser.
Site Details	**Site area**: 8.85 ha **Current site use**: The electrolyser area comprises an area of open grassland and hardstanding with a natural gas Above Ground Installation (AGI) located in the north-east corner. There are access roads from the minor road to the south of the southern boundary that leads to the AGI. There are wooded and heavily vegetated areas in the central and southern electrolyser areas, with Hardstanding covering about 5 % to 10 % of the electrolyser area. The water pipeline comprises one agricultural field in the western area and an area of woodland and dense vegetation in the eastern area. A narrow minor road crosses the centrally between the two areas. There is a public walkway on the eastern boundary of this area. **Proposed site use**: The proposed development comprises a Green Hydrogen electrolyser unit. The proposed development plans show a number of water tanks and colling towers in the north east of the site, with the main electrolyser building in the south and further auxiliary hydrogen units in the west. The plans show that an annex to the main electrolyser building will be used for rest rooms and common areas. **Surrounding land use**: The site is located in an area of predominantly agricultural land use.
Ground & Groundwater Conditions	The ground conditions were observed Topsoil and Reworked Topsoil over Made Ground, this is in turn directly underlain by weathered bedrock of the Avon Group, with the exception of the far north east which encountered Topsoil over Black Rock Subgroup. Made Ground generally comprised reworked weather bedrock with inclusions of construction materials with localised clinker encountered. Natural sub surface voiding / areas of zero resistance within the calcareous mudstone of the Avon Group were encountered in two of the boreholes (BH01 (14.60 – 16.30 m BGL) and BH02 (11.30 – 11.70 m BGL)). Both voids appeared below the water table and showed linear orientation. The strike and the volume of these voids was not investigated during this phase of works. Presently the precise mechanism for void formation is uncertain and there are a number of scenarios that may facilitated void formation. At this stage it is considered that they may represent solutioned widened joints that may be of variable dimension and length. This may be exacerbated through a tidally influenced groundwater regime introducing brackish water. The water table beneath the site is observed to be reduced to the north (i.e. groundwater reduces towards the Haven).
Geotechnical Comments	Geotechnical information has been obtained on the ground conditions at the Assessment Site to provide a preliminary appraisal in relation to likely rock mass quality, material reuse, foundations, pavements, concrete classification and groundwater management. Any chosen foundation solution will be required to suitably mitigate the effects of potential instability associated with the encountered ground conditions (voids). Where voids are suitably identified and treated it is considered a shallow foundation solution may be adopted for low to moderate loads. Where the treatment of voids is uncertain it is recommended that a risk-based design approach is undertaken and either suitably designed reinforced shallow foundations or deeper piled foundation solutions be adopted. Buried obstructions have been encountered during this investigation and may be present elsewhere on site particularly associated with remnant footings associated with former farm buildings. These will require removal as part of the site preparatory site works. Piled foundations embedded below the encountered voids offer a practical foundation solution, particularly where the ground is required to support moderate to high loads for sensitive structures. The formation below the encounter voids is observed to comprise slightly weathered bedrock and is moderately strong and would be expected to offer relatively favourable high end bearing resistances. It is not recommended to adopt a piled foundation solution above or within the depth range of anticipated voids. Based on the ground conditions encountered at the Site, it is expected that, in general for the main building that floor slabs supported on a suitable depth of sub-base will prove adequate provided the exposed natural deposits are proof rolled and any soft or degradable materials removed and replaced with compacted granular fill. This will be subject to

Section	Summary
	suitable identification and treatment of voids. Consideration should be given to the inclusion of gas protection measures where identified. It is considered that a Design Sulphate Class of DS-1 and an Aggressive Chemical Environment for Concrete (ACEC) Classification of AC-1 would be appropriate for all buried concrete structures. Infiltration based drainage is unlikely to be viable in the shallow deposits.
Human Health	No chemical contaminants of concern where recorded above the respective AC for a commercial end use. However, laboratory analysis identified asbestos fibres were recorded in a single location (WS02 at 0.3 m BGL). The Made Ground is variable across the site and there is nothing significantly visibly different with the Made Ground encountered in WS02, with would suggest that the potential of asbestos present in soil is locally restricted. WS02 is located to the south of the former sport centre buildings. The asbestos within the Made Ground on-site is considered to pose a potential risk to future site users and maintenance workers within areas of soft landscaping only via the pathways of dermal contact and ingestion. It is recommended that a chemically clean, imported topsoil cover layer, with a minimum thickness of 300 mm and geotextile separation layer, be installed within areas of proposed soft landscaping in order to create a barrier between asbestos impacted Made Ground soils and the future site user. Alternatively further testing and asbestos risk assessment could be undertaken to seek to dismiss the risk.
Controlled Waters	The results of the groundwater sampling do not indicate that the groundwater beneath the Assessment site is grossly contaminated, and no evidence of contamination plumes have been encountered. On this basis contamination risks to controlled water are considered to be low and further consideration is not required.
Ground Gas	The ground gas assessment indicates the site to be classified as CS1.
Recommendations	A Remediation Strategy and Verification Plan based on a watching brief approach should be developed for the site prior to redevelopment. This will likely be a requirement of a contamination land related Planning Condition attached to a future Decision Notice for the development of the site. Additional ground investigation is recommended to improve the conceptual site model, in particular obtaining further information of the distribution and depth of the void, the groundwater regime beneath the site, the potential presence of buried topsoil and further assessment of ground gases. Further investigation to support detailed foundation design, once a greater conceptual understanding of the voids / areas of zero resistance beneath the site, is also recommended.

1 INTRODUCTION

1.1 Preamble

1.1.1 RPS Consulting Services Ltd (RPS) was commissioned by RWE Generation UK (RWE) to undertake a Ground Investigation and prepare a Ground Investigation Interpretative Report (GIR) for two parcels of land under RWE ownership at Pembroke Power Station, West Pennar, Pembroke, SA71 5SS. These works have been undertaken in accordance with our appointment and in line with the RWE Contract ref. MPC1871.

1.1.2 It is understood RWE are looking to identify areas within which to develop green hydrogen electrolyser projects and pursue NGESO's Stability Pathfinder Phase 3. The areas that have been subject to intrusive ground investigation and assessment as part of this study comprise the 'Electrolyser Assessment Area' and 'Water Pipeline Area' as set out in Drawing JFR2796_002_SBP_V01. These area names are the vernacular used hence forth and further details for the two areas is presented in Sections 1.2 and 1.3.

1.1.3 RPS has previously undertaken a Desk Based Assessment[1] that incorporates both the electrolyser assessment and water pipelines areas, (with that report also providing commentary on an additional proposed hydrogen pipeline and additional cable routes). A summary of this earlier assessment and pertinent information is presented in Section 2.

1.2 Site Areas

1.2.1 The two proposed development areas are located immediately west of the existing Pembroke Power Station, as shown on Drawing JFR2796_001_SLP_V01. The combined areas cover a total area of approximately 8.85 hectares (ha) with the boundaries set out in Drawing JFR2796_002_SBP_V01.

Electrolyser Assessment Area

1.2.2 The proposed Electrolyser Assessment Area is located in an area which was formally a contractors' compound facility during a period of construction, and includes the footprint of the proposed electrolyser. The Electrolyser Assessment Area currently comprises an area of open grassland and hardstanding with a natural gas Above Ground Installation (AGI) located in the north-east corner. There are currently access roads from the minor road to the south of the southern boundary that leads to the AGI. Wooded and heavily vegetated areas occupy the central and southern sections of the Electrolyser Assessment Area.

Water Pipeline Area

1.2.3 The Water Pipeline Area occupies the land between the existing water treatment plant within the existing power station and proposed Electrolyser Assessment Area. This area currently comprises one agricultural field in the west and an area of woodland and dense vegetation in the east. A narrow minor road crosses centrally between the two areas. There is a public footpath on the eastern boundary of this area.

[1] RPS 2022: RWE Pembroke Hydrogen / Electrolyser Area – Phase 1 Preliminary Risk Assessment. Version 1. Rev0 dated 19th October 2022. Ref: 20220803 R JFR2786 RWE Pembroke Hydrogen_Electroysler Area PRA V1 R0

1.3 Proposed Development

1.3.1 The proposed development layout indicating the proposed structures and water pipeline route is presented in Drawing 299919-00 S2 P01.

1.4 Scope of Work

1.4.1 The scope of work performed by RPS comprises the preparation of an interpretative Ground Investigation Report in general accordance with the requirements of BS EN 1997-2 (2007).

1.4.2 This Ground Investigation Report presents an assessment of the ground conditions, together with recommended characteristic values of geotechnical properties for use in the preliminary design of the geotechnical elements of the proposed development. Analysis of in situ and laboratory geotechnical data is provided (including where required: soil classification, consolidation characteristics, total and effective stress parameters, earthworks acceptance, California Bearing Ratio (CBR), modulus of subgrade reaction, and concrete classification). In addition, preliminary recommendations for ground engineering required to facilitate the development is provided including preliminary recommendations relating to potentially suitable foundation solutions, reuse of earthworks materials, ground improvement, and concrete classification.

1.4.3 In addition, this report presents an assessment of the risk associated with any existing contamination in the ground to human health, the environment, and the proposed structures following redevelopment of the site. Chemical analytical data has been compared to published assessment criteria and exceedances identified. A qualitative environmental risk assessment for human health and controlled waters has been carried out in accordance with current guidance and best practice. The conceptual site model developed as part of earlier Phase 1 studies (RPS, 2022[1]) has been further developed to identify potential source-pathway-receptor pollutant linkages.

1.5 Limitations

1.5.1 Unless stated otherwise, information from the previous desk studies or third party studies have not been included in this report and, where referenced, the reports presenting this information should be read in conjunction with this report.

1.5.2 The recommendations and conclusions presented herein are based on the information available at the time of witing and proposed end use. Where an alternate end use is proposed additional information and assessment will be required.

1.5.3 In accordance with the stage of the project the investigation and assessments works should be considered as a preliminary and should not be construed as detailed design.

1.5.4 Details of the limitations in regards to this type of assessment are described in Appendix K.

1.5.5 Further limitations to the intrusive works undertaken due to the on-site constraints are discussed in Section 3.3.

1.6 Legislation and Guidance

1.6.1 The assessment has been undertaken in general accordance with BS EN ISO 21365[2] and is considered suitable to meet the initial requirements to support a planning application as outlined within Planning Policy Wales. The assessment also reflects the recommendations of

[2] BS EN ISO 21365:2020 Soil quality - conceptual site models for potentially contaminated sites

Environmental Agency/National Resource Wales guidance, Land Contamination: Risk management, (LCRM 2020).

1.6.2 This report has been produced in general accordance with:

- British Standard requirements for the 'Investigation of potentially contaminated sites - Code of practice' (ref. BS10175:2011+A1:2017);
- British Standard requirements for the 'Code of practice for ground investigations' (ref. BS5930:2015+A1:2020);
- British Standard requirements for the 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings' (ref BS8485:2015+A1:2019);
- CIRIA Document C665: Assessing Risks Posed by Hazardous Ground Gases to Buildings;
- DEFRA Environmental Protection Act 1990: Part 2A - *Contaminated Land Statutory Guidance* (2012);
- BS EN 1997-1 (2004 + A1:2013): Eurocode 7: Geotechnical design – Part 1: General rules; and
- BS EN 1997-2 (2007): Eurocode 7: Geotechnical design – Part 2: Ground investigation and testing.

2 BACKGROUND AND PREVIOUS STUDIES

2.1 Site History

Electrolyser Assessment Area

2.1.1 From the earliest mapping until the 1972 plan the site is shown as undeveloped agricultural land. Aerial imagery from 1969 shows the site to be fully developed with a number of buildings across the whole site, the mapping from 1972 indicate these buildings to form an industrial Hostel. Electoral substations are shown in the north and the central areas with access roads also shown. There has been groundworks across the site with embankments and cuttings now marked.

2.1.2 By 1975 mapping all building, except a U shape building in the centre have been removed. This building was partially demolished to form a L shaped building which was utilised as a sport hall with land to the north being annotated as sports field. This was subsequently removed.

2.1.3 By 2012 the AIG had been constructed in the north east of the site.

Water Pipeline Area

2.1.4 From the earliest mapping the area is shown as undeveloped agricultural land. By the 1972 area is shown to cross two slopes assumed to be cuttings relating to the development of the Power Station to the east. A drain is indicated along the southern boundary. No further significant changes are noted.

2.2 British Geological Survey Records

2.2.1 As part of this assessment RPS has obtained records from the British Geological Survey (BGS) of a single confidential borehole drilled by Geotechnical Engineering Limited for National Grid in February 1991. The borehole is located in the southwest portion of the Electrolyser Assessment Area. The borehole comprised a rotary borehole to 10 m below ground level (BGL) A copy of the borehole log is presented in Appendix B, App. B.1 with the approximate location plotted on Drawing: JFR2796_003_GBP_V01.

2.2.2 The borehole log has an indicated ground elevation of circa 25 m Above Ordnance Datum (m AOD). Reviewing the location on more recent topographical data suggest the elevations of this area should be between 23 – 24 m AOD, indicating a variance of > 1.0 m in elevation. The earlier RPS desk study does not identify significant profiling of the site surface following 1991, therefore the associated elevations presented on this log and the indicative location of such should be treated with caution. For completeness data from this location has been incorporated within this assessment where considered salient.

2.2.3 Following further review of the available geological records for the site, RPS has also further reviewed the following records from the British Geological Survey (BGS):

- Geological Survey of England and Wales 1:63,360/1:50,000 geological map series, New Series: Pembroke & Linney Head Sheets 244 and 245; and
- Geological Survey of England and Wales 1:10,560 Pembrokeshire 39 NE. Second Edition 1909.

2.3 Geological Setting

2.3.1 The site is located within part of the Anglo-Welsh basin. The basin is one of several North Atlantic basins associated to the Caledonian Orogeny and is characterised by terrestrial red-bed sedimentary fill from Silurian to Carboniferous age phasing to shallow marine deposits.

2.3.2 The basin is referred to as a flexural subsidence foreland basin[3] with synsedimentary extensional and transtensional faults observed in Pembrokeshire in the late Silurian to early Devonian. The upper Devonian strata (Skrinkle Sandstone) rest unconformably on Upper Silurian to Lower Devonian strata as a result of the Acadian Orogeny. This structural regime is dominated by the Variscan orogeny forming the Ritec Fault and the subsequent northwest southeast trending Ridgeway and Castlemartin-Orielton Anticlines with the intervening Pembroke Syncline (south of the Retic Fault).

The site is located in the southern arm of the Pembroke Syncline with bedrock indicated on the 1:10,560 mapping as dipping between 45° to 60° to the north south of the site. Immediate north of the site the bedrock is indicated as dipping steeply to the south. Bedding orientations are illustrated in Figure 1. The strata boundaries are bisected by subordinate north-south trending transgressive faults.

2.3.3 The majority of the Electrolyser Assessment Area is indicated to be occupied by the Avon Group (AG). This unit is indicated in the BGS 1:10,560 map as the Lower Limestone Shales, forming the lowest portion of the Carboniferous Limestone Series of Lower Avonian age. A review of the stratigraphical sequence indicates that the Avon Group is likely to comprise the series indicated as Lower Limestone Shales. Although not indicated in the BGS244 sheet, an unconformity is indicated between the Avon Group Limestone and Skrinkle Sandstone in the BGS 228 sheet. It is dated between Courceyan Substage (CS) and Courceyan Substage (CF).

2.3.4 The northeast potion of the Electrolyser Assessment Area and majority of the Water Pipeline area are indicated to be occupied by the overlying 'Lower Part' of the Carboniferous Limestone Series. The 'Lower Part' of the Carboniferous Limestone Series comprises the Black Rock Subgroup and Gully Oolite Formation (BRS).

2.3.5 Further review of the mapping data indicates sporadic observations of drift deposits comprising 'pebbly drift', with a shale ridge indicated south of the investigation area. The distribution of these deposits is not mapped.

2.4 Hydrogeology

2.4.1 The Electrolyser Assessment Area is located above a Secondary A Aquifer relating to the Avon Group bedrock. The Water Pipeline Area is also underlain by a Principal Aquifer, relating to the BRS bedrock. Each aquifer is defined below:

- Principal Aquifer: These formations provide a high level of water storage and may support water supply and / or river base flow on a strategic scale.
- Secondary A Aquifer: These formations are formed of permeable layers capable of supporting water supplies at a local scale, in some cases forming an important source of base flow to rivers.

2.4.2 According to EA data, the Electrolyser Assessment Site is not located in a groundwater Source Protection Zone (SPZ).

[3] James, D M D. 1987. Tectonics and sedimentation in the Lower Palaeozoic back-arc basin of South Wales, UK. Some quantitative aspects of basin development. Norsk Geologisk Tidsskrift, Vol. 67, 419–426

2.4.3 Under the Water Framework Directive, the Environment Agency's local River Basin Management Plan classifies groundwater chemical quality beneath the Assessment Site as good quality.

2.4.4 Information provided by the EA indicates that there are no active licensed groundwater abstractions within 2 km of the Assessment Site.

2.5 Non-Coal Mining

2.5.1 The Groundsure report included within the RPS 2022 Phase 1 report indicated the Electrolyser Assessment Site is within an area that may have been affected by historical non-coal mining.

2.5.2 There are four records of unspecified ground workings at the Electrolyser Assessment Site mapped between 1975 and 1994. Based on the historical maps available, it is anticipated that these ground workings are likely the cuttings that were made across the Electrolyser Assessment Site. There are also a further two unspecified pits recorded at the Electrolyser Assessment Site mapped between the same dates, in the south-east corner of the electrolyser area. The unspecified ground workings are indicated in the north and south-west of the electrolyser area.

2.5.3 Two records of unspecified ground workings are indicated at the western boundary of the water pipeline area, dated 1975 and 1994.

2.6 Outline Conceptual Site Model

2.6.1 An outline conceptual site model (CSM) consists of an appraisal of the *source-pathway-receptor* 'contaminant linkages' which is central to the approach used to determine the existence of 'contaminated land' according to the definition set out under Part 2A of the Environmental Protection Act 1990. For a risk to exist (under Part 2A), all three of the following components must be present to facilitate a potential 'pollutant linkage'.

- **Source** referring to the source of contamination (Hazard).
- **Pathway** for the contaminant to move/migrate to receptor(s).
- **Receptor** (Target) that could be affected by the contaminant(s).

2.6.2 Receptors include human beings, controlled waters and buildings / structures. The National Planning Policy Framework, used to address contaminated land through the planning process, follows the same principles as those set out under Part 2A. Further details on the Part 2A regime are presented within Appendix L.

2.6.3 As part of the RPS 2022 assessment the potential risks to receptors for potential source were given one of the following classifications:

- **Low risk** - it is considered unlikely that issues within the category will give rise to significant harm to identified receptors
- **Moderate risk** - it is possible, but not certain that issues within the category will give rise to significant harm to receptors
- **High risk** - there is a high potential that issues within the category will give rise to significant harm to identified receptors

2.6.4 An outline CSM was developed on the basis of the site reconnaissance and desk study. The CSM is used to identify potential sources, pathways and receptors (i.e. potential pollutant linkages) on site post development and is summarised in the table below.

2.6.5 Based on the findings of the desk-based study there is potential for contamination to be present within the Made Ground beneath the site, associated with previous land use, the oil refinery to the west and the power station to the east. Historically there was an incinerator and spoil heap in the west and a substation in the east. Adjacent land has had a varied history with a number of pits

and areas of groundworks recorded and present day the site is bound by Valero Oil Refinery and Pembroke Power Station.

2.6.6 The Pipeline Assessment Area is located in an area where the estimated probability of the property being above the Action Level for radon is 10 – 30 %. Full protection measures would need to be implemented where buildings are proposed. Given the proposed development is routing a hydrogen pipeline (i.e. a structure), no radon protection measures will be required.

Table 2-1 Electrolyser Site: Outline Conceptual Site Model

Potential Source	Contaminants of Concern	Via	Potential Pathways	Linkage Potentially Active?	Receptors	Qualitative Risk Rating	Notes
On site – Made ground, infilled former cuttings (and pond), land raise	Metals, hydrocarbons, and asbestos	Soil	Direct contact/ingestion	✓	Future site users	Low	Limited potential for significant contamination to exist. Post development risks minimised by buildings, hardstanding and manged landscaping.
			Inhalation of volatiles	×		Low	Limited potential for significant volatile contaminants to exist. Risk of inhalation of soil vapours in internal areas and such contamination exists.
			Airborne migration of soil or dust	✓	Off-site users	Low	Limited potential for significant contamination to exist. Post development risks minimised by buildings, hardstanding and manged landscaping.
			Leaching of mobile contaminants	✓	Secondary A Aquifer	Low	Potential for soil leaching and vertical and lateral migration of contaminants (if present) in shallow groundwater to impact controlled waters receptors.
		Groundwater	Direct contact/ingestion	✓ ✓	Future site users Off-site users	Low	Very shallow groundwater unlikely to be present.
			Inhalation of volatiles	× ×	Future site users Off-site users	Low	Limited potential for significant volatile contamination in groundwater.
			Vertical and lateral migration in permeable strata	✓ ✓	Secondary A Aquifer Unnamed stream	Low	Potential for soil leaching and vertical and lateral migration of those contaminants in groundwater to impact controlled waters receptors.
Off-site – Power station, tanks, limekiln, cornmill and groundworks / land raising	Metals, hydrocarbons, and solvents	Groundwater	Direct contact/ingestion	×	Future site users	Low	There is a potential for contaminants to migrate beneath the site from off-site sources in any shallow groundwater present in the Made Ground or granular soils within the superficial deposits.
			Inhalation of volatiles	✓×	Future site users	Low	

Potential Source	Contaminants of Concern	Via	Potential Pathways	Linkage Potentially Active?	Receptors	Qualitative Risk Rating	Notes
On and off-site – Made Ground / natural strata or bio-degradation of contamination	Carbon dioxide, methane and radon.	Ground Gas	Inhalation of ground gas	✓ ✓	Future site users Off-site users	Low to moderate	There is potential for ground gases to be generated beneath the site associated with the former uses. Where present, there is potential for ingress and build-up within indoor areas.
			Explosive risks	✓ ✓	Future site users Off-site users Future and off-site Structures	Low to moderate	

Notes

1. The Qualitative Risk Rating does not consider the potential for the pathway to be active. In the event that a Moderate or High Qualitative Risk Rating is identified further assessment is recommended.

3 GROUND INVESTIGATION METHODOLOGY

3.1 Aim of the investigation

3.1.1 The principal aims of the ground investigation were:

- To provide a ground model of the assessment site based on the findings of the ground investigation undertaken;
- To determine the engineering properties of the underlying soils and to provide preliminary geotechnical parameters to assist the redevelopment of the assessment site;
- To allow preliminary consideration of foundation design, pavement design, concrete classification, floor slab, earthworks and the likely viability of soakaways;
- Provide ground conditions information to refine the preliminary conceptual site model set out in the RPS 2022 Phase 1 Contaminated Land Assessment;
- Investigation of potential contamination source areas identified within the RPS 2022 Phase 1 Contaminated Land Assessment;
- Allow risk assessments to be undertaken to determine potential contamination risks to human health and controlled waters based on a potential future commercial redevelopment scenario and the risk from ground gas; and
- Where identified, provide commentary on shallow sub surface voids, hazards and buried obstructions.

3.2 Summary of Works Undertaken

3.2.1 The intrusive ground investigation works were undertaken between 11th October and 24th October 2023 and comprised rotary cored boreholes (including dynamic sampling), windowless sampling, trial pits, soakaways and Dynamic Cone Penetrometer (DCP). All exploratory locations were agreed prior to their commencement by representatives from RPS and RWE. The exploratory hole locations are indicated on Drawing JFR2796_004_EHP_V01.

3.2.2 Upon completion of the intrusive works, three rounds of groundwater level and ground gas monitoring, and one groundwater sampling round were undertaken.

3.2.3 The intrusive investigation works comprised the following:

- PAS 128 survey, including ground penetrating radar (GPR) of all exploratory locations, prior to excavation;
- Drilling of three rotary cored boreholes (utilising dynamic sampling techniques within the shallow deposits) to depths of between 15.00 m and 18.50 m BGL;
- Drilling of nine window sample boreholes to a maximum depth of 5.00 m BGL;
- Excavation of eleven machine excavated trial pits to a maximum depth of 3.20 m BGL;
- Advancement of twenty four dynamic cone penetrometer tests (DCP) to a maximum depth of 1.00 m BGL;
- Excavation of two hand excavated trial pits to a depth of 1.20 m BGL at the eastern extremity of the proposed pipeline route;
- Installation of one 50 mm gas and groundwater monitoring well in one borehole, with a response zone between 5.00 – 15.00 m;

- Installation of temporary casing and flush covers into two boreholes, to allow for groundwater monitoring. Full standpipe installations were not possible due to subsurface voiding;
- Soil sampling for laboratory chemical analysis to help establish the presence and extent of chemical contamination within the soils and to assist waste classification of soils;
- Standard Penetration Test(s) in all boreholes to refusal;
- Hand Shear Vane testing (where applicable);
- Logging of soil and groundwater conditions;
- Full time site attendance by geo-environmental / geotechnical consultants from RPS; and
- Three rounds of groundwater level monitoring following completion of the intrusive works, including sampling and analysis for chemical contaminants on one occasion.

3.2.4 During the intrusive works sub surface voids were encountered and downhole Closed Circuit Television (CCTV) survey techniques of two boreholes were then utilised as part of the works undertaken as an addition to the above scope.

3.3 Constraints Observed

Constraints

3.3.1 Investigation locations across both areas were constrained due to site features as detailed in Table 3-1. Whilst excluded from this assessment, it is understood the Proposed Hydrogen Pipeline to the west of the Electrolyser Investigation Area (see Section 2) has not been subject to intrusive investigation due to the standoff associated to the high-pressure gas main.

Table 3-1: Summary of Constraints

Constraint	Site Area	Remark
Ecological standoff zones	Electrolyser Assessment & Water Pipeline areas	Ground penetrating investigative work was limited to areas of unimproved natural grassland, due to ecological constraints. In addition, due to the ecological constraints on the site areas of broadleaved woodland, scrub and hedgerows could not be accessed. The southwest section of the site, as well as the majority of the demolished building in the centre of the site could not be accessed, for the above reasons. The areas excluded from the survey due to these constraints are presented in Drawing: Figure2_Phase1_Hydrogen_20220803
Gas Main (high pressure)	Electrolyser Assessment & Water Pipeline areas	The pipeline emerges from the Valero Above Ground Installation (AGI) in the northeast of the site and runs approximately east – west across the northern section of the Electrolyser Site and across the Water Pipeline Area. A stand-off zone of 15 m each side of the pipe was agreed prior to commencement of siteworks. This zone inhibited the investigation into the excavatability of the sub surface materials along the proposed pipeline route. The areas excluded from the survey due to this constraint are presented in Drawing: Figure2_Phase1_Hydrogen_20220803
Services (general)	Electrolyser Assessment & Water Pipeline areas	During trial pit excavation a number of (potentially redundant) services were uncovered (undamaged). These were likely associated with the sites former use as set out within the desk study report. Where excavations could not safely be moved, they were terminated resulting in the full depth of excavation not being achieved. Further details of these excavations is presented in Table 3-2
Sub Surface Voids	Electrolyser Assessment Area	Presence of underground naturally occurring geological cavities . Areas of zero resistance/drilling returns were noted during the drilling of BH01 (14.60 – 16.30 m BGL) and BH02 (11.30 – 11.70 m BGL). These areas were subsequently investigated using downhole CCTV. The encountered voids restricted the installation

Constraint	Site Area	Remark
		of 'standard' groundwater monitoring wells and have resulted in reduced recovery of the rockmass for rock classification purposes.
Core Recovery	Electrolyser Assessment Area	The presence of voids and the characteristics of the rock (steeply dipping bedding) mass have resulted in limited geotechnical testing due for Uniaxial Compressive Strength (UCS) due to the recovered competent lengths of core that have been bisected by discontinuities, drilling disturbance or are of insufficient quality to undertake the test.

Relocated Exploratory Hole Positions

3.3.2 Exploratory hole locations that have been terminated or replaced due to the observed onsite constraints are presented in Table 3-2.

Table 3-2: Exploratory Hole Locations Aborted or Relocated Due to Onsite Constraints

Exploratory Position	Site Area	Reason for Change
HP03 and HP04	Water Pipeline areas	The hand pits situated along the proposed water pipeline route were aborted following the site walkover. It was confirmed that they would fall within the 15 m standoff zone around high-pressure gas main and could not be practically relocated. HP01 and HP02 fell outside of the standoff zone, so where available to excavate.
HP04, 05, 06, 07 and 08	Hydrogen Pipeline Area[1]	The hand pits situated along the proposed hydrogen pipeline route were aborted for the reasons set out above. No intrusive investigation or assessment have been undertaken for this area.
TP06 Soakaway	Electrolyser Assessment Area	Due to the presence of presumably redundant services, TP06 could not be advanced to the required depth. As such a soakage test in this location was not possible.

Notes.

1. Hydrogen Pipeline Area not investigated as part of this assessment report.

3.4 Laboratory Analysis

Geo-environmental

3.4.1 Laboratory chemical analysis undertaken on soil, rock and groundwater samples collected during the ground investigation and subsequent groundwater monitoring rounds. Full laboratory analysis reports are presented within Appendix G, App. G.1 for the soils tests and Appendix G, App. G.2 for the groundwater.

Soil

3.4.2 A total of twenty-six soil samples were submitted to a UKAS / MCERTS accredited laboratory for analysis for a variety of contaminants of concern including:

- Asbestos screen;
- Inorganic Determinands:
  - pH, organic matter, arsenic, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, zinc, sulphide, sulphate and total cyanide
- Organic Determinands:

- Speciated Polycyclic Aromatic Hydrocarbons (PAH), Total Petroleum Hydrocrocarbons (TPH) Criteria Working Ground (CWG) including BTEX and MTBE, and monohydric phenol.

Groundwater

3.4.3 A total of three groundwater samples were submitted to a UKAS/MCERTS accredited laboratory for analysis for the following suite if contaminants of concern:

- Inorganic Determinands:
  - pH, organic matter, arsenic, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, zinc, sulphide, sulphate and total cyanide.
- Organic Determinands:
  - Speciated PAH, TPH CWG including BTEX and MTBE, and monohydric phenol.

Geotechnical

3.4.4 Bulk samples were obtained at regular intervals from the exploratory locations, with rock core subsamples selected for subsequent laboratory testing. The sample depths are indicated on the exploratory hole records in Appendix B.

3.4.5 The rock core samples were carefully logged and prepared prior to preserving the subsample by wrapping in clingfilm/tinfoil and coating with at least three layers of wax. The sample was further protected by a covering of waxed cheesecloth, labelled and transported horizontally in padded, wooden core boxes.

3.4.6 Samples recovered for geotechnical testing were scheduled with an UKAS accredited laboratory for the following tests (quantities in brackets):

- Water Content (37)
- Atterberg Limits (4 point) (2)
- Particle Density (2)
- Particle Size Distribution (PSD) by wet sieve and pipette (7);
- Moisture content / dry density relationship (2.5 kg hammer method) (3); and
- Point Load Index (PLI) (16)
- Uniaxial Compressive Strength (UCS) (1)

3.4.7 Laboratory certificates for all testing undertaken can be found in Appendix H. Note: Testing for soil sulphates has been undertaken as part of the geo-environmental testing and results for this analysis is presented in Appendix G, App. G.1. The geotechnical laboratory results are further discussed in Sections 4.2 and 5.

4 GROUND CONDITIONS

4.1 Introduction

4.1.1 This section provides a summary and interpretation of the ground conditions encountered both during the ground investigation undertaken by RPS and third party information from previous investigations where relevant. Reference should be made to the Investigation Borehole, Trial Pit and Window Sample logs with respect to specific location details in the following appendices:

- App. B.2 Rotary Borehole Logs;
- App. B.3 Windowless Sampler Borehole Logs;
- App. B.4 Trial Pit Logs; and

4.1.2 In addition to the above, reference should be made to the CCTV images of the encountered voids Appendix E.

4.1.3 The locations of the exploratory holes are presented in Drawing: JFR2796_004_EHP_V01.

4.2 Geology

4.2.1 A detailed descriptions of each strata encountered is presented in the following sections which indicate the weathering profile and structural observations for the rock mass. Due to both the sedimentary nature of the bedrock and variability observed within the rock mass encountered during the recent intrusive works, Approach 4 (classification incorporating material and mass features) has been adopted from BS 5930. The geotechnical data reviewed from the exploratory hole records as part of this assessment comprised rock quality information in the form of fracture spacing information, Total Core Recovery (TCR), Solid Core Recovery (SCR) and Rock Quality Designation (RQD).

4.2.2 The index properties of the soils encountered in the weathered rock (Grade E) are discussed within the following sections. The geotechnical parameters associated with the below are discussed in Section 5.3:

- The Unconfined Compressive Strength Index (UCS),
- Point Load Index (PLI); and
- Total Core Recovery (TCR).

4.2.3 A Geological schematic section has been developed for the Assessment Site and is presented in Drawing: JFR2796_006_CCS_V01, indicating the conjectured geological boundaries.

4.2.4 Table 4 -1 provides a summary description of the general geological sequence across the site, based upon the ground investigations undertaken by RPS, combined with the historical BGS borehole where within the area of site.

Electrolyser Assessment Area

4.2.5 The investigation within the Electrolyser Assessment Area has identified a cover of Topsoil and Made Ground over Avon Group (AG) mudstone of varying weathering degrees. The distribution of strata in the general vicinity is governed by the east west orientated Pembroke Syncline resulting locally in bedding dipping moderately to steeply to the north (see Section 2.3). The underlying Skinkle Sandstone has not been encountered. Assuming a moderate dip of 30° and no faulting the Skrinkle Sandstone is anticipated to be in the region of 100 m below the existing site surface.

4.2.6 During the intrusive works within the Electrolyser Assessment Area, voids have been observed at depth within BH01 (14.60 – 16.30 m BGL) and BH02 (11.30 – 11.70 m BGL). These are further discussed in the below sections.

Water Pipeline Area

4.2.7 The investigation within the Water Pipeline Area has been undertaken within the conjectured outcrop of the Black Rock Subgroup and Gully Oolite Formation, with a maximum investigation depth of 1.2 m BGL. As such this stratum has been recovered as a residual soil (weathering grade E) and as such an accurate description of the 'less weathered' rock mass is not possible.

Table 4-1: Summary of Geology

Geology	Strata	Exploratory Hole Location[1]				Location	Description	Comment	Depth to top of strata m BGL	Thickness (m)[1]
		Borehole	Trial Pit	Window Samples	Hand Pits					
Made Ground (anthropogenic material)	Reworked Topsoil	BH01	TP01, TP02, TP03, TP06, TP07, TP08, TP10, TP11	WS02, WS06	-	Observed across the investigation area, largely associated to the areas indicated to be historically developed.	Soft brown slightly sandy silty CLAY, with frequent rootlets.	Areas of what is described herein as reworked topsoil is used to describe areas that overly general Made Ground (see below), albeit that Reworked Topsoil is generally indistinguishable from naturally occurring undisturbed aeras of Topsoil.	From surface.	0.1 – 0.40. Generally, 0.2 – 0.4 m thick, with 0.4 m recorded in TP10
	General Made Ground	BH01	TP01, TP02, TP03, TP06, TP07, TP10, TP11	WS02, WS05, WS06	-		Firm becoming stiff yellowish brown, orangish brown and brown slightly gravelly silty CLAY, with a low cobble content. Gravel is sub-angular fine to coarse mudstone. Cobbles are sub-angular mudstone, rarely brick and concrete.	The recovered Made Ground is generally reworked natural material and is often very similar to Avon Ground Mudstone – Weathering Grade E, with the addition of some sparse anthropogenic construction related gravel and cobbles (concrete and brick)	0.1 – 0.6	0.10 - 1.40[3]
	Tarmacadam	-	TP08	WS05	-	Limited to areas associated with current roads	Poorly banded TARMACADAM.	Tarmac encountered in two locations and observed to be in poor condition.	From surface	0.05
	Concrete	BH01	-	-	-	Limited to areas associated with previous structures	CONCRETE – no further description available. Encountered within hand pit. Drilled out using open holing technique.	BH01 encountered concrete associated with a redundant service	0.60	0.30
Topsoil	-	BH02, BH03	TP04, TP05, TP09	WS01, WS03, WS04, WS07, WS08, WS09	HP01, HP02	Observed across the investigation area(s) in areas where Made Ground is not present. .	Soft brown slightly sandy silty CLAY, with frequent rootlets.	Locally the topsoil has been tilled.	From surface	0.20 – 0.50 Generally, between 0.3 – 0.4 m thick.
Bedrock	Avon Group Mudstone - Weathering Class E	BH01, BH02, BH03	TP01, TP02, TP03, TP04, TP05, TP07, TP09, TP10, TP11	WS01, WS03, WS04, WS05, WS06, WS07, WS08, WS09	-	Encountered across the Electrolyser Assessment Area. In exploratory locations with no Made Ground, this strata is encountered directly below the Topsoil. In locations that encountered Made Ground, this strata is encountered directly below, at variable depths.	Stiff fissile orangish brown mottled sightly gravelly silty CLAY, with a low cobble content and rare sand lenses (up to 2 mm thick). Gravel is sub-angular fine to coarse very weak lithorelicts of mudstone. Cobbles are sub-angular mudstone.	Material reasonably consistent across the investigation area. Avon Group Mudstone weathered to a stiff gravelly clay, often fissile. Rotary boreholes able to dynamically sample to approximately 8.00 m BGL.	0.20 – 1.60	0.30 - 9.35 Variable thickness due to presence of Made Ground
	Avon Group Mudstone and Sandstone – Weathering Class D	BH01, BH02, BH03	-	-	-	Encountered within all rotary boreholes. Class D material generally found below Class E and above Class C and B material.	Extremely weak dark grey, locally reddish brown MUDSTONE. Recovered as sub-angular and angular fine to coarse clayey Gravel. Gravel frequently shows structure, bedded at 40 – 50°.	Gravel lithorelicts frequently fizzed when exposed to hydrochloric acid, indicating calcareous material. Thicknesses of Class D material generally low compared to Class E, B and C.	6.90 – 11.10	0.75 – 1.00
	Avon Group Mudstone and Sandstone – Weathering Class C – B	BH01, BH02, BH03	-	-	-	Encountered within all rotary boreholes. Class C and B material generally found below Class D material.	Weak to medium strong dark grey thickly laminated (50°) calcareous MUDSTONE.	Core fizzed when exposed to hydrochloric acid. Voiding was encountered in BH01 and BH02, both within this strata, below the water table.	9.20 – 17.10	1.10 – 5.80
	Blackrock Subgroup and Gully Oolite Formation – Weathering Class E	-	-	-	HP01, HP02	Encountered across the Water Pipeline area.	Soft to firm brow to yellowish brown slightly gravelly CLAY. Gravel is sub-angular fine to coarse very weak lithorelicts of mudstone.	This stratum has been recovered to a maximum depth of 1.2 m BGL.	0.4 – 0.5	>0.7

Notes.

1. Depths indicated are depths proven only
2. See Drawing JFR2796_003_GBP_V01 for location of stratum.
3. Made Ground has been recorded to 2.85 m BGL in the BGS historical borehole see Section 2.2

Topsoil

4.2.8 Material described as Topsoil was encountered in the exploratory holes as listed in Table 4-1. The Topsoil was observed to be tilled indicating the former agricultural land use. The topsoil encountered was observed as cohesive soil comprising a clay of variable sand and silt content with frequent rootlets. The Topsoil has been observed as typically 0.3 m thickness with locally thicker deposits of up to 0.5 m recorded.

4.2.9 An apparent buried topsoil horizon has been recorded in the historical borehole between 2.85 – 3.3 m BGL. The present-day elevation is uncertain due to ambiguity with the historical borehole's elevation (see Section 2.2).

Made Ground

4.2.10 Made Ground has been recorded across the site and for the purpose of this assessment has been subdivided to the following categories.

Made Ground - Reworked Topsoil

4.2.11 Made Ground in the form of reworked topsoil has been recovered across the Electrolyser Assessment Area. The distinction of Reworked Topsoil has been applied where General Made Ground (see below) has been observed underlying the Reworked Topsoil. The material descriptions are directly comparable to the naturally occurring topsoil descriptions encountered elsewhere on site. Reworked Topsoil has been observed to a maximum depth of 0.45 m.

4.2.12 The absence of anthropogenic inclusions is indicative of localised shallow reworking associated with agricultural activities and the site development history. The distribution of the Reworked Topsoil has not been presented in the geological model (Table 4-1).

Made Ground - General Made Ground

4.2.13 General Made Ground, defined by the anthropogenic inclusions has been observed across the Electrolyser Assessment Area in approximately half of the positions undertaken. This stratum has not been observed in the Water Pipeline Area. The vernacular "General Made Ground" (GMG) is used hence forth to describe this deposit.

4.2.14 The GMG has generally been recovered as a firm fine-grained soil of variable coarse secondary constituents up to cobble size. Anthropogenic inclusions such as wood, brick and concrete have been observed. The field descriptions indicate the stratum comprises largely of reworked weathered AG bedrock with inclusions of construction debris. GMG in the form of a coarse limestone gravel with occasional limestone cobbles has been recovered in TP07 and TP11, with a sand recovered in WS02.

4.2.15 Whilst observed as predominantly fine grained it cannot be discounted that the GMG is heterogeneous in nature, however it is likely that the deposit is constrained to the areas of former development as presented within the desktop study report. Obstructions have been observed within the GMG, associated to former foundations.

4.2.16 Where encountered GMG has been proven to a maximum depth of 1.6 m BGL in the recent 2023 works, however in several locations the exploratory hole location has been terminated due to dense ground conditions and/or services and as such locally thicknesses may exceed this. GMG has been recorded in the historical borehole (see Section 2.2) to 2.85 m BGL in the southwest portion of the Electrolyser Assessment Area.

4.2.17 Atterberg Limit testing was undertaken on six samples of the GMG from shallow depth. The results are plotted in Figure 2 and indicate the soils to comprise clays of intermediate to high

plasticity. The results are observed to be comparable to that of the AG and indicted these soils are likely derived from locally site won weathered AG. Following removal of the coarse material the modified plasticity index for these samples has been calculated as between 15 -30 and indicates the fine-grained fraction of the GMG to be of low to medium volume change potential in accordance with NHBC[4].

4.2.18 Particle Size Distribution (PSD) testing was undertaken on four samples collected from the GMG from depths of 0.2 m BGL. The constituents of the samples are summarised in Table 4-2. The laboratory results generally correlate well with the field log descriptions and confirm the proportions of constituents observed.

Table 4-2: Particle Size Distribution Results (Made Ground)

Exploratory Hole ID	Depth to top of sample (m BGL)	Stratum	Proportion (%)					Sample Description
			Clay	Silt	Fines[1]	Sand	Gravel	
BH01	0.4	MG	32	24	56	26	18	Sandy gravelly silty CLAY
TP01	0.5		48	20	68	18	14	
TP02	0.2		35	17	52	18	30	
TP11	0.6		13	11	24	19	57	Clayey sandy GRAVEL

Notes.

1. Fines comprises the combined Clay and Silt Fractions.
2. *Denotes combined silt and clay proportion

4.2.19 Two SPTs were undertaken within the GMG at shallow depth. The results indicate N_{60} of between 24 to 262. The higher result represents a refusal, and this likely represents an obstruction and must be discounted. Whilst an N_{60} of 24 has been measured in WS05 the test drives have been undertaken within the underlying AG and as such no reliance on this data should be made.

Made Ground – Concrete & Tarmacadam

4.2.20 Concrete and tarmacadam have been recoded to depths of up to 0.3 m. The tarmacadam has been observed to generally be in poor condition. No reinforcement observations of the concrete are available.

Superficial Deposits

4.2.21 Whilst not identified during this phase of intrusive works and not directly indicated in the available 1:50,000 scale mapping, further review of the data from BGS indicates that locally sporadic observations of drift deposits comprising ‘pebbly drift’. As such the presence of superficial soils should not be entirely discounted.

Avon Group

4.2.22 AG has been recovered in all exploratory locations penetrating through the overlying Made Ground (bar HP01 and HP02, which were considered to encounter Black Rock Subgroup as discussed

[4] National House Building Couch: Standards 2023 Chapter 4.2 – Building Near Trees

below). BGS data indicates the AG to consist of interbedded grey mudstones and thin to medium-bedded skeletal packstones with one to several thick units of ooidal and skeletal grainstones. Thin units of calcite mudstone and mudstone are present locally.

4.2.23 The typical sequence and associated depths observed during the intrusive works are summarised in Table 4-1. 'Competent' rock has been recovered only in the deeper rotary boreholes. Where recovered in the RPS 2023 intrusive works the AG has been recorded as variable with depth principally due to the varying state of weathering.

4.2.24 The AG has been recovered from surface as Grade E (residual or reworked) and has been observed to grade through to B (partially weathered) from below 9.2 m BGL. At surface the formation is described as a stiff clay with increasing gravel content of mudstone lithorelicts. At depth the recovered mudstone is predominantly described as an extremely weak to medium strong, thinly laminated dark grey calcareous mudstone and was observed to effervesce when exposed to dilute hydrochloric acid. The colouration variation with depth is observed to comprise yellowish browns and light grey and becomes dark grey at depth within the less weathered material. The onsite historical borehole (see Section 2.2), indicates a similar succession to the RPS 2023 records however, a green colouration is indicated.

4.2.25 Voids have been encountered in two of the three boreholes within the AG bedrock. Further detail is presented in Section 4.3 below.

4.2.26 Atterberg Limit testing was undertaken on 25 samples of the AG, primarily from shallow depth within the Grade E soils. The results are plotted in Figure 2 and indicate the soils to comprise clays of intermediate to high plasticity. Following removal of the coarse material the modified plasticity index for these samples has been calculated between 11 and 39, which indicates the fine-grained fraction of the AG to be of low to medium volume change potential.

4.2.27 Hand shear vane tests (30 tests) were undertaken within the Grade E soils in the trial pits to provide measurements of the undrained shear strength of the fine-grained soils. The results of the testing are presented in the exploratory holes logs (Appendix B, App. B.4) and Figure 3. The tests have been performed on the excavated clods of the fine-grained soils. It was observed the AG was typically too friable to obtain reliable results, particularly from beyond 3.0 m BGL. The results indicate a minimum and maximum c_u of 105 to 200 kPa with no obvious trend of increasing strength with depth. The results broadly correlate with the consistency descriptions within the logs.

4.2.28 Particle Size Distribution (PSD) testing was undertaken on three samples collected from the AG (Grade E) from depths of 0.7 m BGL. The constituents of the samples are summarised in Table 4-3. The laboratory results generally correlate well with the field log descriptions and confirm the proportions of constituents observed.

Table 4-3: Particle Size Distribution Results (Avon Group)

Exploratory Hole ID	Depth to top of sample (m BGL)	Stratum	Proportion (%)					Sample Description
			Clay	Silt	Fines[1]	Sand	Gravel	
BH02	0.7	AG	25	20	45	25	30	Sandy gravelly silty CLAY
TP02	1.6		48	22	70	19	11	
TP10	1.5		22	17	39	19	42	

Notes.

1. Fines comprises the combined Clay and Silt Fractions.
2. *Denotes combined silt and clay proportion

4.2.29 45 SPTs were undertaken within the AG, of which 43 tests were undertaken in the Grade E weathered material and two tests undertaken in the Grade D material. The maximum depth of testing recorded was 9.5 m BGL. Material of increased strength is anticipated below these depths however no further SPT testing was undertaken to improve core recovery in competent strata following SPT refusal. The results are presented in Figure 4 and indicate a general increase in strength with depth. These should be treated with some caution as higher SPT results may be indicative of larger gravel sized fragments of AG affecting the penetration of the SPT.

4.2.30 Dynamic sampling techniques were restricted to recovery of the Grade E. Dynamic sampling was observed to refuse in the Grade D materials and the boreholes were then progressed with rotary drilling techniques. Rotary coring was deployed from 7.5, 9.5 and 8.8 m BGL for BH01, BH02 and BH03 respectively.

4.2.31 The Total Core Recovery, TCR (representing both dynamic sampling and rotary coring) from the drilling is presented in Figure 5. The plot indicates variable recovery from below 8 m BGL where rotary coring was undertaken.

- TCR: Total Core Recovery was generally recorded above 60 % for all boreholes with a reduction in TCR observed in observed BH03 in an area of friable mudstone and in BH02 adjacent to the encountered void.
- SCR: Solid Core Recovery was observed to improve with depth in BH01 and BH02 however a reduction as observed in BH03. The reduction at depth observed is associated to the fissile, highly fractured nature of the recovered rock;
- RQD: Rock Quality Designation are all lower than 60 % and suggest a fractured rock mass. No specific trends are observed in any of the boreholes bar a marginal increase in the BH01 location with depth.

4.2.32 The onsite historical borehole indicates improved TCR when compared to the RPS boreholes however, the SCR and RQD are broadly comparable. Limited recoveries and rock quality data reflect the closely interbedded and laminated rock mass with perpendicular joint set. The rock mass term based upon the recorded RQD values would range between very poor to fair.

Black Rock Subgroup and Gully Oolite Formation

4.2.33 The BRS has been recovered to a maximum depth of 1.2 m BGL as a residual soil (weathering Grade E), in two hand pits HP01 and HP02 located within the water pipeline area. A single Atterberg Limit test has been undertaken (see Figure 2) and indicates the stratum to be comparable to the AG.

4.3 Voided Ground

4.3.1 During the intrusive works within the Electrolyser Assessment Area, areas of zero resistance were noted during the drilling of BH01 (14.60 – 16.30 m BGL) and BH02 (11.30 – 11.70 m BGL). These areas were subsequently investigated using downhole CCTV.

4.3.2 The imagery was analysed, and it was interpreted to show natural sub surface voiding within the calcareous mudstone of the Avon Group. Both voids appeared below the water table and showed linear orientation. The strike and the volume of these voids was not investigated during this phase of works. Images of voiding can be seen in Appendix E.

4.3.3 Presently the precise mechanism for void formation is uncertain and there are a number of scenarios that may facilitated void formation. At this stage it is considered that they may represent solutioned widened joints that may be of variable dimension and length. The AG comprises of a

Palaeozoic limestone and is recognised as susceptible to solution features[5]. This may be exacerbated through a tidally influenced groundwater regime introducing brackish water. Both voids are observed to overly 'more competent' Grade B AG bedrock and the weathering profiles are observed to significantly improve below the void pavement.

4.3.4 Locally more extensive palaeokarstic features and gash breccias are observed associated to the Pembroke Syncline (see Section 2). The nearest recorded records of such larger solution features are in Stackpole and Longstone Down and these are located in different geological formations.

4.4 Visual and Olfactory Evidence of Contamination

4.4.1 No visual or olfactory evidence of contamination was encountered in soils or groundwater across the site.

4.5 Groundwater

Intrusive Investigation

4.5.1 Groundwater was encountered within a number of exploratory holes during the ground investigation. The observations are summarised in Table 4-4. It should be noted that within the boreholes the observations comprise standing water levels opposed to typical groundwater strikes. The CCTV observed the voids to be fully saturated and as such this standing water level likely represents the general standing groundwater level. The groundwater observations are also shown on the exploratory hole logs included in Appendix B. The onsite historical borehole record indicates a groundwater strike at 2.58 m BGL and this appears relatively consistent with the RPS 2023 observations.

Table 4-4: Summary of Groundwater Observations

Exploratory Hole Location	Strata	Depth to water m BGL	Observation /comment
BH01	AG	2.5	Driller notes soils as wet. Potentially perched water. Not full water strike.
		13.8	Standing water level end of borehole.
BH02		9.7	Standing water level end of borehole.
BH03		9.6	Standing water level end of borehole.
TP04		2.0	Groundwater Seepage.
TP05		3.2	Groundwater Seepage.
TP09		2.6	Groundwater Seepage.
TP11		2.5	Groundwater Seepage
WS01		0.3	Perched Groundwater.
WS02		0.3	Perched Groundwater.
WS03		0.5	Perched Groundwater.
WS07		1.2	Perched Groundwater.

Notes.

1. Refer to exploratory hole records in Appendix B

[5] BGS. The use of karst geomorphology for planning, hazard avoidance and development in Great Britain. Vol 134, pp 18 -131, 2011.

Groundwater Monitoring

4.5.2 Upon completion of the ground investigation, three rounds of groundwater level monitoring have been undertaken with one round of groundwater sampling. The results of groundwater level monitoring are included within Appendix I, and are summarised in Table 4-5.

4.5.3 Groundwater levels monitored to date indicate that the groundwater levels have been rising following completion of the drilling. Based upon the limited data to date it appears groundwater levels reduce to the north of the site (i.e., groundwater reduces towards the Haven).

Table 4-5: Summary of Groundwater Piezometric Levels

Monitoring Well ID	Well Screen Depth (m BGL [m AOD])	Strata	Depth to Water (m BGL) [m AOD]		
			20/10/2023[1]	30/11/2023	30/11/2023
BH01	No standpipe installed due to voiding - borehole collared to 4.50 m and surface covered	AG	13.50 (5.91)	10.88 (8.53)	8.86 (10.55)
BH02	No standpipe installed due to voiding - borehole collared to 4.50 m and surface covered		10.5 (11.68)	6.39 (15.79)	6.80 (15.38)
BH03	5.0 – 15.0 (17.02 – 7.02)		9.60 (12.42)	5.74 (16.28)	6.17 (15.85)

Notes.

1. Groundwater observation represent end of drilling observation

5 GEOTECHNICAL ASSESSMENT

5.1 Introduction

5.1.1 This section of the report presents comments on the ground conditions identified in relation to design and construction of the geotechnical elements of the proposed structures.

5.1.2 It should be noted that this is a preliminary appraisal in relation to likely rock mass quality, material reuse, foundations, pavements, concrete classification, groundwater management and the likely viability of soakaways. The appraisal is based solely on the site derived information obtained as a result of the studies stated herein. This ground investigation was designed to provide data to inform the pre-feed options and as such the comments are considered preliminary.

5.1.3 It is not intended to form a Geotechnical Design Report, as defined by Eurocode 7 (EC7, 2009) but rather simply provides an overview of the geotechnical characterisation of the site. The site constraints (see Table 3-1) have constrained the investigation works. It should therefore be recognised that there remains a degree of uncertainty due to the spatial extent and constraints in undertaking this investigation which will need to be addressed through further targeted ground investigation for design.

5.1.4 As presented in Section 1.3, the proposed development comprises the Electrolyser development and perpendicular Water Pipeline. It is considered that the Water pipeline will not require any significant earthworks or require the construction of structures.

5.2 Geotechnical Data and Testing (Rock)

5.2.1 The laboratory testing and results for the bedrock that has been weathered to a residual soil (Grade E) comprised; moisture content, plasticity and particle size distribution, with in-situ field testing comprising SPTs and hand vane readings. The test results for the soils have been discussed earlier in Section 4.2.

5.2.2 Geotechnical laboratory testing for the for the rock mass comprised Point Load Index (PLI) and Uniaxial Compressive Strength (UCS) tests with the quantities of testing and results summarised in Table 5-1.

5.2.3 Due to the steeply inclined bedding recovery of a suitable length of core for UCS testing has been constrained to one sample of Grade G AG (BH01 14.40 – 14.59 m BGL). The test result indicates a result of 6.3 MPa.

5.2.4 A correction factor has been adopted to enable comparison of PLI to UCS, and is based on a study undertaken on coal measures bedrock[6] . This is considered moderately conservative when compared to the various relationship between uniaxial compressive strength and point load strength for weak rocks[7]. The PLI $I_{s(50)}$ has been corrected to provide an estimation of the UCS. Based upon the following correction factor:

$$UCS = 21.0\ Is50$$

5.2.5 The results of this correction are presented in Table 5-1 and indicate a broad correlation between the single laboratory UCS and correlated UCS from PLI testing and indicate the rock strength to range between very weak and weak and is consistent with the field logs.

[6] J. Rusnak & C. Mark. Using the Point Load Test to Determine the Uniaxial Compressive Strength of Coal Measure Bedrock

[7] M. J. Tomlinson: Foundation Design and Construction. 7th Edition. Pearson Prentice Hall Harlow England. 2001.

Table 5-1: Correlated UCS from PLI Results

AG Weathering Grade	No. of Tests	UCS Min	UCS Max	UCS Average
Grade C	5	4.8	16.7	7.7
Grade C/B	3	2.8	23.6	9.8
Grade B	8	1.8	22.5	5.6

Notes.

1. UCS presented are calculated from PLI as set out in Section 5.2

5.3 Strength Characteristics and Parameters

5.3.1 A spectrum of data is observable for SPT N (N_{60}) values and c_u within the fine-grained soils. As identified previously a general increase in both N_{60} and c_u is observed with depth.

5.3.2 There are numerous published relationships between c_u and N values within both normally and over consolidated clays most notably discussed by Stroud and Butler, 1975 (Stroud & Butler, 1975), who goes on to advocate correlations are dependent on variations in liquid limit, average plasticity and location; and for the soils at this site a single conservative correlation factor, f_1, of 4.5 has been adopted. This has been deduced using the field consistency descriptions, plasticity data and previous experience within fine grained soils. The chosen factor (f_1) is considered conservative in this approach.

5.3.3 The hand vane results have been corrected based upon the available plasticity index data to allow for soil anisotropy by a factor of 0.85[8]. Figure 6 presents the results of this correlation overlaying the correlated SPT N_{60} values over the corrected hand vane results. It can be seen that there is a general conformance between the two data sets. In the undertaking of this assessment, we are not aware of any significant earthworks or slopes and as such have not considered the residual values from the hand vane testing further. This data has been used to derive material properties for the Grade E AG. From consideration of the measured values and properties of the material, a linear variable value of undrained shear strength of 60+8z- (kPa) is considered appropriate for preliminary design purposes where z is measured from 1 m BGL in the AG.

5.3.4 From consideration of the correlation with plasticity index (BS 8004, 2015) and the visual description of the material, an effective angle of internal friction of 24 degrees is suggested for use in design analysis. For this material, effective cohesion should be taken to be zero in any preliminary design analysis.

5.3.5 It is widely accepted in the UK that the undrained Young's modulus (Eu) can be related to undrained shear strength (c_u) for the clayey soils. A factor of conversion in the range of 220 to 1000 has been recommended in different references. The value of 400 was considered to generate the Eu values from c_u, therefore Eu=24+3.2z (MPa) is considered appropriate formula to calculate the undrained elastic modulus for AG Grade E soils.

5.3.6 The Elastic Modulus (E') can be estimated using a combination of the UCS, mass factor (*j*) and Modulus Ratio (M*r*) using the following formula[1]

$$Em = j\ Mrq\ uc$$

[8] Bjerrum, L. Problems of Soil Mechanics d Construction on soft clays and structurally unstable soils. General Report in Proceedings of thr 8th Internation Conference on Soil mechanic. Mosow. 3. PP 111 – 159. 1973

[1] Tomlinson, M. J,. Foundation Design and Construction. Seventh Edition.

5.3.7 The mass factor has been based upon the quality description from the borehole logs with the modulus ratio adopted based upon the rock group[2].

5.3.8 The ratio of drained Young's modulus (E') to the undrained elastic modulus (Eu) may be approximated to be a value of E'/Eu= 0.65. Thus, E'= 24.65+2.08z (MPa) is considered an appropriate formula to calculate the drained elastic modulus for the AG Grade E soils.

5.3.9 The following table shows the preliminary ground model and geotechnical parameters based of the findings of the intrusive investigation and subsequent testing. Note, the Made ground thicknesses are likely to be variable and the values presented will require revision with additional ground investigation data.

Table 5-2: Preliminary Ground Model and Geotechnical Parameters

Strata	Top (m BGL)	Thickness (m)	Bulk Density	UCS	ϕ'	c_u (kPa)	Eu	E'
Made Ground	*0*	*0.1 – 1.4*[2]	18[3]	-	24[3]	-	-	7[3]
Avon Group (Grade E)	*0.20 – 1.60*	*0.3 – 9.35*	22[3]	-	24	60+8z[1]	24 +3.2z	18+ 2.08z
Avon Group (Grade D)	*6.9 - 11.10*	*0.75 - 1.00*	25	2	-	-	-	72[4]
Avon Group (Grade C/B)	*9.20 - 17.10*	*1.10 - 5.80*	25	5.6	-	-	-	250
Black Rock Subgroup	-	Additional data is required for preliminary geotechnical design						

Notes.

1. z = depth below existing surface
2. See Table 4-1 for further details on geometry as presented depths and thicknesses may be variable
3. Conservative estimate
4. Elastic modulus presented for rock

5.4 Foundation Considerations

General

5.4.1 Any chosen foundation solution will be required to suitably mitigate potential future instability associated to the encountered ground conditions (voids). Dissolution features pose a hazard to foundations because of the pre-existence of one or more of the following.

- Loose and metastable weathered or superficial deposits overlying solution widened joints and cavities.
- Large cavities / caves within the underlying strata.
- Dissolution-widened discontinuities in the bedrock affecting its load-carrying behaviour.
- Loose and metastable bedrock caused by collapse, e.g., cave collapse.

5.4.2 Destabilisation of metastable deposits can induce upward micro-void migration, with movements finally leading to the appearance of a depression or subsidence sinkhole at the ground surface. Similarly, destabilisation of a metastable cavity results in the cavity reaching the ground surface again producing a subsidence sinkhole.

[2] Hobbs, N, B., General Report on state-of-the-art review, in Proceding of a Conference on Settlement of Structures, Pentech Press, Cambridge. Pp. 579-609. 1974

5.4.3 The overall risk these hazards present to the development depends both on its vulnerability to these hazards and its intended use. The vulnerability depends on the type of substructure, being greatest for isolated pad footings and ground-bearing floor slabs, and least for a suspended ground floor slab supported on piles founded below the base of the features. Likewise the risk associated with its use is generally lower for an unoccupied building than it is for a residential development for example.

5.4.4 For any proposed structures or sensitive development, where voids are suitably identified and treated (if necessary), then a shallow foundation solution may be adopted for low to moderate loads. Where the treatment of voids is uncertain it is recommended that a deeper piled foundation solution be adopted penetrating below the depth of identified voids.

5.4.5 The following recommendations are presented on the predication that further targeted intrusive investigation to enable delineation and extent of voided ground, such that the void basement is well mapped and understood, and that associated ground treatment if warranted are undertaken for the Electrolyser Assessment Area, The scope of such further assessment and the determination of appropriate treatment are beyond the scope of this report and further studies should therefore be undertaken in this regard.

Buried Obstructions

5.4.6 A small number of buried obstructions have been encountered during this investigation, in the following locations:

- BH01, concrete was found between 0.6 and 0.9m bgl, and was penetrated using rotary open hole technique.
- WS02 was terminated within the Made Ground on a potential concrete obstruction.
- TP06 concrete obstruction was encountered in the pit at 0.2m bgl, the pit extended northwards, proving thickness of concrete to be approximately 0.5m. The pit was terminated at 0.8m bgl due to presence of a plastic pipe running east to west across the pit at 0.6m. Pit could not be extended further due to ecological constraints.
- TP07, although no concrete footing was encountered, services were encountered at 0.8m. The pit was extended to the south as far as ecological constraints allowed. Terminated shallow to reduce risk to services.
- TP08, located in the central part of the site and was positioned to target the bunded material and potentially former structures in this area. The pit was terminated at 0.3m bgl due to potential redundant services and buried structures. Due to ecological constraints and the proximity of the existing road way this trial pit could not be extended. The buried structures comprised a brick wall in the north west corner, buried service running east to west. The thickness of the concrete in this area is therefore unknown.

5.4.7 A number of trial pits were positioned to target the potential for buried footing associated with the former industrial hostel development these include

- TP06 to target the potential constructed slope.
- TP09 to target a former building in the west.
- TP07 to target the larger U shape building.

5.4.8 These trial pits were positioned to target representative structures at the stie. No significant concrete obstructions were noted in the targeted trial pits.

5.4.9 Buried obstructions have been encountered during this investigation and where typically related to services or relatively minor concrete features. Based on the consistent form of the previous built structure, it is considered reasonable to assume that obstructions in the remainder of the site area

similar, although we can't rule out more significant structures. All structures may require removal as part of the site preparatory site works.

Made Ground

5.4.10 The Made Ground encountered has been identified to a maximum depth of 1.4 m. Made Ground is inherently variable and should not be relied upon as a foundation material in its present condition. The use of conventional foundations on the near surface Made Ground cannot be recommended due to likely insufficient bearing capacity and unacceptable differential settlements. It is considered that based on limited anthropogenic inclusions in the Made Ground where required and subject to ground engineering, the Made Ground could be used as a general fill and achieve similar material properties to the adjacent Grade E AG materials.

Strip / Shallow Foundations

5.4.11 The underlying Grade E AG has been recorded as being firm to stiff with hand shear vane and correlated SPT data indicating a shear strength of c. 60 k Pa from between 1 to 2 m BGL and presents a suitable founding horizon for lightly to moderately loaded structures. For preliminary purposes an Allowable Bearing Pressure (ABP) of c. 110 kN/m^2 may be adopted for 1 m width foundations.

