



Trelewis Primary School Extension

Ground Investigation Report

A113930

Blaenau Gwent County Borough Council
Merthyr Tydfil County Borough Council
October 2019

Prepared on behalf of WYG Environment Planning Transport Limited.

DOCUMENT CONTROL

Document:	Interpretive Ground Investigation Report	
Project:	Trelewis Primary School	
Client:	Blaenau Gwent/Merthyr Tydfil County Borough Council	
Job Number:	A113930	
File Origin:	N:\Environmental\projects\A113930 - Trelewis Primary School Extension\Report\A113930 - Trelewis Primary School Extension Oct 19 Draft.docx	
Revision:	V1	
Date:	October 2019	
Written by:	Checked by:	Approved By:
Paul Vincent Principal Engineering Geologist	Paul Vincent Principal Engineering Geologist	Chris Pugh Technical Director
Rachal Seaman Consultant		
Description of revision: First Issue to Client		

CONTENTS

EXECUTIVE SUMMARY	6
1. INTRODUCTION	7
1.1 Instruction	7
1.2 Brief	7
1.3 Report Scope	7
1.4 Limitations	8
2. SITE INFORMATION	9
2.1 Location	9
2.2 Site Description	9
3. SITE SETTING	10
3.1 Geology, hydrogeology and hydrology	10
3.1.1 Geology	10
3.1.2 Hydrogeology	10
3.1.3 Hydrology	10
3.2 Radon	10
4. SITE INVESTIGATION	11
4.1 Scope	11
5. GROUND CONDITIONS ENCOUNTERED	12
5.1 Strata encountered	12
5.1.1 Topsoil	12
5.1.2 Glacial Deposits	12
5.1.3 Grovesend Formation	13
5.2 Groundwater	13
5.3 In Situ Testing	13
5.3.1 Standard Penetration Testing	13

5.3.2	TRL Probe Testing.....	13
5.3.3	Soil Infiltration Testing	13
*Value calculated using linear extrapolation		Error! Bookmark not defined.
5.4	Visual or Olfactory Evidence of Contamination.....	14
5.5	Obstructions.....	14
6.	LABORATORY TESTING	15
6.1	Geotechnical Testing	15
6.2	Environmental Testing	15
7.	COAL MINING RISK ASSESSMENT	17
7.1	Introduction	17
7.2	SouRhes of Information.....	17
7.2.1	Coal Mining Risk Assessment	17
7.3	Risk Assessment and Mitigation Strategy.....	17
7.4	Conclusion and Recommendations.....	19
8.	GEOTECHNICAL ASSESSMENT.....	20
8.1	Ground Conditions.....	20
8.2	Soil Properties	20
8.2.1	Glacial Deposits	20
9.	GEOTECHNICAL DESIGN CONSIDERATIONS.....	22
9.1	Proposed Development	22
9.2	Foundations	22
9.3	Floor Slabs.....	23
9.4	Chemical Attack on Buried Concrete	23
9.5	Temporary Works.....	23
9.6	Pavements.....	23
9.7	Drainage.....	24

10. GROUND CONTAMINATION ASSESSMENT – HUMAN HEALTH.....	25
10.1 Introduction	25
10.2 Assessment Criteria	25
10.2.1 Generic Assessment Criteria.....	25
10.2.2 Proposed End Use	26
10.2.3 Soil Organic Matter	26
10.3 Tier 1 – Soil Screening	27
10.4 Asbestos	27
11. GROUND CONTAMINATION ASSESSMENT – WIDER ENVIRONMENT.....	28
11.1 Introduction	28
11.2 Assessment Criteria	28
11.3 Tier 1 Screening Assessment – Soil Derived Leachate	28
12. SITE CONCEPTUAL MODEL AND GROUND CONTAMINATION RISK ASSESSMENT.....	31
12.1 Introduction	31
12.2 Site Conceptual Model	31
12.2.1 SouRHes	31
12.2.2 Pathways.....	32
12.2.3 Receptors.....	32
12.3 Ground Contamination Risk Assessment Table.....	32
13. CONCLUSIONS AND RECOMMENDATIONS.....	35
13.1 Ground Contamination	35
13.1.1 Summary.....	35
13.1.2 Asbestos.....	35
13.2 Geotechnical	36
13.3 Recommendations	36
14. NOTES	38

15. GLOSSARY	39
---------------------------	-----------

16. REFERENCES	40
-----------------------------	-----------

FIGURES

- Figure 1 – Site Location Plan
- Figure 2 – Proposed Site Development Plan
- Figure 3 – Site Investigation Layout Plan

TABLES

Table 1 - Summary of strata depths (m bgl).....	12
Table 2 – Soil Infiltration Testing Results Summary	13
Table 3 - Summary of Geotechnical Testing	15
Table 4 - Summary of environmental testing	16
Table 5 – Potential Coal Mining Legacy Issues.....	18
Table 6 – Identified Risks and Mitigation.....	18
Table 7 - Summary of in-situ and laboratory tests results within the Glacial Deposits.....	20
Table 8 – Summary of Asbestos Quantification.....	27
Table 9 – Summary of Exceedances within Soil Derived Leachate Samples	29
Table 10 - Ground Contamination Assessment Risk Table	33

APPENDICES

- Appendix A – Report Conditions
- Appendix B - Exploratory Hole Logs
- Appendix C – Soil Infiltration Testing Results
- Appendix D – TRL Probe Results
- Appendix E – Geotechnical laboratory test results
- Appendix F – Environmental laboratory test results
- Appendix G – CIRIA C552 Risk Methodology

EXECUTIVE SUMMARY

The Site	The site is located to the east of Ebenezer Close, in the district of Merthyr Tydfil. The site is approximately 0.02 hectares comprising an area of grassed open space used as a sports field directly to the southeast of Trelewis Primary School.
Site Investigation	A site investigation was undertaken on the site with the following scope of works: eight rotary open holed boreholes, one machine excavated trial pit, one soakaway test and in-situ testing. Geotechnical and contamination laboratory testing. The proposed development plan was not confirmed until after the investigations was completed.
Ground Conditions	The findings of the ground investigation indicate variable thicknesses of Glacial Deposits up to 9.1 m, overlying the Grovesend Formation of predominantly mudstones, sandstone and siltstones.
Mining	A Coal Mining Risk Assessment Report was undertaken in MaRHH 2019. The findings are summarised: There is a risk to the development from potential shallow mine workings within the Mynyddislwyn Coal Seam. This risk should be quantified by the drilling of a number of rotary probe holes in and around the proposed extension. There are no mine entries impacting the site. As such further risk mitigation works are not considered necessary for the proposed development.
Geotechnical Assessment	The ground investigation has shown the Glacial Deposits are generally suitable as a founding stratum with foundations to be deepened where Made Ground or clay soils are encountered. Traditional shallow foundations taken down to a minimum of 0.75m bgl and founded on the coarse-grained Glacial Deposits, may be designed to an allowable net bearing pressure of 150kPa. A raft foundation may also be a possible alternative foundation option. Raft foundations are used to spread the load from a structure over a large area. Floor slabs may be ground bearing for combined dead and live loads of up to 20kPa provided any made ground soils or layers of soft/loose ground has been removed. For pavement design, a CBR value of 10% is recommended. Due to the nature of the deposits, the subgrade should be inspected during construction to identify any loose, soft or other unsuitable material, which should be removed and replaced with suitable compacted backfill.
Ground Contamination Assessment	Based on the findings of the ground investigation, the site is considered to pose a limited risk to future site users and the wider environment. Asbestos containing materials have been identified in one sample, albeit at concentrations below the laboratory limit of detection. Given the predominant hardstanding across the site no additional risk management procedures are required within the proposed development, however a reactive approach will be required during the construction phase to identify and assess any asbestos containing materials encountered during the development of the site.
Conclusions and Recommendations	Further soakaway testing may need to be undertaken once the position and invert level of the proposed soakaway is known. The construction phase should be undertaken in the context of a reactive approach to ensure that any previously identified asbestos is assessed, and the risk assessment presented herein is updated to include additional risk management procedures where necessary

1. INTRODUCTION

1.1 Instruction

WYG Environment Planning Transport Ltd (WYG) was commissioned by Blaenau Gwent/Merthyr Tydfil County Borough Council to undertake a Ground Investigation and Interpretive Report at a playing field adjacent to the current Trelewis Primary School (known hereafter as “the site”).

The location of the site is shown on Figure 1.

1.2 Brief

The brief was to undertake a preliminary intrusive ground investigation to provide information on the ground conditions and to provide a geotechnical assessment and contaminated land risk assessment to support proposals for redevelopment.

The investigation was designed to comprise the following elements:

- 9 No. rotary percussive boreholes to a maximum depth of 35.0m bgl;
- 2 No. soil infiltration tests within a mechanically excavated trial pits;
- On-site inspection and logging of samples;
- In-situ testing in exploratory holes;
- Chemical and geotechnical sampling in exploratory holes;
- Laboratory geotechnical and chemical testing of soils; and
- Coal Mining Risk Assessment.

1.3 Report Scope

This report summarises the work undertaken and includes the following elements:

- Full factual records of the site works carried out;
- Summary of the ground conditions encountered;
- In-Situ testing results;
- Environmental laboratory testing results;
- Geotechnical laboratory testing results;
- Interpretation of Geotechnical and Environmental laboratory data, including a ground contamination risk assessment; and

- An executive summary of the report to allow a rapid, layman's overview.

1.4 Limitations

This report has been prepared in accordance with the requirements of Blaenau Gwent/Merthyr Tydfil County Borough Council. It is subject to the report conditions presented in Appendix A.

The information contained in this report is intended for the use of Blaenau Gwent/Merthyr Tydfil County Borough Council and WYG can take no responsibility for the use of this information by any third party or for uses other than that described in this report or detailed within the terms of our engagement.

2. SITE INFORMATION

2.1 Location

The site is located on an area of grassed open space used as a sports field directly to the southeast of Trelewis Primary School. The site is approximately 0.02 hectares (ha) in area and is centred on National Grid Reference (NGR) ST 10581 97375.

The site address is: Trelewis Primary School, Trelewis CF46 6AH

A site location plan is presented in Figure 1.

2.2 Site Description

The site is currently a grass covered playing field adjacent to The Trelewis Primary School.

The site is not accessible to the public. The site boundaries are comprised of metal fencing with two access gates in the south (main) and north (secondary) of the site. There is also a gated footbridge that comes from the town and over the railway line in the south east of the site. A railway line is located adjacent to the western boundary running broadly north to south. The site generally slopes from north west to south east with a steep slope in the south west at the bottom of the sports field, decreasing in elevation from south west to north east. The site is bound to the north and east by fields with animals out to pasture and to the south by a field and residential properties.

The ground cover on site is largely hardstanding tarmacadam with grass verges along the north east, west and south east boundaries and a grassed sports fields approximately 30 m by 50m in the south east. There is an area of dense vegetation in the south east of the site, including well developed trees.

3. SITE SETTING

3.1 Geology, hydrogeology and hydrology

3.1.1 Geology

No Made Ground is recorded on site or within 250m of the site on BGS geological maps. However, mapping indicates that a railway line (which runs just west of the site) could potentially be a souRHe of Made Ground.

The BGS geological map shows superficial Glacial Deposits (sand and gravel) within the site.

The site is underlain by the Grovesend Formation, which consists of mudstones, sandstones and siltstones. Coal bearing strata are also indicated to be present beneath the site.

3.1.2 Hydrogeology

The Grovesend Formation bedrock and Superficial Glacial deposits are designated as Secondary A Aquifers. These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important souRHe of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

3.1.3 Hydrology

The nearest surface waterRHouse is Bargod Taf located approximately 300m to the east of the site which flows in a general north- south direction towards the River Taff.

3.2 Radon

The BRE document 211 (Scivyer, 2015) mapping coverage for the site area was consulted and indicates that the site is located within an area where no radon protection measures are required for new developments.

4. SITE INVESTIGATION

The site investigation was undertaken between the 15th and 21st August 2019.

Details of the fieldwork methods are given in the notes section at the end of this report.

4.1 Scope

The scope of the site investigation included the following:

- Eight rotary open-holed boreholes (designated RH01 to RH08) to depths ranging from 17.00 m to 35.00 m bgl with SPTs conducted at the base of the hand dug inspection pit and 1.50m thereafter;
- One machine excavated trial pit designated TP01 to depth 1.5m bgl with a soil infiltration test undertaken;
- On-site inspection and logging of recovered samples;
- Representative soil samples taken and submitted for geotechnical classification testing;
- Representative soil samples submitted and tested for a suite of potential contaminants; and

Figure 3 shows the layout of the exploratory holes advanced during the site investigation. Exploratory hole logs including photographic plates are presented in Appendix B.

5. GROUND CONDITIONS ENCOUNTERED

5.1 Strata encountered

The sequence of strata encountered beneath the site was;

- Topsoil;
- Glacial Deposits;
- Grovesend Formation.

A summary of each stratum depth is provided in Table 1 below, with descriptions of each stratum detailed in the subsequent sections. Exploratory hole logs including photographic plates can also be seen in Appendix B.

Table 1 - Summary of strata depths (m bgl)

Location	Topsoil	Glacial Deposits	Grovesend Formation
RH01	GL - 0.25	0.25 – 6.10	6.10 – 35.0*
RH02	GL - 0.25	0.25 – 7.70	7.70 – 35.0*
RH03	GL - 0.25	0.25 – 5.70	5.70 – 35.0*
RH04	GL - 0.25	0.25 – 8.20	8.20 – 17.0*
RH05	GL - 0.25	0.25 – 9.10	9.10 – 35.0*
RH06	GL - 0.25	0.25 – 7.20	7.20 – 35.0*
RH07	GL - 0.25	0.25 – 8.60	8.60 – 35.0*
RH08	GL - 0.25	0.25 – 9.10	9.10 – 35.0*
TP01	GL - 0.20	0.20 – 1.50*	ne

*Base of stratum not proven
ne denotes not encountered

5.1.1 Topsoil

Topsoil was encountered in all exploratory locations, to depths as indicated in Table 1. It was generally recorded as a brown slightly silty slightly gravelly slightly sandy clay.

5.1.2 Glacial Deposits

Glacial Deposits were encountered in all locations, to depths as indicated in Table 1. The Glacial Deposits were variable across the site but were typically described as an orange brown clayey sandy gravel with variable cobble content. Gravels and cobbles are described as sandstone.

Exploratory hole logs are presented in Appendix B including full descriptions of each position.

5.1.3 Grovesend Formation

Grovesend Formation was encountered in all borehole locations, at depths as indicated in Table 1, the base of the stratum was not encountered.

This stratum generally comprised sandstone and mudstone with occasional thin coal bands. No voids, workings or workable coal was encountered.

5.2 Groundwater

Groundwater was encountered at one location, RH01, at a depth of 26.40 m.

5.3 In Situ Testing

5.3.1 Standard Penetration Testing

Standard Penetration Tests (SPTs) were undertaken throughout all borehole positions at shallow depths.

The results are presented in the exploratory hole logs included in Appendix B.

5.3.2 TRL Probe Testing

TRL probes were undertaken at three locations adjacent to RH01, RH05 and RH06. The results are presented in Appendix D.

5.3.3 Soil Infiltration Testing

A machine excavated trail pit was excavated in one location at the site, soil infiltration testing was undertaken in TP01.

The results from TP01 are presented in the table below and in Appendix C.

Table 2 – Soil Infiltration Testing Results Summary

Location	Test Number	Hydraulic Conductivity (m/sec)
TP01	1	N/A*

* Test carried out over 19 hours; permeability too low to be calculated

5.4 Visual or Olfactory Evidence of Contamination

No visual or olfactory evidence of contamination was encountered during the investigation

5.5 Obstructions

None encountered.

6. LABORATORY TESTING

6.1 Geotechnical Testing

A programme of laboratory testing was carried out on samples taken from the various strata encountered during the site investigation. Geotechnical testing was scheduled by WYG and carried out by GSTL Ltd, an approved supplier in accordance with the requirements of WYG quality system and UKAS accredited for a range of geotechnical tests. The test procedures used were generally in accordance with the methods described in BS1377:1990. Details of the specific tests used in each case are given in Table 3. Laboratory geotechnical test results are given in Appendix F.

Table 3 - Summary of Geotechnical Testing

Test	No.	Test Method
PSD: Wet Sieve method	14	BS1377:1990 Part 2:9.2
BRE Reduced Suite: pH, Acid Soluble Sulphate, Water Soluble Sulphate and Total Sulphur	7	BS1377:1990 Part 3 & BRE CP2/79 (non-accredited test)

6.2 Environmental Testing

Environmental chemistry was investigated by specialist chemical analysis of selected soil samples carried out by ALS Environmental Laboratories, an approved supplier in accordance with the requirements of WYG quality system and UKAS and MCERTS accredited for a range of chemical analyses. The testing was scheduled by WYG and is summarised in Table 4 for soil samples. The test results are included in Appendix E.

Table 4 - Summary of environmental testing

Test suite	No.
<u>Soil Samples:</u> Suite E UK Specification for Ground Investigation; • Heavy metals including Chromium (Hexavalent), Boron (water soluble), Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, MeRHury, Nickel, Selenium, Vanadium and Zinc; • Inorganics – including pH, Water soluble Sulphate as SO₄ (2:1 Extract), Cyanide (Easily liberatable- low level); • Speciated Petroleum Hydrocarbons (TPH CWG); • Speciated Polyaromatic Hydrocarbons (USEPA 16); • BTEX and MTBE; • Phenol; and • Asbestos Screen.	14

7. COAL MINING RISK ASSESSMENT

7.1 Introduction

The following Coal Mining Risk Assessment has been undertaken in line with the guidance outlined in line with PPG 14 – Development on Unstable Land, whereby a risk-based approach is adopted for the assessment of historical coal mine workings based on readily available information and site-specific data, where required.

7.2 SouRHes of Information

The following souRHes have been consulted as part of the risk assessment process:

- Coal Mining Risk Assessment Report dated MaRHh 2019 (Terrafirma);

7.2.1 Coal Mining Risk Assessment

A Coal Mining Risk Assessment Report was undertaken in MaRHh 2019. The findings are summarised below:

"There is a risk to the development from potential shallow mine workings within the Mynyddislwyn Coal Seam. This risk should be quantified by the drilling of a number of rotary probe holes in and around the proposed extension. There are no mine entries impacting the site."

7.3 Risk Assessment and Mitigation Strategy

The following table summarises the key hazards identified by review of the available data souRHes, the factors affecting risk posed by each hazard and an assessment of the estimated risk posed to any proposed re-development on the site.

Assessing risks from coal mining is based upon guidance provided by the Coal Authority following a 'risk based' approach implemented through PPG 14 – Development on Unstable Land.

The risk posed has been assessed as one of three categories;

High risk	Based upon the data available there is a significant risk of shallow ground instability associated with coal mining. Investigation will be required as part of the site re-development. Mitigation measures likely to be required.
Moderate risk	Based upon the data available there is a potentially significant risk of shallow ground instability associated with coal mining. Investigation will be required as part of the site re-development. Mitigation measures may be required.
Low risk	Based upon the data available there is a low risk of shallow ground instability associated with coal mining. No further assessment or investigation is recommended.

The table below summarises the potential risks associated with coal mining legacy at the site.

Table 5 – Potential Coal Mining Legacy Issues

Coal Mining Legacy	Yes	No	Risk Assessment
Underground mining (recorded)		x	Not Required
Shallow (<30m) underground mining (recorded)	✓		Required
Underground mining (unrecorded)		x	Not Required
Shallow (<30m) underground mining (unrecorded)	✓		Required
Recorded mine entries (Shafts and adits)		x	Not Required
Mining geology	✓		Required
Record of previous mine gas emissions		x	Not Required
Record of coal mining surface hazard		x	Not Required
Surface mining (recorded/unrecorded)		x	Not Required

Based on the information obtained from this assessment, the following risk assessment has been compiled, which identified plausible risks at the site in the context of the proposed end use.

Table 6 – Identified Risks and Mitigation

Hazard	Area of site affected	Factors affecting risk	Mitigation	Risk
Collapse of shallow recorded/unrecorded workings at the site and coal mining geology	Entire site	Data presented above indicates the Mynyddislwyn seam outcrops some 90m west of the site.	Drilling of 8 no. rotary perHussive boreholes to a maximum depth of 35m bgl has recorded no workings beneath the site, coal was recorded in one location at a depth of 30.40m bgl and was recorded as 0.50m thick.	Low Risk

7.4 Conclusion and Recommendations

The mining risk assessment indicates that there is a **Low risk** of ground instability as a result of unrecorded mining beneath the site. As such further risk mitigation works are not considered necessary for the proposed development.

8. GEOTECHNICAL ASSESSMENT

8.1 Ground Conditions

The ground conditions across the site generally comprise Topsoil overlying generally coarse-grained Glacial Deposits over bedrock of the Grovesend Formation. Shallow groundwater was not encountered during the ground investigation.

8.2 Soil Properties

The ranges of the various soil properties measured are discussed below, to aid in the selection of design values. However, the appropriate choice of characteristic and design values will depend on the particular analysis and design philosophy used and should be selected by the designer.

Where characteristic values are given, these are reasonably conservative estimates of a measured or assessed property that may be used to represent the overall behaviour of the material. Design values are similar but also take into account the ground-structure interaction for a given structure so need to be selected by the designer. It is recommended, however, that design values used do not exceed the characteristic values given in this report.

8.2.1 Glacial Deposits

Glacial deposits were encountered in all locations to a maximum depth of 9.10 m bgl and generally comprising orange brown clayey sandy gravel with variable cobble content. Gravels and cobbles are described as sandstone. There was no obvious Made Ground encountered although subsequent laboratory testing has indicated the presence of Asbestos in one sample collected (RH06 at 0.60m). A summary of the in-situ SPT N values and laboratory test results can be seen in Table 7 below.

Table 7 - Summary of in-situ and laboratory tests results within the Glacial Deposits

	No. of results	Range (min-max)	Average	Lower quartile	Upper quartile	Characteristic value ⁺
SPT N Values	10	25 – 50	36	29	45	25
Angle of shearing resistance ϕ (°)*	10	35 – 41	38	36	40	35

Notes:

+ suggested characteristic values are appropriate for most normal applications but designers should satisfy themselves that they are suitable for the specific application and design method they are using;

* Estimated from a correlation from Peck, Hansen and Thornburn, Foundation Engineering, Wiley, 2nd ed., (1974)(6)

Based on the above, it is recommended that the following values are taken as design/characteristic values for this material:

- SPT N Value 25
- Angle of shearing resistance, ϕ 35°

9. GEOTECHNICAL DESIGN CONSIDERATIONS

9.1 Proposed Development

The proposed development is to comprise a single-story extension building located south east of the existing school building.

9.2 Foundations

Traditional shallow foundations taken down to a minimum of 0.75m bgl and founded on the coarse-grained Glacial Deposits, may be designed to an allowable net bearing pressure of 150kPa. This will give a factor of safety greater than 3 against ultimate bearing capacity failure and should result in settlement of less than 25mm for strip footings of no more than 1.0m wide or pad footings of up to 2.0m square. Foundation excavations should be deepened where Made Ground or clay soils are encountered.

Foundation excavations should be inspected by a suitably experienced engineer or inspector to ensure the founding material is granular natural deposits. Any soft, loose or otherwise unsuitable material should be excavated and replaced by compacted granular backfill or lean concrete.

A raft foundation may also be a possible alternative foundation option. Raft foundations are used to spread the load from a structure over a large area, normally the entire area of the structure. They are often needed on soft or loose soils or compressible Made Ground with low bearing capacity as they can spread the loads over a larger area. Raft foundations may incorporate beams or thickened areas to provide additional support for specific loads. Raft foundations have the advantage of reducing differential settlements as the concrete slab resists differential movements between loading positions.

Dependant on the loadings, a raft foundation proposed will impose approximate bearing pressures ranging from around 10kPa in the central areas to around 90kPa in the extreme corners with the typical loading being around 60kPa. The founding level of the highest loaded areas is around 1m below existing ground levels and in view of this, it is considered that a presumed bearing value of 100 kPa would be applicable in these areas to give a factor of safety of greater than 3 against ultimate bearing capacity failure and should result in total settlements of less than 25mm. If very soft or loose Made Ground is encountered at the formation level, localised excavation and replacement with compacted granular fill should be carried out. Raft foundations should be

designed by a suitably qualified structural engineer.

9.3 Floor Slabs

Floor slabs may be ground bearing for combined dead and live loads of up to 20kPa provided any made ground soils or layers of soft/loose ground has been removed. The formation should be proof rolled using a heavy vibrating roller and inspected by a suitably experienced engineer or inspector. Any material such as soft clay, deleterious material containing weak or degradable contaminants, or other unsuitable material, should be excavated and replaced by well-compacted granular fill.

9.4 Chemical Attack on Buried Concrete

Chemical tests undertaken on representative samples show low levels of water-soluble sulphates and generally slightly alkaline conditions. Based on these conditions, it is recommended that for foundations the Design Sulphate Class for the site, as defined in BRE Special Digest 1, be taken as DS-1, and the Aggressive Chemical Environment for Concrete (ACEC) site classification be taken as AC-1.

9.5 Temporary Works

Excavated pits generally remained open and stable during the investigation and it is considered that most shallow excavation for foundations and service runs should remain stable in the short term. However, where soft or variable materials are encountered some collapse may occur requiring localised support or battering of the excavation. All excavations requiring man entry should be fully supported to prevent unexpected collapse.

Groundwater was not encountered during the investigation, although it should be noted that groundwater levels can vary seasonally. It is considered likely that any excavations below these depths will require significant dewatering operations, which may also impact stability.

9.6 Pavements

CBR values are typically in the range 10% to 134% with the majority of results between 10% and 20%. For pavement design, a value of 10% is recommended. Due to the nature of the deposits, the subgrade should be inspected during construction to identify any loose, soft or other unsuitable

material, which should be removed and replaced with suitable compacted backfill.

9.7 Drainage

Soakaway testing of the deposits beneath the site recorded soil infiltration values too low to be reported during the preliminary tests indicating very low to low permeability and poor drainage conditions. Based on SA01 the use of soakaways would not be a viable option.

10. GROUND CONTAMINATION ASSESSMENT – HUMAN HEALTH

10.1 Introduction

The UK Contaminated Land Regime (CLR) allows for a tiered approach to the assessment of ground contamination which is designed to allow increasingly site-specific assessment. In order to assess the potential risk posed by contaminants contained within the soils at the study area a generic quantitative risk assessment (gQRA) has been undertaken by comparing recorded concentrations of chemical constituents in soil with Generic Assessment Criteria (GAC) to identify whether, at the concentrations recorded, the presence of the constituent has the potential to adversely affect the health of site users (a Tier 1 assessment). GAC are set at levels where potential exposure is deemed to be within acceptable limits.

If the recorded concentrations of a particular constituent are below the GAC then the risk is generally considered to be acceptable and further assessment / or mitigation measures are not required. Where a substance is recorded at concentrations higher than GAC this does not necessarily indicate that a particular risk is present, however, it does typically signify the requirement to undertake further assessment in line with the UK tiered risk assessment framework.

10.2 Assessment Criteria

10.2.1 Generic Assessment Criteria

The following GAC for soils have been utilised for the screening process, in order of preference:

- CL:AIRE published C4SL (DEFRA, 2014);
- CIEH/LQM published S4UL (LQM/CIEH, 2015);
- WYG internal Tier 1 Screening Criteria (issue 15) derived using the derivation tool CLEA version 1.06, in line with the current UK Contaminated Land Regime.

C4SL are currently available for arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI and lead¹. The C4SL were originally developed to support the categorisation of sites in accordance with Part 2A are also, based on DEFRA guidance, considered suitable for use during the assessment of sites as part of the planning process.

¹ Arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI, lead assuming 6% SOM (1% SOM C4SL also published for benzene).

Where C4SLs are not available, 'Suitable for Use Levels' (S4UL) developed by CIEH/LQM have been used. The S4UL provide GAC based on minimal or tolerable risk intended to be protective of human health for individual or mixtures of substances. It is considered conservative and appropriate to use these values for contaminants for which C4SL are unavailable. GAC for volatile and semi-volatile organic compounds (VOC and SVOC) not presented in the S4UL document are sourced from CL:AIRE (CL:AIRE, January 2010).

Where no published screening values are available WYG have derived their own values (easily Liberatable cyanide).

The CLEA model states that "For most exposure pathways, the contamination is assumed to be at or within one metre of the surface" (Environment Agency, 2009). It is considered that at depths greater than 1.0m, the probability of human exposure via the direct contact pathways are significantly reduced, leaving inhalation of volatile compounds as the dominant pathway with regard to human health risks. Typically, volatile compounds only significantly affect the indoor inhalation pathway. The same screening concentrations have been used for all depths at this stage, though it is noted that these are highly conservative for depths below 1.00m bgl.

10.2.2 Proposed End Use

Screening criteria have been developed for the following land use scenarios:

- Residential with plant uptake;
- Residential without plant uptake;
- Allotments;
- Public open space (park and residential);
- Commercial / Industrial.

The proposed development on site will consist of the construction of a single storey school building within a sports field adjacent to an existing primary school. As the proposed land use does not fall into one of the categories listed above, the screening assessment has been undertaken against the residential without plant uptake scenario to provide a conservative assessment.

10.2.3 Soil Organic Matter

For organic contaminants, the generic soil screening values have been derived for a range of

concentrations of soil organic matter (1%, 2.5%, 6%). In order to provide a conservative assessment, the GAC derived for a 1% SOM have been adopted.