5.4.12 It should be noted that the effects of potentially voided ground should be considered. If the possibility of an unknown dissolution feature has to be accommodated, then the structure and floor slabs should be capable of bridging over any void, which might develop anywhere beneath it. This is commonly achieved by forming the footings as a series of orthogonal grillages or raft.

Piled Foundations

5.4.13 Piled foundations embedded below the encountered voids offer a practical foundation solution, particularly where the ground is required to support moderate to high loads for sensitive structures. The formation below the encounter voids is observed to comprise slightly weathered bedrock and is moderately strong and would be expected to offer relatively favourable high end bearing resistances. It is not recommended to adopt a piled foundation solution above or within the depth range of anticipated voids.

5.4.14 Care is needed in the design and construction of such piles to overcome the problems presented by metastable materials and cavities. These can be temporarily destabilised by disturbance during pile installation arising from both vibration and the use of flushwater. Likewise, any long-term settlement or collapse of the metastable materials would necessitate that the piles be designed for collapse and negative skin friction loads.

5.4.15 Further ground investigation and assessment will be required to determine the likely floor of any voids. Further targeted site investigation is required to provide sufficient information to allow the development of geotechnical design parameters for the chosen founding strata.

5.4.16 It should be noted that a significant degree of the pile resistance is generated with the penetration within the bedrock. This assumption is highly dependent on the appropriate selection of piling method to manage the observed voids an achieve pile formation. Specialist piling contractors may potentially offer specific knowledge with regards to pile construction and void remediation.

5.4.17 An appropriate piling platform should be designed and constructed in accordance with BRE Digest 470 (Working Platforms for Tracked Plant) , again making due consideration of potentially subsurface voids.

Floor Slabs

5.4.18 Based on the ground conditions encountered at the Site, it is expected that, in general for the main building that floor slabs supported on a suitable depth of sub-base will prove adequate provided the exposed natural deposits are compacted by a heavy smooth wheeled roller and any soft or degradable materials removed and replaced with compacted granular fill.

5.4.19 Further review and verification testing will be required where Made Ground is re-engineered for incorporation within the design. Alternatively Made Ground, highly weathered or soft spots identified during consideration should be removed and replaced with a competent granular engineered backfill will be required. The floor slab design will be required to be of sufficient strength to span any variability observed in the formation. Floor slab will be required to accommodate the moderate volume change potential of the soils.

5.4.20 Reference should be made with respect to the potential for ground gas and the inclusion of gas protection measures as part of any slab design.

5.5 Pavement Design

5.5.1 Testing of the shallow soils using a TRL approved dynamic cone penetrometer (DCP) was undertaken at 24 locations to derive CBR values. The CBR values presented have been derived using empirical correlations from Design Guidance for Road Pavement Foundations[9].

5.5.2 The onsite recorded measurements are presented in Appendix D. The results have been collated and averaged by depot over 50 mm increments. The averaged and lower quartile values for the depth increments are presented in Figure 7.

5.5.3 The results indicate averaged results above 10 % however, lower quartile values indicate that above 0.5 m depth a more conservative 2.5 % CBR should be adopted for the purpose of preliminary designs. In areas of future cut a design CBR of 7.5 % would likely be achievable.

5.5.4 The final formation level will require inspection and consideration should be given to the removal of the soft soils (soft areas) where encountered. Where encountered soft spots should treated by either replacement with compacted suitable granular fill materials, treatment with lime or cement to reduce the moisture content and / or the use of geo-synthetics. Prior to construction the CBR will require measuring and any subbase designed accordingly.

5.6 Vegetation and Trees

5.6.1 As stated in Paragraph 5.4.15, the fine-grained weathered bedrock (Grade E residual soils) and cohesive Made Ground have been observed to have low to medium volume change potential. The likely requirement for a deep foundation solution will largely mitigate the effect from volume change sensitive soils. Where any de-vegetation or proposed planting are proposed consideration should be given to the effects on proposed development and hardstanding. Due to site size and the observed variability in groundwater levels it is recommended proposed planting and de-vegetation are assessed on a case-by-case basis.

5.7 Material Reuse

5.7.1 Presently the degree of cut and fill required for the Electrolyser Assessment Area is unknown. The site is observed to slope from south to north with an approximate elevation change approaching 10 m, however the elevation change of the area of the proposed development is approaching half of

[9] Design Guidance for Road Pavement Foundations (Draft HD25). Interim Advice Note 73/06. Revision 1 (2009).

that level change. As such it is assumed cut and fil works will be constrained to the shallow soils (within 2 to 3 m of the existing site surface). Based upon the requirements of the Water Pipeline there is no significant cut and fill anticipated for this area.

5.7.2 No geotechnical testing for the purpose of material reuse has been undertaken for the observed Topsoil materials or the Made Ground – Reworked Topsoil materials. Further testing (see BS 3882[10]) and demonstration of the geo-environmental suitability of such materials may allow these materials to be reused as topsoil (Class 5 Topsoil or Class 4 General Landscape Fill in accordance with Highways Specification[11]) within the scheme.

5.7.3 General Made Ground has been identified during this phase of investigation. It is likely that the General Made Ground is present adjacent to former onsite structures and a suitable management plan for reuse will likely allow incorporation within earthworks materials. Where the suitability cannot be demonstrated offsite disposal will be required.

5.7.4 Bedrock has been observed to comprise of an upper weathered horizon overlying competent bedrock of increasing competency with depth. The upper weathered zone is observed to be fine grained in composition with residual soils (Grade E) materials anticipated within the likely cut depths (2 to 3 m BGL). It is considered these materials may likely be used as General Fill as cohesive general fill (Class 2) in general accordance with the Highways Specification. Pockets of Made Ground may require a granular general fill (Class 1) classification. The precise classification and subdivision within these classes being determined based on appropriate geotechnical classification testing of the arisings. This is beyond the scope of this assessment.

5.7.5 Standard Proctor (2.5kg rammer) compaction testing has been undertaken three samples (see Table 5-3). Natural moisture contents are observed to be higher than the corresponding Optimum Moisture Contents (OMC) and as such indicate that prior to placement the shallow soils will require 'drying' to achieve adequate compaction of 95 % MDD, being typically maximum moisture content of circa 18 %. Given the variability of the materials an end product specification should be developed for the compaction of the materials, limiting air voids to no greater than 5 %.

Table 5-3: Summary Compaction Data

Location ID	Depth (m BGL)	Formation	Description	Moisture Content (%)	OMC (%)	MDD (Mg/m^3)
TP02	0.2 - 0.4	Made Ground (general)	Sandy gravelly clay	19	13	1.85
TP11	0.6 - 0.8	Made Ground (general)	Clayey gravel	23	12	1.87
TP10	1.5 - 1.7	Avon Group	Gravelly clay	21	12	1.90

Notes.

1. Results presented in full in Appendix H
2. All tests undertaken with a 2.5 kg rammer

5.7.6 Based on guidance given in CIRIA Report C504 (1999) and TRL 199 (1989) any proposed cuttings less than 5 m in height should not be made greater than 1(v):2(h) and any greater than 5 m in height should be battered at no greater than 1(v):2.5(h). Any proposed slopes should be confirmed thorough stability analysis.

5.7.7 Should embankments or unsupported slopes be formed in fill materials, then based on guidance given in CIRIA Report C504 (1999) and TRL 199 (1989) embankments should not be made

[10] British Standard: BS 3882:2015 – Specification for Topsoil

[11] Highways Agency, 2009b. Manuel of Contract Documents for Highways Works. Volume 1. Specification for Highways Works. Series 600, Earthworks.

greater than 1(v):1.75(h). It is emphasised that the side slopes stated are for preliminary purposes and that their use should be confirmed by a thorough stability analysis.

5.8 Chemical Attack

5.8.1 Samples collected from the Topsoil, Made Ground, Avon Ground and the Black Rock Subgroup were tested for pH and for sulphate content. The results are presented below:

Table 5-4: pH and Sulphate Analytical Data

Strata	No. of Samples	pH Range	Characteristic pH	Sulphate Range (mg/l)	Characteristic Sulphate (mg/l)	Design Sulphate Class	ACEC Class
Topsoil	6	6.14 – 8.39	6.14	3.10 - 15.50	15.50	DC -1	AC-1
Made Ground	15	7.12 - 8.66	7.12	6.10 – 54.20	54.20		
Avon Group	4	7.91 – 8.41	7.91	1.50 – 30.80	30.80		
Black Rock Subgroup	1	7.82	7.82	354.50	354.50		

5.8.2 The data was used to assess appropriate classification for buried concrete in accordance with BRE Special Digest 1, based on the following assumptions:

- Brownfield ground conditions; and
- Mobile groundwater conditions.

5.8.3 Based on the above, it is considered that a Design Sulphate Class of DS-1 and an Aggressive Chemical Environment for Concrete (ACEC) Classification of AC-1 would be appropriate for all buried concrete structures.

5.9 Soakaways

5.9.1 In order to evaluate ground permeability and infiltration rate, two infiltration soakaway tests were undertaken in TP02 and TP11. A third test location was initial planned (TP06) however, due to the presence of redundant services it was not possible to undertake a test in this location.

5.9.2 The results of the soakway tests are presented in Appendix C.

5.9.3 The soakaway tests were undertaken within strata of the Avon Group and within the Made Ground.

5.9.4 Infiltration rates are normally calculated by measuring the time taken for the water level to fall from 75 % to 25 % effective storage depth in the test pit, however the test in TP06 was run for a period of three hours and limited infiltration was recorded, with infiltration only just encountering the 75 % effective storage depth. An extrapolated infiltration rate has therefore been calculated for this test, and is presented on the data sheet however, this value should be used with caution. It is considered unlikely that infiltration would have closely followed the straight line projection shown on the graph within the data sheet and therefore the calculated value is likely to be an overestimation. In addition, multiple tests were not undertaken as such the ground is not saturated and any values again may overestimate the longterm soakage rate that could be applied in any subsequent soakaway design.

5.9.5 The test in TP11 was terminated due to collapse of the side wall, however it is worth noting that prior to the collapse, recorded at one hour and seven minutes, no infiltration was recorded.

5.9.6 On this basis, limited infiltration was recorded within the two tests, and therefore shallow soakaway drainage is unlikely to be suitable.

5.10 Updated Geotechnical Risk Register

5.10.1 The preliminary geotechnical risk register from the RPS 2022 report has been updated based upon the site works observations and is presented in Table 5-5. The risk register will require continual revision following further intrusive works, assessment and as further data is acquired for the development.

5.10.2 The potential risks are given one of the following classifications:

- Low risk - it is considered unlikely that issues within the category will give rise to significant damage in relation to the proposed development.
- Moderate risk - it is possible, but not certain that issues within the category will give rise to significant damage in relation to the proposed development.
- High risk - there is a high potential that issues within the category will give rise to significant damage in relation to the proposed development.
- N/A - The anticipated ground conditions are not consistent with this hazard.

Table 5-5 Geotechnical Risk Register

Hazard Description	Potential for Hazard	Comments / Possible Engineering Requirements
Sudden lateral / vertical changes in ground conditions	H	Made Ground has been identified to be of variable thicknesses (up to 1.4 m BGL) and presently founding on the Made Ground is not considered viable as a founding stratum. Cavities have been observed in the underlying Avon Group bedrock. Given limited deeper ground investigation works have been undertaken to date the extent of voiding across the sites is unknown and significant potential exists for sudden change in ground conditions associated to both variable weathering and voids.
Highly compressible / low bearing capacity soils, (including peat and soft clay)	L	Excluding the presence of cavities: the general ground conditions encountered are not conducive of highly compressible soils although Made Ground have been encountered.
Ground dissolution features / natural cavities	H	Limestone bedrock is indicated beneath the Electrolyser Assessment Site and voided solutioned widened joints have been identified in two boreholes, but the extent of such has not been determined as part of this ground investigation
Shrinking and swelling clays	L/M	The ground conditions are anticipated to be weathered bedrock underlying Made Ground and have been shown to have a low to medium volume change potential. Final development proposals should be reviewed with consideration to nearby vegetation where a shallow foundation solution is adopted.
Slope stability issues	L	The Electrolyser Assessment Site slopes down along the water pipeline route towards the east. Given there is likely to be limited reprofiling for the proposed development, and a water pipe will be installed in the area of slopes, there is not considered to be a considerable risk for slope stability. *Any temporary slopes created as part of the development should be subject to appropriate geotechnical design based on site-specific site investigation information.*
High groundwater table (including waterlogged ground)	L/M	The groundwater table has shown to be at a depth of circa 6-9 m BGL. The tidal variation in groundwater level should be determined prior to development of the site. Perched groundwater has been encountered and as such localised measures e.g. sump pumping may be required to manage any water encountered in shallow excavations
Filled and Made Ground (including embankments)	L/M	A limited thickness of Made Ground has been encountered in places across the Electrolyser Assessment Site.

Hazard Description	Potential for Hazard	Comments / Possible Engineering Requirements
Aggressive Ground	L	Laboratory analysis indicates generally less aggressive ground conditions with a DS-1 for all strata tested.
Obstructions (including foundations, services, basements, tunnels and adjacent sub-structures)	M	The proposed electrolyser area has been previously developed prior to its most recent use as a sports and recreational ground. There is a possibility that remnant foundations / sub – structures exist beneath the existing ground level. The natural gas pipe from Valero Oil Refinery in the east also underlies the Electrolyser Assessment Site but it is not known whether this has been routed through a concrete channel or just buried with gravel.

6 HUMAN HEALTH RISK ASSESSMENT

6.1 Introduction

6.1.1 The assessment of risks posed to human health by the presence of soil contaminants is based upon the guidelines outlined in CLR11 (DEFRA & EA, 2004), which provides a framework for risk assessment and follows a tiered process, with each subsequent tier involving a higher degree of input into the assessment should risks be identified. These tiers comprise:

- Tier 1 – Qualitative Risk Assessment, This stage qualitatively identifies each of the Source-Pathway-Receptors components that are present on the Assessment Site, which forms the basis of the UK risk assessment approach. The Tier 1 assessment is presented within Section 2.6.
- Tier 2 – Generic Quantitative Risk Assessment (GQRA): this stage aims to identify contaminants of concern and their spatial distribution and requires benchmarks against which to compare the concentrations of soil contaminants. This requires the comparison of contaminant concentrations to published assessment criteria (AC). The following sections comprise the Tier 2 Assessment.
- Tier 3 – Detailed Quantitative Risk Assessment (DQRA): This stage is undertaken where screening levels are exceeded, and unacceptable risks identified. A tier 3 assessment is outside the scope of this report.

6.2 Tier 2 – Generic Quantitative Risk Assessment

6.2.1 The following Sections summarises the soil analytical data and provides a comparison to published assessment criteria (AC) derived to support the assessment of chronic risk to human health receptors.

6.2.2 The selected AC are Suitable 4 Use Levels (S4UL) published by Land Quality Management: Chartered Institute of Environmental Health (LQM:CIEH) in 2015. In accordance with the copyright notice, the Publication Number for RPS Group is S4UL3177.

6.2.3 A notable exclusion from the S4Uls is lead. In the absence of a S4UL for lead, the Category 4 Screening Level (C4SL) has been selected, published by DEFRA in 2014. It is noted that the C4SL are based on the acceptance of a low level of toxicological concern, rather than the more conservative standard adopted in the derivation of S4Uls, which are based on a tolerable or minimal level of risk.

6.2.4 In the absence of available guidance from DEFRA and the Environment Agency for the assessment of acute risks from cyanide, it is considered appropriate to use the methods proposed by the Massachusetts Department of Environmental Protection (MADEP) and the first edition of the SNIFFER Framework, which can be used as a basis for assessing acute risks. Using this method, an AC of 53 mg/kg has been derived for the assessment of acute risk.

6.2.5 The potential risk posed to controlled waters from contaminants of concern within soils beneath the site is not addressed by these screening criteria.

6.2.6 Given the proposed use of the Assessment Site following development as a green hydrogen plant (electrolyser plant) the assessment has been based on the commercial end use criteria.

6.2.7 Soil Organic Matter (SOM) for the samples ranged from 0.6 % to 6.4 %. Concentrations of contaminants of concern have therefore, where appropriate, been compared conservatively to the AC derived for an SOM value of 1 %.

6.3 Comparison of Soil Analyses to Assessment Criteria

6.3.1 Chemical analysis by a UKAS/MCERTS accredited laboratory was undertaken on 15 samples of Made Ground, six samples of Topsoil and five samples of the natural strata. A comparison of soil analyses to the relevant AC is summarised below and presented as Appendix F. Analytical certificates for soils are presented in Appendix G.

6.3.2 For inorganic contaminants principally comprising metals and PAH, the laboratory analysis results have initially been compared against the relevant screening criteria to identify any exceedances of the criteria that would warrant further consideration. Where exceedances of a particular contaminant are identified, the statistical 95 % Upper Confidence Limit (UCL) of the true mean concentration has been calculated for all data available and compared against the relevant screening criteria, in line with UK best practice.

6.3.3 For all TPH and asbestos contaminants, the results of the laboratory analysis have been compared directly against the appropriate screening criteria, as the most likely source of this contamination is considered to be from point sources e.g. spillages. Therefore, the statistical assessment of data is not considered valid in the first instance and this approach is considered to be in line with UK best practice.

Inorganic Contaminants

6.3.4 The assessment has been undertaken utilising the results of the metals and inorganic soil analysis from samples taken from the recent ground investigation undertaken by RPS, following the approach outlined above.

6.3.5 Table 6-1 summarises the results of the laboratory analysis for inorganic contaminants encountered across the Assessment Site and compares them with the relevant screening values for a commercial end use.

Table 6-1: Summary of Inorganic Contaminant Soil Analysis

Contaminant	Number of Tests	Screening Criteria (S4ULs) (mg/kg)	Min	Max	Number of Exceedances
Water Soluble Sulphate as SO4 2:1 Extract (g/l)	26	-	1.5	354.5	0
Cyanide	26	53	<0.5	<0.5	0
Phenol	26	1300	<0.15	<0.15	0
Arsenic	26	640	5.5	22.8	0
Cadmium	26	190	0.1	0.2	0
Chromium	26	8,600	13.7	31.8	0
Chromium VI	26	33	<0.3	<0.3	0
Copper	26	68,000	11	45	0
Lead	26	2300	16	130	0
Mercury	26	58	<0.1	0.3	0
Nickel	26	980	10.9	68.9	0
Selenium	26	12,000	<1	2	0
Zinc	26	730,000	50	241	0

6.3.6 The results indicate that all above inorganic contaminants lie below the relevant screening criteria for a commercial end use. On this basis, it is considered that levels of inorganic contaminants

across the Assessment Site lie at tolerable levels of risks to human health for a commercial development scenario.

Polycyclic Aromatic Hydrocarbons (PAH)

6.3.7 The assessment has been undertaken utilising the results of the PAH soil analysis from samples taken from the recent ground investigation, following the approach outlined above.

6.3.8 Table 6-2 summarises the results of the laboratory analysis for PAH encountered within soils across the Assessment Site and compares them with the relevant screening values for a commercial end use.

Table 6-2: Summary of PAH Soil Analysis

Contaminant	Number of Tests	Screening Criteria (S4UIs) (mg/kg)	Min (mg/kg)	Max (mg/kg)	Number of Exceedances
Naphthalene	26	190	<0.04	<0.04	0
Acenaphthene	26	84,000	<0.03	<0.03	0
Acenaphthylene	26	83,000	<0.05	<0.05	0
Fluoranthene	26	23,000	<0.04	<0.04	0
Anthracene	26	520,000	<0.03	0.16	0
Phenanthrene	26	22,000	<0.04	<0.04	0
Fluorene	26	63,000	<0.03	0.48	0
Chrysene	26	350	<0.03	0.33	0
Pyrene	26	54,000	<0.06	0.28	0
Benzo(a)anthracene	26	170	<0.02	0.033	0
Benzo(b)fluoranthene	26	44	<0.05	0.36	0
Benzo(k)fluoranthene	26	1,200	<0.02	0.14	0
Benzo(a)pyrene	26	35	<0.04	0.23	0
Dibenzo(a,h)anthracene	26	3.5	<0.04	0.2	0
Benzo(g,h,i)perylene	26	3,900	<0.04	<0.04	0
Indeno(1,2,3-cd)pyrene	26	500	<0.04	0.21	0
PAH, Total Detected USEPA 16	26	-	<0.6	2.7	0

6.3.9 The results indicate that all above PAH concentrations lie below the relevant screening criteria for a commercial end use. On this basis, it is considered that levels of PAH contaminants across the Assessment Site lie at tolerable levels of risks to human health for a commercial development scenario.

Total Petroleum Hydrocarbons (TPH) & BTEX

6.3.10 The assessment has been undertaken utilising the results of the TPH / BTEX soil analysis from samples taken from the recent ground investigation, following the approach outlined above.

6.3.11 Table 6-3 summarises the results of the laboratory analysis for TPH / BTEX encountered within soils across the Assessment Site and compares them with the relevant screening values for a commercial end use.

Table 6-3: Summary of TPH Soil Analysis

Contaminant	Number of Tests	Screening Criteria (S4UIs) (mg/kg)	Min	Max	Number of Exceedances
TPH Criteria Working Group (CWG) (mg/kg)					
>C5 to C6 Aliphatic	26	3200	<0.1<	0.1	0
>C6 to C8 Aliphatic	26	7800	<0.1	<0.1	0
>C8 to C10 Aliphatic	26	2000	0.1	<0.1	0
>C10 to C12 Aliphatic	26	9700	<0.2	<0.2	0
>C12 to C16 Aliphatic	26	59000	<4	<4	0
>C16 to C21 Aliphatic	26	-	<7	<7	0
>C21 to C35 Aliphatic	26	-	<7	136	0
>C16 to C35 Aliphatic	26	1600000	<14	143	0
Total Aliphatic C5-C35	26	-	<19	136	0
>C5 to C7 Aromatic	26	26000	<0.1	<0.1	0
>C7 to C8 Aromatic	26	56000	<0.1	<0.1	0
>C8 to C10 Aromatic	26	3500	<0.1	<0.1	0
>C10 to C12 Aromatic	26	16000	<0.2	<0.2	0
>C12 to C16 Aromatic	26	36000	<4	<4	0
>C16 to C21 Aromatic	26	28000	<7	<7	0
>C21 to C35 Aromatic	26	28000	<7	324	0
Total Aromatic C5-C35	26	-	<19	324	0
TPH Ali/Aro	26	-	<38	432	0
BTEX (mg/kg)					
Benzene	26	27	<0.005	<0.005	0
Toluene	26	5700	<0.005	<0.005	0
Ethylbenzene	26	56000	<0.005	<0.005	0
p/m-Xylene	26	5900	<0.005	<0.005	0
o-Xylene	26	5900	<0.005	<0.005	0

6.3.12 The results indicate that all above TPH and BTEX contaminants lie below the relevant screening criteria for a commercial end use. On this basis, it is considered that levels of TPH and BTEX contaminants across the Assessment Site lie at tolerable levels of risks to human health for a commercial development scenario.

Asbestos

6.3.13 A total of 26 soil samples were submitted for laboratory asbestos screening. Asbestos fibres were detected in a single sample of Made Ground (WS02 at 0.3 m BGL). The asbestos in this location is described as fibre bundles of amosite.

6.3.14 The sample was scheduled for quantification testing which indicates the concentration of asbestos within the sample is <0.0011% wt.

Summary of Risks to Human Health

6.3.15 The risk assessment has shown that concentration of chemical contaminants of concern within the soils are generally low across the Assessment Site and no exceedances of the commercial screening criteria have been recorded.

6.3.16 Asbestos fibres were detected in a single sample (WS02 at 0.3 m BGL) located in the south east of the site. The Made Ground is variable across the site and there is nothing significantly visibly different with the Made Ground encountered in WS02, with would suggest that the potential of asbestos present in soil is locally restricted. WS02 is located to the south of the former sport centre buildings.

6.3.17 As a consequence, with the exception of this very localised identification of asbestos no affirmative remedial action is required with respect to protection of human health given the proposed commercial reuse of the site. The risk from the identified asbestos to end users of the site can be mitigated through the placement of a cover system in the soft landscaped areas of the site. This would typically comprise a geotextile separation layer with 300 mm of overlying subsoil and topsoil. Alternatively further sampling and a risk assessment could be undertaken to seek to dismiss the risk.

7 CONTROLLED WATERS RISK ASSESSMENT

7.1 Introduction

7.1.1 Based upon the historical use of the assessment there is limited potential for contamination to be present that poses a risk to controlled waters which would require remediation to facilitate any future development.

7.1.2 A generic quantitative risk assessment has been undertaken to determine potential risks and impact to controlled waters from the presence of chemical contamination within the groundwater at the Assessment Site.

7.1.3 This section provides a summary of the concentrations of chemical contaminants encountered within groundwater during the single round of groundwater sampling undertaken by RPS in November and December 2023, and determines whether potential contamination risk are posed to controlled waters.

7.2 Generic Quantitative Risk Assessment

7.2.1 The generic quantitative risk assessment involves the comparison of tabulated analytical results for groundwater and surface water samples taken from the Assessment Site with published Assessment Criteria (AC).

7.2.2 Groundwater chemical data collected by RPS during the monitoring programme at the Assessment Site has been screened against Environmental Quality Standards (EQS) for a brackish / saltwater scenario, given the proximity of the Assessment Site to Millford Haven. These are as set out in the Water Framework Directive and are used for the protection of surface water bodies. UK Drinking Water Standards (DWS), applied in the context of potable water supply and aquifer protection, have been utilised where EQS are not available. For some parameters where no brackish/saltwater EQS are available, freshwater EQS have been used (copper and manganese).

7.2.3 The controlled water receptors that have been identified at the Assessment Site are:

- Surface water drains / unnamed streams to the east of the Electrolyser area.
- Millford Haven is located 207 m to the north of the Assessment Site.

7.2.4 Given the costal nature of the Assessment Site the groundwater Aquifers beneath the site, which is classified as a Secondary A Aquifer within the Avon Group have been discounted as a viable potable water supply and therefore an assessment against the DWS has only been undertaken where an EQS is not available.

7.2.5 For a number of chemicals of concern the EQS is less than the laboratory limit of detection. For the purpose of this preliminary assessment, where all samples are recorded at less than the laboratory limit of detection no further assessment is considered necessary.

7.2.6 The potential risk to on site human health receptors from contaminants of concern in groundwater is not addressed by these screening criteria and is not considered a viable pathway.

Groundwater Sampling Summary

7.2.7 During the recent ground investigation, a total of three monitoring wells were installed across the Assessment Site with installation within the natural bedrock strata.

7.2.8 Following completion of the RPS intrusive investigation works a single round of groundwater sampling was undertaken. The groundwater samples were analysed for a range of inorganic and

organic contaminants. The laboratory analysis results are presented within Appendix G App. G.2. The results of the groundwater sampling are summarised in the following sections.

7.2.9 Table 7-1 below summarised the groundwater laboratory results taken from the monitoring wells installed, where results lie above the laboratory detection limit. A summary assessment sheet is presented in Appendix F. All other results lie below the laboratory detection limit.

Table 7-1: Groundwater Analysis (RPS Boreholes)

Contaminant	Number of Tests	Min (µg/l)	Max (µg/l)	Screening Criteria (EQS[1])	Number of Exceedances	Location of exceedance Value
Benzo(ghi)perylene	3	<0.005	0.009	0.002 µg/l	3 (1 above the LoD)	BH02
Benzo(a)anthracene	3	<0.005	0.015	-	3 (1 above the LoD)	BH02
Benzo(b)fluoranthene	3	<0.005	0.023	-	3 (1 above the LoD)	BH02
Benzo(a)pyrene	3	<0.005	0.013	-	3 (2 above the LoD)	BH01 & BH02
Benzo(k)fluoranthene	3	<0.005	0.009	-	3 (1 above the LoD)	BH02
Chrysene	3	<0.005	0.02	-	3 (1 above the LoD)	BH02
Fluoranthene	3	<0.005	0.026	-	3 (2 above the LoD)	BH01 & BH02
Indeno(1,2,3-cd)pyrene	3	<0.005	0.011	0.002 µg/l	3 (1 above the LoD)	BH02
Phenanthrene	3	<0.005	0.017	-	3 (1 above the LoD)	BH02
Pyrene	3	<0.005	0.019	-	3 (2 above the LoD)	BH01 & BH02

7.3 Summary and Discussion

7.3.1 The groundwater assessment has shown that, in general very low levels of contaminants of concern have been recorded within the groundwater below the Assessment Site, with the majority of contaminants being recorded at levels below the laboratory limit of detection. Concentrations of PAHs have been recorded above the laboratory limit of detection in BH01 and BH02, with two PAHs (Benzo(ghi)perylene and Indeno(1,2,3-cd)pyrene) recorded above the EQS for saltwater. These exceedances recorded are considered to be marginal exceedances. A substantial amount of soil analysis has been undertaken which identifies absent or very low levels of PAHs in soils. This together with the limited previous use of the site indices a lack of a source of PAH contamination at the site.

7.3.2 The results of the groundwater sampling do not indicate that the groundwater beneath the Assessment site is grossly contaminated, and no evidence of contamination plumes have been encountered. On this basis contamination risks to controlled water are considered to be low and further consideration or remedial action is not required.

8 GROUND GAS RISK ASSESSMENT

8.1 Introduction

8.1.1 This section provides a preliminary assessment of risk posed by the present of ground gases, in particular methane and carbon dioxide. RWE intend to redevelop the site for a Hydrogen electrolyser unit. The proposed development plans show a number of water tanks and colling towers in the north east of the site, with the main electrolyser building in the south and further auxiliary hydrogen units in the west. The plans show that an annex to the main electrolyser building will be used for rest rooms and common areas.

8.1.2 Although a small amount of regrading maybe required to provide a development platform, significant cut and fill and therefore changes to the near surface materials is not anticipated as part of the development.

8.2 Assessment Methodology

8.2.1 In the UK, current guidance on the assessment of hazardous ground gases is derived primarily from the British Standards BS 8576 (BSI, 2013), BS 8485 (BSI, 2019), CIRIA Report C665 (CIRIA, 2007) and CL:AIRE RB17.

8.2.2 Research bulletin 17, published by Contaminated Land: Applications in Real Environments (RB17), outlines a step by step process of how to assess ground gas risks based on the ground conditions beneath the Assessment Site. The document has been written to be compatible with quantitative risk assessment measures outlined in CIRIA C665 and BS8485, and is based on principals described in “Local Authority guide to ground gas, Chartered Institute of Environmental Health, (2008)”. Its primary use is to demonstrate that, providing a series of conditions are met, gas characteristic situation and gas protection measures can be determined without the need for gas monitoring. This approach, by virtue of the methodology is limited to low risk sites.

8.2.3 Sites that are deemed suitable for assessment using this document are considered by CL:AIRE to include sites that do not fall into the following “high risk” categories, as these are deemed to require a full gas monitoring:

- High risk sites such as domestic or industrial landfills.
- Sites where the Made Ground has a high proportion of degradable content.
- Sites where there are recorded mine workings with a large gas reservoir and pathway to ground level e.g. vent shaft.
- Sites where Made Ground is greater than 5 m thick or an average depth of 3 m thick or greater.
- Sites where migration from an off site source with a credible migration pathway needs to be assessed.
- Sites that exceed a designated total organic carbon limit in soils (discussed in detail in the following section).
- Sites designated under Part 2a of the Environmental Protection Act, 1990.

8.2.4 RB17 details “low risk sites”, where traditional ground gas reporting would indicate a number of visits would be required as they were “moderate risk”, which can be assessed using the RB17 process, to include

- Sites underlain by natural soils with a high carbonate content.

- Sites underlain by natural soils containing methane, only providing that pockets of trapped gas cannot be quickly released.
- Made Ground up to 5 m depth and of low organic content.
- Areas of flooded mine workings or working abandoned by the 20th century, unless buildings are within 20 m of a mine opening or connected to deeper, unflooded mines.

8.2.5 The process of undertaking the CL:AIRE gas risk assessment is commenced by, prior to site investigation, generating a robust, detailed conceptual site model, to detail all possible source-pathway-receptor linkages, and current and historical off and on site sources of ground gas, predominately methane and carbon dioxide. This is usually in the form of a comprehensive desk study and purchased historical maps and land uses, plus any available information in previous reports. Reference should also be made to Radon gas barrier requirements and the discovery of any volatile organic compounds on site. Based on findings of the site investigation, this conceptual model should be refined within the ground investigation report.

8.2.6 Following the refined conceptual model, a flowchart assessment is utilised in order to assess the ground gas risk, as detailed on page 4 of RB17. Stage 1 is to ensure that the Assessment Site does not fall into any of the high risk categories listed above and considers the geology / anthropogenic sources of gas beneath and in close proximity to the Assessment Site. If the ground investigation identifies that the Assessment Site does fall into one of these high risk categories, a full gas monitoring regime is required. If the Assessment Site is considered low risk the Total Organic Carbon (TOC) within the Made Ground are considered. TOC concentrations are compared against maximum permissible threshold values for each characteristic Situation (SC). If the value for CS3 is exceeded, then gas monitoring is required. These values are set out below:

- CS1 - <1 % TOC for Made ground.
- CS2 - <1.5 % TOC for Made ground, <3 % TOC for Made Ground in place for more than 20 years.
- CS3 - < 4 % TOC for Made ground, <6 % TOC for Made Ground in place for more than 20 years

8.2.7 TOC content of natural soils is not considered within the assessment. The calculation of TOC should be undertaken by soil type, e.g. in heterogeneous soils, the TOC of each fraction should be calculated separately and a weighted TOC calculated for total Made Ground Unit. Where data allows the TOC associated with the non degradable elements of the Made Ground should be discounted. TOC concentrations are required to be rounded up to the nearest 0.5 %.

8.2.8 If the TOC does not exceed the threshold for CS3 then, stage 2 is to assess whether the underlying natural soils can only produce carbon dioxide and not methane, as it is considered that even if elevated concentrations of carbon dioxide are present, in most cases where natural soils are the source zone this is unlikely to affect developments or human health.

8.2.9 If soils can produce methane, an assessment of the radon protection measures are required as stage 3. If Radon protection is required, this is deemed suitable to also protect against the methane risk, and no gas monitoring or further gas protection measures is required. If radon protection is not required, it is considered the Assessment Site will require CS 2 gas measures.

8.2.10 If the underlying soils cannot produce methane, stage 3 is to assess whether radon protection measures are required. If yes, then radon protection should be installed within the buildings, and if no, the Assessment Site is considered to be CS 1, and no further ground gas monitoring or gas protection measures within buildings are required.

8.2.11 TOC concentrations are required to be assessed as above in order to ensure compliance with the final characteristic situation from the flow chart process, with comparison to Table 1 of RB17.

8.3 Potential Gas Sources and Migration Pathways

8.3.1 Potential ground gas sources at the site comprise Made Ground across the site which is encountered to a maximum depth of 2.85 m BGL, although localised deeper Made ground may be present. The Made Ground was generally of low organic content and comprised reworked natural soils with inclusions of construction materials, with localised inclusion of clinker and wood. In the historical borehole an apparent buried topsoil horizon has been recorded in the historical borehole between 2.85 – 3.3 m BGL. Therefore, there remains a potential for buried topsoil to be present across the site.

8.3.2 Bedrock beneath the site comprises the Avon group, which comprises interbedded mudstones and calcareous mudstones. Voids have been encountered in two of the three boreholes within the AG bedrock. It should be noted that the Void is fully flooded.

8.4 Assessment

8.4.1 Ground conditions beneath the site have been proven to comprise the following:

- Topsoil and reworked topsoil to a maximum depth of 0.5 m BGL:
- Made Ground to a maximum depth of 2.85 m, although locally maybe slightly deeper associated with previous development; and
- Bedrock geology beneath the proposed structures to comprise Avon Group.

8.4.2 No olfactory evidence of contamination was encountered during the site investigation and was not recorded on the historical borehole logs.

8.4.3 A review of the historical plans for the site, indicates that the site has been subject to small amount of earthworks to produce a development platform for the industrial hostel which was present across the whole site area between the late 1960s and early 1970s. Any land raising undertaken as part of these works is likely to have comprised natural arisings from the cut materials on site and within the local vicinity.

8.4.4 Based on the requirement of geology and underlying soils, an absence of degradable materials within the Made Ground and absence of methane producing natural soils and natural soils with a high organic matter, and lack of any on or off site sources of ground gas or plausible pathways identified at any stage of desk or field investigation, the Assessment Site broadly aligns with the screening criteria for suitability for assessment under the RB17 methodology.

8.4.5 The Total Organic Carbon (TOC) content within the Made Ground and Topsoil has been calculated using SOM concentration (provided in the laboratory results in Appendix G). The calculation is as follows:

Total organic carbon (%) = Organic matter (%) / 1.72

8.4.6 This conversion factor assumes organic matter contains 58 % organic carbon. However, this can vary with the type of organic matter, soil type and soil depth. Conversion factors can be as high as 2.50, especially for subsoils.

8.4.7 On the assumption that topsoil will be removed prior to development, TOC concentrations have been calculated for the Made Ground and ranges from 0.2 to 1.16 % with an average of 0.57 %.

8.4.8 Based on the above the majority of the site would be considered to fall within CS1 indicating no requirement for gas protection measures.

9 REVISED CONCEPTUAL SITE MODEL

9.1 Introduction

9.1.1 An outline conceptual site model (CSM) consists of an appraisal of the *source-pathway-receptor* 'contaminant linkages' which is central to the approach used to determine the existence of 'contaminated land' according to the definition set out under Part 2A of the Environmental Protection Act 1990. For a risk to exist (under Part 2A), all three of the following components must be present to facilitate a potential 'pollutant linkage'.

- **Source** referring to the source of contamination (Hazard);
- **Pathway** for the contaminant to move/migrate to receptor(s); and,
- **Receptor** (Target) that could be affected by the contaminant(s).

9.1.2 Receptors include human beings, controlled waters and buildings / structures. The National Planning Policy Framework, used to address contaminated land through the planning process, follows the same principles as those set out under Part 2A. Further details on the Part 2A regime are presented within Appendix L.

9.1.3 The potential pollutant linkages identified as part of the outline CSM have been assessed in light of the findings of the site investigation and are discussed below for each of the potential post development individual receptors identified in the Outline Conceptual Model.

9.2 Human Health Receptors

Future Site Users

9.2.1 No chemical contaminants of concern where recorded above the respective AC for a commercial end use. However, asbestos fibres were recorded in a single location (WS02 at 0.3 m BGL). The Made Ground is variable across the site and there is nothing significantly visibly different with the Made Ground encountered in WS02, with would suggest that the potential of asbestos present in soil is locally restricted. WS02 is located to the south of the former sport centre buildings.

9.2.2 The asbestos within the Made Ground on-site is considered to pose a risk to future site users and maintenance workers within areas of soft landscaping only via the pathways of dermal contact and ingestion. It is recommended that a chemically clean, imported topsoil cover layer, with a minimum thickness of 300 mm, be installed within areas of proposed soft landscaping in order to create a barrier between asbestos impacted Made Ground soils and the future site user.

9.2.3 No potentially volatile compounds were detected within soils or groundwater samples at concentrations considered to represent a potential risk to future site users via the volatilisation pathway.

9.2.4 The ground gas assessment indicates the site to be classified as CS2, whereby ground gas protection measures are not required.

9.2.5 On the basis of recommended mitigation measures being implemented, the concentrations of contaminants of concern detected within soil and groundwater and ground gas concentrations recorded beneath the site are not considered likely to pose a significant risk to future site users upon completion of the redevelopment.

Off-site Human Heath Receptors

9.2.6 Following redevelopment, for areas of the site covered by building footprint or hardstanding there is limited potential for the air-borne migration of soil or dust to impact neighbouring receptors.

Although asbestos fibres were detected within Made Ground soil, if a chemically clean, imported topsoil cover layer, with a minimum thickness of 300 mm, is installed within areas of proposed soft landscaping, then the risk of asbestos impacted Made Ground being disturbed and asbestos fibres migrating off-site post-development, will be mitigated.

9.2.7 During any enabling work activities (such as earthworks) which may occur as part of the redevelopment of the site, there is a risk of asbestos impacted soils being disturbed and asbestos fibres becoming air-borne which may migrate to the surrounding third party site users. However, this risk can be mitigated via effective dust suppression and stockpile management during any earthwork activities required as part of the redevelopment of the site.

9.2.8 Concentrations of contaminants of concern considered to represent a significant risk to human health receptors were not recorded within groundwater samples analysed from beneath the site.

9.2.9 On the basis of recommended mitigation measures being implemented, the concentrations of contaminants of concern detected within soil and groundwater beneath the site are not considered likely to pose a significant risk to off-site human health receptors upon completion of the redevelopment.

Construction/ Maintenance Workers

9.2.10 S4ULs or C4SLs cannot be used to assess the acute (short term exposure) risk that personnel in close contact with exposed soils may experience during demolition, redevelopment or site maintenance duties.

9.2.11 Potential risks to construction workers can easily be controlled in most site areas by the use of appropriate personal protective equipment (disposable coveralls, gloves, and particulate/vapour masks) and by adopting high levels of personal hygiene.

9.2.12 Risks to construction workers during any construction related activities from asbestos impacted soils has not been considered within this assessment as it is presumed that any construction activities (i.e. excavations) will involve appropriate health and safety measures under Construction Design and Management Regulations (CDM) 2015. It is however recommended that construction contractors and groundworkers are vigilant during all groundworks for the presence of ACMs and that any visually identified ACM should be removed and disposed of to an appropriately licenced facility. Furthermore, consideration should be given to the potential presence of elevated concentrations of ground gas and / or low oxygen concentrations which construction workers may be exposed to within any excavations or other sub-surface works undertaken as part of the construction of the proposed development.

9.3 Controlled Waters Receptors

9.3.1 The groundwater assessment has shown that, in general very low levels of contaminants of concern have been recorded within the groundwater below the Assessment Site, with the majority of contaminants being recorded at levels below the laboratory limit of detection. Concentrations of PAHs have been recorded above the laboratory limit of detection in BH01 and BH02, with two PAHs recorded above the EQS for saltwater. These exceedances recorded are considered to be marginal exceedances.

9.3.2 The results of the groundwater sampling do not indicate that the groundwater beneath the Assessment site is grossly contaminated, and no evidence of contamination plumes have been encountered. On this basis contamination risks to controlled water are considered to be very low and further consideration or remedial action is not required.

9.4 Structures and Infrastructure

Buildings (on site and off site)

9.4.1 The ground gas assessment indicates the site to be classified as CS1, whereby ground gas protection measures are not required.

Polymeric Utility Pipes

9.4.2 A preliminary assessment of soil concentrations has not identified exceedances of the UKWIR threshold concentrations for PE and PVE pipes (the water supply pipes most susceptible to the migration of contaminants migrating through the pipe material).

9.5 Revised Conceptual Model

9.5.1 The potential source-pathway-receptor linkages and associated risks upon completion of the proposed development at the site, as identified following completion of the assessment, are summarised in the revised CSM below (Table 10-1).

9.5.2 As part of the assessment the potential risks to receptors for potential source is given one of the following classification:

- Low risk - it is considered unlikely that issues within the category will give rise to significant harm to identified receptors;
- Moderate risk - it is possible, but not certain that issues within the category will give rise to significant harm to receptors; and,
- High risk - there is a high potential that issues within the category will give rise to significant harm to identified receptors.

9.5.3 The risk assessment is based upon the available information relating to the site and recommended mitigation measures being implemented. Should ground conditions inconsistent with those outlined in this report be encountered RPS should be contacted to enable further assessment.

Table 9-1: Revised Conceptual Site Model

Potential Source	Contaminants of Concern	Via	Potential Pathways	Linkage Potentially Active?	Receptors	Qualitative Risk Rating
On site – Made ground, infilled former cuttings (and pond), land raise	Metals, hydrocarbons and asbestos	Soil	Direct contact / ingestion	×	Future site users	**N/A**
			Inhalation of volatiles	×		**N/A**
			Airborne migration of soil or dust	✓	Future site Users Off-site users	**Low**
			Leaching of mobile contaminants	×	Secondary A Aquifer	**N/A**
	Metals, and hydrocarbons	Groundwater	Direct contact / ingestion	× ×	Future site users Off-site users	**N/A**
			Inhalation of volatiles	× ×	Future site users Off-site users	**N/A**
			Vertical migration in permeable strata	×	Secondary A Aquifer Unnamed stream	**N/A**
			Vertical migration via future piled foundations	×	Future site users	**N/A**
			Lateral migration in permeable strata	×	Future site users	**N/A**
Off-site – Power station, tanks, limekiln, cornmill and groundworks / land raising	Metals, hydrocarbons, solvents and PCBs	Groundwater	Direct contact / ingestion	×	Future site users Off-site users	**N/A**
			Inhalation of volatiles	×	Future site users Off-site users Future and off-site Structures	**N/A**
On and off-site – Made Ground / natural strata or bio-degradation of contamination	Carbon dioxide and methane	Ground Gas	Inhalation of ground gas	✓	Future site users	**Low**
			Explosive risk	✓ ✓	Future site users Buildings / structures	**Low**

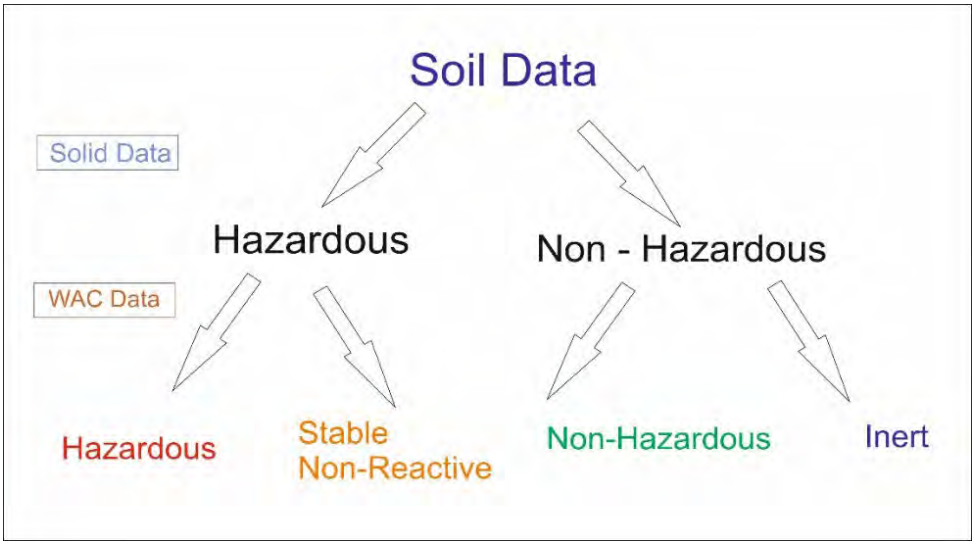
10 WASTE CHARACTERISATION AND MATERIALS REUSE

10.1 Introduction

10.1.1 All soils arisings generated through excavation have the potential to be classified as waste. It is the responsibility of the developer to determine whether the soil arisings constitute waste or not.

10.1.2 If disposal to landfill is required, the material should be classified in line with the Hazardous Waste Directive - HWD, Council Directive 91/689/EC. EA Waste Classification Technical Guidance WM3 (2018) provides information of how soils wastes is classified. This guidance states that the soil data obtained during site investigation should be utilised to determine the waste classification of soils. This legislation divides waste into two categories, hazardous and non-hazardous.

10.1.3 Material that has been determined as either hazardous or non-hazardous can then be subdivided into a number of classes relating to the type of landfill/cell to which the material can be sent through Waste Acceptance Testing (if appropriate), as presented in Insert 1 below: Material that has been determined as either hazardous or non-hazardous can then be subdivided into a number of classes relating to the type of landfill/cell to which the material can be sent through Waste Acceptance Testing (if appropriate), as presented in Insert 1 below:



Insert 1: Hazardous and non Hazardous

10.1.4 Waste Acceptance Criteria is required by the landfill operators to determine if suitable licences are held to accept the waste. WAC testing is not used to confirm the classification of waste as Hazardous or Non-hazardous.

10.1.5 Soils to be disposed of off-site need to be characterised prior to disposal. All parties involved in the management of the waste are responsible for ensuring that the waste is appropriately classified i.e. the developer, the waste disposal contractor, and the landfill. Testing and analysis of the actual soils to be disposed of may be required.

10.2 Material Re-Use

10.2.1 Soil arisings generated on site may be suitable for re-use under an exemption or the CL:AIRE DOW CoP (Definition of Waste: Code of Practise), providing that assessments can determine that the materials do not represent a risk, are suitable for their intended use without treatment, there is a certainty of use and the materials are only used in the quantities required. A Materials Management Plan authorised by a Qualified Person will be required prior to the excavation of these materials.

10.2.2 If the materials are not suitable for re-use under an exemption or the CL:AIRE DOW CoP, then an exemption or waste permit may be required.

10.2.3 Excavated materials deposited on land outside of a permit or exemption may legally be considered a waste and may therefore be liable for landfill tax.

10.3 Preliminary HazWasteOnline™ Assessment

10.3.1 In order to inform the waste characterisation, soil data has been processed using web-based HazWasteOnline™ software, which allows users to classify waste as defined in the EWC (European Waste Catalogue 2002) based on the regulatory framework for the Classification Labelling and Packaging of Substances and mixtures Regulation, (EC) No 172/2008 and the latest Environment Agency guidance (Technical Guidance WM3).

10.3.2 In line with guidance in the Environment Agency guidance (Technical Guidance WM3) and the List of Waste Decision 200/532/EC the materials have been classified as Waste Code 17 05 03*/17 05 04 Soil (including excavated soil from contaminated sites), stone and dredging spoil.

Soil Sampling and Analysis

Solid Suite of Analysis

10.3.3 Chemical analysis was undertaken on 26 soils samples from across the Assessment Site and at varying shallow depths. The soil samples were analysed for the following solid suite of analysis:

pH, arsenic, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, zinc, sulphide, sulphate, total cyanide, total organic carbon, total phenols, speciated polyaromatic hydrocarbons (PAH), and speciated total petroleum hydrocarbons (TPH CWG) including benzene, toluene, ethylbenzene and xylenes (BTEX) and methyl tert-butyl ether (MTBE). Shallow samples were also screened for the presence of asbestos.

Solid Soil Waste Assessment

10.3.4 The results of the soil analysis have been assessed using HazWasteOnline. The assessment shows all of the samples are considered to be classified as non-hazardous materials (waste code 17 05 04) as detailed within Table 10-1.

Table 10-1 Solid Waste Assessment

Sample	Depth m BGL	Strata	Classification result	Comments
BH01	0.5	Made Ground	Non-Hazardous	-
BH02	0.2	Topsoil	Non-Hazardous	-
BH03	0.2	Topsoil	Non-Hazardous	-
HP01	0.5	Black Rock	Non-Hazardous	-
HP02	0.2	Topsoil	Non-Hazardous	-
TP01	0.6	Made Ground	Non-Hazardous	-

Sample	Depth m BGL	Strata	Classification result	Comments
TP01	1.5	Made Ground	Non-Hazardous	-
TP02	0.3	Made Ground	Non-Hazardous	-
TP03	0.5	Made Ground	Non-Hazardous	-
TP04	0.2	Topsoil	Non-Hazardous	-
TP05	0.5	Avon Group	Non-Hazardous	-
TP06	0.6	Made Ground	Non-Hazardous	-
TP07	0.2	Made Ground	Non-Hazardous	-
TP07	0.5	Made Ground	Non-Hazardous	-
TP08	0.25	Made Ground	Non-Hazardous	-
TP09	0.2	Topsoil	Non-Hazardous	-
TP10	0.5	Made Ground	Non-Hazardous	-
TP11	0.2	Made Ground	Non-Hazardous	-
TP11	0.7	Made Ground	Non-Hazardous	-
WS01	0.4	Avon Group	Non-Hazardous	-
WS02	0.3	Made Ground	Non-Hazardous	Asbestos quantification <0.001%wt.
WS03	1	Avon Group	Non-Hazardous	-
WS05	0.4	Made Ground	Non-Hazardous	-
WS06	0.4	Made Ground	Non-Hazardous	-
WS08	0.7	Avon Group	Non-Hazardous	-
WS09	0.2	Topsoil	Non-Hazardous	-

WAC testing results

10.3.5 One sample of Topsoil, one sample of Made Ground and one sample of Avon Group were subject to WAC analysis. All the samples were initially classified as non-hazardous based on their chemical properties.

10.3.6 The results of the WAC analysis indicate the samples may be disposed of at an Inert Waste Landfill.

10.4 Summary

10.4.1 The result of the waste characterisation exercise are provided in Appendix J and are summarised within Table 10-2.

Table 10-2 Waste Classification Summary

Sample	Depth m BGL	Strata	Solid Suite Analysis	Asbestos Fibres Encountered	WAC Classification
BH01	0.5	Made Ground	Non-Hazardous	None	-
BH02	0.2	Topsoil	Non-Hazardous	None	-
BH03	0.2	Topsoil	Non-Hazardous	None	Inert waste
HP01	0.5	Black Rock	Non-Hazardous	None	-
HP02	0.2	Topsoil	Non-Hazardous	None	-
TP01	0.6	Made Ground	Non-Hazardous	None	-
TP01	1.5	Made Ground	Non-Hazardous	None	-
TP02	0.3	Made Ground	Non-Hazardous	None	-
TP03	0.5	Made Ground	Non-Hazardous	None	-

Sample	Depth m BGL	Strata	Solid Suite Analysis	Asbestos Fibres Encountered	WAC Classification
TP04	0.2	Topsoil	Non-Hazardous	None	-
TP05	0.5	Avon Group	Non-Hazardous	None	-
TP06	0.6	Made Ground	Non-Hazardous	None	-
TP07	0.2	Made Ground	Non-Hazardous	None	-
TP07	0.5	Made Ground	Non-Hazardous	None	-
TP08	0.25	Made Ground	Non-Hazardous	None	-
TP09	0.2	Topsoil	Non-Hazardous	None	-
TP10	0.5	Made Ground	Non-Hazardous	None	-
TP11	0.2	Made Ground	Non-Hazardous	None	-
TP11	0.7	Made Ground	Non-Hazardous	None	-
WS01	0.4	Avon Group	Non-Hazardous	None	-
WS02	0.3	Made Ground	Non-Hazardous	Asbestos quantification <0.001%wt.	Inert waste
WS03	1	Avon Group	Non-Hazardous	None	-
WS05	0.4	Made Ground	Non-Hazardous	None	-
WS06	0.4	Made Ground	Non-Hazardous	None	-
WS08	0.7	Avon Group	Non-Hazardous	None	Inert waste
WS09	0.2	Topsoil	Non-Hazardous	None	-

10.4.2 The results of the waste classification and WAC testing indicated that the topsoil materials and underling natural materials should be classified as non hazardous and would be suitable for disposal at an inert landfill. The Made Ground should be classified as non hazardous and may be considered as inert subject to approval with the landfill, further testing may be required.

11 CONCLUSIONS AND RECOMMENDATIONS

11.1 Conclusions

11.1.1 A ground investigation has been undertaken to support the proposed development of a hydrogen electrolyser unit.

Ground Investigation

11.1.2 The key findings from the ground investigation are as follows:

- The investigation has identified the Assessment Site to comprise Topsoil and Reworked Topsoil over Made Ground, this is in turn directly underlain by weathered bedrock of the Avon Group, with the exception of the far north east which encountered Topsoil over Black Rock Subgroup.
- Made Ground generally comprised reworked weather bedrock with inclusions of construction materials with localised clinker encountered.
- Buried structures and redundant services were encountered across the site, relating to the historical development.
- The Avon Group generally comprised interbedded mudstones and calcareous mudstones.
- The distribution of strata in the general vicinity is governed by the east west orientated Pembroke Syncline resulting locally in bedding dipping moderately to steeply to the north.
- Naturally occurring sub surface voiding within the calcareous mudstone of the Avon Group was encountered in two of the boreholes (BH01 (14.60 – 16.30 m BGL) and BH02 (11.30 – 11.70 m BGL)). Both voids appeared below the water table and showed linear orientation and are considered likely to represent solution widened joints within the Vadose Zone. The strike and the volume of these voids was not investigated during this phase of works.
- The water table beneath the site is observed to be fall to the north (i.e. groundwater falls towards the Haven).

Geo-Environmental

11.1.3 No chemical contaminants of concern were recorded above the respective Assessment Criteria for a commercial end use. However, asbestos fibres were recorded in a single location (WS02 at 0.3 m BGL). The Made Ground is variable across the site and there is nothing significantly visibly different with the Made Ground encountered in WS02, with would suggest that the potential of asbestos present in soil is locally restricted. WS02 is located to the south of the former sport centre buildings.

11.1.4 The asbestos within the Made Ground on-site is considered to pose a potential risk to future site users and maintenance workers within areas of soft landscaping via the pathways of dermal contact and ingestion. It is recommended that a chemically clean, imported topsoil cover layer, with a minimum thickness of 300 mm, be installed within areas of proposed soft landscaping in order to create a barrier between asbestos impacted Made Ground soils and the future site user. Alternatively further sampling and a risk assessment could be undertaken to seek to dismiss the risk.

11.1.5 The results of the groundwater sampling do not indicate that the groundwater beneath the site is grossly contaminated, and no evidence of contamination plumes have been encountered. On this basis contamination risks to controlled water are considered to be very low and further consideration or remedial action is not required.

11.1.6 The ground gas assessment indicates the site to be classified as CS1, whereby ground gas protection measures are required. Further monitoring and assessment should be undertaken to confirm this.

Geotechnical

11.1.7 Geotechnical information has been obtained on the ground conditions at the Assessment Site to provide a preliminary appraisal in relation to likely rock mass quality, material reuse, foundations, pavements, concrete classification and groundwater management.

11.1.8 The overall risk of the voided ground hazards present to the development depends both on its vulnerability to these hazards and its intended use. The vulnerability depends on the type of substructure, being greatest for isolated pad footings and ground-bearing floor slabs, and least for a suspended ground floor slab supported on piles founded below the base of the features. Likewise the risk associated with its use is generally lower for an unoccupied building than it is for a residential development for example.

11.1.9 Any chosen foundation solution will be required to suitably mitigate instability associated to the encountered ground conditions (voids). It should be noted that the effects of potentially voided ground should be considered. If the possibility of an unknown dissolution feature has to be accommodated, then the structure and floor slabs should be capable of bridging over any void, which might develop anywhere beneath it. This is commonly achieved by forming the footings as a series of orthogonal grillages or raft. Where voids are suitably identified and treated it is considered a shallow foundation solution may be adopted for low to moderate loads.

11.1.10 For heavier loads and where the treatment of voids is uncertain it is recommended that a deeper piled foundation solution be adopted.

11.1.11 Buried obstructions have been encountered during this investigation and may be present elsewhere on site particularly associated with remnant footings associated with former farm buildings. These will require removal as part of the site preparatory site works.

11.1.12 The underlying Grade E AG has been recorded as being firm to stiff with hand shear vane and correlated SPT data indicating a shear strength of c. 60 k Pa from between 1 to 2 m BGL and presents a suitable founding horizon for lightly to moderately loaded structures. For preliminary purposes an Allowable Bearing Pressure (ABP) of c. 110 kN/m^2 may be adopted for 1 m width foundations.

11.1.13 Piled foundations embedded below the encountered voids offer a practical foundation solution, particularly where the ground is required to support moderate to high loads for sensitive structures. The formation below the encounter voids is observed to comprise slightly weathered bedrock and is moderately strong and would be expected to offer relatively favourable high end bearing resistances. It is not recommended to adopt a piled foundation solution above or within the depth range of anticipated voids. Care is needed in the design and construction of such piles to overcome the problems presented by metastable materials and cavities. These can be temporarily destabilised by disturbance during pile installation arising from both vibration and the use of flushwater. Likewise, any long-term settlement or collapse of the metastable materials would necessitate that the piles be designed for collapse and negative skin friction loads.

11.1.14 Based on the ground conditions encountered at the Site, it is expected that, in general for the main building that floor slabs supported on a suitable depth of sub-base will prove adequate provided the exposed natural deposits are proof rolled and any soft or degradable materials removed and replaced with compacted granular fill. Reference should be made with respect to the potential for ground gas and the inclusion of gas protection measures as part of any slab design.

11.1.15 Testing of the shallow soils using a TRL approved dynamic cone penetrometer (DCP) was undertaken at 24 locations to derive CBR values. The results indicate averaged results above 10 % however, lower quartile values indicate that above 0.5 m depth a more conservative 2.5 % CBR

should be adopted for the purpose of preliminary designs. In areas of future cut a design CBR of 7.5 % would likely be achievable.

11.1.16 It is considered that a Design Sulphate Class of DS-1 and an Aggressive Chemical Environment for Concrete (ACEC) Classification of AC-1 would be appropriate for all buried concrete structures.

11.1.17 Presently the degree of cut and fill required for the Electrolyser Assessment Area is unknown. General Made Ground has been identified during this phase of investigation. It is likely that the General Made Ground is present adjacent to former onsite structures and a suitable management plan for reuse will likely allow incorporation within earthworks materials. Where the suitability cannot be demonstrated offsite disposal will be required. It is considered the natural weathered bedrock may likely be used as General Fill as cohesive general fill (Class 2) in general accordance with the Highways Specification. Pockets of Made Ground may require a granular general fill (Class 1) classification. The cohesive materials are likely to require moisture conditioning to be able to meet a minimum end product specification of achieving 95 % Maximum Dry Density based on a 2.5kg rammer determination of Optimum Moisture Content and Maximum Dry Density.

11.1.18 Limited infiltration was recorded within the two soakaway tests undertaken at the site, and therefore shallow soakaway drainage is unlikely to be suitable.

11.2 Recommendations

Geo-environmental

11.2.1 Based upon the assessment of the results obtained during the investigation the following recommendations are made:

- A Remediation Strategy and Verification Plan is developed for the site prior to redevelopment. This will likely be a requirement of a contamination land related Planning Condition attached to a future Decision Notice for the development of the site. This is likely to include the following:
  - Soft landscaped areas should have a chemically clean, imported topsoil cover layer installed. Any imported material must comply with import criteria to be set out in the Remediation Strategy and any applicable soft landscape strategy;

Geotechnical

11.2.2 Additional ground investigation is recommended to address the following:

- Further investigation of the void to include but not limited to:
  - void distribution,
  - void depths,
  - groundwater regime, including determination of tidal influence and whether the groundwater is brackish in nature and whether this is variable dependant on tidal influence.
- Further investigation to determine detailed information on bedding dips and weathering profiles. This will support the understanding of the potential void distribution and detailed foundation design. This should include investigating of areas currently excluded due to ecological constraints during the current phase of works.
- Further investigation to support detailed foundation design, to be undertaken following final development plans and structural loading information is available.

- Further investigation around historical borehole to confirm presence of buried Topsoil identified, this will also help to inform the gas regime.
- Cut and fill / earthworks analysis to include a review of the cut and fill profile, as part of this further geotechnical testing of the weathered bedrock may be required to support design of earthwork strategy (to be done following the earthwork analysis).

11.2.3 Its assumed detailed foundation design cannot be undertaken until the extent of the voiding is better understood, therefore a phased approach to the above investigation is considered necessary.