10.3 Tier 1 – Soil Screening

A total of fourteen soil samples collected from across the site were submitted for chemical laboratory analysis. Full copies of laboratory certificates for all soil analysis are included in Appendix F.

Comparison of the chemical analysis results with the generic assessment criteria for a residential with plant uptake end use has identified no exceedances in the soil samples. A summary of the soil screening process is presented in Appendix F.

10.4 Asbestos

Since 2009 there have been laboratory improvements in the detection of asbestos and as such all samples of Made Ground and natural material were subject to an asbestos screen. There is no published screening value for asbestos.

A total of fourteen samples were collected and analysed for the presence of asbestos containing materials. The laboratory results indicated that asbestos was positively identified in one sample RH06, 0.60 m. These samples were subsequently scheduled for quantification tests and the results are summarised below, as well as within Appendix F.

Table 8 – Summary of Asbestos Quantification

Exploratory Hole	Depth (m bgl)	Asbestos Identified (Laboratory Description)	Asbestos Containing Material (Laboratory Description)	Gravimetric Quantification (ACM) (mass %)	PCOM Quantification (fibres) (mass %)	Gravimetric and PCOM Total* (mass %)
RH06	0.60	Chrysotile	Loose fibres in soil	<0.001	<0.001	<0.001

Table Notes: ACM = asbestos containing material. PCOM = phase contrast optical microscopy. *total of mass % from gravimetric quantification and phase contrast optical microscopy quantification.

Quantification testing has indicated the presence of asbestos containing materials to be present at concentrations below the laboratory limit of detection. The risks posed by the presence of asbestos are considered in more detail in the risk assessment presented in Section 12.

11. GROUND CONTAMINATION ASSESSMENT – WIDER ENVIRONMENT

11.1 Introduction

The potential for contaminated groundwater on site to adversely affect controlled water receptors (groundwater and surface water bodies) has been assessed at this stage by direct comparison of analytical data from the WYG ground investigation with relevant Water Quality Standards (WQS).

Similarly, the potential for soil contamination to impact controlled waters has been assessed by comparing analytical data from soil derived leachate tests directly against WQS.

11.2 Assessment Criteria

In light of the environmental setting of the site under consideration. The following water quality standards have been adopted, in order of preference.

- Water Framework Directive (WFD),
- Environmental Quality Standards (EQS);²
- WHO 2008 - Petroleum Products in Drinking Water (WHO 2008)
- UK Drinking Water Standards³.

11.3 Tier 1 Screening Assessment – Soil Derived Leachate

Soil derived leachate samples can be used to identify potentially mobile contamination within soil samples collected from the site. It should be noted that the laboratory preparation of leachate samples is likely to produce higher concentrations of leachable components than conditions encountered on site, as such the following assessment is considered to be inherently conservative in nature.

Eight soil derived leachate samples were screened against a suite of determinants outlined in

² Where WFD 2015 are not presented revoked WFD 2010 standards are used

³ WHO 2005; WHO 2008; UK Water Supply Regulations 2010 and 1989 Regulations. Priority given to UK drinking water standards

Section 11.2.

The following table summarises the determinants which have been identified at concentrations in excess of the relevant WQS screening criteria. Where no screening criteria were available, the laboratory limit of detection (LOD) was used.

Table 9 – Summary of Exceedances within Soil Derived Leachate Samples

Determinant	Units	Maximum	Minimum	Screening Value	Exceedances	
					No.	Location
Copper	µg/l	4.39	0.826	1.0	6	RH02, RH03, RH04, RH06, RH07, RH08
Zinc	µg/l	29.6	2.27	1.09	3	RH03, RH06, RH07
Fluoranthene	µg/l	0.0886	0.00658	0.0063	8	RH02, RH03, RH04, RH05, RH06, RH07, RH08, TP01
Benzo(a)pyrene	µg/l	0.00269	<0.02	0.00017	2	RH07
Acenaphthylene	µg/l	0.0154	<0.005	<0.005	1	RH02
Phenanthrene	µg/l	0.0445	<0.005	<0.005	8	RH02, RH03, RH04, RH05, RH06, RH07, RH08, TP01
Fluorene	µg/l	0.0173	<0.005	<0.005	2	RH03, RH05
Chrysene	µg/l	0.00681	<0.005	<0.005	1	RH07
Pyrene	µg/l	0.0638	<0.005	<0.005	7	RH02, RH03, RH05, RH06, RH07, RH08, TP01
Benzo(a)anthracene	µg/l	0.0123	<0.005	<0.005	1	RH07

A number of determinants (heavy metals and PAH compounds) were identified within soil derived leachate samples at concentrations in excess of the relevant screening value or limit of detection.

The screening criteria for lead, copper, and zinc should be considered in the context of the bioavailability of the contaminant which can be calculated using the Water Framework Metal Bioavailability Assessment Tool (M-BAT)⁴. The results of the bioavailability calculations indicate the following range of concentrations which should be assessed as part of the screening process

⁴ www.wfduk.org

for copper and zinc.

Table 10 – Summary of Calculated PNEC concentrations for Copper and Zinc

Determinant	Units	Maximum PNEC	Minimum PNEC	Exceedances	
				No.	Location
Copper	µg/l	38.56	13.19	0	N/A
Zinc	µg/l	30.34	16.94	2	RH06, RH07

The bioavailability assessment indicates concentrations of zinc within two samples of glacial deposits in excess of the calculated PNEC (predicted no-effect concentration) within the Water Framework Directive.

The majority of exceedances associated with the elevated concentrations of PAH have been identified within RH07, however some PAH compounds have been identified at elevated concentrations in samples from the wider site, particularly within RH02, RH03 and RH04. the samples are all obtained from natural strata.

The recorded exceedances in soil derived leachate samples have been carried forward to the risk assessment presented in Section 12.

12. SITE CONCEPTUAL MODEL AND GROUND CONTAMINATION RISK ASSESSMENT

12.1 Introduction

In general, ground contamination can occur through several causes, particularly from historical operations and activities. Contamination can result from either on-site sources or from on-site migration from off-site sources, leading to long term liabilities under recent legislation for any site owner.

The Environmental Protection Act 1990 (Part IIA) makes provisions for a risk-based framework for the identification, assessment, management and redevelopment of contaminated land within the UK. The provisions of the Act came into effect in England and Wales in July 2001 and are aimed at ensuring that actions taken with respect to contaminated land are directed by a technically well-founded assessment of risk.

The process of risk assessment is an evaluation of the probability of harm, and comprises the identification of sources of contamination, receptors that may be affected by the contamination and pathways by which the receptors may be harmed forming a pollution linkage. The site conceptual model (presented below) forms the basis for the qualitative assessment of ground contamination risks associated with the site.

12.2 Site Conceptual Model

The conceptual model for the site reflects the findings and observations during the site investigation. The key source, pathway, receptor model is outlined below within the context of the anticipated future development of the existing school.

12.2.1 Sources

The following sources of contamination have been identified from the site investigation:

- General contamination within near surface soils;
- Potentially Mobile Contamination within Glacial Deposits (Heavy metals and PAH from soil derived leachate samples);
- Asbestos within Glacial Deposits;

12.2.2 Pathways

The primary pathways by which sensitive receptors may come into contact with ground contamination are considered to be the following:

- Direct dermal contact or ingestion of soils, or inhalation of dust (i.e. human interaction with surface and sub-surface materials);
- Disturbance of potential asbestos impacted soils and subsequent inhalation of asbestos fibres;
- Leaching and horizontal or vertical migration through the unsaturated ground, whether through permeable sub-surface materials and/or preferential pathways;
- Lateral and vertical migration of groundwater through permeable sub-surface materials and/or preferential pathways;
- The migration and accumulation of ground gases or vapours through permeable sub-surface materials and/or preferential pathways.

12.2.3 Receptors

The following are considered to be sensitive receptors:

- Site construction workers;
- Future Site users (within the context of the ongoing use as a school);
- Groundwater within underlying Secondary A Aquifer;
- Future Building Infrastructure.

12.3 Ground Contamination Risk Assessment Table

The pollution linkages and a qualitative risk assessment are presented in the table below. The risk assessment considers the site within an area context and assesses potential risks to identified receptors in relation to the existing site setting and the proposed development. CIRIA C552 has been used to define the risk rating presented in the Qualitative Risk Assessment matrix, methodology for which is presented in Appendix G.

Table 11 - Ground Contamination Assessment Risk Table

SouRHe	Pathway	Receptor	Consequence of risk being realised	Probability of risk being realised	Risk Classification	Potential risk management requirements
General contamination associated with Glacial Deposits on site, including mobile contamination	Direct dermal contact or ingestion	Current site users	Medium	Unlikely	Low Risk	Across the site, elevated concentrations of contaminants have not been identified within any of the soil samples and as such these materials are considered to pose a low risk to site users.
		Future site users		Unlikely	Low Risk	
		Construction workers		Unlikely	Low Risk	
	Leaching and horizontal or vertical migration	Groundwater (Secondary A Aquifer)	Mild	Low Likelihood	Low Risk	The laboratory test results of the soil derived leachate testing from the general Glacial Deposits indicated a limited number of elevated concentrations of heavy metals and PAH compounds above the EQS screening criteria. Given the conservative nature of the leachate testing methodology and the relatively minor exceedances identified in the soil derived leachate samples the recorded concentrations are not considered to pose a significant risk to controlled waters.
		Surface waters (Bargod Taf)		Low Likelihood	Low Risk	

SouRHe	Pathway	Receptor	Consequence of risk being realised	Probability of risk being realised	Risk Classification	Potential risk management requirements
Asbestos containing materials	Inhalation	Current and future site users	Medium	Low likelihood	Moderate to Low Risk	One sample has been identified as containing chrysotile asbestos fibres, with quantification testing indicating concentrations below the laboratory limit of detection.
		Construction Workers	Medium	Low likelihood	Moderate to Low Risk	A total of 14 samples were screened from the near surface soils, with only one isolated identification of asbestos at low concentrations. The proposed development indicates the site will be covered by hard landscaping and the building footprint. As such the exposure pathway will be removed during the development.

13. CONCLUSIONS AND RECOMMENDATIONS

13.1 Ground Contamination

13.1.1 Summary

Made Ground was not identified on the site during the ground investigation. Based on the results of chemical testing, no contamination has been identified within the near surface deposits, whereby, within the context of general contaminants, the soils on site pose a low risk to future site users associated with the proposed development.

A limited number of contaminants have been identified within soil derived leachate samples from natural strata. However, given the conservative nature of the test procedure and the absence of significant Made Ground deposits identified on the site the risk to the wider environment is considered to be of a low order of magnitude.

13.1.2 Asbestos

Asbestos containing materials have been identified within one sample, at below the laboratory limit of detection within RH06 at 0.60 m. A total of 14 samples have been screened for the presence of asbestos. In the absence of significant Made Ground and in light of the proposed development including predominant hardstanding no further risk management procedures are considered necessary. However, it is recommended that the development phase is undertaken utilising a reactive approach to ensure any previously identified asbestos encountered during the construction phase is identified and the risk management procedures updated accordingly.

13.2 Geotechnical

The ground investigation has shown the Glacial Deposits are generally suitable as a founding stratum with foundations to be deepened where Made Ground or clay soils are encountered.

Traditional shallow foundations taken down to a minimum of 0.75m bgl and founded on the coarse-grained Glacial Deposits, may be designed to an allowable net bearing pressure of 150kPa. A raft foundation may also be a possible alternative foundation option. Raft foundations are used to spread the load from a structure over a large area.

Floor slabs may be ground bearing for combined dead and live loads of up to 20kPa provided any made ground soils or layers of soft/loose ground has been removed.

It is recommended that for foundations the Design Sulphate Class for the site, as defined in BRE Special Digest 1, be taken as DS-1, and the Aggressive Chemical Environment for Concrete (ACEC) site classification be taken as AC-1.

For pavement design, a CBR value of 10% is recommended. Due to the nature of the deposits, the subgrade should be inspected during construction to identify any loose, soft or other unsuitable material, which should be removed and replaced with suitable compacted backfill.

Soakaway testing of the deposits beneath the site recorded soil infiltration values too low to be calculated during the preliminary tests indicating very low permeability and poor drainage conditions. Based on TP01 the use of soakaways would not be a viable option, but further testing will need to be undertaken once the position and invert level of the proposed soakaway is known.

13.3 Recommendations

Based on the findings of the site investigation, the following recommendations are presented outlining the requirements for further ground investigation and general recommendations to support the proposed development.

- The construction phase should be undertaken in the context of a reactive approach to ensure that any previously identified asbestos is assessed, and the risk assessment presented herein is updated to include additional risk management procedures where necessary.
- Further soakaway testing may need to be undertaken once the position and invert level

of the proposed soakaway is known.

14. NOTES

1. Standards

All boring operations, sampling of soils, *in situ* testing and geotechnical laboratory testing have been carried out in accordance with the recommendations of the British Standards BS 5930(2015)⁽¹⁾, BS 1377 (1990)⁽²⁾ and BS10175 (2001)⁽³⁾.

Soil and rock descriptions follow the recommendations of BS 593. Where descriptions or classifications are based on other documents (e.g. BS 8004 (1986) or CIRIA Project Report 11 (1993)), this is stated in the report text.

2. Site methods

Unless specifically stated otherwise, the following methods are used for exploratory holes.

- Holes described as cable perHussive are bored using a light cable perHussive rig. Standard penetration tests are carried out where appropriate, as shown in the logs. Disturbed and undisturbed samples are taken from the exploratory holes at the depths on the records.
- Window sampling generally uses the windowless sampling method, using a tracked Geotool.
- Dynamic probes are usually heavy dynamic probes, using the same tracked Geotool used for window sampling.

3. Definitions and abbreviations

The following terms are used in the exploratory hole logs

Samples

U	Undisturbed 102mm dia. sample
TW	Thin Walled undisturbed 102mm dia. sample
B	Bulk sample
D	Small disturbed sample
W	Water sample
CBR	California Bearing Ratio test or CBR value obtained from Mexiprobe test

In situ tests

S	Standard penetration test (SPT)
N	SPT N value (blows/300mm)
HP	Hand penetrometer – shear strength
SV	Hand shear vane – shear strength
VOC	Volatile organic compounds (ppm)
PID	Photo-ionisation detector – used to detect the presence of VOCs.

Core recovery and rock quality

TCR	Total core recovery (%)
SCR	Solid core recovery (%)
RQD	Rock quality designation (%)
FI	Fracture index
NR	No recovery
NI	Not intact

Rotary drilling sizes

Index letter	Nominal diameter (mm)	
	Borehole	Core
N	75	54
H	99	76
P	120	92
S	146	113

Water strikes

▽	Level of water strike
▼	Water level rose to this level (see Remarks at foot of log for details)

Depth means depth below existing ground level unless otherwise specified. Values specified in soil descriptions given in the exploratory hole logs are depths unless otherwise specified.

15. GLOSSARY

AOD	above Ordnance Datum
bgl	below ground level
BGS	British Geological Survey
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
C4SL	Category 4 Screening Levels
CIEH	Chartered Institute of Environmental Health
CLEA	Contaminated Land Exposure Assessment
CoC	Constituent of Concern
CSM	Conceptual Site Model
DEFRA	Department of Environment, food and Rural Affairs
DQRA	Detailed Quantitative Risk Assessment
DTS	Desktop Study
DRO	Diesel Range Organics
DWS	Drinking Water Standard
EA	Environment Agency (England)
EPH	Extractable Petroleum Hydrocarbons
EQS	Environmental Quality Standards
FOC	Fraction Organic Carbon
GPR	Ground Penetrating Radar
LOD	Limit of detection
LQM	Land Quality Management
NRW	Natural Resources Wales
OS	Ordnance Survey
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PPE	Personal Protection Equipment
ppm	parts per million
PRO	Petroleum Range Organics
SGV	Soil Guideline Values
SOM	Soil Organic Matter
SVOC	Semi-volatile organic compounds
TPH	Total Petroleum Hydrocarbon
TSV	Tier 1 Screening Values
VOC	Volatile Organic Carbon
VPH	Volatile Petroleum Hydrocarbons

16. REFERENCES

- British Geological Survey . (2018). *GeoIndex* . Retrieved from <http://www.bgs.ac.uk/GeoIndex/>
- CIRIA. (2001). *Contaminated land risk assessment A guide to good practice*.
- DEFRA. (2018). *MAGIC*. Retrieved from Magic Map: <http://magic.defra.gov.uk/MagicMap.aspx>
- Environment Agency . (MaRHh 2017). *New Groundwater Vulnerability Mapping Methodology in England and Wales. Reference SC040016/R*. Environment Agency .
- Environment Agency. (2008). *R&D Publication 66. Guidance for the Safe Development of Housing on Land Affected by Contamination*.
- Scivyer, C. (2015). *BRE 211. Radon: Guidance on protective measures for new buildings (including supplementary advice for extensions, conversions and refurbishment projects). Fifth Edition* . BRE.
- Squirrell, H. C. (1969). *Geology of the South Wales Coalfield. Part 1. The Country Around Newport (Mon.) Explanation of the One-inch Geological Sheet 249, New Series*. London: Her Majesty's Stationary Office.
- The Coal Authority. (2019). *Coal Athority Interactive Viewer*. Retrieved from <http://mapapps2.bgs.ac.uk/coalauthority/home.html>
- Zetica UXO. (2008). *Zetica UXO Risk Maps*. Retrieved from <https://zeticauxo.com/downloads-and-resouRHes/risk-maps/>

FIGURES

Figure 1 – Site Location Plan



DO NOT SCALE: CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ANY OMISSIONS OR ERRORS

REV	DESCRIPTION	BY	CHK	APP	DATE
-----	-------------	----	-----	-----	------

Client:
BLAENAU GWENT COUNTY BOROUGH COUNCIL

5th FLOOR
LONGCROSS COURT
47 NEWPORT ROAD
CARDIFF
CF24 0AD
TEL: +44 (0)29 2082 9200
FAX: +44 (0)29 2045 5321
e-mail: cardiff@wyg.com

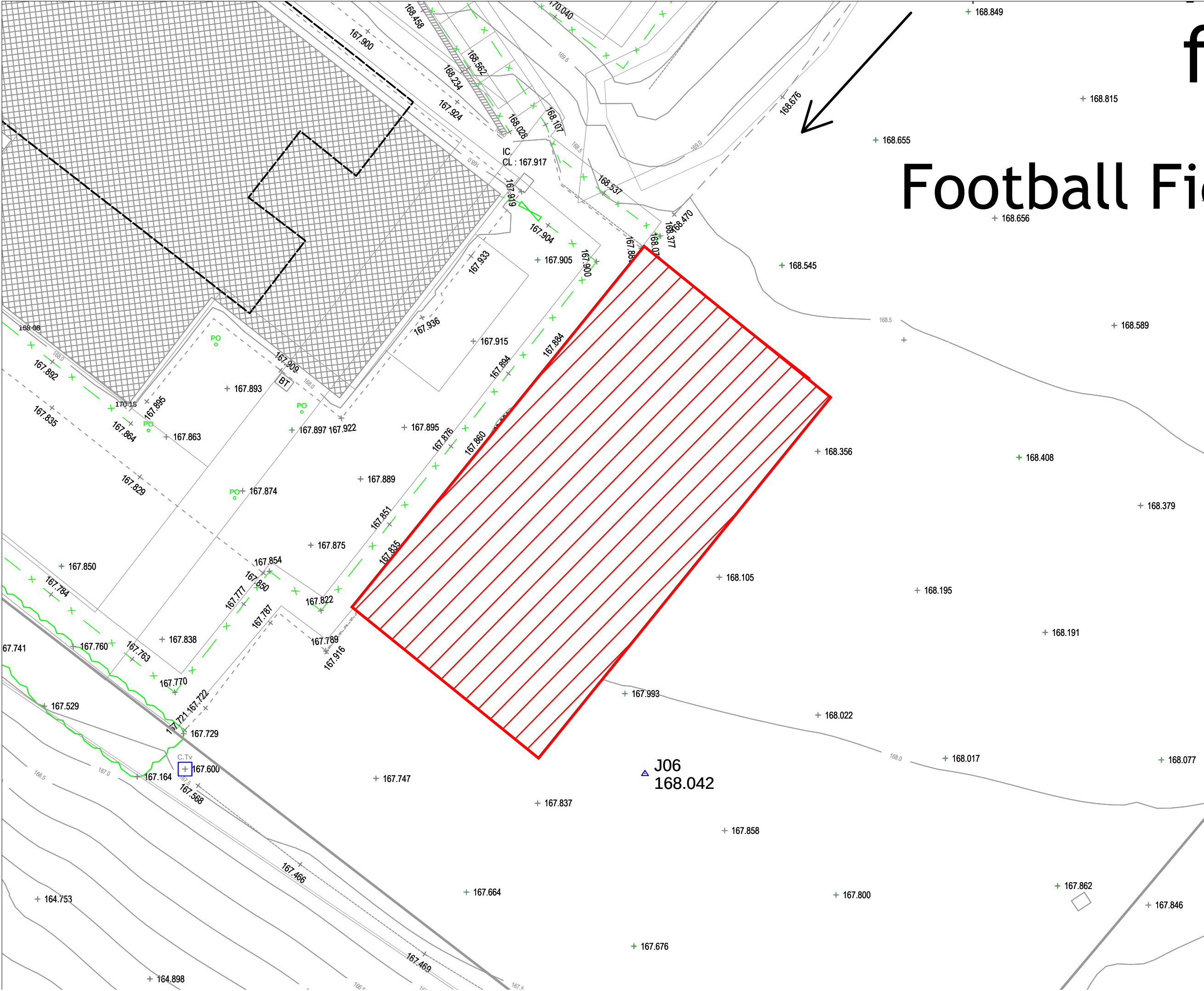


Project:
TRELEWIS PRIMARY SCHOOL

Drawing Title:
SITE LOCATION PLAN

Scale @	A3	Drawn	Date	Checked	Date	Approved	Date
Project No.	A113930	Office	CDF	Type	N	Drawing No.	1
Revision	00						

Figure 2 – Proposed Site Development Plan



NOTES

Notes :-
DO NOT SCALE FROM THIS DRAWING
ANY DISCREPANCIES TO BE REPORTED TO THE CONTRACT ADMINISTRATOR
DRAWINGS ISSUED WITHOUT STATUS ARE DRAFT ONLY
UNDERGROUND SERVICES WILL BE SUPPLIED TO SUCCESSFUL CONTRACTOR PRIOR TO COMMENCEMENT ON SITE.
CONTRACTOR TO CHECK FOR UNDERGROUND AND OVERHEAD SERVICES ON SITE

Key:

Site Boundary

Proposed Extension

REVISION / DESCRIPTION	Drawn By	Checked By	Date
 Dyngor Bwrdeistref Sirol Blaenau Gwent County Borough Council Community Services Division Municipal Offices, Civic Centre, Ebbw Vale, NP23 5SB Environment Directorate / Cyfarwyddiaeth Amgylchedd Blaenau Gwent, NP23 5SB, W.C.E., F.I.H.E., W.C.A.M., Corporate Director Environment / Cyfarwyddwr Cynnalweddol Amgylchedd			

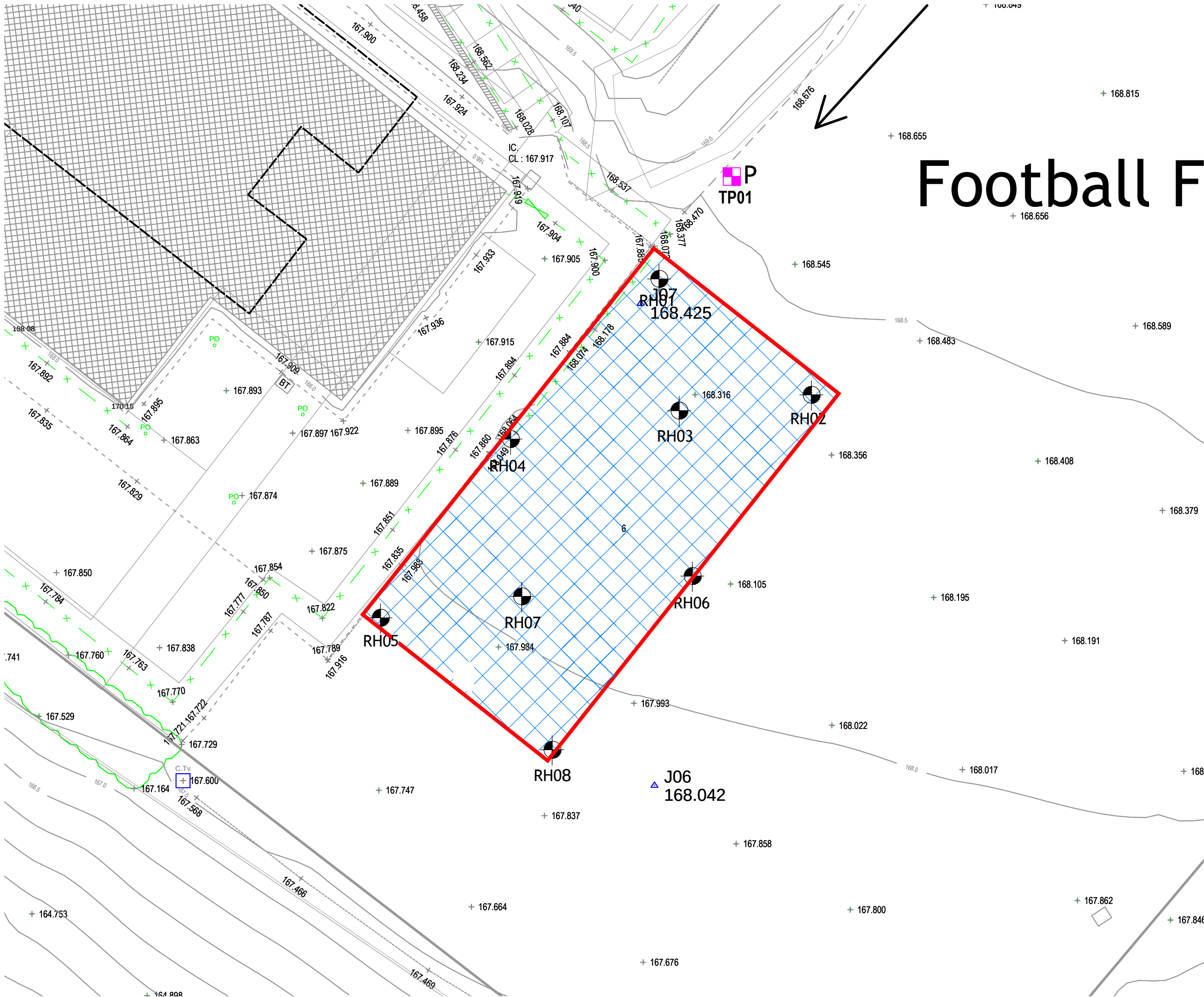
Client				CLIENT
Project Title				TS1083_TRELEWIS_PRIMARY_SCHOOL_EXTENSION
Drawing Title				GROUND INVESTIGATION EXPLORATORY_HOLE_LOCATION_PLAN
Date	Scale @ A1	Checked By	Checked_BY	Drawn By JN
MAY_2019	SCALE			
Drawing Number			Revision	
TS1083/GI/003			A	

Figure 3 – Site Investigation Layout Plan

LEGEND:

- Site Boundary
- Proposed Extension
- Rotary Borehole Location
- Permeability test location
- Trial Pit

Football F



REV	DESCRIPTION	BY	CHK	APP	DATE
-----	-------------	----	-----	-----	------

Client:
BLAENAU GWENT COUNTY BOROUGH COUNCIL

5th FLOOR
LONGCROSS COURT
47 NEWPORT ROAD
CARDIFF
CF24 0AD
TEL: +44 (0)29 2082 9200
FAX: +44 (0)29 2045 5321
e-mail: cardlff@wyg.com



Project:
TRELEWIS PRIMARY SCHOOL

Drawing Title:
SITE INVESTIGATION LAYOUT PLAN

Scale @	A3	Drawn	Date	Checked	Date	Approved	Date
Project No.	A113930	Office	CDF	Type	N	Drawing No.	2
Revision	00						

APPENDICES

APPENDIX A – REPORT CONDITIONS

APPENDIX A - REPORT CONDITIONS GROUND INVESTIGATION

This report is produced solely for the benefit of Blaenau Gwent County Borough Council & Merthyr Tydfil County Borough Council and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of future changes in the condition of the site.

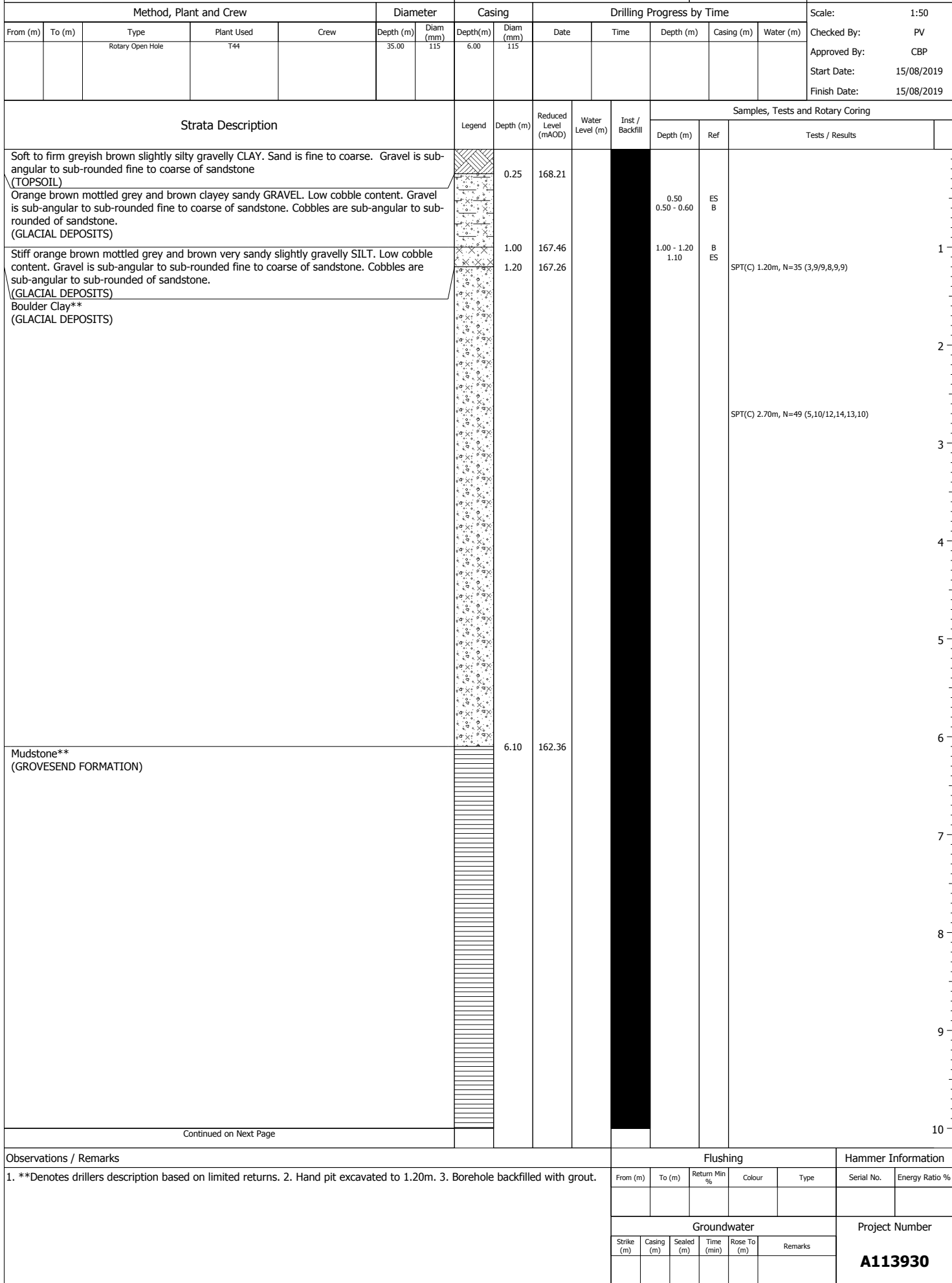
This report is based on a visual site inspection, reference to accessible referenced historical records, information supplied by those parties referenced in the text and preliminary discussions with local and Statutory Authorities. Some of the opinions are based on unconfirmed data and information and are presented as the best that can be obtained without further extensive research. Where ground contamination is suspected but no physical site test results are available to confirm this, the report must be regarded as initial advice only, and further assessment should be undertaken prior to activities related to the site. Where test results undertaken by others have been made available these can only be regarded as a limited sample. The possibility of the presence of contaminants, perhaps in higher concentrations, elsewhere on the site cannot be discounted.

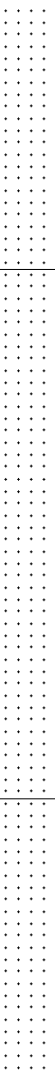
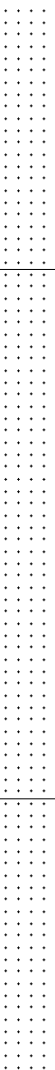
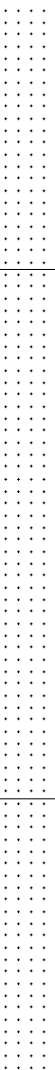
Whilst confident in the findings detailed within this report because there are no exact UK definitions of these matters, being subject to risk analysis, we are unable to give categorical assurances that they will be accepted by Authorities or Funds etc. without question as such bodies often have unpublished, more stringent objectives. This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to WYGE. In time improved practices or amended legislation may necessitate a re-assessment.

The assessment of ground conditions within this report is based upon the findings of the study undertaken. We have interpreted the ground conditions in between locations on the assumption that conditions do not vary significantly. However, no investigation can inspect each and every part of the site and therefore changes or variances in the physical and chemical site conditions as described in this report cannot be discounted.

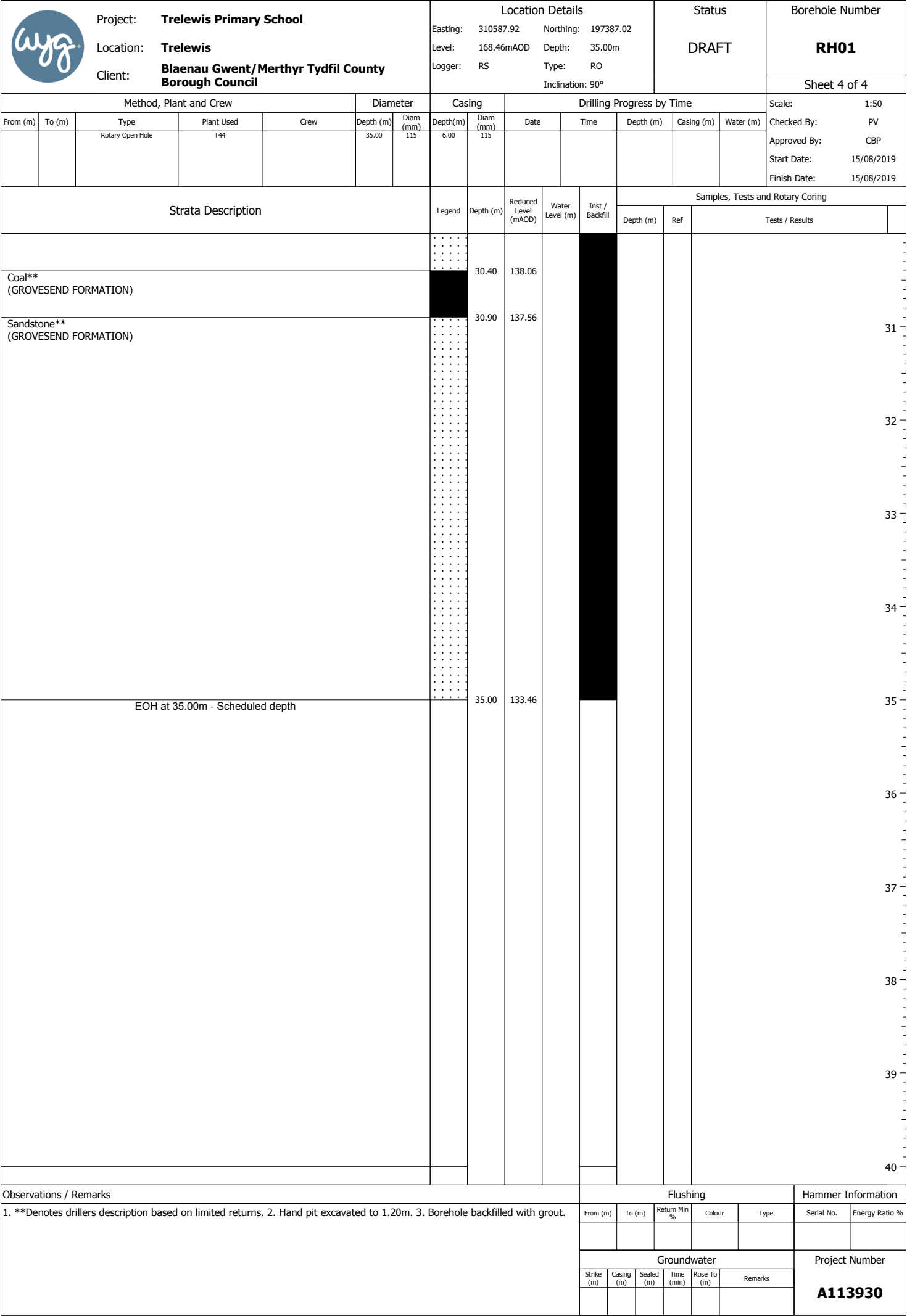
The report is limited to those aspects of land contamination specifically reported on and is necessarily restricted and no liability is accepted for any other aspect especially concerning gradual or sudden pollution incidents. The opinions expressed cannot be absolute due to the limitations of time and resources imposed by the agreed brief and the possibility of unrecorded previous use and abuse of the site and adjacent sites. The report concentrates on the site as defined in the report and provides an opinion on surrounding sites. If migrating pollution or contamination (past or present) exists further extensive research will be required before the effects can be better determined.

APPENDIX B - EXPLORATORY HOLE LOGS

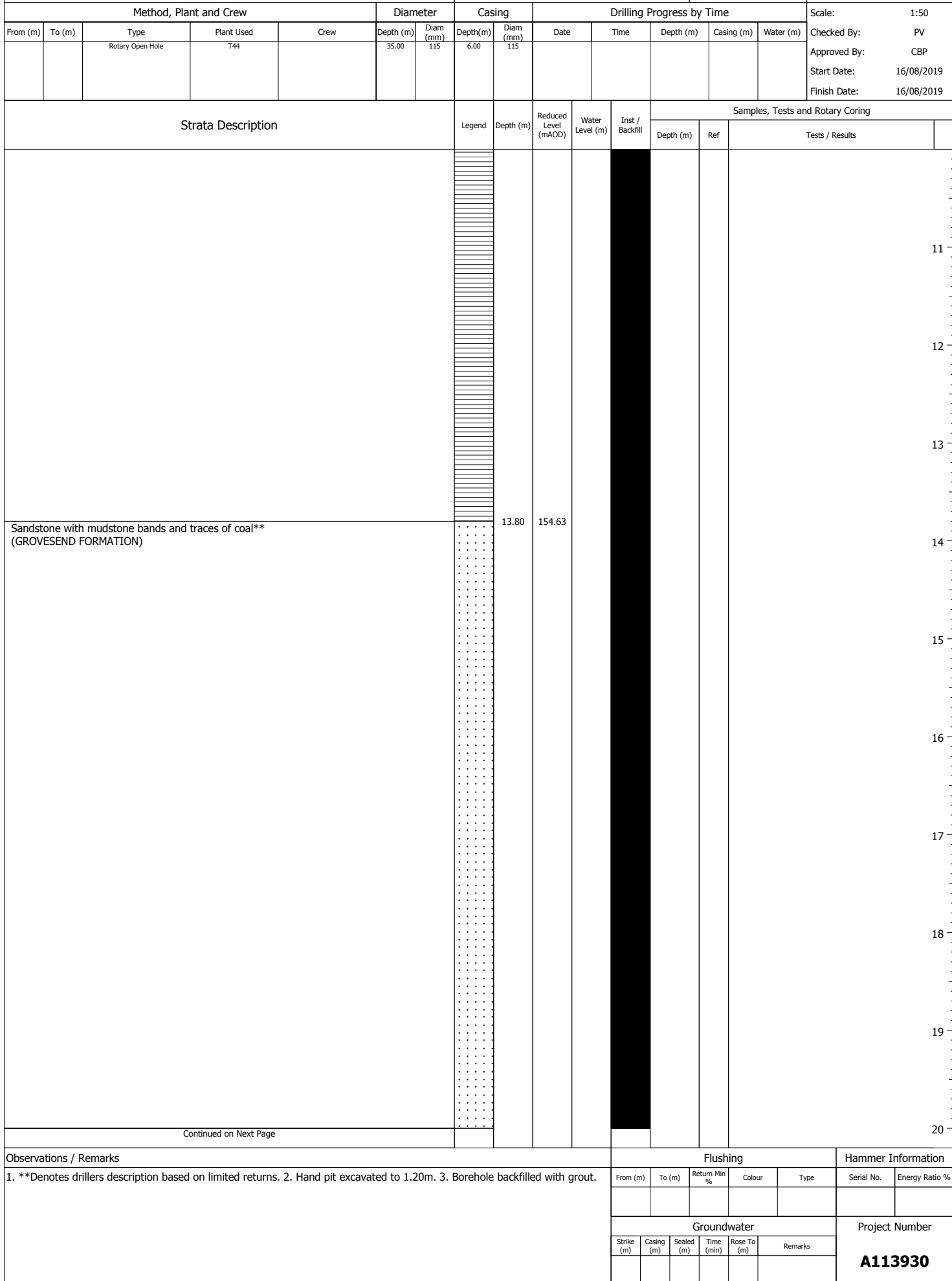


		Project: Trelewis Primary School				Location Details				Status		Borehole Number			
		Location: Trelewis				Easting: 310587.92 Northing: 197387.02				DRAFT		RH01			
		Client: Blaenau Gwent/Merthyr Tydfil County Borough Council				Level: 168.46mAOD Depth: 35.00m Logger: RS Type: RO Inclination: 90°									
Method, Plant and Crew					Diameter		Casing		Drilling Progress by Time				Scale: 1:50		
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By: PV	
		Rotary Open Hole	T44		35.00	115	6.00	115						Approved By: CBP	
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring			Start Date: 15/08/2019
												Depth (m)	Ref	Tests / Results	Finish Date: 15/08/2019
								12.90	155.56					11	
															Sandstone with mudstone bands** (GROVESEND FORMATION)
Sandstone** (GROVESEND FORMATION)								18.20	150.26					14	
Sandstone with traces of coal** (GROVESEND FORMATION)															
Continued on Next Page														16	
Observations / Remarks 1. **Denotes drillers description based on limited returns. 2. Hand pit excavated to 1.20m. 3. Borehole backfilled with grout.															Flushing
							From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %		
							Groundwater						Project Number		
							Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	A113930		

		Project: Trelewis Primary School				Location Details				Status		Borehole Number				
		Location: Trelewis				Easting: 310587.92 Northing: 197387.02				DRAFT		RH01				
		Client: Blaenau Gwent/Merthyr Tydfil County Borough Council				Level: 168.46mAOD Depth: 35.00m Logger: RS Type: RO Inclination: 90°										
Method, Plant and Crew						Diameter		Casing		Drilling Progress by Time				Scale: 1:50		
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By:	PV	
		Rotary Open Hole	T44		35.00	115	6.00	115						Approved By:	CBP	
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring				
												Depth (m)	Ref	Tests / Results		
								21.90	146.56						21	
Mudstone** (GROVESEND FORMATION)															22	
Sandstone** (GROVESEND FORMATION)								22.70	145.76							23
															24	
															25	
															26	
															27	
															28	
															29	
															30	
Continued on Next Page																
Observations / Remarks										Flushing				Hammer Information		
1. **Denotes drillers description based on limited returns. 2. Hand pit excavated to 1.20m. 3. Borehole backfilled with grout.										From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %
										Groundwater					Project Number	
										Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	A113930
										26.40	-	-	0	0.00		

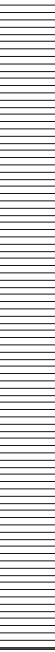


		Project: Trelewis Primary School				Location: Trelewis				Client: Blaenau Gwent/Merthyr Tydfil County Borough Council				Location Details Easting: 310593.55 Northing: 197382.38 Level: 168.43mAOD Depth: 35.00m Logger: RS Type: RO Inclination: 90°				Status DRAFT		Borehole Number RH02	
														Sheet 1 of 4							
Method, Plant and Crew						Diameter		Casing		Drilling Progress by Time						Scale: 1:50					
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By:	PV						
		Rotary Open Hole	T44		35.00	115	6.00	115						Approved By:	CBP						
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring									
												Depth (m)	Ref	Tests / Results							
Soft to firm greyish brown slightly silty gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of sandstone (TOPSOIL) Orange brown mottled grey and brown silty gravelly fine to coarse SAND. Low cobble content. Gravel is sub-angular to sub-rounded fine to coarse of sandstone. Cobbles are sub-angular to sub-rounded of sandstone. (GLACIAL DEPOSITS) Greyish brown silty sandy GRAVEL. Sand is fine to coarse. Low cobble content. Gravel is sub-angular to sub-rounded fine to coarse of sandstone. (GLACIAL DEPOSITS) Boulder Clay** (GLACIAL DEPOSITS)								0.25	168.18												
								0.50	167.93												
								1.20	167.23												
Mudstone** (GROVESEND FORMATION)								7.70	160.73												
Continued on Next Page																					
Observations / Remarks										Flushing				Hammer Information							
1. **Denotes drillers description based on limited returns. 2. Hand pit excavated to 1.20m. 3. Borehole backfilled with grout.										From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %					
										Groundwater				Project Number							
										Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	A113930					



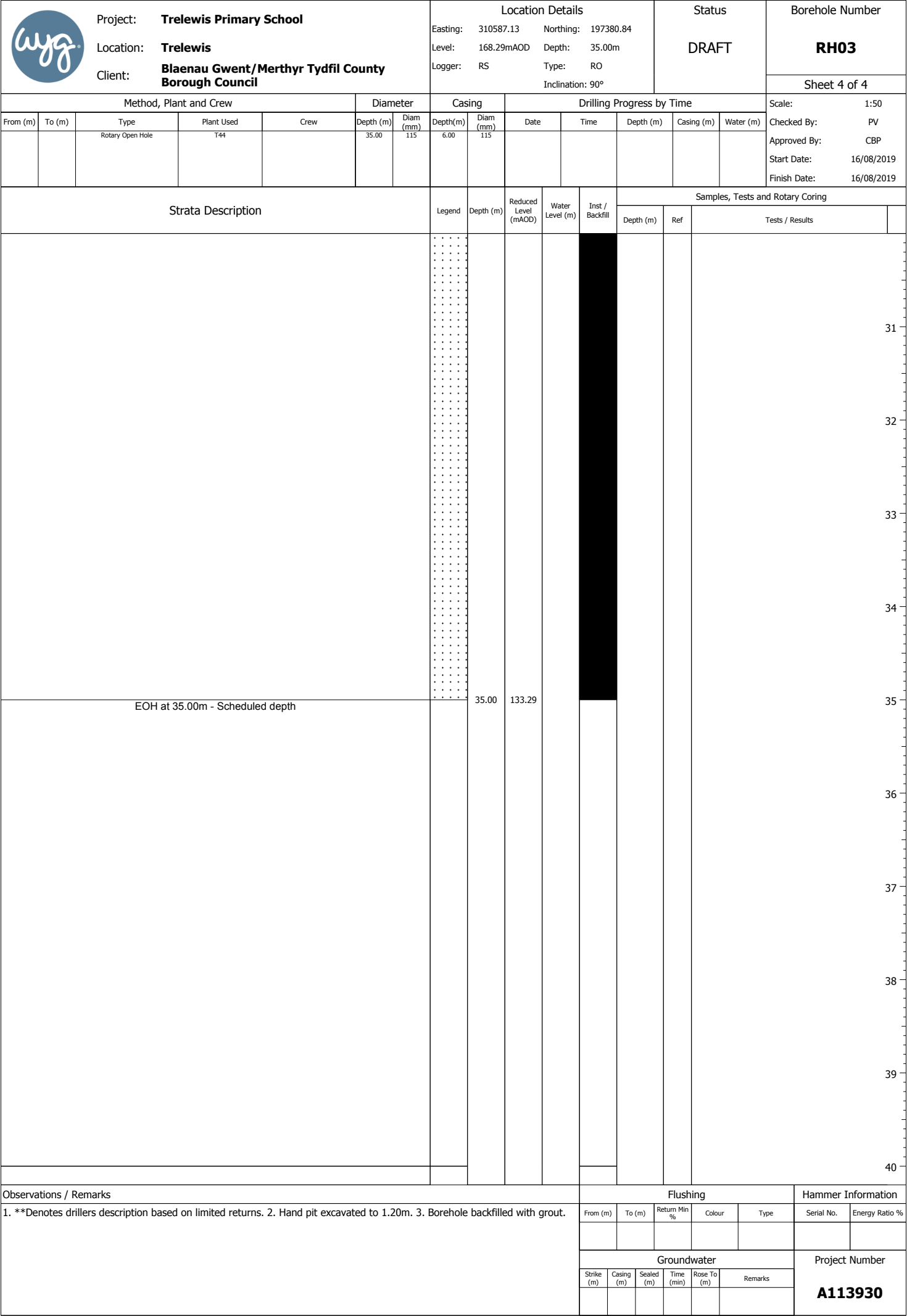
 Project: Trelewis Primary School Location: Trelewis Client: Blaenau Gwent/Merthyr Tydfil County Borough Council						Location Details Easting: 310593.55 Northing: 197382.38 Level: 168.43mAOD Depth: 35.00m Logger: RS Type: RO Inclination: 90°						Status DRAFT		Borehole Number RH02		
												Sheet 3 of 4				
Method, Plant and Crew					Diameter		Casing		Drilling Progress by Time					Scale: 1:50		
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By:	PV	
		Rotary Open Hole	T44		35.00	115	6.00	115						Approved By:	CBP	
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring				
												Depth (m)	Ref	Tests / Results		
Continued on Next Page																
Observations / Remarks 1. **Denotes drillers description based on limited returns. 2. Hand pit excavated to 1.20m. 3. Borehole backfilled with grout.										Flushing				Hammer Information		
										From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %
										Groundwater						
Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	A113930										

 Project: Trelewis Primary School Location: Trelewis Client: Blaenau Gwent/Merthyr Tydfil County Borough Council						Location Details Easting: 310593.55 Northing: 197382.38 Level: 168.43mAOD Depth: 35.00m Logger: RS Type: RO Inclination: 90°						Status DRAFT		Borehole Number RH02			
						Sheet 4 of 4											
						Method, Plant and Crew From (m) To (m) Type Plant Used Crew Rotary Open Hole T44						Diameter Depth (m) Diam (mm) 35.00 115		Casing Depth(m) Diam (mm) 6.00 115		Drilling Progress by Time Date Time Depth (m) Casing (m) Water (m)	
Strata Description						Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring Depth (m) Ref Tests / Results						
EOH at 35.00m - Scheduled depth							35.00	133.43									
						</											

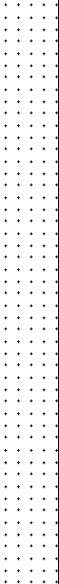
 Project: Trelewis Primary School Location: Trelewis Client: Blaenau Gwent/Merthyr Tydfil County Borough Council						Location Details Easting: 310587.13 Northing: 197380.84 Level: 168.29mAOD Depth: 35.00m Logger: RS Type: RO Inclination: 90°						Status DRAFT		Borehole Number RH03		
Method, Plant and Crew						Diameter		Casing		Drilling Progress by Time				Scale: 1:50		
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By: PV	Approved By: CBP	
		Rotary Open Hole	T44		35.00	115	6.00	115						Start Date: 16/08/2019	Finish Date: 16/08/2019	
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring				
												Depth (m)	Ref	Tests / Results		
Soft to firm greyish brown slightly silty gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of sandstone (TOPSOIL) Brown mottled grey and brown clayey sandy sub-angular to sub-rounded fine to coarse sandstone GRAVEL. Low cobble content. Cobbles are sub-angular to sub-rounded of sandstone. (GLACIAL DEPOSITS) Boulder Clay** (GLACIAL DEPOSITS)								0.25	168.04			0.40 0.50	ES B	SPT(C) 0.50m, N=32 (4,7/7,8,8,9)		
								0.50	167.79							
Mudstone** (GROVESEND FORMATION)								5.70	162.59							
Continued on Next Page																
Observations / Remarks										Flushing				Hammer Information		
1. **Denotes drillers description based on limited returns. 2. Hand pit excavated to 1.20m. 3. Borehole backfilled with grout.										From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %
										Groundwater						Project Number
										Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	A113930

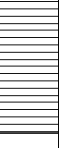
 Project: Trelewis Primary School Location: Trelewis Client: Blaenau Gwent/Merthyr Tydfil County Borough Council						Location Details Easting: 310587.13 Northing: 197380.84 Level: 168.29mAOD Depth: 35.00m Logger: RS Type: RO Inclination: 90°						Status DRAFT		Borehole Number RH03			
						Sheet 2 of 4											
						Method, Plant and Crew From (m) To (m) Type Plant Used Crew Rotary Open Hole T44						Diameter Depth (m) Diam (mm) 35.00 115		Casing Depth(m) Diam (mm) 6.00 115		Drilling Progress by Time Date Time Depth (m) Casing (m) Water (m)	
Strata Description						Legend		Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring Depth (m) Ref Tests / Results					
Sandstone with mudstone bands and traces of coal** (GROVESEND FORMATION)								12.90	155.39								
																Continued on Next Page	
Observations / Remarks 1. **Denotes drillers description based on limited returns. 2. Hand pit excavated to 1.20m. 3. Borehole backfilled with grout.										Flushing From (m) To (m) Return Min % Colour Type						Hammer Information Serial No. Energy Ratio %	
										Groundwater Strike (m) Casing (m) Sealed (m) Time (min) Rose To (m) Remarks						Project Number	
																A113930	

 Project: Trelewis Primary School Location: Trelewis Client: Blaenau Gwent/Merthyr Tydfil County Borough Council						Location Details Easting: 310587.13 Northing: 197380.84 Level: 168.29mAOD Depth: 35.00m Logger: RS Type: RO Inclination: 90°						Status DRAFT		Borehole Number RH03		
												Sheet 3 of 4				
Method, Plant and Crew					Diameter		Casing		Drilling Progress by Time					Scale: 1:50		
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By:	PV	
		Rotary Open Hole	T44		35.00	115	6.00	115						Approved By:	CBP	
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring				
												Depth (m)	Ref	Tests / Results		
Continued on Next Page																
Observations / Remarks 1. **Denotes drillers description based on limited returns. 2. Hand pit excavated to 1.20m. 3. Borehole backfilled with grout.										Flushing				Hammer Information		
										From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %
							Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	A113930			

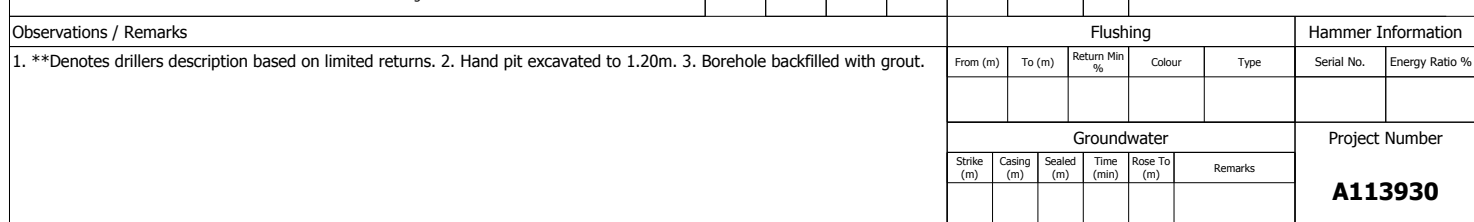


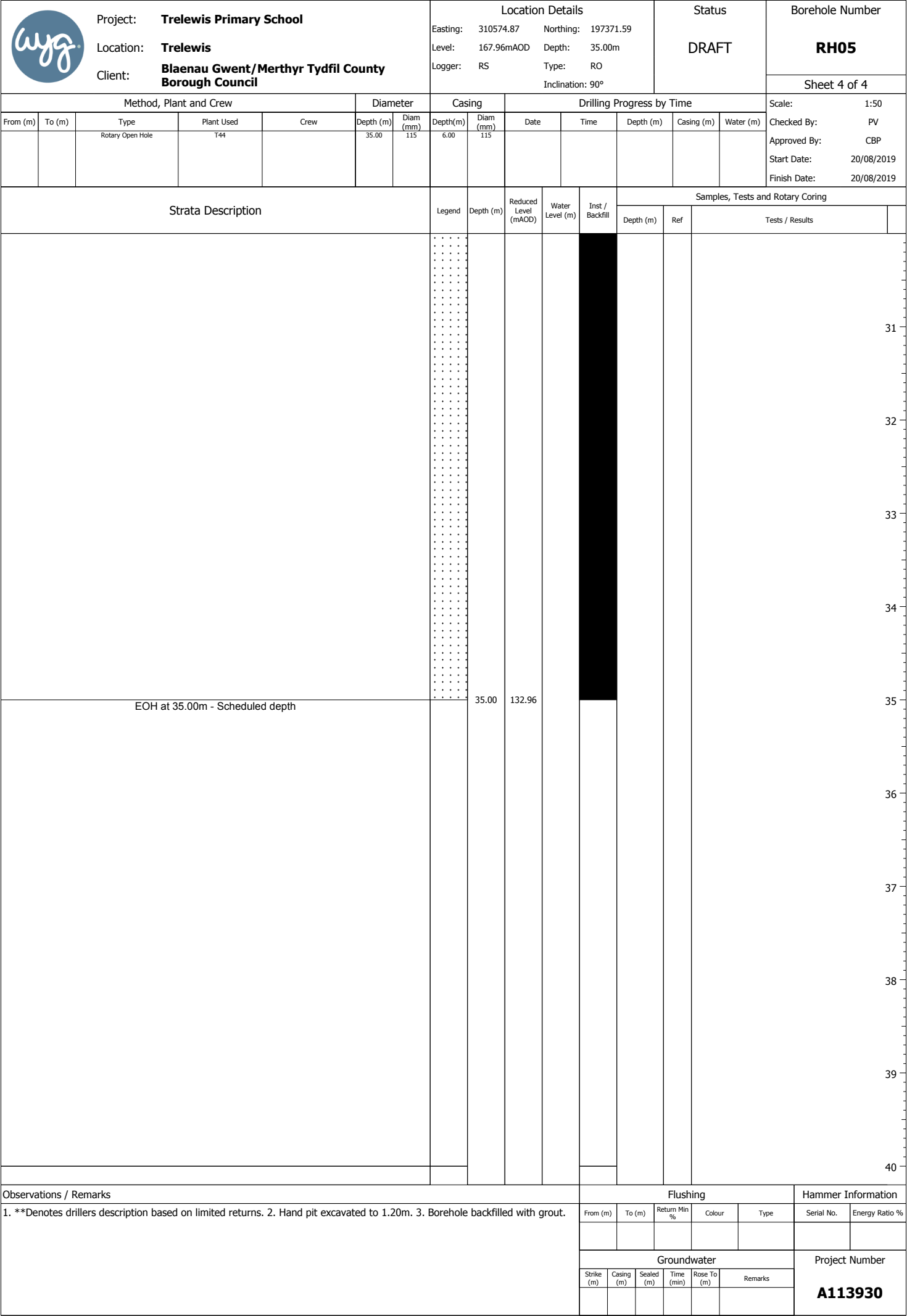
 Project: Trelewis Primary School Location: Trelewis Client: Blaenau Gwent/Merthyr Tydfil County Borough Council						Location Details Easting: 310582.43 Northing: 197379.51 Level: 168.19mAOD Depth: 17.00m Logger: RS Type: RO Inclination: 90°						Status DRAFT		Borehole Number RH04						
Method, Plant and Crew						Diameter		Casing		Drilling Progress by Time				Scale: 1:50						
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By: PV	Approved By: CBP					
		Rotary Open Hole	T44		17.00	115	6.00	115						Start Date: 19/08/2019	Finish Date: 19/08/2019					
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring								
												Depth (m)	Ref	Tests / Results						
Soft to firm greyish brown slightly silty gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of sandstone (TOPSOIL) Orange brown mottled grey and brown silty gravelly fine to coarse SAND. Low cobble content. Gravel is sub-angular to sub-rounded fine to coarse of sandstone. Cobbles are sub-angular to sub-rounded of sandstone. (GLACIAL DEPOSITS) Brown mottled grey and brown clayey sandy sub-angular to sub-rounded fine to coarse sandstone GRAVEL. Low cobble content. Cobbles are sub-angular to sub-rounded of sandstone. (GLACIAL DEPOSITS) Boulder Clay** (GLACIAL DEPOSITS)								0.25	167.94				0.50 0.50 - 0.60	ES B	SPT(C) 1.20m, N=30 (3,4/6,7,8,9)	1				
								0.70	167.49				1.00 1.00 - 1.20	ES B						
								1.20	166.99											
Mudstone** (GROVESEND FORMATION)								8.20	159.99							2				
																				3
																				4
																				5
																				6
																				7
																				8
																				9
																				10
							Continued on Next Page													
Observations / Remarks										Flushing				Hammer Information						
1. **Denotes drillers description based on limited returns. 2. Hand pit excavated to 1.20m. 3. Borehole backfilled with grout.										From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %				
										Groundwater				Project Number						
										Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	A113930				