FIGURES

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Client	RWE
Project	RWE Pembroke Electrolyser
Figure Number	Figure 1
Figure Title	Exert from BGS 1:10,560 Pembrokeshire 39 NE, with Approximate Site Boundary Overlay
Job Ref	JFR2796
Drawn By	TF
PM/Checked by	KD
Date	DEC 2023

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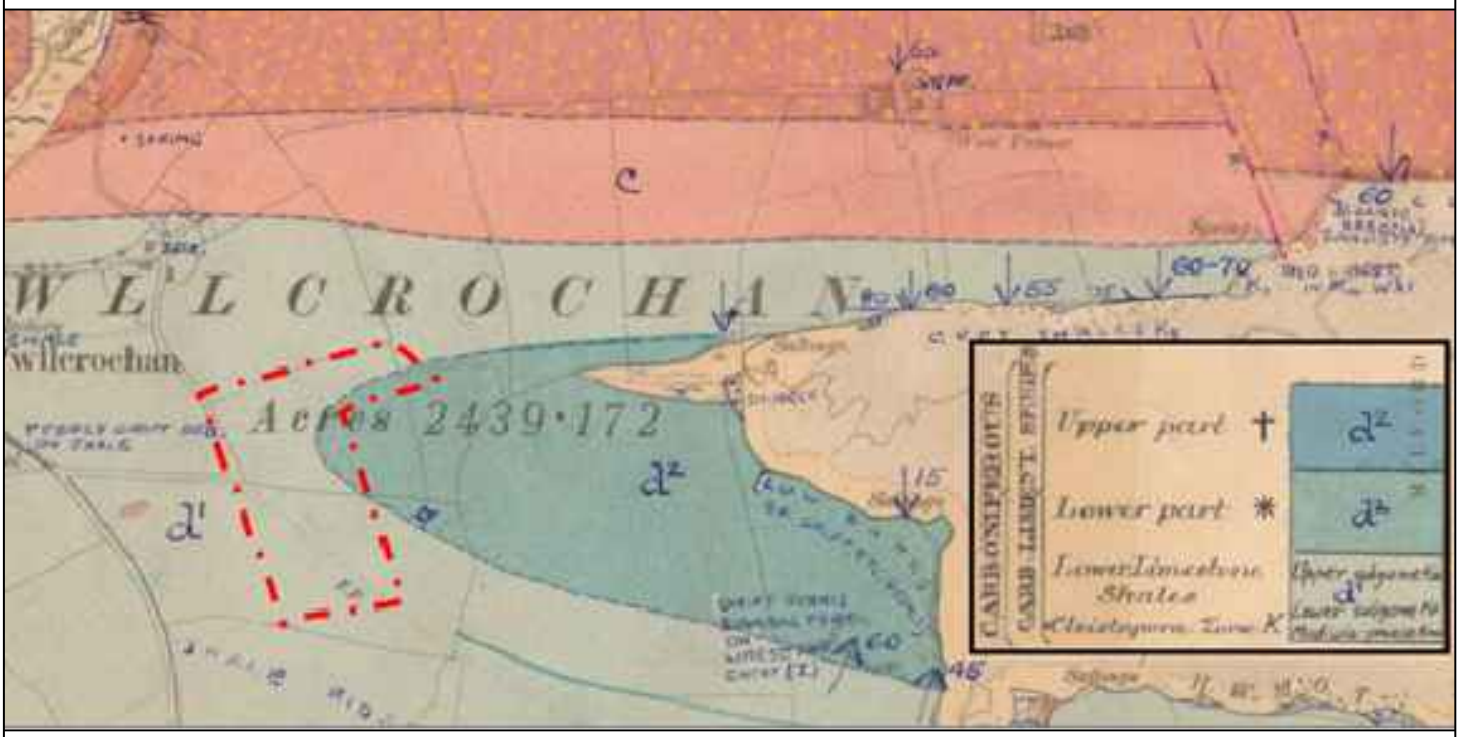

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Client	RWE
Project	RWE Pembroke Electrolyser
Figure Number	Figure 2
Figure Title	Casagrande Plot of Atterberg Test Results
Job Ref	JFR2796
Drawn By	TF
PM/Checked by	KD
Date	DEC 2023

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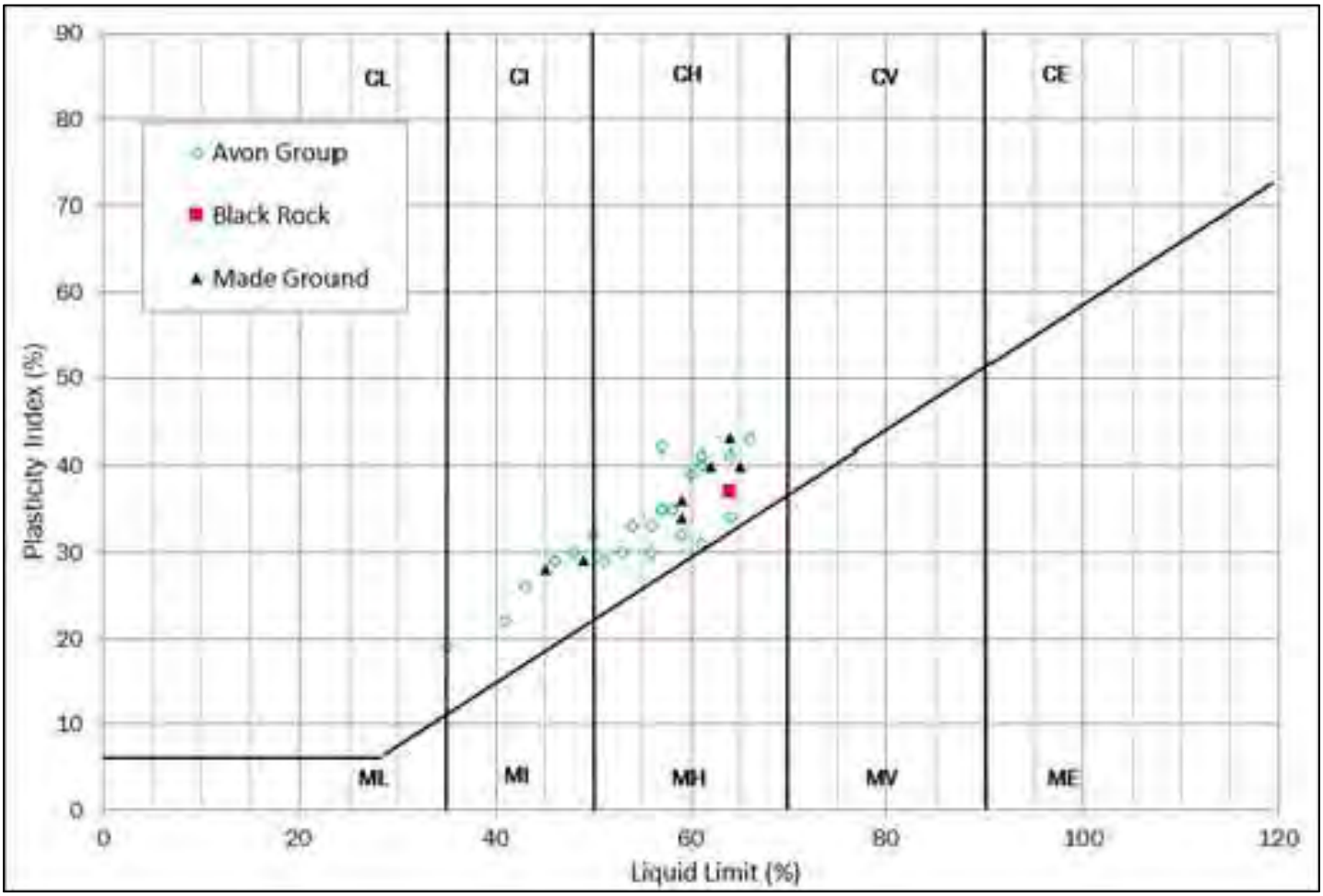

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Client	RWE
Project	RWE Pembroke Electrolyser
Figure Number	Figure 3
Figure Title	Plot of Hand Vane Results vs Depth

Job Ref	JFR2796
Drawn By	TF
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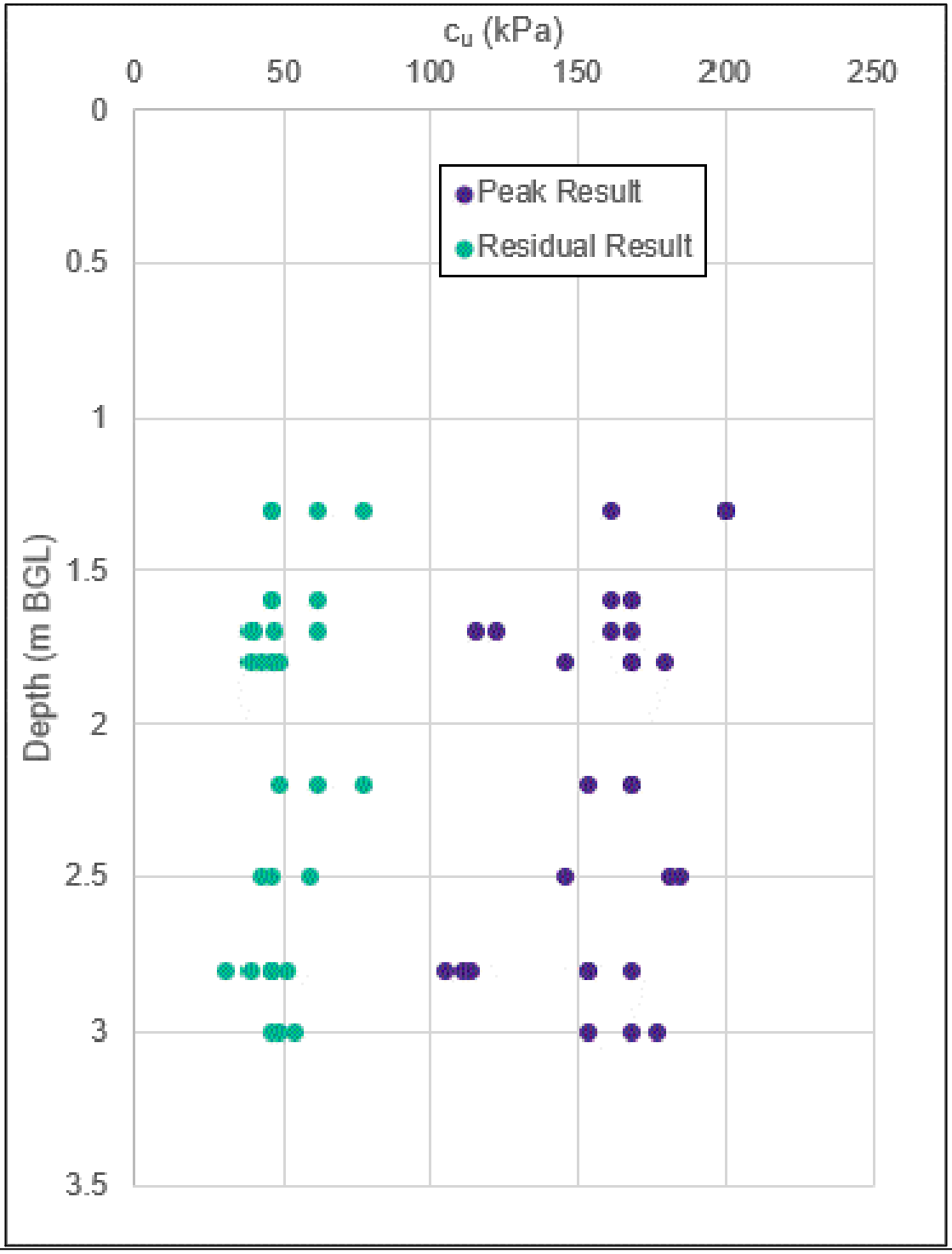

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Client	RWE
Project	RWE Pembroke Electrolyser
Figure Number	Figure 4
Figure Title	Plot of N60 vs Depth for Geology
Job Ref	JFR2796
Drawn By	TF
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Date	DEC 2023

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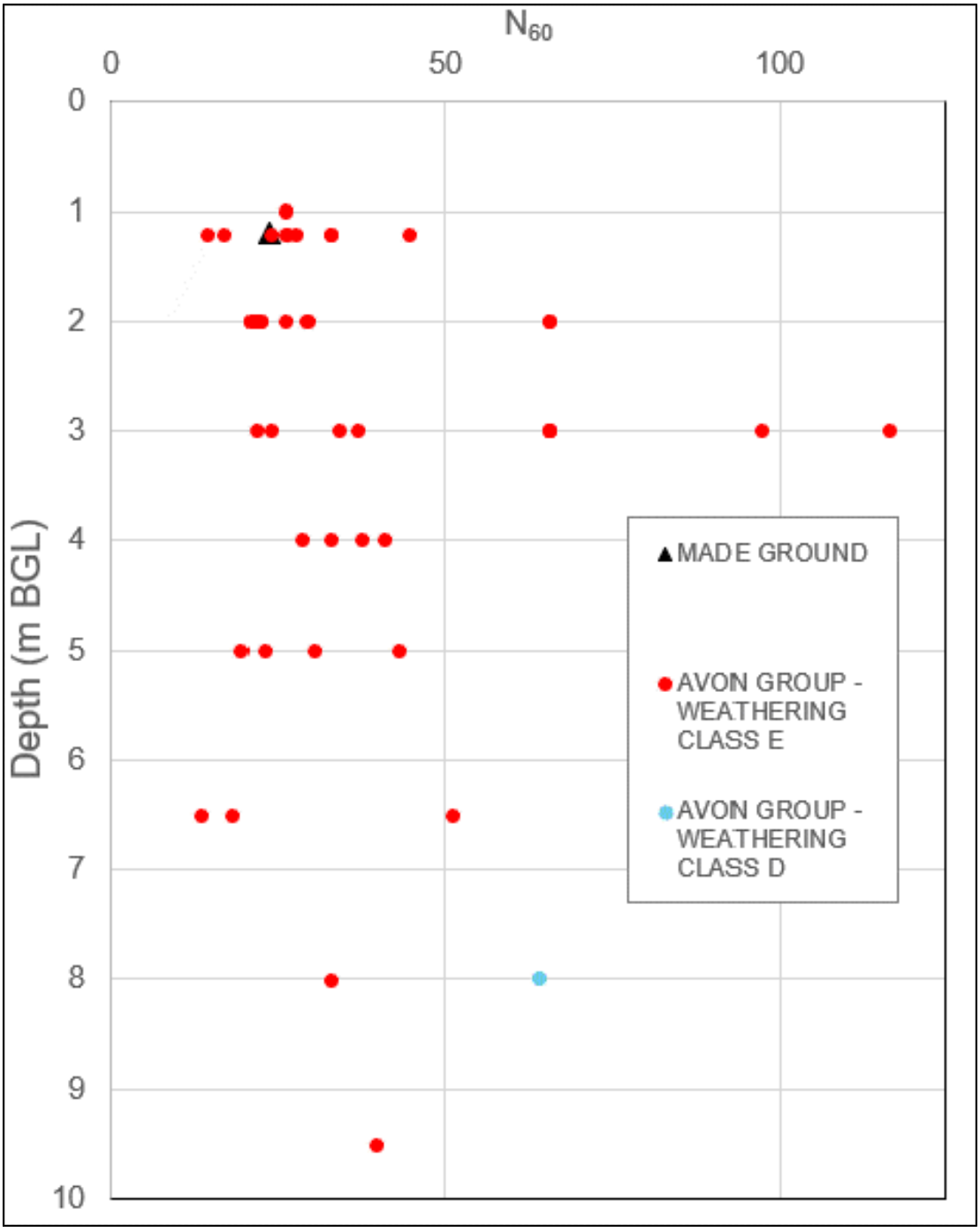

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Client	RWE
Project	RWE Pembroke Electrolyser
Figure Number	Figure 5
Figure Title	Plot of SCR and UCS from PLI

Job Ref	JFR2796
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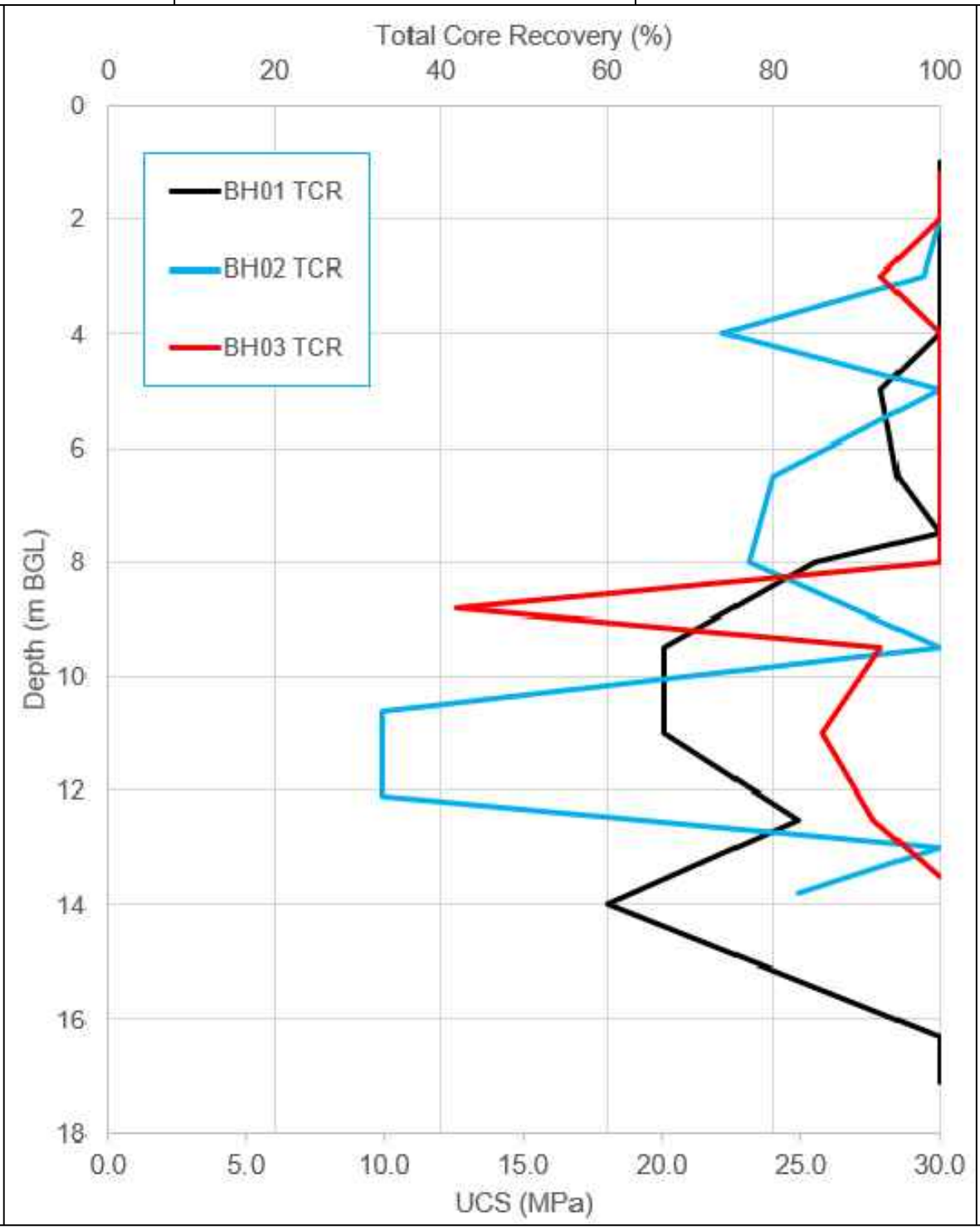

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Client	RWE
Project	RWE Pembroke Electrolyser
Figure Number	Figure 6
Figure Title	Plot of Factored SPT N60 Results and cu from Corrected Hand Vane Results
Job Ref	JFR2796
Drawn By	TF
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Date	DEC 2023

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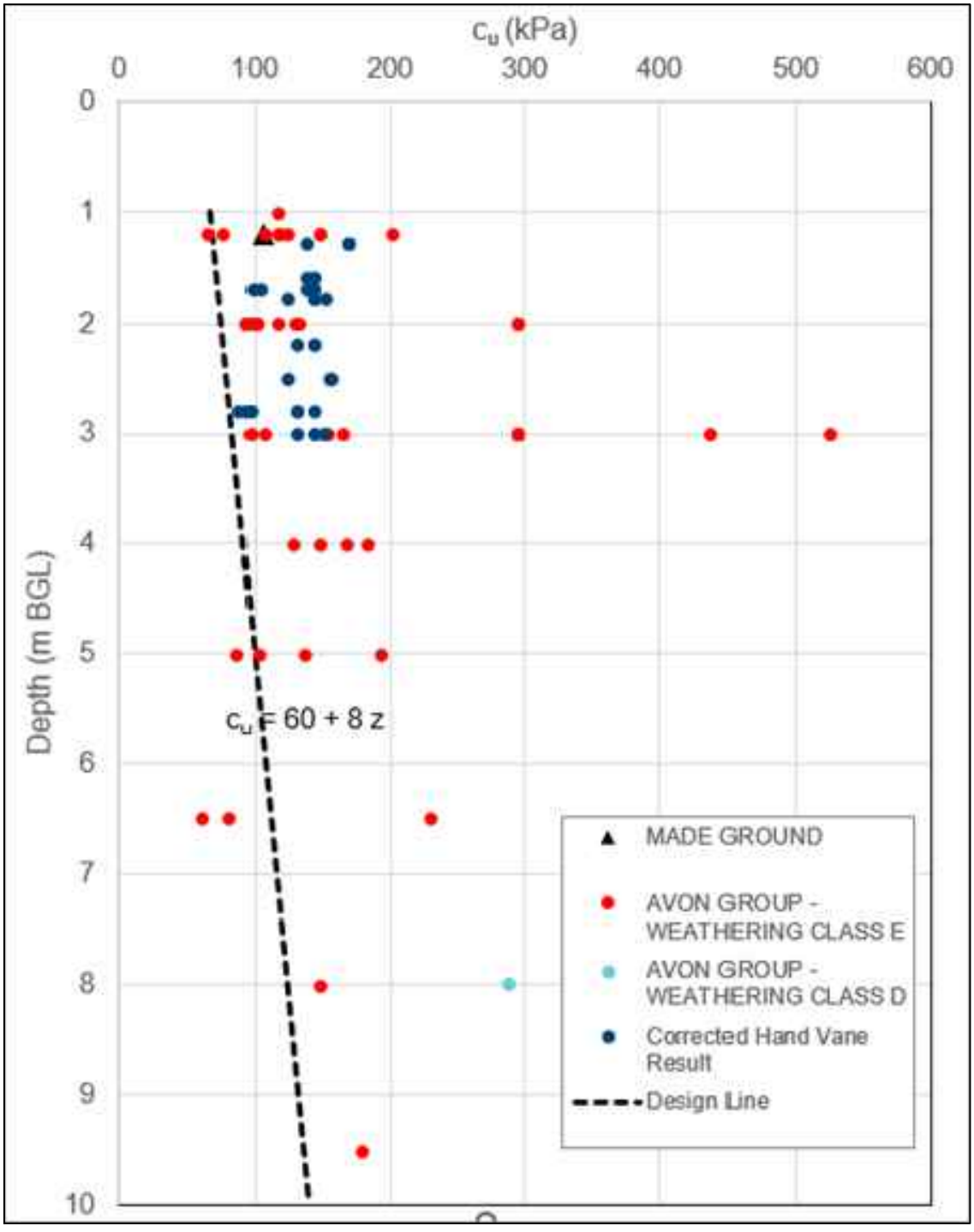

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Client	RWE
Project	RWE Pembroke Electrolyser
Figure Number	Figure 7
Figure Title	Plot of Averaged CBR and Low Quartile CBR from Depth Averaged DCP Testing
Job Ref	JFR2796
Drawn By	TF
PM/Checked by	KD
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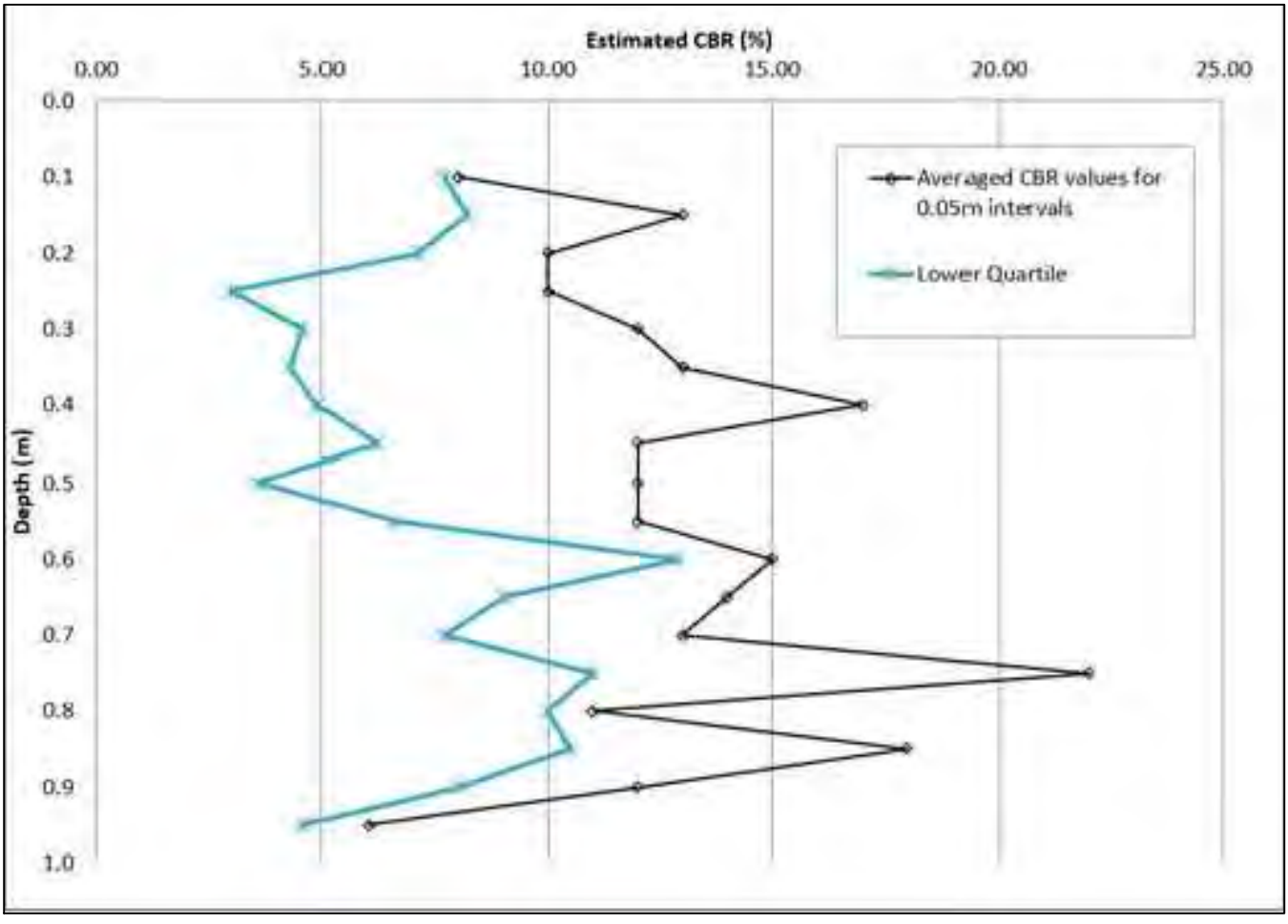
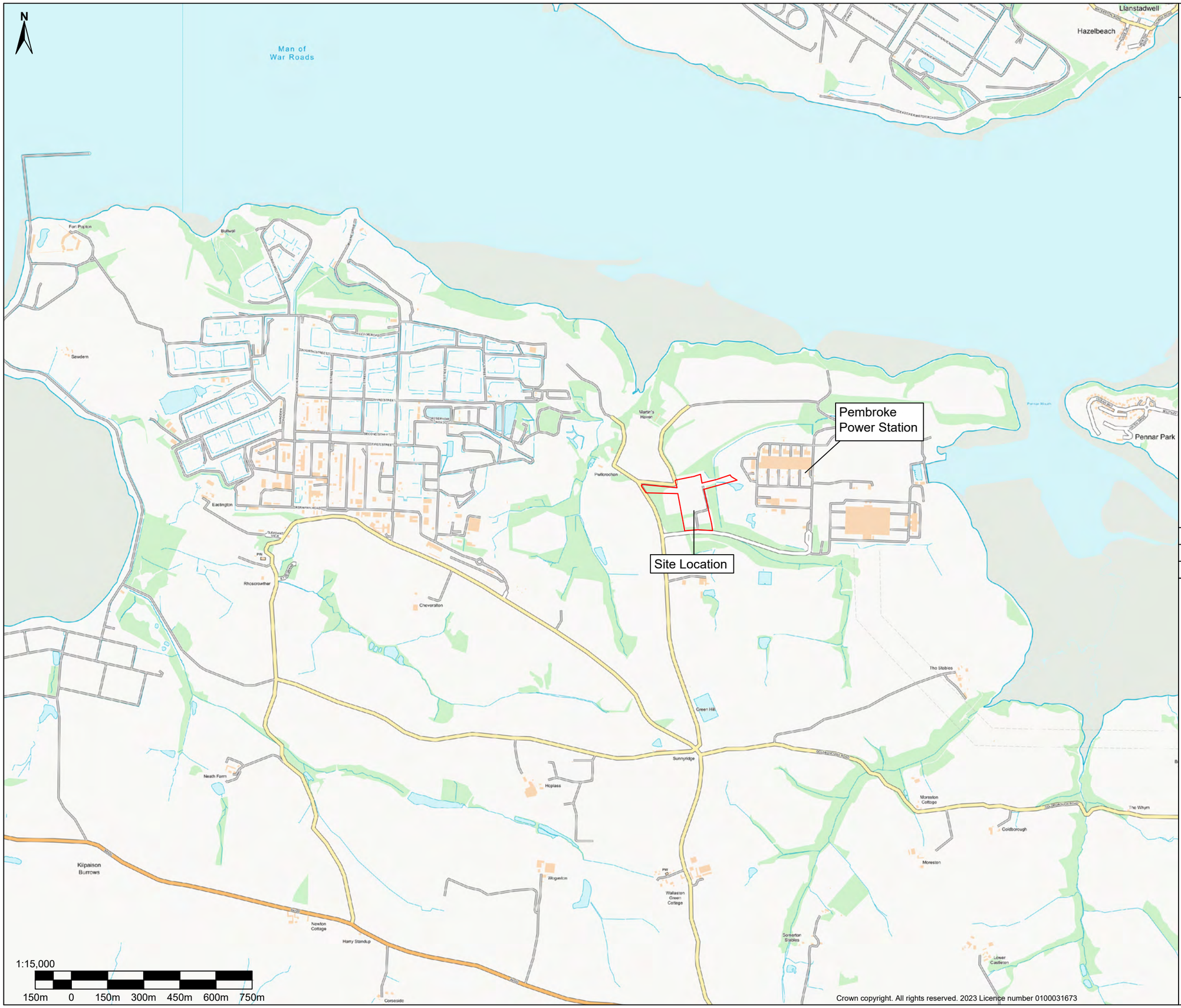


DRAWINGS

Drawing 1	**JFR2796_001_SLP_V01**
	Site Location Plan
Drawing 2	**JFR2796_002_SBP_V01**
	Site Boundary Plan
Drawing 3	**JFR2796_003_GBP_V01**
	Geology From BGS
Drawing 4	**JFR2796_004_EHP_V01**
	Exploratory Hole Location Plan
Drawing 5	**Figure2_Phase1_Hydrogen_2 0220803**
	Phase 1 Habitat Plan
Drawing 6	**JFR2796_006_CCS_V01**
	Conceptual Cross Section
Drawing 7	**299919-00 S2 P01**
	Pembroke Green Hydrogen 1 Site Layout



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Legend:

Site Boundary

Rev	Description	By	CB	Date

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Project RWE Pembroke Electrolyser

Title Site Location Plan

Status	Drawn By	PM/Checked by
FINAL	TF	KD
Job Ref	**Scale @ A3**	**Date Created**
JFR2796	1:15,000	DEC 2023

RPS Drawing / Figure Number: JFR2796_001_SLP_V01

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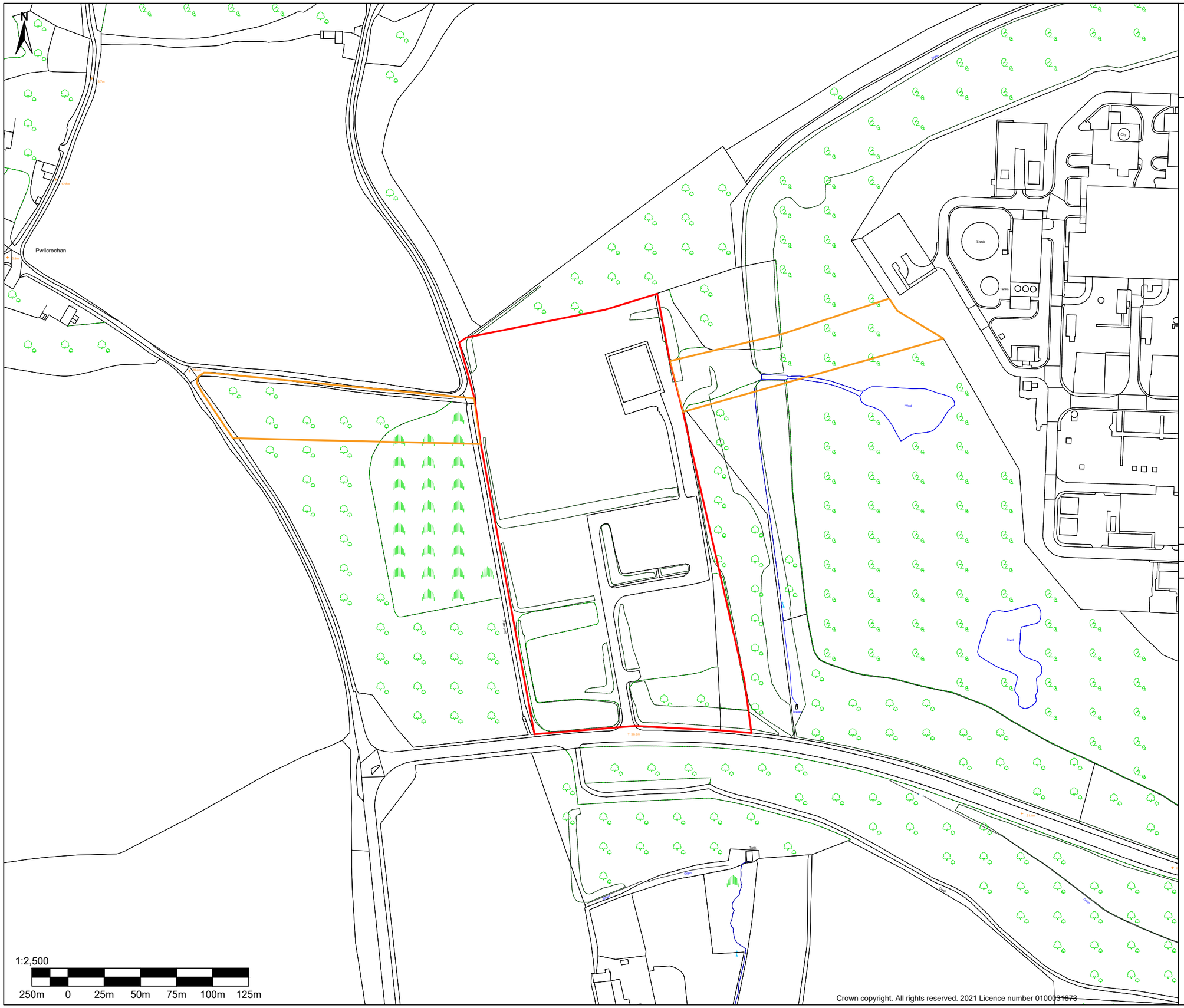

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Legend:

- Electrolyser Assessment Area
- Water Pipeline Area

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Client RWE

Project RWE Pembroke Electrolyser

Title Site Boundary Plan

Status	Drawn By	PM/Checked by
FINAL	TF	KD
Job Ref	**Scale @ A3**	**Date Created**
JFR2796	1:2500	DEC 2023
RPS Drawing / Figure Number		**Rev**
JFR2796_002_SBP_V01		0

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Legend:

- Electrolyser Assessment Area
- Water Pipeline Area
- BLACK ROCK SUBGROUP AND GULLY OOLITE FORMATION (UNDIFFERENTIATED) - LIMESTONE
- AVON GROUP - LIMESTONE AND MUDSTONE, INTERBEDDED
- SKRINKLE SANDSTONE FORMATION - SANDSTONE
- RIDGEWAY CONGLOMERATE FORMATION - CONGLOMERATE

1:3,500

35m 0 35m 75m 110m 145m 180m

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Project RWE Pembroke Electrolyser

Title BGS Geology Plan

Status	Drawn By	PM/Checked by
Final	TF	PR/GJ
Job Ref	**Scale @ A3**	**Date Created**
JFR2796	1:3500	NOV 2023

RPS Drawing / Figure Number: JFR2796_003_GBP_V01

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Legend:

- Electrolyser Assessment Area
- Water Pipeline Area
- BH — Rotary Cored Boreholes
- WS — Window Sample Boreholes
- TRL-DCP — Proposed TRL-DCP Locations
- TP — Trial Pit Locations
- TP — Soakaway Test Locations
- HP — Hand Pit Locations
- BH — BGS Borehole Record
- Gas Main Easement

For the location of section A - A'
see drawing JFR_006_CCS_V01

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Client RWE

Project RWE Pembroke Electrolyser

Title Exploratory Hole Location Plan

Status	Drawn By	PM/Checked by
Final	TF	PR/GJ
Job Ref	**Scale @ A3**	**Date Created**
JFR2796	1:1250	NOV 2023
RPS Drawing / Figure Number		**Rev**
JFR2796_004_EHP_V01		0

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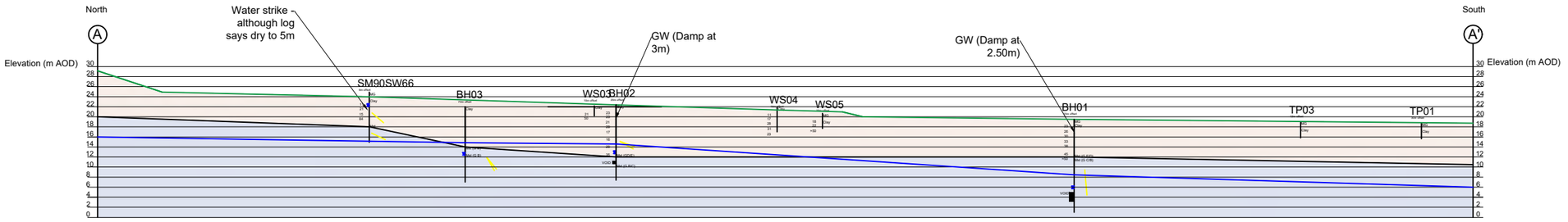
Conceptual Geological Cross Section

Section Line A - A'



Legend:

- Ground Level
- Approximate average depth to groundwater inferred from monitoring
- Groundwater strikes during drilling
- Avon Group Mudstone - Weathering Class E/D
- Avon Group Mudstone - Weathering Class C/B
- Apparent Dip Angle
- Void

For the location of section A - A' see drawing JFR2796_004_EHP_V01

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Client RWE

Project RWE Pembroke Electrolyser

Title Conceptual Geological Cross Section

Status	Drawn By	PM/Checked by
Final	TF	PR/GJ
Job Ref	**Scale @ A3**	**Date Created**
JFR2796	~ 1:1000	DEC 2023

RPS Drawing / Figure Number: JFR2796_006_CCS_V01

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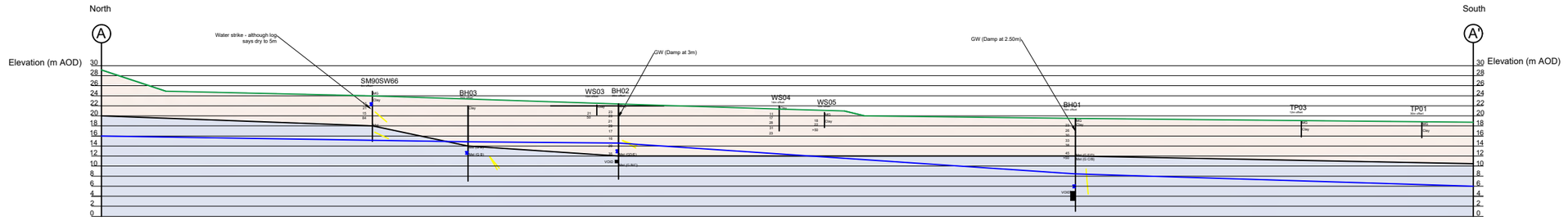
Conceptual Geological Cross Section

Section Line A - A'



For the location of section A - A' see drawing JFR2796_004_EHP_V01

Legend:

- Ground Level
- Approximate average depth to groundwater inferred from monitoring
- Groundwater strikes during drilling
- Avon Group Mudstone - Weathering Class E/D
- Avon Group Mudstone - Weathering Class C/B
- Apparent Dip Angle
- Void

Rev	Description	By	CB	Date

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Client RWE

Project RWE Pembroke Electrolyser

Title Conceptual Geological Cross Section

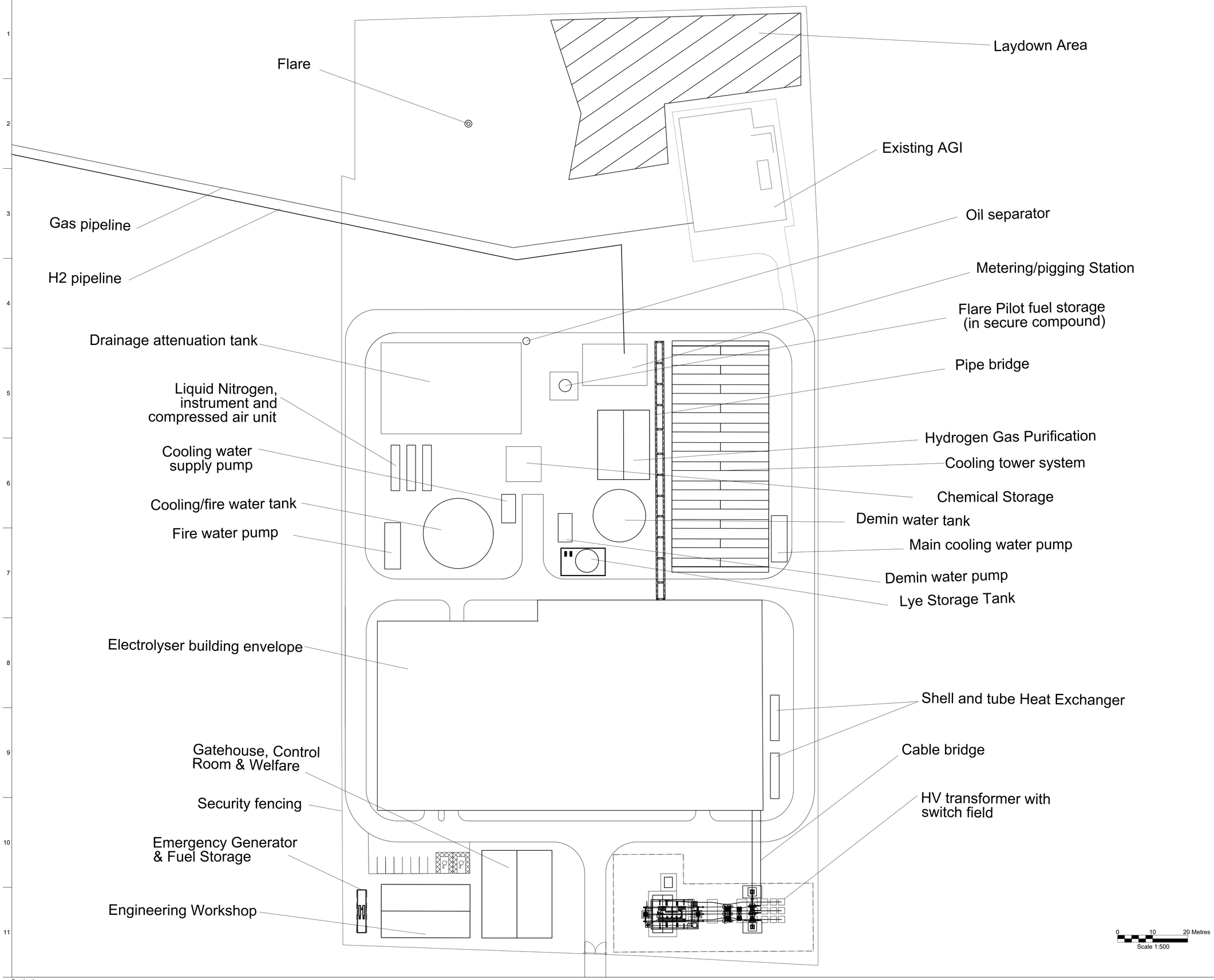
Status	Drawn By	PM/Checked by
Final	TF	PR/GJ

Job Ref	Scale @ A3	Date Created
JFR2796	~ 1:1000	DEC 2023

RPS Drawing / Figure Number: JFR2796_006_CCS_V01

Rev: 0

rpsgroup.com



NOTES:

1. This drawing represents an early concept that is subject to change as the design matures.

Issue	Date	By	Chkd	Appd
P01	12/03/24	MA	CY	CM

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Client
RWE Generation UK plc

Job Title
Pembroke Green Hydrogen 1

Drawing Title
Site Layout

Scale at A1 NTS

Discipline Layout

Job No **299919-00**

Drawing Status **S2**

Drawing No **TBC**

Issue **P01**

Do not scale

Appendix A

Site Photographs

Plate 01: BH01 Redundant Clay Pipe at 0.60m bgl.

Plate 02: BH01 1.00m to 3.00m bgl. Box 1.

Plate 03: BH01 3.00m to 5.00m bgl. Box 2.

Plate 04: BH01 5.00m to 7.50m bgl. Box 3.

Plate 05: BH7.50m to 9.50m bgl. Box 4.

Plate 06: BH0 9.50m to 12.50m bgl. Box 5.

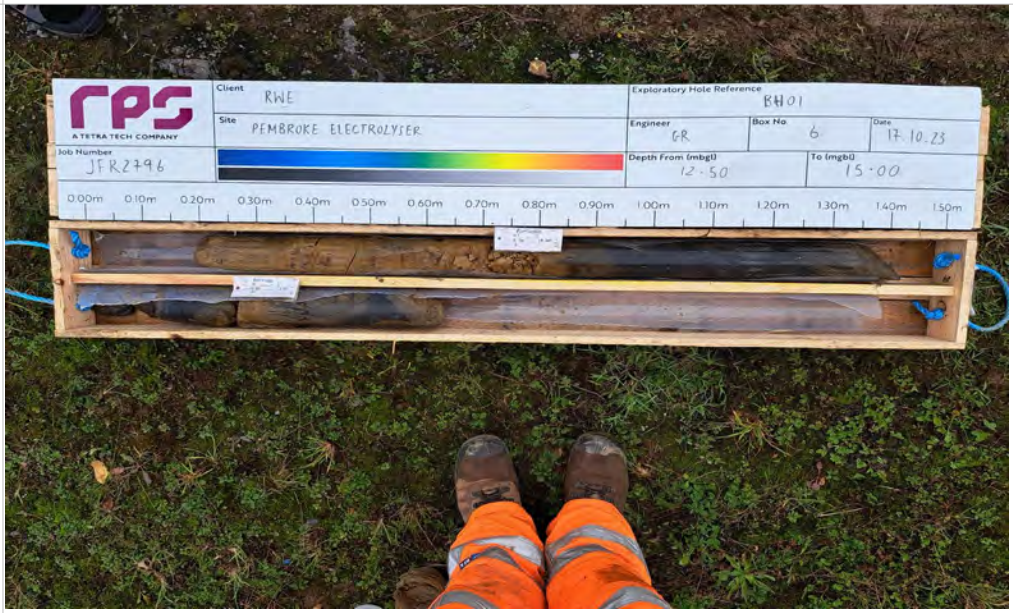


Plate 07: BH0112.50 to 15.00m bgl. Box 6.

Plate 08: BH01 16.30m to 18.50m bgl. Box 7.

Plate 11: BH02 1.20m to 3.00m bgl. Box 1.

Plate 12: BH02: 3.00m to 5.00m bgl Box 2.

Plate 13: BH02 5.00m to 8.00m bgl. Box 3.

Plate 14 BH02: 8.00m to 10.60m bgl. Box 4.

Plate 15: BH02 10.60m to 13.80m bgl. Box 5

Plate 16: BH02 13.80m to 15.00m bgl. Box 6

Plate 17: BH03 1.20m to 3.00m bgl. Box 1.

Plate 18: BH03 3.00m to 5.00m bgl. Box 2.

Plate 19: BH03 5.00m to 8.00m bgl. Box 3.

Plate 20: BH03 8.00m to 11.00m bgl. Box 4.

Plate 21: BH03 11.00m to 13.50m bgl. Box 5.

Plate 22: BH03 13.50m to 15.00m bgl. Box 6.

Plate 01: TP01 sidewall 0.00m to 3.10m

Plate: TP01 Spoil 0.00m to 3.10m.

Plate 03: TP02 sidewall 0.00m to 2.90m.

Plate 04: TP02 spoil 0.00m to 2.90m

Plate 05: TP03 Sidewall 0.00m to 3.10m.

Plate 06: TP03 Spoil 0.00m to 3.20m

Plate 07: TP04 Sidewall 0.00m to 2.30m.

Plate 08: TP04 Spoil 0.00m 2.30m.

Plate 09: TP05 Sidewall 0.00m to 3.20m

Plate 10: TP05 Spoil 0.00m to 3.20m

Plate 11: TP06 Sidewall 0.00m to 0.80m.

Plate 12: TP06 Spoil 0.00m to 0.80m.

Plate 13: TP07 Sidewall 0.00m to 1.00m.

Plate 14: TP07 Spoil 0.00m to 1.00m.

Plate 15: TP08 Sidewall 0.00m to 0.30m.

Plate 16: TP08 Spoil 0.00m to 0.30m

Plate 17: TP09 Sidewall 0.00m to 2.70m.

Plate 18: TP09 Spoil 0.00m to 2.70m

Plate 19: TP10 Sidewall 0.00m to 2.80m.

Plate 20: TP10 Sidewall 0.00m to 2.80m.

Plate 21: TP11 Sidewall 0.00m to 2.50m.

Plate 22: TP11 Sidewall 0.00m to 2.50m.

Plate 23: Trial Pitting at TP05.

Plate 24: Trial Pitting at TP03.

Plate 01: WS01 Spoil 0.00m to 1.20m bgl.

Plate 02: WS01 Sample Recovery 1.20m to 3.00m bgl.

Plate 03: WS02 Spoil 0.00m to 1.20m bgl.

Plate 04: WS02 Perched Groundwater in Hand Pit.

Plate 05: WS03 Spoil 0.00m to 1.20m bgl.

Plate 06: WS03 Hand Pitr 0.00m to 1.20m bgl.

Plate 07: WS03 Sample Recovery 1.20m to 3.00m bgl.

Plate 08: WS04 Hand Pit 0.00m to 1.20m bgl.

Plate 09: WS04 Sample Recovery 1.20m to 5.00m bgl.

Plate 10: WS05 Spoil 0.00m to 1.20m bgl.

Plate 11: WS05 Hand Pit 0.00m to 1.20m bgl.

Plate 12: WS05: Sample Recovery 1.20m to 3.00m bgl.

Plate 13: WS06 Hand Pit 0.00m to 1.20m bgl.

Plate 14: WS06 Sample Recovery 1.20m to 2.00m bgl.

Plate 15: WS07 Hand Pit 0.00m to 1.20m bgl.

Plate 16: WS07 Sample Recovery 1.20m to 3.00m bgl.

Plate 17: WS08 Spoil 0.00m to 1.20m bgl.

Plate 18: WS08 Sample Recovery 1.20m to 3.00m bgl.

Plate 19: WS09 Hand Pit 0.00m to 1.20m bgl.

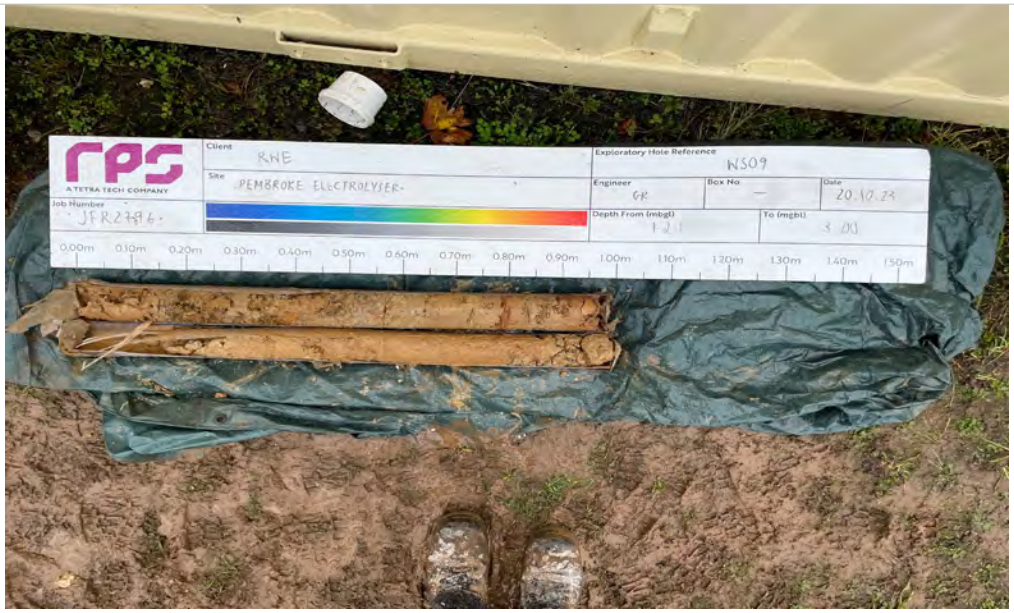


Plate 20: WS09 Sample Recovery 1.20m to 3.00m bgl.

Appendix B

Exploratory Hole Records

App. B.1

Historical Borehole Records

Geotechnical Engineering Limited

BOREHOLE LOG

SM90SW/66 9250 0239

COMMERCIAL

IN CONFIDENCE

CLIENT NATIONAL GRID COMPANY

SITE ANGLE BAY, PEMBROKE

Date 19th - 20th February, 1991 Ground level 25.00mOD

BOREHOLE 4A

Sheet 1 of 1

Scale 1 : 50

progress/ water levels	casing (m)	SPT/ U70	depths (m)	core/ sample	description	depth (m)	level (mOD)	legend
19/2/91					TOPSOIL	0.15	24.85	
					FILL - limestone gravel/cobbles with some sandy matrix.	0.60	24.40	
			1.03 - 1.43	U	FILL - stiff red-brown silty clay with some lithic gravel.			
					approx	1.30	23.70	
Water struck at 2.58m.		N= 11	2.00 - 2.45	S	FILL - stiff brown and green slightly sandy silty clay with some lithic gravel. Pocket of stiff red-brown silty clay at base.			
			2.58	W				
		N= 21	3.04 - 3.49	S	Firm dark brown silty CLAY with some fine lithic gravel. Abundant rootlets and organic odour.	2.85	22.15	
						3.30	21.70	
PM Dry 20/2/91 AM 1.76	98 to 2.86	N= 15	4.00 - 4.45	S	Stiff green-brown faintly laminated silty CLAY with trace rootlets and occasional fine lithic gravel. (Completely weathered Bedrock?)			
	5.37		5.09			5.05	19.95	
		N= 84	5.09 - 5.54	C 35 - -	Dark green discoloured green, thinly laminated fragmented moderately to highly weathered silty calcareous MUDSTONE, weak. Bedding dips 40°. Completely weathered clay with lithorelicts in places.			
			6.56	100 23 -		6.55	18.45	
			8.06	100 30 11	Dark grey discoloured orange-brown, fragmented to closely jointed slightly weathered calcareous silty MUDSTONE. Occasional limestone band 300mm thick, moderately strong to strong. Bedding dips 25°. Joints, mostly sub-parallel to bedding 60 - 70°, 80 - 90°, generally spaced >1m. Grades to siltstone at base.			
			9.44	80 80 22				
PM 2.17			9.98		END OF BOREHOLE	9.98	15.02	

Equipment/Methods

Dry core drilled from 0.00m to 5.09m.
Waterflush rotary core drilled (T86) from 5.09m to 9.98m.

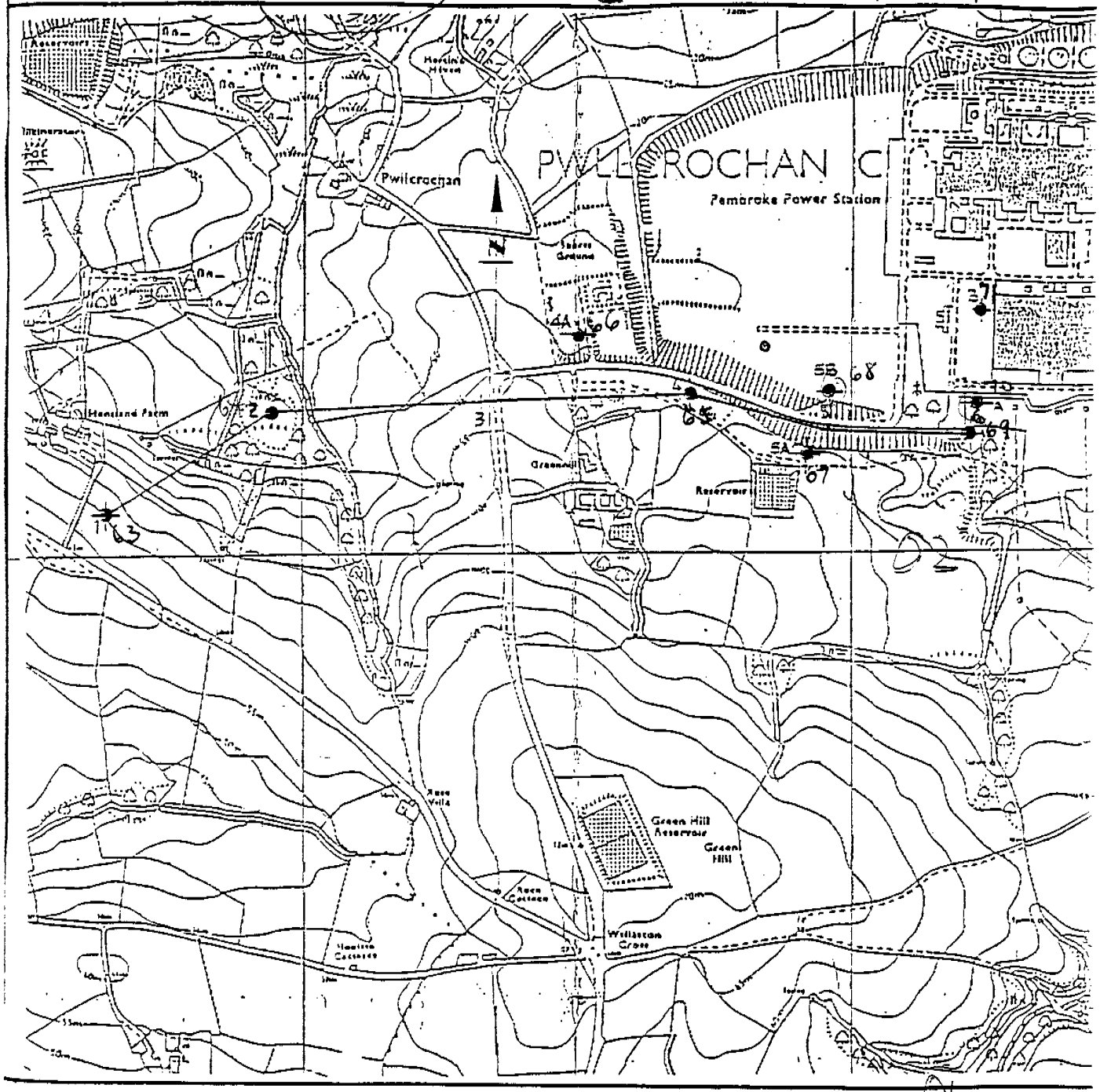
Remarks

Upon completion, borehole backfilled with local material.

GEL JOB No 5526

FIGURE 5

COMMERCIAL
IN CONFIDENCE
SM90SW/103-71

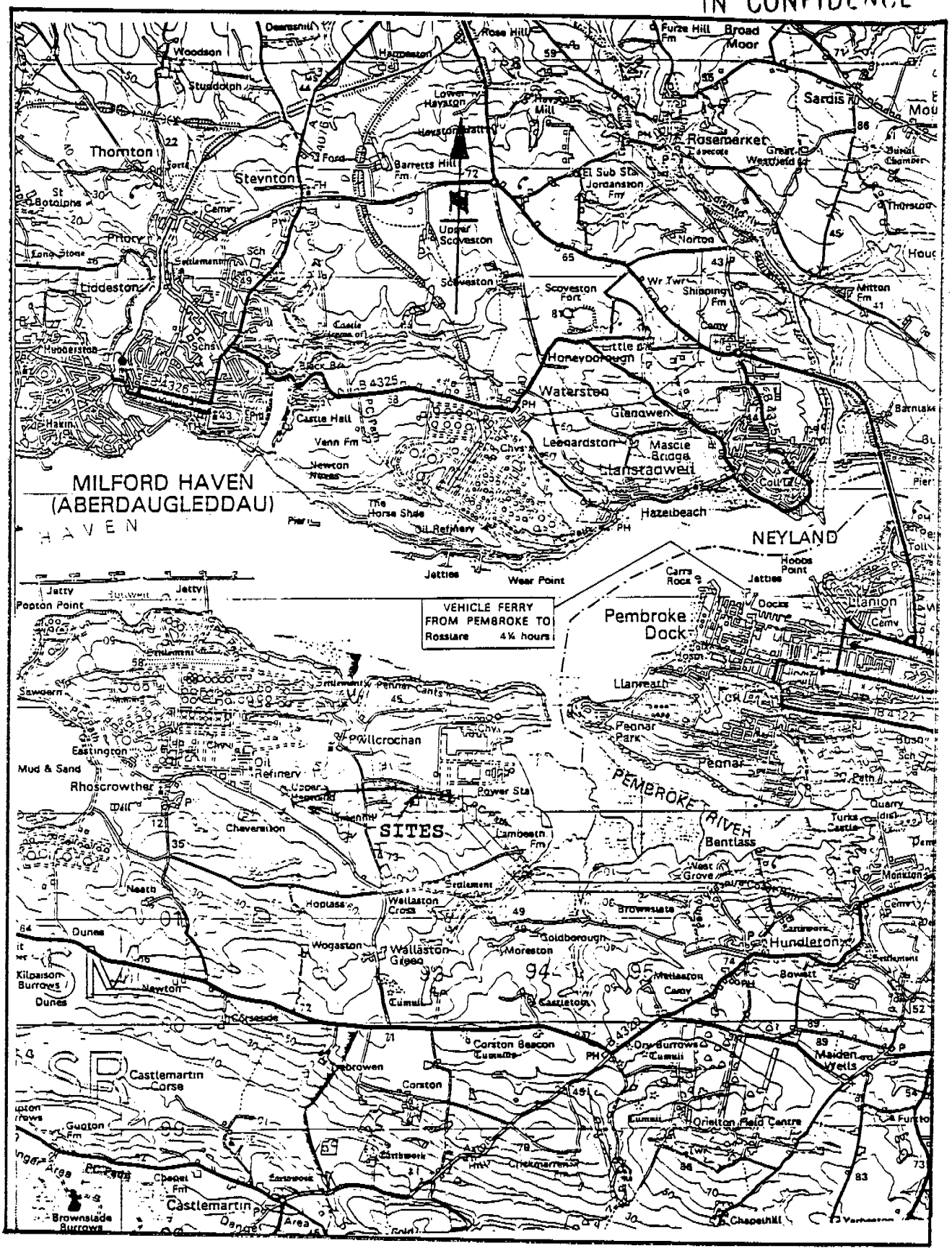


Borehole location plan

Scale - 1/10,000

Figure 1

SM90SW/COMMERCIAL
IN CONFIDENCE



Site location plan

Scale - 1/50,000

Figure 2

App. B.2

Rotary Borehole Logs

A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC		Borehole ID: BH01
	Contract Number: JFR2796	Start Date: 12/10/2023	End Date: 17/10/2023	Checked By: GJ	Status: DRAFT — Sheet 1 of 2
Rotary Core Drilling Log	Easting: 192521.3	Northing: 202529.0	Ground Level: 19.41mOD	Plant Used: Fraste PLG	Logged By: GR — Scale: 1:50
Weather: Light rain, occasionally heavy.	Termination: Target Depth Reached.		SPT Hammer: AP3 Energy Ratio: 67.84%		

Samples & Core Recovery					Strata Details				Groundwater	
Depths	Type/ Ref	SPT	TCR/SCR/ RQD	Fracture Spacing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
						(0.60)		Grass over firm brown gravelly sandy silty CLAY. Gravel is sub-rounded and sub-angular fine to coarse siltstone and limestone. [MADE GROUND]		
0.40 - 0.60 0.50	B ES				18.81	0.60 (0.30)		CONCRETE [MADE GROUND]		
		SPT(C) 1.00m, N=23 (4,7/5,5,6,7)	100 N/A N/A		18.51	0.90		*0.60 m bgl: Redundant clay pipe.* Firm to stiff very closely fissured orangish brown, yellowish brown and brown mottled slightly gravelly CLAY. Gravel is angular fine to medium lithorelicts of very weak dark grey mudstone. [AVON GROUP - WEATHERING CLASS E]		
						(1.65)		*1.00 - 1.40 m bgl: Occasional light grey mottling.*		
		SPT(C) 2.00m, N=26 (5,6/6,6,7,7)						*2.00 - 2.55 m bgl: Becoming very gravelly. Gravel is randomly orientated sub-angular and sub-rounded fine to coarse lithorelicts of very weak reddish brown and dark grey mudstone.*		
2.20 - 2.30	D		100 N/A N/A		16.86	2.55		*2.50 m bgl: Drillers logs describe soils as wet.*		
		SPT(C) 3.00m, N=30 (5,6/7,7,7,9)	100 N/A N/A		16.61	2.80		Soft to firm dark grey and yellowish brown mottled very gravelly CLAY, with rare black relict rootlet remnants. Gravel is sub-angular and angular fine to coarse lithorelicts of very weak dark grey mudstone. [AVON GROUP - WEATHERING CLASS E]		
3.90 - 4.00	D	SPT(C) 4.00m, N=33 (7,9/9,8,7,9)	100 N/A N/A					Firm to stiff brown, light brown, light grey and light orangish brown mottled gravelly CLAY. Gravel is randomly orientated, subanglar and angular, fine to medium lithorelicts of very weak to medium strong dark grey and grey mudstone and weak orange sandstone. [AVON GROUP - WEATHERING CLASS E]		
								3.50 - 6.60 m bgl: Becoming very gravelly.		
								4.00 - 4.40 m bgl: Possible SPT disturbance.		
								4.40 - 4.50 m bgl: With rare white rootlets (<1mm diameter) and black relict rootlet remnants.		
						(3.80)				
		SPT(C) 5.00m, N=38 (8,9/9,10,9,10)	93 N/A N/A					*5.75 - 6.60 m bgl: Becoming very stiff.*		
6.70 - 6.80	D	SPT(C) 6.50m, N=45 (8,11/10,12,12,11)	95 N/A N/A	NI	12.81	6.60 (0.30)		Dense orangish brown becoming brown frequently cemented fine to medium SAND with rare angular fine to coarse lithorelicts of extremely weak sandstone. [AVON GROUP - WEATHERING CLASS E]		
					12.51	6.90		Very weak orangish brown MUDSTONE Disintegrated to sub-angular to sub-rounded fine to coarse lithorelicts of extremely weak orangish brown mudstone. [AVON GROUP - WEATHERING CLASS D]		
						(0.75)				
7.85 - 8.05	C	SPT(C) 7.50m, 50 (25 for 145mm/50 for 115mm)	100 70 56		11.76	7.65		Weak to medium strong indistinctly thinly laminated dark grey locally orangish brown calcareous MUDSTONE. Fractures are 0° to 90° closely to widely spaced planar and smooth with occasional orangish brown silt infill. [AVON GROUP - WEATHERING CLASS C/B]		
			85 45 32	NI 90 250				*8.20 - 8.60 m bgl: Non intact recovered as orangish brown and dark brown mottled sandy gravel of subangular, fine to medium lithorelicts of weak mudstone.*		
						(2.50)				
								9.00 - 9.75 m bgl: Dark grey becoming grey.		
								9.50 - 10.15 m bgl: Limited Recovery.		
								9.75 - 10.10 m bgl: Non intact recovered as gravel and cobble sized lithorelicts of extremely weak grey mudstone. Potentially highly fractured		

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)
12-10-2023	12:00	0.00		
12-10-2023	17:00	5.00		
13-10-2023	08:00	5.00		
13-10-2023	17:00	8.00	4.00	
16-10-2023	08:00	8.00	4.00	
16-10-2023	17:00	15.00	4.00	
17-10-2023	08:00	15.00	4.00	

Installation

Ref	Top (m)	Base (m)	Type	Dia (mm)

Flush Information

Top (m)	Base (m)	Flush Type	Return	Flush Colour
7.50	18.50	AIR MIST	-	

Borehole Diameter

Depth (m)	Dia (mm)
4.00	152
18.50	120

Casing Diameter

Depth (m)	Dia (mm)
4.00	152

Remarks:

1) Hand pit undertaken from ground level to 0.60m bgl.
2) BS5930 2020 Weathering Approach 4 adopted in logging.
3) Borehole collared with temporary casing to 4.50m bgl and left open (to 15.40 m bgl. Flush cover installed at the surface.
4) Groundwater recorded at 13.80 m bgl.
5) Hole collapsed from 18.50 to 15.40 m bgl.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
2.50			0		Driller notes soils as wet. Potentially perched water. Not full water strike.
13.80			0		Standing water level end of

Fracture spacing reported in mm as minimum, average and maximum values. TCR, SCR and RQD reported in %. NDP = No Determination Possible. Numbers in descriptions relate to bedding spacing (min/avg/max).