 Project: Trelewis Primary School Location: Trelewis Client: Blaenau Gwent/Merthyr Tydfil County Borough Council						Location Details Easting: 310582.43 Northing: 197379.51 Level: 168.19mAOD Depth: 17.00m Logger: RS Type: RO Inclination: 90°						Status DRAFT		Borehole Number RH04		
												Sheet 2 of 2				
Method, Plant and Crew					Diameter		Casing		Drilling Progress by Time					Scale: 1:50		
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By:	PV	
		Rotary Open Hole	T44		17.00	115	6.00	115						Approved By:	CBP	
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring				
												Depth (m)	Ref	Tests / Results		
Sandstone** (GROVESEND FORMATION)								13.10	155.09							
EOH at 17.00m - Terminated due to air flush disturbing paving within school								17.00	151.19							
Observations / Remarks										Flushing				Hammer Information		
1. **Denotes drillers description based on limited returns. 2. Hand pit excavated to 1.20m. 3. Borehole backfilled with grout.										From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %
										Groundwater						Project Number
Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	A113930										

 Project: Trelewis Primary School Location: Trelewis Client: Blaenau Gwent/Merthyr Tydfil County Borough Council						Location Details Easting: 310574.87 Northing: 197371.59 Level: 167.96mAOD Depth: 35.00m Logger: RS Type: RO Inclination: 90°						Status DRAFT		Borehole Number RH05		
												Sheet 1 of 4				
Method, Plant and Crew					Diameter		Casing		Drilling Progress by Time					Scale: 1:50		
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By: PV	Approved By: CBP	
		Rotary Open Hole	T44		35.00	115	6.00	115						Start Date: 20/08/2019	Finish Date: 20/08/2019	
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring				
												Depth (m)	Ref	Tests / Results		
Soft to firm greyish brown slightly silty gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of sandstone (TOPSOIL) Brown mottled grey and brown clayey sandy sub-angular to sub-rounded fine to coarse sandstone GRAVEL. Low cobble content. Cobbles are sub-angular to sub-rounded of sandstone. (GLACIAL DEPOSITS) Boulder Clay** (GLACIAL DEPOSITS)								0.25	167.71			0.00	ES	SPT(C) 0.50m, N=28 (6,6/6,7,7,8)		
								0.50	167.46			0.30 - 0.40 0.40	B ES			
Mudstone** (GROVESEND FORMATION)								9.10	158.86							
Continued on Next Page																
Observations / Remarks										Flushing				Hammer Information		
1. **Denotes drillers description based on limited returns. 2. Hand pit excavated to 1.20m. 3. Borehole backfilled with grout.										From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %
										Groundwater					Project Number	
										Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	A113930

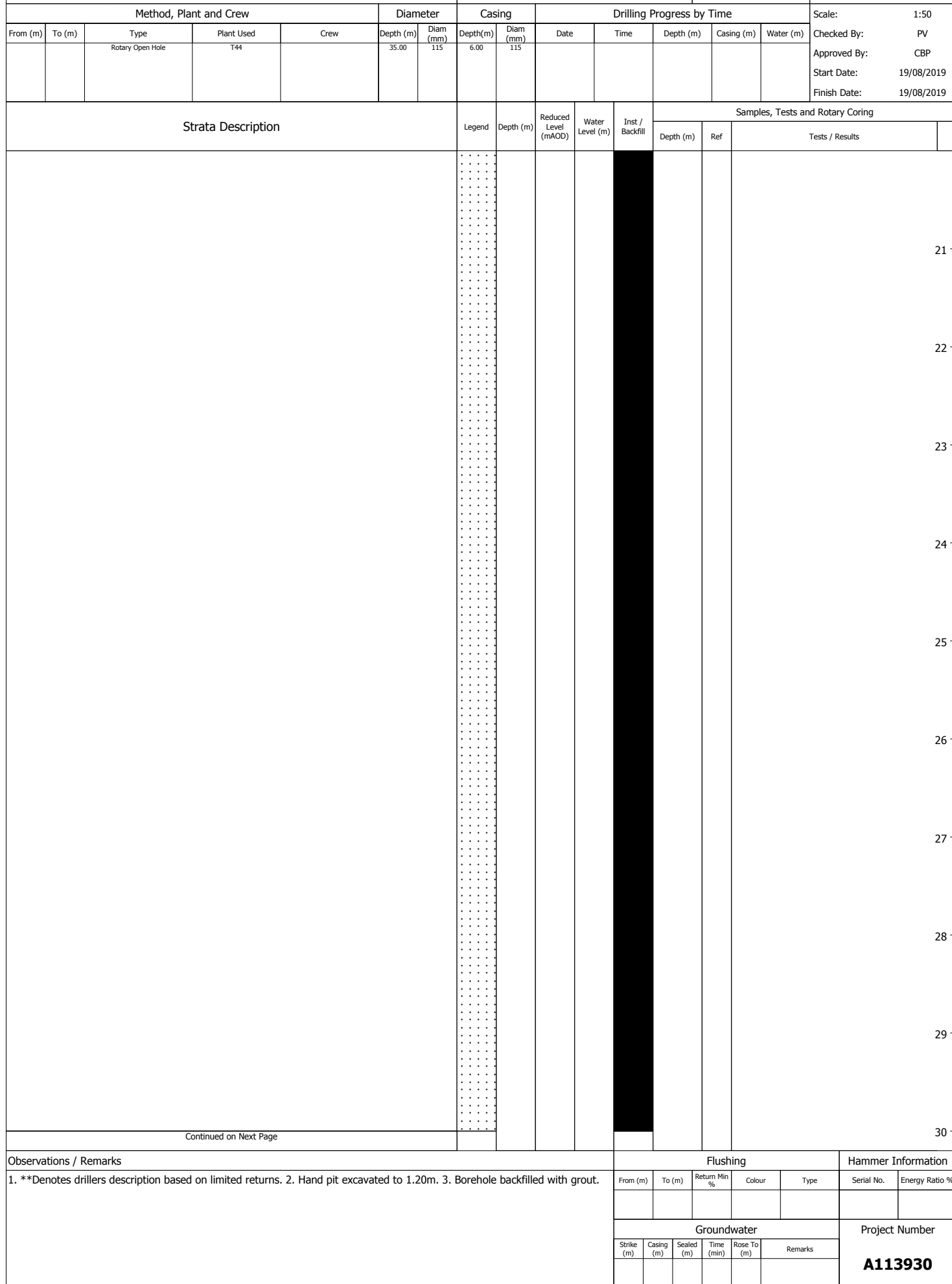
		Project: Trelewis Primary School				Location Details				Status		Borehole Number																
		Location: Trelewis				Easting: 310574.87 Northing: 197371.59				DRAFT		RH05																
		Client: Blaenau Gwent/Merthyr Tydfil County Borough Council				Level: 167.96mAOD Depth: 35.00m Logger: RS Type: RO Inclination: 90°																						
Method, Plant and Crew					Diameter		Casing		Drilling Progress by Time				Scale: 1:50															
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By: PV														
		Rotary Open Hole	T44		35.00	115	6.00	115						Approved By: CBP														
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring			Start Date: 20/08/2019													
												Depth (m)	Ref	Tests / Results	Finish Date: 20/08/2019													
								13.90	154.06					11														
														12														
														13														
														14														
														15														
														16														
														17														
														18														
														19														
														20														
														Sandstone with mudstone bands** (GROVESEND FORMATION)								13.90	154.06					14
														15														
														16														
17																												
18																												
19																												
20																												
Continued on Next Page																												
Observations / Remarks										Flushing				Hammer Information														
1. **Denotes drillers description based on limited returns. 2. Hand pit excavated to 1.20m. 3. Borehole backfilled with grout.										From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %												
										Groundwater						Project Number												
Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	A113930																						

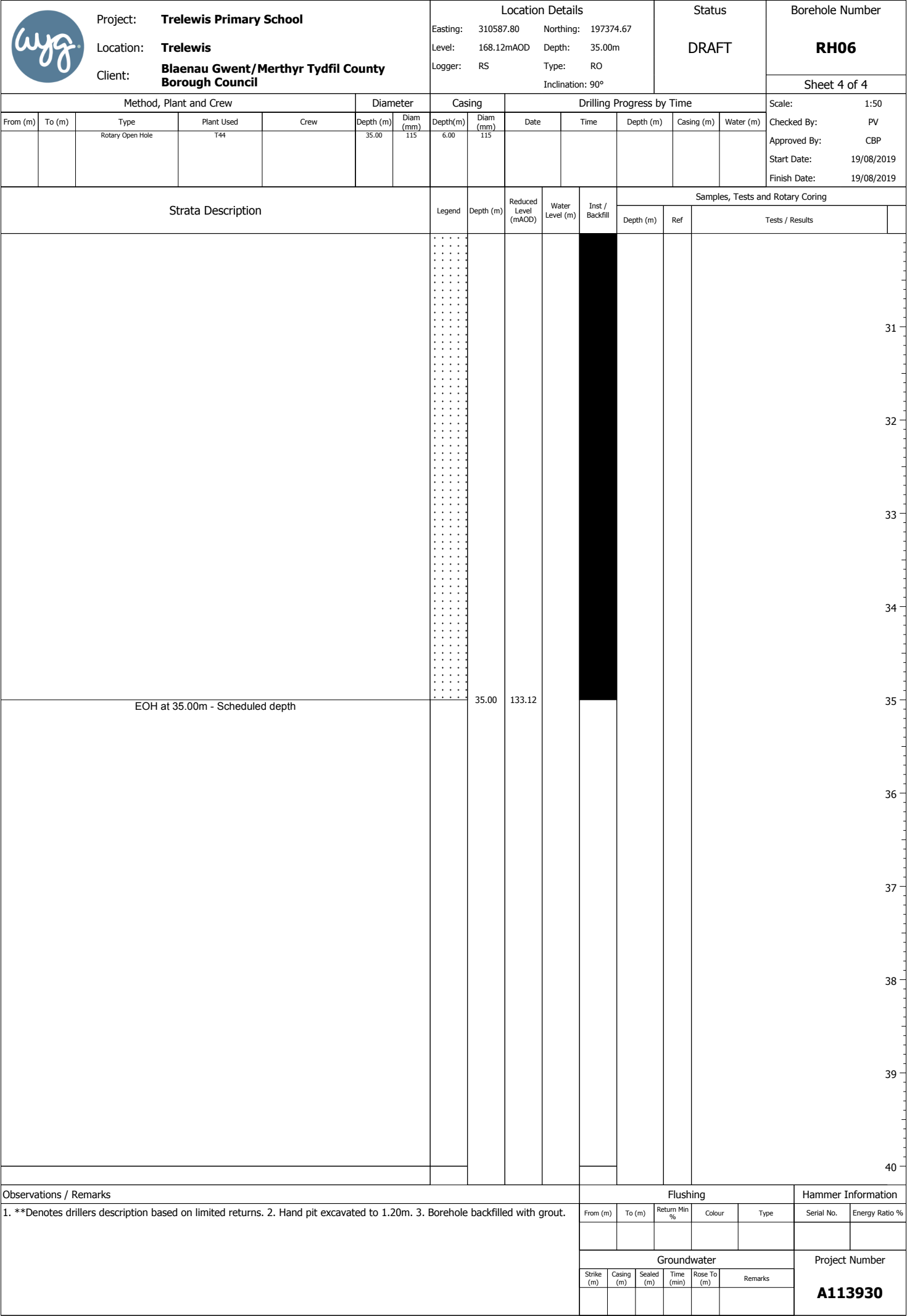




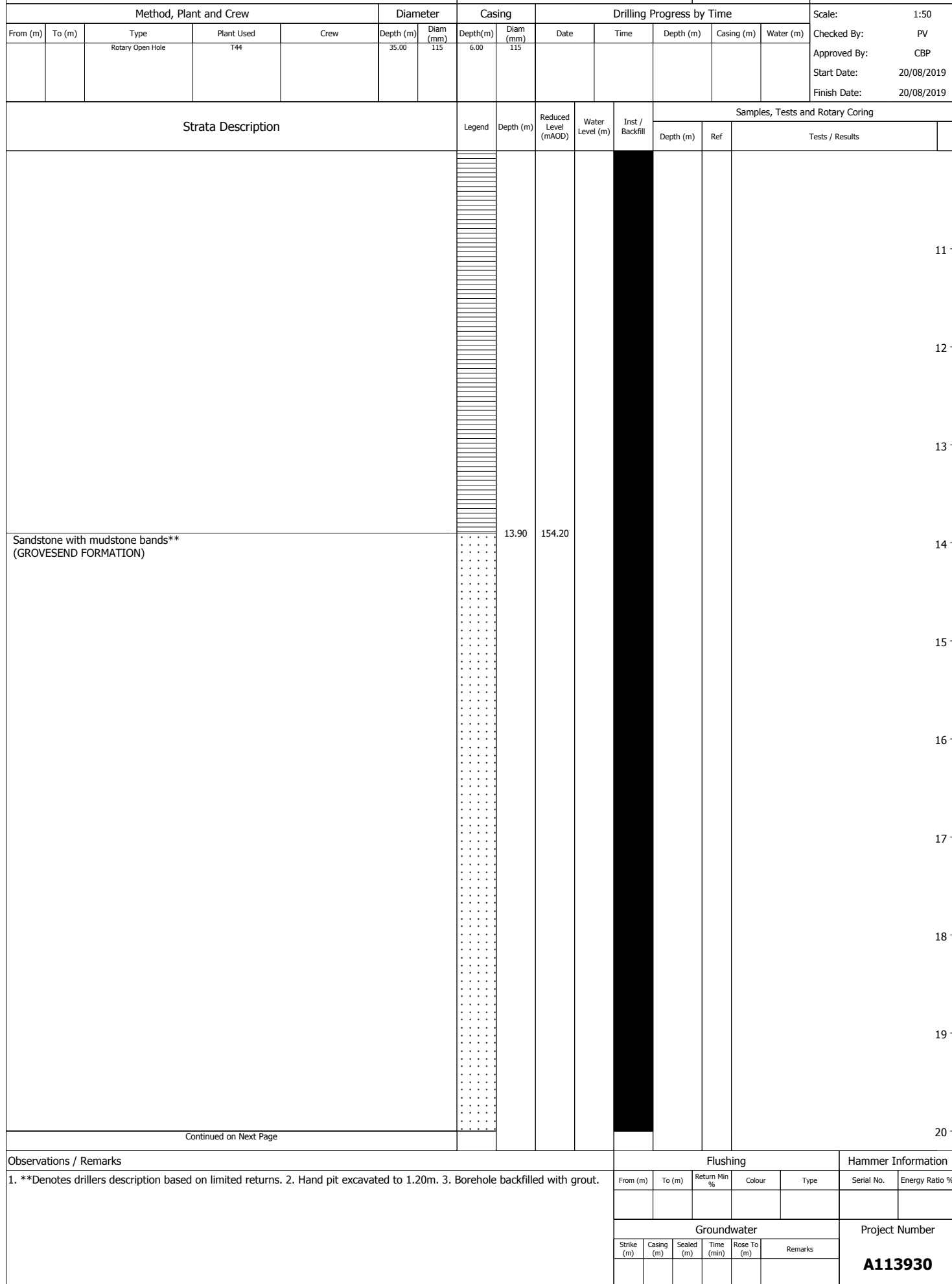
 Project: Trelewis Primary School Location: Trelewis Client: Blaenau Gwent/Merthyr Tydfil County Borough Council						Location Details Easting: 310587.80 Northing: 197374.67 Level: 168.12mAOD Depth: 35.00m Logger: RS Type: RO Inclination: 90°						Status DRAFT		Borehole Number RH06		
												Sheet 1 of 4				
Method, Plant and Crew					Diameter		Casing		Drilling Progress by Time					Scale: 1:50		
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By: PV	Approved By: CBP	
		Rotary Open Hole	T44		35.00	115	6.00	115						Start Date: 19/08/2019	Finish Date: 19/08/2019	
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring				
												Depth (m)	Ref	Tests / Results		
Soft to firm greyish brown slightly silty gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of sandstone (TOPSOIL) Orange brown mottled grey and brown silty sandy GRAVEL. Low cobble content. Gravel is sub-angular to sub-rounded fine to coarse of sandstone. Cobbles are sub-angular to sub-rounded of sandstone. (GLACIAL DEPOSITS) Boulder Clay** (GLACIAL DEPOSITS)								0.25	167.87			0.40 0.40 - 0.50 0.60 0.60 - 0.70	ES B ES B	SPT(C) 0.90m, N=26 (2,5/5,5,7,9)	1	
								0.70	167.42							
Mudstone** (GROVESEND FORMATION)								7.20	160.92						2	
Continued on Next Page															3	
															4	
															5	
															6	
															7	
															8	
															9	
															10	
Observations / Remarks										Flushing				Hammer Information		
1. **Denotes drillers description based on limited returns. 2. Hand pit excavated to 1.20m. 3. Borehole backfilled with grout.										From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %
										Groundwater				Project Number		
										Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	A113930

		Project: Trelewis Primary School				Location Details				Status		Borehole Number				
		Location: Trelewis				Easting: 310587.80 Northing: 197374.67				DRAFT		RH06				
		Client: Blaenau Gwent/Merthyr Tydfil County Borough Council				Level: 168.12mAOD Depth: 35.00m Logger: RS Type: RO Inclination: 90°										
Method, Plant and Crew					Diameter		Casing		Drilling Progress by Time				Scale: 1:50			
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By: PV		
		Rotary Open Hole	T44		35.00	115	6.00	115						Approved By: CBP		
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring			Start Date: 19/08/2019	
												Depth (m)	Ref	Tests / Results	Finish Date: 19/08/2019	
								13.20	154.92					11		
														12		
														13		
														14		
														15		
														16		
														17		
														18		
														19		
														20		
														Sandstone with mudstone bands** (GROVESEND FORMATION)		
Continued on Next Page																
Observations / Remarks										Flushing				Hammer Information		
1. **Denotes drillers description based on limited returns. 2. Hand pit excavated to 1.20m. 3. Borehole backfilled with grout.										From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %
										Groundwater						Project Number
Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	A113930										

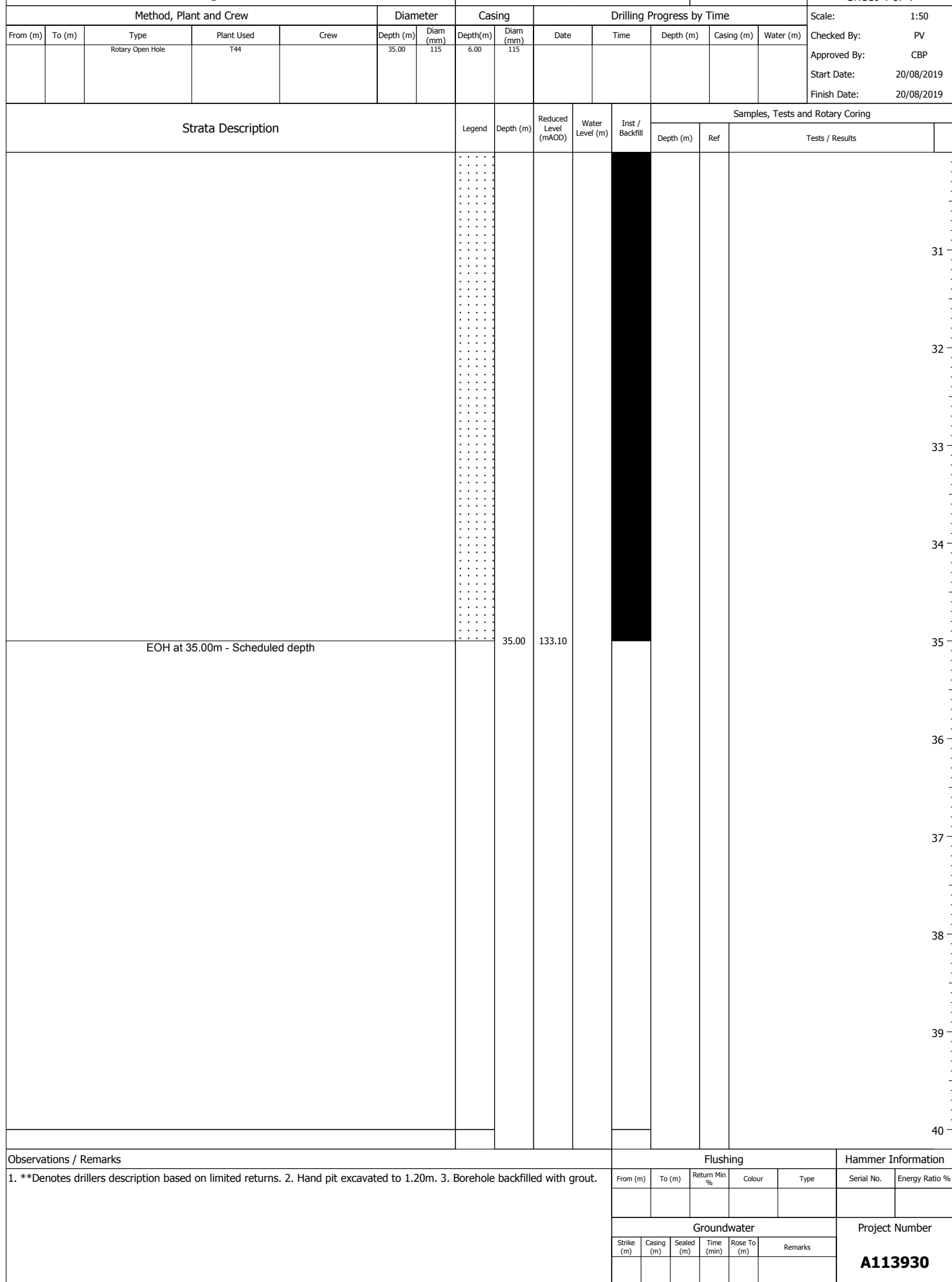


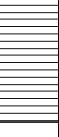


 Project: Trelewis Primary School Location: Trelewis Client: Blaenau Gwent/Merthyr Tydfil County Borough Council							Location Details Easting: 310581.45 Northing: 197374.01 Level: 168.10mAOD Depth: 35.00m Logger: RS Type: RO Inclination: 90°					Status DRAFT		Borehole Number RH07		
												Sheet 1 of 4				
Method, Plant and Crew						Diameter		Casing		Drilling Progress by Time				Scale: 1:50		
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By: PV		
		Rotary Open Hole	T44		35.00	115	6.00	115						Approved By: CBP		
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring			Start Date: 20/08/2019	
												Depth (m)	Ref	Tests / Results		Finish Date: 20/08/2019
Soft to firm greyish brown slightly silty gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of sandstone (TOPSOIL) Orange brown mottled grey and brown silty sandy GRAVEL. Low cobble content. Gravel is sub-angular to sub-rounded fine to coarse of sandstone. Cobbles are sub-angular to sub-rounded of sandstone. (GLACIAL DEPOSITS) Boulder Clay** (GLACIAL DEPOSITS)								0.25	167.85			0.40 0.40 - 0.50	ES B	SPT(C) 0.50m, N=25 (4,3/4,7,7,7)		
								0.50	167.60							
Mudstone** (GROVESEND FORMATION)								8.60	159.50							
Continued on Next Page																
Observations / Remarks										Flushing				Hammer Information		
1. **Denotes drillers description based on limited returns. 2. Hand pit excavated to 1.20m. 3. Borehole backfilled with grout.										From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %
										Groundwater					Project Number	
										Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	A113930

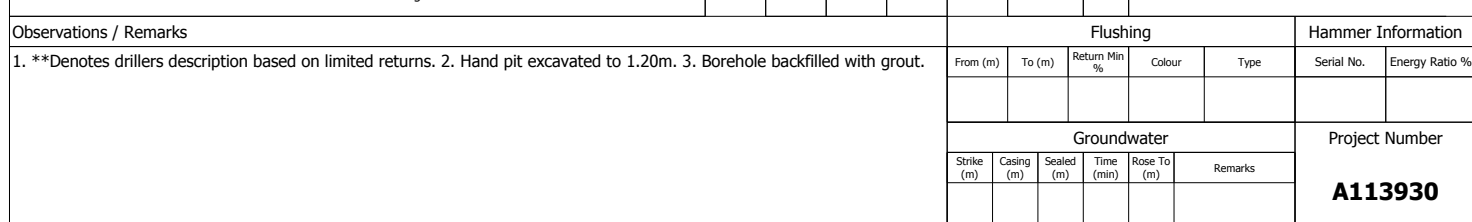


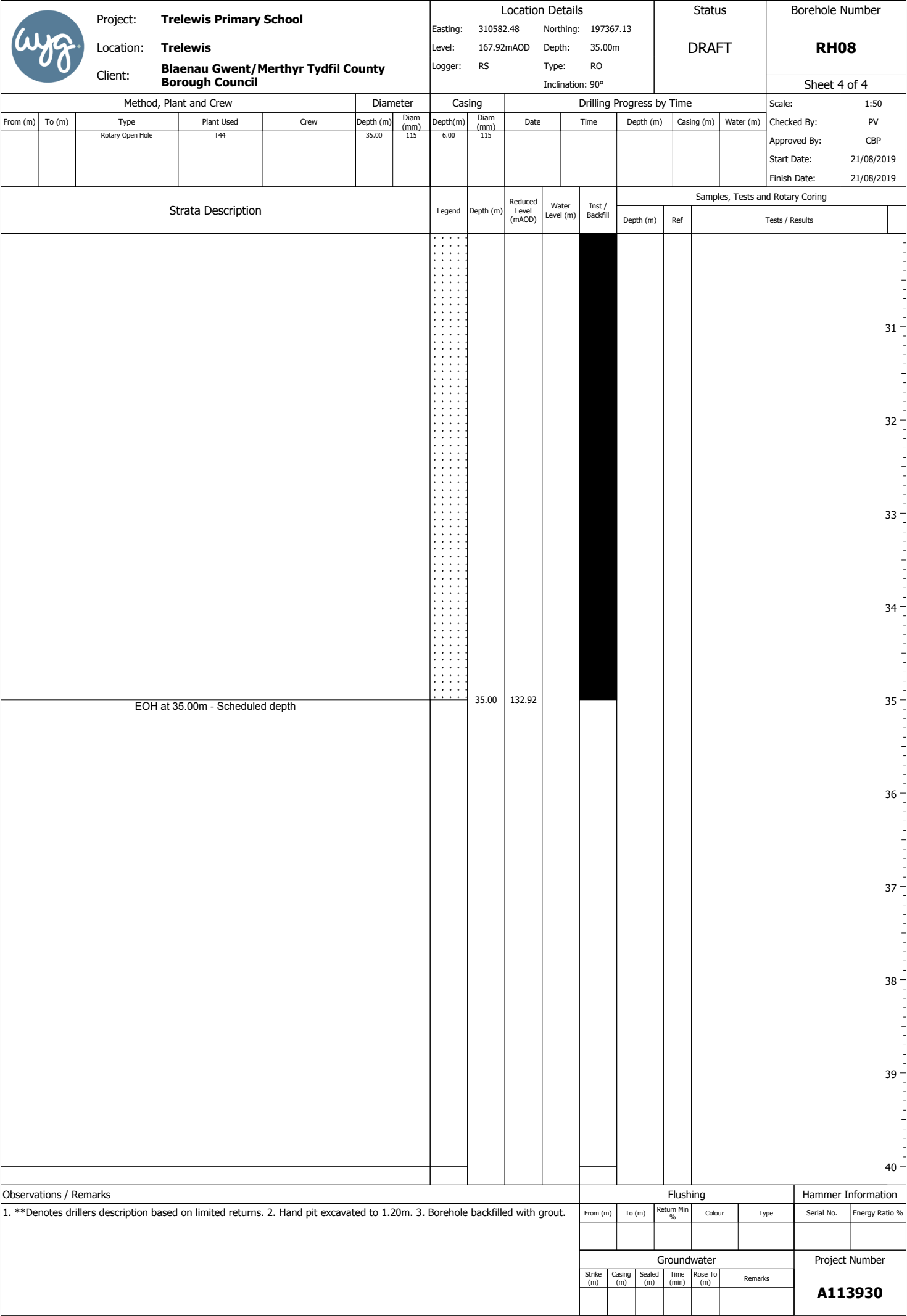
		Project: Trelewis Primary School				Location Details				Status		Borehole Number							
		Location: Trelewis				Easting: 310581.45 Northing: 197374.01				DRAFT		RH07							
		Client: Blaenau Gwent/Merthyr Tydfil County Borough Council				Level: 168.10mAOD Depth: 35.00m Logger: RS Type: RO Inclination: 90°													
Method, Plant and Crew						Diameter		Casing		Drilling Progress by Time				Scale: 1:50					
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By:	PV				
		Rotary Open Hole	T44		35.00	115	6.00	115						Approved By:	CBP				
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring							
												Depth (m)	Ref	Tests / Results					
Continued on Next Page																			
Observations / Remarks										Flushing				Hammer Information					
1. **Denotes drillers description based on limited returns. 2. Hand pit excavated to 1.20m. 3. Borehole backfilled with grout.										From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %			
										Groundwater					Project Number				
										Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	A113930			

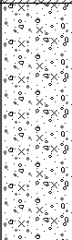


 Project: Trelewis Primary School Location: Trelewis Client: Blaenau Gwent/Merthyr Tydfil County Borough Council						Location Details Easting: 310582.48 Northing: 197367.13 Level: 167.92mAOD Depth: 35.00m Logger: RS Type: RO Inclination: 90°						Status DRAFT		Borehole Number RH08		
												Sheet 1 of 4				
Method, Plant and Crew					Diameter		Casing		Drilling Progress by Time					Scale: 1:50		
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By: PV	Approved By: CBP	
		Rotary Open Hole	T44		35.00	115	6.00	115						Start Date: 21/08/2019	Finish Date: 21/08/2019	
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring				
												Depth (m)	Ref	Tests / Results		
Soft to firm greyish brown slightly silty gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of sandstone (TOPSOIL) Brown mottled grey and brown clayey sandy sub-angular to sub-rounded fine to coarse sandstone GRAVEL. Low cobble content. Cobbles are sub-angular to sub-rounded of sandstone. (GLACIAL DEPOSITS) Boulder Clay** (GLACIAL DEPOSITS)								0.25	167.67			0.40 0.40 - 0.50	ES B	SPT(C) 0.50m, N=43 (3,4/4,11,16,12)		
								0.50	167.42							
Mudstone** (GROVESEND FORMATION)								9.10	158.82							
Continued on Next Page																
Observations / Remarks										Flushing				Hammer Information		
1. **Denotes drillers description based on limited returns. 2. Hand pit excavated to 1.20m. 3. Borehole backfilled with grout.										From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %
										Groundwater				Project Number		
										Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	A113930

		Project: Trelewis Primary School				Location Details				Status		Borehole Number							
		Location: Trelewis				Easting: 310582.48 Northing: 197367.13				DRAFT		RH08							
		Client: Blaenau Gwent/Merthyr Tydfil County Borough Council				Level: 167.92mAOD Depth: 35.00m Logger: RS Type: RO Inclination: 90°													
Method, Plant and Crew					Diameter		Casing		Drilling Progress by Time					Scale: 1:50					
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By:	PV				
		Rotary Open Hole	T44		35.00	115	6.00	115						Approved By:	CBP				
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring							
												Depth (m)	Ref	Tests / Results					
Sandstone with mudstone bands** (GROVESEND FORMATION)								13.70	154.22										
Continued on Next Page																			
Observations / Remarks										Flushing				Hammer Information					
1. **Denotes drillers description based on limited returns. 2. Hand pit excavated to 1.20m. 3. Borehole backfilled with grout.										From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %			
										Groundwater					Project Number				
										Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	A113930			





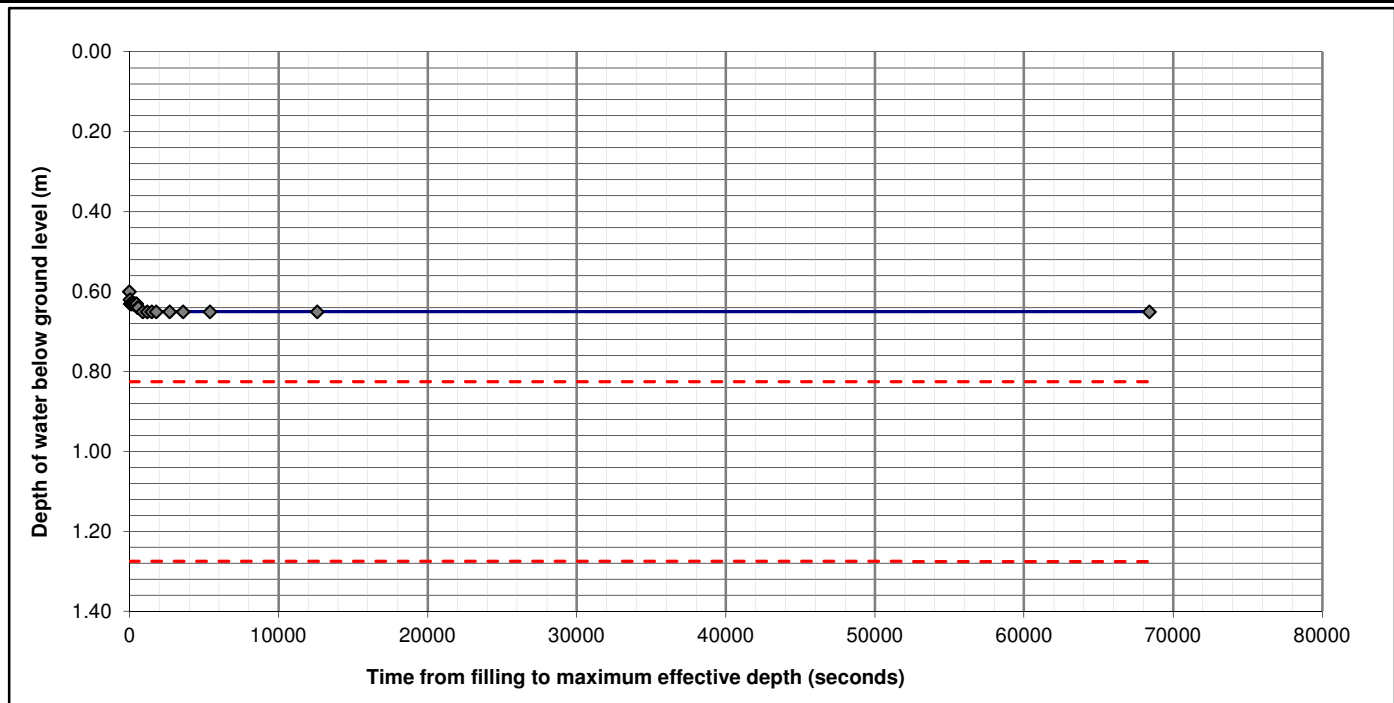
	Project: Trelewis Primary School		Location Details				Status		Pit Number		
	Location: Trelewis		Easting: 310596.28 Northing: 197398.71				DRAFT		TP01		
	Client: Blaenau Gwent/Merthyr Tydfil County Borough Council		Level: 168.83mAOD Depth: 1.50m Logger: RS Type: TP								
			Groundwater					Scale: 1:25			
Hole Information			Strike (m)		Rose To (m)	After (mins)	Remarks		Checked By: PV		
Pit Dimensions m m			Orientation: °						Approved By: CBP		
			Shoring:						Start Date: 21/08/2019		
			Stability:						Finish Date: 21/08/2019		
			Plant: Mini Digger								
Strata Description			Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Samples and Testing			
								Depth (m)	Ref	Tests / Results	
Soft to firm greyish brown slightly silty gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of sandstone (TOPSOIL)				0.25	168.58			0.50 0.50 - 0.60	ES B		
Orange brown mottled grey and brown silty sandy sub-angular to sub-rounded fine to coarse sandstone GRAVEL with a high cobble content. Cobbles and boulders are sub-angular to sub-rounded of sandstone. (GLACIAL DEPOSITS)				1.05	167.78			1.20 1.20 - 1.30	ES B		
Brown mottled grey silty sandy gravelly sub-angular to sub-rounded sandstone COBBLES. (GLACIAL DEPOSITS)				1.50	167.33						
EOH at 1.50m - Scheduled depth											
										5	
Observations / Remarks										Project Number A113930	
1. Trial pit backfilled on completion											

APPENDIX C – SOIL INFILTRATION TESTING RESULTS



DATE:	21/08/2019
PROJECT No:	A113930
PROJECT NAME:	Trelewis Primary School
CLIENT:	BGCBC
TRIAL PIT ID:	TP01
TEST NUMBER:	1

SOAKAWAY TEST - SOIL INFILTRATION RATE/PERMEABILITY CALCULATION



Time Elapsed (s)	Time Elapsed (mins)	Distance to water surface from ground level (m)	PIT LENGTH (m):	2.10	Pit construction		
			PIT WIDTH (m):	0.65	Sandy silty slightly clayey gravel with cobbles.		
			PIT DEPTH (m):	1.50			
0	0.00	0.600	INPUT PARAMETERS:				
30	0.50	0.620	Total volume of pit		(m ³)	1.23	
60	1.00	0.630	Pit volume between 75% and 25% depths = L x W x ½D		(m ³)	0.61	
90	1.50	0.630	Effective depth of Pit		(m)	0.90	
120	2.00	0.630	Proportion of pit volume occupied by gravel solids		(0-1)	0.00	
150	2.50	0.630	Maximum potential volume of Water		(m ³)	1.23	
180	3.00	0.630	Level of water in pit at 75% effective depth (p ₇₅)		(m)	0.23	
210	3.50	0.630	Level of water in pit at 25% effective depth (p ₂₅)		(m)	0.68	
240	4.00	0.630					
270	4.50	0.630	Effective volume between 75% & 25% depth V _{p75-25} = V x P _g		(m ³)	0.61	
300	5.00	0.630	Surface area of pit up to 50% effective depth (A _{p50})		(m ²)	3.84	
360	6.00	0.630					
420	7.00	0.630	Time at 75% effective depth (p ₇₅)		(s)	n/a	
480	8.00	0.630	Time at 25% effective depth (p ₂₅)		(s)	n/a	
540	9.00	0.640	Time for outflow for 75% and 25% effective depth (Tp75-25)		(s)	#VALUE!	
600	10.00	0.640	OUTPUT:				
900	15.00	0.650	SOIL INFILTRATION RATE (f)		V _{p75 - 25}	(m/s)	#VALUE!
1200	20.00	0.650			A _{p50} X T _{p75 - 25}		
1500	25.00	0.650					
1800	30.00	0.650	WATER INPUT:		1000 L in 2 minutes		
2700	45.00	0.650	GEOLOGY OF TEST SECTION:				
3600	60.00	0.650	Sandy silty clayey gravel with cobbles.				
5400	90.00	0.650					
12600	210.00	0.650					
68400	1140.00	0.650					
			Compiled by: RS				
			Checked by: PV				

APPENDIX D – TRL PROBE RESULTS

WYG Environment

5th Floor, Longcross Court, 47 Newport Road, Cardiff
Tel: 02920 829200
Fax: 02920 455321
Environmental Consultancy
Ground Engineering Services



PROJECT No.:	A113930
PROJECT NAME:	Trelewis Primary School
CLIENT:	Blaenau Gwent County Borough Council
FIGURE No.:	TRL-DCP-RC01/1

DCP-CBR Corellation

$$\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$$

DCP -Modulus E Corellation

$$E = 17.6 (\text{CBR})^{0.64} \text{ MPa}$$

In situ CBR by TRL Probe

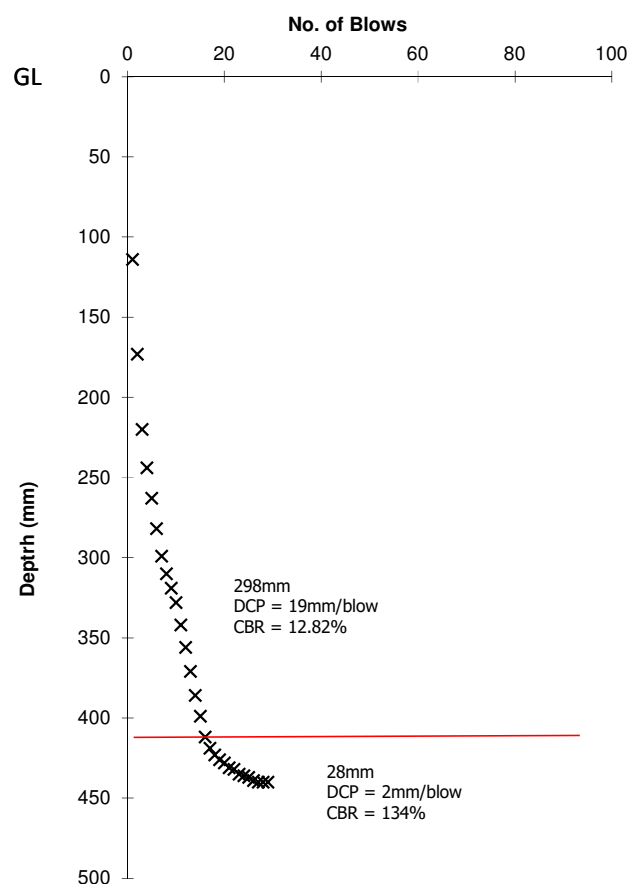
Reference: 1 Position: RC01 Date: 21 August 2019

mm per blow	Σ Blows	Reading on Scale (mm)	Depth from Ground Level (mm)	mm per blow	Σ Blows	Reading on Scale (mm)	Depth from Ground Level (mm)
114	1	199	114		46		-85
59	2	258	173	47			-85
47	3	305	220	48			-85
24	4	329	244	49			-85
19	5	348	263	50			-85
19	6	367	282	51			-85
17	7	384	299	52			-85
11	8	395	310	53			-85
9	9	404	319	54			-85
9	10	413	328	55			-85
14	11	427	342	56			-85
14	12	441	356	57			-85
15	13	456	371	58			-85
15	14	471	386	59			-85
13	15	484	399	60			-85
13	16	497	412	61			-85
7	17	504	419	62			-85
4	18	508	423	63			-85
3	19	511	426	64			-85
2	20	513	428	65			-85
3	21	516	431	66			-85
1	22	517	432	67			-85
3	23	520	435	68			-85
1	24	521	436	69			-85
1	25	522	437	70			-85
2	26	524	439	71			-85
1	27	525	440	72			-85
	28	525	440	73			-85
	29	525	440	74			-85
-525	30	refusal	-85	75			-85
	31		-85	76			-85
	32		-85	77			-85
	33		-85	78			-85
	34		-85	79			-85
	35		-85	80			-85
	36		-85	81			-85
	37		-85	82			-85
	38		-85	83			-85
	39		-85	84			-85
	40		-85	85			-85
	41		-85	86			-85
	42		-85	87			-85
	43		-85	88			-85
	44		-85	89			-85
	45		-85	90			-85

Test started at: 0 m below ground level

Zero Reading: 85 mm

Zero reading = start depth below ground surface



After Design manual for Roads and Bridges, Volume 7 Pavement Design and maintenance, Section 3 Pavement Maintenance Assessment, Part 2 HD29/08

Data compiled by: RS
Data checked by: PV

WYG Environment

5th Floor, Longcross Court, 47 Newport Road, Cardiff

Tel: 02920 829200

Fax: 02920 455321

Environmental Consultancy

Ground Engineering Services



PROJECT No.: A113930

PROJECT NAME: Trelewis Primary School

CLIENT: Blaenau Gwent County Borough Council

FIGURE No.: TRL-DCP-RC05/1

DCP-CBR Corellation

$$\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$$

DCP -Modulus E Corellation

$$E = 17.6 (\text{CBR})^{0.64} \text{ MPa}$$

In situ CBR by TRL Probe

Reference: 1

Position: RC05

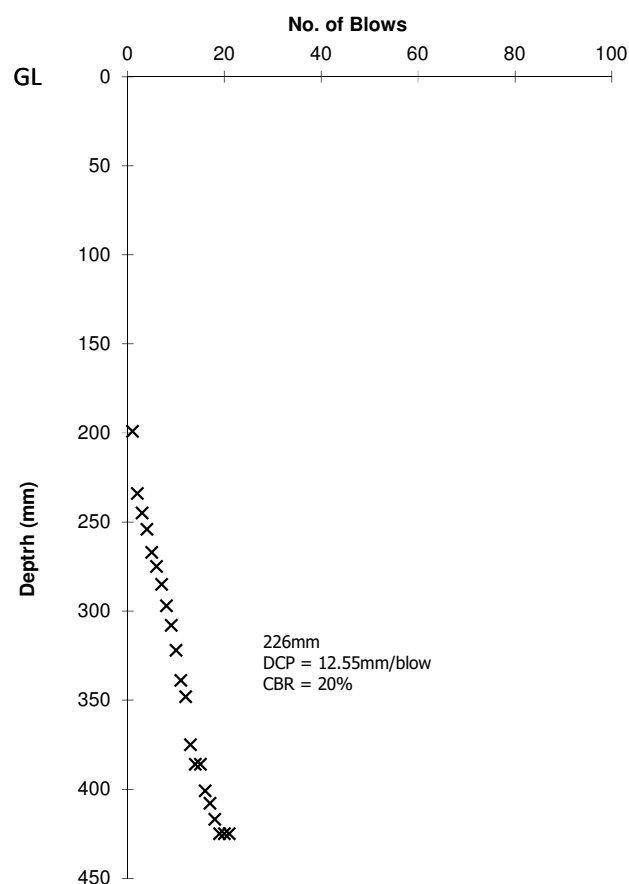
Date: 21 August 2019

mm per blow	Σ Blows	Reading on Scale (mm)	Depth from Ground Level (mm)	mm per blow	Σ Blows	Reading on Scale (mm)	Depth from Ground Level (mm)
199	1	284	199		46		-85
35	2	319	234		47		-85
11	3	330	245		48		-85
9	4	339	254		49		-85
13	5	352	267		50		-85
8	6	360	275		51		-85
10	7	370	285		52		-85
12	8	382	297		53		-85
11	9	393	308		54		-85
14	10	407	322		55		-85
17	11	424	339		56		-85
9	12	433	348		57		-85
27	13	460	375		58		-85
11	14	471	386		59		-85
	15	471	386		60		-85
15	16	486	401		61		-85
7	17	493	408		62		-85
9	18	502	417		63		-85
8	19	510	425		64		-85
	20	510	425		65		-85
	21	510	425		66		-85
-510	22	refusal	-85		67		-85
	23		-85		68		-85
	24		-85		69		-85
	25		-85		70		-85
	26		-85		71		-85
	27		-85		72		-85
	28		-85		73		-85
	29		-85		74		-85
	30		-85		75		-85
	31		-85		76		-85
	32		-85		77		-85
	33		-85		78		-85
	34		-85		79		-85
	35		-85		80		-85
	36		-85		81		-85
	37		-85		82		-85
	38		-85		83		-85
	39		-85		84		-85
	40		-85		85		-85
	41		-85		86		-85
	42		-85		87		-85
	43		-85		88		-85
	44		-85		89		-85
	45		-85		90		-85

Test started at: 0 m below ground level

Zero Reading: 85 mm

Zero reading = start depth below ground surface



After Design manual for Roads and Bridges, Volume 7 Pavement Design and maintenance, Section 3 Pavement Maintenance Assessment, Part 2 HD29/08

Data compiled by: RS
Data checked by: PV

WYG Environment

5th Floor, Longcross Court, 47 Newport Road, Cardiff
Tel: 02920 829200
Fax: 02920 455321
Environmental Consultancy
Ground Engineering Services



PROJECT No.:	A113930
PROJECT NAME:	Trelewis Primary School
CLIENT:	Blaenau Gwent County Borough Council
FIGURE No.:	TRL-DCP-RC06/1

DCP-CBR Corellation

$$\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$$

DCP -Modulus E Corellation

$$E = 17.6 (\text{CBR})^{0.64} \text{ MPa}$$

In situ CBR by TRL Probe

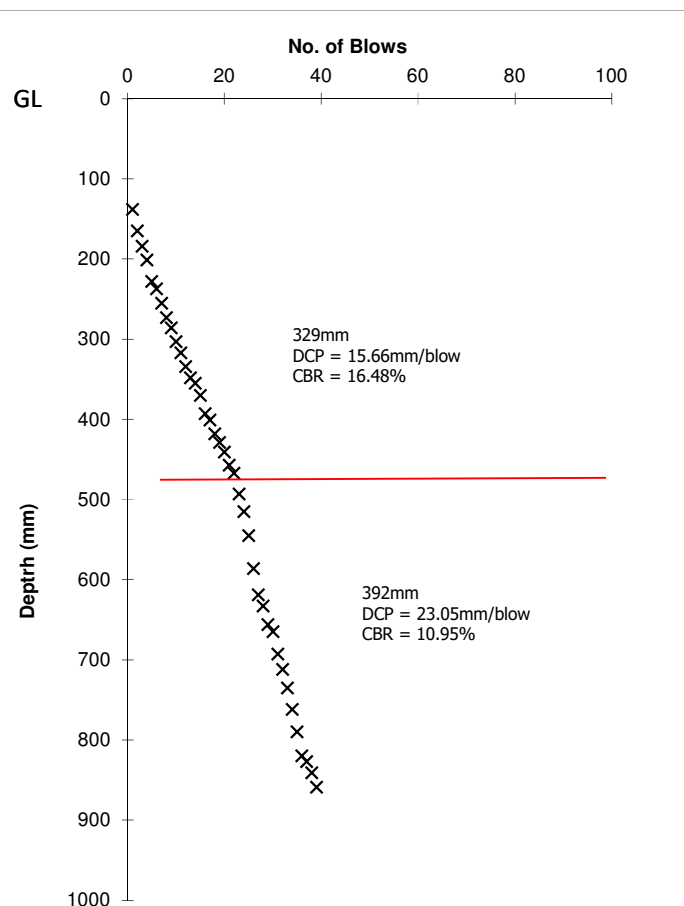
Reference: 1 Position: RC06 Date: 21 August 2019

mm per blow	Σ Blows	Reading on Scale (mm)	Depth from Ground Level (mm)	mm per blow	Σ Blows	Reading on Scale (mm)	Depth from Ground Level (mm)
138	1	223	138		46		-85
27	2	250	165		47		-85
19	3	269	184		48		-85
17	4	286	201		49		-85
27	5	313	228		50		-85
9	6	322	237		51		-85
18	7	340	255		52		-85
18	8	358	273		53		-85
13	9	371	286		54		-85
17	10	388	303		55		-85
14	11	402	317		56		-85
17	12	419	334		57		-85
14	13	433	348		58		-85
7	14	440	355		59		-85
15	15	455	370		60		-85
23	16	478	393		61		-85
8	17	486	401		62		-85
17	18	503	418		63		-85
11	19	514	429		64		-85
12	20	526	441		65		-85
16	21	542	457		66		-85
10	22	552	467		67		-85
26	23	578	493		68		-85
22	24	600	515		69		-85
30	25	630	545		70		-85
41	26	671	586		71		-85
33	27	704	619		72		-85
14	28	718	633		73		-85
23	29	741	656		74		-85
9	30	750	665		75		-85
28	31	778	693		76		-85
19	32	797	712		77		-85
23	33	820	735		78		-85
27	34	847	762		79		-85
28	35	875	790		80		-85
30	36	905	820		81		-85
7	37	912	827		82		-85
14	38	926	841		83		-85
18	39	944	859		84		-85
-944	40	end	-85		85		-85
	41		-85		86		-85
	42		-85		87		-85
	43		-85		88		-85
	44		-85		89		-85
	45		-85		90		-85

Test started at: 0 m below ground level

Zero Reading: 85 mm

Zero reading = start depth below ground surface



After Design manual for Roads and Bridges, Volume 7 Pavement Design and maintenance, Section 3 Pavement Maintenance Assessment, Part 2 HD29/08

Data compiled by: RS
Data checked by: PV

APPENDIX E – GEOTECHNICAL LABORATORY TEST RESULTS



Laboratory Report



Contract Number: 45593

Client Ref: **A113930**Report Date: **17-09-2019**

Client PO:

Client **WYG Group**
Arndale Court
Headingley
Leeds
LS6 2UJ

Contract Title: **Trelewis Primary School**
For the attention of: **Paul Vincent**

Date Received: **04-09-2019**Date Completed: **17-09-2019**

Test Description	Qty
PSD Wet Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	14
BRE Reduced Suite includes pH, water & acid soluble sulphate and total sulphur BRE - BR279 - @ Non Accredited Test	7
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 certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories:

Emma Sharp (Office Manager) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager)
Sean Penn (Administrative/Accounts Assistant) - Shaun Jones (Laboratory manager) - Wayne Honey (Administrative/Quality Assistant)



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **45593**

Borehole/Pit No. **TP01**

Site Name **Trelewis Primary School**

Sample No.

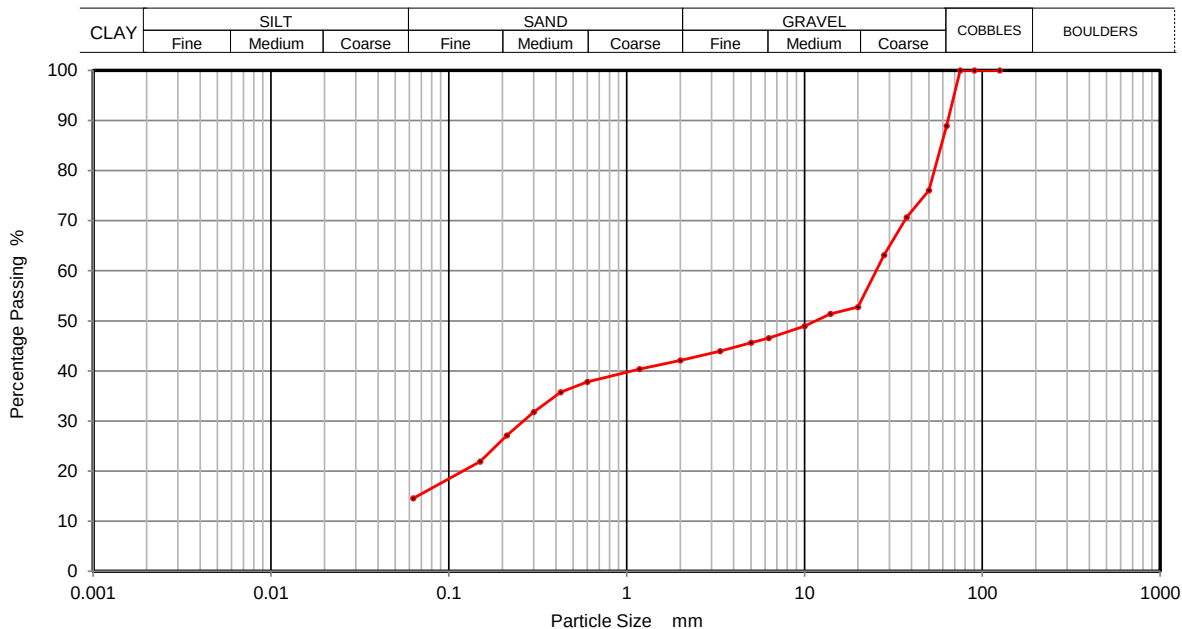
Soil Description **Brown clayey/silty fine to coarse sandy fine to coarse GRAVEL (with cobbles)**

Depth Top **0.50**

Depth Base **0.60**

Date Tested **12/09/2019**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	89		
50	76		
37.5	71		
28	63		
20	53		
14	51		
10	49		
6.3	47		
5	46		
3.35	44		
2	42		
1.18	40		
0.6	38		
0.425	36		
0.3	32		
0.212	27		
0.15	22		
0.063	15		

Sample Proportions	% dry mass
Cobbles	11
Gravel	47
Sand	27
Silt and Clay	15

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	16/09/2019	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	17/09/2019	Paul Evans	<i>P. Evans</i>





**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number **45593**

Borehole/Pit No. **TP01**

Site Name **Trelewis Primary School**

Sample No.