A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC		Borehole ID: BH01
	Contract Number: JFR2796	Start Date: 12/10/2023	End Date: 17/10/2023	Checked By: GJ	Status: DRAFT — Sheet 2 of 2
Rotary Core Drilling Log	Easting: 192521.3	Northing: 202529.0	Ground Level: 19.41mOD	Plant Used: Fraste PLG	Logged By: GR — Scale: 1:50

Weather: Light rain, occasionally heavy. | Termination: Target Depth Reached. | SPT Hammer: AP3 Energy Ratio: 67.84%

Samples & Core Recovery					Strata Details				Groundwater	
Depths	Type/ Ref	SPT	TCR/SCR/ RQD	Fracture Spacing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
					9.26	10.15		*zone.* *10.10 - 10.15 m bgl: Dark brown silty fine to medium sand.* Extremely weak thinly laminated dark reddish brown MUDSTONE. [AVON GROUP - WEATHERING CLASS C]		
10.30 - 10.40	D		67 35 17							
								11.00 - 11.45 m bgl: No Recovery. Drilling disturbance.		
			67 47 28			(3.20)		*11.00 - 12.40 m bgl: Frequent incipient fractures opened on bedding by drilling.*		
								12.40 - 12.55 m bgl: Recovered as soft brown gravelly clay. Gravel is angular and tabular, fine to coarse mudstone.		
12.70 - 12.95	C		83 70 57					*13.10 - 13.35 m bgl: Fracture 20° planar rough.*		
					6.06	13.35		Very weak to weak thinly laminated dark grey, black, dark reddish brown and orangish brown mottled calcareous MUDSTONE. Laminations are 85° to 90°. Fracture set 1: 40 - 50°, closely to widely spaced planar, stepped rough or smooth with infill of orangish brown silt. Fracture set 2: 20° Fracture set 3: 0°. Fracture set 4: on bedding 85° to 90°. [AVON GROUP - WEATHERING CLASS C]		
13.40 - 14.00	C			55 55 55						
						(1.25)				
14.15 - 14.29	C			NI 100 150						
14.40 - 14.60	C		60 60 55					*14.00 - 14.60 m bgl: Limited Recovery.*		
					4.81	14.60		VOID [AVON GROUP]		
						(1.70)				
					3.11	16.30		Very weak to weak thinly laminated dark grey, dark reddish brown and orangish brown mottled calcareous MUDSTONE. Laminations are 85° to 90°. Fracture set 1: 40 - 50°, closely to widely spaced planar, stepped rough or smooth with infill of orangish brown silt. Fracture set 2: 20° Fracture set 3: 0°. Fracture set 4: on bedding 85° to 90° planar smooth with infill of orangish brown silt. [AVON GROUP - WEATHERING CLASS C]		
			100 69 69			(0.80)				
16.80 - 17.10	C				2.31	17.10				
				NI 90 240				*16.30 - 16.60 m bgl: Non intact drilling disturbance - Recovered as soft greyish brown and orangish brown mottled gravelly clay and fractured mudstone. Gravel is angular, fine to medium mudstone.* *16.60 - 16.80 m bgl: Non intact drilling disturbance - Strata fractured on bedding recovered as angular, fine to coarse mudstone gravel.*		
17.50 - 17.95	C		100 71 68			(1.40)				
								Medium strong thinly laminated dark grey greyish brown and dark reddish brown mottled calcareous MUDSTONE. Laminations are 85° to 90°. Fractures set 1: 60° widely spaced planar smooth with orangish brown silt veneer. [AVON GROUP - WEATHERING CLASS B]		
18.10 - 18.50	C				0.91	18.50		*17.10 - 17.55 m bgl: Non intact drilling disturbance - Recovered as angular, fine to coarse mudstone gravel.* *18.20 - 18.25 m bgl: Non intact drilling disturbance - Recovered as angular, fine to coarse mudstone gravel.*		
								End of Borehole at 18.50m		

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)
17-10-2023	12:00	18.50	4.00	13.50

Installation				
Ref	Top (m)	Base (m)	Type	Dia (mm)

Flush Information				
Top (m)	Base (m)	Flush Type	Return	Flush Colour

Borehole Diameter	
Depth (m)	Dia (mm)
4.00	152
18.50	120

Casing Diameter	
Depth (m)	Dia (mm)
4.00	152

Remarks:

1) Hand pit undertaken from ground level to 0.60m bgl.
2) BS5930 2020 Weathering Approach 4 adopted in logging.
3) Borehole collared with temporary casing to 4.50m bgl and left open (to 15.40 m bgl. Flush cover installed at the surface.
4) Groundwater recorded at 13.80 m bgl.
5) Hole collapsed from 18.50 to 15.40 m bgl.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
2.50			0		Driller notes soils as wet. Potentially perched water. Not full water strike.
13.80			0		Standing water level end of

Fracture spacing reported in mm as minimum, average and maximum values. TCR, SCR and RQD reported in %. NDP = No Determination Possible. Numbers in descriptions relate to bedding spacing (min/avg/max).

A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC		Borehole ID: BH02
	Contract Number: JFR2796	Start Date: 18/10/2023	End Date: 19/10/2023	Checked By: GJ	Status: DRAFT	Sheet 1 of 2
Rotary Core Drilling Log	Easting: 192476.0	Northing: 202441.5	Ground Level: 22.18mOD	Plant Used: Fraste PLG	Logged By: EL	Scale: 1:50

Weather: Light rain, occasionally heavy. | Termination: Target Depth Reached. | SPT Hammer: AP3 Energy Ratio: 67.84%

Samples & Core Recovery					Strata Details				Groundwater	
Depths	Type/ Ref	SPT	TCR/SCR/ RQD	Fracture Spacing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
						(0.30)		Grass over soft dark brown CLAY, with frequent rootlets. [TOPSOIL]		
0.20	ES				21.88	0.30		Soft to firm dark orangish brown gravelly silty CLAY, with a low boulder content. Gravel is angular to sub-angular fine to coarse mudstone. Boulders are sub-angular mudstone (220mm). [AVON GROUP - WEATHERING CLASS E]		
0.70 - 0.80	B				21.28	(0.60) 0.90		Stiff greyish brown and dark brown mottled gravelly CLAY. Gravel is sub-angular fine to coarse lithorelicts of extremely weak mudstone. [AVON GROUP - WEATHERING CLASS E]		
		SPT(C) 1.20m, N=23 (3,5/6,6,5,6)	100 N/A N/A					*1.70 - 2.40m bgl: Dark reddish brown, slightly gravelly clay. Gravel is sub-angular fine to coarse lithorelicts of very weak greyish brown mudstone and yellowish brown sandstone*		
		SPT(C) 2.00m, N=23 (1,2/5,6,6,6)	100 N/A N/A					*2.70 - 2.90m bgl: Yellowish brown and light brown clay, with rare gravel. Gravel is sub-angular fine to coarse lithorelicts of extremely weak mudstone.*		
2.95 - 3.00	D	SPT(C) 3.00m, N=21 (3,4/5,5,6,5)	98 N/A N/A					*2.90 - 4.15m bgl: Dark reddish brown.* *3.00 - 3.60 mbgl: Non intact drilling disturbance - recovered as very soft brown and yellowish brown gravelly clay. Gravel is subangular, fine and medium, lithorelicts of weak mudstone.*		
						(5.90)		*3.80 - 3.85 mbgl: Rare white rootlets present (<1mm diameter)*		
		SPT(C) 4.00m, N=29 (6,6/6,7,8,8)	74 N/A N/A					*4.00 - 4.15 mbgl: Non intact drilling disturbance probable SPT influence recovered as very soft brown and yellowish brown gravelly clay. Gravel is subangular, fine and medium, weak litholericts of mudstone.* *4.15 - 5.15m bgl: Greyish brown slightly gravelly clay, with rare white rootlets (<1mm).* *4.55 - 4.60 mbgl: Assumed Zone of Core Loss*		
		SPT(C) 5.00m, N=17 (1,3/4,4,4,5)	100 N/A N/A					*5.15 - 6.20m bgl: Brown, orangish brown and yellowish brown gravelly clay, with rare fine gravel sized pockets of orangish brown fine grained sand.* *5.65 - 5.85 mbgl: Firm to stiff dark reddish brown, black and light brown mottled clay. Frequent fine gravel sized pockets of light brown silt.*		
		SPT(C) 6.50m, N=16 (4,3/3,3,5,5)	80 N/A N/A		15.38	6.80		*6.20 - 6.80m bgl: Greyish brown.* *6.50 - 6.80 mbgl: Assumed Zone of Core Loss Probable SPT Influence* Stiff orangish brown and yellowish brown slightly gravelly silty CLAY. Gravel is sub-angular fine to medium extremely weak lithorelicts of mudstone. [AVON GROUP - WEATHERING CLASS E]		
7.15 - 7.30	D									
		SPT(C) 8.00m, N=29 (4,5/7,6,7,9)	77 N/A N/A			(2.85)		*7.85 - 8.60 mbgl: Firm to stiff friable greyish brown silty gravelly clay. Gravel is randomly orientated, sub-angular and tabular, fine to medium, randomly orientated lithorelicts of extremely weak mudstone.*		
9.40 - 9.50	D	SPT(C) 9.50m, N=35 (5,7/8,7,8,12)			12.53	9.65		Extremely weak dark grey SILTSTONE thinly interbeddded with extremely weak red fine grained SANDSTONE,	▼	

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)
18-10-2023	08:00	0.00		
18-10-2023	17:00	10.60	4.50	
19-10-2023	08:00		4.50	9.70
19-10-2023	17:00	15.00		

Installation

Ref	Top (m)	Base (m)	Type	Dia (mm)

Flush Information

Top (m)	Base (m)	Flush Type	Return	Flush Colour

Borehole Diameter

Depth (m)	Dia (mm)
4.50	152
15.00	120

Casing Diameter

Depth (m)	Dia (mm)
4.50	152

Remarks:

1) Hand pit undertaken from ground level to 1.20m bgl
2) BS5930 2020 Weathering Approach 4 adopted in logging.
3) Borehole collared with temporary casing to 4.50m bgl and left open to 15.00 m bgl. Flush cover installed at surface.
4) Groundwater standing at 9.70m bgl on completion of borehole.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
9.70			0		Standing water level end of borehole.

Fracture spacing reported in mm as minimum, average and maximum values. TCR, SCR and RQD reported in %. NDP = No Determination Possible. Numbers in descriptions relate to bedding spacing (min/avg/max).

A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC		Borehole ID: BH02
	Contract Number: JFR2796	Start Date: 18/10/2023	End Date: 19/10/2023	Checked By: GJ	Status: DRAFT — Sheet 2 of 2
Rotary Core Drilling Log	Easting: 192476.0	Northing: 202441.5	Ground Level: 22.18mOD	Plant Used: Fraste PLG	Logged By: EL — Scale: 1:50
Weather: Light rain, occasionally heavy.	Termination: Target Depth Reached.		SPT Hammer: AP3 Energy Ratio: 67.84%		

Samples & Core Recovery					Strata Details				Groundwater	
Depths	Type/ Ref	SPT	TCR/SCR/ RQD	Fracture Spacing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
			100 18 18	NI		(0.85)		frequently disintegrated to thinly laminated orangish brown and light brown mottled silt. Bedding and laminations orientated at 30° to 40°.		
					11.68	10.50		[AVON GROUP - WEATHERING CLASS D/E]		
						(0.60)		Extremely weak thinly laminated yellowish brown and dark grey, locally reddish brown MUDSTONE. Recovered non intact as gravelly clay. Gravel is sub-angular fine to coarse lithorelicts of very weak mudstone.		
					11.08	11.10		[AVON GROUP - WEATHERING CLASS D/E]		
			33 10 0			(0.30)		*10.90 - 11.10 mbgl: Becoming strong.*		
					10.78	11.40		ASSUMED ZONE OF CORE LOSS. [AVON GROUP]		
						(0.40)		VOID.		
					10.38	11.80		[AVON GROUP]		
						(0.30)		ASSUMED ZONE OF CORE LOSS.		
				NI	10.08	12.10		[AVON GROUP]		
			33 11 11			(1.10)		Medium strong thinly laminated dark grey locally orangish brown mottled calcareous MUDSTONE. Recovered non intact as angular fine to coarse gravel and rare cobble. [AVON GROUP - WEATHERING CLASS B]		
13.15 - 13.30	D		100 21 21		8.98	13.20		Weak to medium strong thickly laminated dark grey and light grey calcareous MUDSTONE. Fracture set 1; 60° widely spaced, locally infilled with calcite. Fracture set 2; on bedding 20 - 30° closely to medium spaced planar and undulating smooth infilled with wet dark grey silt. Fracture set 3: 10 - 20° widely spaced planar and undulating or smooth.		
				NI 90 300		(1.80)		[AVON GROUP - WEATHERING CLASS B/C]		
14.24 - 14.37	C		83 67 58					*13.35 - 13.90 mbgl: Non intact recorded as angular fine to coarse gravel and cobbles.*		
								13.37 - 13.46 mbgl: Fracture 60° planar, smooth, infilled with a veneer of orangish brown silt.		
14.55 - 14.70	C							*14.28 - 14.38 mbgl: Incipient fracture, closed.*		
								14.55 - 14.65 mbgl: Oval shape incipient fracture with white calcareous infill.		
					7.18	15.00		*14.70 - 15.00 mbgl: 70° incipient fracture with white calcareous infill.*		
								End of Borehole at 15.00m		

11 12 13 14 15 16 17 18 19 20

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)

Installation

Ref	Top (m)	Base (m)	Type	Dia (mm)

Flush Information

Top (m)	Base (m)	Flush Type	Return	Flush Colour
10.60	15.00	AIR MIST	-	

Borehole Diameter

Depth (m)	Dia (mm)
4.50	152
15.00	120

Casing Diameter

Depth (m)	Dia (mm)
4.50	152

Remarks:

1) Hand pit undertaken from ground level to 1.20m bgl
2) BS5930 2020 Weathering Approach 4 adopted in logging.
3) Borehole collared with temporary casing to 4.50m bgl and left open to 15.00 m bgl. Flush cover installed at surface.
4) Groundwater standing at 9.70m bgl on completion of borehole.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
9.70			0		Standing water level end of borehole.

Fracture spacing reported in mm as minimum, average and maximum values. TCR, SCR and RQD reported in %. NDP = No Determination Possible. Numbers in descriptions relate to bedding spacing (min/avg/max).

A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC		Borehole ID: BH03
	Contract Number: JFR2796	Start Date: 20/10/2023	End Date: 23/10/2023	Checked By: GJ	Status: DRAFT — Sheet 1 of 2
Rotary Core Drilling Log	Easting: 192568.7	Northing: 202402.4	Ground Level: 22.02mOD	Plant Used: Fraste PLG	Logged By: PR — Scale: 1:50

Weather: Light rain, occasionally heavy. | Termination: Target Depth Reached. | SPT Hammer: AP3 Energy Ratio: 67.84%

Samples & Core Recovery					Strata Details				Groundwater	
Depths	Type/ Ref	SPT	TCR/SCR/ RQD	Fracture Spacing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.20	ES					(0.50)		Grass over soft dark brown slightly sandy silty CLAY, with frequent rootlets. [TOPSOIL]		
					21.52	0.50				
						(0.40)		Soft becoming firm yellowish brown, locally dark brown slightly gravelly silty CLAY, with low cobble content. Gravel is sub-angular fine to coarse mudstone. Cobbles are sub-angular mudstone (up to 100mm). [AVON GROUP - WEATHERING CLASS E]		
0.80 - 0.90	B				21.12	0.90				
		SPT(C) 1.20m, N=15 (2,3/4,4,3,4)								
1.50 - 1.60	D		100 N/A N/A					Stiff reddish brown locally yellowish brown slightly gravelly silty CLAY. Gravel is sub-angular fine to coarse tabular extremely weak mudstone. [AVON GROUP - WEATHERING CLASS E]		
								1.75 - 1.85m bgl. Becoming gravelly.		
		SPT(C) 2.00m, N=19 (2,3/4,5,4,6)								
2.50 - 2.60	D		100 N/A N/A					*2.50 -3.50m bgl. Yellowish brown locally orangish brown and grey.*		
								2.70m bgl. 40° very thin bed of grey clay.		
		SPT(C) 3.00m, N=19 (2,3/4,5,4,6)						*2.90m bgl. High strength dark grey calcareous mudstone cobble (80mm diam).*		
3.50 - 3.60	D		93 N/A N/A					*Rare pockets (10x20mm) weathered to yellowish brown fine grained Sand.*		
		SPT(C) 4.00m, N=25 (5,7/6,6,6,7)				(6.40)				
4.50	D		100 N/A N/A					*4.75 - 4.85m bgl. Increased gravel content. Predominantly dark grey mudstone.*		
		SPT(C) 5.00m, N=20 (3,4/4,4,6,6)								
5.60 - 5.70	D		100 N/A N/A					*5.50 - 6.00m Gravel predominantly yellowish brown mudstone.*		
								6.00m bgl. Contact between yellowish brown and brownish grey `beds inclined at 40°.		
6.20 - 6.30	D							*6.00 - 6.50m bgl. Brownish grey with faint organic odour and rare relict rootlets. Gravel predominantly dark grey calcareous mudstone. Reduced gravel content.*		
		SPT(C) 6.50m, N=12 (2,3/2,3,3,4)						*6.50 - 7.30m bgl. Yellowish brown locally mottled greyish brown.*		
			100 N/A N/A		14.72	7.30				
7.50 - 7.60	D					(0.50)		Yellowish brown locally orangish brown and greyish brown slightly gravelly clayey fine and medium SAND. Gravel is sub-angular fine to coarse extremely weak lithorelicts of fine to medium sandstone.		
					14.22	7.80		[AVON GROUP - WEATHERING CLASS E]		
		SPT(C) 8.00m, 50 (10,12/50 for 265mm)						*7.30 -7.45m bgl. Frequent black staining (possibly manganese).*		
			100 N/A N/A			(1.00)		Extremely weak very thinly bedded yellowish brown becoming brownish grey, then dark grey MUDSTONE. Recovered as sub-angular and angular fine to coarse clayey Gravel. Gravel frequently shows structure, bedded at 40 - 50°.		
					13.22	8.80		[AVON GROUP - WEATHERING CLASS D]		
			42 14 14			(0.40)		*8.15m bgl. Brownish grey.*		
								8.55m bgl. Dark grey.		
					12.82	9.20		ASSUMED ZONE OF CLORE LOSS. [AVON GROUP]		
9.30 - 9.40	C							Weak thinly laminated dark grey with extremely closely spaced grey thin laminations (oriented at 50°) calcareous MUDSTONE. Fracture set 1; 50° very closely to closely		

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)
17-10-2023	00:00	1.20		
17-10-2023	12:00	0.00		
20-10-2023	08:00	1.20		
20-10-2023	16:00	6.50	4.50	
23-10-2023	08:00	6.50	4.50	
03-11-2023	14:00	15.00	4.50	9.60

Installation

Ref	Top (m)	Base (m)	Type	Dia (mm)
1	0.00	5.00	PLAIN	50
1	5.00	15.00	SLOTTED	50

Flush Information

Top (m)	Base (m)	Flush Type	Return	Flush Colour
8.80	15.00	AIR MIST	-	

Borehole Diameter

Depth (m)	Dia (mm)
4.50	300
15.00	120

Casing Diameter

Depth (m)	Dia (mm)
4.50	152

Remarks:

1) Handpit excavated from ground level to 1.20m.
2) Groundwater strike not observed prior to adding water flush. Groundwater measured at 9.60m end of hole.
3) Plain 50mm HDPE standpipe installed from 0.00 - 5.00m bgl, with slotted from 5.00 - 15.00m blg.
4) BS5930 2020 Weathering Approach 4 adopted in logging.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Fracture spacing reported in mm as minimum, average and maximum values. TCR, SCR and RQD reported in %. NDP = No Determination Possible. Numbers in descriptions relate to bedding spacing (min/avg/max).

A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC		Borehole ID: BH03
	Contract Number: JFR2796	Start Date: 20/10/2023	End Date: 23/10/2023	Checked By: GJ	Status: DRAFT — Sheet 2 of 2
Rotary Core Drilling Log	Easting: 192568.7	Northing: 202402.4	Ground Level: 22.02mOD	Plant Used: Fraste PLG	Logged By: PR — Scale: 1:50

Weather: Light rain, occasionally heavy. | Termination: Target Depth Reached. | SPT Hammer: AP3 Energy Ratio: 67.84%

Samples & Core Recovery					Strata Details				Groundwater	
Depths	Type/ Ref	SPT	TCR/SCR/ RQD	Fracture Spacing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
10.10 - 10.20	C		93 41 20					spaced planar smooth, locally infilled with calcite. Fracture set 2; 30° widely spaced planar smooth. Fracture set 3. 80° medium to widely spaced, all stained orangish brown. [AVON GROUP - WEATHERING CLASS B]		
								9.45 - 9.75m bgl. Recovered non intact.		
								9.80 - 10.00m bgl. 2no. 30° fractures, 1no. 10° fractures and 2no. 50° fractures all planar smooth stained orangish brown.		
								10.00 - 10.20m bgl. Very closely spaced 50° bedding fractures planar smooth stained orangish brown.		
				NI 80 160				*10.65m bgl. 50° undulating calcite vein (1mm diam) perpendicular to bedding.*		
								10.70 - 10.85m bgl. Fracture 10° undulating rough stained orangish brown.		
11.50 - 11.62	C		86 70 43					*11.10m bgl. 30° planar calcite vein (up to 1mm thick) with cross cutting 10° undulating calcite vein (up to 1mm thick).*		
11.90 - 12.00	C							*11.50 - 12.20m bgl. 50° fractures become 60°.*		
								12.00m Fracture 15° undulating smooth stained orangish brown.		
								12.10 - 12.25m bgl. 10° calcite vein (up to 3mm thick).		
12.50 - 12.62	C					(5.80)		*12.40 -12.50m bgl. Recovered non intact.*		
								12.65m bgl. Fracture 50° planar smooth with faint orangish brown staining.		
			92 47 30	NI 90 200				*12.90 -13.00m Recovered as soft dark grey gravelly Clay. Gravel is sub-angular fine to coarse calcareous mudstone. (Weathering Class E).*		
								13.10 - 15.00m bgl. Bedding indistinct.		
								13.15m bgl. 50° planar smooth calcite vein (up to 1mm thick).		
								13.20m bgl. 50° planar smooth calcite vein (up to 1mm thick).		
								13.50 - 13.90m bgl. Recovered non intact.		
								13.80 - 13.90m bgl. Recovered as soft dark grey gravelly Clay. Gravel is sub-angular fine to coarse calcareous mudstone. (Weathering Class E).		
			100 0 0					*13.85 - 14.10m bgl. Recovered non intact.*		
14.30 - 14.35	C			NI 30 80				*13.90 - 14.40m bgl. Very closely spaced 10, 30 and 50° fractures planar smooth with thin veneer of grey clay.*		
								14.70 - 14.90m bgl. Fracture 20° undulating smooth infilled with dark grey gravelly Clay.		
					7.02	15.00		End of Borehole at 15.00m		

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation				
Ref	Top (m)	Base (m)	Type	Dia (mm)
1	0.00	5.00	PLAIN	50
1	5.00	15.00	SLOTTED	50

Flush Information				
Top (m)	Base (m)	Flush Type	Return	Flush Colour

Borehole Diameter		Casing Diameter	
Depth (m)	Dia (mm)	Depth (m)	Dia (mm)
4.50	300	4.50	152
15.00	120		

Remarks:

1) Handpit excavated from ground level to 1.20m.
2) Groundwater strike not observed prior to adding water flush. Groundwater measured at 9.60m end of hole.
3) Plain 50mm HDPE standpipe installed from 0.00 - 5.00m bgl, with slotted from 5.00 - 15.00m blg.
4) BS5930 2020 Weathering Approach 4 adopted in logging.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Fracture spacing reported in mm as minimum, average and maximum values. TCR, SCR and RQD reported in %. NDP = No Determination Possible. Numbers in descriptions relate to bedding spacing (min/avg/max).

App. B.3

Windowless Sampler Borehole Logs

A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC		Borehole ID: WS01
	Contract Number: JFR2796	Start Date: 13/10/2023	End Date: 13/10/2023	Checked By: KD	Status: DRAFT — Sheet 1 of 1
Windowless Borehole Log	Easting: 192549.6	Northing: 202377.9	Ground Level: 22.29mOD	Plant Used: DART PREMIER	Logged By: PR/EL/GR — Scale: 1:40
Weather: Light rain, occasionally heavy.	Termination: SPT Refusal		SPT Hammer: EQU448 Energy Ratio: 78.66%		

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.30 - 0.50	B			22.09	0.20		Grass over soft brown slightly sandy CLAY, with frequent rootlets. [TOPSOIL]		
0.40	ES						Firm becoming stiff light brown locally yellowish brown slightly sandy slightly gravelly CLAY, with rare cobble content. Gravel is sub-angular fine to coarse mudstone. Cobbles are sub-angular mudstone (up to 150mm length). [AVON GROUP - WEATHERING CLASS E]		
		SPT(C) 1.20m, N=25 (3,3/5,5,7,8)					*1.20 - 1.65m bgl: No Recovery. SPT disturbance.*		
					(2.80)		*1.65 - 2.00m bgl: Reddish brown. Gravel is calcareous.*		
		SPT(C) 2.00m, N=16 (2,2/2,3,4,7)					*2.00 - 2.40m bgl. No Recovery. SPT disturbance.*		
2.70 - 2.80	D						*2.00 - 2.40m bgl. Reddish brown, with occasional sand and gravel sized pockets of soft yellowish brown silt. Gravel is calcareous.*		
		SPT(C) 3.00m, N=50 (5,7/10,13,15 ,12)		19.29	3.00		End of Borehole at 3.00m		

Start & End of Shift Observations					Installation				
Date	Time	Depth (m)	Casing (m)	Water (m)	Ref	Top (m)	Base (m)	Type	Diameter (mm)

Remarks:
1) Hand pit undertaken from ground level to 1.20m bgl
2) Hole backfilled with bentonite pellets on completion.
3) Perched groundwater encountered at 0.30m.
4) BS5930 2020 Weathering Approach 4 adopted in logging.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)
	87	1.20	2.00	63
	77	2.00	3.00	60

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
0.30			0		Perched Groundwater.

A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC		Borehole ID: WS02
	Contract Number: JFR2796	Start Date: 13/10/2023	End Date: 13/10/2023	Checked By: KD	Status: DRAFT — Sheet 1 of 1
Windowless Borehole Log	Easting: 192550.3	Northing: 202418.3	Ground Level: 22.22mOD	Plant Used: DART PREMIER	Logged By: PR/EL/GR — Scale: 1:40
Weather: Light rain, occasionally heavy.	Termination: SPT Refusal		SPT Hammer: EQU448 Energy Ratio: 78.66%		

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.30 0.30 - 0.50	ES B			22.02	0.20		Grass over soft brown slightly sandy CLAY, with frequent rootlets [MADE GROUND]	▼	
					(1.00)		Very dense grey slightly gravelly clayey fine to coarse SAND, with low cobble content. Gravel is sub-angular, fine to coarse limestone and mudstone. Cobbles are angular brick. (up to 100mm). [MADE GROUND] *0.30 m bgl: Perched groundwater observed.*		
		SPT(C) 1.20m, 50 (8,7/50 for 75mm)		21.02	1.20		End of Borehole at 1.20m		

1 2 3 4 5 6 7 8

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation				
Ref	Top (m)	Base (m)	Type	Diameter (mm)

Remarks:

1) Hand pit undertaken from ground level to 1.20m bgl
2) Hole backfilled with bentonite pellets on completion.
3) Perched groundwater encountered at 0.30m.
4) BS5930 2020 Weathering Approach 4 adopted in logging.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
0.30			0		Perched Groundwater.

RPS A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC			Borehole ID: WS03
	Contract Number: JFR2796	Start Date: 13/10/2023	End Date: 13/10/2023	Checked By: KD	Status: DRAFT	Sheet 1 of 1
Windowless Borehole Log	Easting: 192488.2	Northing: 202436.9	Ground Level: 22.20mOD	Plant Used: DART PREMIER	Logged By: PR/EL/GR	Scale: 1:40
Weather: Light rain, occasionally heavy.		Termination: SPT Refusal		SPT Hammer: EQU448 Energy Ratio: 78.66%		

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				22.00	0.20		Grass over soft brown slightly sandy CLAY, with frequent rootlets. [TOPSOIL]		
							Firm becoming stiff light brown locally yellowish brown slightly sandy slightly gravelly CLAY. Gravel is sub-angular, fine to coarse mudstone. [AVON GROUP - WEATHERING CLASS E]		
							0.50 m bgl: Perched groundwater observed.		
1.00 1.00 - 1.20	ES B	SPT(C) 1.20m, N=21 (4,5/6,5,5,5)			(1.80)				
							1.40 - 2.00m bgl: Reddish brown. Gravel is tabular.		
							1.65 - 1.75 mbgl: Local lenses of orangish brown silt.		
							1.70 - 2.00 mbgl: Locally reddish brown with pockets of cream orange and light grey mottled clay.		
		SPT(C) 2.00m, N=50 (4,6/10,13,13 ,14)		20.20	2.00		End of Borehole at 2.00m		

1 2 3 4 5 6 7 8

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation				
Ref	Top (m)	Base (m)	Type	Diameter (mm)

Remarks:

1) Hand pit undertaken from ground level to 1.20m bgl
2) Hole backfilled with bentonite pellets on completion.
3) Perched groundwater encountered at 0.50m.
4) BS5930 2020 Weathering Approach 4 adopted in logging.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)
	87	1.20	2.00	100

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
0.50			0		Perched Groundwater.

A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC		Borehole ID: WS04
	Contract Number: JFR2796	Start Date: 12/10/2023	End Date: 12/10/2023	Checked By: KD	Status: DRAFT	Sheet 1 of 1
Windowless Borehole Log	Easting: 192487.4	Northing: 202472.6	Ground Level: 21.81mOD	Plant Used: DART PREMIER	Logged By: PR/EL/GR	Scale: 1:40
Weather: Light rain, occasionally heavy.		Termination: Target Depth Reached		SPT Hammer: EQU448 Energy Ratio: 78.66%	

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				21.56	0.25		Grass over soft becoming firm light brown slightly sandy CLAY with frequent rootlets. [TOPSOIL]		
0.80 - 1.00	B				(1.30)		Firm becoming stiff light brown locally yellowish brown and reddish brown slightly gravelly CLAY, with low cobble content. Gravel is sub-angular fine to coarse low strength mudstone. Cobbles are subrounded mudstone (100mm). [AVON GROUP - WEATHERING CLASS E]		
		SPT(C) 1.20m, N=11 (3,3/3,3,2,3)					*1.30 - 1.40m bgl: Weak mudstone cobble.*		
				20.26	1.55		Firm to stiff light brown, orangish brown and greyish brown mottled gravelly CLAY. Gravel is angular, fine to coarse, lithorelicts of extremely weak reddish brown mudstone. [AVON GROUP - WEATHERING CLASS E]		
		SPT(C) 2.00m, N=17 (4,5/5,4,4,4)					*1.55 - 2.10m bgl: Brown, with rare fine gravel sized pockets of orange silt.*		
							2.10 - 2.50m bgl: Silt pockets absent.		
2.55 - 2.70	D						*2.55 - 2.70m bgl: Yellowish brown. Gravel is sandstone.*		
							2.70 - 5.00m bgl. Stiff becoming very stiff greyish brown, locally reddish brown.		
		SPT(C) 3.00m, N=28 (6,7/7,7,7,7)			(3.45)				
							3.60 - 3.65 m bgl: Weak mudstone cobble.		
		SPT(C) 4.00m, N=31 (4,5/6,7,8,10)					*4.00 - 4.45m bgl: No Recovery. SPT disturbance.*		
		SPT(C) 5.00m, N=23 (4,4/4,5,6,8)		16.81	5.00		End of Borehole at 5.00m		

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation					
Ref	Top (m)	Base (m)	Type	Diameter (mm)	

Remarks:

1) Hand pit undertaken from ground level to 1.20m bgl
2) Hole backfilled with bentonite pellets on completion.
3) Groundwater not encountered.
4) BS5930 2020 Weathering Approach 4 adopted in logging.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)
	87	1.20	2.00	100
	77	2.00	3.00	100
	67	3.00	4.00	85
	57	4.00	5.00	60

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC		Borehole ID: WS05
	Contract Number: JFR2796	Start Date: 13/10/2023	End Date: 13/10/2023	Checked By: KD	Status: DRAFT	Sheet 1 of 1
Windowless Borehole Log	Easting: 192511.7	Northing: 202479.5	Ground Level: 21.25mOD	Plant Used: DART PREMIER	Logged By: PR/EL/GR	Scale: 1:40
Weather: Light rain, occasionally heavy.		Termination: SPT Refusal		SPT Hammer: EQU448 Energy Ratio: 78.66%	

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				21.20	0.05		Poorly banded TARMACADAM [MADE GROUND]		
0.30 - 0.50	B			20.95	0.30		Grey slightly silty sandy GRAVEL. Gravel is sub-angular, fine to coarse limestone. [MADE GROUND]		
0.40	ES				(1.00)		Firm becoming stiff light brown locally yellowish brown slightly sandy slightly gravelly CLAY with rare pockets of soft white clayey silt. Gravel is sub-angular, fine to coarse mudstone. [MADE GROUND]		
		SPT(C) 1.20m, N=18 (4,5/4,4,5,5)		19.95	1.30		Stiff reddish brown, orangish brown and brown mottled slightly gravelly CLAY, with rare pockets of orangish brown and light grey silt. Gravel is reddish brown and dark grey sub-angular fine to coarse very weak lithorelicts of mudstone. [AVON GROUP - WEATHERING CLASS E]		
		SPT(C) 2.00m, N=22 (6,6/5,5,6,6)			(1.70)		*1.95 - 2.60m bgl: Yellowish brown and brown.* *2.00 - 2.05 mbgl: Band of very weak dark grey calcareous mudstone.*		
2.60	ES						*2.60 - 2.90m bgl: Yellowish brown and orangish brown.*		
		SPT(C) 3.00m, 50 (9,10/50 for 270mm)		18.25	3.00		*2.90 - 3.00m bgl: Reddish brown locally orangish brown.* End of Borehole at 3.00m		

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation					
Ref	Top (m)	Base (m)	Type	Diameter (mm)

Remarks:

1) Hand pit undertaken from ground level to 1.20m bgl
2) Hole backfilled with bentonite pellets on completion.
3) Groundwater not encountered.
4) BS5930 2020 Weathering Approach 4 adopted in logging.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)
	87	1.20	2.00	100
	77	2.00	3.00	100

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC		Borehole ID: WS06
	Contract Number: JFR2796	Start Date: 12/10/2023	End Date: 12/10/2023	Checked By: KD	Status: DRAFT
					Sheet 1 of 1
Windowless Borehole Log	Easting: 192528.0	Northing: 202492.4	Ground Level: 20.55mOD	Plant Used: DART PREMIER	Logged By: PR/EL/GR
					Scale: 1:40

Weather: Light rain, occasionally heavy. | Termination: SPT Refusal | SPT Hammer: EQU448 Energy Ratio: 78.66%

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				20.45	0.10		Grass over soft brown slightly sandy CLAY with frequent rootlets. [MADE GROUND]		
0.40 0.40 - 0.60	ES B				(0.50)		Firm light brown slightly sandy slightly gravelly clayey SILT. Gravel is sub-angular, fine to coarse siltstone and rare brick and clinker. [MADE GROUND]		
				19.95	0.60		Firm becoming stiff light brown locally yellowish brown and reddish brown slightly gravelly CLAY, with low cobble content. Gravel is sub-angular fine to coarse low strength mudstone. Cobbles are subrounded mudstone (up to 100mm). [AVON GROUP - WEATHERING CLASS E]		
		SPT(C) 1.20m, N=25 (3,5/5,7,7,6)			(1.40)		*1.45 - 1.60m bgl: Greyish brown and brown gravelly clay.*		
							1.60 - 1.95m bgl: Orangish brown and brown.		
		SPT(C) 2.00m, N=50 (7,10/10,13,12,15)		18.55	2.00		*1.95m bgl: Sub-angular tabular mudstone cobble.* End of Borehole at 2.00m		

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation				
Ref	Top (m)	Base (m)	Type	Diameter (mm)

Remarks:
1) Hand pit undertaken from ground level to 1.20m bgl
2) Hole backfilled with bentonite pellets on completion.
3) Groundwater not encountered.
4) BS5930 2020 Weathering Approach 4 adopted in logging.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)
	87	1.20	2.00	100

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC		Borehole ID: WS07
	Contract Number: JFR2796	Start Date: 12/10/2023	End Date: 12/10/2023	Checked By: KD	Status: DRAFT
					Sheet 1 of 1
Windowless Borehole Log	Easting: 192547.6	Northing: 202511.7	Ground Level: 19.42mOD	Plant Used: DART PREMIER	Logged By: PR/EL/GR
					Scale: 1:40

Weather: Light rain, occasionally heavy. | Termination: SPT Refusal | SPT Hammer: EQU448 Energy Ratio: 78.66%

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.20 - 0.30	B				(0.30)		Grass over soft becoming firm light brown slightly sandy CLAY with frequent rootlets. [TOPSOIL]		
				19.12	0.30		Firm becoming stiff light brown locally yellowish brown and reddish brown slightly gravelly CLAY, with low cobble content. Gravel is sub-angular fine to coarse extremely weak mudstone. Cobbles are subrounded mudstone (up to 100mm). [AVON GROUP - WEATHERING CLASS E]		
0.60 - 0.80	B								
		SPT(C) 1.20m, N=18 (4,4/4,4,4,6)			(2.30)				
							1.70 - 2.60m bgl: Greyish brown becoming yellowish brown, light grey and light brown.		
		SPT(C) 2.00m, N=17 (3,3/3,4,5,5)					*2.30 - 2.60 m bgl: Occasional pockets of light brown silt.*		
				16.82	2.60		Firm light yellowish brown becoming brown CLAY with rare lenses of light grey silt. Rare angular fine extremely weak mudstone lithorelicts. [AVON GROUP - WEATHERING CLASS E]		
					(0.40)				
		SPT(C) 3.00m, 50 (13,13/50 for 225mm)		16.42	3.00		*2.90m bgl: Dark grey calcareous mudstone cobble.* End of Borehole at 3.00m		

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation					
Ref	Top (m)	Base (m)	Type	Diameter (mm)	

Remarks:
1) Hand pit undertaken from ground level to 1.20m bgl
2) Hole backfilled with bentonite pellets on completion.
3) Groundwater not encountered.
4) BS5930 2020 Weathering Approach 4 adopted in logging.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)
	87	1.20	2.00	100
	77	2.00	3.00	100

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
1.20			0		

A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC			Borehole ID: WS08
	Contract Number: JFR2796	Start Date: 13/10/2023	End Date: 13/10/2023	Checked By: KD	Status: DRAFT	Sheet 1 of 1
Windowless Borehole Log	Easting: 192462.2	Northing: 202512.9	Ground Level: 19.69mOD	Plant Used: DART PREMIER	Logged By: PR/EL/GR	Scale: 1:40
Weather: Light rain, occasionally heavy.		Termination: SPT Refusal		SPT Hammer: EQU448 Energy Ratio: 78.66%		

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				19.49	0.20		Grass over soft brown slightly sandy CLAY with frequent rootlets. [TOPSOIL]		
0.60 - 0.80 0.70	B ES						Firm becoming stiff light brown locally yellowish brown slightly sandy slightly gravelly CLAY. Gravel is sub-angular fine to coarse mudstone. [AVON GROUP - WEATHERING CLASS E]		
							1.00m bgl: Yellowish brown and brown.		
		SPT(C) 1.20m, N=20 (3,4/4,5,5,6)							
					(2.80)		*1.50 - 1.70m bgl: Orangish brown, with rare pockets (up to 30mm) dark grey.*		
							1.80 - 2.00m bgl: Brown.		
		SPT(C) 2.00m, N=16 (4,4/4,3,5,4)					*2.00 - 2.45m bgl: No Recovery. SPT disturbance.*		
							2.70 - 3.00m bgl: Locally orangish brown.		
		SPT(C) 3.00m, N=50 (5,5/12,12,13 ,13)		16.69	3.00		End of Borehole at 3.00m		

Start & End of Shift Observations					Installation				
Date	Time	Depth (m)	Casing (m)	Water (m)	Ref	Top (m)	Base (m)	Type	Diameter (mm)

Remarks:
1) Hand pit undertaken from ground level to 1.20m bgl
2) Hole backfilled with bentonite pellets on completion.
3) Groundwater not encountered.
4) BS5930 2020 Weathering Approach 4 adopted in logging.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)
	87	1.20	2.00	100
	77	2.00	3.00	55

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC			Borehole ID: WS09
	Contract Number: JFR2796	Start Date: 12/10/2023	End Date: 12/10/2023	Checked By: KD	Status: DRAFT	Sheet 1 of 1
Windowless Borehole Log	Easting: 192543.0	Northing: 202540.4	Ground Level: 19.21mOD	Plant Used: DART PREMIER	Logged By: PR/EL/GR	Scale: 1:40
Weather: Light rain, occasionally heavy.		Termination: SPT Refusal		SPT Hammer: EQU448 Energy Ratio: 78.66%		

Samples & In Situ Testing				Strata Details				Groundwater	
Depths	Type/ Ref	SPT	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.20	ES				(0.30)		Grass over soft becoming firm light brown slightly sandy silty CLAY. [TOPSOIL]		
0.30 - 0.50	B			18.91	0.30		Firm becoming stiff light brown locally yellowish brown and reddish brown slightly gravelly silty CLAY, with low cobble content. Gravel is sub-angular fine to coarse extremely weak mudstone. Cobbles are sub-rounded mudstone (up to 100mm). [AVON GROUP - WEATHERING CLASS E]		
0.80 - 1.00	B								
		SPT(C) 1.20m, N=34 (3,5/7,8,10,9)					*1.40m bgl: Mudstone cobble. REcovered non intact due to SPT disturbance.*		
					(2.70)		*1.60 - 1.65m bgl: Rare pockets of orangish brown silt.*		
							1.70 - 2.00m bgl: Orangish brown and yellowish brown.		
		SPT(C) 2.00m, N=16 (2,2/3,4,4,5)					*2.00 - 2.20m bgl: No Recovery. SPT disturbance.*		
							2.20 - 2.80m bgl: brown and yellowish brown.		
							2.80 - 3.00m Dark grey and brown mottled grey.		
		SPT(C) 3.00m, N=50 (6,7/12,10,14 ,14)		16.21	3.00		End of Borehole at 3.00m		

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Installation					
Ref	Top (m)	Base (m)	Type	Diameter (mm)	

Remarks:

1) Hand pit undertaken from ground level to 1.20m bgl
2) Hole backfilled with bentonite pellets on completion.
3) Groundwater not encountered.
4) BS5930 2020 Weathering Approach 4 adopted in logging.

Windowless Sample Run Details				
Test Number	Diameter (mm)	Depth Top (m)	Depth Base (m)	Recovery (%)
	87	1.20	2.00	100
	77	2.00	3.00	80

Casing	
Depth (m)	Diameter (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

App. B.4

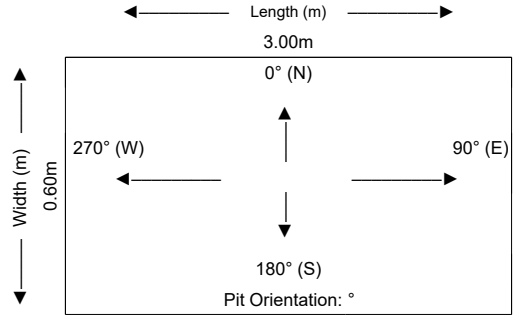
Trial Pit Logs

A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC			Trial Pit ID: TP01
	Contract Number: JFR2796	Start Date: 18/10/2023	End Date: 18/10/2023	Checked By: KD	Status: DRAFT	Sheet 1 of 1
Trial Pit Log	Easting: 192482.5	Northing: 202601.4	Ground Level: 18.98mOD	Plant Used: JCB 3CX	Logged By: PR	Scale: 1:33
Weather: Light rain, occasionally heavy.		Hole Termination: Hard Digging.		Stability: Stable		

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Type/Ref	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		
0.10	ES		18.78	0.20		Grass over soft brown slightly sandy silty CLAY, with frequent rootlets. [MADE GROUND]		
0.50 - 0.70	B			(1.40)		Firm becoming stiff yellowish brown locally light brown and orangish brown sandy gravelly silty CLAY, with rare wood fragments (up to 100mm). Gravel is sub-angular and angular fine to coarse mudstone and limestone. [MADE GROUND]		
0.60	ES					*1.10 - 1.20m bgl. Northern area of pit coloured reddish brown, with increased sand content.*		
						1.30m bgl. Cable sand exposed in southern end of trial pit. Pit moved north and excavation continued.		
1.50	ES		17.38	1.60		Stiff friable grey becoming yellowish brown slightly gravelly silty CLAY, with a low cobble content. Gravel is sub-angular tabular fine to coarse mudstone. Cobbles are sub-angular tabular mudstone (up to 90mm). [AVON GROUP - WEATHERING CLASS E]		
1.70 - 1.90	B					*1.80 - 3.10m bgl. Yellowish brown.*		
1.80	D	HV 1.80m, 180, 169, 169, 146 kPa		(1.50)				
2.90 - 3.10	B							
3.00	D	HV 3.00m, 154, 169, 177 kPa	15.88	3.10		End of Trial Pit at 3.10m		

Dimensions:

Final Depth: 3.10m



General Remarks:

1) Trial pit terminated at 3.10m due to hard digging. A bladed 0.60m bucket was used.
2) Backfilled with arisings on completion and topsoil reinstated.
3) Groundwater not encountered.
4) BS5930 2020 Weathering Approach 4 adopted in logging.
5) Hand shear vanes undertaken in all suitable material. Depths with no recorded results, meant material was not suitable to complete the test.

Water Strikes	
Strike (m)	Remarks

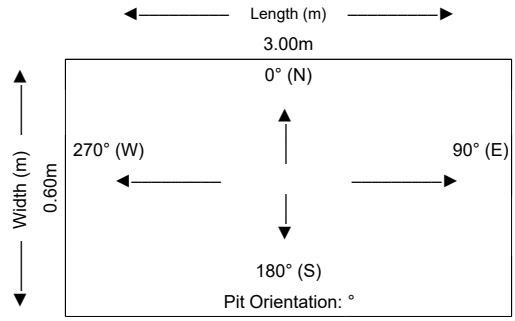
A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC			Trial Pit ID: TP02
	Contract Number: JFR2796	Start Date: 19/10/2023	End Date: 19/10/2023	Checked By: KD	Status: DRAFT	Sheet 1 of 1
Trial Pit Log	Easting: 192443.6	Northing: 202575.8	Ground Level: 19.17mOD	Plant Used: JCB 3CX	Logged By: PR	Scale: 1:33
Weather: Light rain, occasionally heavy.		Hole Termination: At Soakaway Test Depth.		Stability: Stable		

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Type/Ref	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		
0.20 - 0.40	B		18.97	0.20		Grass over soft brown slightly sandy silty CLAY, with frequent rootlets. [MADE GROUND]		
0.30	ES		18.77	0.40		Firm orangish brown locally yellowish brown and brown sandy gravelly silty CLAY, with frequent pockets (up to 100mm diam) of silty fine to coarse sand. Gravel is sub-angular fine to coarse mudstone, rarely limestone and brick. [MADE GROUND]		
						Firm becoming stiff friable yellowish brown locally orangish brown and brown sandy gravelly silty CLAY. Gravel is sub-angular extremely weak mudstone. [AVON GROUP - WEATHERING CLASS E]		
						1.10 - 1.20m bgl. Grey locally yellowish brown and orangish brown.		
						1.20 - 1.50m bgl. Reduced sand content.		
1.30	D	HV 1.30m, 162, 200, 200, 200 kPa						
1.60 - 1.70	B			(2.50)				
2.70	D							
2.70 - 2.90	B		16.27	2.90		End of Trial Pit at 2.90m		

1 2 3 4 5

Dimensions:

Final Depth: 2.90m



General Remarks:

1) Trial pit terminated at 2.90m to allow for soakaway test. A bladed 0.60m bucket was used.
2) Backfilled with arisings on completion and topsoil reinstated.
3) Groundwater not encountered.
4) BS5930 2020 Weathering Approach 4 adopted in logging.
5) Hand shear vanes undertaken in all suitable material. Depths with no recorded results, meant material was not suitable to complete the test.
6) Soakaway carried out in accordance with BRE DG 365 between 1.80 and 2.08m.

Water Strikes	
Strike (m)	Remarks

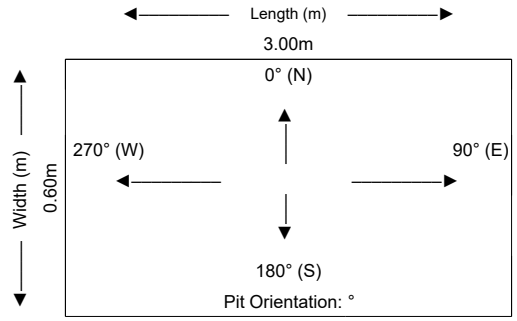
A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC			Trial Pit ID: TP03
	Contract Number: JFR2796	Start Date: 18/10/2023	End Date: 18/10/2023	Checked By: KD	Status: DRAFT	Sheet 1 of 1
Trial Pit Log	Easting: 192499.2	Northing: 202576.1	Ground Level: 19.01mOD	Plant Used: JCB 3CX	Logged By: PR	Scale: 1:33
Weather: Light rain, occasionally heavy.		Hole Termination: Hard Digging.		Stability: Light rain, occasionally heavy.		

Samples & In Situ Testing			Strata Details					
Depths	Type/Ref	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water	Backfill
			18.81	0.20		Grass over soft brown slightly sandy silty CLAY, with frequent rootlets. [MADE GROUND]		
0.40 - 0.60	B					Firm becoming stiff yellowish brown locally light brown and orangish brown slightly sandy slightly gravelly silty CLAY, with a low cobble content and rare wood fragments (up to 300mm). Gravel is sub-angular and angular fine to coarse mudstone, limestone and brick. Cobbles are angular brick (up to 150mm). [MADE GROUND]		
0.50	ES			(0.80)		*0.60 - 1.00m bgl. Central area of pit coloured reddish brown, with increased sand content.*		
			18.01	1.00		*0.60m bgl. Cable sand encountered, move trench east and continue excavation.*		
1.20	ES					Stiff yellowish brown locally orangish brown and grey slightly gravelly silty CLAY. Gravel is sub-angular tabular fine to coarse mudstone. [AVON GROUP - WEATHERING CLASS E]		
1.50 - 1.70	B							
1.60	D							
2.00 - 2.20	B					*1.90 - 3.20m bgl. Grey, locally yellowish brown with rare rootlets and a faint organic odour.*		
				(2.20)				
2.80	D	HV 2.80m, 169, 154, 154 kPa						
			15.81	3.20		End of Trial Pit at 3.20m		

1 2 3 4 5

Dimensions:

Final Depth: 3.20m



General Remarks:

1) Trial pit terminated at 3.20m due to hard digging. A bladed 0.60m bucket was used.
2) Backfilled with arisings on completion and topsoil reinstated.
3) Groundwater not encountered.
4) BS5930 2020 Weathering Approach 4 adopted in logging.
5) Hand shear vanes undertaken in all suitable material. Depths with no recorded results, meant material was not suitable to complete the test.

Water Strikes	
Strike (m)	Remarks

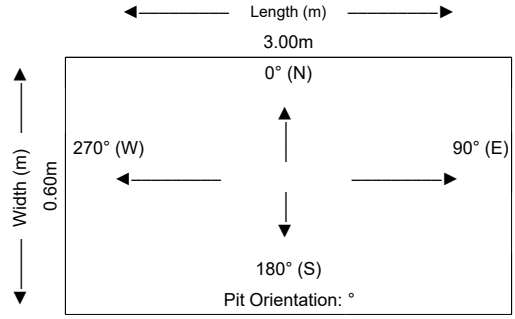
A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC			Trial Pit ID: TP04
	Contract Number: JFR2796	Start Date: 17/10/2023	End Date: 17/10/2023	Checked By: KD	Status: DRAFT	Sheet 1 of 1
Trial Pit Log	Easting: 192473.1	Northing: 202525.5	Ground Level: 19.50mOD	Plant Used: JCB 3CX	Logged By: PR	Scale: 1:33
Weather: Light rain, occasionally heavy.		Hole Termination: Hard Digging.		Stability: Stable		

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Type/Ref	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.40)		Grass over soft brown slightly sandy silty CLAY, with frequent rootlets. [TOPSOIL]		
0.20 - 0.40	B							
0.30	D		19.10	0.40		Firm becoming stiff light brown mottled and grey slightly gravelly silty CLAY, with a low cobble content. Gravel is sub-angular tabular fine to coarse mudstone. Cobbles are sub-angular tabular mudstone (up to 190mm). [AVON GROUP - WEATHERING CLASS E]		
0.85	D					*0.80 - 0.90m bgl. Band of stiff reddish brown slightly sandy slightly gravelly silty Clay.*		
				(1.90)				
						1.70 - 1.80m bgl. Band of stiff reddish brown slightly sandy slightly gravelly silty Clay.		
1.90 - 2.10	B					*1.90 - 2.30m bgl. Friable.*		
1.95	D					*2.00m bgl. Seepage.*		
			17.20	2.30		End of Trial Pit at 2.30m		

1 2 3 4 5

Dimensions:

Final Depth: 2.30m



General Remarks:

1) Trial pit terminated at 2.30m due to hard digging. A bladed 0.60m bucket was used.
2) Backfilled with arisings on completion and topsoil reinstated.
3) Groundwater seepage encountered at 2.00m.
4) BS5930 2020 Weathering Approach 4 adopted in logging.
5) No hand shear vanes undertaken, material was not suitable to complete the test.

Water Strikes	
Strike (m)	Remarks
2.00	Groundwater Seepage.

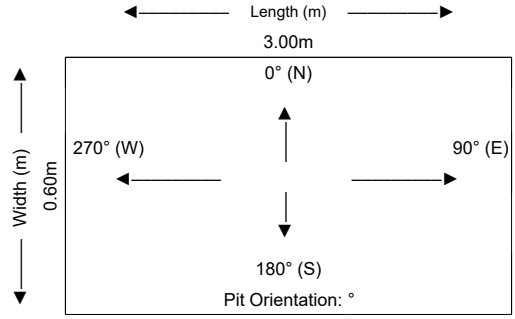
A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC			Trial Pit ID: TP05
	Contract Number: JFR2796	Start Date: 16/10/2023	End Date: 16/10/2023	Checked By: KD	Status: DRAFT	Sheet 1 of 1
Trial Pit Log	Easting: 192547.1	Northing: 202526.1	Ground Level: 19.41mOD	Plant Used: JCB 3CX	Logged By: EL	Scale: 1:33
Weather: Light rain, occasionally heavy.		Hole Termination: Hard Digging.		Stability: Stable		

Samples & In Situ Testing			Strata Details					
Depths	Type/Ref	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water	Backfill
0.20	ES			(0.40)		Grass over soft brown slightly sandy silty CLAY, with frequent rootlets [TOPSOIL]		
						0.40 - 0.40m bgl. Rootlets absent.		
			19.01	0.40				
0.50	ES					Firm mottled orangish brown, yellowish brown sandy gravelly silty CLAY. Gravel is sub-angular fine to coarse mudstone. [AVON GROUP - WEATHERING CLASS E]		
0.70	D			(0.40)				
			18.61	0.80		Stiff brownish grey locally orangish brown slightly gravelly silty CLAY, with a low cobble content. Gravel is sub-angular fine to coarse mudstone. Cobbles are sub-angular mudstone (up to 200mm). [AVON GROUP - WEATHERING CLASS E]		
						0.80 - 1.00m bgl. Yellowish brown.		
						1.40 - 1.50m bgl. Grey.		
				(2.40)				
2.80	D	HV 2.80m, 105, 111, 114 kPa						
			16.21	3.20		End of Trial Pit at 3.20m		

1
2
3
4
5

Dimensions:

Final Depth: 3.20m



General Remarks:

1) Trial pit terminated at 3.20m due to hard digging. A bladed 0.60m bucket was used.
2) Backfilled with arisings on completion and topsoil reinstated.
3) Groundwater seepage encountered at 3.20m.
4) BS5930 2020 Weathering Approach 4 adopted in logging.
5) Hand shear vanes undertaken in all suitable material. Depths with no recorded results, meant material was not suitable to complete the test.

Water Strikes	
Strike (m)	Remarks
3.20	Groundwater Seepage.

A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC		Trial Pit ID: TP06
	Contract Number: JFR2796	Start Date: 20/10/2023	End Date: 20/10/2023	Checked By: KD	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting: 192492.6	Northing: 202485.7	Ground Level: 20.87mOD	Plant Used: JCB 3CX	Logged By: PR
					Scale: 1:33

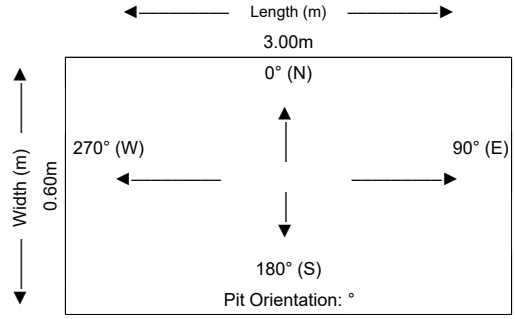
Weather: Light rain, occasionally heavy. | Hole Termination: Presence of Services. | Stability: Stable

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Type/Ref	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		
0.10	ES		20.67	0.20		Grass over soft brown slightly sandy silty CLAY, with frequent rootlets. [MADE GROUND]		
0.40 - 0.60	B			(0.50)		Greyish brown slightly gravelly sandy SILT, with a low cobble content. Gravel is sub-angular fine to coarse mudstone and limestone. Cobbles are sub-angular concrete. [MADE GROUND]		
0.60	ES		20.17	0.70		*0.20 - 0.70m bgl. In sittu concrete structure in south end of pit.* *0.60m bgl. Plastic pipe (100mm) uncovered running E-W across pit.*		
			20.07	0.80		Firm light brown locally orangish brown and brown slightly sandy slightly gravelly silty CLAY. Gravel is angular fine to coarse mudstone. [MADE GROUND]		
						End of Trial Pit at 0.80m		

1 2 3 4 5

Dimensions:

Final Depth: 0.80m



General Remarks:

1) Trial pit terminated at 0.80m due to presence of services, likely to be redundant. No space to move pit. A bladed 0.60m bucket was used.
2) Backfilled with arisings on completion and topsoil reinstated.
3) Groundwater not encountered.
4) BS5930 2020 Weathering Approach 4 adopted in logging.
5) Hand shear vanes undertaken in all suitable material. Depths with no recorded results, meant material was not suitable to complete the test.
6) Material encountered in TP06 was very similar in composition to that encountered in engineered slope to the south of pit.

Water Strikes	
Strike (m)	Remarks

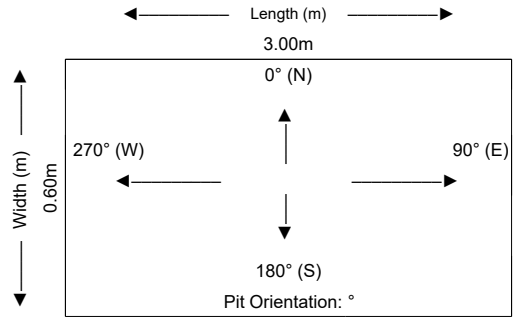
A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC			Trial Pit ID: TP07
	Contract Number: JFR2796	Start Date: 16/10/2023	End Date: 16/10/2023	Checked By: KD	Status: DRAFT	Sheet 1 of 1
Trial Pit Log	Easting: 192546.8	Northing: 202477.2	Ground Level: 20.43mOD	Plant Used: JCB 3CX	Logged By: PR	Scale: 1:33
Weather: Light rain, occasionally heavy.		Hole Termination: Presence of Services.		Stability: Stable		

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Type/Ref	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		
			20.38	0.05		Grey slightly sandy silty sub-angular and sub-rounded fine to coarse limestone GRAVEL, with a high cobble and boulder content. Cobbles and boulders are sub-angular and sub-rounded limestone (up to 270m length). [MADE GROUND]		
0.20	ES		20.18	0.25				
0.50	ES			(0.55)		Grey, locally brown slightly sandy silty sub-angular and sub-rounded fine to coarse limestone GRAVEL, with a medium cobble and low boulder content. Cobbles and boulders are sub-angular and sub-rounded limestone (up to 220mm length). [MADE GROUND]		
0.50 - 0.70	B							
0.60	ES							
			19.63	0.80				
0.90	D		19.43	1.00		Firm becoming stiff yellowish brown, locally brown and grey sandy CLAY, with a low cobble content. Gravel is sub-angular and sub-rounded fine to coarse mudstone with rare brick. [MADE GROUND]		
						Firm grey, yellowish brown, orangish brown and light brown slightly gravelly sandy CLAY. Gravel is sub-angular fine to coarse mudstone. Strata exposed at west end of trial pit only. [AVON GROUP - WEATHERING CLASS E]		
						0.80m bgl. Several services dissecting pit, unable to excavate along whole length of trial pit.		
						End of Trial Pit at 1.00m		

1 2 3 4 5

Dimensions:

Final Depth: 1.00m



General Remarks:

1) Trial pit terminated at 1.00m due to presence of services, likely to be redundant. A bladed 0.60m bucket was used.
2) Backfilled with arisings on completion and topsoil reinstated.
3) Groundwater not encountered.
4) BS5930 2020 Weathering Approach 4 adopted in logging.
5) Hand shear vanes undertaken in all suitable material. Depths with no recorded results, meant material was not suitable to complete the test.