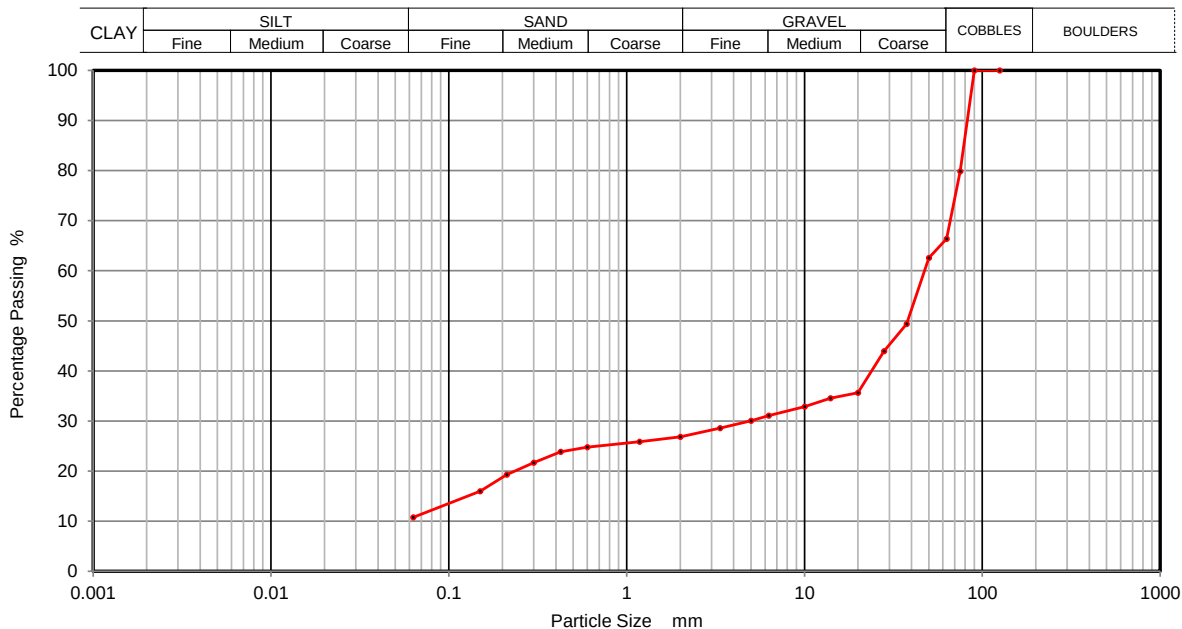
Soil Description **Brown clayey/silty fine to coarse sandy fine to coarse GRAVEL (with cobbles)**

Depth Top **1.20**

Depth Base **1.30**

Date Tested **12/09/2019**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	80		
63	66		
50	63		
37.5	49		
28	44		
20	36		
14	35		
10	33		
6.3	31		
5	30		
3.35	29		
2	27		
1.18	26		
0.6	25		
0.425	24		
0.3	22		
0.212	19		
0.15	16		
0.063	11		

Sample Proportions	% dry mass
Cobbles	34
Gravel	39
Sand	16
Silt and Clay	11

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	16/09/2019	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	17/09/2019	Paul Evans	<i>P. Evans</i>





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **45593**

Borehole/Pit No. **RC01**

Site Name **Trelewis Primary School**

Sample No.

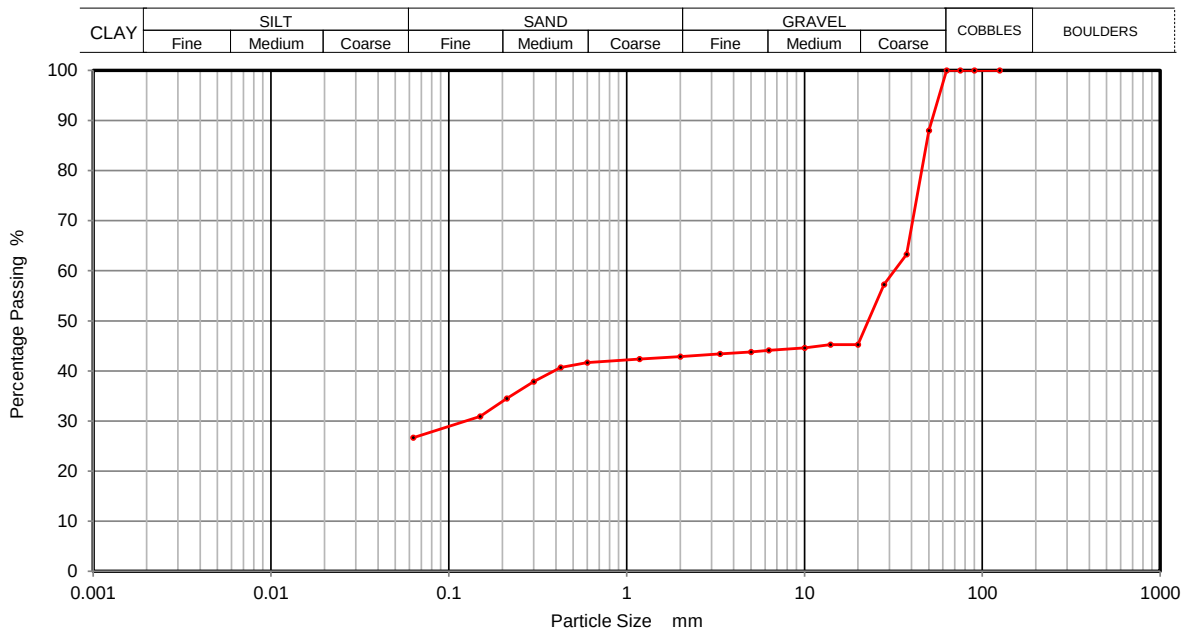
Soil Description **Brown fine to coarse sandy silty/clayey fine to coarse GRAVEL**

Depth Top **0.50**

Depth Base **0.60**

Date Tested **12/09/2019**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	88		
37.5	63		
28	57		
20	45		
14	45		
10	45		
6.3	44		
5	44		
3.35	43		
2	43		
1.18	42		
0.6	42		
0.425	41		
0.3	38		
0.212	34		
0.15	31		
0.063	27		

Sample Proportions	% dry mass
Cobbles	0
Gravel	57
Sand	16
Silt and Clay	27

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	16/09/2019	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	17/09/2019	Paul Evans	<i>P. Evans</i>





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **45593**

Borehole/Pit No. **RC01**

Site Name **Trelewis Primary School**

Sample No.

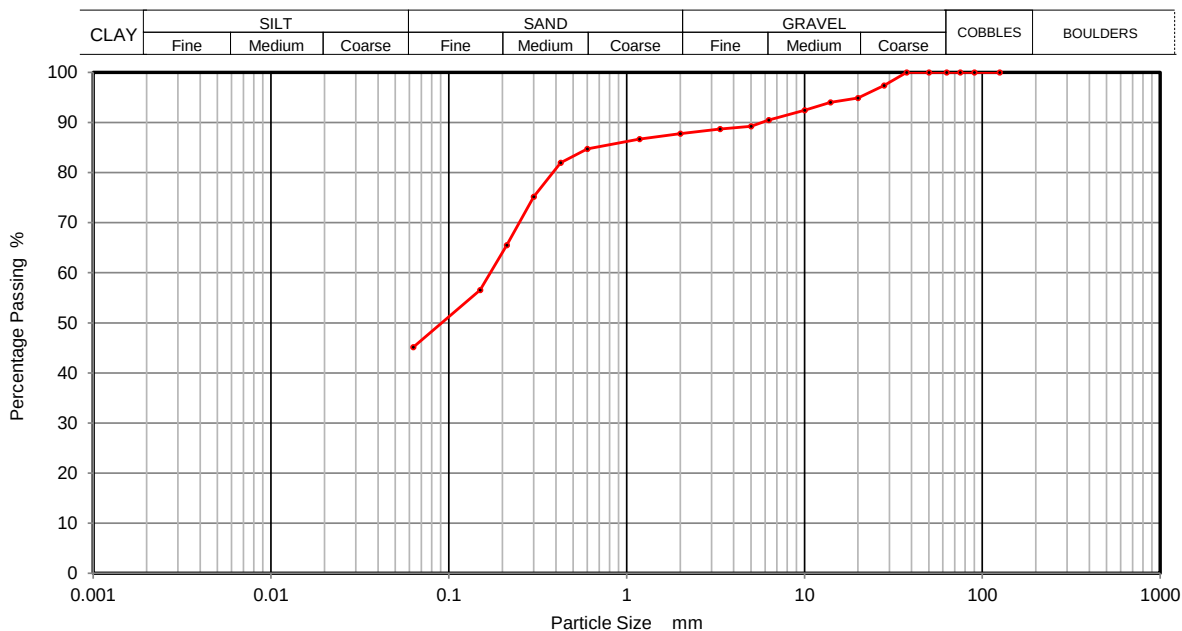
Soil Description **Brown fine to coarse gravelly fine to coarse sandy CLAY/SILT**

Depth Top **1.00**

Depth Base **1.20**

Date Tested **12/09/2019**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	97		
20	95		
14	94		
10	92		
6.3	91		
5	89		
3.35	89		
2	88		
1.18	87		
0.6	85		
0.425	82		
0.3	75		
0.212	66		
0.15	57		
0.063	45		

Sample Proportions	% dry mass
Cobbles	0
Gravel	12
Sand	43
Silt and Clay	45

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	16/09/2019	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	17/09/2019	Paul Evans	<i>P. Evans</i>



2788



**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number **45593**

Borehole/Pit No. **RC02**

Site Name **Trelewis Primary School**

Sample No.

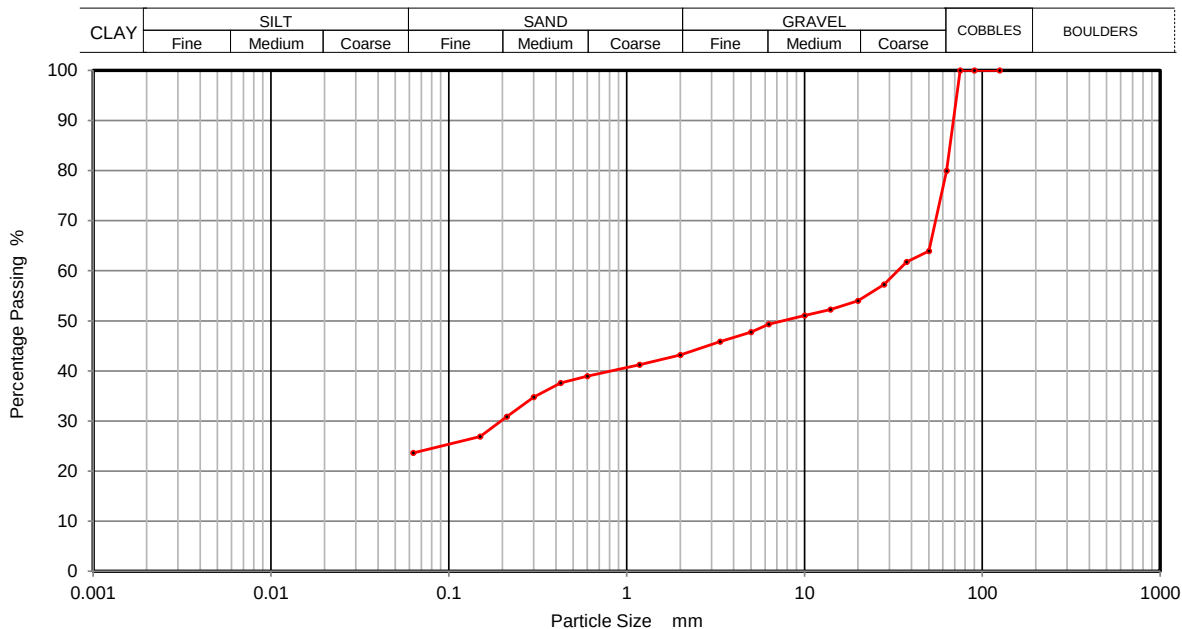
Soil Description **Brown fine to coarse sandy clayey/silty fine to coarse GRAVEL (with cobbles)**

Depth Top **0.35**

Depth Base **0.45**

Date Tested **12/09/2019**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	80		
50	64		
37.5	62		
28	57		
20	54		
14	52		
10	51		
6.3	49		
5	48		
3.35	46		
2	43		
1.18	41		
0.6	39		
0.425	38		
0.3	35		
0.212	31		
0.15	27		
0.063	24		

Sample Proportions	% dry mass
Cobbles	20
Gravel	37
Sand	19
Silt and Clay	24

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	16/09/2019	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	17/09/2019	Paul Evans	<i>P. Evans</i>



2788



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **45593**

Borehole/Pit No. **RC02**

Site Name **Trelewis Primary School**

Sample No.

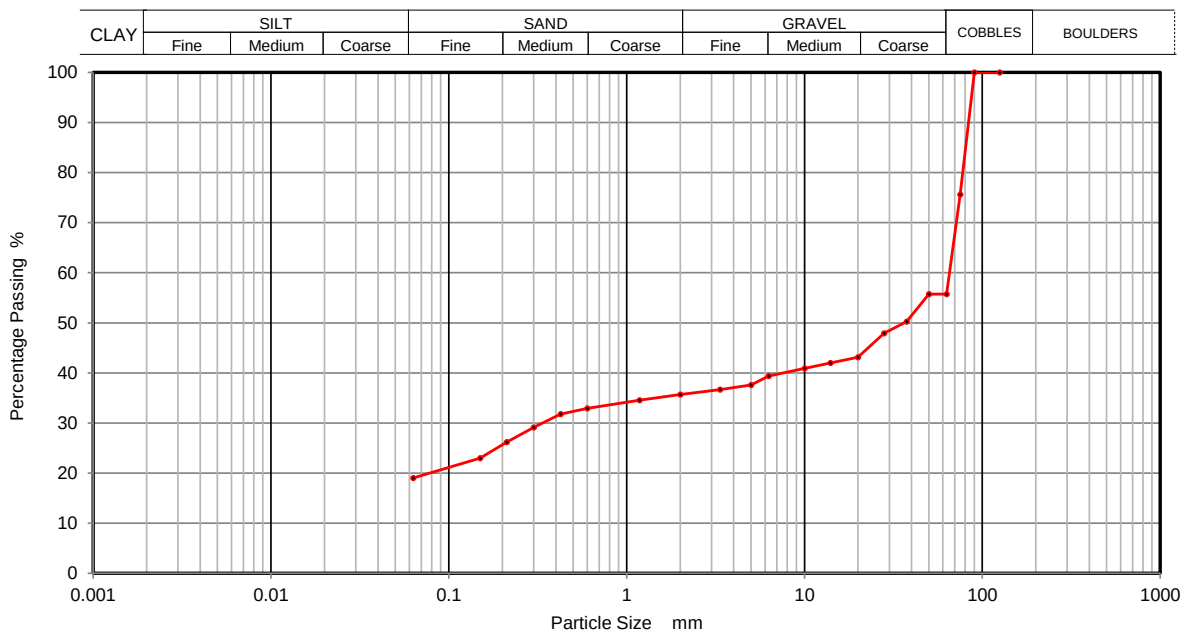
Soil Description **Brown fine to coarse sandy clayey/silty fine to coarse GRAVEL (with cobbles)**

Depth Top **1.00**

Depth Base **1.20**

Date Tested **12/09/2019**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	76		
63	56		
50	56		
37.5	50		
28	48		
20	43		
14	42		
10	41		
6.3	39		
5	38		
3.35	37		
2	36		
1.18	35		
0.6	33		
0.425	32		
0.3	29		
0.212	26		
0.15	23		
0.063	19		

Sample Proportions	% dry mass
Cobbles	44
Gravel	20
Sand	17
Silt and Clay	19

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	16/09/2019	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	17/09/2019	Paul Evans	<i>DP Evans</i>





**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number **45593**

Borehole/Pit No. **RC03**

Site Name **Trelewis Primary School**

Sample No.

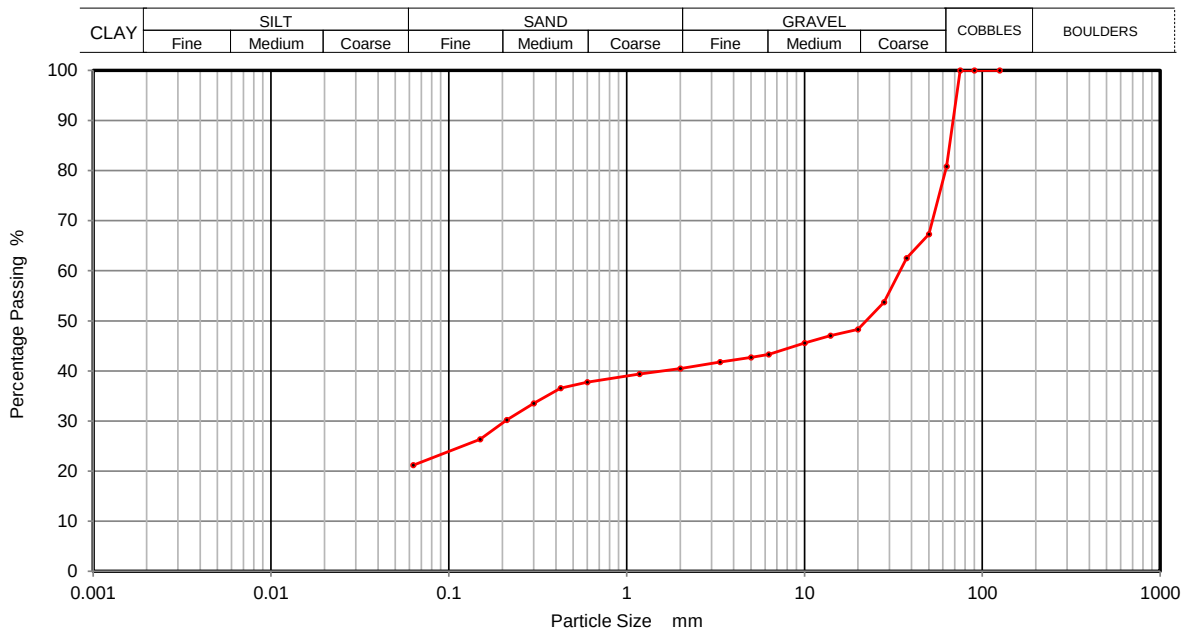
Soil Description **Brown fine to coarse sandy clayey/silty fine to coarse GRAVEL (with cobbles)**

Depth Top **0.50**

Depth Base

Date Tested **12/09/2019**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	81		
50	67		
37.5	63		
28	54		
20	48		
14	47		
10	46		
6.3	43		
5	43		
3.35	42		
2	40		
1.18	39		
0.6	38		
0.425	37		
0.3	34		
0.212	30		
0.15	26		
0.063	21		

Sample Proportions	% dry mass
Cobbles	19
Gravel	41
Sand	19
Silt and Clay	21

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	16/09/2019	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	17/09/2019	Paul Evans	<i>P. Evans</i>





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **45593**

Borehole/Pit No. **RC04**

Site Name **Trelewis Primary School**

Sample No.

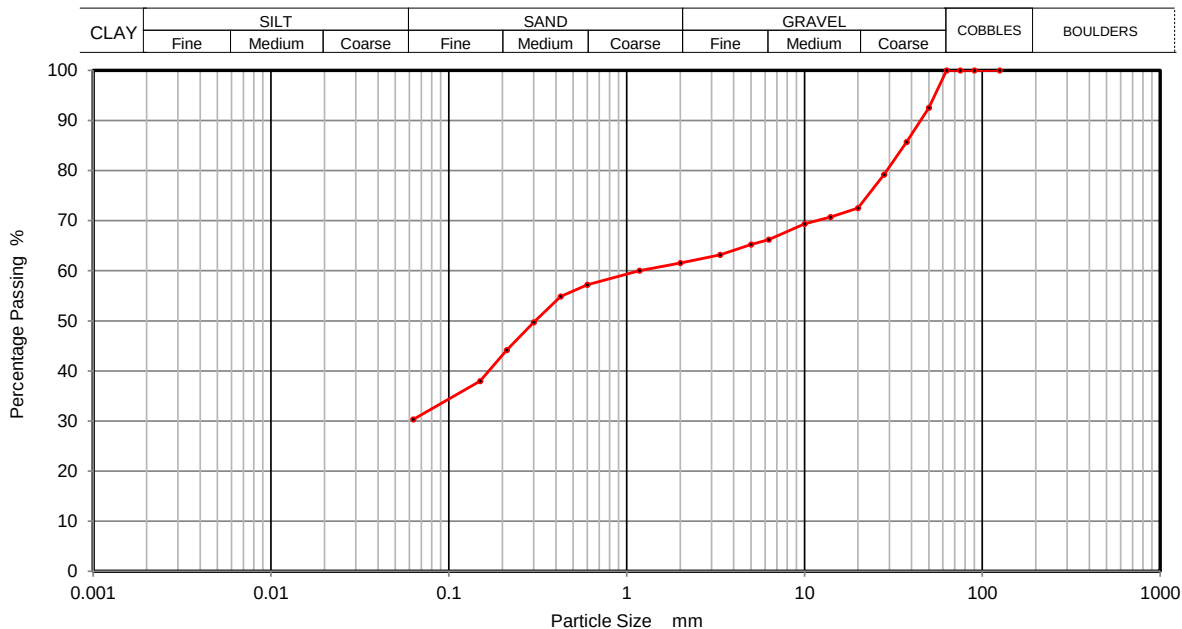
Soil Description **Brown clayey/silty fine to coarse sandy fine to coarse GRAVEL**

Depth Top **0.50**

Depth Base **0.60**

Date Tested **12/09/2019**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	93		
37.5	86		
28	79		
20	73		
14	71		
10	69		
6.3	66		
5	65		
3.35	63		
2	62		
1.18	60		
0.6	57		
0.425	55		
0.3	50		
0.212	44		
0.15	38		
0.063	30		

Sample Proportions	% dry mass
Cobbles	0
Gravel	38
Sand	32
Silt and Clay	30

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	16/09/2019	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	17/09/2019	Paul Evans	<i>P. Evans</i>





**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number **45593**

Borehole/Pit No. **RC04**

Site Name **Trelewis Primary School**

Sample No.

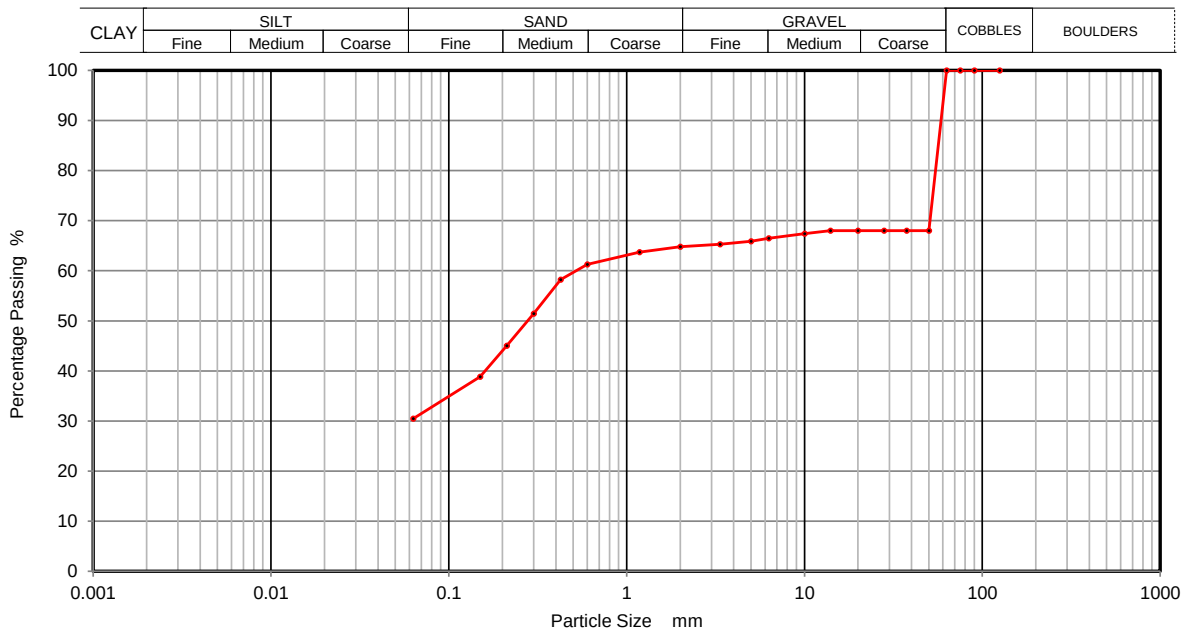
Soil Description **Brown clayey/silty fine to coarse sandy fine to coarse GRAVEL**

Depth Top **0.50**

Depth Base **0.60**

Date Tested **12/09/2019**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	68		
37.5	68		
28	68		
20	68		
14	68		
10	67		
6.3	66		
5	66		
3.35	65		
2	65		
1.18	64		
0.6	61		
0.425	58		
0.3	51		
0.212	45		
0.15	39		
0.063	30		

Sample Proportions	% dry mass
Cobbles	0
Gravel	35
Sand	35
Silt and Clay	30

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	16/09/2019	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	17/09/2019	Paul Evans	<i>P. Evans</i>



2788



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **45593**

Borehole/Pit No. **RC05**

Site Name **Trelewis Primary School**

Sample No.

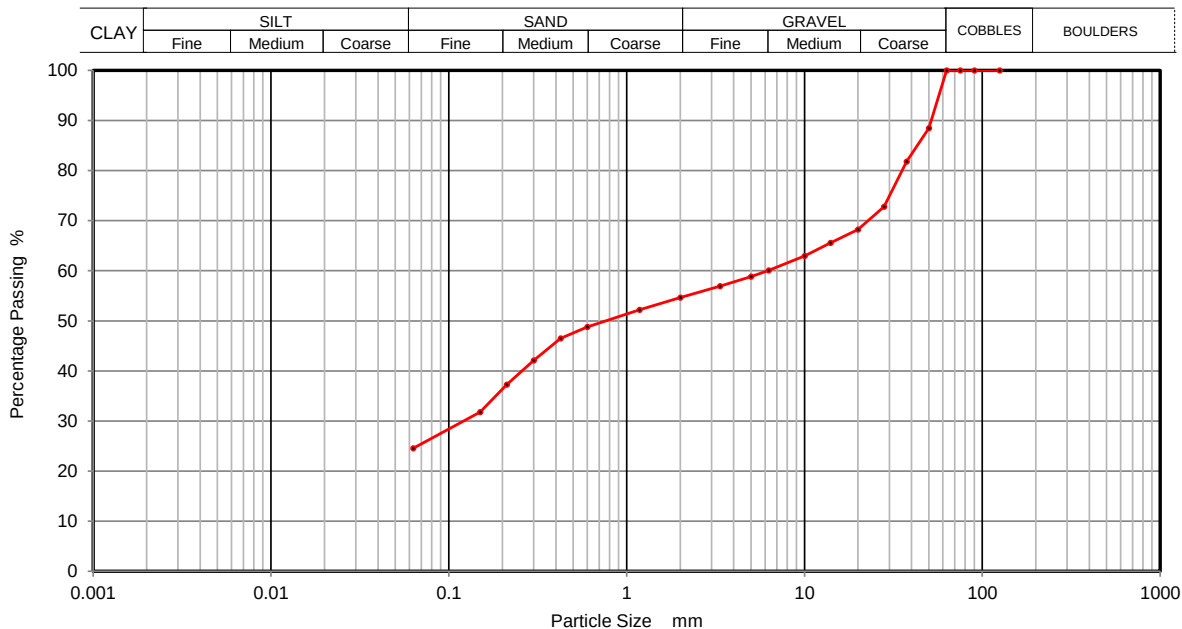
Soil Description **Brown clayey/silty fine to coarse sandy fine to coarse GRAVEL**

Depth Top **0.30**

Depth Base **0.40**

Date Tested **12/09/2019**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	88		
37.5	82		
28	73		
20	68		
14	66		
10	63		
6.3	60		
5	59		
3.35	57		
2	55		
1.18	52		
0.6	49		
0.425	46		
0.3	42		
0.212	37		
0.15	32		
0.063	25		

Sample Proportions	% dry mass
Cobbles	0
Gravel	45
Sand	30
Silt and Clay	25

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	16/09/2019	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	17/09/2019	Paul Evans	<i>P. Evans</i>





**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number **45593**

Borehole/Pit No. **RC06**

Site Name **Trelewis Primary School**

Sample No.