Water Strikes	
Strike (m)	Remarks

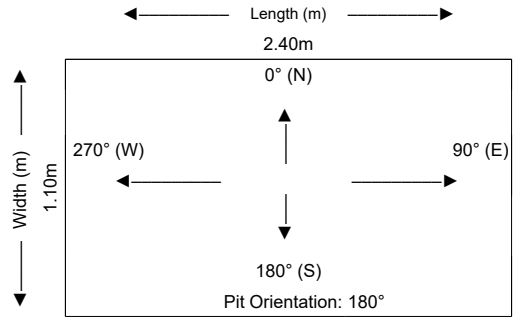
RPS A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC			Trial Pit ID: TP08
	Contract Number: JFR2796	Start Date: 18/10/2023	End Date: 18/10/2023	Checked By: KD	Status: DRAFT	Sheet 1 of 1
Trial Pit Log	Easting: 192523.8	Northing: 202435.9	Ground Level: 22.32mOD	Plant Used: JCB 3CX	Logged By: PR	Scale: 1:33
Weather: Light rain, occasionally heavy.	Hole Termination: Presence of Structures and Services.		Stability: Stable			

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Type/Ref	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		
0.10	ES		22.12	0.20		Soft brown slightly sandy silty CLAY, with frequent rootlets. [MADE GROUND]		
0.25	ES		22.02	0.30		Firm yellowish brown locally brown and orangish brown slightly gravelly silty CLAY. Gravel is sub-angular fine to coarse mudstone. [MADE GROUND]		
						End of Trial Pit at 0.30m		

1 2 3 4 5

Dimensions:

Final Depth: 0.30m



General Remarks:

1) Trial pit terminated at 0.30m due to buried structures and services, likely to be redundant. No room to expand or move pit due to ecological stipulations. A bladed 0.60m bucket was used.
2) Backfilled with arisings on completion and topsoil reinstated.
3) Groundwater not encountered.
4) Brick wall encountered in north west corner of pit, with sand running E-W across pit (suggesting buried service). Tarmac surface encountered along southern short wall of pit.
5) Hand shear vanes undertaken in all suitable material. Depths with no recorded results, meant material was not suitable to complete the test.

Water Strikes	
Strike (m)	Remarks

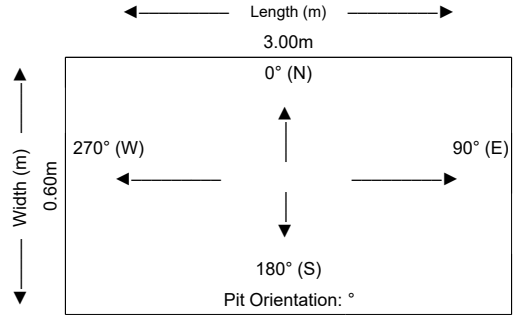
A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC			Trial Pit ID: TP09
	Contract Number: JFR2796	Start Date: 17/10/2023	End Date: 17/10/2023	Checked By: KD	Status: DRAFT	Sheet 1 of 1
Trial Pit Log	Easting: 192471.0	Northing: 202427.7	Ground Level: 22.45mOD	Plant Used: JCB 3CX	Logged By: PR	Scale: 1:33
Weather: Light rain, occasionally heavy.		Hole Termination: Sidewall Instability		Stability: Unstable 0.90 - 1.50m.		

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Type/Ref	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES		22.15	(0.30) 0.30		Grass over soft brown slightly sandy silty CLAY, with frequent rootlets. [TOPSOIL]		
0.40 - 0.60	B					Firm becoming stiff yellowish brown locally orangish brown and brown slightly sandy slightly gravelly silty CLAY. Gravel is sub-angular tabular fine to coarse mudstone. [AVON GROUP - WEATHERING CLASS E]		
0.50	ES			(1.10)		*0.90 - 1.50m bgl Sidewall instability in southern wall.*		
						1.30 - 1.40m bgl. Band of light brown slightly gravelly clayey sand. Groundwater water seepage.		
			21.05	1.40		Stiff light brown locally yellowish brown, orangish brown and grey slightly gravelly silty CLAY, with close to medium spaced thin beds of slightly gravelly clayey sand. Gravel is angular fine to coarse mudstone. [AVON GROUP - WEATHERING CLASS E]		
1.60	D							
1.60 - 1.80	B	HV 1.70m, 116, 169, 162, 123 kPa		(1.30)				
		HV 2.50m, 146, 182, 185 kPa				*2.60m bgl. Groundwater seepage.*		
			19.75	2.70		End of Trial Pit at 2.70m		

1 2 3 4 5

Dimensions:

Final Depth: 2.70m



General Remarks:

1) Trial pit terminated at 2.70m due to sidewall instability. A bladed 0.60m bucket was used.
2) Backfilled with arisings on completion and topsoil reinstated.
3) Groundwater seepage encountered at 1.30 and 2.60m.
4) BS5930 2020 Weathering Approach 4 adopted in logging.
5) Hand shear vanes undertaken in all suitable material. Depths with no recorded results, meant material was not suitable to complete the test.

Water Strikes	
Strike (m)	Remarks
2.60	Groundwater Seepage.

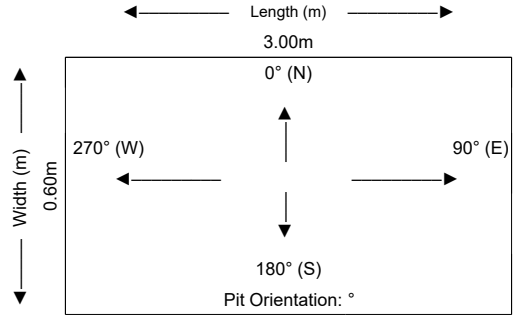
A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC			Trial Pit ID: TP10
	Contract Number: JFR2796	Start Date: 17/10/2023	End Date: 17/10/2023	Checked By: KD	Status: DRAFT	Sheet 1 of 1
Trial Pit Log	Easting: 192575.7	Northing: 202432.4	Ground Level: 21.52mOD	Plant Used: JCB 3CX	Logged By: PR	Scale: 1:33
Weather: Light rain, occasionally heavy.		Hole Termination: Hard Digging.		Stability: Stable		

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Type/Ref	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.40)		Grass over soft brown slightly sandy silty CLAY, with frequent rootlets. [MADE GROUND]		
0.50	ES		21.12	0.40		Stiff grey locally yellowish brown and greyish brown slightly gravelly silty CLAY. Gravel is sub-angular fine to coarse mudstone. Likely to be reworked natural material. [MADE GROUND]		
1.50 - 1.70	B	HV 1.60m, 162, 169, 169 kPa	20.92	0.60		Stiff light brown locally yellowish brown, orangish brown and grey sandy gravelly silty CLAY, with a low cobble and boulder content. Gravel is sub-angular fine to coarse mudstone. Cobbles and boulders are sub-angular fine to coarse mudstone (up to 250mm). [AVON GROUP - WEATHERING CLASS E]		
1.95	D			(2.00)		*1.90 - 2.00m bgl. Stiff reddish brown slightly gravelly friable silty Clay.*		
2.50	D		18.92	2.60		End of Trial Pit at 2.60m		

1 2 3 4 5

Dimensions:

Final Depth: 2.60m



General Remarks:

1) Trial pit terminated at 2.60m due to hard digging. A bladed 0.60m bucket was used.
2) Backfilled with arisings on completion and topsoil reinstated.
3) Groundwater not encountered.
4) BS5930 2020 Weathering Approach 4 adopted in logging.
5) Hand shear vanes undertaken in all suitable material. Depths with no recorded results, meant material was not suitable to complete the test.

Water Strikes	
Strike (m)	Remarks

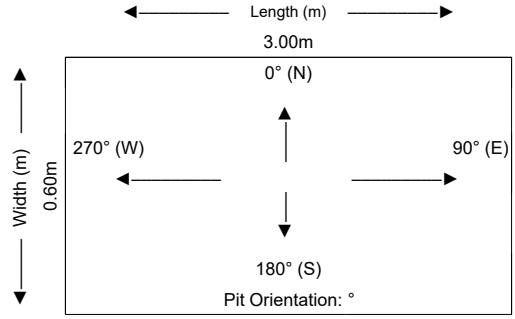
A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC			Trial Pit ID: TP11
	Contract Number: JFR2796	Start Date: 19/10/2023	End Date: 19/10/2023	Checked By: KD	Status: DRAFT	Sheet 1 of 1
Trial Pit Log	Easting: 192578.2	Northing: 202387.3	Ground Level: 21.80mOD	Plant Used: JCB 3CX	Logged By: PR	Scale: 1:33
Weather: Light rain, occasionally heavy.		Hole Termination: At Soakaway Test Depth.		Stability: Stable		

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Type/Ref	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES		21.55	0.25		Soft light brown slightly sandy slightly gravelly silty CLAY, with frequent rootlets. Gravel is sub-angular and angular fine and medium mudstone and rare angular medium brick fragments. [MADE GROUND]		
0.60 - 0.80	B			(0.85)		Yellowish brown, locally brown, orangish brown and grey wilty clayey sandy sub-angular and angular fine to coarse mudstone, rarely brick. GRAVEL, with a low cobble content and rare wood (up to 100mm diam). Cobbles are sub-rounded mudstone. [MADE GROUND]		
0.70	ES					*1.00m bgl. Pocket (600x30mm) of clayey sand in eastern end of pit.*		
1.20	D		20.70	1.10		Stiff yellowish brown locally grey and orangish brown slightly gravelly silty CLAY, with rare pockets (up to 200mm) of clayey sand. Gravel is sub-angular and sub-rounded tabular fine to coarse mudstone. [AVON GROUP - WEATHERING CLASS E]		
1.20 - 1.40	B			(1.40)				
2.20	D	HV 2.20m, 169, 154, 169 kPa						
			19.30	2.50		End of Trial Pit at 2.50m		

1 2 3 4 5

Dimensions:

Final Depth: 2.50m



General Remarks:

1) Trial pit terminated at 2.50m to allow for soakaway. A bladed 0.60m bucket was used.
2) Backfilled with arisings on completion and topsoil reinstated.
3) Groundwater not encountered.
4) BS5930 2020 Weathering Approach 4 adopted in logging.
5) Hand shear vanes undertaken in all suitable material. Depths with no recorded results, meant material was not suitable to complete the test.
6) Soakaway carried out in accordance with BRE DG 365 between 1.50 and 1.41m.

Water Strikes	
Strike (m)	Remarks
2.50	

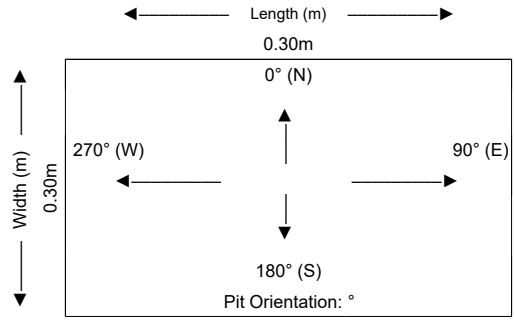
RPS A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC		Trial Pit ID: HP01
	Contract Number: JFR2796	Start Date: 17/10/2023	End Date: 17/10/2023	Checked By: KD	Status: DRAFT — Sheet 1 of 1
Trial Pit Log	Easting: 192690.4	Northing: 202615.2	Ground Level: 6.72mOD	Plant Used: Hand Digging Tools	Logged By: EL — Scale: 1:33
Weather: Light rain, occasionally heavy.	Hole Termination: Target Depth Reached.		Stability: Stable		

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Type/Ref	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.50)		Grass over soft brown slightly sandy silty CLAY with rare rootlets. [TOPSOIL]		
0.50	ES		6.22	0.50		Firm dark grey slightly silty CLAY. [BLACK ROCK SUBGROUP AND GULLY OOLITE FORMATION - WEATHERING CLASS E]		
0.80	ES			(0.40)		*0.75 - 0.90 m bgl: Becoming gravelly with occasional cobbles. Gravel is subangular, fine to coarse mudstone.*		
1.00 - 1.10	B		5.82	0.90		Soft to firm orangish brown, yellowish brown, reddish brown and white mottled CLAY with rare sub-angular, fine to coarse mudstone gravel. [BLACK ROCK SUBGROUP AND GULLY OOLITE FORMATION - WEATHERING CLASS E]		
			5.62	1.10		Soft to firm dark grey locally light grey slightly gravelly CLAY. Gravel is angular and sub-angular, fine to coarse mudstone and siltstone. [BLACK ROCK SUBGROUP AND GULLY OOLITE FORMATION - WEATHERING CLASS E]		
			5.52	1.20		End of Trial Pit at 1.20m		

1 2 3 4 5

Dimensions:

Final Depth: 1.20m



General Remarks:

1) Hand excavated pit to 1.20 m bgl.
2) No groundwater encountered.
3) Groundwater not encountered.
4) BS5930 2020 Weathering Approach 4 adopted in logging.

Water Strikes	
Strike (m)	Remarks

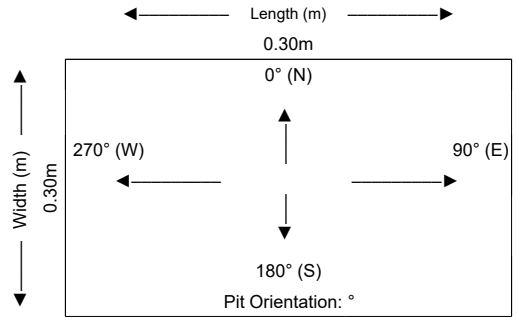
RPS A TETRA TECH COMPANY	Contract Name: Pembroke (Electrolyser) Investigation		Client: RWE Generation UK PLC		Trial Pit ID: HP02
	Contract Number: JFR2796	Start Date: 17/10/2023	End Date: 17/10/2023	Checked By: KD	Status: DRAFT
					Sheet 1 of 1
Trial Pit Log	Easting: 192670.5	Northing: 202583.1	Ground Level: 6.62mOD	Plant Used: HAnd Digging Tools	Logged By: EL
					Scale: 1:33
Weather: Light rain, occasionally heavy.		Hole Termination: Target depth reached.		Stability: Stable	

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Type/Ref	Testing	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		
0.20	ES			(0.40)		Grass over soft brown silty CLAY with frequent rootlets. [TOPSOIL]		
			6.22	0.40		*0.30 - 0.40 m bgl: No rootlets recorded.*		
0.60	ES		6.02	0.60		Soft to locally firm brown gravelly silty CLAY with rare sub-angular cobbles. Gravel is sub-angular, fine to coarse siltstone and mudstone. [BLACK ROCK SUBGROUP AND GULLY OOLITE FORMATION - WEATHERING CLASS E		
1.00 - 1.10	B			(0.60)				
			5.42	1.20		Soft and locally firm yellowish brown slightly gravelly CLAY. Gravel is angular and sub-angular, fine to coarse mudstone and siltstone. [BLACK ROCK SUBGROUP AND GULLY OOLITE FORMATION - WEATHERING CLASS E		
						End of Trial Pit at 1.20m		

1 2 3 4 5

Dimensions:

Final Depth: 1.20m



General Remarks:

1) Hand excavated pit to 1.20 m bgl.
2) No groundwater encountered.
3) Groundwater not encountered.
4) BS5930 2020 Weathering Approach 4 adopted in logging.

Water Strikes	
Strike (m)	Remarks

Appendix C

Soakaway Result Sheets

Calculation Sheet

DETERMINATION OF SOIL INFILTRATION RATE								Office	
Technical Guidance & Reference: BRE DG 365 Revised 2016 Soakaway Design								CARDIFF	
Project Title	Pembroke (Electrolyser) Investigation								
Project No	JFR2796	By	PR	Checked	KD	Date			

Test Details

Trial Pit :	TP02
Test No :	1
Date of Test :	19/10/2023

Permeable Strata

Depth to Top :	0.40	m
Depth to Base :	2.90	m
Depth to GW :		m

Trial Pit Details

Length of Pit :	1.70	m
Width of Pit :	0.60	m
Base of Pit :	2.90	m

Test Conditions

Depth of water at start	=	1.80	m bgl
Effective storage depth	=	1.10	m
Gravel Backfill	=	No	
Depth to water 75% full	=	2.08	m bgl
Depth to water 25% full	=	2.63	m bgl
Volume 75% to 25% depth, V_{p75-25}	=	0.56	m³
Mean internal surface area, a_{s50}	=	2.25	m²

Soil Infiltration Rate - by extrapolation

Time 75% full, t_{p75}	=	174.7	min
Time 25% full, t_{p25}	=	761.3	min
Time for outflow, t_{p75-25}	=	586.7	min

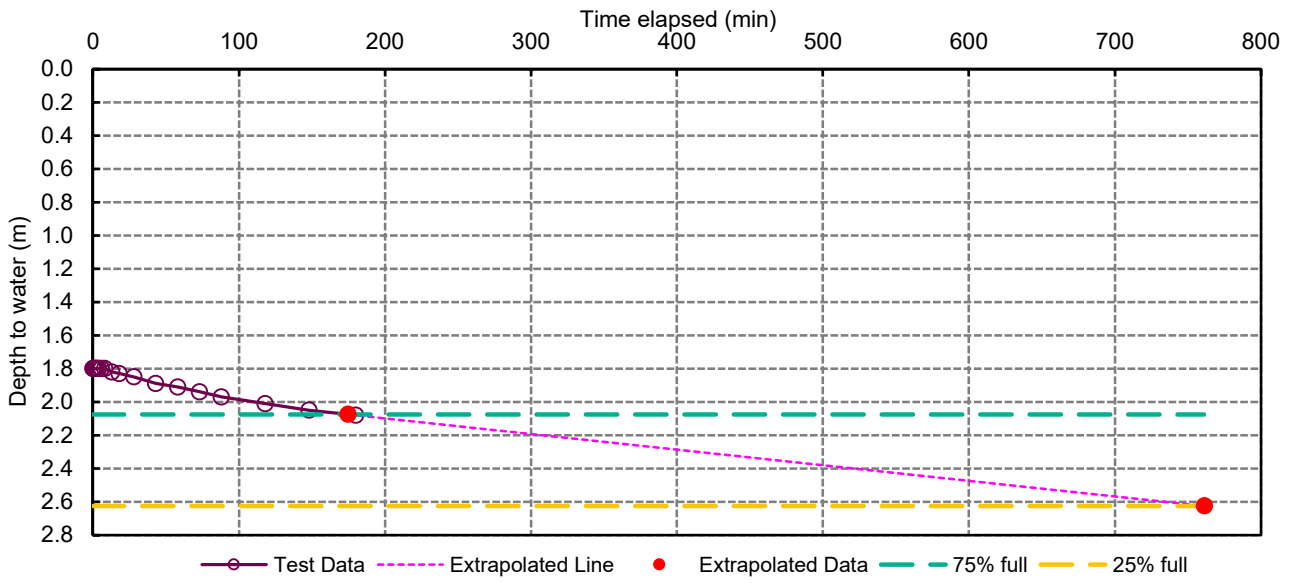
Soil Infiltration Rate = 7.07E-06 m/s

Test Data

Elapsed Time (mins)	Depth to Water (m)
0	1.80
0.5	1.80
1	1.80
2	1.80
3	1.80
4	1.80
6	1.80
8	1.80
13	1.82
18	1.83
28	1.85
43	1.89
58	1.91
73	1.94
88	1.97
118	2.01
148	2.05
180	2.08

Comments

During testing, infiltration reached the 75% depth line therefore an extrapolated Infiltration rate has been calculated. However, it is unlikely that infiltration would follow this trend and this value should be used with caution.



Calculation Sheet

DETERMINATION OF SOIL INFILTRATION RATE

Technical Guidance & Reference: BRE DG 365 Revised 2016 Soakaway Design

Office: CARDIFF

Project Title	Pembroke (Electrolyser) Investigation						
Project No	JFR2796	By	PR	Checked	KD	Date	

Test Details

Trial Pit :	TP11
Test No :	1
Date of Test :	19/10/2023

Permeable Strata

Depth to Top :	1.10	m
Depth to Base :	2.90	m
Depth to GW :		m

Trial Pit Details

Length of Pit :	1.90	m
Width of Pit :	0.60	m
Base of Pit :	2.90	m

Test Conditions

Depth of water at start	=	1.41	m bgl
Effective storage depth	=	1.49	m
Gravel Backfill	=	No	
Depth to water 75% full	=	1.78	m bgl
Depth to water 25% full	=	2.53	m bgl
Volume 75% to 25% depth, V_{p75-25}	=	0.85	m³
Mean internal surface area, a_{s50}	=	3.67	m²

Soil Infiltration Rate - by extrapolation

Time 75% full, t_{p75}	=	N/A	min
Time 25% full, t_{p25}	=	N/A	min
Time for outflow, t_{p75-25}	=	N/A	min

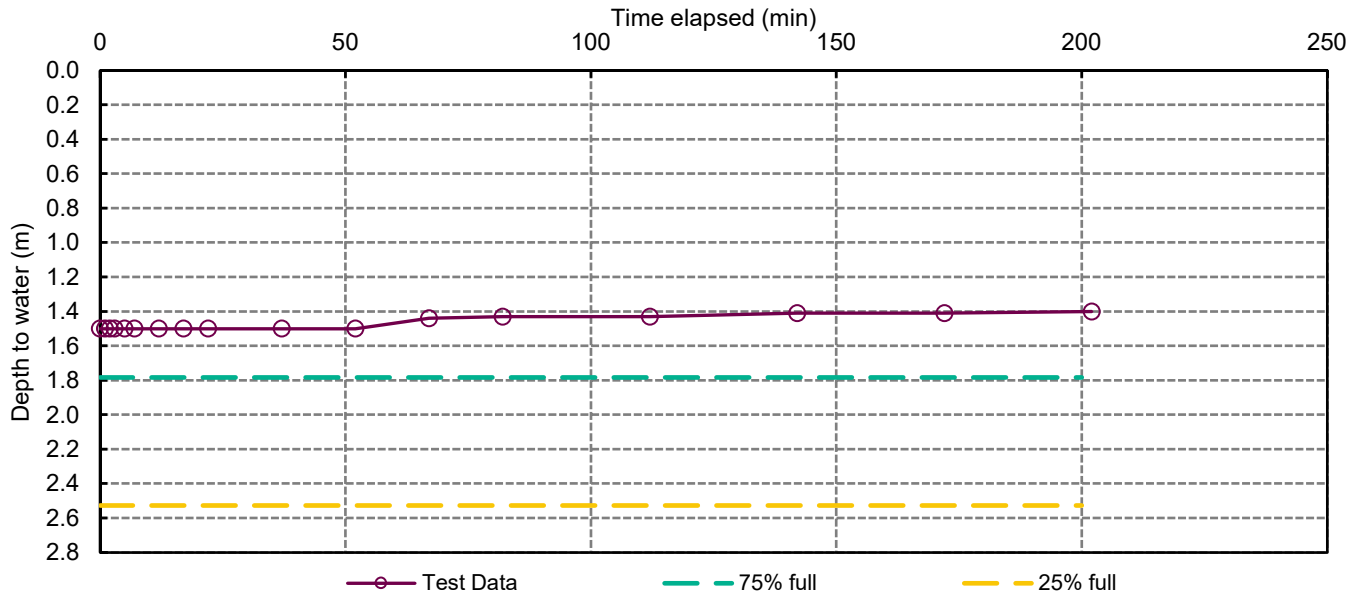
Soil Infiltration Rate = N/A m/s

Comments

Side wall collapse caused water level to rise. Test void.

Test Data

Elapsed Time (mins)	Depth to Water (m)
0	1.50
1	1.50
2	1.50
3	1.50
5	1.50
7	1.50
12	1.50
17	1.50
22	1.50
37	1.50
52	1.50
67	1.44
82	1.43
112	1.43
142	1.41
172	1.41
202	1.40



Appendix D

Dynamic Cone Penetrometer Results

Laboratory Report

GEOTECHNICAL SITE & TESTING LABORATORIES
A PHENNA GROUP COMPANY

Contract Number: 68724

Client Ref:
Client PO: **PO23-0636**

Client: **RPS Group**
St Annes House
Oxford Square
Oxford Street
Newbury
RG14 1JQ

Contract Title: **Pembroke power station**
For the attention of: **Patrick Roberts**

Date Received: **18-09-2023**
Date Completed: **24-10-2023**
Report Date: **24-10-2023**

This report has been checked and approved by:

Shaun Thomas
Site Manager

Test Description	Qty
Provision of WS tracked rig with 2 man crew & hand tools excludes consumables and breaker.	4
Bentonite Swelltight Pellets 25kg Bag	9
Disposal of samples for job	1
Clear Core Wall Liners 1m Length	16

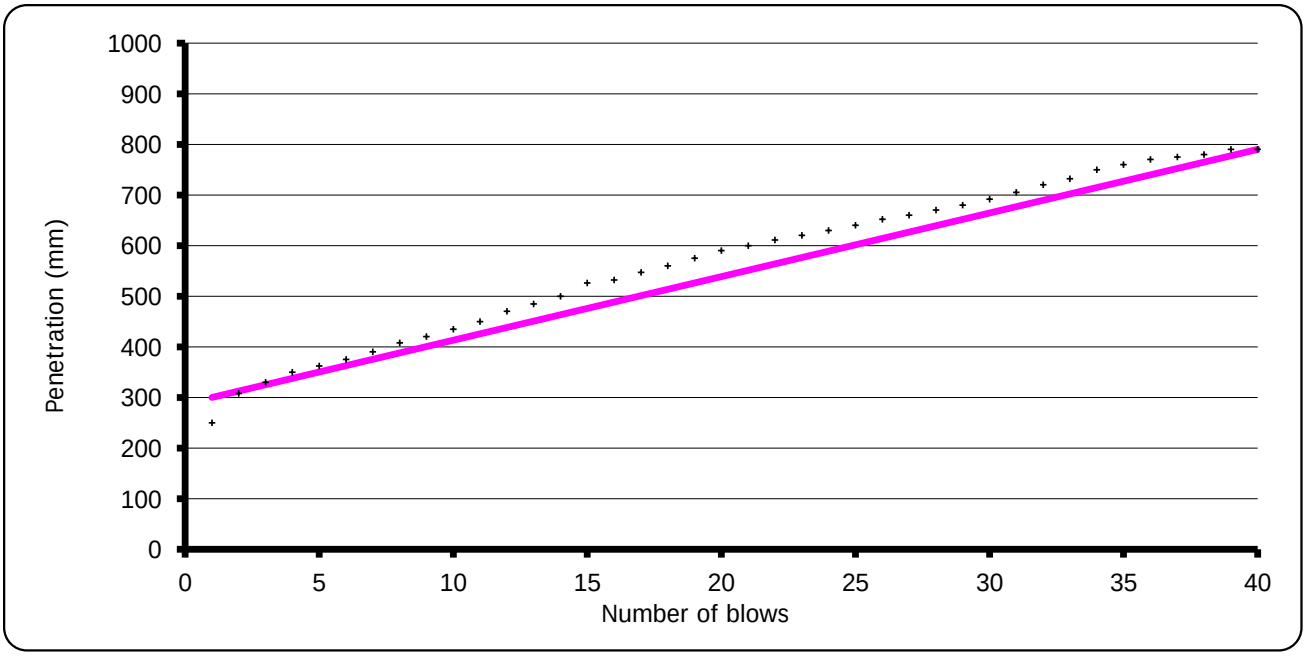
Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
 # - denotes test carried out by approved contractor
@ - denotes non accredited tests

Approved Signatories:
Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (Human Resources/ Health and Safety Manager)

GEO Site & Testing Services Ltd
Units 3-4, Heol Aur, Dafen, Llanelli, Carmarthenshire, Wales SA14 8QN
Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 1
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 12.5641 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 20.8

Remarks:

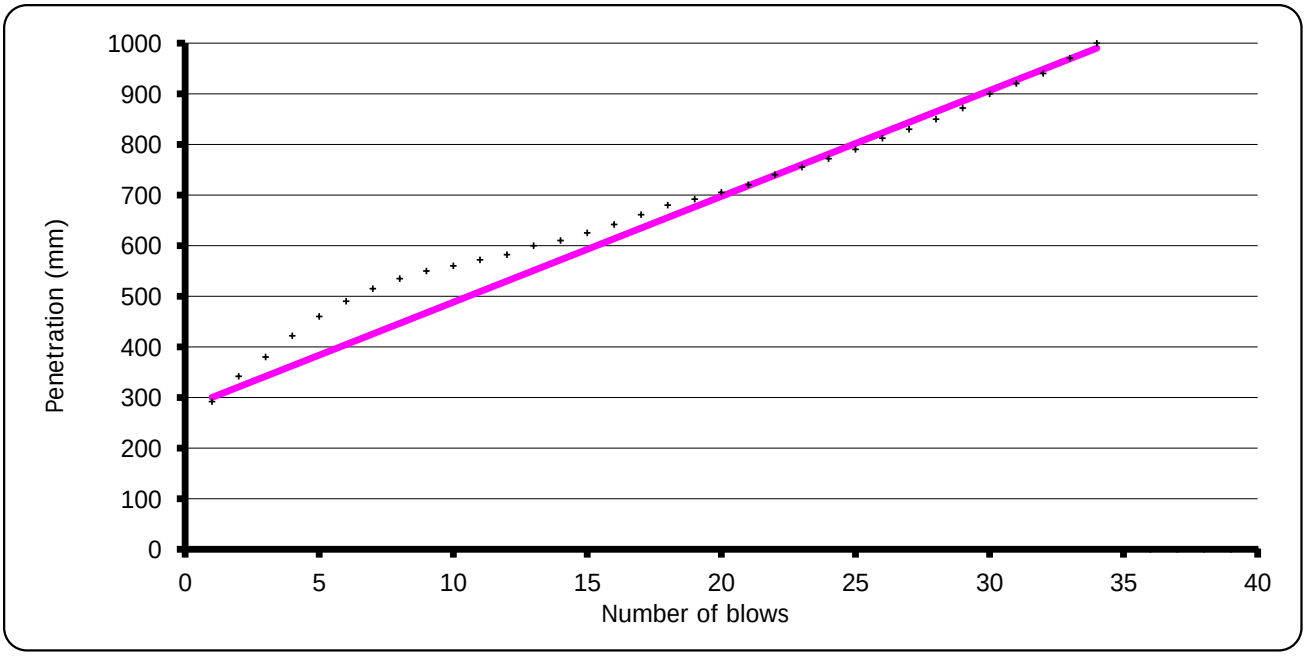
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 2
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 20.9091 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 12.1

Remarks:

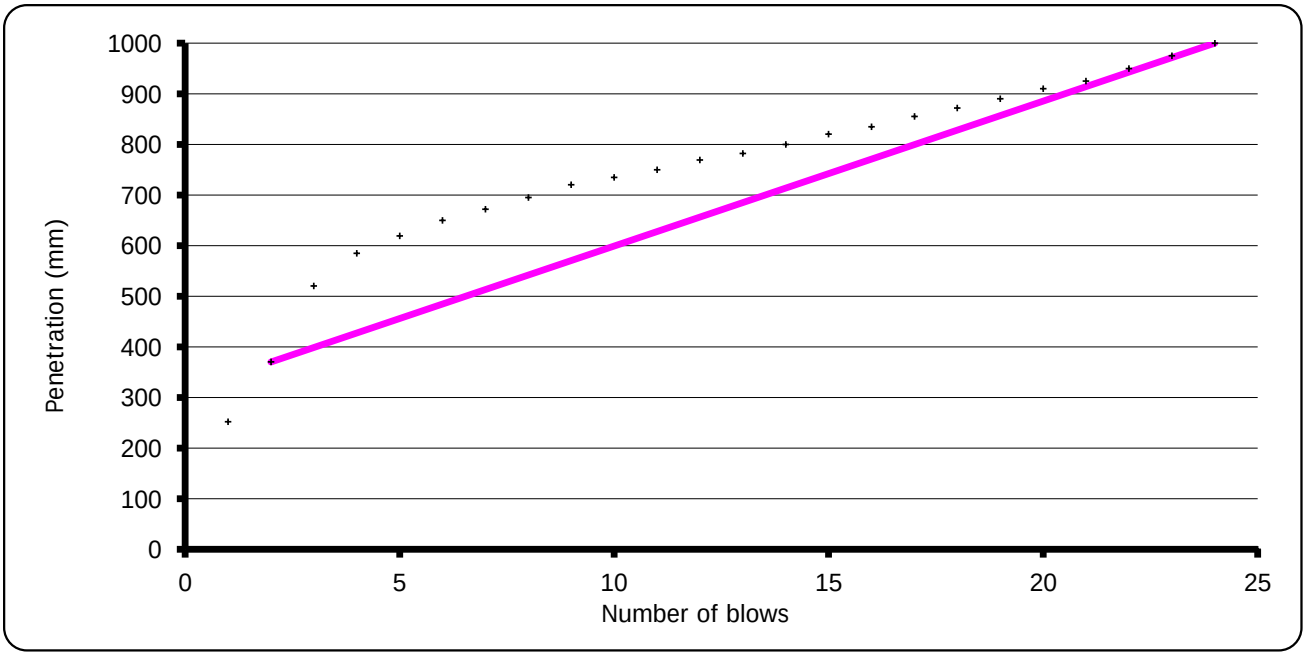
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 3
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 28.6364 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 8.7

Remarks:

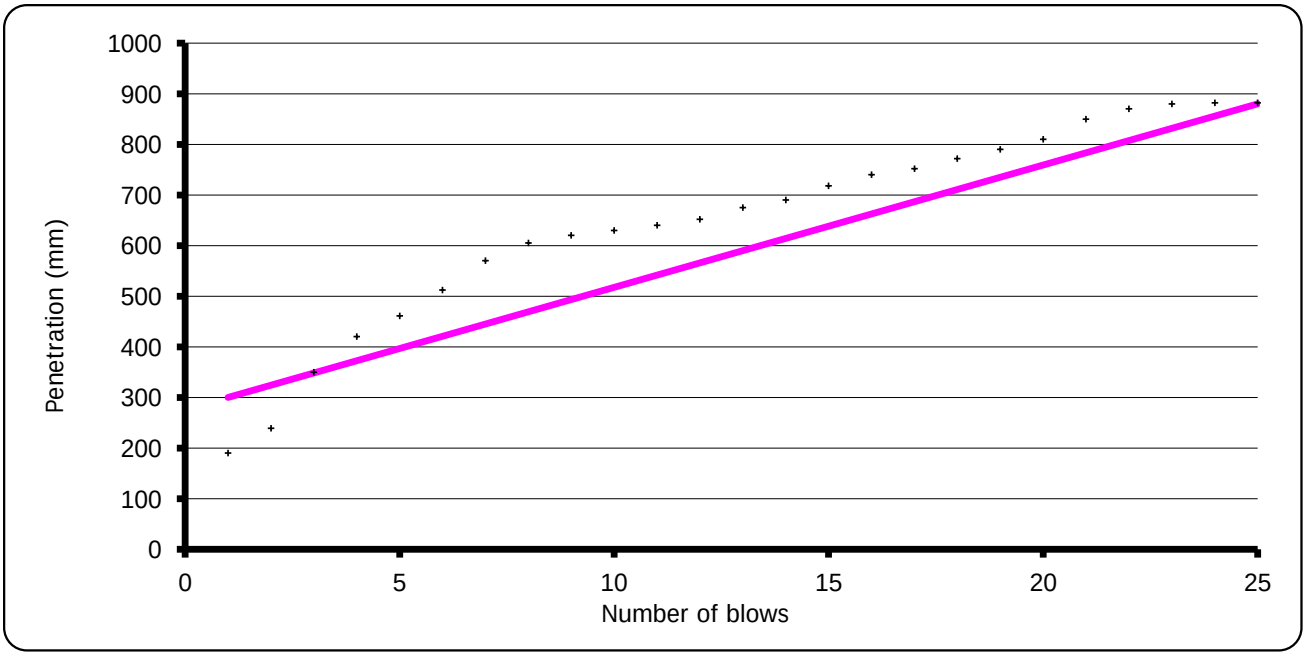
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 4
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 24.1667 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 10.4

Remarks:

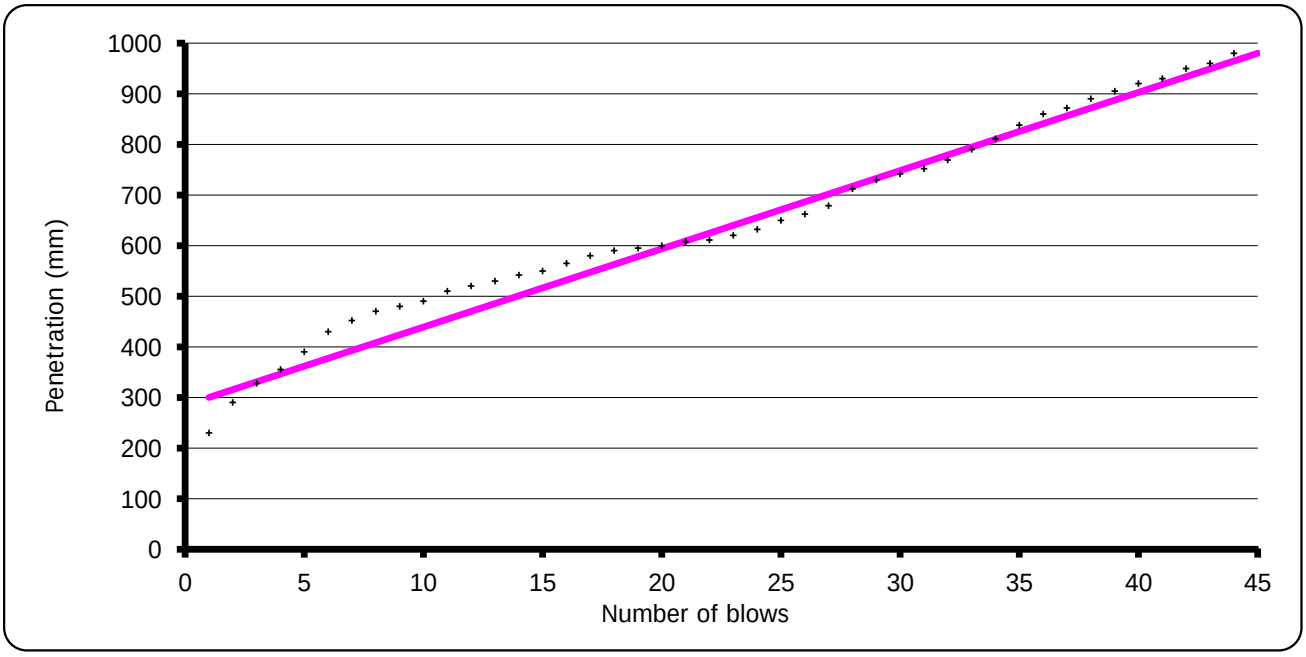
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 5
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 15.4545 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 16.7

Remarks:

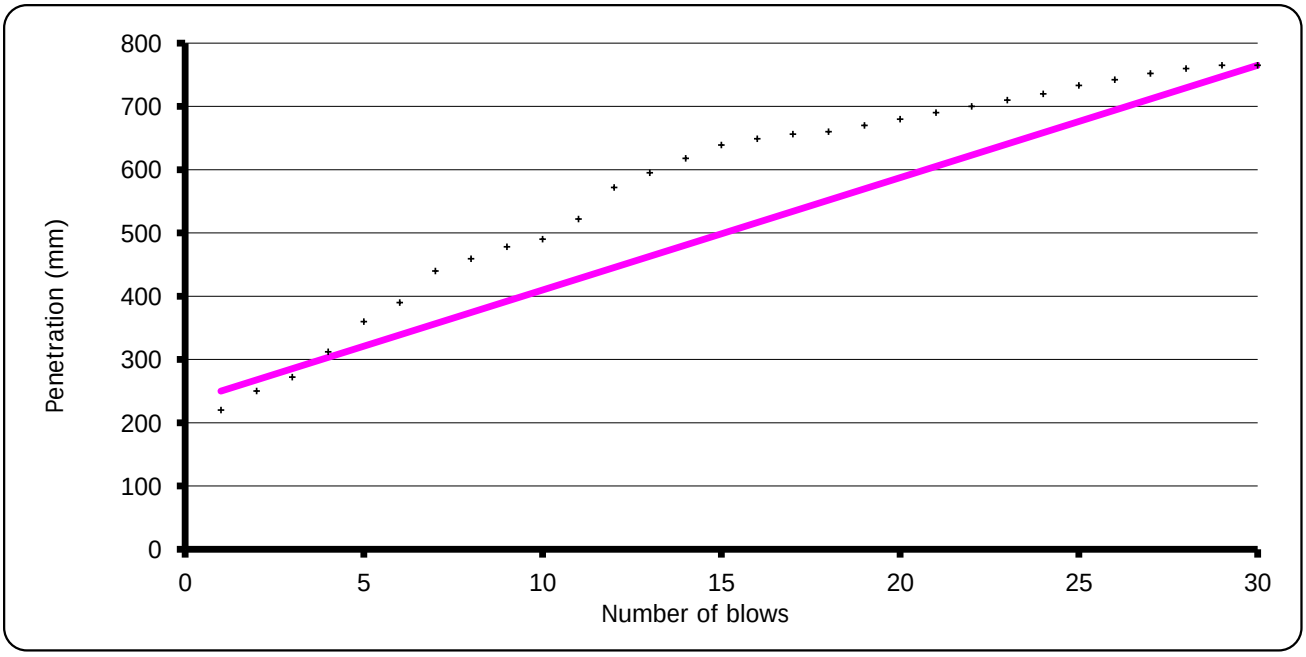
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 6
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 17.7586 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 14.4

Remarks:

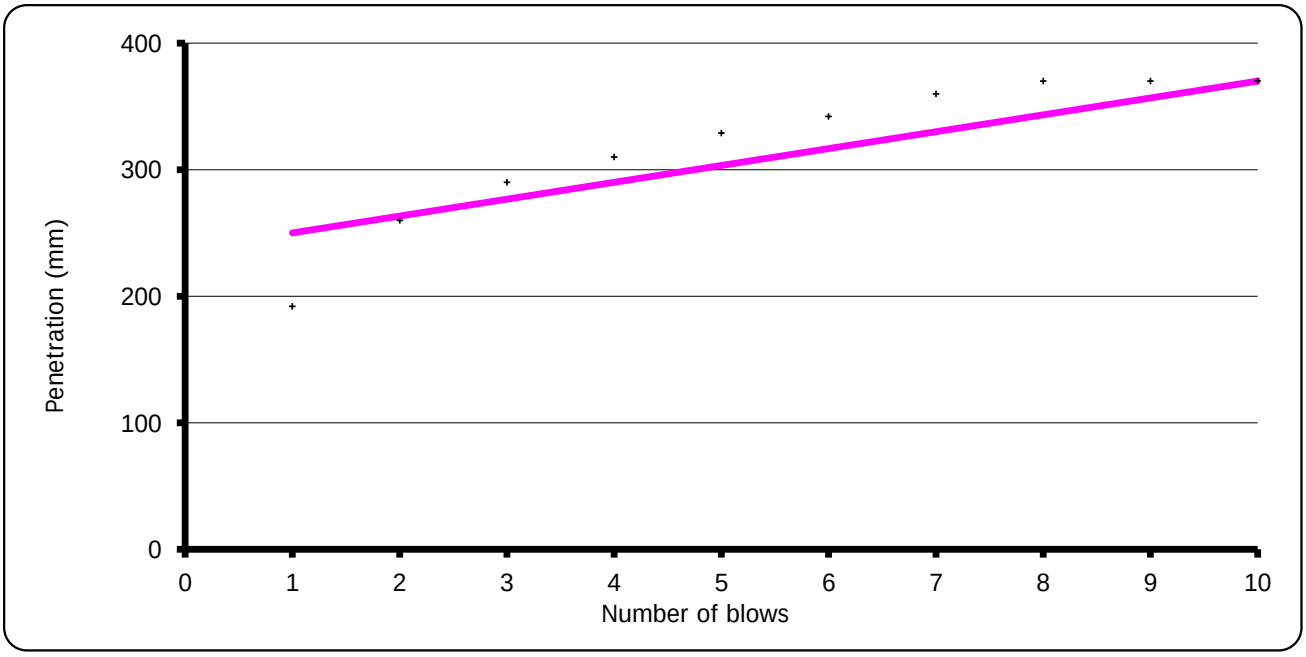
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 7
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 13.3333 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 19.5

Remarks:

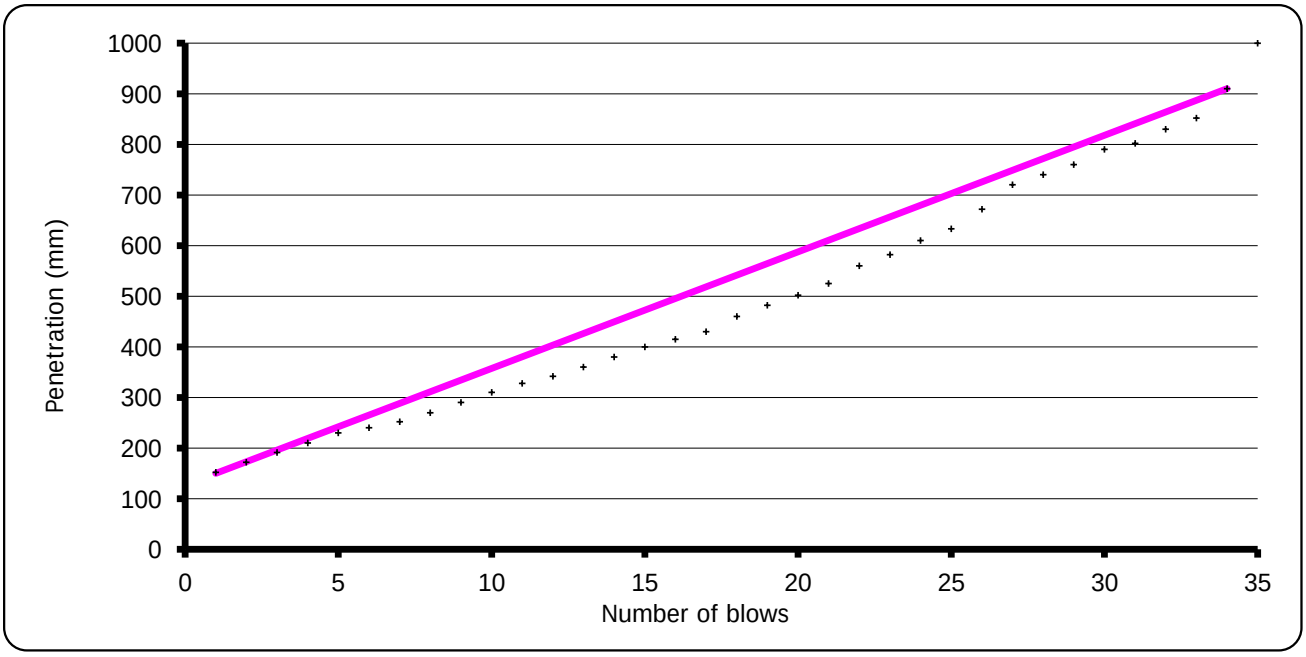
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 8
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 23.0303 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 11.0

Remarks:

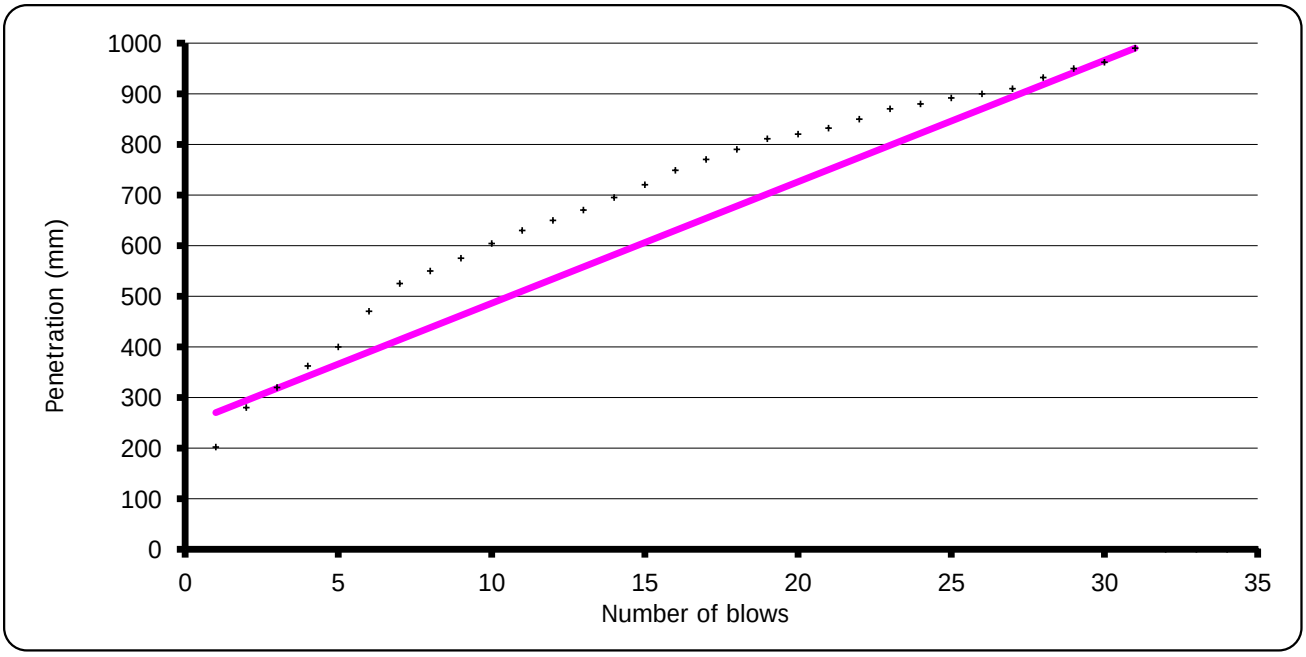
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 9
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 24.0000 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 10.5

Remarks:

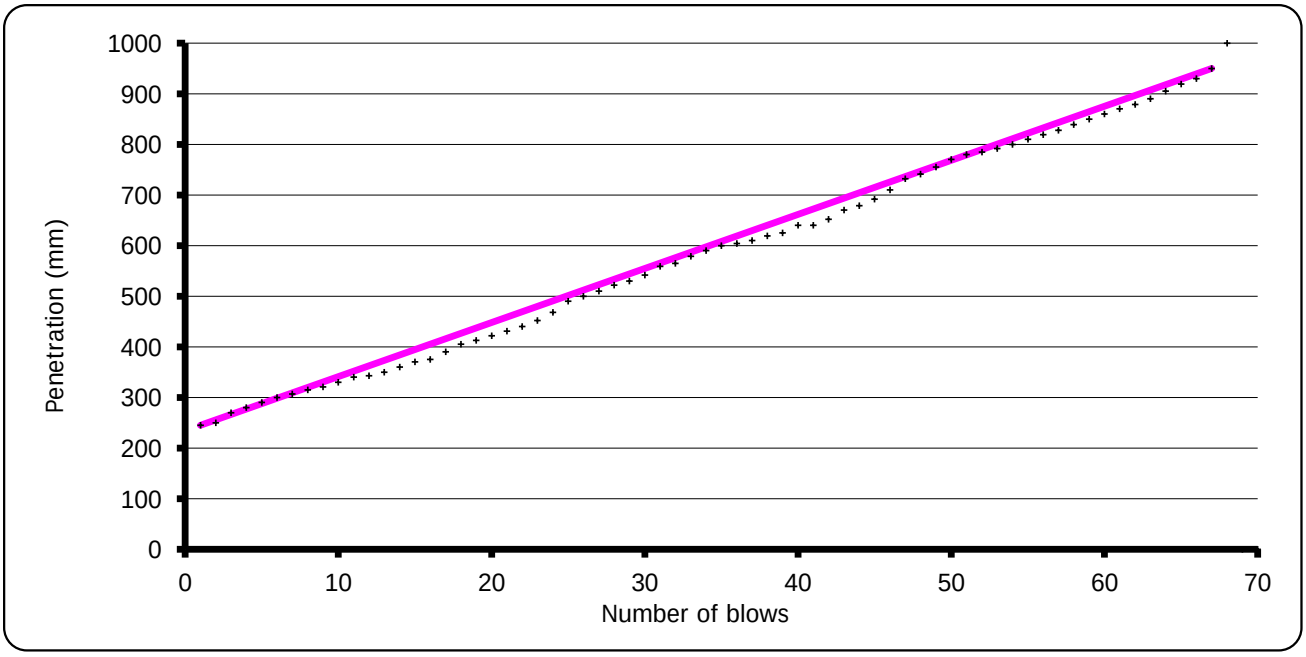
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 10
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 10.6818 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 24.7

Remarks:

For and behalf of GEO Site & Testing Services Ltd

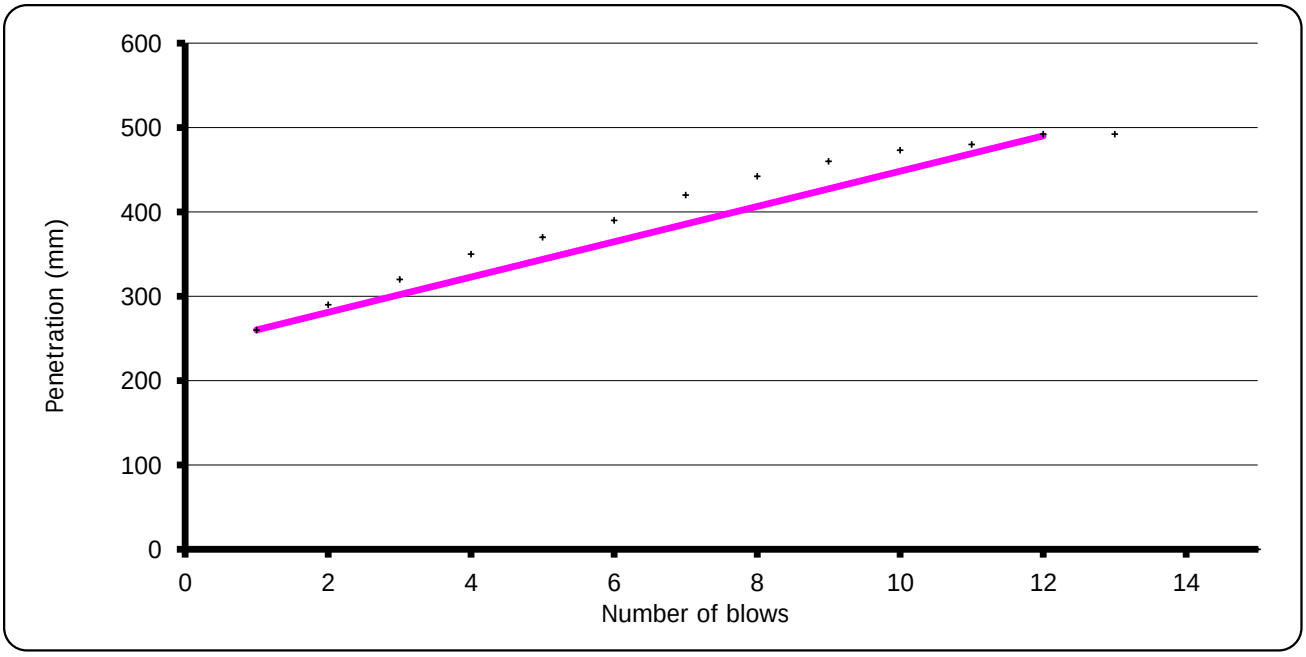
GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES
A PHENNA GROUP COMPANY

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 11
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 20.9091 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 12.1

Remarks:

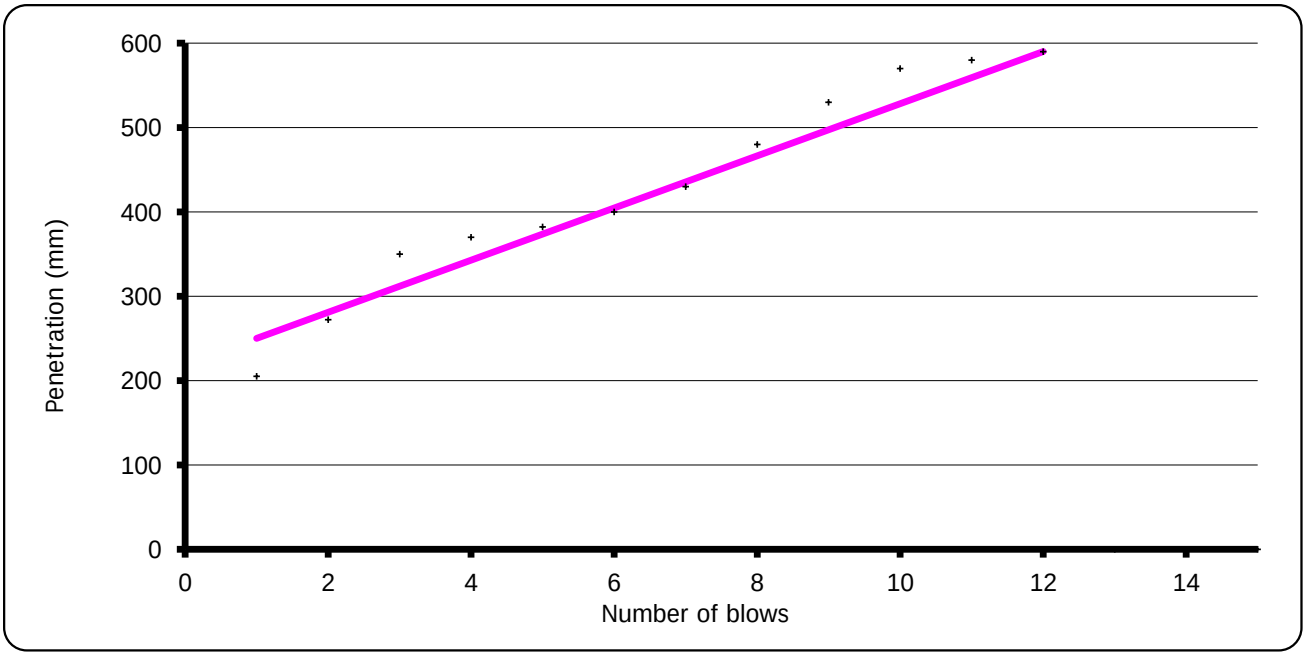
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 12
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 30.9091 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 8.0

Remarks:

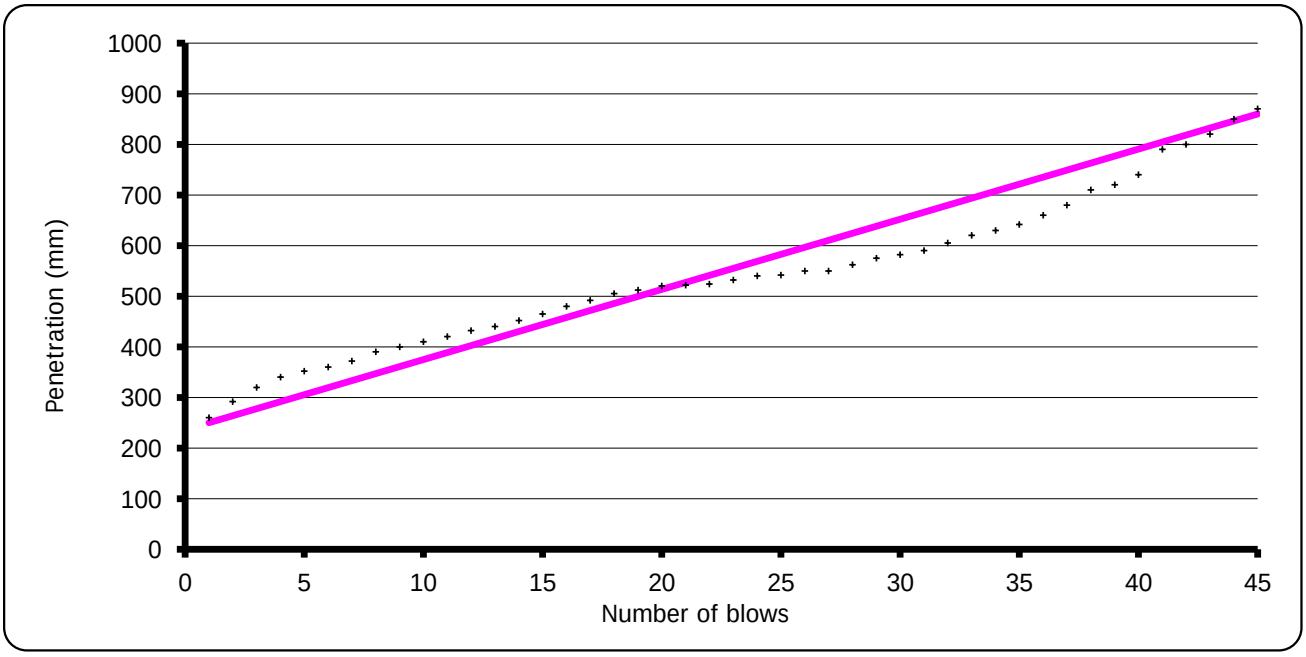
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 13
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 13.8636 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 18.8

Remarks:

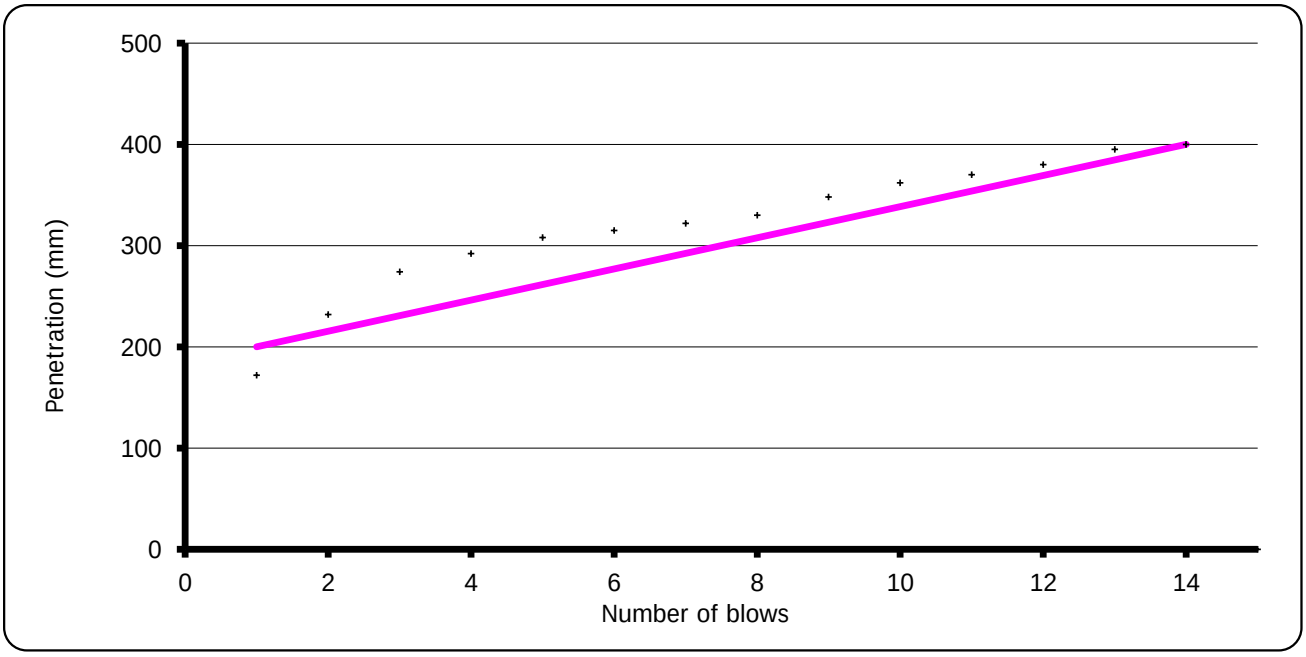
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 14
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 15.3846 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 16.8

Remarks:

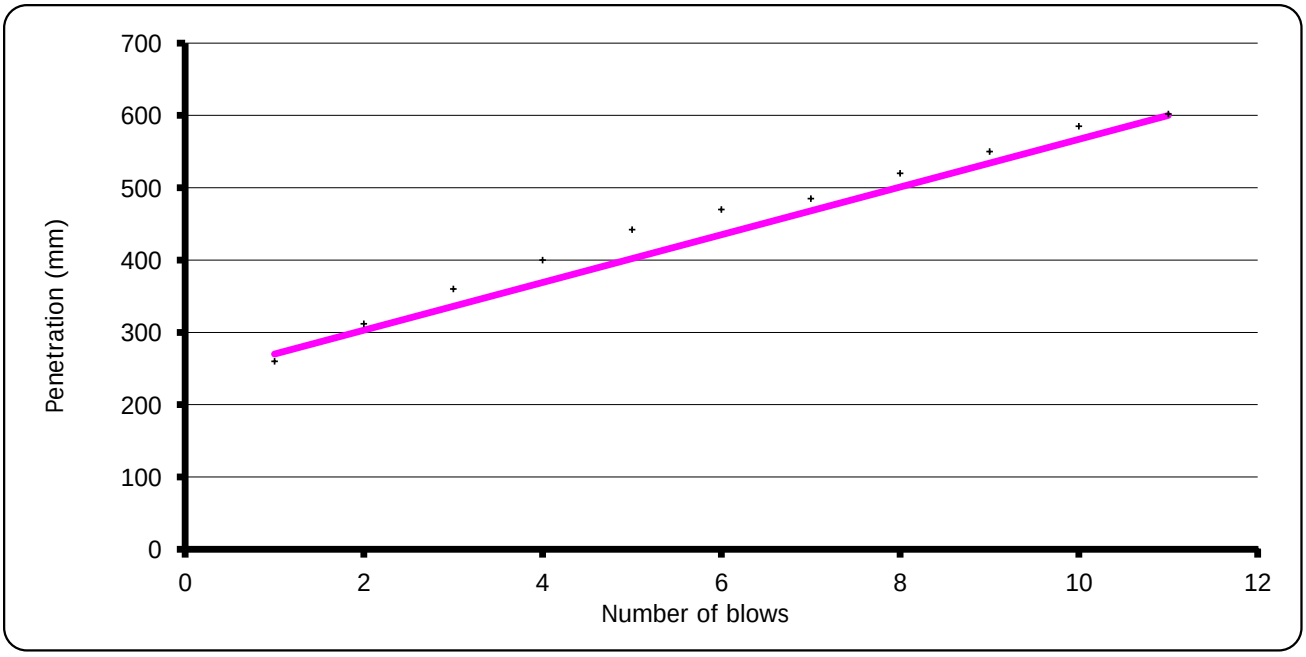
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 15
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 33.0000 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 7.5