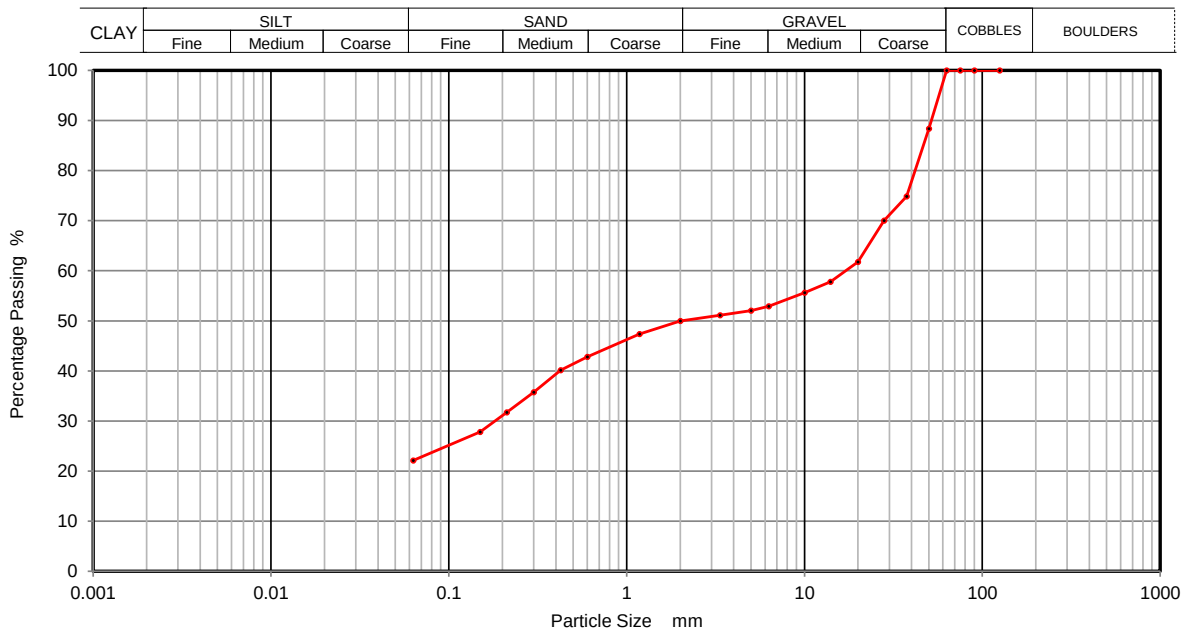
Soil Description **Brown clayey/silty fine to coarse sandy fine to coarse GRAVEL**

Depth Top **0.40**

Depth Base **0.50**

Date Tested **12/09/2019**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	88		
37.5	75		
28	70		
20	62		
14	58		
10	56		
6.3	53		
5	52		
3.35	51		
2	50		
1.18	47		
0.6	43		
0.425	40		
0.3	36		
0.212	32		
0.15	28		
0.063	22		

Sample Proportions	% dry mass
Cobbles	0
Gravel	50
Sand	28
Silt and Clay	22

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	16/09/2019	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	17/09/2019	Paul Evans	<i>P. Evans</i>





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **45593**

Borehole/Pit No. **RC06**

Site Name **Trelewis Primary School**

Sample No.

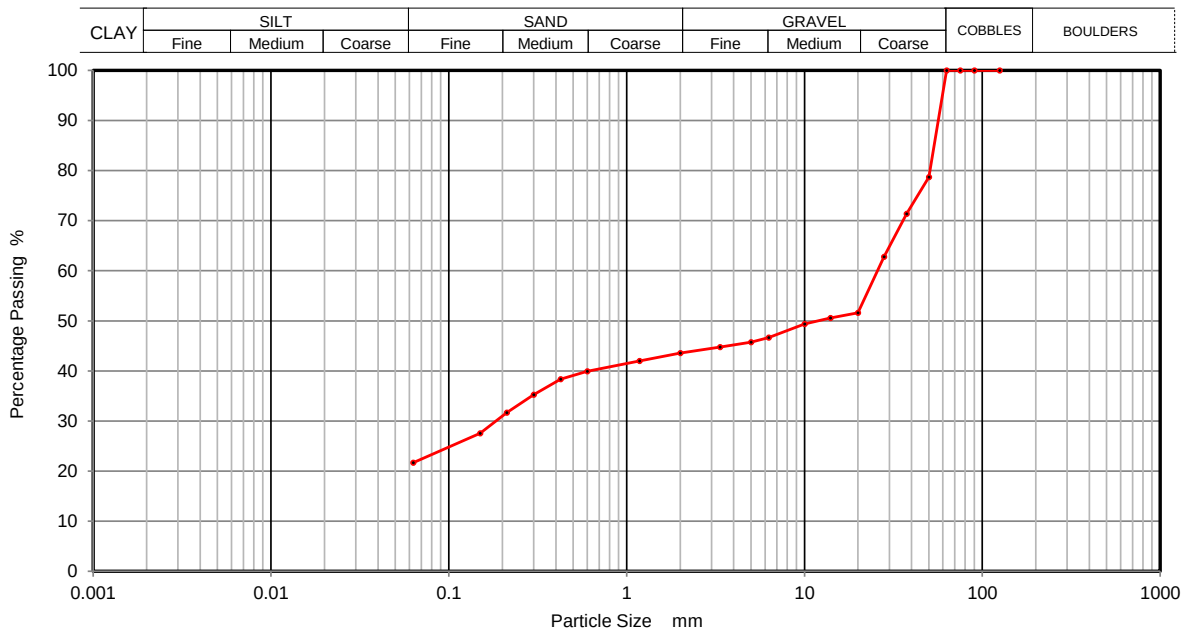
Soil Description **Brown clayey/silty fine to coarse sandy fine to coarse GRAVEL**

Depth Top **0.60**

Depth Base **0.70**

Date Tested **12/09/2019**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	79		
37.5	71		
28	63		
20	52		
14	51		
10	49		
6.3	47		
5	46		
3.35	45		
2	44		
1.18	42		
0.6	40		
0.425	38		
0.3	35		
0.212	32		
0.15	28		
0.063	22		

Sample Proportions	% dry mass
Cobbles	0
Gravel	56
Sand	22
Silt and Clay	22

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	16/09/2019	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	17/09/2019	Paul Evans	<i>P. Evans</i>



2788



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **45593**

Borehole/Pit No. **RC07**

Site Name **Trelewis Primary School**

Sample No.

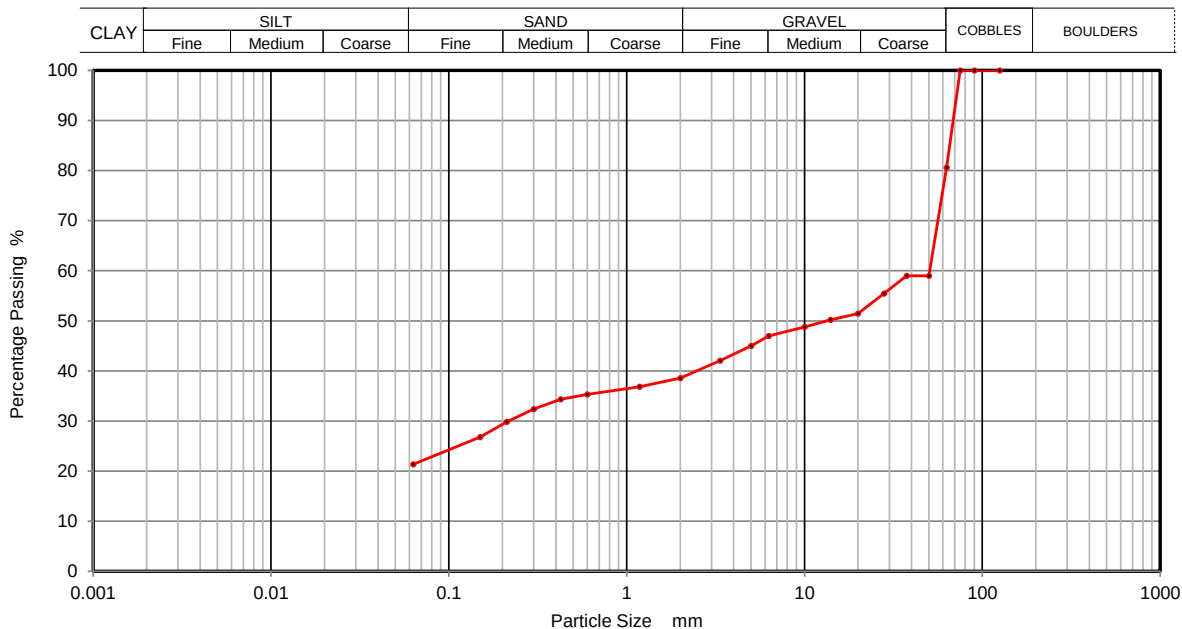
Soil Description **Brown fine to coarse sandy clayey/silty fine to coarse GRAVEL (with cobbles)**

Depth Top **0.40**

Depth Base **0.50**

Date Tested **12/09/2019**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	81		
50	59		
37.5	59		
28	55		
20	51		
14	50		
10	49		
6.3	47		
5	45		
3.35	42		
2	39		
1.18	37		
0.6	35		
0.425	34		
0.3	32		
0.212	30		
0.15	27		
0.063	21		

Sample Proportions	% dry mass
Cobbles	19
Gravel	42
Sand	18
Silt and Clay	21

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	16/09/2019	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	17/09/2019	Paul Evans	<i>P. Evans</i>



2788



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **45593**

Borehole/Pit No. **RC08**

Site Name **Trelewis Primary School**

Sample No.

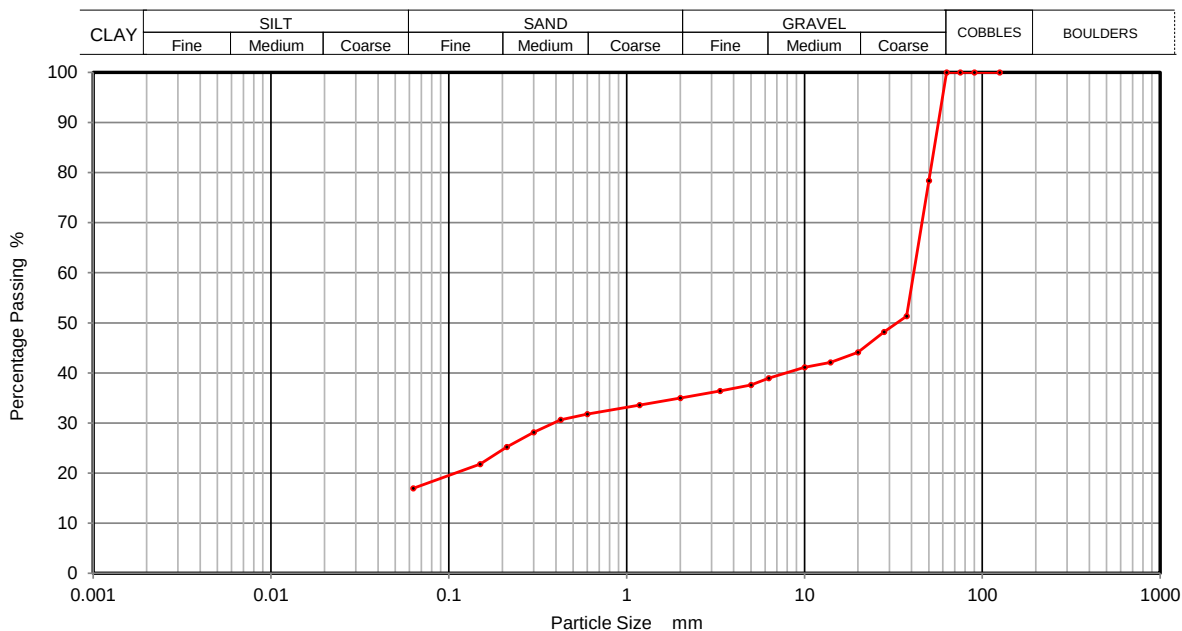
Soil Description **Brown clayey/silty fine to coarse sandy fine to coarse GRAVEL**

Depth Top **0.40**

Depth Base **0.50**

Date Tested **12/09/2019**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	78		
37.5	51		
28	48		
20	44		
14	42		
10	41		
6.3	39		
5	38		
3.35	36		
2	35		
1.18	34		
0.6	32		
0.425	31		
0.3	28		
0.212	25		
0.15	22		
0.063	17		

Sample Proportions	% dry mass
Cobbles	0
Gravel	65
Sand	18
Silt and Clay	17

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	16/09/2019	Wayne Honey	<i>W. Honey</i>
RO/MH	Approved	17/09/2019	Paul Evans	<i>P. Evans</i>



APPENDIX F – ENVIRONMENTAL LABORATORY TEST RESULTS



Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

WYG Geo-Environment
5th Floor
Longcross Court
47 Newport Road
Cardiff
CF24 0AD

Attention: Rachael Seaman

CERTIFICATE OF ANALYSIS

Date of report Generation:	20 September 2019
Customer:	WYG Geo-Environment
Sample Delivery Group (SDG):	190904-93
Your Reference:	A113930
Location:	Trelewis School
Report No:	522273

This report has been revised and directly supersedes 521233 in its entirety.

We received 14 samples on Wednesday September 04, 2019 and 14 of these samples were scheduled for analysis which was completed on Friday September 20, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
20647672	RC01	ES1	0.50	15/08/2019
20647683	RC01	ES1	1.10	15/08/2019
20647687	RC02	ES1	0.40	15/08/2019
20647694	RC02	ES1	1.00	15/08/2019
20647703	RC03	ES1	0.40	16/08/2019
20647719	RC04	ES1	0.50	16/08/2019
20647729	RC04	ES1	1.00	16/08/2019
20647617	RC05	ES1	0.00 - 0.00	20/08/2019
20647624	RC06	ES1	0.40	19/08/2019
20647636	RC06	ES1	0.60	19/08/2019
20647645	RC07	ES1	0.40	19/08/2019
20647655	RC08	ES1	0.40	20/08/2019
20647606	TP01	ES1	0.50	21/08/2019
20647664	TP01	ES1	1.20	21/08/2019

Maximum Sample/Coolbox Temperature (°C) :

12.6

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

Results Legend

X Test
N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
2064729	RC04	ES1	1.00	1kg Cardboard Container 60g VOC (ALE215)	S
2064719	RC04	ES1	0.50	250g Amber Jar (ALE210) 1kg Cardboard Container	S
2064703	RC03	ES1	0.40	60g VOC (ALE215)	S
2064784	RC02	ES1	1.00	250g Amber Jar (ALE210) 1kg Cardboard Container	S
2064787	RC02	ES1	0.40	60g VOC (ALE215)	S
2064783	RC01	ES1	1.10	250g Amber Jar (ALE210) 1kg Cardboard Container	S
2064762	RC01	ES1	0.50	250g Amber Jar (ALE210) 1kg Cardboard Container	S
Alkalinity Filtered as CaCO3	All	NDPs: 0 Tests: 8			X
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 8			X
Anions by Kone (soil)	All	NDPs: 0 Tests: 14		X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 8			X
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 14		X	X
Asbestos Quantification - Full	All	NDPs: 0 Tests: 1			
Boron Water Soluble	All	NDPs: 0 Tests: 14		X	X
CEN Readings	All	NDPs: 0 Tests: 8			X
Chromium III	All	NDPs: 0 Tests: 14		X	X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 22		X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 8			X
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 8			X
EPH CWG (Aliphatic) Filtered GC (W)	All	NDPs: 0 Tests: 8			X
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 14		X	X
EPH CWG (Aromatic) Filtered GC (W)	All	NDPs: 0 Tests: 8			X

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

Results Legend

X Test
N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Results Legend	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type	
	20647729	RC04	ES1	1.00	1kg Cardboard Container	S						
	20647719	RC04	ES1	0.50	60g VOC (ALE215)	S						
	20647703	RC03	ES1	0.40	250g Amber Jar (ALE210)	S						
	20647694	RC02	ES1	1.00	1kg Cardboard Container	S						
	20647687	RC02	ES1	0.40	60g VOC (ALE215)	S						
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 14										
GRO by GC-FID (S)	All	NDPs: 0 Tests: 14										
GRO by GC-FID (W)	All	NDPs: 0 Tests: 8										
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 14										
Mercury Dissolved	All	NDPs: 0 Tests: 8										
Metals in solid samples by OES	All	NDPs: 0 Tests: 14										
Nitrite by Kone (w)	All	NDPs: 0 Tests: 8										
PAH by GCMS	All	NDPs: 0 Tests: 14										
PAH in waters by GC-MS (diss.filt)	All	NDPs: 0 Tests: 8										
pH	All	NDPs: 0 Tests: 14										
pH Value of Filtered Water	All	NDPs: 0 Tests: 8										
Phenols by HPLC (S)	All	NDPs: 0 Tests: 14										
Phenols by HPLC (W)	All	NDPs: 0 Tests: 8										
Sample description	All	NDPs: 0 Tests: 14										
Total Organic Carbon	All	NDPs: 0 Tests: 14										

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

Results Legend

X Test
N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Results Legend																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
X Test																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
N No Determination Possible																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
			20647729	RC04	ES1	1.00	1kg Cardboard Container 60g VOC (ALE215)	S																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										

20647664	TP01	ES1	1.20	1kg Cardboard Container	S					
20647606	TP01	ES1	0.50	60g VOC (ALE215)	S					X
				250g Amber Jar (ALE210)	S				X	
				1kg Cardboard Container	S	X				
20647655	RC08	ES1	0.40	60g VOC (ALE215)	S				X	
				250g Amber Jar (ALE210)	S			X		
				1kg Cardboard Container	S	X				
20647645	RC07	ES1	0.40	60g VOC (ALE215)	S				X	
				250g Amber Jar (ALE210)	S			X		
				1kg Cardboard Container	S	X				
20647636	RC06	ES1	0.60	60g VOC (ALE215)	S				X	
				250g Amber Jar (ALE210)	S			X		
				1kg Cardboard Container	S	X				
20647624	RC06	ES1	0.40	60g VOC (ALE215)	S				X	
				250g Amber Jar (ALE210)	S			X		
				1kg Cardboard Container	S					
20647617	RC05	ES1	0.00 - 0.00	60g VOC (ALE215)	S				X	
				250g Amber Jar (ALE210)	S			X		
				1kg Cardboard Container	S					
20647729	RC04	ES1	1.00	60g VOC (ALE215)	S				X	
				250g Amber Jar (ALE210)	S			X		



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

Results Legend



Test


No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)

20647664

Customer
Sample Reference

TP01

AGS Reference

ES1

Depth (m)

1.20

Container

250g Amber Jar
(ALE210)

60g VOC (ALE215)

Sample Type

S

S

Anions by Kone (soil)

All

NDPs: 0
Tests: 14

X

Boron Water Soluble

All

NDPs: 0
Tests: 14

X

Chromium III

All

NDPs: 0
Tests: 14

X

Cyanide Comp/Free/Total/Thiocyanate

All

NDPs: 0
Tests: 22

X

EPH CWG (Aliphatic) GC (S)

All

NDPs: 0
Tests: 14

X

EPH CWG (Aromatic) GC (S)

All

NDPs: 0
Tests: 14

X

GRO by GC-FID (S)

All

NDPs: 0
Tests: 14

X

Hexavalent Chromium (s)

All

NDPs: 0
Tests: 14

X

Metals in solid samples by OES

All

NDPs: 0
Tests: 14

X

PAH by GCMS

All

NDPs: 0
Tests: 14

X

pH

All

NDPs: 0
Tests: 14

X

Phenols by HPLC (S)

All

NDPs: 0
Tests: 14

X

Sample description

All

NDPs: 0
Tests: 14

X

Total Organic Carbon

All

NDPs: 0
Tests: 14

X

TPH CWG GC (S)

All

NDPs: 0
Tests: 14

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

Results Legend

- X** Test
N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)

20647664

Customer Sample Reference

TP01

AGS Reference

ES1

Depth (m)

1.20

Container

250g Amber Jar (ALE210)
60g VOC (ALE215)

Sample Type

S S

VOC MS (S)

All

NDPs: 0
Tests: 14

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
20647672	RC01	0.50	Dark Brown	Sandy Silt Loam	Stones	Vegetation
20647683	RC01	1.10	Dark Brown	Sandy Loam	Stones	Vegetation
20647687	RC02	0.40	Dark Brown	Sandy Loam	Stones	None
20647694	RC02	1.00	Dark Brown	Sandy Loam	Stones	Vegetation
20647703	RC03	0.40	Dark Brown	Sandy Silt Loam	Stones	Vegetation
20647719	RC04	0.50	Dark Brown	Sandy Clay Loam	Stones	None
20647729	RC04	1.00	Dark Brown	Loamy Sand	Stones	Vegetation
20647617	RC05	0.00 - 0.00	Dark Brown	Loamy Sand	Stones	None
20647624	RC06	0.40	Dark Brown	Sandy Loam	Stones	Vegetation
20647636	RC06	0.60	Dark Brown	Sandy Loam	Stones	Vegetation
20647645	RC07	0.40	Dark Brown	Sandy Loam	Stones	Vegetation
20647655	RC08	0.40	Dark Brown	Sandy Silt Loam	Vegetation	Stones
20647606	TP01	0.50	Light Brown	Sand	None	Stones
20647664	TP01	1.20	Dark Brown	Loamy Sand	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

Asbestos Identification - Solid Samples

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&+5@ Sample deviation (see appendix)

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	RC01ES1 0.50 SOLID 15/08/2019 00:00:00 04/09/2019 12:49:00 190904-93 20647672 TM048	09/09/2019	Barbara Urbanek-Wals h	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	RC01ES1 1.10 SOLID 15/08/2019 00:00:00 04/09/2019 12:49:00 190904-93 20647683 TM048	09/09/2019	Barbara Urbanek-Wals h	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	RC02ES1 0.40 SOLID 15/08/2019 00:00:00 04/09/2019 12:49:00 190904-93 20647687 TM048	09/09/2019	Barbara Urbanek-Wals h	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	RC02ES1 1.00 SOLID 15/08/2019 00:00:00 04/09/2019 12:49:00 190904-93 20647694 TM048	10/09/2019	Marcin Magdziarek	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	RC03ES1 0.40 SOLID 16/08/2019 00:00:00 04/09/2019 12:49:00 190904-93 20647703 TM048	10/09/2019	Marcin Magdziarek	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	RC04ES1 0.50 SOLID 16/08/2019 00:00:00 04/09/2019 12:49:00 190904-93 20647719 TM048	09/09/2019	Barbara Urbanek-Wals h	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	RC04ES1 1.00 SOLID 16/08/2019 00:00:00 04/09/2019 12:49:00 190904-93 20647729 TM048	10/09/2019	Lucy Caroe	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	RC05ES1 0.00 - 0.00 SOLID 20/08/2019 00:00:00 04/09/2019 12:49:00 190904-93 20647617 TM048	10/09/2019	Marcin Magdziarek	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



CERTIFICATE OF ANALYSIS

SDG: 190904-93 **Client Reference:** A113930 **Report Number:** 522273
Location: Trelewis School **Order Number:** C19/900 **Superseded Report:** 521233

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	RC06ES1 0.40 SOLID 19/08/2019 00:00:00 04/09/2019 12:49:00 190904-93 20647624 TM048	10/09/2019	Marcin Magdziarek	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	RC06ES1 0.60 SOLID 19/08/2019 00:00:00 04/09/2019 12:49:00 190904-93 20647636 TM048	09/09/2019	Lucy Caroe	Loose fibres in soi	Not Detected (#)	Trace (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	RC07ES1 0.40 SOLID 19/08/2019 00:00:00 04/09/2019 12:49:00 190904-93 20647645 TM048	10/09/2019	Marcin Magdziarek	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	RC08ES1 0.40 SOLID 20/08/2019 00:00:00 04/09/2019 12:49:00 190904-93 20647655 TM048	10/09/2019	Marcin Magdziarek	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP01ES1 0.50 SOLID 21/08/2019 00:00:00 04/09/2019 12:49:00 190904-93 20647606 TM048	09/09/2019	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP01ES1 1.20 SOLID 21/08/2019 00:00:00 04/09/2019 12:49:00 190904-93 20647664 TM048	09/09/2019	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

Asbestos Quantification - Full



CERTIFICATE OF ANALYSIS

Validated

SDG:	190904-93	Client Reference:	A113930	Report Number:	522273
Location:	Trelewis School	Order Number:	C19/900	Superseded Report:	521233

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&*§@ Sample deviation (see appendix)

Additional Asbestos Components	Analysts Comments	Asbestos Quantification - Gravimetric - %	Asbestos Quantification - PCOM	Asbestos Quantification - Total - %
None (#)	-	<0.001 (#)	<0.001 (#)	<0.001 (#)

Cust. Sample Ref.	RC06ES1
Depth (m)	0.60
Sample Type	SOLID
Date Sampled	19/08/2019 00:00:00
Date Received	04/09/2019 12:49:00
SDG	190904-93
Original Sample	20647636
Method Number	TM304



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.099
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Trelewis School
Natural Moisture Content (%)	10.5
Dry Matter Content (%)	90.5

Case

SDG	190904-93
Lab Sample Number(s)	20647606
Sampled Date	21-Aug-2019
Customer Sample Ref.	TP01 ES1
Depth (m)	0.50

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Nitrite as NO ₂	<0.05	<0.05	<0.5	<0.5	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Dissolved Organic Carbon	<3	<3	<30	<30	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Naphthalene (diss.filt)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Ammonia as NH ₃	<0.2	<0.2	<2	<2	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Acenaphthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Arsenic	0.00051	<0.0005	0.0051	<0.005	-	-	-
Total Ammonium as NH ₄	<0.3	<0.3	<3	<3	-	-	-
Acenaphthylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Barium	0.163	<0.0002	1.63	<0.002	-	-	-
Nitrate as NO ₃	<0.3	<0.3	<3	<3	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Fluoranthene (diss.filt)	0.0000194	<0.000005	0.000194	<0.00005	-	-	-
Anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Boron	0.0474	<0.01	0.474	<0.1	-	-	-
Phenanthrene (diss.filt)	0.0000139	<0.000005	0.000139	<0.00005	-	-	-
Total Alkalinity Filtered as CaCO ₃	7	<2	70	<20	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Fluorene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-

Leach Test Information

Date Prepared	06-Sep-2019
pH (pH Units)	7.97
Conductivity (µS/cm)	15.60
Temperature (°C)	17.40
Volume Leachant (Litres)	0.891



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Trelewis School
Mass Sample taken (kg)	0.099	Natural Moisture Content (%)	10.5
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	90.5
Particle Size <4mm	>95%		

Case

SDG	190904-93
Lab Sample Number(s)	20647606
Sampled Date	21-Aug-2019
Customer Sample Ref.	TP01 ES1
Depth (m)	0.50

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Pyrene (diss.filt)	0.0000149	<0.000005	0.000149	<0.00005	-	-	-
Benzo(a)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Benzo(b)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene (diss.filt)	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Copper	0.000826	<0.0003	0.00826	<0.003	-	-	-
Dibenzo(a,h)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Lead	0.000348	<0.0002	0.00348	<0.002	-	-	-
Benzo(g,h,i)perylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(1,2,3-cd)pyrene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Molybdenum	0.00647	<0.003	0.0647	<0.03	-	-	-
PAH 16 EPA Total by GCMS (diss.filt)	<0.000082	<0.000082	<0.00082	<0.00082	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.00227	<0.001	0.0227	<0.01	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-

Leach Test Information

Date Prepared	06-Sep-2019
pH (pH Units)	7.97
Conductivity (µS/cm)	15.60
Temperature (°C)	17.40
Volume Leachant (Litres)	0.891



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Trelewis School
Mass Sample taken (kg)	0.101	Natural Moisture Content (%)	12.4
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	89
Particle Size <4mm	>95%		

Case

SDG	190904-93
Lab Sample Number(s)	20647617
Sampled Date	20-Aug-2019
Customer Sample Ref.	RC05 ES1
Depth (m)	0.00 - 0.00

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Nitrite as NO ₂	<0.05	<0.05	<0.5	<0.5	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Dissolved Organic Carbon	<3	<3	<30	<30	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Naphthalene (diss.filt)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Ammonia as NH ₃	<0.2	<0.2	<2	<2	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Acenaphthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Total Ammonium as NH ₄	<0.3	<0.3	<3	<3	-	-	-
Acenaphthylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Barium	0.0224	<0.0002	0.224	<0.002	-	-	-
Nitrate as NO ₃	1.43	<0.3	14.3	<3	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Fluoranthene (diss.filt)	0.0000798	<0.000005	0.000798	<0.00005	-	-	-
Anthracene (diss.filt)	0.00000885	<0.000005	0.0000885	<0.00005	-	-	-
Boron	0.0192	<0.01	0.192	<0.1	-	-	-
Phenanthrene (diss.filt)	0.0000445	<0.000005	0.000445	<0.00005	-	-	-
Total Alkalinity Filtered as CaCO ₃	7.5	<2	75	<20	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Fluorene (diss.filt)	0.00000595	<0.000005	0.0000595	<0.00005	-	-	-
Chrysene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-

Leach Test Information

Date Prepared	06-Sep-2019
pH (pH Units)	8.05
Conductivity (µS/cm)	19.10
Temperature (°C)	18.10
Volume Leachant (Litres)	0.889



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Trelewis School
Mass Sample taken (kg)	0.101	Natural Moisture Content (%)	12.4
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	89
Particle Size <4mm	>95%		

Case

SDG	190904-93
Lab Sample Number(s)	20647617
Sampled Date	20-Aug-2019
Customer Sample Ref.	RC05 ES1
Depth (m)	0.00 - 0.00

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Pyrene (diss.filt)	0.0000444	<0.000005	0.000444	<0.00005	-	-	-
Benzo(a)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chromium	0.00164	<0.001	0.0164	<0.01	-	-	-
Benzo(b)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene (diss.filt)	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Copper	0.000942	<0.0003	0.00942	<0.003	-	-	-
Dibenzo(a,h)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Lead	0.000367	<0.0002	0.00367	<0.002	-	-	-
Benzo(g,h,i)perylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(1,2,3-cd)pyrene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
PAH 16 EPA Total by GCMS (diss.filt)	0.000183	<0.000082	0.00183	<0.00082	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.00261	<0.001	0.0261	<0.01	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-

Leach Test Information

Date Prepared	06-Sep-2019
pH (pH Units)	8.05
Conductivity (µS/cm)	19.10
Temperature (°C)	18.10
Volume Leachant (Litres)	0.889