Remarks:

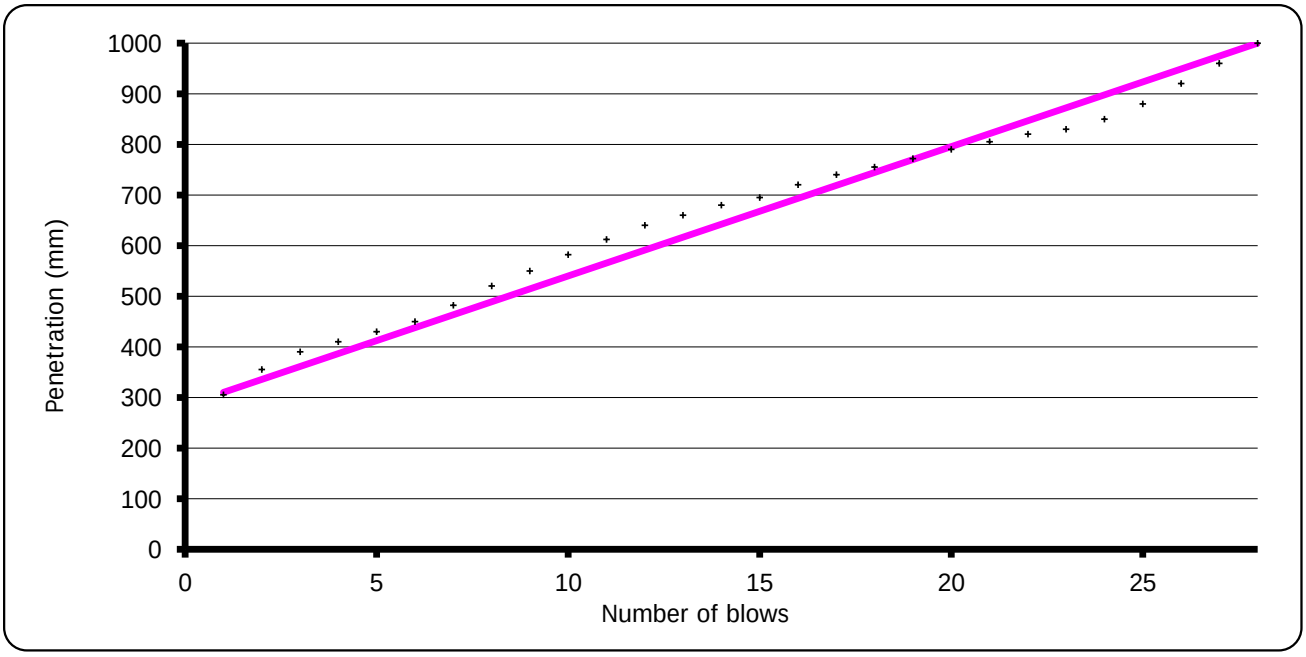
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 16
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 25.5556 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 9.8

Remarks:

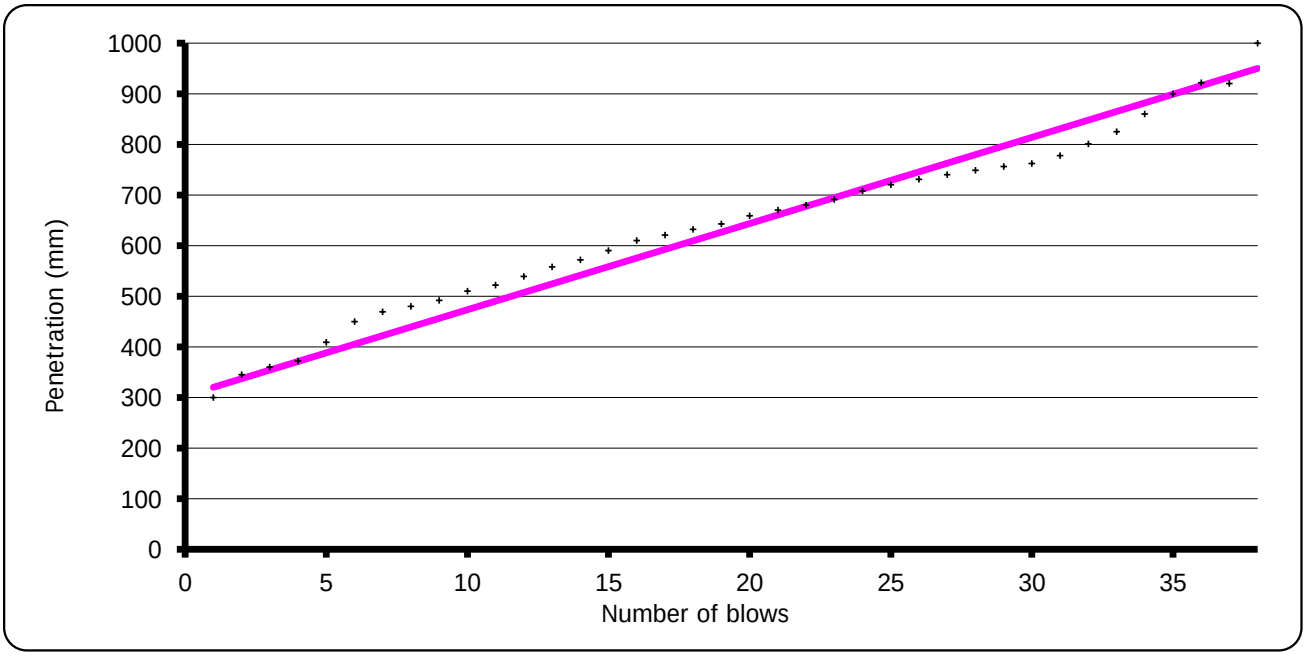
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 17
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 17.0270 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 15.1

Remarks:

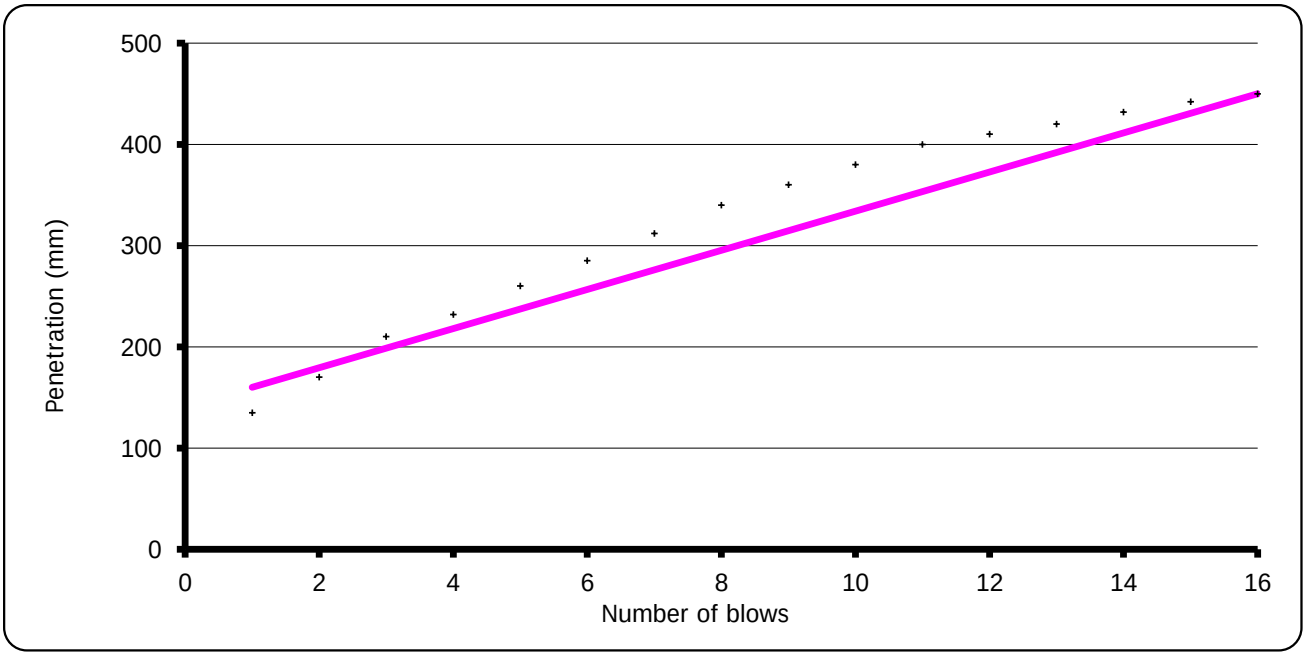
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 18
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 19.3333 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 13.2

Remarks:

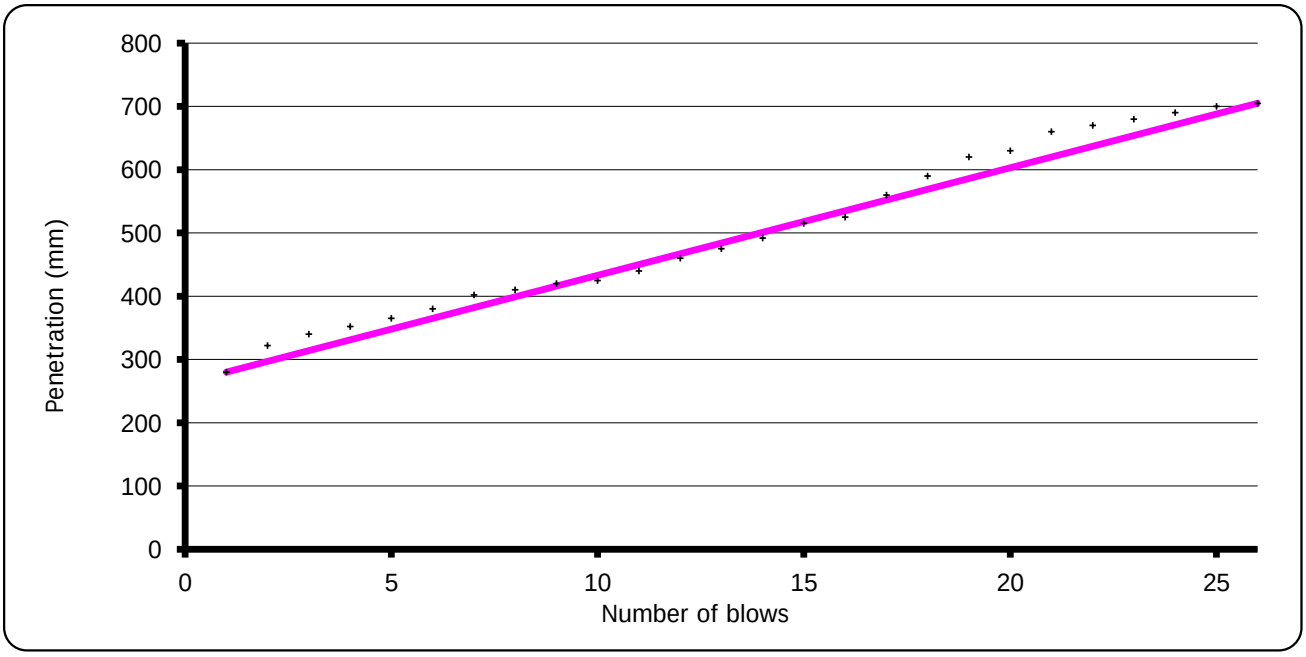
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 19
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 17.0000 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 15.1

Remarks:

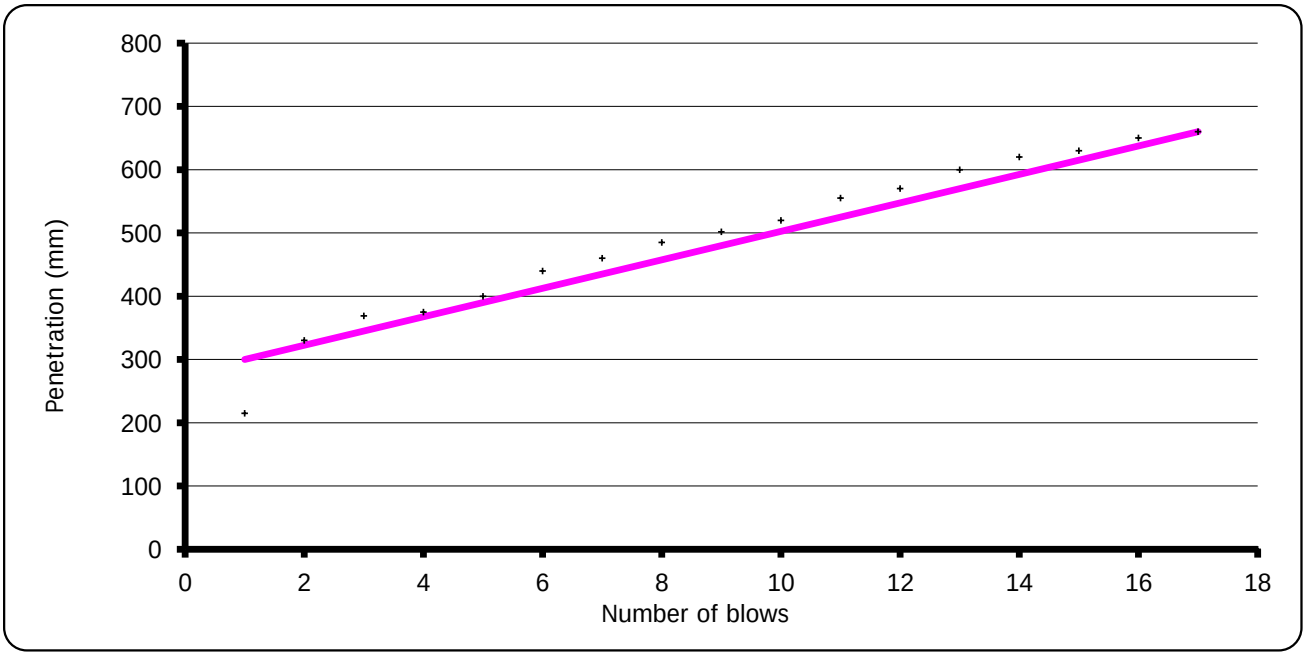
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 20
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 22.5000 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 11.2

Remarks:

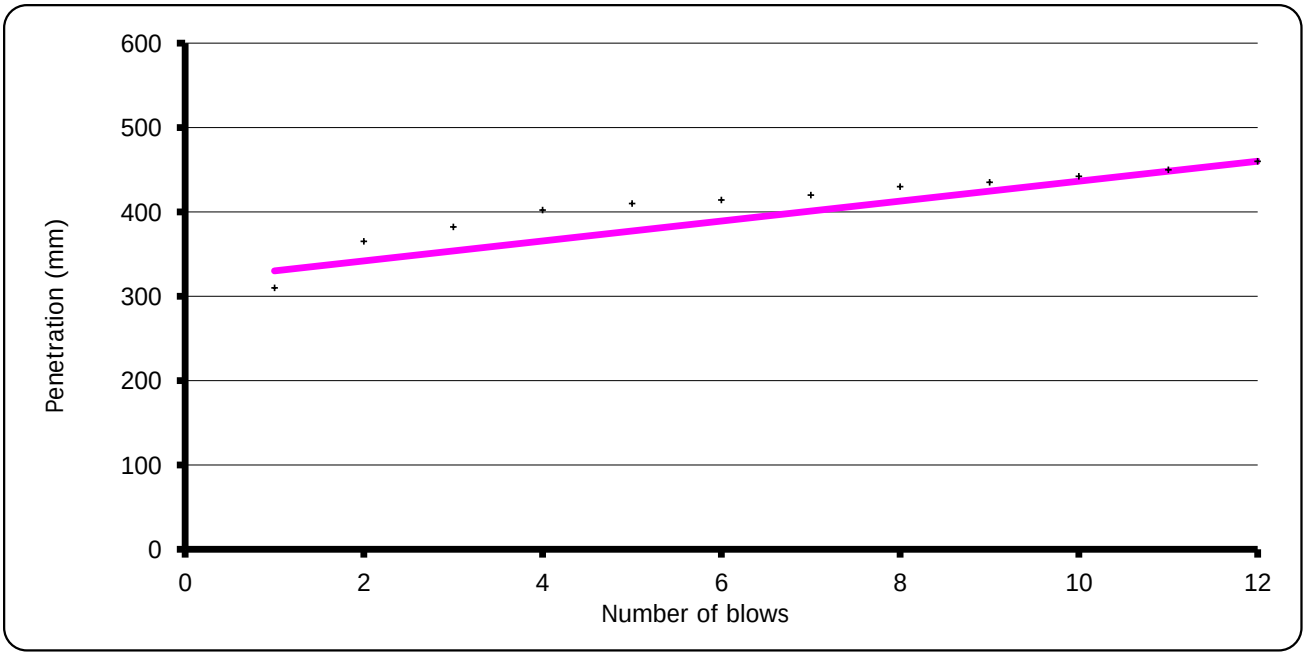
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 21
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 11.8182 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 22.2

Remarks:

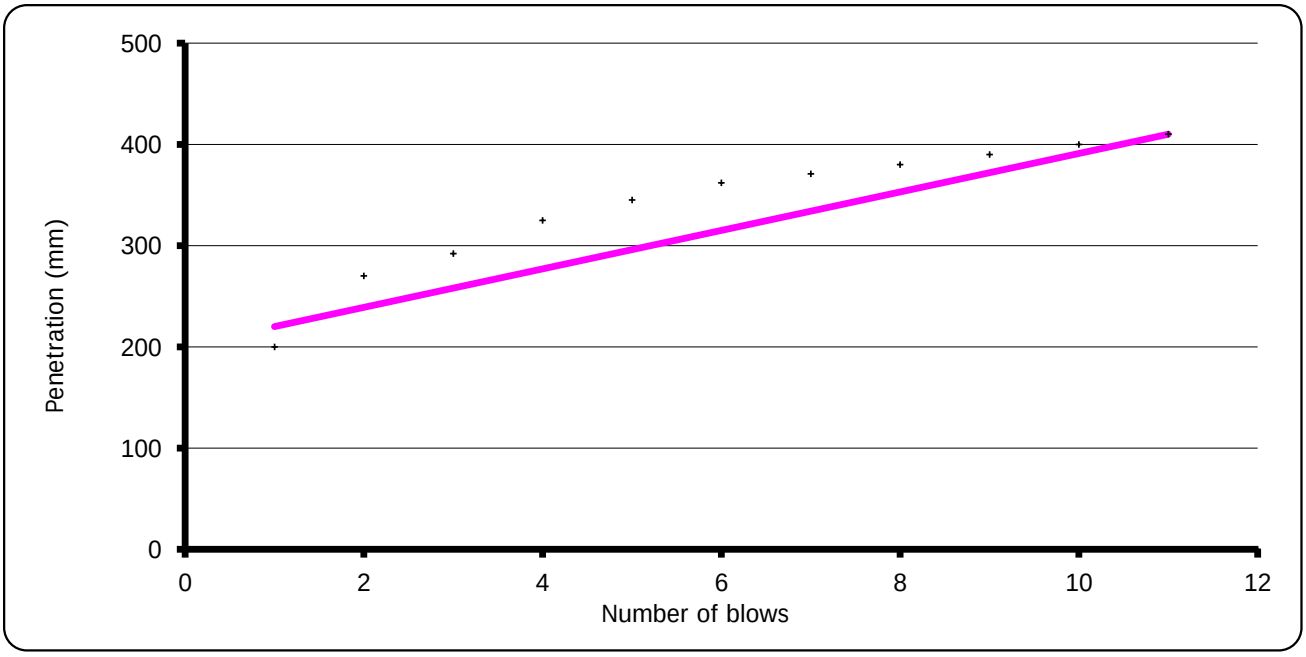
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 22
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 19.0000 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 13.4

Remarks:

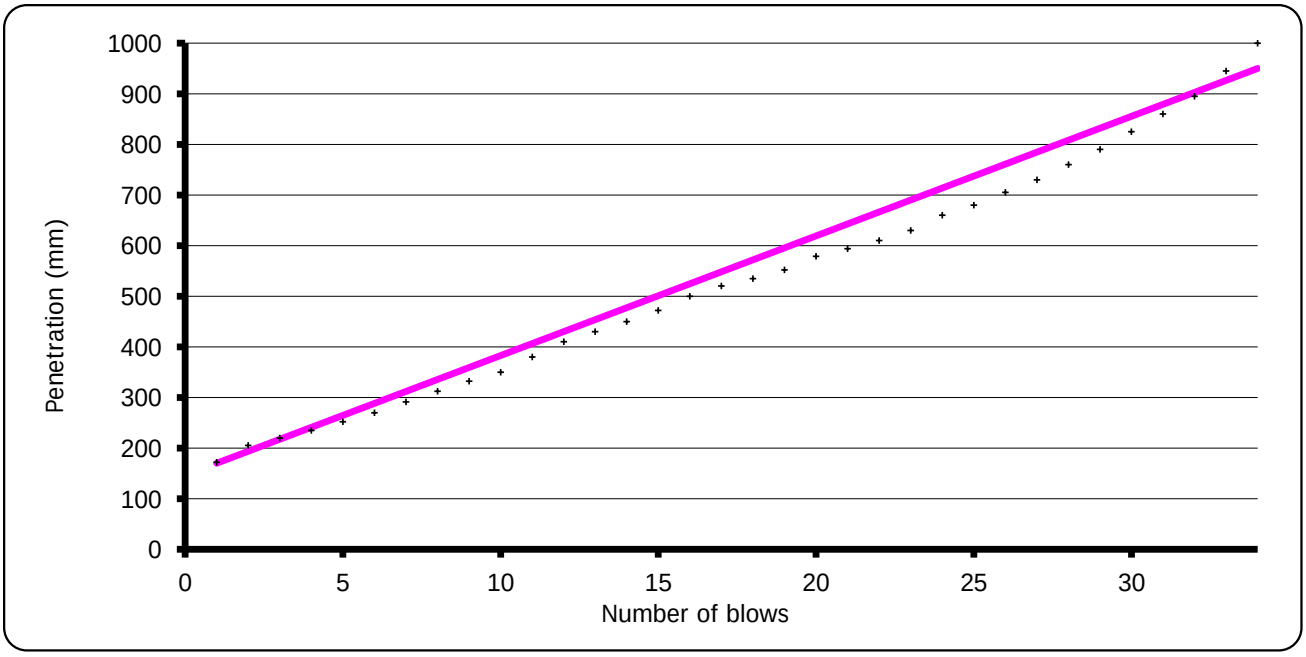
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 23
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 23.6364 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 10.7

Remarks:

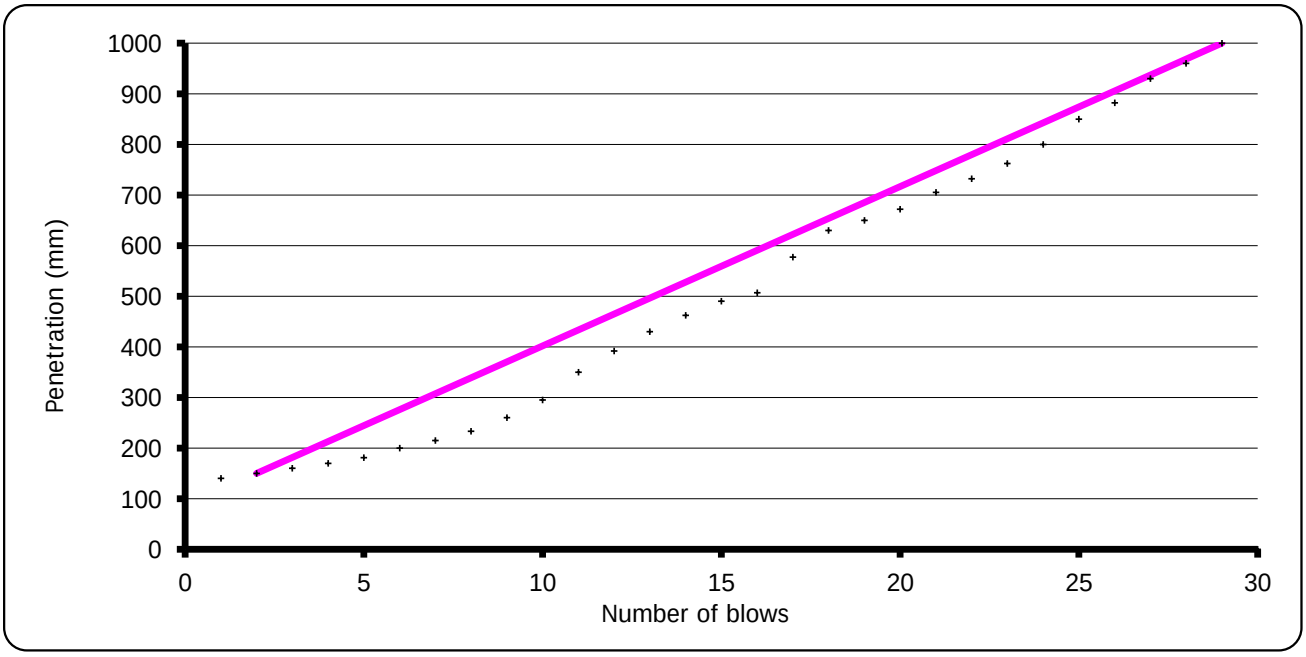
For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Test Report: Determination of the Dynamic Cone Penetrometer Test
CBR Value
in accordance with TRL Dynamic Cone Operating Instructions (2nd edition)

Client:	RPS Group
Client ref:	
Location:	Pembroke power station
Contract Number:	68724
Date tested:	16/10/2023
Test Position:	DCP 24
Depth (m) :	GL
Equipment Used:	TRL - Dynamic Cone Penetrometer 1
DCP Cone Angle:	90°
Tested By:	Dean Smith



Rate of Penetration 31.4815 mm/blow

$Log_{10}(CBR) = 2.48 - 1.057 Log_{10}(Rate\ of\ Penetration)$

CBR Value (%): 7.9

Remarks:

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Paul Evans (Quality/Technical Manager)

Date: 24.10.23

Appendix E

Downhole CCTV Survey Results

Plate 01: BH01 side view at 14.59 m bgl. Natural void, dimension and orientation unknown.

Plate 02: BH01 side view at 14.64 m bgl. Natural void, dimension and orientation unknown.

Plate 03: BH01 downhole view at 14.13 m bgl. Open void, no borehole walls visible.

Plate 04: BH01 downhole view at 14.27 m bgl. Open void, no borehole walls visible.

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5th Floor, One Temple Quay
Temple Back East, Bristol
BS1 6DZ, United Kingdom

Client: RWE Generation UK PLC	
Project: Pembroke Electrolyser:	Job ref: JFR2796
Checked By: PR	Date: NOV 2023

Plate 05: BH01 downhole view at 14.11 m bgl. Borehole walls visible on right hand side. Top of void.

Plate 06: BH01 downhole view at 14.06 m bgl. Borehole walls visible on right hand side. Top of void.

Plate 07 BH01 downhole view at 12.45 m bgl. Water table can be seen below. Regular borehole sidewalls.

Plate 08: BH01 sidewall view at 12.01 m bgl. Irregular borehole sidewall, due to fracturing and collapse during drilling.

Plate 09: BH01 downhole view at 11.63 m bgl. Collapsed material associated with near vertical jointing.

Plate 10: BH01 downhole view at 11.51 m bgl. Collapsed material associated with near vertical jointing.

Plate 11: BH01 downhole view at 11.37 m bgl. Collapsed material associated with near vertical jointing.

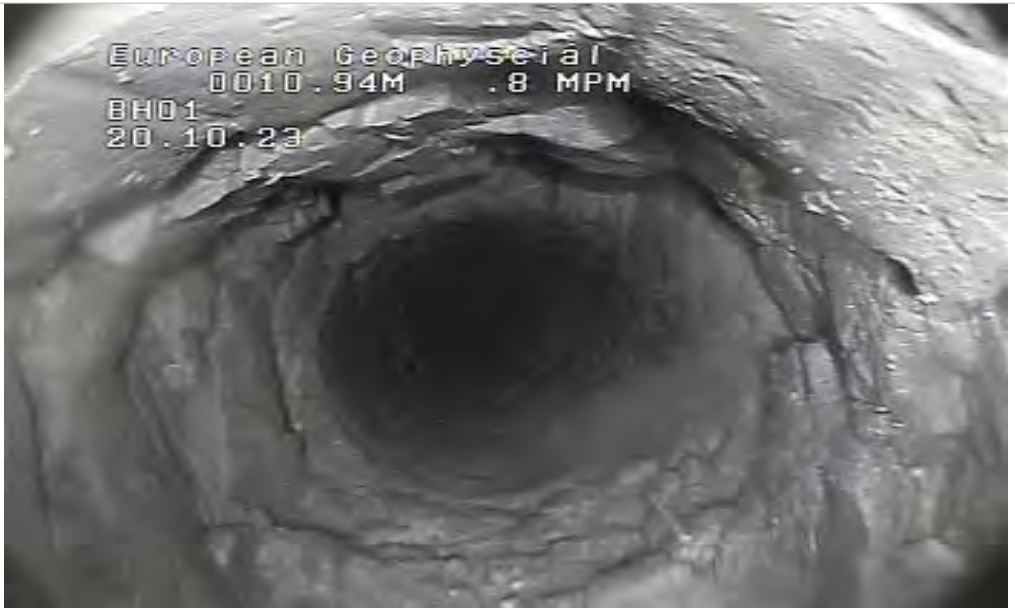

Plate 12: BH01 downhole view at 10.94 m bgl. Loose borehole sidewall, collapsed material due to jointing.

Plate 13: BH01 sidewall view at 9.95 m bgl, showing near vertical jointing.

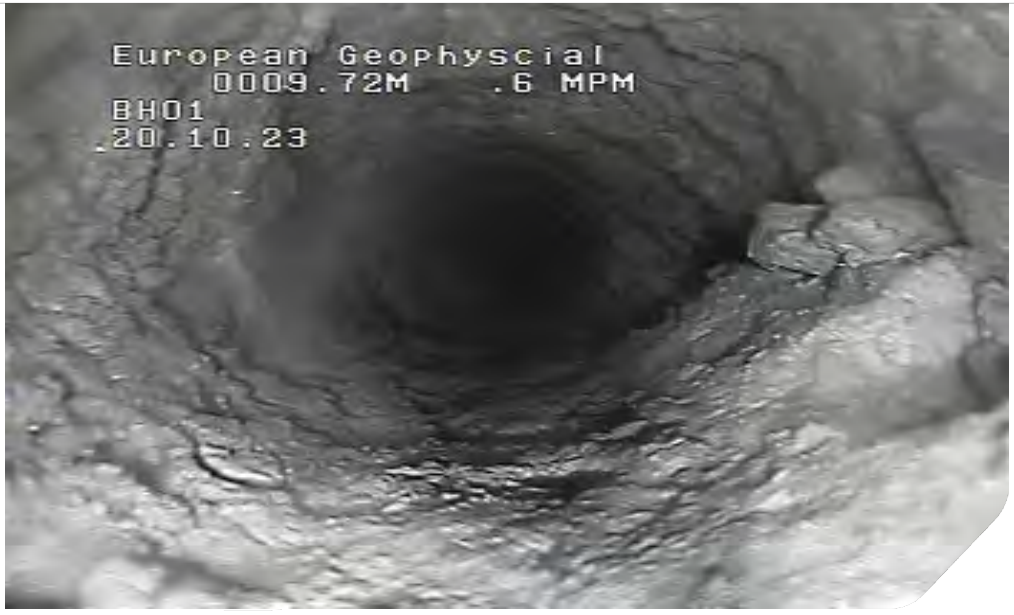

Plate 14: BH01 downhole view at 9.72 m bgl, showing jointing in the sidewall.

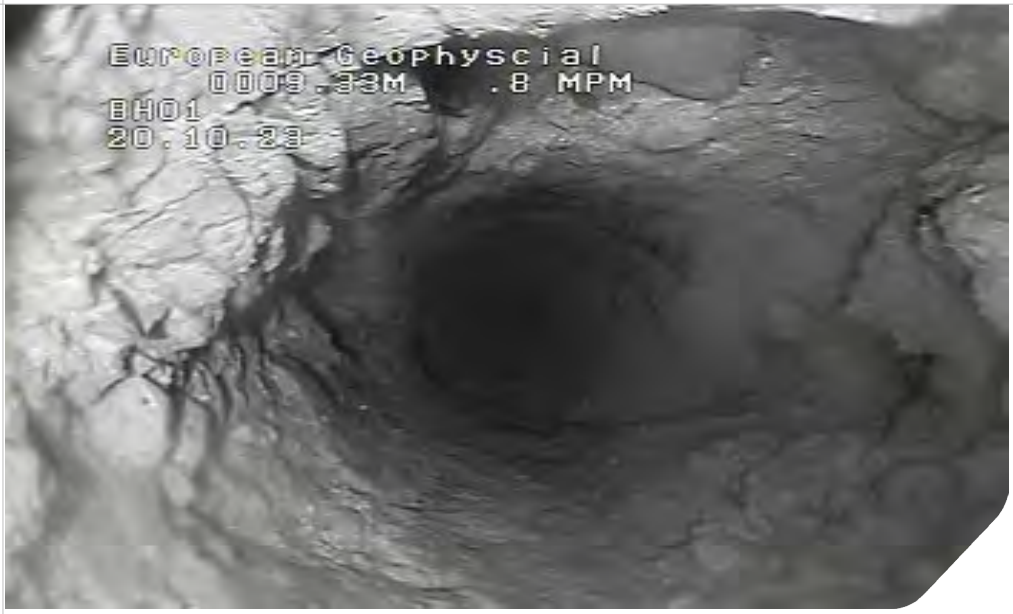

Plate 15: BH01 downhole view at 9.33 m bgl, showing jointing in the sidewall.

Plate 16: BH01 downhole view at 8.41 m bgl, showing jointing in the sidewall.

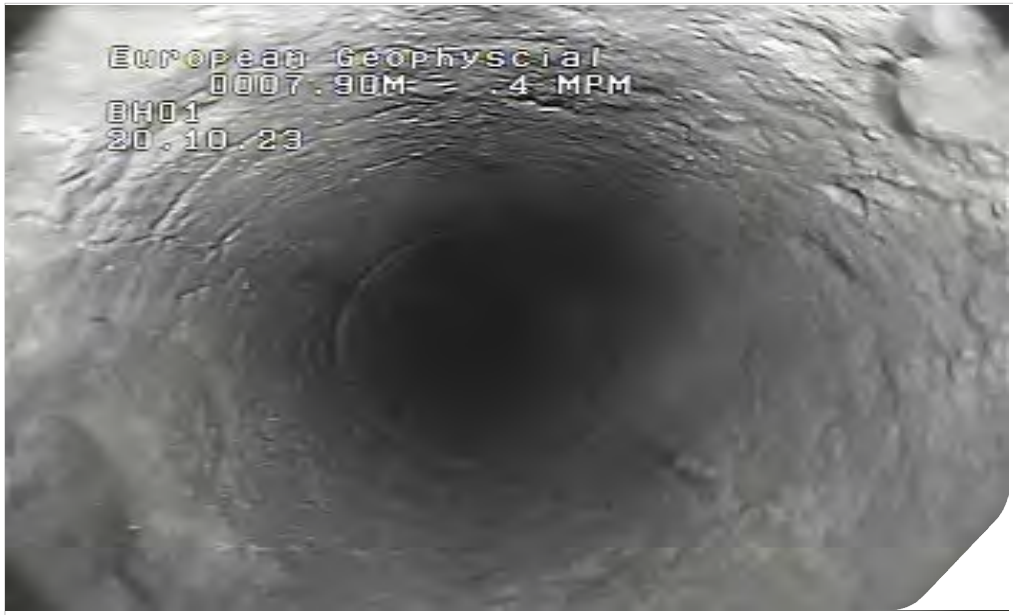

Plate 17: BH01 downhole view at 7.90 m bgl, borehole wall with no visible discontinuities.

Plate 18: BH02 sidewall view at 11.12 m bgl. Showing natural voiding. Size and orientation unknown.

Plate 19: BH02 sidewall view at 11.13 m bgl. Showing natural voiding. Size and orientation unknown

Plate 20: BH02 sidewall view at 11.56 m bgl. Showing natural voiding. Size and orientation unknown

Plate 21: BH02 sidewall view at 11.57 m bgl. Showing natural voiding. Size and orientation unknown

Plate 22: BH02 sidewall view at 11.77 m bgl. Showing natural voiding. Size and orientation unknown

Plate 23: BH02 sidewall view at 12.11 m bgl. Showing natural voiding. Size and orientation unknown

Plate 24: BH02 sidewall view at 12.16 m bgl. Showing natural voiding. Size and orientation unknown

Plate 25: BH02 sidewall view at 11.89 m bgl. Showing natural voiding. Size and orientation unknown :

Plate 26: BH02 sidewall view at 11.83 m bgl. Showing natural voiding. Size and orientation unknown

Plate 27: BH02 sidewall view at 11.47 m bgl. Showing natural voiding. Size and orientation unknown

Appendix F

Comparison of Analytical Data to Assessment Criteria

TABLE SUMMARISING SOIL RESULTS AND HIGHLIGHTING EXCEEDANCES ABOVE SOIL ASSESSMENT CRITERIA
PEMBROKE (ELECTROLYSER) INVESTIGATION

SOM 1%			Assessment Criteria			Strata				No. of Exceedances			MG	TS	TS	BR	TS	MG	MG	MG	MG	TS	AG	MG	MG	MG	MG	TS	MG	MG	MG	AG	MG
													BH01	BH02	BH03	HP01	HP02	TP01	TP01	TP02	TP03	TP04	TP05	TP06	TP07	TP07	TP08	TP09	TP10	TP11	TP11	WS01	WS02
Analyte	Units	LOD	RwHP	POSpark	Commercial	Contam ID	No. of Tests	Min	Max	RwHP	POSpark	Commercial	0.50	0.20	0.20	0.50	0.20	0.60	1.50	0.30	0.50	0.20	0.50	0.60	0.20	0.50	0.25	0.20	0.50	0.20	0.70	0.40	0.30
Stones Content	%		-	-	-	*Stone*																											
Arsenic	mg/kg	0.5	37	170	640	7440-38-2	26	5.5	22.8				16.3	11.5	10.4	9.2	5.5	16.8	16.8	16.2	13.1	15.2	15.1	9.1	6	15.7	22.8	13.6	20.7	14.3	18.7	13	8.1
Cadmium	mg/kg	0.1	11	560	190	7440-43-9	26	0.1	0.2				*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	0.2	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
Chromium Trivalent	mg/kg		910	33000	8600	16065-83-1																											
Chromium Hexavalent*	mg/kg	0.3	6	220	33	18540-29-9	26	0.3	0.3				*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*
Copper	mg/kg	1	2400	44000	68000	7440-50-8	26	11	45				27	25	30	36	17	23	42	45	21	35	24	23	11	20	24	24	25	24	21	16	23
Lead*	mg/kg	5	200	1300	2300	7439-92-1	26	16	130				52	60	50	47	27	31	93	130	32	46	69	26	16	39	86	66	52	46	49	28	19
Mercury	mg/kg	0.1	40	240	1100	7439-97-6	26	0.1	0.3				0.2	*0.1*	*0.1*	*0.1*	*0.1*	0.3	0.2	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	0.2	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
Molybdenum#	mg/kg		-	-	17000	7439-98-7																											
Nickel	mg/kg	0.7	130	800	980	7440-02-0	26	10.9	68.6				36.3	24.8	28.2	58.4	15.2	38.3	37.8	44.5	34.5	29.9	30.6	20	10.9	30.7	68.6	26.8	46.4	31.1	55.4	29.9	15.3
Selenium	mg/kg	1	250	1800	12000	7782-49-2	26	1	2				*1*	2	*1*	*1*	*1*	*1*	*1*	2	*1*	*1*	*1*	*1*	*1*	*1*	2	*1*	*1*	*1*	*1*	*1*	*1*
Zinc	mg/kg	5	3700	170000	730000	7440-66-6	26	50	241				84	85	113	195	50	157	119	129	95	117	106	90	53	92	241	88	131	119	132	72	93
Beryllium	mg/kg		1.7	63	12	7440-41-7																											
Boron	mg/kg		290	46000	240000	7440-42-8																											
Vanadium	mg/kg		410	5000	9000	7440-62-2																											
Cyanide (Total)^	mg/kg	0.5	53	53	53	57-12-5	26	0.5	0.5				*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*
Organic matter	mg/kg	0.2	-	-	-	P1313	26	0.4	6.5				2	5.4	3.8	1.2	1.2	1.2	0.7	0.4	0.5	2.5	2.3	1.7	1	0.4	1	1.9	0.4	1.9	0.7	0.4	1.6
Phenol, Total	mg/kg	0.15	120	440	440	P2099	26	0.15	0.15				*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*
Sulphate (Total) as SO4	mg/l	0.0015	-	-	-	14808-79-8	26	1.5	354.5				8	10.7	7.1	354.5	3.1	6.3	13	6.1	14.8	15.5	1.5	12.9	22.6	50.2	6.8	4.5	34.2	9	10.2	8.8	19.9
pH	pH Units	0.01	-	-	-	P1334	26	6.14	8.66				8.18	6.14	8.39	7.82	8.2	8.41	8.27	7.12	8.41	8.23	8.02	8.14	8.44	8.43	8.11	7.96	8.66	8.22	8.45	8.41	8.21
>C5 to C6 Aliphatic	mg/kg	0.1	42	95000	3200	P1407	26	0.1	0.1				*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
>C6 to C8 Aliphatic	mg/kg	0.1	100	150000	7800	P1408	26	0.1	0.1				*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
>C8 to C10 Aliphatic	mg/kg	0.1	27	14000	2000	P1409	26	0.1	0.1				*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
>C10 to C12 Aliphatic	mg/kg	0.2	130	21000	9700	P1410	26	0.2	0.2				*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*
>C12 to C16 Aliphatic	mg/kg	4	1100	25000	59000	P1411	26	4	4				*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*
>C16 to C21 Aliphatic	mg/kg	7	-	-	-	P1412	26	7	7				*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*
>C21 to C35 Aliphatic	mg/kg	7	-	-	-	P1413	26	7	136				*7*	*7*	32	*7*	*7*	*7*	*7*	*7*	*7*	27	*7*	108	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	136
>C16 to C35 Aliphatic	mg/kg	14	65000	450000	1600000	xxx	26	14	143				*14*	*14*	39	*14*	*14*	*14*	*14*	*14*	*14*	34	*14*	115	*14*	*14*	*14*	*14*	*14*	*14*	*14*	*14*	143
>C35 to C44 Aliphatic	mg/kg		65000	450000	1600000	P1415																											
Total Aliphatic C5-C35	mg/kg	19	-	-	-	P1418	26	19	136				*19*	*19*	32	*19*	*19*	*19*	*19*	*19*	*19*	27	*19*	108	*19*	*19*	*19*	*19*	*19*	*19*	*19*	*19*	136
>C5 to C7 Aromatic	mg/kg	0.1	70	76000	26000	P1441	26	0.1	0.1				*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
>C7 to C8 Aromatic	mg/kg	0.1	130	87000	56000	P1355	26	0.1	0.1				*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
>C8 to C10 Aromatic	mg/kg	0.1	34	7200	3500	P1356	26	0.1	0.1				*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
>C10 to C12 Aromatic	mg/kg	0.2	74	9200	16000	P1357	26	0.2	0.2				*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*
>C12 to C16 Aromatic	mg/kg	4	140	10000	36000	P1358	26	4	4				*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*
>C16 to C21 Aromatic	mg/kg	7	260	7600	28000	P1359	26	7	7				*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*
>C21 to C35 Aromatic	mg/kg	7	1100	7800	28000	P1360	26	7	324				*7*	*7*	53	*7*	27	*7*	*7*	*7*	*7*	21	11	324	58	*7*	*7*	*7*	*7*	*7*	*7*	*7*	262
>C35 to C44 Aromatic	mg/kg		1100	7800	28000	P1362																											
Total Aromatic C5-C35	mg/kg	19	-	-	-	P1947	26	19	324				*19*	*19*	53	*19*	27	*19*	*19*	*19*	*19*	21	*19*	324	58	*19*	*19*	*19*	*19*	*19*	*19*	*19*	262
TPH Ali/Aro	mg/kg	38	-	-	-	P1371	26	38	432				*38*	*38*	85	*38*	*38*	*38*	*38*	*38*	*38*	48	*38*	432	58	*38*	*38*	*38*	*38*	*38*	*38*	*38*	398
EPH (C10-C40)	mg/kg		-	-	-	P1401																											
Hazard Index - RwHP	-	-	-	-	-	xxx	26	0.1	0.4				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3
Hazard Index - POSpark	-	-	-	-	-	xxx	26	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hazard Index - Commercial	-	-	-	-	-	xxx	26	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Benzene	mg/kg	0.005	0.087	90	27	71-43-2	26	0.005	0.005				*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Ethylbenzene	mg/kg	0.005	47	17000	5700	100-41-4	26	0.005	0.005				*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Toluene	mg/kg	0.005	130	87000	56000	108-88-3	26	0.005	0.005				*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Xylene	mg/kg		60	17000	6600	1330-20-7																											
M- & P-Xylene	mg/kg	0.005	56	17000	5900	P1374	26	0.005	0.005				*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
O-Xylene	mg/kg	0.005	-	-	-	95-47-6	26	0.005	0.005				*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Total Xylene (M, P & O)	mg/kg	0.01	60	17000	6600	xxx	26	0.01	0.01				*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*
MTBE	mg/kg	0.005	-	-	-	1634-04-4	26	0.005	0.005				*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Naphthalene	mg/kg	0.04	2.3	1200	190	91-20-3	26	0.04	0.04				*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*
Acenaphthylene	mg/kg	0.03	170	29000	83000	208-96-8	26	0.03	0.03				*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*
Acenaphthene	mg/kg	0.05	210	29000	84000	83-32-9	26	0.05	0.05				*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*
Fluorene	mg/kg	0.04	170	20000	63000	86-73-7	26	0.04	0.04				*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*
Phenanthrene	mg/kg	0.03	95	6200	22000	85-01-8	26	0.03	0.16				*0.03*	*0.03*	0.06	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	0.06	*0.03*	0.06	*0.03*	*0.03*	0.16	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*
Anthracene	mg/kg	0.04	2400	150000	520000	120-12-7	26	0.04	0.04				*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*
Fluoranthene	mg/kg	0.03	280	6300	23000	206-44-0	26	0.03	0.48				*0.03*	*0.03*	0.14	*0.03*	0.11	0.05	*0.03*	*0.03*	*0.03*	0.14	*0.03*	0.13	0.07	*0.03*	0.48	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	0.09
Pyrene	mg/kg	0.03	620	15000	54000	129-00-0	26	0.03	0.33				*0.03*	*0.03*	0.11	*0.03*	0.09	*0.03*	*0.03*	*0.03*	*0.03*	0.12	*0.03*	0.11	0.05	*0.03*	0.33	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	0.06
Benzo(a)anthracene	mg/kg	0.06	7.2	49	170	56-55-3	26	0.06	0.28				*0.06*	*0.06*	0.11	*0.06*	0.11	*0.06*	*0.06*	*0.06*	*0.06*	0.12	*0.06*	0.12	*0.06*	*0.06*	0.28	*0.06*	*0.06*	*0.06*	*0.06*	*0.06*	0.07
Chrysene	mg/kg	0.02	15	93	350	218-01-9	26	0.02	0.33				*0.02*	*0.02*	0.09	*0.02*	0.08	*0.02*	*0.02*	*0.02*	*0.02*	0.09	*0.02*	0.09	0.05	*0.02*	0.33	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	0.07
Benzo(b)fluoranthene	mg/kg	0.05	2.6	13	44	205-99-2	26	0.05	0.36				*0.05*	*0.05*	0.14	*0.05*	0.12	*0.05*	*0.05*	*0.05*	*0.05*	0.13	*0.05*	0.14	0.08	*0.05*	0.36	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	0.09
Benzo(k)fluoranthene	mg/kg	0.02	77	370	1200	207-08-9	26	0.02	0.14				*0.02*	*0.02*	0.05	*0.02*	0.04	*0.02*	*0.02*	*0.02*	*0.02*	0.05	*0.02*	0.05	0.03	*0.02*	0.14	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	0.04
Benzo(a)pyrene (BaP)	mg/kg	0.04	2.2	11	35	50-32-8	26	0.04	0.23				*0.04*	*0.04*	0.1	*0.04*	0.08	*0.04*	*0.04*	*0.04*	*0.04*	0.09	*0.04*	*0.04*	0.05	*0.04*	0.23	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	0.06
Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	27	150	500	193-39-5	26	0.04	0.2				*0.04*	*0.04*	0.07	*0.04*	0.06	*0.04*	*0.04*	*0.04*	*0.04*	0.08	*0.04*	0.08	0.05	*0.04*	0.2	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*
Dibenzo(a,h)anthracene	mg/kg	0.04	0.24	1.1	3.5	53-70-3	26	0.04	0.04				*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*
Benzo(g,h,i)perylene	mg/kg	0.04	320	1400	3900	191-24-2	26	0.04	0.21				*0.04*	*0.04*	0.07	*0.04*	0.06	*0.04*	*0.04*	*0.04*	*0.04*	0.08	*0.04*	0.08	0.05	*0.04*	0.21	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*
Total PAH	mg/kg	0.6	-	-	-	P1874	26	0.6	2.7				*0.6*	*0.6*	0.9	*0.6*	0.8	*0.6*	*0.6*	*0.6*	*0.6*	1	*0.6*	0.9	*0.6*	*0.6*	2.7	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*
PCB (sum of x Aroclors)*	mg/kg		8	-	240	1336-36-3																											
1,2 Dichloroethane	mg/kg		1.6	1800	270	107-06-2																											
1,1,1 Trichloroethane (TCA)	mg/kg		8.8	57000	660	71-55-6																											
1,1,1,2 Tetrachloroethane	mg/kg		1.2	1500	110	630-20-6																											
1,1,2,2 Tetrachloroethane	mg/kg		1.6	1800	270	79-34-5																											
Tetrachloroethene (PCE)	mg/kg		0.18	810	19	127-18-4																											
Carbon Tetrachloride	mg/kg		0.026	190	2.9	56-23-2																											
Trichloroethene (TCE)	mg/kg		0.016	70	1.2	79-01-6																											
Trichloromethane (Chloroform)	mg/kg		0.91	2600	99	67-66-3																											
Vinyl Chloride (Chloroethene)	mg/kg		0.00064	4.8	0.059	75-01-4																											
Asbestos (Presence of)	TEXT		-	-	-	P2039	26						NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	Fibre Bundles
Asbestos Analysts Comments	TEXT		-	-	-	P1889	26						NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	Amosite
Asbestos Fibre Count	%					P1019																											

* Category 4 Screening Levels C4SL

\# EIC/AGS/CL:AIRE Soil Generic Assessment Criteria date January 2010

^ Massachusetts Department of Environmental Protection (MADEP) and the first edition of the SNIFFER Framework

\+ EA Soil Guidance Values for Dioxins, Furans and Dioxin-like PCBs in soils Science Report SC050021/ Dioxins SGVs

This is a summary table and it is possible that not all analytical results are reproduced. Whilst we endeavour to present the data accurately errors can occur during transcribing. The laboratory certificate should be referred to as the authenticated and complete source of results.

Land-use Scenarios - RwHP = Residential with Home Grown Produce, RwoHP = Residential without Home Grown Produce, POSresi = Public Open Space within residential, POSpark = Public Open Space not associated with residential

LOD = Limit of Detection. Results in italics are equal to or less than the LOD

This table should be read in conjunction with the accompanying guide on the selection of evaluation crtieria and the project specific note presenting the justification for selection.

TABLE SUMMARISING SOIL RESULTS AND HIGHLIGHTING EXCEEDANCES ABOVE SOIL ASSESSMENT CRITERIA
PEMBROKE (ELECTROLYSER) INVESTIGATION

SOM 1%			Assessment Criteria		Strata	AG	MG	MG	AG	TS
						WS03	WS05	WS06	WS08	WS09
Analyte	Units	LOD	RwHP	POSpark	Commercial	1.00	0.40	0.40	0.70	0.20
Stones Content	%		-	-	-					
Arsenic	mg/kg	0.5	37	170	640	12.3	8.8	12.2	13	11.8
Cadmium	mg/kg	0.1	11	560	190	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
Chromium Trivalent	mg/kg		910	33000	8600					
Chromium Hexavalent*	mg/kg	0.3	6	220	33	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*
Copper	mg/kg	1	2400	44000	68000	17	13	17	25	28
Lead*	mg/kg	5	200	1300	2300	24	24	31	68	55
Mercury	mg/kg	0.1	40	240	1100	0.2	*0.1*	0.2	*0.1*	0.2
Molybdenum#	mg/kg		-	-	17000					
Nickel	mg/kg	0.7	130	800	980	30	23.1	41.7	22.7	29.7
Selenium	mg/kg	1	250	1800	12000	*1*	*1*	*1*	*1*	*1*
Zinc	mg/kg	5	3700	170000	730000	75	50	116	82	107
Beryllium	mg/kg		1.7	63	12					
Boron	mg/kg		290	46000	240000					
Vanadium	mg/kg		410	5000	9000					
Cyanide (Total)^	mg/kg	0.5	53	53	53	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*
Organic matter	mg/kg	0.2	-	-	-	0.9	0.5	0.7	3.7	6.5
Phenol, Total	mg/kg	0.15	120	440	440	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*
Sulphate (Total) as SO4	mg/l	0.0015	-	-	-	30.8	33.3	54.2	29.8	5.3
pH	pH Units	0.01	-	-	-	7.91	8.55	8.55	8.1	7.65
>C5 to C6 Aliphatic	mg/kg	0.1	42	95000	3200	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
>C6 to C8 Aliphatic	mg/kg	0.1	100	150000	7800	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
>C8 to C10 Aliphatic	mg/kg	0.1	27	14000	2000	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
>C10 to C12 Aliphatic	mg/kg	0.2	130	21000	9700	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*
>C12 to C16 Aliphatic	mg/kg	4	1100	25000	59000	*4*	*4*	*4*	*4*	*4*
>C16 to C21 Aliphatic	mg/kg	7	-	-	-	*7*	*7*	*7*	*7*	*7*
>C21 to C35 Aliphatic	mg/kg	7	-	-	-	*7*	*7*	91	*7*	*7*
>C16 to C35 Aliphatic	mg/kg	14	65000	450000	1600000	*14*	*14*	98	*14*	*14*
>C35 to C44 Aliphatic	mg/kg		65000	450000	1600000					
Total Aliphatic C5-C35	mg/kg	19	-	-	-	*19*	*19*	91	*19*	*19*
>C5 to C7 Aromatic	mg/kg	0.1	70	76000	26000	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
>C7 to C8 Aromatic	mg/kg	0.1	130	87000	56000	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
>C8 to C10 Aromatic	mg/kg	0.1	34	7200	3500	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
>C10 to C12 Aromatic	mg/kg	0.2	74	9200	16000	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*
>C12 to C16 Aromatic	mg/kg	4	140	10000	36000	*4*	*4*	*4*	*4*	*4*
>C16 to C21 Aromatic	mg/kg	7	260	7600	28000	*7*	*7*	*7*	*7*	*7*
>C21 to C35 Aromatic	mg/kg	7	1100	7800	28000	*7*	*7*	153	*7*	*7*
>C35 to C44 Aromatic	mg/kg		1100	7800	28000					
Total Aromatic C5-C35	mg/kg	19	-	-	-	*19*	*19*	153	*19*	*19*
TPH Ali/Aro	mg/kg	38	-	-	-	*38*	*38*	244	*38*	*38*
EPH (C10-C40)	mg/kg		-	-	-					
Hazard Index - RwHP	-	-	-	-	-	0.1	0.1	0.2	0.1	0.1
Hazard Index - POSpark	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0
Hazard Index - Commercial	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0
Benzene	mg/kg	0.005	0.087	90	27	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Ethylbenzene	mg/kg	0.005	47	17000	5700	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Toluene	mg/kg	0.005	130	87000	56000	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Xylene	mg/kg		60	17000	6600					
M- & P-Xylene	mg/kg	0.005	56	17000	5900	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
O-Xylene	mg/kg	0.005	-	-	-	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Total Xylene (M, P & O)	mg/kg	0.01	60	17000	6600	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*
MTBE	mg/kg	0.005	-	-	-	*0.005*	*0.005*	*0.005*	*0.005*	*0.005*
Naphthalene	mg/kg	0.04	2.3	1200	190	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*
Acenaphthylene	mg/kg	0.03	170	29000	83000	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*
Acenaphthene	mg/kg	0.05	210	29000	84000	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*
Fluorene	mg/kg	0.04	170	20000	63000	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*
Phenanthrene	mg/kg	0.03	95	6200	22000	*0.03*	*0.03*	*0.03*	0.09	*0.03*
Anthracene	mg/kg	0.04	2400	150000	520000	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*
Fluoranthene	mg/kg	0.03	280	6300	23000	*0.03*	*0.03*	*0.03*	0.18	*0.03*
Pyrene	mg/kg	0.03	620	15000	54000	*0.03*	*0.03*	*0.03*	0.13	*0.03*
Benzo(a)anthracene	mg/kg	0.06	7.2	49	170	*0.06*	*0.06*	*0.06*	0.11	*0.06*
Chrysene	mg/kg	0.02	15	93	350	*0.02*	*0.02*	*0.02*	0.07	*0.02*
Benzo(b)fluoranthene	mg/kg	0.05	2.6	13	44	*0.05*	*0.05*	*0.05*	0.08	*0.05*
Benzo(k)fluoranthene	mg/kg	0.02	77	370	1200	*0.02*	*0.02*	*0.02*	0.03	*0.02*
Benzo(a)pyrene (BaP)	mg/kg	0.04	2.2	11	35	*0.04*	*0.04*	*0.04*	0.07	*0.04*
Indeno(1,2,3-c,d)pyrene	mg/kg	0.04	27	150	500	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*
Dibenzo(a,h)anthracene	mg/kg	0.04	0.24	1.1	3.5	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*
Benzo(g,h,i)perylene	mg/kg	0.04	320	1400	3900	*0.04*	*0.04*	*0.04*	*0.04*	*0.04*
Total PAH	mg/kg	0.6	-	-	-	*0.6*	*0.6*	*0.6*	0.8	*0.6*
PCB (sum of x Aroclors)*	mg/kg		8	-	240					
1,2 Dichloroethane	mg/kg		1.6	1800	270					
1,1,1 Trichloroethane (TCA)	mg/kg		8.8	57000	660					
1,1,1,2 Tetrachloroethane	mg/kg		1.2	1500	110					
1,1,2,2 Tetrachloroethane	mg/kg		1.6	1800	270					
Tetrachloroethene (PCE)	mg/kg		0.18	810	19					
Carbon Tetrachloride	mg/kg		0.026	190	2.9					
Trichloroethene (TCE)	mg/kg		0.016	70	1.2					
Trichloromethane (Chloroform)	mg/kg		0.91	2600	99					
Vinyl Chloride (Chloroethene)	mg/kg		0.00064	4.8	0.059					
Asbestos (Presence of)	TEXT		-	-	-	NAD	NAD	NAD	NAD	NAD
Asbestos Analysts Comments	TEXT		-	-	-	NAD	NAD	NAD	NAD	NAD
Asbestos Fibre Count	%									

* Category 4 Screening Levels C4SL

\# EIC/AGS/CL:AIRE Soil Generic Assessment Criteria date January 2010

^ Massachusetts Department of Environmental Protection (MADEP) and the first edition of the SNIFFER Framework

\+ EA Soil Guidance Values for Dioxins, Furans and Dioxin-like PCBs in soils Science Report SC050021/ Dioxins SGVs

This is a summary table and it is possible that not all analytical results are reproduced. Whilst we endeavour to present the data accurately errors can occur during transcribing. The laboratory certificate should be referred to as the authenticated and complete source of results.

Land-use Scenarios - RwHP = Residential with Home Grown Produce, RwoHP = Residential without Home Grown Produce, POSresi = Public Open Space within residential, POSpark = Public Open Space not associated with residential

LOD = Limit of Detection. Results in italics are equal to or less than the LOD

This table should be read in conjunction with the accompanying guide on the selection of evaluation crtieria and the project specific note presenting the justification for selection.

Appendix G

Geo-environmental Laboratory Results

App. G.1

Soils

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

RPS
2 Callaghan Square
Cardiff
United Kingdom
CF10 5AZ

Attention :	Karen Dale
Date :	22nd November, 2023
Your reference :	JRF2796
Our reference :	Test Report 23/17207 Batch 1
Location :	Pembroke Electrolyser
Date samples received :	17th October, 2023
Status :	Final Report
Issue :	1

Eight samples were received for analysis on 17th October, 2023 of which eight were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

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

Scope 1&2 emissions - 33.521 kg of CO2

Scope 1&2&3 emissions - 79.219 kg of CO2

Authorised By:

Liza Klebe
Project Co-ordinator

Client Name: RPS
Reference: JRF2796
Location: Pembroke Electrolyser
Contact: Karen Dale
EMT Job No: 23/17207

Report : Solid

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

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-2	3-5	6-8	9-10	11-12	13-14	15-16	17-19			LOD/LOR	Units	Method No.
Sample ID	BH01	WS09	WS06	WS08	WS05	WS03	WS01	WS02					
Depth	0.50	0.20	0.40	0.70	0.40	1.00	0.40	0.30					
COC No / misc													
Containers	V J	V J T	V J T	V J	V J	V J	V J	V J T					
Sample Date	12/10/2023	12/10/2023	12/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023					
Arsenic #	16.3	11.8	12.2	13.0	8.8	12.3	13.0	8.1			<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM30/PM15
Chromium #	28.5	27.4	23.4	24.5	16.2	25.5	23.7	19.2			<0.5	mg/kg	TM30/PM15
Copper #	27	28	17	25	13	17	16	23			<1	mg/kg	TM30/PM15
Lead #	52	55	31	68	24	24	28	19			<5	mg/kg	TM30/PM15
Mercury #	0.2	0.2	0.2	<0.1	<0.1	0.2	<0.1	<0.1			<0.1	mg/kg	TM30/PM15
Nickel #	36.3	29.7	41.7	22.7	23.1	30.0	29.9	15.3			<0.7	mg/kg	TM30/PM15
Selenium #	<1	1	<1	<1	<1	<1	<1	<1			<1	mg/kg	TM30/PM15
Zinc #	84	107	116	82	50	75	72	93			<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03			<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	<0.03	0.09	<0.03	<0.03	<0.03	<0.03			<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	<0.03	0.18	<0.03	<0.03	<0.03	0.09			<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	<0.03	0.13	<0.03	<0.03	<0.03	0.06			<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	0.11	<0.06	<0.06	<0.06	0.07			<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	<0.02	0.07	<0.02	<0.02	<0.02	0.07			<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07	0.11	<0.07	<0.07	<0.07	0.13			<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04	0.07	<0.04	<0.04	<0.04	0.06			<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	<0.6	0.8	<0.6	<0.6	<0.6	<0.6			<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	<0.05	0.09			<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	0.04			<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	94	96	98	102	93	95	82	99			<0	%	TM4/PM8
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4	<4	<4	<4	<4	<4	<4			<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7	<7	<7	<7	<7	<7	<7			<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	<7	91	<7	<7	<7	<7	136			<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35 (EH+HS_CU_1D_AL)	<19	<19	91	<19	<19	<19	<19	136			<19	mg/kg	TM5/TM36/PM8/PM12/PM16

Client Name: RPS
Reference: JRF2796
Location: Pembroke Electrolyser
Contact: Karen Dale
EMT Job No: 23/17207

Report : Solid

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

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-2	3-5	6-8	9-10	11-12	13-14	15-16	17-19			LOD/LOR	Units	Method No.
Sample ID	BH01	WS09	WS06	WS08	WS05	WS03	WS01	WS02					
Depth	0.50	0.20	0.40	0.70	0.40	1.00	0.40	0.30					
COC No / misc													
Containers	V J	V J T	V J T	V J	V J	V J	V J	V J T					
Sample Date	12/10/2023	12/10/2023	12/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023					
TPH CWG													
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	<4	<4	<4	<4	<4	<4			<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7	<7	<7	<7	<7	<7	<7			<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	<7	153	<7	<7	<7	<7	262			<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 (EH+HS_CU_1D_AR) #	<19	<19	153	<19	<19	<19	<19	262			<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35) (EH+HS_CU_1D_Total)	<38	<38	244	<38	<38	<38	<38	398			<38	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15			<0.15	mg/kg	TM26/PM21B
Natural Moisture Content	22.2	60.0	13.4	34.7	12.4	25.1	17.5	21.7			<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3			<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0080	0.0053	0.0542	0.0298	0.0333	0.0308	0.0088	0.0199			<0.0015	g/l	TM38/PM20
Total Cyanide #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			<0.5	mg/kg	TM89/PM45
Organic Matter	2.0	6.5	0.7	3.7	0.5	0.9	0.4	1.6			<0.2	%	TM21/PM24
Sulphide	<10	<10	<10	<10	<10	<10	<10	<10			<10	mg/kg	TM107/PM45
pH #	8.18	7.65	8.55	8.10	8.55	7.91	8.41	8.21			<0.01	pH units	TM73/PM11

Client Name: RPS
Reference: JRF2796
Location: Pembroke Electrolyser
Contact: Karen Dale

Note:

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

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

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

Where trace asbestos is reported the amount of asbestos will be <0.1%.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
23/17207	1	BH01	0.50	2	Charlotte Taylor	09/11/2023	**General Description (Bulk Analysis)**	brown soil/stones
					Charlotte Taylor	09/11/2023	**Asbestos Fibres**	NAD
					Charlotte Taylor	09/11/2023	**Asbestos ACM**	NAD
					Charlotte Taylor	09/11/2023	**Asbestos Type**	NAD
23/17207	1	WS09	0.20	5	Catherine Coles	08/11/2023	**General Description (Bulk Analysis)**	brown soil,roots
					Catherine Coles	08/11/2023	**Asbestos Fibres**	NAD
					Catherine Coles	08/11/2023	**Asbestos ACM**	NAD
					Catherine Coles	08/11/2023	**Asbestos Type**	NAD
23/17207	1	WS06	0.40	8	Catherine Coles	08/11/2023	**General Description (Bulk Analysis)**	brown soil,roots
					Catherine Coles	08/11/2023	**Asbestos Fibres**	NAD
					Catherine Coles	08/11/2023	**Asbestos ACM**	NAD
					Catherine Coles	08/11/2023	**Asbestos Type**	NAD
23/17207	1	WS08	0.70	10	Bart Kuznicki	10/11/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Bart Kuznicki	10/11/2023	**Asbestos Fibres**	NAD
					Bart Kuznicki	10/11/2023	**Asbestos ACM**	NAD
					Bart Kuznicki	10/11/2023	**Asbestos Type**	NAD
23/17207	1	WS05	0.40	12	Anthony Carman	09/11/2023	**General Description (Bulk Analysis)**	Brown Soil/Stones
					Anthony Carman	09/11/2023	**Asbestos Fibres**	NAD
					Anthony Carman	09/11/2023	**Asbestos ACM**	NAD
					Anthony Carman	09/11/2023	**Asbestos Type**	NAD
23/17207	1	WS03	1.00	14	Anthony Carman	09/11/2023	**General Description (Bulk Analysis)**	Brown Soil/Stones
					Anthony Carman	09/11/2023	**Asbestos Fibres**	NAD
					Anthony Carman	09/11/2023	**Asbestos ACM**	NAD
					Anthony Carman	09/11/2023	**Asbestos Type**	NAD
23/17207	1	WS01	0.40	16	Anthony Carman	09/11/2023	**General Description (Bulk Analysis)**	Brown Soil/Stones
					Anthony Carman	09/11/2023	**Asbestos Fibres**	NAD
					Anthony Carman	09/11/2023	**Asbestos ACM**	NAD
					Anthony Carman	09/11/2023	**Asbestos Type**	NAD
23/17207	1	WS02	0.30	19	Anthony Carman	09/11/2023	**General Description (Bulk Analysis)**	Brown Soil/Stones
					Anthony Carman	09/11/2023	**Asbestos Fibres**	Fibre Bundles
					Anthony Carman	09/11/2023	**Asbestos ACM**	NAD
					Anthony Carman	09/11/2023	**Asbestos Type**	Amosite

Client Name: RPS

Matrix : Solid

Reference: JRF2796

Location: Pembroke Electrolyser

Contact: Karen Dale

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
23/17207	1	BH01	0.50	1-2	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17207	1	WS09	0.20	3-5	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17207	1	WS06	0.40	6-8	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17207	1	WS08	0.70	9-10	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17207	1	WS05	0.40	11-12	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17207	1	WS03	1.00	13-14	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17207	1	WS01	0.40	15-16	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17207	1	WS02	0.30	17-19	Cyanide, EPH, GRO, PAH	Sample holding time exceeded

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

SOILS and ASH

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 23/17207

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

EMT Job No: 23/17207

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 Second edition (2021)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.			AR	Yes

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RPS
2 Callaghan Square
Cardiff
United Kingdom
CF10 5AZ

Attention :	Karen Dale
Date :	14th November, 2023
Your reference :	JFR2796
Our reference :	Test Report 23/17621 Batch 1
Location :	Pembroke Electrolyser
Date samples received :	21st October, 2023
Status :	Final Report
Issue :	1

Sixteen samples were received for analysis on 21st October, 2023 of which ten were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

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

Scope 1&2 emissions - 40.544 kg of CO2

Scope 1&2&3 emissions - 95.816 kg of CO2

Authorised By:

Liza Klebe
Project Co-ordinator

Client Name: RPS
Reference: JFR2796
Location: Pembroke Electrolyser
Contact: Karen Dale
EMT Job No: 23/17621

Report : Solid

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

EMT Sample No.	1-3	8-10	13-14	15-16	19-20	21-22	26-28	31-32	35-37	38-40	LOD/LOR	Units	Method No.
Sample ID	BH02	TP09	TP04	TP05	TP07	HP02	TP10	BH03	HP01	TP07			
Depth	0.20	0.20	0.20	0.50	0.20	0.20	0.50	0.20	0.50	0.50			
COC No / misc													
Containers	V J T	V J T	V J	V J	V J	V J	V J T	V J	V J T	V J B			
Sample Date	17/10/2023	17/10/2023	17/10/2023	16/10/2023	16/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	18/10/2023			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023			
Arsenic #	11.5	13.6	15.2	15.1	6.0	5.5	20.7	10.4	9.2	15.7	<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Chromium #	27.1	27.1	22.9	29.4	13.8	13.7	28.7	26.8	25.4	23.1	<0.5	mg/kg	TM30/PM15
Copper #	25	24	35	24	11	17	25	30	36	20	<1	mg/kg	TM30/PM15
Lead #	60	66	46	69	16	27	52	50	47	39	<5	mg/kg	TM30/PM15
Mercury #	0.1	<0.1	<0.1	0.1	<0.1	<0.1	0.1	<0.1	<0.1	0.2	<0.1	mg/kg	TM30/PM15
Nickel #	24.8	26.8	29.9	30.6	10.9	15.2	46.4	28.2	58.4	30.7	<0.7	mg/kg	TM30/PM15
Selenium #	2	1	<1	1	<1	<1	<1	<1	<1	<1	<1	mg/kg	TM30/PM15
Zinc #	85	88	117	106	53	50	131	113	195	92	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	0.06	<0.03	<0.03	<0.03	<0.03	0.06	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	0.14	<0.03	0.07	0.11	<0.03	0.14	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	0.12	<0.03	0.05	0.09	<0.03	0.11	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	0.12	<0.06	<0.06	0.11	<0.06	0.11	<0.06	<0.06	<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	0.09	<0.02	0.05	0.08	<0.02	0.09	<0.02	<0.02	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	0.18	<0.07	0.11	0.16	<0.07	0.19	<0.07	<0.07	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	0.09	<0.04	0.05	0.08	<0.04	0.10	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	0.08	<0.04	0.05	0.06	<0.04	0.07	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	0.08	<0.04	0.05	0.06	<0.04	0.07	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	1.0	<0.6	<0.6	0.8	<0.6	0.9	<0.6	<0.6	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	0.13	<0.05	0.08	0.12	<0.05	0.14	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	0.05	<0.02	0.03	0.04	<0.02	0.05	<0.02	<0.02	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	93	96	98	97	99	100	95	100	99	91	<0	%	TM4/PM8
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	<7	27	<7	<7	<7	<7	32	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35 (EH+HS_CU_1D_AL)	<19	<19	27	<19	<19	<19	<19	32	<19	<19	<19	mg/kg	TM5/TM36/PM8/PM12/PM16

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: RPS
Reference: JFR2796
Location: Pembroke Electrolyser
Contact: Karen Dale
EMT Job No: 23/17621

Report : Solid

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

EMT Sample No.	1-3	8-10	13-14	15-16	19-20	21-22	26-28	31-32	35-37	38-40	LOD/LOR	Units	Method No.
Sample ID	BH02	TP09	TP04	TP05	TP07	HP02	TP10	BH03	HP01	TP07			
Depth	0.20	0.20	0.20	0.50	0.20	0.20	0.50	0.20	0.50	0.50			
COC No / misc													
Containers	V J T	V J T	V J	V J	V J	V J	V J T	V J	V J T	V J B			
Sample Date	17/10/2023	17/10/2023	17/10/2023	16/10/2023	16/10/2023	17/10/2023	17/10/2023	17/10/2023	17/10/2023	18/10/2023			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023			
TPH CWG													
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	<7	21	11	58	27	<7	53	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 (EH+HS_CU_1D_AR) #	<19	<19	21	<19	58	27	<19	53	<19	<19	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35) (EH+HS_CU_1D_Total)	<38	<38	48	<38	58	<38	<38	85	<38	<38	<38	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	mg/kg	TM26/PM21B
Natural Moisture Content	41.9	23.5	28.3	22.0	8.8	12.3	16.7	23.6	21.6	16.4	<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0107	0.0045	0.0155	<0.0015	0.0226	0.0031	0.0342	0.0071	0.3545	0.0502	<0.0015	g/l	TM38/PM20
Total Cyanide #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	mg/kg	TM89/PM45
Organic Matter	5.4	1.9	2.5	2.3	1.0	1.2	0.4	3.8	1.2	0.4	<0.2	%	TM21/PM24
Sulphide	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM107/PM45
pH #	6.14	7.96	8.23	8.02	8.44	8.20	8.66	8.39	7.82	8.43	<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: RPS
Reference: JFR2796
Location: Pembroke Electrolyser
Contact: Karen Dale

Note:

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

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

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

Where trace asbestos is reported the amount of asbestos will be <0.1%.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
23/17621	1	BH02	0.20	3	Bart Kuznicki	10/11/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Bart Kuznicki	10/11/2023	**Asbestos Fibres**	NAD
					Bart Kuznicki	10/11/2023	**Asbestos ACM**	NAD
					Bart Kuznicki	10/11/2023	**Asbestos Type**	NAD
23/17621	1	TP09	0.20	10	Emily Anderton	10/11/2023	**General Description (Bulk Analysis)**	Brown soil with stones and vegetation
					Emily Anderton	10/11/2023	**Asbestos Fibres**	NAD
					Emily Anderton	10/11/2023	**Asbestos ACM**	NAD
					Emily Anderton	10/11/2023	**Asbestos Type**	NAD
23/17621	1	TP04	0.20	14	Bart Kuznicki	10/11/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Bart Kuznicki	10/11/2023	**Asbestos Fibres**	NAD
					Bart Kuznicki	10/11/2023	**Asbestos ACM**	NAD
					Bart Kuznicki	10/11/2023	**Asbestos Type**	NAD
23/17621	1	TP05	0.50	16	Bart Kuznicki	10/11/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Bart Kuznicki	10/11/2023	**Asbestos Fibres**	NAD
					Bart Kuznicki	10/11/2023	**Asbestos ACM**	NAD
					Bart Kuznicki	10/11/2023	**Asbestos Type**	NAD
23/17621	1	TP07	0.20	20	Bart Kuznicki	10/11/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Bart Kuznicki	10/11/2023	**Asbestos Fibres**	NAD
					Bart Kuznicki	10/11/2023	**Asbestos ACM**	NAD
					Bart Kuznicki	10/11/2023	**Asbestos Type**	NAD
23/17621	1	HP02	0.20	22	Bart Kuznicki	10/11/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Bart Kuznicki	10/11/2023	**Asbestos Fibres**	NAD
					Bart Kuznicki	10/11/2023	**Asbestos ACM**	NAD
					Bart Kuznicki	10/11/2023	**Asbestos Type**	NAD
23/17621	1	TP10	0.50	28	Bart Kuznicki	10/11/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Bart Kuznicki	10/11/2023	**Asbestos Fibres**	NAD
					Bart Kuznicki	10/11/2023	**Asbestos ACM**	NAD
					Bart Kuznicki	10/11/2023	**Asbestos Type**	NAD
23/17621	1	BH03	0.20	32	Emily Anderton	10/11/2023	**General Description (Bulk Analysis)**	Brown soil with stones and vegetation
					Emily Anderton	10/11/2023	**Asbestos Fibres**	NAD
					Emily Anderton	10/11/2023	**Asbestos ACM**	NAD
					Emily Anderton	10/11/2023	**Asbestos Type**	NAD

Client Name: RPS
Reference: JFR2796
Location: Pembroke Electrolyser
Contact: Karen Dale

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
23/17621	1	HP01	0.50	37	Bart Kuznicki	10/11/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Bart Kuznicki	10/11/2023	**Asbestos Fibres**	NAD
					Bart Kuznicki	10/11/2023	**Asbestos ACM**	NAD
					Bart Kuznicki	10/11/2023	**Asbestos Type**	NAD
23/17621	1	TP07	0.50	40	Charlotte Taylor	09/11/2023	**General Description (Bulk Analysis)**	brown soil/stones
					Charlotte Taylor	09/11/2023	**Asbestos Fibres**	NAD
					Charlotte Taylor	09/11/2023	**Asbestos ACM**	NAD
					Charlotte Taylor	09/11/2023	**Asbestos Type**	NAD

Client Name: RPS

Matrix : Solid

Reference: JFR2796

Location: Pembroke Electrolyser

Contact: Karen Dale

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
23/17621	1	BH02	0.20	1-3	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17621	1	TP09	0.20	8-10	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17621	1	TP04	0.20	13-14	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17621	1	TP05	0.50	15-16	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17621	1	TP07	0.20	19-20	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17621	1	HP02	0.20	21-22	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17621	1	TP10	0.50	26-28	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17621	1	BH03	0.20	31-32	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17621	1	HP01	0.50	35-37	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17621	1	TP07	0.50	38-40	Cyanide, EPH, GRO, PAH	Sample holding time exceeded

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/17621

SOILS and ASH

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 23/17621

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

EMT Job No: 23/17621

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 Second edition (2021)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.			AR	Yes

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Cardiff
United Kingdom
CF10 5AZ

Attention :	Karen Dale
Date :	15th November, 2023
Your reference :	JFR2796
Our reference :	Test Report 23/17621 Batch 2
Location :	Pembroke Electrolyser
Date samples received :	21st October, 2023
Status :	Final Report
Issue :	1

Fourteen samples were received for analysis on 21st October, 2023 of which eight were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

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

Scope 1&2 emissions - 36.49 kg of CO2

Scope 1&2&3 emissions - 86.234 kg of CO2

Authorised By:

Phil Sommerton BSc
Senior Project Manager

Client Name: RPS
Reference: JFR2796
Location: Pembroke Electrolyser
Contact: Karen Dale
EMT Job No: 23/17621

Report : Solid

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

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	43-44	45-46	47-50	53-56	61-63	64-65	68-69	70-71			LOD/LOR	Units	Method No.
Sample ID	TP01	TP01	TP03	TP08	TP11	TP11	TP02	TP06					
Depth	0.60	1.50	0.50	0.25	0.70	0.20	0.30	0.60					
COC No / misc													
Containers	V J	V J	V J T B	V J T B	V J T	V J	V J	V J					
Sample Date	18/10/2023	18/10/2023	18/10/2023	18/10/2023	19/10/2023	19/10/2023	19/10/2023	20/10/2023					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	2	2	2	2	2	2	2	2					
Date of Receipt	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023					
Arsenic #	16.8	16.8	13.1	22.8	18.7	14.3	16.2	9.1			<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM30/PM15
Chromium #	30.4	29.0	23.2	24.8	25.5	31.8	22.5	18.9			<0.5	mg/kg	TM30/PM15
Copper #	23	42	21	24	21	24	45	23			<1	mg/kg	TM30/PM15
Lead #	31	93	32	86	49	46	130	26			<5	mg/kg	TM30/PM15
Mercury #	0.3	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	0.1			<0.1	mg/kg	TM30/PM15
Nickel #	38.3	37.8	34.5	68.6	55.4	31.1	44.5	20.0			<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1	2	<1	1	2	<1			<1	mg/kg	TM30/PM15
Zinc #	157	119	95	241	132	119	129	90			<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03			<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	<0.03	0.16	<0.03	<0.03	<0.03	0.06			<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.05	<0.03	<0.03	0.48	<0.03	<0.03	<0.03	0.13			<0.03	mg/kg	TM4/PM8
Pyrene #	0.03	<0.03	<0.03	0.33	<0.03	<0.03	<0.03	0.11			<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	0.28	<0.06	<0.06	<0.06	0.12			<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	<0.02	0.33	<0.02	<0.02	<0.02	0.09			<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07	0.50	<0.07	<0.07	<0.07	0.19			<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04	0.23	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	0.20	<0.04	<0.04	<0.04	0.08			<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	0.21	<0.04	<0.04	<0.04	0.08			<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	<0.6	2.7	<0.6	<0.6	<0.6	0.9			<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	0.36	<0.05	<0.05	<0.05	0.14			<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	0.14	<0.02	<0.02	<0.02	0.05			<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	93	107	96	102	104	95	100	99			<0	%	TM4/PM8
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1			<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4	<4	<4	<4	<4	<4	<4			<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7	<7	<7	<7	<7	<7	<7			<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	<7	<7	<7	<7	<7	<7	108			<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35 (EH+HS_CU_1D_AL)	<19	<19	<19	<19	<19	<19	<19	108			<19	mg/kg	TM5/TM36/PM8/PM12/PM16

Element Materials Technology

Client Name: RPS
Reference: JFR2796
Location: Pembroke Electrolyser
Contact: Karen Dale
EMT Job No: 23/17621

Report : Solid

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

EMT Sample No.	43-44	45-46	47-50	53-56	61-63	64-65	68-69	70-71			LOD/LOR	Units	Method No.
Sample ID	TP01	TP01	TP03	TP08	TP11	TP11	TP02	TP06					
Depth	0.60	1.50	0.50	0.25	0.70	0.20	0.30	0.60					
COC No / misc													
Containers	V J	V J	V J T B	V J T B	V J T	V J	V J	V J					
Sample Date	18/10/2023	18/10/2023	18/10/2023	18/10/2023	19/10/2023	19/10/2023	19/10/2023	20/10/2023					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	2	2	2	2	2	2	2	2					
Date of Receipt	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023	21/10/2023					
TPH CWG													
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	<4	<4	<4	<4	<4	<4			<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7	<7	<7	<7	<7	<7	<7			<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	<7	<7	<7	<7	<7	<7	324			<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 (EH+HS_CU_1D_AR) #	<19	<19	<19	<19	<19	<19	<19	324			<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35) (EH+HS_CU_1D_Total)	<38	<38	<38	<38	<38	<38	<38	432			<38	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15			<0.15	mg/kg	TM26/PM21B
Natural Moisture Content	13.7	20.1	12.0	17.4	19.0	30.3	16.0	18.5			<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3			<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0063	0.0130	0.0148	0.0068	0.0102	0.0090	0.0061	0.0129			<0.0015	g/l	TM38/PM20
Total Cyanide #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			<0.5	mg/kg	TM89/PM45
Organic Matter	1.2	0.7	0.5	1.0	0.7	1.9	0.4	1.7			<0.2	%	TM21/PM24
Sulphide	<10	<10	<10	<10	<10	<10	<10	<10			<10	mg/kg	TM107/PM45
pH #	8.41	8.27	8.41	8.11	8.45	8.22	7.12	8.14			<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: RPS
Reference: JFR2796
Location: Pembroke Electrolyser
Contact: Karen Dale

Note:

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

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

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

Where trace asbestos is reported the amount of asbestos will be <0.1%.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
23/17621	2	TP01	0.60	44	Charlotte Taylor	09/11/2023	**General Description (Bulk Analysis)**	brown soil/stones
					Charlotte Taylor	09/11/2023	**Asbestos Fibres**	NAD
					Charlotte Taylor	09/11/2023	**Asbestos ACM**	NAD
					Charlotte Taylor	09/11/2023	**Asbestos Type**	NAD
23/17621	2	TP01	1.50	46	Charlotte Taylor	09/11/2023	**General Description (Bulk Analysis)**	brown soil/stones
					Charlotte Taylor	09/11/2023	**Asbestos Fibres**	NAD
					Charlotte Taylor	09/11/2023	**Asbestos ACM**	NAD
					Charlotte Taylor	09/11/2023	**Asbestos Type**	NAD
23/17621	2	TP03	0.50	50	Emily Anderton	10/11/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Emily Anderton	10/11/2023	**Asbestos Fibres**	NAD
					Emily Anderton	10/11/2023	**Asbestos ACM**	NAD
					Emily Anderton	10/11/2023	**Asbestos Type**	NAD
23/17621	2	TP08	0.25	56	Charlotte Taylor	09/11/2023	**General Description (Bulk Analysis)**	brown soil/stones
					Charlotte Taylor	09/11/2023	**Asbestos Fibres**	NAD
					Charlotte Taylor	09/11/2023	**Asbestos ACM**	NAD
					Charlotte Taylor	09/11/2023	**Asbestos Type**	NAD
23/17621	2	TP11	0.70	63	Charlotte Taylor	08/11/2023	**General Description (Bulk Analysis)**	brown soil/stones
					Charlotte Taylor	08/11/2023	**Asbestos Fibres**	NAD
					Charlotte Taylor	08/11/2023	**Asbestos ACM**	NAD
					Charlotte Taylor	08/11/2023	**Asbestos Type**	NAD
23/17621	2	TP11	0.20	65	Bart Kuznicki	08/11/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Bart Kuznicki	08/11/2023	**Asbestos Fibres**	NAD
					Bart Kuznicki	08/11/2023	**Asbestos ACM**	NAD
					Bart Kuznicki	08/11/2023	**Asbestos Type**	NAD
23/17621	2	TP02	0.30	69	Bart Kuznicki	08/11/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Bart Kuznicki	08/11/2023	**Asbestos Fibres**	NAD
					Bart Kuznicki	08/11/2023	**Asbestos ACM**	NAD
					Bart Kuznicki	08/11/2023	**Asbestos Type**	NAD
23/17621	2	TP06	0.60	71	Emily Anderton	09/11/2023	**General Description (Bulk Analysis)**	Brown soil with stones and vegetation
					Emily Anderton	09/11/2023	**Asbestos Fibres**	NAD
					Emily Anderton	09/11/2023	**Asbestos ACM**	NAD
					Emily Anderton	09/11/2023	**Asbestos Type**	NAD

Client Name: RPS

Matrix : Solid

Reference: JFR2796

Location: Pembroke Electrolyser

Contact: Karen Dale

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
23/17621	2	TP01	0.60	43-44	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17621	2	TP01	1.50	45-46	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17621	2	TP03	0.50	47-50	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17621	2	TP08	0.25	53-56	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17621	2	TP11	0.70	61-63	EPH, GRO, PAH	Sample holding time exceeded
23/17621	2	TP11	0.20	64-65	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17621	2	TP02	0.30	68-69	Cyanide, EPH, GRO, PAH	Sample holding time exceeded
23/17621	2	TP06	0.60	70-71	Cyanide, EPH, GRO, PAH	Sample holding time exceeded

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/17621

SOILS and ASH

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 23/17621

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

EMT Job No: 23/17621

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 Second edition (2021)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.			AR	Yes

App. G.2

Groundwater

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RPS
2 Callaghan Square
Cardiff
United Kingdom
CF10 5AZ

Attention :	Karen Dale
Date :	4th December, 2023
Your reference :	JER2796
Our reference :	Test Report 23/19644 Batch 1
Location :	Pembroke Electroloyse
Date samples received :	22nd November, 2023
Status :	Final Report
Issue :	202312041559

One sample was received for analysis on 22nd November, 2023 and was scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

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

Scope 1&2 emissions - 2.244 kg of CO2

Scope 1&2&3 emissions - 5.304 kg of CO2

Authorised By:

Bruce Leslie
Project Manager

Client Name: RPS
Reference: JER2796
Location: Pembroke Electroloyse
Contact: Karen Dale
EMT Job No: 23/19644

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-6										LOD/LOR	Units	Method No.
Sample ID	BH03												
Depth													
COC No / misc													
Containers	V N Z P G												
Sample Date	20/11/2023												
Sample Type	Ground Water												
Batch Number	1												
Date of Receipt	22/11/2023												
Dissolved Arsenic #	<2.5										<2.5	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5										<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5										<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7										<7	ug/l	TM30/PM14
Dissolved Lead #	<5										<5	ug/l	TM30/PM14
Dissolved Mercury #	<1										<1	ug/l	TM30/PM14
Dissolved Nickel #	<2										<2	ug/l	TM30/PM14
Dissolved Selenium #	<3										<3	ug/l	TM30/PM14
Dissolved Zinc #	<3										<3	ug/l	TM30/PM14
Total Hardness Dissolved (as CaCO3)	402										<1	mg/l	TM30/PM14
PAH MS													
Naphthalene #	<0.1										<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.005										<0.005	ug/l	TM4/PM30
Acenaphthene #	<0.005										<0.005	ug/l	TM4/PM30
Fluorene #	<0.005										<0.005	ug/l	TM4/PM30
Phenanthrene #	<0.005										<0.005	ug/l	TM4/PM30
Anthracene #	<0.005										<0.005	ug/l	TM4/PM30
Fluoranthene #	0.007										<0.005	ug/l	TM4/PM30
Pyrene #	0.008										<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.005										<0.005	ug/l	TM4/PM30
Chrysene #	<0.005										<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	0.011										<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	0.006										<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	0.005										<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005										<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	0.005										<0.005	ug/l	TM4/PM30
PAH 16 Total #	<0.173										<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008										<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008										<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	90										<0	%	TM4/PM30
MTBE #	<5										<5	ug/l	TM36/PM12
Benzene #	<5										<5	ug/l	TM36/PM12
Toluene #	<5										<5	ug/l	TM36/PM12
Ethylbenzene #	<5										<5	ug/l	TM36/PM12
m/p-Xylene #	<5										<5	ug/l	TM36/PM12
o-Xylene #	<5										<5	ug/l	TM36/PM12

Element Materials Technology

Client Name: RPS
Reference: JER2796
Location: Pembroke Electroloyse
Contact: Karen Dale
EMT Job No: 23/19644

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

EMT Sample No.	1-6										Please see attached notes for all abbreviations and acronyms		
Sample ID	BH03												
Depth													
COC No / misc													
Containers	V N Z P G												
Sample Date	20/11/2023												
Sample Type	Ground Water												
Batch Number	1												
Date of Receipt	22/11/2023												
											LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	<10										<10	ug/l	TM36/PM12
>C6-C8 #	<10										<10	ug/l	TM36/PM12
>C8-C10 #	<10										<10	ug/l	TM36/PM12
>C10-C12 #	<5										<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10										<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10										<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10										<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10										<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7 #	<10										<10	ug/l	TM36/PM12
>EC7-EC8 #	<10										<10	ug/l	TM36/PM12
>EC8-EC10 #	<10										<10	ug/l	TM36/PM12
>EC10-EC12 #	<5										<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10										<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10										<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10										<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10										<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10										<10	ug/l	TM5/TM36/PM12/PM16/PM30
Phenol #	<0.01										<0.01	mg/l	TM26/PM0
Sulphate as SO4 #	29.8										<0.5	mg/l	TM38/PM0
Total Cyanide #	<0.01										<0.01	mg/l	TM89/PM0
Hexavalent Chromium	<0.006										<0.006	mg/l	TM38/PM0
Sulphide	<0.01										<0.01	mg/l	TM107/PM0
pH #	8.12										<0.01	pH units	TM73/PM0
Total Organic Carbon #	<2										<2	mg/l	TM60/PM0

Client Name: RPS
Reference: JER2796
Location: Pembroke Electroloyse
Contact: Karen Dale

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 23/19644						

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/19644

SOILS and ASH

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

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

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 23/19644

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013l	PM0	No preparation is required.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013l	PM0	No preparation is required.	Yes			

EMT Job No: 23/19644

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM0	No preparation is required.				

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RPS
2 Callaghan Square
Cardiff
United Kingdom
CF10 5AZ

Attention :	Patrick Roberts
Date :	18th December, 2023
Your reference :	JFR2796
Our reference :	Test Report 23/20365 Batch 1
Location :	..
Date samples received :	2nd December, 2023
Status :	Final Report
Issue :	202312180912

Two samples were received for analysis on 2nd December, 2023 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

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

Scope 1&2 emissions - 4.489 kg of CO2

Scope 1&2&3 emissions - 10.608 kg of CO2

Authorised By:

Phil Sommerton BSc
Senior Project Manager

Element Materials Technology

Client Name: RPS
Reference: JFR2796
Location: ..
Contact: Patrick Roberts
EMT Job No: 23/20365

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-6	7-12										
Sample ID	BH01	BH02										
Depth												
COC No / misc												
Containers	V N Z P G	V N Z P G										
Sample Date	30/11/2023	30/11/2023										
Sample Type	Liquid	Liquid										
Batch Number	1	1										
Date of Receipt	02/12/2023	02/12/2023										

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Dissolved Arsenic	<2.5	<2.5									<2.5	ug/l	TM30/PM14
Dissolved Cadmium	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Total Dissolved Chromium	<1.5	<1.5									<1.5	ug/l	TM30/PM14
Dissolved Copper	<7	<7									<7	ug/l	TM30/PM14
Dissolved Lead	<5	<5									<5	ug/l	TM30/PM14
Dissolved Mercury	<1	<1									<1	ug/l	TM30/PM14
Dissolved Nickel	<2	<2									<2	ug/l	TM30/PM14
Dissolved Selenium	<3	<3									<3	ug/l	TM30/PM14
Dissolved Zinc	<3	<3									<3	ug/l	TM30/PM14
Total Hardness Dissolved (as CaCO3)	415	365									<1	mg/l	TM30/PM14
PAH MS													
Naphthalene	<0.1	<0.1									<0.1	ug/l	TM4/PM30
Acenaphthylene	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Acenaphthene	<0.005	0.005									<0.005	ug/l	TM4/PM30
Fluorene	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Phenanthrene	<0.005	0.017									<0.005	ug/l	TM4/PM30
Anthracene	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Fluoranthene	0.005	0.026									<0.005	ug/l	TM4/PM30
Pyrene	0.005	0.019									<0.005	ug/l	TM4/PM30
Benzo(a)anthracene	<0.005	0.015									<0.005	ug/l	TM4/PM30
Chrysene	<0.005	0.020									<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene	<0.008	0.032									<0.008	ug/l	TM4/PM30
Benzo(a)pyrene	<0.005	0.013									<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene	<0.005	0.011									<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene	<0.005	0.009									<0.005	ug/l	TM4/PM30
PAH 16 Total	<0.173	<0.173									<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	0.023									<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	0.009									<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	100	99									<0	%	TM4/PM30
MTBE	<5	<5									<5	ug/l	TM36/PM12
Benzene	<5	<5									<5	ug/l	TM36/PM12
Toluene	<5	<5									<5	ug/l	TM36/PM12
Ethylbenzene	<5	<5									<5	ug/l	TM36/PM12
m/p-Xylene	<5	<5									<5	ug/l	TM36/PM12
o-Xylene	<5	<5									<5	ug/l	TM36/PM12

Client Name: RPS
Reference: JFR2796
Location: ..
Contact: Patrick Roberts
EMT Job No: 23/20365

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

EMT Sample No.	1-6	7-12									LOD/LOR	Units	Method No.
Sample ID	BH01	BH02											
Depth													
COC No / misc													
Containers	V N Z P G	V N Z P G											
Sample Date	30/11/2023	30/11/2023											
Sample Type	Liquid	Liquid											
Batch Number	1	1											
Date of Receipt	02/12/2023	02/12/2023											
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL)	<10	<10									<10	ug/l	TM36/PM12
>C6-C8 (HS_1D_AL)	<10	<10									<10	ug/l	TM36/PM12
>C8-C10 (HS_1D_AL)	<10	<10									<10	ug/l	TM36/PM12
>C10-C12 (EH_CU_1D_AL)	<5	<5									<5	ug/l	TM5/PM16/PM30
>C12-C16 (EH_CU_1D_AL)	<10	<10									<10	ug/l	TM5/PM16/PM30
>C16-C21 (EH_CU_1D_AL)	<10	<10									<10	ug/l	TM5/PM16/PM30
>C21-C35 (EH_CU_1D_AL)	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 (EH_CU+HS_1D_AL)	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7 (HS_1D_AR)	<10	<10									<10	ug/l	TM36/PM12
>EC7-EC8 (HS_1D_AR)	<10	<10									<10	ug/l	TM36/PM12
>EC8-EC10 (HS_1D_AR)	<10	<10									<10	ug/l	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)	<5	<5									<5	ug/l	TM5/PM16/PM30
>EC12-EC16 (EH_CU_1D_AR)	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC16-EC21 (EH_CU_1D_AR)	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC21-EC35 (EH_CU_1D_AR)	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 (EH_CU+HS_1D_AR)	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) (EH_CU+HS_1D_Total)	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Phenol	<0.01	<0.01									<0.01	mg/l	TM26/PM0
Sulphate as SO4	69.7	21.5									<0.5	mg/l	TM38/PM0
Total Cyanide	<0.01	<0.01									<0.01	mg/l	TM89/PM0
Hexavalent Chromium	<0.006	<0.006									<0.006	mg/l	TM38/PM0
Sulphide	<0.01	<0.01									<0.01	mg/l	TM107/PM0
pH	7.52	7.31									<0.01	pH units	TM73/PM0
Total Organic Carbon	<2	<2									<2	mg/l	TM60/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: RPS
Reference: JFR2796
Location: ..
Contact: Patrick Roberts

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 23/20365						

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/20365

SOILS and ASH

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

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

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 23/20365

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.				
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.				
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.				
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.				

EMT Job No: 23/20365

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM0	No preparation is required.				

Appendix H

Geotechnical Laboratory Results

Laboratory Report

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES A PHENNA GROUP COMPANY

Contract Number: 69335

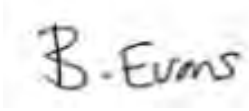
Client Ref: **JER2796**
Client PO: **PO23-0767**

Date Received: **10-11-2023**
Date Completed: **22-11-2023**
Report Date: **22-11-2023**

Client: **RPS Group**
90 Victoria Street
Bristol
BS1 6DP

Contract Title: **Pembroke (Electrolyser)**
For the attention of: **Patrick Roberts**

This report has been checked and approved by:



Brendan Evans
Office Administrator

Test Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	37
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	33
Particle Density (Gas Jar) BS 1377:1990 - Part 2 : 8.2 - * UKAS	2
PSD Wet Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	7
PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected) BS 1377:1990 - Part 2 : 9.4 - * UKAS	7
Dry Den/MC (2.5kg Rammer Method 1 litre mould/CBR Mould) BS 1377:1990 - Part 4 : 3.4 - * UKAS	3
Determination of Point Load Value Axial or Diametrical including WC ***Please note GSTL is not accredited for the water content of rock*** ISRM Suggested Method for Point Load Strength - * UKAS	16
Uniaxial Compressive Strength of Rock inc sample prep 54-165mm diameter cores ISRM Suggested Method for determining uniaxial compressive strength - @ Non Accredited Test	1
Disposal of samples for job	1

Notes - Observations and Interpretations are outside the UKAS Accreditation
*** - denotes test included in laboratory scope of accreditation**
 # - denotes test carried out by approved contractor
@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

Approved Signatories:
Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (Human Resources/ Health and Safety Manager)

GEO Site & Testing Services Ltd
Units 3-4, Heol Aur, Dafen, Llanelli, Carmarthenshire, Wales SA14 8QN
Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

Natural Moisture Content
(BS 1377:1990 - Part 2 : 3.2)
DESCRIPTIONS

GSTL — Geotechnical Site & Testing Laboratories

Contract Number	69335
Site Name	Pembroke (Electrolyser)
Date Tested	17/11/2023

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
BH03		D	1.50	-	1.60	Brown gravelly silty CLAY
BH03		D	2.50	-	2.60	Brown gravelly silty CLAY
BH03		D	3.50	-	3.60	Brown gravelly silty CLAY
BH03		D	5.60	-	5.70	Brown gravelly silty CLAY

Operators
Clayton Jenkins

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

Natural Moisture Content
(BS 1377:1990 - Part 2 : 3.2)

Contract Number	69335
Project Name	Pembroke (Electrolyser)
Date Tested	17/11/2023

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Remarks
BH03		D	1.50	-	1.60	13	
BH03		D	2.50	-	2.60	18	
BH03		D	3.50	-	3.60	13	
BH03		D	5.60	-	5.70	20	

Operator
Clayton Jenkins

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377:1990 - Part 2 : 4.3 & 5.3)	
Contract Number	69335	
Project Name	Pembroke (Electrolyser)	
Date Tested	17/11/2023	
	DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
WS01		D	2.70	-	2.80	Brown gravelly silty CLAY
WS04		D	2.55	-	2.70	Brown gravelly silty CLAY
WS06		B	0.40	-	0.60	Brown gravelly silty CLAY
WS07		B	0.60	-	0.80	Brown gravelly silty CLAY
WS02		B	0.30	-	0.50	Brown gravelly silty sandy CLAY
WS03		B	1.00	-	1.20	Brown gravelly silty sandy CLAY
WS05		B	0.30	-	0.50	Brown gravelly silty CLAY
WS08		B	0.60	-	0.80	Brown gravelly silty CLAY
WS09		B	0.80	-	1.00	Brown gravelly silty CLAY
BH02		D	2.95	-	3.00	Brown gravelly silty CLAY
BH02		B	0.70	-	0.80	Brown fine to coarse sandy fine to coarse gravelly silty CLAY
BH02		D	7.15	-	7.30	Brown silty CLAY
BH02		D	9.40	-	9.50	Brown silty CLAY
BH01		B	0.40	-	0.60	Brown fine to medium gravelly fine to coarse sandy silty CLAY
BH01		D	2.20	-	2.30	Brown gravelly silty CLAY
BH01		D	6.70	-	6.80	Brown gravelly silty CLAY
BH01		D	10.30	-	10.40	Brown gravelly silty CLAY
HP02		B	1.00	-	1.10	Brown gravelly silty CLAY
TP02		B	1.60	-	1.70	Brown fine to coarse gravelly fine to coarse sandy silty CLAY
TP02		D	2.70	-		Brown gravelly silty CLAY
TP04		B	1.90	-	2.10	Brown gravelly silty CLAY
TP10		B	1.50	-	1.70	Brown fine to coarse sandy fine to coarse gravelly silty CLAY
TP11		B	0.60	-	0.80	Brown silty clayey fine to coarse sandy fine to coarse GRAVEL
TP11		B	1.20	-	1.40	Brown gravelly silty CLAY

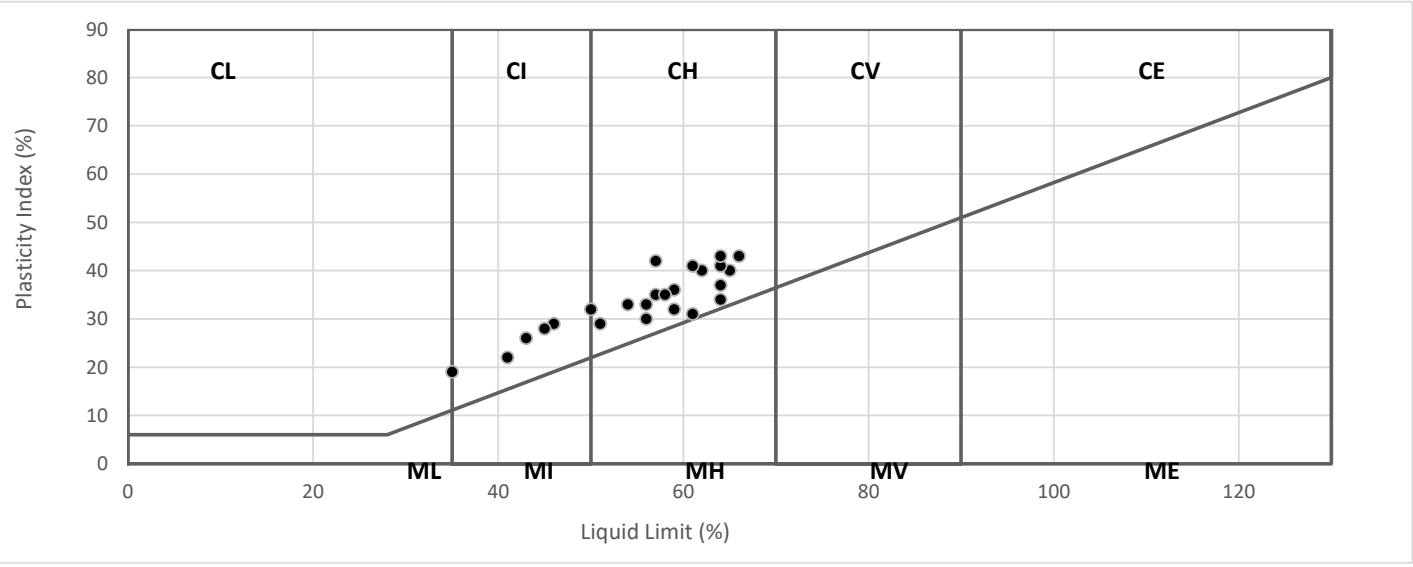
Operator
Clayton Jenkins

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377:1990 - Part 2 : 4.3 & 5.3)	
Contract Number	69335	
Project Name	Pembroke (Electrolyser)	
Date Tested	17/11/2023	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
WS01		D	2.70	-	2.80	16	46	17	29	74	CI Intermediate Plasticity
WS04		D	2.55	-	2.70	17	50	18	32	89	CI/H Inter/High Plasticity
WS06		B	0.40	-	0.60	19	62	22	40	75	CH High Plasticity
WS07		B	0.60	-	0.80	25	54	21	33	82	CH High Plasticity
WS02		B	0.30	-	0.50	17	45	17	28	85	CI Intermediate Plasticity
WS03		B	1.00	-	1.20	28	57	22	35	82	CH High Plasticity
WS05		B	0.30	-	0.50	22	59	23	36	81	CH High Plasticity
WS08		B	0.60	-	0.80	49	61	30	31	80	CH High Plasticity
WS09		B	0.80	-	1.00	27	66	23	43	81	CH High Plasticity
BH02		D	2.95	-	3.00	15	41	19	22	85	CI Intermediate Plasticity
BH02		B	0.70	-	0.80	15	43	17	26	64	CI Intermediate Plasticity
BH02		D	7.15	-	7.30	30	59	27	32	100	CH High Plasticity
BH02		D	9.40	-	9.50	24	56	26	30	100	CH High Plasticity
BH01		B	0.40	-	0.60	30	65	25	40	72	CH High Plasticity
BH01		D	2.20	-	2.30	13	35	16	19	87	CL/I Low/Inter. Plasticity
BH01		D	6.70	-	6.80	21	56	23	33	87	CH High Plasticity
BH01		D	10.30	-	10.40	24	61	20	41	55	CH High Plasticity
HP02		B	1.00	-	1.10	32	64	27	37	80	CH High Plasticity
TP02		B	1.60	-	1.70	26	64	23	41	83	CH High Plasticity
TP02		D	2.70	-		36	64	30	34	85	CH High Plasticity
TP04		B	1.90	-	2.10	16	57	15	42	71	CH High Plasticity
TP10		B	1.50	-	1.70	20	51	22	29	38	CH High Plasticity
TP11		B	0.60	-	0.80	27	64	21	43	36	CH High Plasticity
TP11		B	1.20	-	1.40	19	58	23	35	89	CH High Plasticity

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:2015+A1:2020



Operator
Clayton Jenkins

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377:1990 - Part 2 : 4.3 & 5.3)	
Contract Number	69335	
Project Name	Pembroke (Electrolyser)	
Date Tested	17/11/2023	
	DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
TP06		B	0.40	-	0.60	Brown gravelly silty CLAY
TP01		B	0.50	-	0.70	Brown fine to coarse gravelly fine to coarse sandy silty CLAY
TP01		B	1.70	-	1.90	Brown gravelly silty CLAY
TP09		B	0.40	-	0.60	Brown gravelly sandy silty CLAY
TP03		B	1.50	-	1.70	Brown silty CLAY
TP05		D	2.80	-	2.80	Brown gravelly silty CLAY
BH03		B	0.80	-	0.90	Brown gravelly silty CLAY
BH03		D	4.50	-		Brown gravelly silty CLAY
BH03		D	6.20	-	6.30	Brown gravelly silty CLAY
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		

Operator
Clayton Jenkins

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377:1990 - Part 2 : 4.3 & 5.3)	
Contract Number	69335	
Project Name	Pembroke (Electrolyser)	
Date Tested	17/11/2023	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
TP06		B	0.40	-	0.60	17	49	20	29	79	CI Intermediate Plasticity
TP01		B	0.50	-	0.70	31	59	25	34	80	CH High Plasticity
TP01		B	1.70	-	1.90	28	58	23	35	88	CH High Plasticity
TP09		B	0.40	-	0.60	22	61	21	40	80	CH High Plasticity
TP03		B	1.50	-	1.70	24	60	21	39	100	CH High Plasticity
TP05		D	2.80	-	2.80	21	57	22	35	85	CH High Plasticity
BH03		B	0.80	-	0.90	24	53	23	30	85	CH High Plasticity
BH03		D	4.50	-		17	46	17	29	82	CI Intermediate Plasticity
BH03		D	6.20	-	6.30	22	48	18	30	89	CI Intermediate Plasticity
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
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				-							
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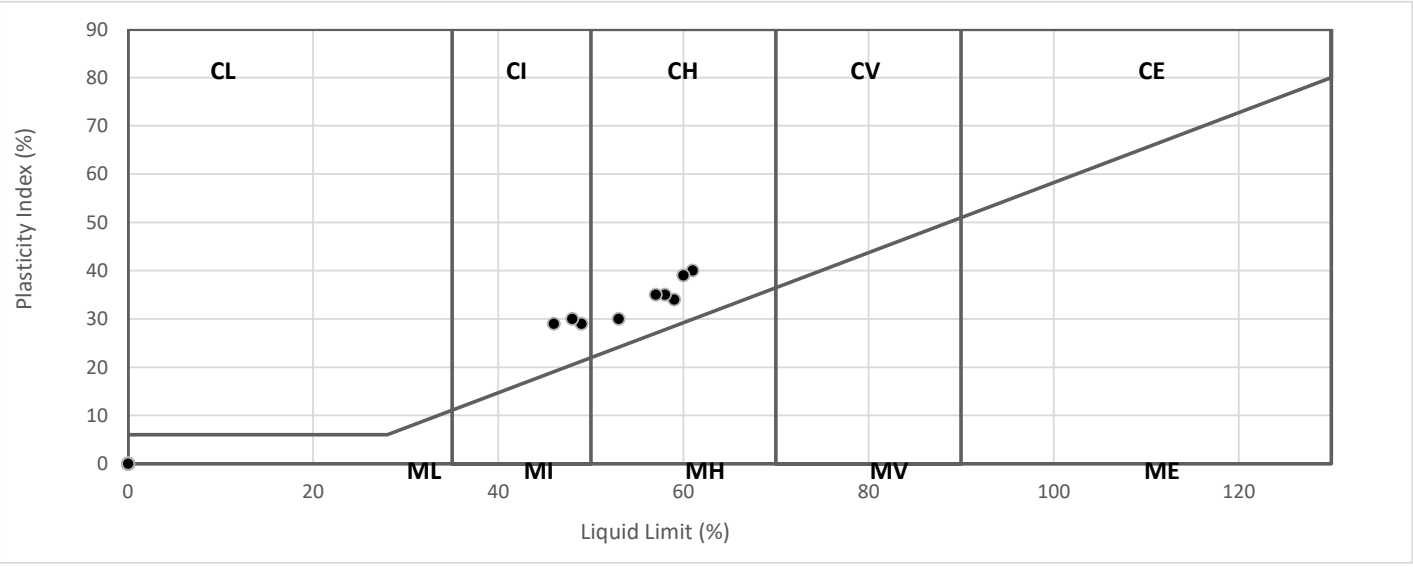
Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:2015+A1:2020



Operator
Clayton Jenkins

UKAS TESTING 2788

PARTICLE DENSITY BY GAS JAR
(BS 1377 : PART 2 : 8.2 : 1990)

Contract Number	69335
Project Name	Pembroke (Electrolyser)
Date Tested	17/11/2023

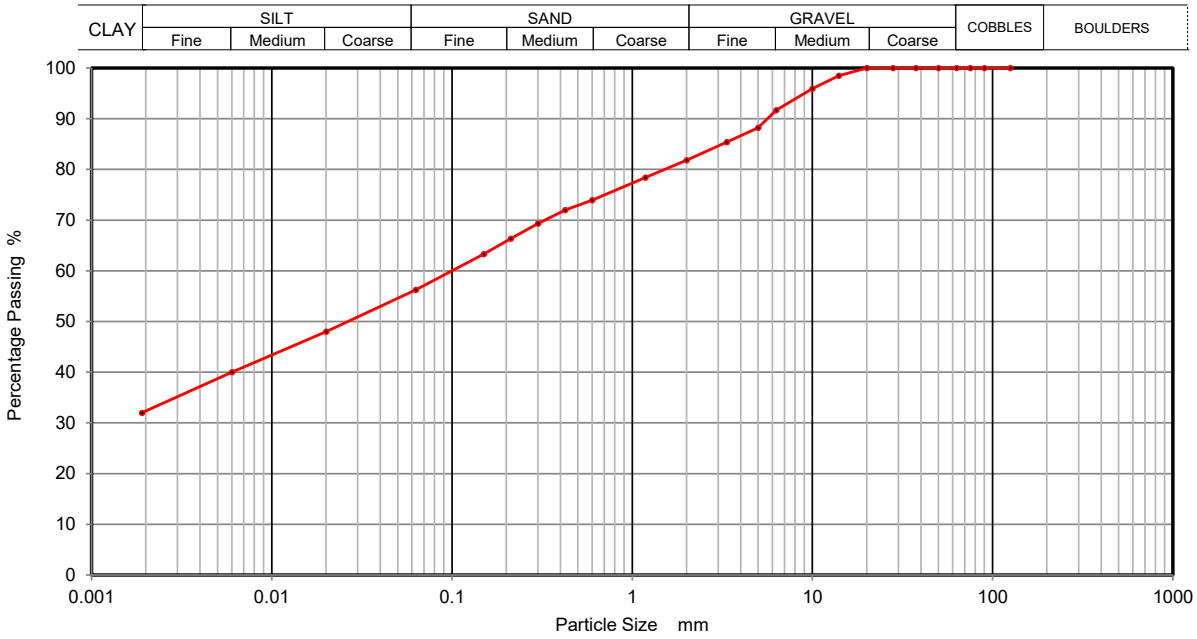
Hole Reference	Sample Number	Sample Type	Depth (m)							Particle Density		Remarks
TP02		B	0.20	-	0.40					2.62		
TP10		B	1.50	-	1.70					2.69		

Key	Reported As
Moisture Content	%
Bulk Density	Mg/m^3
Dry Density	Mg/m^3
Particle Density	Mg/m^3
Air Voids	%

Operator
Conal Aliffe

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	69335
		Borehole/Pit No.	BH01
Project Name	Pembroke (Electrolyser)	Sample No.	
Soil Description	Brown fine to medium gravelly fine to coarse sandy silty CLAY	Depth Top	0.40
		Depth Base	0.60
Date Tested	21/11/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	48
90	100	0.0060	40
75	100	0.0020	32
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	96		
6.3	92		
5	88		
3.35	85		
2	82		
1.18	78		
0.6	74		
0.425	72		
0.3	69		
0.212	66		
0.15	63		
0.063	56		

Sample Proportions	% dry mass
Cobbles	0
Gravel	18
Sand	26
Silt	24
Clay	32

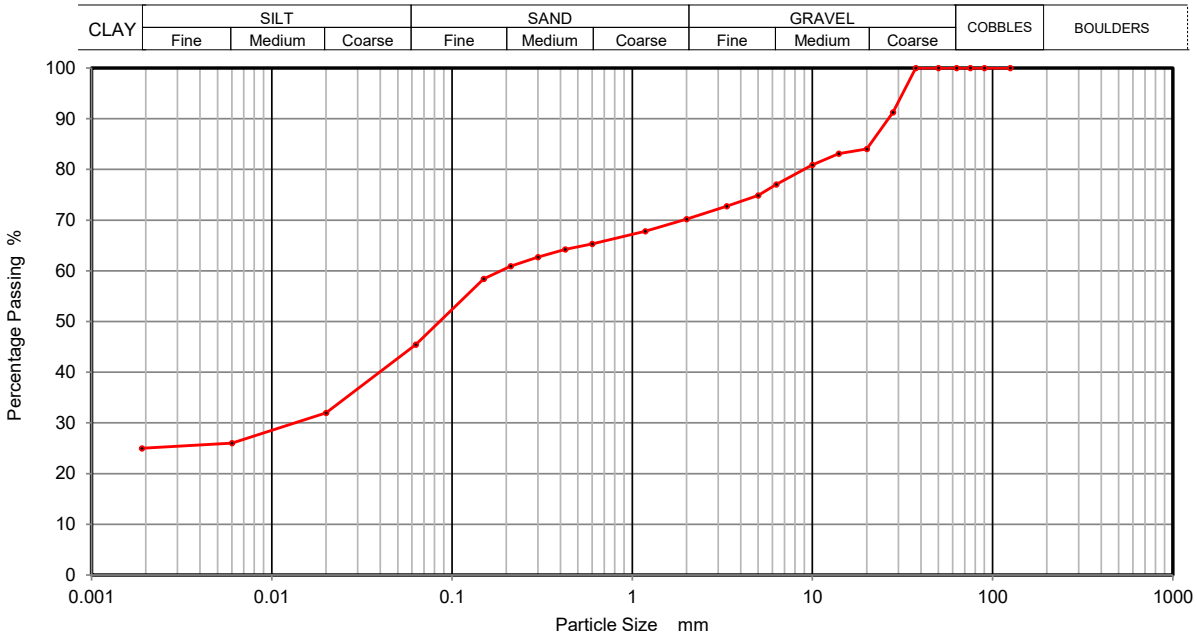
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4	Contract Number	69335
		Borehole/Pit No.	BH02
Project Name	Pembroke (Electrolyser)	Sample No.	
Soil Description	Brown fine to coarse sandy fine to coarse gravelly silty CLAY	Depth Top	0.70
		Depth Base	0.80
Date Tested	21/11/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	32
90	100	0.0060	26
75	100	0.0020	25
63	100		
50	100		
37.5	100		
28	91		
20	84		
14	83		
10	81		
6.3	77		
5	75		
3.35	73		
2	70		
1.18	68		
0.6	65		
0.425	64		
0.3	63		
0.212	61		
0.15	58		
0.063	45		

Sample Proportions	% dry mass
Cobbles	0
Gravel	30
Sand	25
Silt	20
Clay	25

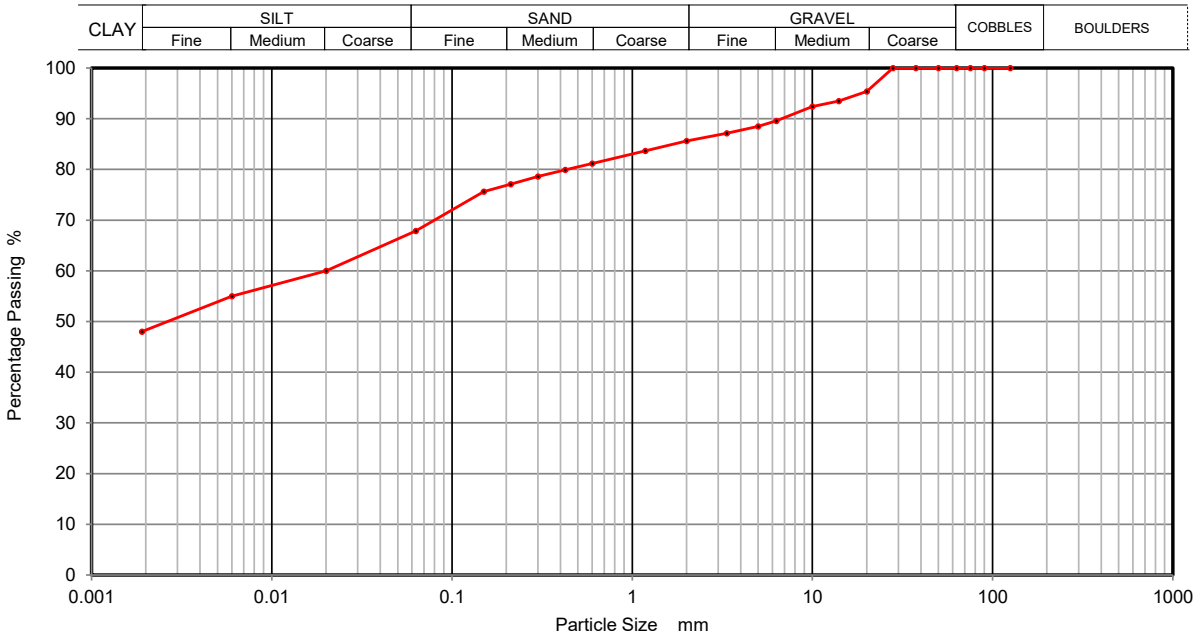
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING
2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	69335
		Borehole/Pit No.	TP01
Project Name	Pembroke (Electrolyser)	Sample No.	
Soil Description	Brown fine to coarse gravelly fine to coarse sandy silty CLAY	Depth Top	0.50
		Depth Base	0.70
Date Tested	21/11/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	60
90	100	0.0060	55
75	100	0.0020	48
63	100		
50	100		
37.5	100		
28	100		
20	95		
14	93		
10	92		
6.3	90		
5	89		
3.35	87		
2	86		
1.18	84		
0.6	81		
0.425	80		
0.3	79		
0.212	77		
0.15	76		
0.063	68		

Sample Proportions	% dry mass
Cobbles	0
Gravel	14
Sand	18
Silt	20
Clay	48

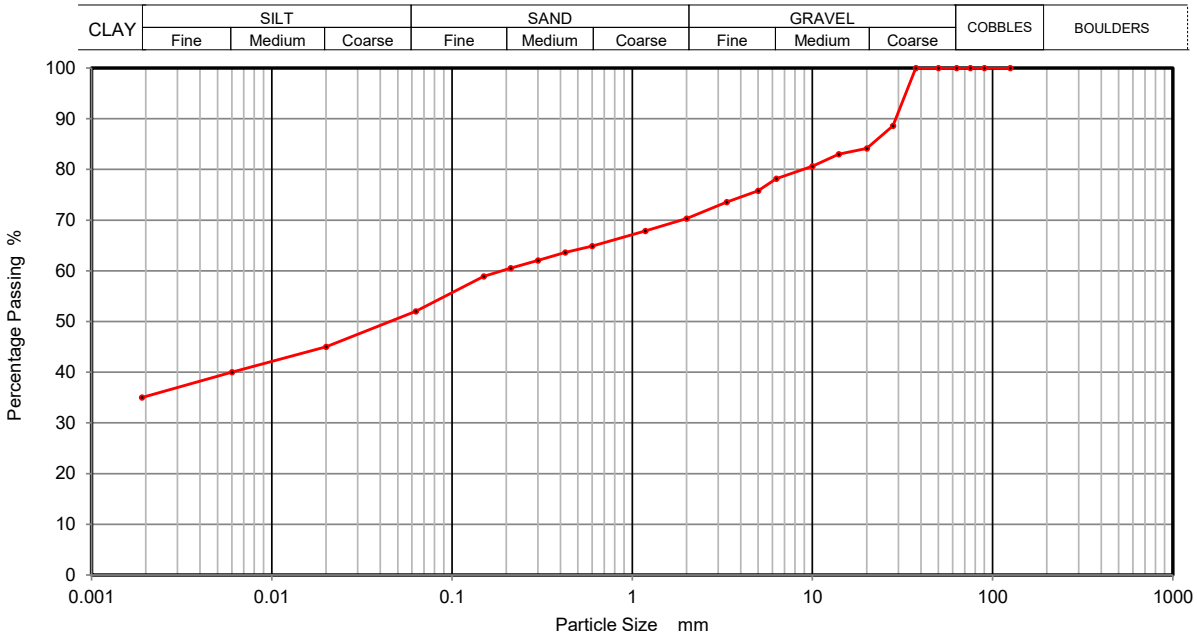
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	69335
		Borehole/Pit No.	TP02
Project Name	Pembroke (Electrolyser)	Sample No.	
Soil Description	Brown fine to coarse sandy fine to coarse gravelly silty CLAY	Depth Top	0.20
		Depth Base	0.40
Date Tested	21/11/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	45
90	100	0.0060	40
75	100	0.0020	35
63	100		
50	100		
37.5	100		
28	89		
20	84		
14	83		
10	81		
6.3	78		
5	76		
3.35	74		
2	70		
1.18	68		
0.6	65		
0.425	64		
0.3	62		
0.212	61		
0.15	59		
0.063	52		

Sample Proportions	% dry mass
Cobbles	0
Gravel	30
Sand	18
Silt	17
Clay	35

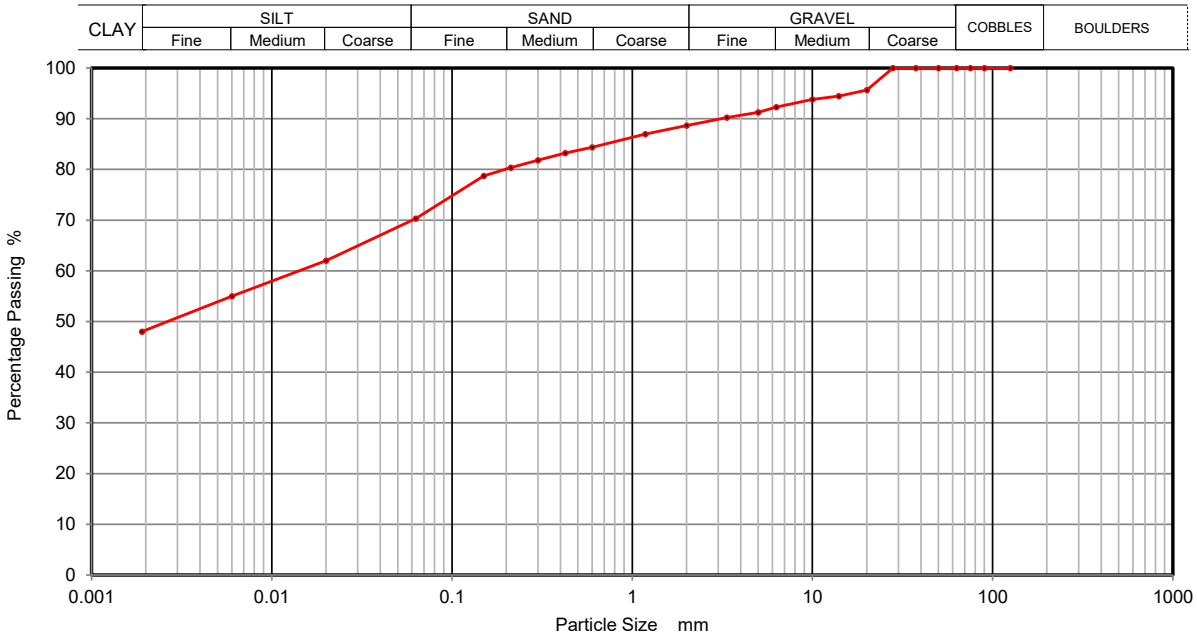
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	69335
		Borehole/Pit No.	TP02
Project Name	Pembroke (Electrolyser)	Sample No.	
Soil Description	Brown fine to coarse gravelly fine to coarse sandy silty CLAY	Depth Top	1.60
		Depth Base	1.70
Date Tested	21/11/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	62
90	100	0.0060	55
75	100	0.0020	48
63	100		
50	100		
37.5	100		
28	100		
20	96		
14	94		
10	94		
6.3	92		
5	91		
3.35	90		
2	89		
1.18	87		
0.6	84		
0.425	83		
0.3	82		
0.212	80		
0.15	79		
0.063	70		

Sample Proportions	% dry mass
Cobbles	0
Gravel	11
Sand	19
Silt	22
Clay	48

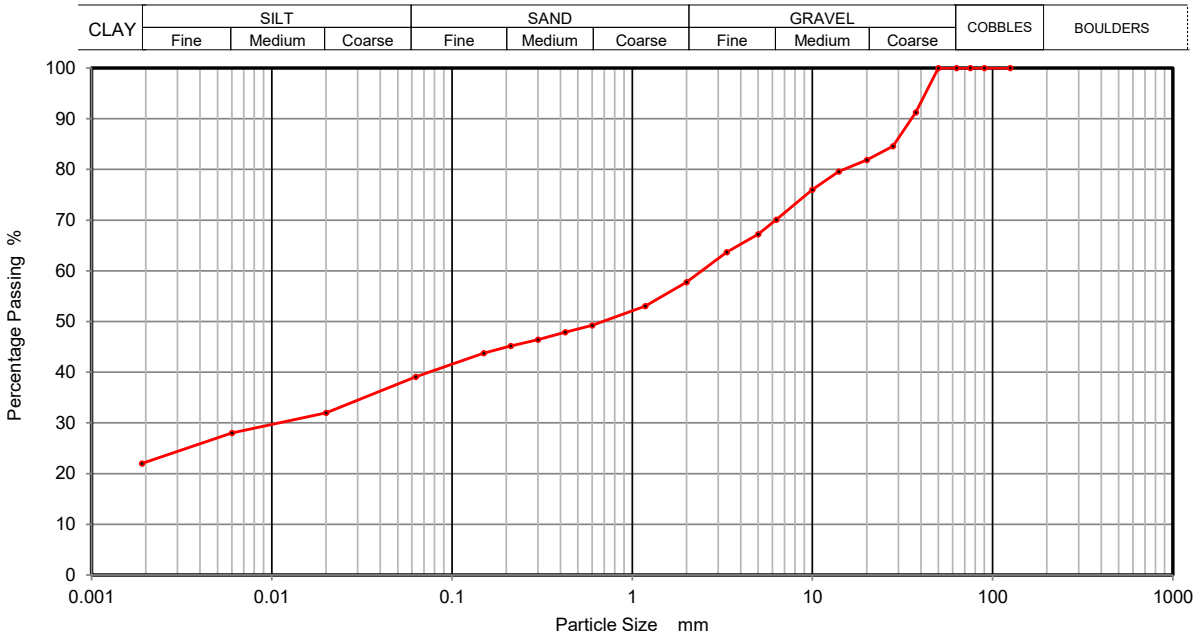
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	69335
		Borehole/Pit No.	TP10
Project Name	Pembroke (Electrolyser)	Sample No.	
Soil Description	Brown fine to coarse sandy fine to coarse gravelly silty CLAY	Depth Top	1.50
		Depth Base	1.70
Date Tested	21/11/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	32
90	100	0.0060	28
75	100	0.0020	22
63	100		
50	100		
37.5	91		
28	85		
20	82		
14	80		
10	76		
6.3	70		
5	67		
3.35	64		
2	58		
1.18	53		
0.6	49		
0.425	48		
0.3	46		
0.212	45		
0.15	44		
0.063	39		

Sample Proportions	% dry mass
Cobbles	0
Gravel	42
Sand	19
Silt	17
Clay	22

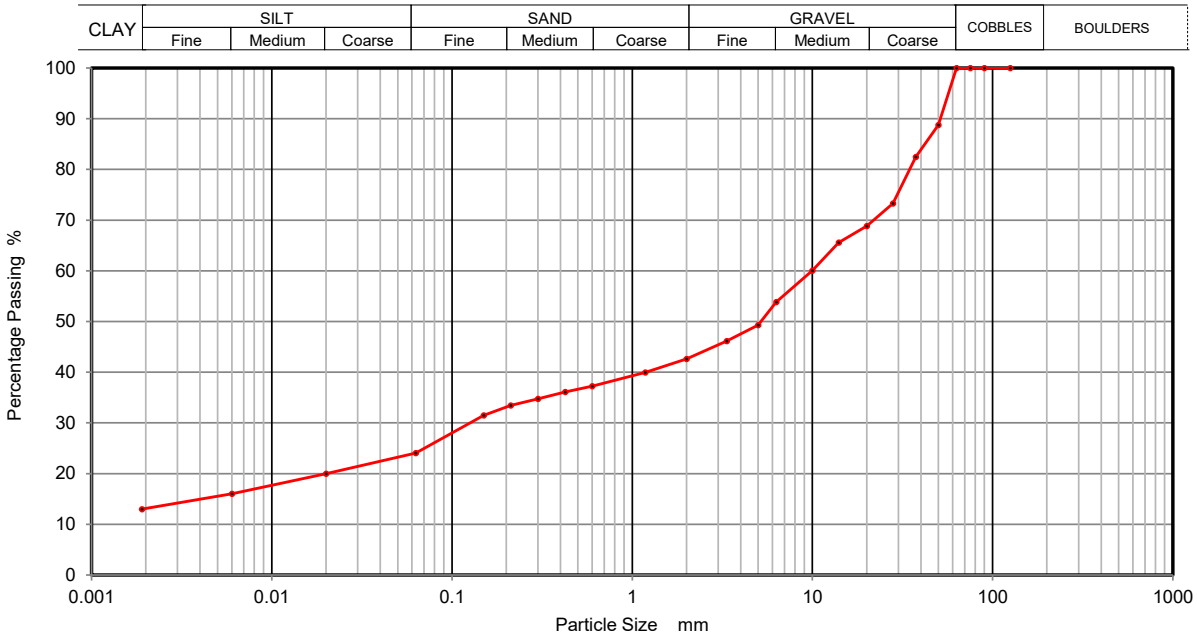
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	69335
		Borehole/Pit No.	TP11
Project Name	Pembroke (Electrolyser)	Sample No.	
Soil Description	Brown silty clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	0.60
		Depth Base	0.80
Date Tested	21/11/2023	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	20
90	100	0.0060	16
75	100	0.0020	13
63	100		
50	89		
37.5	82		
28	73		
20	69		
14	66		
10	60		
6.3	54		
5	49		
3.35	46		
2	43		
1.18	40		
0.6	37		
0.425	36		
0.3	35		
0.212	33		
0.15	32		
0.063	24		

Sample Proportions	% dry mass
Cobbles	0
Gravel	57
Sand	19
Silt	11
Clay	13

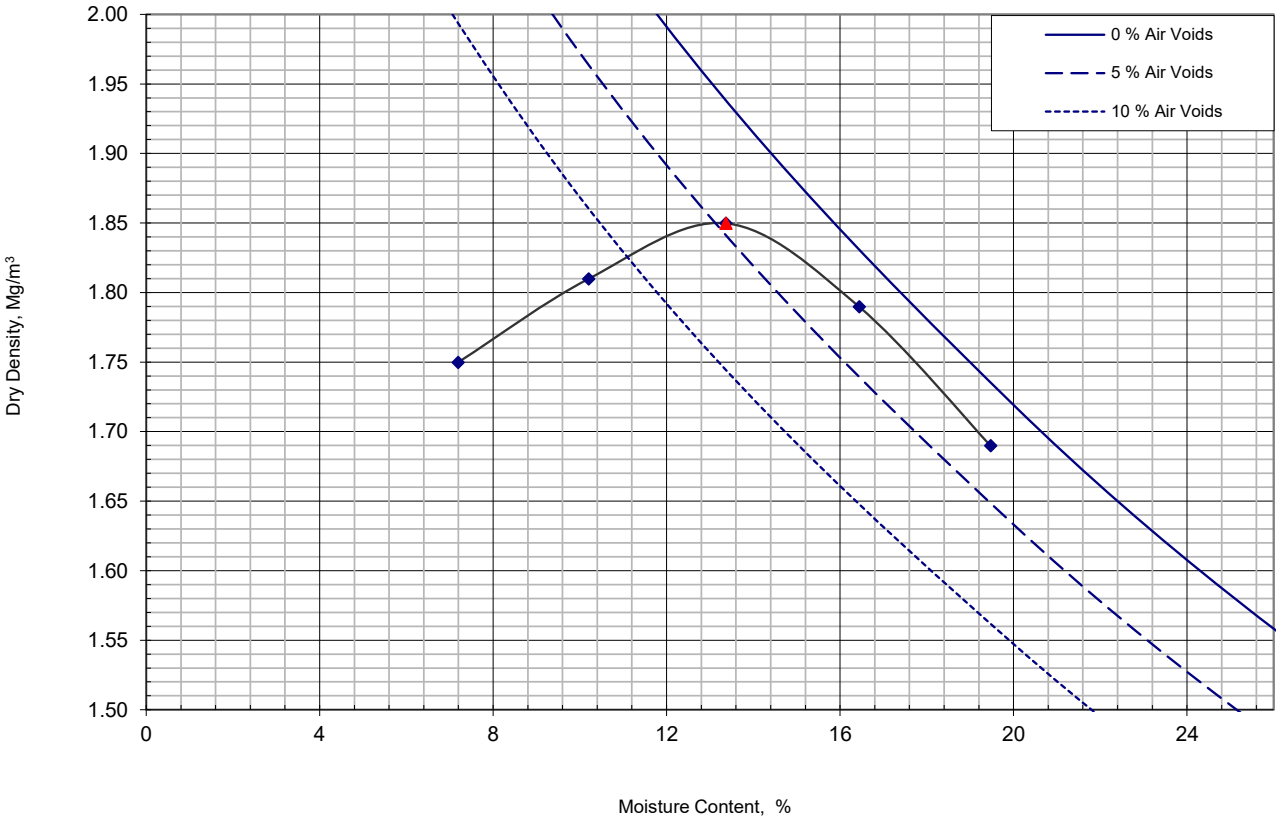
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	Dry Density / Moisture Content Relationship BS 1377:Part 4:1990	Contract Number	69335
		Borehole / Pit No	TP02
Project Name	Pembroke (Electrolyser)	Sample No	
Date Tested	18/11/2023	Depth Top	0.20
Compaction Method	2.5 Kg Rammer	Depth Base	0.40
Compaction Clause	BS1377:Part 4:1990, Clause 3.3	Sample Type	B
Sample Description	Brown fine to coarse sandy fine to coarse gravelly silty CLAY	Single or Separate Sample Used	Single



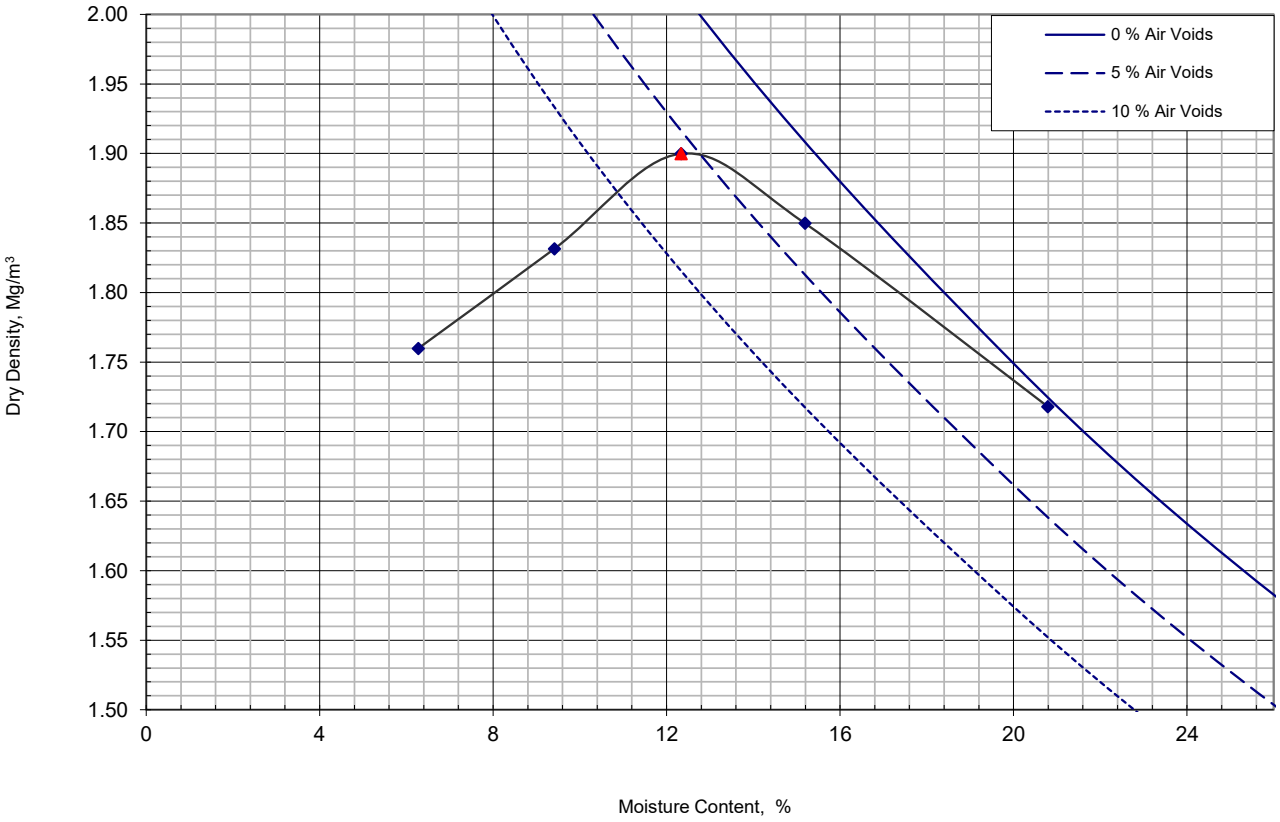
Compaction Point	1	2	3	4	5							
Moisture Content	7.2	10	13	16	19							
Bulk Density	1.88	1.99	2.10	2.08	2.02							
Dry Density	1.75	1.81	1.85	1.79	1.69							

Initial Moisture Content	19	%
Maximum Dry Density	1.85	Mg/m3
Optimum Moisture Content	13	%
Particle Density	2.62 Measured	Mg/m3
Material Retained 37.5mm	0	%
Material Retained 20mm	16	%

UKAS TESTING 2788

Operator
Conor

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	Dry Density / Moisture Content Relationship BS 1377:Part 4:1990	Contract Number	69335
		Borehole / Pit No	TP10
Project Name	Pembroke (Electrolyser)	Sample No	
Date Tested	18/11/2023	Depth Top	1.50
Compaction Method	2.5 Kg Rammer	Depth Base	1.70
Compaction Clause	BS1377:Part 4:1990, Clause 3.3	Sample Type	B
Sample Description	Brown fine to coarse sandy fine to coarse gravelly silty CLAY	Single or Separate Sample Used	Single



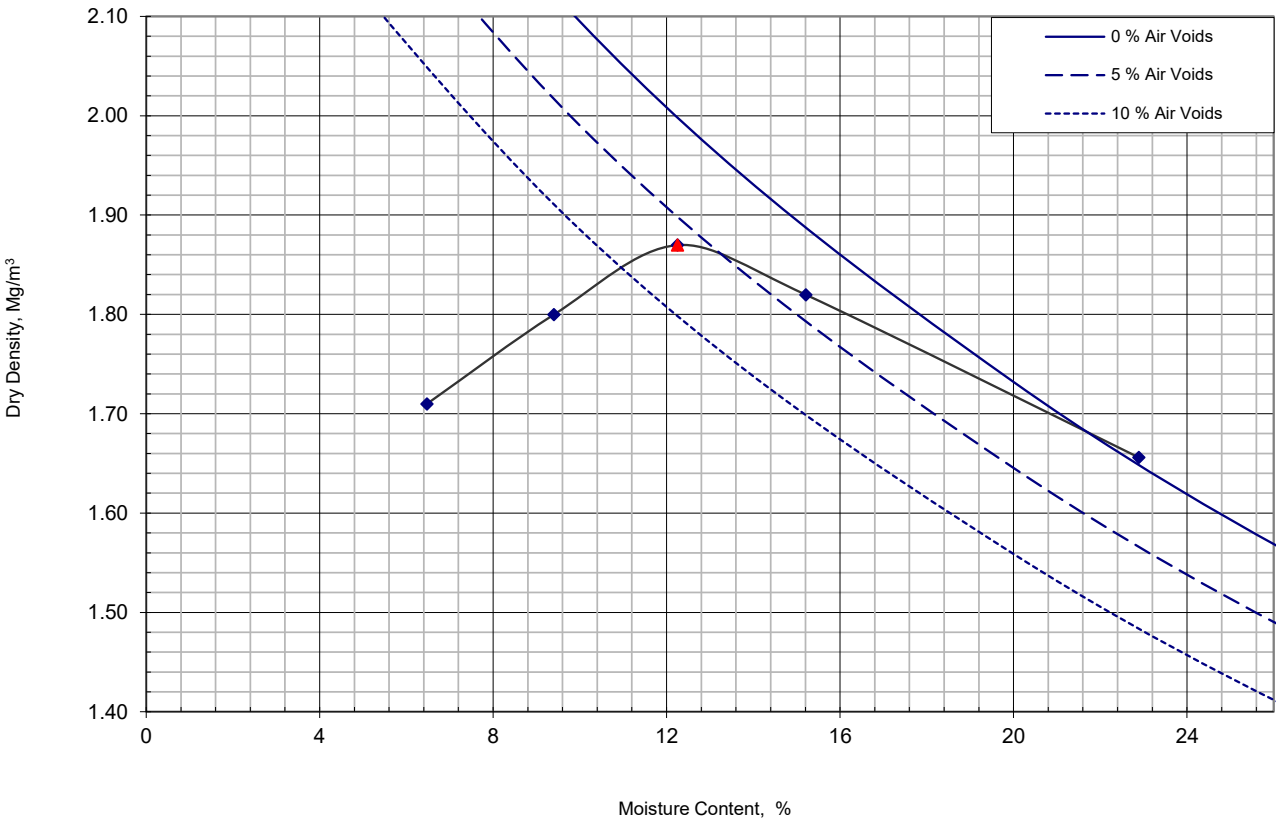
Compaction Point	1	2	3	4	5							
Moisture Content	6.3	9.4	12	15	21							
Bulk Density	1.87	2.00	2.13	2.13	2.08							
Dry Density	1.76	1.83	1.90	1.85	1.72							

Initial Moisture Content	21	%
Maximum Dry Density	1.90	Mg/m3
Optimum Moisture Content	12	%
Particle Density	2.69 Measured	Mg/m3
Material Retained 37.5mm	9	%
Material Retained 20mm	9	%

Operator
Conor

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Dry Density / Moisture Content Relationship BS 1377:Part 4:1990**	Contract Number	69335
		Borehole / Pit No	TP11
Project Name	Pembroke (Electrolyser)	Sample No	
Date Tested	18/11/2023	Depth Top	0.60
Compaction Method	2.5 Kg Rammer	Depth Base	0.80
Compaction Clause	BS1377:Part 4:1990, Clause 3.3	Sample Type	B
Sample Description	Brown silty clayey fine to coarse sandy fine to coarse GRAVEL	Single or Separate Sample Used	Single



Compaction Point	1	2	3	4	5							
Moisture Content	6.5	9.4	12	15	23							
Bulk Density	1.82	1.97	2.10	2.10	2.03							
Dry Density	1.71	1.80	1.87	1.82	1.66							

Initial Moisture Content	23	%
Maximum Dry Density	1.87	Mg/m3
Optimum Moisture Content	12	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	18	%
Material Retained 20mm	13	%

Operator
Conor

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Determination of Unconfined Compressive Strength** **ISRM Suggested Methods Vol 16, No. 2, pp. 135-140 1979**	
Contract Number	69335	
Project Name	Pembroke (Electrolyser)	
Sample Preperation	Sawing and Grinding	
Date Tested	13/11/2023	

Hole Reference	Depth (m)			Diameter	Length	Initial Mass	Moisture Content	Bulk Density	Dry Density	Load Failure	Maximum Strength	Type of Failure
BH01	14.40		14.59	86.3	188.2	2755.5	5.4	2.50	2.37	36.9	6.3	Multiple Fracture

Key	Reported As
Diameter	mm
Length	mm
Initial Mass	g
Moisture Content	%
Bulk Density	Mg/m^3
Dry Density	Mg/m^3
Load Failure	kN
Maximum Strength	MPa

Operator
Julian Jones

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

Point Load Test

The complete ISRM suggested methods for rock characterization, testing and monitoring 1974-2006 Determining Point Load Strength

Contract Number	69335
Project Name	Pembroke (Electrolyser)
Sample Type	Core
Date Tested	13/11/2023

*Please note that GSTL is not accredited for the water content of rock

Hole Reference	Depth (m)			Sample No	Test Type		Width	Platen Seperation	Failure Load	Equivalent Diameter	Point Load	Size Factor	Point Load Index	Moisture Content	Description	Angle Between Plane of Anisotropy & Core Axis	Type of Anisotropy (Bedding or Cleavage)
					d / a / b / i	I //											
BH01	12.70	-	12.95		d			86	1.50		0.20	1.28	0.26	16.7	MUDSTONE		
BH01	17.50	-	17.95		i		98	78	1.90	98.65	0.20	1.36	0.26	22.5	MUDSTONE		
BH01	18.10	-	18.50		d			86	3.19		0.43	1.28	0.55	3.3	MUDSTONE		
BH01	16.80	-	17.10		d			86	7.80		1.05	1.28	1.35	6.1	MUDSTONE		
BH01	13.40	-	14.00		d			86	2.85		0.39	1.28	0.49	4.8	MUDSTONE		
BH01	14.15	-	14.29		d			86	2.30		0.31	1.28	0.40	5.9	MUDSTONE		
BH01	14.40	-	14.60		a		86	44	1.32	69.41	0.27	1.16	0.32	5.1	MUDSTONE		
BH01	7.85	-	8.05		d			86	0.91		0.12	1.28	0.16	23.6	MUDSTONE		
BH02	14.24	-	14.37		d			86	1.08		0.15	1.28	0.19	2.8	MUDSTONE		
BH02	14.55	-	14.70		d			86	0.79		0.11	1.28	0.14	3.1	MUDSTONE		
BH03	9.30	-	9.40		d			86	2.29		0.31	1.28	0.40	4.0	SILTSTONE		
BH03	10.10	-	10.20		d			86	2.36		0.32	1.28	0.41	2.5	SILTSTONE		
BH03	11.50	-	11.62		d			86	3.99		0.54	1.28	0.69	1.8	SILTSTONE		
BH03	11.90	-	12.00		d			86	0.87		0.12	1.28	0.15	3.3	SILTSTONE		
BH03	12.50	-	12.62		d			86	3.86		0.52	1.28	0.67	3.1	SILTSTONE		
BH03	14.30	-	14.35		i		73	83	2.05	87.83	0.27	1.29	0.34	4.0	SILTSTONE		

Key	Reported As
Width	(W) mm
Platen Separation	(D) mm
Failure Load	(P) kN
Equivalent Diameter	(De) mm
Point Load	(Is) MPa
Size Factor	(F)
Point Load Index	(Is(50)) MPa
Moisture Content	%
Description	SC

Operator
Julian Jones

UKAS TESTING
2788

Appendix I

Ground Water Monitoring Records

Client: RWE
Project: Pembroke Electrolyser
Job ref.: JFR2796

BH	Date	Time	Response zone stratum	Response zone (m)	Ground level m AOD	Drilled depth	monitoring data				Comments
							Depth m		Depth m AOD		
							Water	Base	Water	Base	
BH01	20/10/2023	11:00 AM	Avon Group - Limestone and Mudstone	No standpipe installed due to voiding - borehole collared to 4.50m and surface covered	19.41	15.00	13.50	15.00	5.91	4.41	Borehole dipped end of drilling - water added during drilling
	20/11/2023	03:00 PM					10.88	14.40	8.53	5.01	Borehole collared, no standpipe installed due to voids
	30/11/2023	N/A					8.86	14.38	10.55	5.03	Borehole purged dry during previous monitoring run
BH02	20/10/2023	12:30 PM	Avon Group - Limestone and Mudstone	No standpipe installed due to voiding - borehole collared to 4.50m and surface covered	22.18	15.00	10.50	15.00	11.68	7.18	Borehole dipped end of drilling - water added during drilling
	20/11/2023	01:00 PM					6.39	14.30	15.79	7.88	Borehole collared, no standpipe installed due to voids
	30/11/2023	N/A					6.80	13.58	15.38	8.60	Borehole purged dry during previous monitoring run
BH03	23/10/2023	02:00 PM	Avon Group - Limestone and Mudstone	5.00 - 15.00m	22.02	18.50	9.60	18.50	12.42	3.52	Borehole dipped end of drilling - water added during drilling
	20/11/2023	03:00 PM					5.74	15.12	16.28	6.90	50mm Standpipe Installed
	30/11/2023	N/A					6.17	15.10	6.17	15.85	

Appendix J

Waste Classification Assessment

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:

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

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

8VF32-1VZQY-DA2B1

Job name

JRF2796

Description/Comments

Project

JFR2796

Site

Pembroke Electrolyser

Classified by

Name:
Karen Dale
Date:
18 Dec 2023 14:44 GMT
Telephone:
0161 786 8550

Company:
RPS
5 New York Street
Manchester
M1 4JB

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	Date
Hazardous Waste Classification	04 Feb 2021

Next 3 year Refresher due by Feb 2024

Purpose of classification

2 - Material Characterisation

Address of the waste

Pembroke Power Station **Post Code** SA71 5SS

SIC for the process giving rise to the waste

41201 Construction of commercial buildings

Description of industry/producer giving rise to the waste

redevelopment of land

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

excavation of foundations

Description of the waste

Made Ground

Job summary

Related documents

#	Name	Description
1	EMT-23-17207-Batch-1-202311201530.HWOL	Element .hwol file used to populate the Job
2	EMT-23-17621-Batch-1-202311201447.HWOL	Element .hwol file used to populate the Job
3	EMT-23-17621-Batch-2-202311201447.HWOL	Element .hwol file used to populate the Job
4	JRF2796.batch	Element .batch file used to populate the Job

Report

Created by: Karen Dale

Created date: 18 Dec 2023 14:44 GMT

Classification of sample: BH01-12/10/2023-0.50m

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

Sample details

Sample name:
BH01-12/10/2023-0.50m
Moisture content:
22.2%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 22.2% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	16.3	mg/kg		13.339	mg/kg	0.00133 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		27	mg/kg		22.095	mg/kg	0.00221 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	52	mg/kg		42.553	mg/kg	0.00426 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		0.2	mg/kg	1.16	0.19	mg/kg	0.000019 %	✓	
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		36.3	mg/kg	2.637	78.324	mg/kg	0.00783 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		84	mg/kg	2.469	169.739	mg/kg	0.017 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
21		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
22		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				8.18	pH		8.18	pH	8.18 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				28.5	mg/kg	1.462	34.087	mg/kg	0.00341 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0402 %		

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 Deteminand - 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: WS09-12/10/2023-0.20m

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

Sample details

Sample name:
WS09-12/10/2023-0.20m
Moisture content:
60%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 60% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	11.8	mg/kg		7.375	mg/kg	0.000737 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		28	mg/kg		17.5	mg/kg	0.00175 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	55	mg/kg		34.375	mg/kg	0.00344 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		0.2	mg/kg	1.16	0.145	mg/kg	0.0000145 %	✓	
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		29.7	mg/kg	2.637	48.943	mg/kg	0.00489 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1	mg/kg	1.405	0.878	mg/kg	0.0000878 %	✓	
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		107	mg/kg	2.469	165.134	mg/kg	0.0165 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
21		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
22		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				7.65	pH		7.65	pH	7.65 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				27.4	mg/kg	1.462	25.029	mg/kg	0.0025 %	✓	
			215-160-9	1308-38-9									
										Total:	0.034 %		

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 Deteminand - 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: WS06-12/10/2023-0.40m

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

Sample details

Sample name:
WS06-12/10/2023-0.40m
Moisture content:
13.4%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13.4% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	12.2	mg/kg		10.758	mg/kg	0.00108 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		17	mg/kg		14.991	mg/kg	0.0015 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	31	mg/kg		27.337	mg/kg	0.00273 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		0.2	mg/kg	1.16	0.205	mg/kg	0.0000205 %	✓	
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		41.7	mg/kg	2.637	96.957	mg/kg	0.0097 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		116	mg/kg	2.469	252.591	mg/kg	0.0253 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
21		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
22		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				244	mg/kg		215.168	mg/kg	0.0215 %	✓	
				TPH									
31		pH				8.55	pH		8.55	pH	8.55 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				23.4	mg/kg	1.462	30.159	mg/kg	0.00302 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0652 %		

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 Deteminand - 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

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free product encountered

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0215%)

Classification of sample: WS08-13/10/2023-0.70m

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

Sample details

Sample name:
WS08-13/10/2023-0.70m
Moisture content:
34.7%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 34.7% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	13	mg/kg		9.651	mg/kg	0.000965 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		25	mg/kg		18.56	mg/kg	0.00186 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	68	mg/kg		50.483	mg/kg	0.00505 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		<0.1	mg/kg	1.16	<0.116	mg/kg	<0.0000116 %		<**LOD**
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		22.7	mg/kg	2.637	44.434	mg/kg	0.00444 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		82	mg/kg	2.469	150.321	mg/kg	0.015 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				0.09	mg/kg		0.0668	mg/kg	0.00000668 %	✓	
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				0.18	mg/kg		0.134	mg/kg	0.0000134 %	✓	
			205-912-4	206-44-0									
21		pyrene				0.13	mg/kg		0.0965	mg/kg	0.00000965 %	✓	
			204-927-3	129-00-0									
22		benzo[a]anthracene				0.11	mg/kg		0.0817	mg/kg	0.00000817 %	✓	
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				0.07	mg/kg		0.052	mg/kg	0.0000052 %	✓	
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				0.07	mg/kg		0.052	mg/kg	0.0000052 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				0.08	mg/kg		0.0594	mg/kg	0.00000594 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				0.03	mg/kg		0.0223	mg/kg	0.00000223 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				8.1	pH		8.1	pH	8.1 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				24.5	mg/kg	1.462	26.584	mg/kg	0.00266 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0342 %		

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 Deteminand - 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: WS05-13/10/2023-0.40m

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

Sample details

Sample name:
WS05-13/10/2023-0.40m

Moisture content:
12.4%
(dry weight correction)

LoW Code:

Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)

Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12.4% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	8.8	mg/kg		7.829	mg/kg	0.000783 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		13	mg/kg		11.566	mg/kg	0.00116 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	24	mg/kg		21.352	mg/kg	0.00214 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		<0.1	mg/kg	1.16	<0.116	mg/kg	<0.0000116 %		<**LOD**
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		23.1	mg/kg	2.637	54.188	mg/kg	0.00542 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		50	mg/kg	2.469	109.844	mg/kg	0.011 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
21		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
22		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				8.55	pH		8.55	pH	8.55 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				16.2	mg/kg	1.462	21.065	mg/kg	0.00211 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0268 %		

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 Deteminand - 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: WS03-13/10/2023-1.00m

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

Sample details

Sample name:
WS03-13/10/2023-1.00m
Moisture content:
25.1%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 25.1% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5 µg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
2	benzene	601-020-00-8	200-753-7	71-43-2		<5 µg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
3	toluene	601-021-00-3	203-625-9	108-88-3		<5 µg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
4	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5 µg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
5	arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	12.3 mg/kg		9.832 mg/kg	0.000983 %	✓	
6	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 }	048-001-00-5			1	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
7	granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		17 mg/kg		13.589 mg/kg	0.00136 %	✓	
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	24 mg/kg		19.185 mg/kg	0.00192 %	✓	
9	mercury { mercury(II) sulfide }		215-696-3	1344-48-5		0.2 mg/kg	1.16	0.185 mg/kg	0.0000185 %	✓	
10	nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		30 mg/kg	2.637	63.23 mg/kg	0.00632 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<**LOD**
12	zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		75 mg/kg	2.469	148.039 mg/kg	0.0148 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
21		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
22		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				7.91	pH		7.91	pH	7.91 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				25.5	mg/kg	1.462	29.792	mg/kg	0.00298 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0326 %		

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 Deteminand - 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: WS01-13/10/2023-0.40m

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

Sample details

Sample name:
WS01-13/10/2023-0.40m
Moisture content:
17.5%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 17.5% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	13	mg/kg		11.064	mg/kg	0.00111 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		16	mg/kg		13.617	mg/kg	0.00136 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	28	mg/kg		23.83	mg/kg	0.00238 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		<0.1	mg/kg	1.16	<0.116	mg/kg	<0.0000116 %		<**LOD**
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		29.9	mg/kg	2.637	67.095	mg/kg	0.00671 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		72	mg/kg	2.469	151.31	mg/kg	0.0151 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
21		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
22		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				8.41	pH		8.41	pH	8.41 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				23.7	mg/kg	1.462	29.48	mg/kg	0.00295 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0338 %		

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 Deteminand - 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: WS02-13/10/2023-0.30m

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

Sample details

Sample name:
WS02-13/10/2023-0.30m
Moisture content:
21.7%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 21.7% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	8.1	mg/kg		6.656	mg/kg	0.000666 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		23	mg/kg		18.899	mg/kg	0.00189 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	19	mg/kg		15.612	mg/kg	0.00156 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		<0.1	mg/kg	1.16	<0.116	mg/kg	<0.0000116 %		<**LOD**
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		15.3	mg/kg	2.637	33.148	mg/kg	0.00331 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		93	mg/kg	2.469	188.697	mg/kg	0.0189 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				0.09	mg/kg		0.074	mg/kg	0.0000074 %	✓	
			205-912-4	206-44-0									
21		pyrene				0.06	mg/kg		0.0493	mg/kg	0.00000493 %	✓	
			204-927-3	129-00-0									
22		benzo[a]anthracene				0.07	mg/kg		0.0575	mg/kg	0.00000575 %	✓	
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				0.07	mg/kg		0.0575	mg/kg	0.00000575 %	✓	
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				0.06	mg/kg		0.0493	mg/kg	0.00000493 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				0.09	mg/kg		0.074	mg/kg	0.0000074 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				0.04	mg/kg		0.0329	mg/kg	0.00000329 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				398	mg/kg		327.034	mg/kg	0.0327 %	✓	
				TPH									
31		pH				8.21	pH		8.21	pH	8.21 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				19.2	mg/kg	1.462	23.058	mg/kg	0.00231 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0617 %		

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 Deteminand - 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

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free product encountered

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0327%)

Classification of sample: BH02-17/10/2023-0.20m

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

Sample details

Sample name:
BH02-17/10/2023-0.20m
Moisture content:
41.9%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 41.9% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	11.5	mg/kg		8.104	mg/kg	0.00081 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		25	mg/kg		17.618	mg/kg	0.00176 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	60	mg/kg		42.283	mg/kg	0.00423 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		0.1	mg/kg	1.16	0.0817	mg/kg	0.00000817 %	✓	
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		24.8	mg/kg	2.637	46.082	mg/kg	0.00461 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				2	mg/kg	1.405	1.98	mg/kg	0.000198 %	✓	
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		85	mg/kg	2.469	147.914	mg/kg	0.0148 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
21		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
22		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				6.14	pH		6.14	pH	6.14 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				27.1	mg/kg	1.462	27.913	mg/kg	0.00279 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0332 %		

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 Deteminand - 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: TP09-17/10/2023-0.20m

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

Sample details

Sample name:
TP09-17/10/2023-0.20m
Moisture content:
23.5%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 23.5% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	13.6	mg/kg		11.012	mg/kg	0.0011 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		24	mg/kg		19.433	mg/kg	0.00194 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	66	mg/kg		53.441	mg/kg	0.00534 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		<0.1	mg/kg	1.16	<0.116	mg/kg	<0.0000116 %		<**LOD**
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		26.8	mg/kg	2.637	57.217	mg/kg	0.00572 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1	mg/kg	1.405	1.138	mg/kg	0.000114 %	✓	
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		88	mg/kg	2.469	175.95	mg/kg	0.0176 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
21		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
22		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				7.96	pH		7.96	pH	7.96 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				27.1	mg/kg	1.462	32.071	mg/kg	0.00321 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0391 %		

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 Deteminand - 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: TP04-17/10/2023-0.20m

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

Sample details

Sample name:
TP04-17/10/2023-0.20m
Moisture content:
28.3%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 28.3% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	15.2	mg/kg		11.847	mg/kg	0.00118 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		35	mg/kg		27.28	mg/kg	0.00273 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	46	mg/kg		35.853	mg/kg	0.00359 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		<0.1	mg/kg	1.16	<0.116	mg/kg	<0.0000116 %		<**LOD**
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		29.9	mg/kg	2.637	61.447	mg/kg	0.00614 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		117	mg/kg	2.469	225.181	mg/kg	0.0225 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				0.06	mg/kg		0.0468	mg/kg	0.00000468 %	✓	
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				0.14	mg/kg		0.109	mg/kg	0.0000109 %	✓	
			205-912-4	206-44-0									
21		pyrene				0.12	mg/kg		0.0935	mg/kg	0.00000935 %	✓	
			204-927-3	129-00-0									
22		benzo[a]anthracene				0.12	mg/kg		0.0935	mg/kg	0.00000935 %	✓	
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				0.09	mg/kg		0.0701	mg/kg	0.00000701 %	✓	
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				0.09	mg/kg		0.0701	mg/kg	0.00000701 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				0.08	mg/kg		0.0624	mg/kg	0.00000624 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				0.08	mg/kg		0.0624	mg/kg	0.00000624 %	✓	
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				0.13	mg/kg		0.101	mg/kg	0.0000101 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				0.05	mg/kg		0.039	mg/kg	0.0000039 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				48	mg/kg		37.412	mg/kg	0.00374 %	✓	
				TPH									
31		pH				8.23	pH		8.23	pH	8.23 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				22.9	mg/kg	1.462	26.087	mg/kg	0.00261 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0429 %		

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 Deteminand - 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

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free product encountered

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00374%)

Classification of sample: TP05-16/10/2023-0.50m

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

Sample details

Sample name:
TP05-16/10/2023-0.50m
Moisture content:
22%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 22% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	15.1	mg/kg		12.377	mg/kg	0.00124 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		24	mg/kg		19.672	mg/kg	0.00197 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	69	mg/kg		56.557	mg/kg	0.00566 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		0.1	mg/kg	1.16	0.0951	mg/kg	0.00000951 %	✓	
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		30.6	mg/kg	2.637	66.133	mg/kg	0.00661 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1	mg/kg	1.405	1.152	mg/kg	0.000115 %	✓	
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		106	mg/kg	2.469	214.545	mg/kg	0.0215 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
21		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
22		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				8.02	pH		8.02	pH	8.02 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				29.4	mg/kg	1.462	35.221	mg/kg	0.00352 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0446 %		

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 Deteminand - 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: TP07-16/10/2023-0.20m

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

Sample details

Sample name:
TP07-16/10/2023-0.20m
Moisture content:
8.8%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 8.8% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	6	mg/kg		5.515	mg/kg	0.000551 %	✓	
6		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 }	048-001-00-5			1	0.2	mg/kg		0.184	mg/kg	0.0000184 %	✓	
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		11	mg/kg		10.11	mg/kg	0.00101 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	16	mg/kg		14.706	mg/kg	0.00147 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		<0.1	mg/kg	1.16	<0.116	mg/kg	<0.0000116 %		<**LOD**
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		10.9	mg/kg	2.637	26.415	mg/kg	0.00264 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		53	mg/kg	2.469	120.287	mg/kg	0.012 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
14		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
15		acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
16		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
17		fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
18		phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
19		anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
20		fluoranthene		205-912-4	206-44-0		0.07	mg/kg		0.0643	mg/kg	0.00000643 %	✓	
21		pyrene		204-927-3	129-00-0		0.05	mg/kg		0.046	mg/kg	0.0000046 %	✓	
22		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
23		chrysene	601-048-00-0	205-923-4	218-01-9		0.05	mg/kg		0.046	mg/kg	0.0000046 %	✓	
24		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.05	mg/kg		0.046	mg/kg	0.0000046 %	✓	
25		indeno[123-cd]pyrene		205-893-2	193-39-5		0.05	mg/kg		0.046	mg/kg	0.0000046 %	✓	
26		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
27		benzo[ghi]perylene		205-883-8	191-24-2		0.05	mg/kg		0.046	mg/kg	0.0000046 %	✓	
28		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.08	mg/kg		0.0735	mg/kg	0.00000735 %	✓	
29		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.03	mg/kg		0.0276	mg/kg	0.00000276 %	✓	
30		TPH (C6 to C40) petroleum group			TPH		58	mg/kg		53.309	mg/kg	0.00533 %	✓	
31		pH			PH		8.44	pH		8.44	pH	8.44 pH		
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
33		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		13.8	mg/kg	1.462	18.538	mg/kg	0.00185 %	✓	
											Total:	0.0253 %		

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 Deteminand - 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

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free product encountered

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00533%)

Classification of sample: HP02-17/10/2023-0.20m

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

Sample details

Sample name:
HP02-17/10/2023-0.20m
Moisture content:
12.3%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12.3% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	5.5	mg/kg		4.898	mg/kg	0.00049 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		17	mg/kg		15.138	mg/kg	0.00151 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	27	mg/kg		24.043	mg/kg	0.0024 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		<0.1	mg/kg	1.16	<0.116	mg/kg	<0.0000116 %		<**LOD**
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		15.2	mg/kg	2.637	35.688	mg/kg	0.00357 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		50	mg/kg	2.469	109.942	mg/kg	0.011 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				0.11	mg/kg		0.098	mg/kg	0.0000098 %	✓	
			205-912-4	206-44-0									
21		pyrene				0.09	mg/kg		0.0801	mg/kg	0.00000801 %	✓	
			204-927-3	129-00-0									
22		benzo[a]anthracene				0.11	mg/kg		0.098	mg/kg	0.0000098 %	✓	
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				0.08	mg/kg		0.0712	mg/kg	0.00000712 %	✓	
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				0.08	mg/kg		0.0712	mg/kg	0.00000712 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				0.06	mg/kg		0.0534	mg/kg	0.00000534 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				0.06	mg/kg		0.0534	mg/kg	0.00000534 %	✓	
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				0.12	mg/kg		0.107	mg/kg	0.0000107 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				0.04	mg/kg		0.0356	mg/kg	0.00000356 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				8.2	pH		8.2	pH	8.2 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13.7	mg/kg	1.462	17.83	mg/kg	0.00178 %	✓	
			215-160-9	1308-38-9									
										Total:	0.025 %		

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 Deteminand - 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: TP10-17/10/2023-0.50m

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

Sample details

Sample name:
TP10-17/10/2023-0.50m
Moisture content:
16.7%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 16.7% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	20.7	mg/kg		17.738	mg/kg	0.00177 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		25	mg/kg		21.422	mg/kg	0.00214 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	52	mg/kg		44.559	mg/kg	0.00446 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		0.1	mg/kg	1.16	0.0994	mg/kg	0.00000994 %	✓	
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		46.4	mg/kg	2.637	104.835	mg/kg	0.0105 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		131	mg/kg	2.469	277.188	mg/kg	0.0277 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
21		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
22		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				8.66	pH		8.66	pH	8.66 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				28.7	mg/kg	1.462	35.944	mg/kg	0.00359 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0544 %		

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 Deteminand - 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: BH03-17/10/2023-0.20m

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

Sample details

Sample name:
BH03-17/10/2023-0.20m
Moisture content:
23.6%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 23.6% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	10.4	mg/kg		8.414	mg/kg	0.000841 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		30	mg/kg		24.272	mg/kg	0.00243 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	50	mg/kg		40.453	mg/kg	0.00405 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		<0.1	mg/kg	1.16	<0.116	mg/kg	<0.0000116 %		<**LOD**
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		28.2	mg/kg	2.637	60.157	mg/kg	0.00602 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		113	mg/kg	2.469	225.753	mg/kg	0.0226 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				0.06	mg/kg		0.0485	mg/kg	0.00000485 %	✓	
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				0.14	mg/kg		0.113	mg/kg	0.0000113 %	✓	
			205-912-4	206-44-0									
21		pyrene				0.11	mg/kg		0.089	mg/kg	0.0000089 %	✓	
			204-927-3	129-00-0									
22		benzo[a]anthracene				0.11	mg/kg		0.089	mg/kg	0.0000089 %	✓	
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				0.09	mg/kg		0.0728	mg/kg	0.00000728 %	✓	
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				0.1	mg/kg		0.0809	mg/kg	0.00000809 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				0.07	mg/kg		0.0566	mg/kg	0.00000566 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				0.07	mg/kg		0.0566	mg/kg	0.00000566 %	✓	
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				0.14	mg/kg		0.113	mg/kg	0.0000113 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				0.05	mg/kg		0.0405	mg/kg	0.00000405 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				85	mg/kg		68.77	mg/kg	0.00688 %	✓	
				TPH									
31		pH				8.39	pH		8.39	pH	8.39 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				26.8	mg/kg	1.462	31.691	mg/kg	0.00317 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0464 %		

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 Deteminand - 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

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free product encountered

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00688%)

Classification of sample: HP01-17/10/2023-0.50m

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

Sample details

Sample name:
HP01-17/10/2023-0.50m
Moisture content:
21.6%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 21.6% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	9.2	mg/kg		7.566	mg/kg	0.000757 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		36	mg/kg		29.605	mg/kg	0.00296 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	47	mg/kg		38.651	mg/kg	0.00387 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		<0.1	mg/kg	1.16	<0.116	mg/kg	<0.0000116 %		<**LOD**
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		58.4	mg/kg	2.637	126.63	mg/kg	0.0127 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		195	mg/kg	2.469	395.981	mg/kg	0.0396 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
21		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
22		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				7.82	pH		7.82	pH	7.82 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				25.4	mg/kg	1.462	30.529	mg/kg	0.00305 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0671 %		

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 Deteminand - 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: TP07-18/10/2023-0.50m

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

Sample details

Sample name:
TP07-18/10/2023-0.50m
Moisture content:
16.4%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 16.4% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	15.7	mg/kg		13.488	mg/kg	0.00135 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		20	mg/kg		17.182	mg/kg	0.00172 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	39	mg/kg		33.505	mg/kg	0.00335 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		0.2	mg/kg	1.16	0.199	mg/kg	0.0000199 %	✓	
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		30.7	mg/kg	2.637	69.541	mg/kg	0.00695 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		92	mg/kg	2.469	195.168	mg/kg	0.0195 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
21		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
22		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				8.43	pH		8.43	pH	8.43 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				23.1	mg/kg	1.462	29.005	mg/kg	0.0029 %	✓	
			215-160-9	1308-38-9									
										Total:	0.04 %		

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 Deteminand - 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: TP01-18/10/2023-0.60m

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

Sample details

Sample name:
TP01-18/10/2023-0.60m
Moisture content:
13.7%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13.7% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	16.8	mg/kg		14.776	mg/kg	0.00148 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		23	mg/kg		20.229	mg/kg	0.00202 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	31	mg/kg		27.265	mg/kg	0.00273 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		0.3	mg/kg	1.16	0.306	mg/kg	0.0000306 %	✓	
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		38.3	mg/kg	2.637	88.817	mg/kg	0.00888 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		157	mg/kg	2.469	340.967	mg/kg	0.0341 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				0.05	mg/kg		0.044	mg/kg	0.0000044 %	✓	
			205-912-4	206-44-0									
21		pyrene				0.03	mg/kg		0.0264	mg/kg	0.00000264 %	✓	
			204-927-3	129-00-0									
22		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				8.41	pH		8.41	pH	8.41 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				30.4	mg/kg	1.462	39.078	mg/kg	0.00391 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0573 %		

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 Deteminand - 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: TP01-18/10/2023-1.50m

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

Sample details

Sample name:
TP01-18/10/2023-1.50m
Moisture content:
20.1%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 20.1% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5 µg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
2	benzene	601-020-00-8	200-753-7	71-43-2		<5 µg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
3	toluene	601-021-00-3	203-625-9	108-88-3		<5 µg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
4	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5 µg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
5	arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	16.8 mg/kg		13.988 mg/kg	0.0014 %	✓	
6	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 }	048-001-00-5			1	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
7	granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		42 mg/kg		34.971 mg/kg	0.0035 %	✓	
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	93 mg/kg		77.435 mg/kg	0.00774 %	✓	
9	mercury { mercury(II) sulfide }		215-696-3	1344-48-5		0.2 mg/kg	1.16	0.193 mg/kg	0.0000193 %	✓	
10	nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		37.8 mg/kg	2.637	82.986 mg/kg	0.0083 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<**LOD**
12	zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		119 mg/kg	2.469	244.668 mg/kg	0.0245 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
21		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
22		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				8.27	pH		8.27	pH	8.27 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				29	mg/kg	1.462	35.292	mg/kg	0.00353 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0531 %		

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 Deteminand - 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: TP03-18/10/2023-0.50m

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

Sample details

Sample name:
TP03-18/10/2023-0.50m
Moisture content:
12%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	13.1	mg/kg		11.696	mg/kg	0.00117 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		21	mg/kg		18.75	mg/kg	0.00188 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	32	mg/kg		28.571	mg/kg	0.00286 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		<0.1	mg/kg	1.16	<0.116	mg/kg	<0.0000116 %		<**LOD**
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		34.5	mg/kg	2.637	81.219	mg/kg	0.00812 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		95	mg/kg	2.469	209.449	mg/kg	0.0209 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
21		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
22		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				8.41	pH		8.41	pH	8.41 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				23.2	mg/kg	1.462	30.275	mg/kg	0.00303 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0422 %		

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 Deteminand - 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: TP08-18/10/2023-0.25m

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

Sample details

Sample name:
TP08-18/10/2023-0.25m
Moisture content:
17.4%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 17.4% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	22.8	mg/kg		19.421	mg/kg	0.00194 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		24	mg/kg		20.443	mg/kg	0.00204 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	86	mg/kg		73.254	mg/kg	0.00733 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		<0.1	mg/kg	1.16	<0.116	mg/kg	<0.0000116 %		<**LOD**
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		68.6	mg/kg	2.637	154.069	mg/kg	0.0154 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				2	mg/kg	1.405	2.394	mg/kg	0.000239 %	✓	
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		241	mg/kg	2.469	506.9	mg/kg	0.0507 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				0.16	mg/kg		0.136	mg/kg	0.0000136 %	✓	
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				0.48	mg/kg		0.409	mg/kg	0.0000409 %	✓	
			205-912-4	206-44-0									
21		pyrene				0.33	mg/kg		0.281	mg/kg	0.0000281 %	✓	
			204-927-3	129-00-0									
22		benzo[a]anthracene				0.28	mg/kg		0.239	mg/kg	0.0000239 %	✓	
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				0.33	mg/kg		0.281	mg/kg	0.0000281 %	✓	
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				0.23	mg/kg		0.196	mg/kg	0.0000196 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				0.2	mg/kg		0.17	mg/kg	0.000017 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				0.21	mg/kg		0.179	mg/kg	0.0000179 %	✓	
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				0.36	mg/kg		0.307	mg/kg	0.0000307 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				0.14	mg/kg		0.119	mg/kg	0.0000119 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				8.11	pH		8.11	pH	8.11 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				24.8	mg/kg	1.462	30.874	mg/kg	0.00309 %	✓	
			215-160-9	1308-38-9									
										Total:	0.085 %		

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 Deteminand - 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: TP11-19/10/2023-0.70m

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

Sample details

Sample name:
TP11-19/10/2023-0.70m
Moisture content:
19%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

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

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	18.7	mg/kg		15.714	mg/kg	0.00157 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		21	mg/kg		17.647	mg/kg	0.00176 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	49	mg/kg		41.176	mg/kg	0.00412 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		<0.1	mg/kg	1.16	<0.116	mg/kg	<0.0000116 %		<**LOD**
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		55.4	mg/kg	2.637	122.75	mg/kg	0.0123 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		132	mg/kg	2.469	273.905	mg/kg	0.0274 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
21		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
22		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				8.45	pH		8.45	pH	8.45 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				25.5	mg/kg	1.462	31.319	mg/kg	0.00313 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0544 %		

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 Deteminand - 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: TP11-19/10/2023-0.20m

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

Sample details

Sample name:
TP11-19/10/2023-0.20m
Moisture content:
30.3%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 30.3% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5 µg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
2	benzene	601-020-00-8	200-753-7	71-43-2		<5 µg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
3	toluene	601-021-00-3	203-625-9	108-88-3		<5 µg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
4	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5 µg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
5	arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	14.3 mg/kg		10.975 mg/kg	0.0011 %	✓	
6	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 }	048-001-00-5			1	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
7	granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		24 mg/kg		18.419 mg/kg	0.00184 %	✓	
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	46 mg/kg		35.303 mg/kg	0.00353 %	✓	
9	mercury { mercury(II) sulfide }		215-696-3	1344-48-5		<0.1 mg/kg	1.16	<0.116 mg/kg	<0.0000116 %		<**LOD**
10	nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		31.1 mg/kg	2.637	62.932 mg/kg	0.00629 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1 mg/kg	1.405	1.078 mg/kg	0.000108 %	✓	
12	zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		119 mg/kg	2.469	225.515 mg/kg	0.0226 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
21		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
22		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				8.22	pH		8.22	pH	8.22 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				31.8	mg/kg	1.462	35.67	mg/kg	0.00357 %	✓	
			215-160-9	1308-38-9									
										Total:	0.043 %		

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 Deteminand - 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: TP02-19/10/2023-0.30m

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

Sample details

Sample name:
TP02-19/10/2023-0.30m
Moisture content:
16%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

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

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5	µg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
5		arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	16.2	mg/kg		13.966	mg/kg	0.0014 %	✓	
6		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 }	048-001-00-5			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
7		granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		45	mg/kg		38.793	mg/kg	0.00388 %	✓	
8		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	130	mg/kg		112.069	mg/kg	0.0112 %	✓	
9		mercury { mercury(II) sulfide }		215-696-3	1344-48-5		<0.1	mg/kg	1.16	<0.116	mg/kg	<0.0000116 %		<**LOD**
10		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		44.5	mg/kg	2.637	101.149	mg/kg	0.0101 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				2	mg/kg	1.405	2.422	mg/kg	0.000242 %	✓	
12		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		129	mg/kg	2.469	274.603	mg/kg	0.0275 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
21		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
22		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				<38	mg/kg		<38	mg/kg	<0.0038 %		<**LOD**
				TPH									
31		pH				7.12	pH		7.12	pH	7.12 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				22.5	mg/kg	1.462	28.349	mg/kg	0.00283 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0612 %		

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 Deteminand - 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: TP06-20/10/2023-0.60m

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

Sample details

Sample name:
TP06-20/10/2023-0.60m
Moisture content:
18.5%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 18.5% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<5 µg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
2	benzene	601-020-00-8	200-753-7	71-43-2		<5 µg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
3	toluene	601-021-00-3	203-625-9	108-88-3		<5 µg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
4	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<5 µg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
5	arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }	033-002-00-5			1	9.1 mg/kg		7.679 mg/kg	0.000768 %	✓	
6	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 }	048-001-00-5			1	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
7	granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		23 mg/kg		19.409 mg/kg	0.00194 %	✓	
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	26 mg/kg		21.941 mg/kg	0.00219 %	✓	
9	mercury { mercury(II) sulfide }		215-696-3	1344-48-5		0.1 mg/kg	1.16	0.0979 mg/kg	0.00000979 %	✓	
10	nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		20 mg/kg	2.637	44.501 mg/kg	0.00445 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<**LOD**
12	zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		90 mg/kg	2.469	187.542 mg/kg	0.0188 %	✓	

#		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									
13		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.3	mg/kg	2.27	<0.681	mg/kg	<0.0000681 %		<**LOD**
		024-017-00-8											
14		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
15		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				0.06	mg/kg		0.0506	mg/kg	0.00000506 %	✓	
			201-581-5	85-01-8									
19		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
20		fluoranthene				0.13	mg/kg		0.11	mg/kg	0.000011 %	✓	
			205-912-4	206-44-0									
21		pyrene				0.11	mg/kg		0.0928	mg/kg	0.00000928 %	✓	
			204-927-3	129-00-0									
22		benzo[a]anthracene				0.12	mg/kg		0.101	mg/kg	0.0000101 %	✓	
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				0.09	mg/kg		0.0759	mg/kg	0.00000759 %	✓	
		601-048-00-0	205-923-4	218-01-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				0.08	mg/kg		0.0675	mg/kg	0.00000675 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				0.08	mg/kg		0.0675	mg/kg	0.00000675 %	✓	
			205-883-8	191-24-2									
28		benzo[b]fluoranthene				0.14	mg/kg		0.118	mg/kg	0.0000118 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				0.05	mg/kg		0.0422	mg/kg	0.00000422 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		TPH (C6 to C40) petroleum group				432	mg/kg		364.557	mg/kg	0.0365 %	✓	
				TPH									
31		pH				8.14	pH		8.14	pH	8.14 pH		
				PH									
32		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<**LOD**
		006-007-00-5											
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				18.9	mg/kg	1.462	23.311	mg/kg	0.00233 %	✓	
			215-160-9	1308-38-9									
										Total:	0.0673 %		

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 Deteminand - 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

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No free product encountered

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0365%)

Appendix A: Classifier defined and non GB MCL determinands

ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

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

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

mercury(II) sulfide (EC Number: 215-696-3, CAS Number: 1344-48-5)

Description/Comments: Data from ECHA's C&L and SDS Sigma Aldrich V6 dated 17/9/2019

Threshold for EUH031 based on calculation method in WM3 Box C12.1
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/8530
Data source date: 14 May 2020
Hazard Statements: EUH031 >= 1 % , EUH031 , Skin Sens. 1; H317 , STOT RE 2; H373

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

- **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , 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.

- **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

GB MCL index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

- **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

Appendix B: Rationale for selection of metal species

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

most appropriate

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 appropriate

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

No Chromium Vi, therefore most appropriate.

mercury {mercury(II) sulfide}

most appropriate

nickel {nickel sulfate}

most appropriate

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

most appropriate

zinc {zinc sulphate}

No Chromium VI, most appropriate

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

worse case

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

worse case

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

worse case

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2023.348.5858.10852 (16 Dec 2023)
HazWasteOnline Database: 2023.348.5858.10852 (16 Dec 2023)

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

Appendix K

General Notes

RPS Consulting Services Ltd

Phase 1 - Environmental Risk Assessment / Desk Study Environmental Review

General Notes

1. A "desk study" means that no site visits have been carried out as any part thereof, unless otherwise specified.
2. This report provides available factual data for the site obtained only from the sources described in the text and related to the site on the basis of the location information provided by the Client.
3. The desk study information is not necessarily exhaustive and further information relevant to the site may be available from other sources.
4. The accuracy of maps cannot be guaranteed and it should be recognised that different conditions on site may have existed between and subsequent to the various map surveys.
5. No sampling or analysis has been undertaken in relation to this desk study.
6. Any borehole data from British Geological Survey sources is included on the basis that: "The British Geological Survey accept no responsibility for omissions or misinterpretation of the data from their Data Bank as this may be old or obtained from non-BGS sources and may not represent current interpretation".
7. Where any data supplied by the Client or from other sources, including that from previous site investigations, have been used it has been assumed that the information is correct. No responsibility can be accepted by RPS for inaccuracies in the data supplied by any other party.
8. This report is prepared and written in the context of an agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in legislation may necessitate a re-interpretation of the report in whole or in part after its original submission.
9. The copyright in the written materials shall remain the property of the RPS Company but with a royalty-free perpetual licence to the Client deemed to be granted on payment in full to the RPS Company by the Client of the outstanding amounts.
10. The report is provided for sole use by the Client and is confidential to them, their professional advisors, no responsibility whatsoever for the contents of the report will be accepted to any person other than the Client. [Unless otherwise agreed]
11. These terms apply in addition to the RPS "Standard Terms & Conditions" (or in addition to another written contract which may be in place instead thereof) unless specifically agreed in writing. (In the event of a conflict between these terms and the said Standard Terms & Conditions the said Standard Terms & Conditions shall prevail.) In the absence of such a written contract the Standard Terms & Conditions will apply.

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Phase 2 – Site Investigations

General Notes

1. The assessments made in this report are based on the ground conditions as revealed by intrusive investigations, together with the results of any field or laboratory testing or chemical analysis undertaken and other relevant data which may have been obtained including previous site investigations. In any event, ground contamination often exists as small discrete areas of contamination ("hot spots") and there can be no certainty that any or all such areas have been located and/or sampled.

2. There may be special conditions appertaining to the site which have not been taken into account in the report. The assessment may be subject to amendment in the light of additional information becoming available.

3. Where any data supplied by the Client or from other sources, including that from previous site investigations, have been used it has been assumed that the information is correct. No responsibility can be accepted by RPS Companies for inaccuracies within the data supplied by other parties.

4. Whilst the report may express an opinion on possible ground conditions between or beyond trial pit or borehole locations, or on the possible presence of features based on either visual, verbal or published evidence this is for guidance only and no liability can be accepted for the accuracy thereof.

5. Comments on groundwater conditions are based on observations made at the time of the investigation unless otherwise stated. Groundwater conditions may vary due to seasonal or other effects.

6. This report is prepared and written in the context of the agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in legislation may necessitate a re-interpretation of the report in whole or part after its original submission.

7. The copyright in the written materials shall remain the property of the RPS Company but with a royalty-free perpetual licence to the client deemed to be granted on payment in full to the RPS Company by the client of the outstanding amounts.

8. The report is provided for sole use by the Client and is confidential to them and their professional advisors. No responsibility whatsoever for the contents of the report will be accepted to any person other than the Client.

9. These terms apply in addition to the RPS Group "Standard Terms of Business" (or in addition to another written contract which may be in place instead thereof) unless specifically agreed in writing. (In the event of a conflict between these terms and the said Standard Terms of Business the said Standard Terms of Business shall prevail). In the absence of such a written contract the Standard Terms of Business will apply.

Appendix L

Part 2A (The Contaminated Land Regime)

Contaminated Land Definition

Under Section 57 of the Environmental Act 1995, Part 2A was inserted into the Environmental Protection Act 1990 to include provisions for the management of contaminated land.

Subsequent regulations were first implemented in England in April 2000, Scotland in July 2000 and Wales in July 2001[1], providing a definition of 'contaminated land' and setting out the nature of liabilities that can be incurred by owners of contaminated land and groundwater.

According to the Act, contaminated land is defined as 'any land which appears to the local authority in whose area the land is situated to be in such a condition, by reason of substances in, on or under the land that:

- *significant harm* is being caused or there is a *significant possibility* of such harm being caused; or
- *significant pollution* of controlled waters[2] is being caused or there is a significant possibility of such pollution being caused[3]'

The guidance on determining whether a particular possibility is significant is based on the principles of risk assessment and in particular on considerations of the magnitude or consequences of the different types of significant harm caused. The term 'possibility of significant harm being caused' should be taken, as referring to a measure of the probability, or frequency, of the occurrence of circumstances that could lead to significant harm being caused.

The following situations are defined where harm is to be regarded as significant:

- Chronic or acute toxic effect, serious injury or death to humans
- Irreversible or other adverse harm to the ecological system
- Substantial damage to, or failure of, buildings
- Disease, other physical damage or death of livestock or crops
- The pollution of controlled waters[4].

With regard to radioactivity, contaminated land is defined as 'any land which appears to be in such a condition, by reason of substances in, on or under the land that harm is being caused, or there is a *significant possibility of such harm being caused*[5]'.

The Risk Assessment Methodology

Risk assessment is the process of collating known information on a hazard or set of hazards in order to estimate actual or potential risks to receptors. The receptor may be humans, a water resource, a sensitive local ecosystem or future construction materials. Receptors can be connected with the hazard via one or several exposure pathways (e.g. the pathway of direct contact). Risks are generally managed by isolating or removing the hazard, isolating the receptor, or by intercepting the exposure pathway. Without the three

[1] In England by The Contaminated Land (England) Regulations 2000, updated by The Contaminated Land (England) (Amendment) Regulations 2012; in Scotland by The Contaminated Land (Scotland) Regulations 2000, updated by the Contaminated Land (Scotland) Regulations 2005; and in Wales by The Contaminated Land (Wales) Regulations 2001, updated by the Contaminated Land (Wales) Regulations 2006.

[2] In Scotland the term "controlled water" has been updated to "water environment" under the Contaminated Land (Scotland) Regulations 2005 in line with the Water Environment and Water Services (Scotland) Act 2003.

[3] The definition was amended in 2012 by implementation of the Water Act 2003.

[4] Groundwater in this context does not include waters within underground strata but above the saturated zone.

[5] The Radioactive Contaminated Land (Modification of Enactments) (England) Regulations 2006 and Contaminated Land (Wales) Regulations 2006.

essential components of a source (hazard), pathway and receptor, there can be no risk. Thus, the mere presence of a hazard at a site does not mean that there will necessarily be attendant risks.

The Risk Assessment

By considering where a viable pathway exists which connects a source with a receptor, this assessment will identify where pollutant linkages may exist. A pollutant linkage is the term used by the DEFRA in their standard procedure on risk assessment. If there is no pollutant linkage, then there is no risk. Therefore, only where a viable pollutant linkage is established does this assessment go on to consider the level of risk. Risk should be based on a consideration of both:

6 The likelihood of an event (probability) - takes into account both the presence of the hazard and receptor and the integrity of the pathway.

7 The severity of the potential consequence - takes into account both the potential severity of the hazard and the sensitivity of the receptor.

For further information please see the Contaminated Land section on the DEFRA website (www.defra.gov.uk).

GROUND INVESTIGATION REPORT

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2023-12-20

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