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Trelewis School
Mass Sample taken (kg)	0.103	Natural Moisture Content (%)	14.9
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	87
Particle Size <4mm	>95%		

Case

SDG	190904-93
Lab Sample Number(s)	20647636
Sampled Date	19-Aug-2019
Customer Sample Ref.	RC06 ES1
Depth (m)	0.60

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Nitrite as NO ₂	<0.05	<0.05	<0.5	<0.5	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Dissolved Organic Carbon	3.17	<3	31.7	<30	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Naphthalene (diss.filt)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Ammonia as NH ₃	<0.2	<0.2	<2	<2	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Acenaphthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Total Ammonium as NH ₄	<0.3	<0.3	<3	<3	-	-	-
Acenaphthylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Barium	0.0351	<0.0002	0.351	<0.002	-	-	-
Nitrate as NO ₃	1.51	<0.3	15.1	<3	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Fluoranthene (diss.filt)	0.00000658	<0.000005	0.0000658	<0.00005	-	-	-
Anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Boron	0.0535	<0.01	0.535	<0.1	-	-	-
Phenanthrene (diss.filt)	0.00000708	<0.000005	0.0000708	<0.00005	-	-	-
Total Alkalinity Filtered as CaCO ₃	14	<2	140	<20	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Fluorene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-

Leach Test Information

Date Prepared	06-Sep-2019
pH (pH Units)	7.43
Conductivity (µS/cm)	30.50
Temperature (°C)	18.00
Volume Leachant (Litres)	0.887



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Trelewis School
Mass Sample taken (kg)	0.103	Natural Moisture Content (%)	14.9
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	87
Particle Size <4mm	>95%		

Case

SDG	190904-93
Lab Sample Number(s)	20647636
Sampled Date	19-Aug-2019
Customer Sample Ref.	RC06 ES1
Depth (m)	0.60

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Pyrene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Benzo(b)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene (diss.filt)	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Copper	0.0022	<0.0003	0.022	<0.003	-	-	-
Dibenzo(a,h)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Benzo(g,h,i)perylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(1,2,3-cd)pyrene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
PAH 16 EPA Total by GCMS (diss.filt)	<0.000082	<0.000082	<0.00082	<0.00082	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.019	<0.001	0.19	<0.01	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-

Leach Test Information

Date Prepared	06-Sep-2019
pH (pH Units)	7.43
Conductivity (µS/cm)	30.50
Temperature (°C)	18.00
Volume Leachant (Litres)	0.887



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Trelewis School
Mass Sample taken (kg)	0.107	Natural Moisture Content (%)	19
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	84
Particle Size <4mm	>95%		

Case

SDG	190904-93
Lab Sample Number(s)	20647645
Sampled Date	19-Aug-2019
Customer Sample Ref.	RC07 ES1
Depth (m)	0.40

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Nitrite as NO ₂	0.166	<0.05	1.66	<0.5	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Dissolved Organic Carbon	4.67	<3	46.7	<30	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Naphthalene (diss.filt)	0.000015	<0.00001	0.00015	<0.0001	-	-	-
Total Ammonia as NH ₃	0.606	<0.2	6.06	<2	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Acenaphthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Total Ammonium as NH ₄	0.642	<0.3	6.42	<3	-	-	-
Acenaphthylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Barium	0.0672	<0.0002	0.672	<0.002	-	-	-
Nitrate as NO ₃	3.3	<0.3	33	<3	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Fluoranthene (diss.filt)	0.0000886	<0.000005	0.000886	<0.00005	-	-	-
Anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Boron	0.0542	<0.01	0.542	<0.1	-	-	-
Phenanthrene (diss.filt)	0.0000227	<0.000005	0.000227	<0.00005	-	-	-
Total Alkalinity Filtered as CaCO ₃	13	<2	130	<20	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Fluorene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene (diss.filt)	0.00000681	<0.000005	0.0000681	<0.00005	-	-	-

Leach Test Information

Date Prepared	06-Sep-2019
pH (pH Units)	7.05
Conductivity (µS/cm)	35.70
Temperature (°C)	18.40
Volume Leachant (Litres)	0.883



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Trelewis School
Mass Sample taken (kg)	0.107	Natural Moisture Content (%)	19
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	84
Particle Size <4mm	>95%		

Case

SDG	190904-93
Lab Sample Number(s)	20647645
Sampled Date	19-Aug-2019
Customer Sample Ref.	RC07 ES1
Depth (m)	0.40

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Pyrene (diss.filt)	0.0000638	<0.000005	0.000638	<0.00005	-	-	-
Benzo(a)anthracene (diss.filt)	0.0000123	<0.000005	0.000123	<0.00005	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Benzo(b)fluoranthene (diss.filt)	0.00000579	<0.000005	0.0000579	<0.00005	-	-	-
Benzo(k)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene (diss.filt)	0.00000269	<0.000002	0.0000269	<0.00002	-	-	-
Copper	0.00258	<0.0003	0.0258	<0.003	-	-	-
Dibenzo(a,h)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Lead	0.000207	<0.0002	0.00207	<0.002	-	-	-
Benzo(g,h,i)perylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(1,2,3-cd)pyrene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
PAH 16 EPA Total by GCMS (diss.filt)	0.000218	<0.000082	0.00218	<0.00082	-	-	-
Nickel	0.000434	<0.0004	0.00434	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.0296	<0.001	0.296	<0.01	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-

Leach Test Information

Date Prepared	06-Sep-2019
pH (pH Units)	7.05
Conductivity (µS/cm)	35.70
Temperature (°C)	18.40
Volume Leachant (Litres)	0.883



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Trelewis School
Mass Sample taken (kg)	0.105	Natural Moisture Content (%)	16.3
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	86
Particle Size <4mm	>95%		

Case

SDG	190904-93
Lab Sample Number(s)	20647655
Sampled Date	20-Aug-2019
Customer Sample Ref.	RC08 ES1
Depth (m)	0.40

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Nitrite as NO ₂	<0.05	<0.05	<0.5	<0.5	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Dissolved Organic Carbon	3.73	<3	37.3	<30	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Naphthalene (diss.filt)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Ammonia as NH ₃	<0.2	<0.2	<2	<2	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Acenaphthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Total Ammonium as NH ₄	<0.3	<0.3	<3	<3	-	-	-
Acenaphthylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Barium	0.0414	<0.0002	0.414	<0.002	-	-	-
Nitrate as NO ₃	4.66	<0.3	46.6	<3	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Fluoranthene (diss.filt)	0.0000102	<0.000005	0.000102	<0.00005	-	-	-
Anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Boron	0.0445	<0.01	0.445	<0.1	-	-	-
Phenanthrene (diss.filt)	0.0000121	<0.000005	0.000121	<0.00005	-	-	-
Total Alkalinity Filtered as CaCO ₃	22.5	<2	225	<20	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Fluorene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-

Leach Test Information

Date Prepared	06-Sep-2019
pH (pH Units)	7.15
Conductivity (µS/cm)	53.80
Temperature (°C)	17.90
Volume Leachant (Litres)	0.885



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Trelewis School
Mass Sample taken (kg)	0.105	Natural Moisture Content (%)	16.3
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	86
Particle Size <4mm	>95%		

Case

SDG	190904-93
Lab Sample Number(s)	20647655
Sampled Date	20-Aug-2019
Customer Sample Ref.	RC08 ES1
Depth (m)	0.40

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Pyrene (diss.filt)	0.00000658	<0.000005	0.0000658	<0.00005	-	-	-
Benzo(a)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Benzo(b)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene (diss.filt)	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Copper	0.00238	<0.0003	0.0238	<0.003	-	-	-
Dibenzo(a,h)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Benzo(g,h,i)perylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(1,2,3-cd)pyrene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
PAH 16 EPA Total by GCMS (diss.filt)	<0.000082	<0.000082	<0.00082	<0.00082	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.0105	<0.001	0.105	<0.01	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-

Leach Test Information

Date Prepared	06-Sep-2019
pH (pH Units)	7.15
Conductivity (µS/cm)	53.80
Temperature (°C)	17.90
Volume Leachant (Litres)	0.885



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Trelewis School
Mass Sample taken (kg)	0.107	Natural Moisture Content (%)	19
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	84
Particle Size <4mm	>95%		

Case

SDG	190904-93
Lab Sample Number(s)	20647694
Sampled Date	15-Aug-2019
Customer Sample Ref.	RC02 ES1
Depth (m)	1.00

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Nitrite as NO ₂	0.071	<0.05	0.71	<0.5	-	-	-
Sulphate (soluble)	4.1	<2	41	<20	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Dissolved Organic Carbon	5.68	<3	56.8	<30	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Naphthalene (diss.filt)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Ammonia as NH ₃	2.09	<0.2	20.9	<2	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Acenaphthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Arsenic	0.00119	<0.0005	0.0119	<0.005	-	-	-
Total Ammonium as NH ₄	2.21	<0.3	22.1	<3	-	-	-
Acenaphthylene (diss.filt)	0.0000154	<0.000005	0.000154	<0.00005	-	-	-
Barium	0.00778	<0.0002	0.0778	<0.002	-	-	-
Nitrate as NO ₃	2.03	<0.3	20.3	<3	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Fluoranthene (diss.filt)	0.0000371	<0.000005	0.000371	<0.00005	-	-	-
Anthracene (diss.filt)	0.00000506	<0.000005	0.0000506	<0.00005	-	-	-
Boron	<0.01	<0.01	<0.1	<0.1	-	-	-
Phenanthrene (diss.filt)	0.0000244	<0.000005	0.000244	<0.00005	-	-	-
Total Alkalinity Filtered as CaCO ₃	11.5	<2	115	<20	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Fluorene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-

Leach Test Information

Date Prepared	07-Sep-2019
pH (pH Units)	7.36
Conductivity (µS/cm)	34.50
Temperature (°C)	19.50
Volume Leachant (Litres)	0.883



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Trelewis School
Mass Sample taken (kg)	0.107	Natural Moisture Content (%)	19
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	84
Particle Size <4mm	>95%		

Case

SDG	190904-93
Lab Sample Number(s)	20647694
Sampled Date	15-Aug-2019
Customer Sample Ref.	RC02 ES1
Depth (m)	1.00

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Pyrene (diss.filt)	0.000027	<0.000005	0.00027	<0.00005	-	-	-
Benzo(a)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Benzo(b)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene (diss.filt)	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Copper	0.00259	<0.0003	0.0259	<0.003	-	-	-
Dibenzo(a,h)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Lead	0.000863	<0.0002	0.00863	<0.002	-	-	-
Benzo(g,h,i)perylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(1,2,3-cd)pyrene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
PAH 16 EPA Total by GCMS (diss.filt)	0.000109	<0.000082	0.00109	<0.00082	-	-	-
Nickel	0.000664	<0.0004	0.00664	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.00673	<0.001	0.0673	<0.01	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-

Leach Test Information

Date Prepared	07-Sep-2019
pH (pH Units)	7.36
Conductivity (µS/cm)	34.50
Temperature (°C)	19.50
Volume Leachant (Litres)	0.883



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.114
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Trelewis School
Natural Moisture Content (%)	26.6
Dry Matter Content (%)	79

Case

SDG	190904-93
Lab Sample Number(s)	20647703
Sampled Date	16-Aug-2019
Customer Sample Ref.	RC03 ES1
Depth (m)	0.40

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Nitrite as NO ₂	0.103	<0.05	1.03	<0.5	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Dissolved Organic Carbon	5.53	<3	55.3	<30	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Naphthalene (diss.filt)	0.0000104	<0.00001	0.000104	<0.0001	-	-	-
Total Ammonia as NH ₃	<0.2	<0.2	<2	<2	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Acenaphthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Total Ammonium as NH ₄	<0.3	<0.3	<3	<3	-	-	-
Acenaphthylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Barium	0.0665	<0.0002	0.665	<0.002	-	-	-
Nitrate as NO ₃	7.81	<0.3	78.1	<3	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Fluoranthene (diss.filt)	0.0000202	<0.000005	0.000202	<0.00005	-	-	-
Anthracene (diss.filt)	0.00000739	<0.000005	0.0000739	<0.00005	-	-	-
Boron	0.0494	<0.01	0.494	<0.1	-	-	-
Phenanthrene (diss.filt)	0.000031	<0.000005	0.00031	<0.00005	-	-	-
Total Alkalinity Filtered as CaCO ₃	49	<2	490	<20	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Fluorene (diss.filt)	0.0000173	<0.000005	0.000173	<0.00005	-	-	-
Chrysene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-

Leach Test Information

Date Prepared	06-Sep-2019
pH (pH Units)	8.26
Conductivity (µS/cm)	104.00
Temperature (°C)	17.70
Volume Leachant (Litres)	0.876



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg) 0.114

Mass of dry sample (kg) 0.090

Particle Size <4mm >95%

Site Location

Trelewis School

Natural Moisture Content (%) 26.6

Dry Matter Content (%) 79

Case

SDG 190904-93

Lab Sample Number(s) 20647703

Sampled Date 16-Aug-2019

Customer Sample Ref. RC03 ES1

Depth (m) 0.40

Eluate Analysis

	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Pyrene (diss.filt)	0.0000138	<0.000005	0.000138	<0.000005	-	-	-
Benzo(a)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Benzo(b)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene (diss.filt)	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Copper	0.00411	<0.0003	0.0411	<0.003	-	-	-
Dibenzo(a,h)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Lead	0.00034	<0.0002	0.0034	<0.002	-	-	-
Benzo(g,h,i)perylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(1,2,3-cd)pyrene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Molybdenum	0.00739	<0.003	0.0739	<0.03	-	-	-
PAH 16 EPA Total by GCMS (diss.filt)	0.0001	<0.000082	0.001	<0.00082	-	-	-
Nickel	0.000524	<0.0004	0.00524	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.0204	<0.001	0.204	<0.01	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-

Leach Test Information

Date Prepared	06-Sep-2019
pH (pH Units)	8.26
Conductivity (µS/cm)	104.00
Temperature (°C)	17.70
Volume Leachant (Litres)	0.876



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Trelewis School
Mass Sample taken (kg)	0.106	Natural Moisture Content (%)	17.6
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	85
Particle Size <4mm	>95%		

Case

SDG	190904-93
Lab Sample Number(s)	20647729
Sampled Date	16-Aug-2019
Customer Sample Ref.	RC04 ES1
Depth (m)	1.00

Eluate Analysis

	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Nitrite as NO ₂	<0.05	<0.05	<0.5	<0.5	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Dissolved Organic Carbon	8.79	<3	87.9	<30	-	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Naphthalene (diss.filt)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Ammonia as NH ₃	1.3	<0.2	13	<2	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Acenaphthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Arsenic	0.00149	<0.0005	0.0149	<0.005	-	-	-
Total Ammonium as NH ₄	1.38	<0.3	13.8	<3	-	-	-
Acenaphthylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Barium	0.00528	<0.0002	0.0528	<0.002	-	-	-
Nitrate as NO ₃	1.15	<0.3	11.5	<3	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Fluoranthene (diss.filt)	0.0000101	<0.000005	0.000101	<0.00005	-	-	-
Anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Boron	<0.01	<0.01	<0.1	<0.1	-	-	-
Phenanthrene (diss.filt)	0.00000981	<0.000005	0.0000981	<0.00005	-	-	-
Total Alkalinity Filtered as CaCO ₃	10	<2	100	<20	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Fluorene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-

Leach Test Information

Date Prepared	06-Sep-2019
pH (pH Units)	7.43
Conductivity (µS/cm)	21.50
Temperature (°C)	18.50
Volume Leachant (Litres)	0.884



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Trelewis School
Mass Sample taken (kg)	0.106	Natural Moisture Content (%)	17.6
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	85
Particle Size <4mm	>95%		

Case

SDG	190904-93
Lab Sample Number(s)	20647729
Sampled Date	16-Aug-2019
Customer Sample Ref.	RC04 ES1
Depth (m)	1.00

Eluate Analysis

	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Pyrene (diss.filt)	0.00000785	<0.000005	0.0000785	<0.00005	-	-	-
Benzo(a)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chromium	0.00102	<0.001	0.0102	<0.01	-	-	-
Benzo(b)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene (diss.filt)	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Copper	0.00439	<0.0003	0.0439	<0.003	-	-	-
Dibenzo(a,h)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Lead	0.00107	<0.0002	0.0107	<0.002	-	-	-
Benzo(g,h,i)perylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(1,2,3-cd)pyrene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
PAH 16 EPA Total by GCMS (diss.filt)	<0.000082	<0.000082	<0.00082	<0.00082	-	-	-
Nickel	0.000962	<0.0004	0.00962	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.00464	<0.001	0.0464	<0.01	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-

Leach Test Information

Date Prepared	06-Sep-2019
pH (pH Units)	7.43
Conductivity (µS/cm)	21.50
Temperature (°C)	18.50
Volume Leachant (Litres)	0.884



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990:BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM243		Mixed Anions In Soils By Kone
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM304	HSE Contract research Report no 83/1996	Asbestos Quantification in Soil: Fibres identified by morphology only

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

Test Completion Dates

Lab Sample No(s)
Customer Sample Ref.

AGS Ref.
Depth
Type

	20647672	20647683	20647687	20647694	20647703	20647719	20647729	20647617	20647624	20647636
	RC01	RC01	RC02	RC02	RC03	RC04	RC04	RC05	RC06	RC06
	ES1	ES1	ES1	ES1	ES1	ES1	ES1	ES1	ES1	ES1
	0.50	1.10	0.40	1.00	0.40	0.50	1.00	0.00 - 0.00	0.40	0.60
	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Alkalinity Filtered as CaCO ₃				12-Sep-2019	11-Sep-2019		11-Sep-2019	11-Sep-2019		11-Sep-2019
Ammoniacal Nitrogen				10-Sep-2019	10-Sep-2019		10-Sep-2019	10-Sep-2019		10-Sep-2019
Anions by Kone (soil)	09-Sep-2019	11-Sep-2019	09-Sep-2019	11-Sep-2019	09-Sep-2019	09-Sep-2019	09-Sep-2019	09-Sep-2019	11-Sep-2019	09-Sep-2019
Anions by Kone (w)				11-Sep-2019	11-Sep-2019		11-Sep-2019	11-Sep-2019		11-Sep-2019
Asbestos ID in Solid Samples	09-Sep-2019	09-Sep-2019	09-Sep-2019	10-Sep-2019	10-Sep-2019	09-Sep-2019	10-Sep-2019	10-Sep-2019	10-Sep-2019	09-Sep-2019
Asbestos Quantification - Full										20-Sep-2019
Boron Water Soluble	10-Sep-2019	09-Sep-2019	10-Sep-2019	10-Sep-2019	09-Sep-2019	10-Sep-2019	10-Sep-2019	10-Sep-2019	10-Sep-2019	09-Sep-2019
CEN 10:1 Leachate (1 Stage)				07-Sep-2019	06-Sep-2019		06-Sep-2019	06-Sep-2019		06-Sep-2019
CEN Readings				09-Sep-2019	08-Sep-2019		08-Sep-2019	08-Sep-2019		08-Sep-2019
Chromium III	10-Sep-2019	09-Sep-2019	09-Sep-2019	11-Sep-2019	10-Sep-2019	10-Sep-2019	10-Sep-2019	10-Sep-2019	11-Sep-2019	10-Sep-2019
Cyanide Comp/Free/Total/Thiocyanate	10-Sep-2019	10-Sep-2019	09-Sep-2019	11-Sep-2019	11-Sep-2019	09-Sep-2019	11-Sep-2019	11-Sep-2019	10-Sep-2019	11-Sep-2019
Dissolved Metals by ICP-MS				11-Sep-2019	11-Sep-2019		11-Sep-2019	11-Sep-2019		11-Sep-2019
Dissolved Organic/Inorganic Carbon				10-Sep-2019	09-Sep-2019		10-Sep-2019	09-Sep-2019		09-Sep-2019
EPH CWG (Aliphatic) Filtered GC (W)				11-Sep-2019	10-Sep-2019		10-Sep-2019	10-Sep-2019		10-Sep-2019
EPH CWG (Aliphatic) GC (S)	10-Sep-2019	11-Sep-2019	11-Sep-2019	11-Sep-2019	10-Sep-2019	11-Sep-2019	10-Sep-2019	11-Sep-2019	11-Sep-2019	10-Sep-2019
EPH CWG (Aromatic) Filtered GC (W)				11-Sep-2019	10-Sep-2019		10-Sep-2019	10-Sep-2019		10-Sep-2019
EPH CWG (Aromatic) GC (S)	10-Sep-2019	11-Sep-2019	11-Sep-2019	11-Sep-2019	10-Sep-2019	11-Sep-2019	10-Sep-2019	11-Sep-2019	11-Sep-2019	10-Sep-2019
GRO by GC-FID (S)	09-Sep-2019	09-Sep-2019	09-Sep-2019	09-Sep-2019	09-Sep-2019	09-Sep-2019	09-Sep-2019	09-Sep-2019	09-Sep-2019	09-Sep-2019
GRO by GC-FID (W)				10-Sep-2019	10-Sep-2019		10-Sep-2019	10-Sep-2019		10-Sep-2019
Hexavalent Chromium (s)	09-Sep-2019	09-Sep-2019	09-Sep-2019	10-Sep-2019	09-Sep-2019	09-Sep-2019	09-Sep-2019	09-Sep-2019	10-Sep-2019	09-Sep-2019
Mercury Dissolved				10-Sep-2019	10-Sep-2019		10-Sep-2019	10-Sep-2019		10-Sep-2019
Metals in solid samples by OES	10-Sep-2019	09-Sep-2019	09-Sep-2019	11-Sep-2019	10-Sep-2019	10-Sep-2019	10-Sep-2019	10-Sep-2019	11-Sep-2019	10-Sep-2019
Nitrite by Kone (w)				09-Sep-2019	09-Sep-2019		09-Sep-2019	09-Sep-2019		09-Sep-2019
PAH by GCMS	09-Sep-2019	09-Sep-2019	11-Sep-2019	11-Sep-2019	09-Sep-2019	12-Sep-2019	11-Sep-2019	12-Sep-2019	09-Sep-2019	11-Sep-2019
PAH in waters by GC-MS (diss.filt)				11-Sep-2019	11-Sep-2019		11-Sep-2019	11-Sep-2019		11-Sep-2019
pH	11-Sep-2019	11-Sep-2019	11-Sep-2019	11-Sep-2019	11-Sep-2019	11-Sep-2019	11-Sep-2019	11-Sep-2019	11-Sep-2019	11-Sep-2019
pH Value of Filtered Water				11-Sep-2019	11-Sep-2019		11-Sep-2019	10-Sep-2019		11-Sep-2019
Phenols by HPLC (S)	11-Sep-2019	11-Sep-2019	10-Sep-2019	11-Sep-2019	11-Sep-2019	10-Sep-2019	11-Sep-2019	10-Sep-2019	11-Sep-2019	10-Sep-2019
Phenols by HPLC (W)				11-Sep-2019	10-Sep-2019		10-Sep-2019	11-Sep-2019		10-Sep-2019
Sample description	05-Sep-2019	05-Sep-2019	05-Sep-2019	06-Sep-2019	05-Sep-2019	05-Sep-2019	05-Sep-2019	05-Sep-2019	06-Sep-2019	05-Sep-2019
Total Organic Carbon	11-Sep-2019	10-Sep-2019	11-Sep-2019	11-Sep-2019	10-Sep-2019	10-Sep-2019	11-Sep-2019	10-Sep-2019	11-Sep-2019	10-Sep-2019
TPH CWG Filtered (W)				11-Sep-2019	10-Sep-2019		10-Sep-2019	10-Sep-2019		10-Sep-2019
TPH CWG GC (S)	10-Sep-2019	11-Sep-2019	11-Sep-2019	11-Sep-2019	10-Sep-2019	11-Sep-2019	10-Sep-2019	11-Sep-2019	11-Sep-2019	10-Sep-2019
VOC MS (S)	09-Sep-2019	09-Sep-2019	09-Sep-2019	09-Sep-2019	10-Sep-2019	06-Sep-2019	09-Sep-2019	09-Sep-2019	09-Sep-2019	09-Sep-2019



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

Lab Sample No(s)
Customer Sample Ref.

AGS Ref.
Depth
Type

	20647645	20647655	20647606	20647664
	RC07	RC08	TP01	TP01
	ES1	ES1	ES1	ES1
	0.40	0.40	0.50	1.20
	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Alkalinity Filtered as CaCO ₃	11-Sep-2019	11-Sep-2019	12-Sep-2019	
Ammoniacal Nitrogen	10-Sep-2019	10-Sep-2019	09-Sep-2019	
Anions by Kone (soil)	09-Sep-2019	09-Sep-2019	09-Sep-2019	09-Sep-2019
Anions by Kone (w)	11-Sep-2019	11-Sep-2019	11-Sep-2019	
Asbestos ID in Solid Samples	10-Sep-2019	10-Sep-2019	09-Sep-2019	09-Sep-2019
Boron Water Soluble	09-Sep-2019	10-Sep-2019	10-Sep-2019	09-Sep-2019
CEN 10:1 Leachate (1 Stage)	06-Sep-2019	06-Sep-2019	06-Sep-2019	
CEN Readings	08-Sep-2019	08-Sep-2019	08-Sep-2019	
Chromium III	10-Sep-2019	10-Sep-2019	10-Sep-2019	10-Sep-2019
Cyanide Comp/Free/Total/Thiocyanate	11-Sep-2019	11-Sep-2019	11-Sep-2019	11-Sep-2019
Dissolved Metals by ICP-MS	11-Sep-2019	11-Sep-2019	11-Sep-2019	
Dissolved Organic/Inorganic Carbon	10-Sep-2019	09-Sep-2019	10-Sep-2019	
EPH CWG (Aliphatic) Filtered GC (W)	10-Sep-2019	10-Sep-2019	10-Sep-2019	
EPH CWG (Aliphatic) GC (S)	10-Sep-2019	11-Sep-2019	10-Sep-2019	10-Sep-2019
EPH CWG (Aromatic) Filtered GC (W)	10-Sep-2019	10-Sep-2019	10-Sep-2019	
EPH CWG (Aromatic) GC (S)	10-Sep-2019	11-Sep-2019	10-Sep-2019	10-Sep-2019
GRO by GC-FID (S)	09-Sep-2019	09-Sep-2019	09-Sep-2019	09-Sep-2019
GRO by GC-FID (W)	10-Sep-2019	10-Sep-2019	10-Sep-2019	
Hexavalent Chromium (s)	09-Sep-2019	09-Sep-2019	09-Sep-2019	09-Sep-2019
Mercury Dissolved	10-Sep-2019	10-Sep-2019	10-Sep-2019	
Metals in solid samples by OES	10-Sep-2019	10-Sep-2019	10-Sep-2019	10-Sep-2019
Nitrite by Kone (w)	09-Sep-2019	09-Sep-2019	09-Sep-2019	
PAH by GCMS	11-Sep-2019	11-Sep-2019	11-Sep-2019	09-Sep-2019
PAH in waters by GC-MS (diss.filt)	11-Sep-2019	11-Sep-2019	11-Sep-2019	
pH	11-Sep-2019	11-Sep-2019	11-Sep-2019	11-Sep-2019
pH Value of Filtered Water	11-Sep-2019	11-Sep-2019	11-Sep-2019	
Phenols by HPLC (S)	10-Sep-2019	10-Sep-2019	10-Sep-2019	10-Sep-2019
Phenols by HPLC (W)	10-Sep-2019	10-Sep-2019	11-Sep-2019	
Sample description	05-Sep-2019	05-Sep-2019	05-Sep-2019	05-Sep-2019
Total Organic Carbon	10-Sep-2019	10-Sep-2019	10-Sep-2019	10-Sep-2019
TPH CWG Filtered (W)	10-Sep-2019	10-Sep-2019	10-Sep-2019	
TPH CWG GC (S)	10-Sep-2019	11-Sep-2019	10-Sep-2019	10-Sep-2019
VOC MS (S)	09-Sep-2019	10-Sep-2019	09-Sep-2019	06-Sep-2019



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

ASSOCIATED AQC DATA

Alkalinity Filtered as CaCO₃

Component	Method Code	QC 2053	QC 2047
Total Alkalinity Filtered as CaCO ₃	TM043	107.5 100.35 : 114.15	107.5 100.35 : 114.15

Ammoniacal Nitrogen

Component	Method Code	QC 2094	QC 2045	QC 2069
Ammoniacal Nitrogen as N	TM099	99.2 93.14 : 108.60	101.6 93.14 : 108.60	101.2 93.14 : 108.60

Anions by Kone (soil)

Component	Method Code	QC 2023	QC 2089	QC 2097
Chloride (soluble)	TM243		102.59 74.32 : 123.04	93.78 74.32 : 123.04
Water Soluble Sulphate as SO ₄ 2:1 Extract	TM243	98.6 75.60 : 131.10	92.99 88.92 : 111.08	87.38 88.92 : 111.08

Anions by Kone (w)

Component	Method Code	QC 2078	QC 2031	QC 2080
Chloride	TM184	105.0 92.93 : 115.43	106.0 92.93 : 115.43	108.0 92.93 : 115.43
Sulphate (soluble)	TM184	102.4 90.53 : 113.03	104.0 90.53 : 113.03	104.4 90.53 : 113.03
TON as NO ₃	TM184	106.0 96.26 : 111.21	105.5 96.26 : 111.21	107.0 96.26 : 111.21

Boron Water Soluble

Component	Method Code	QC 2038	QC 2013	QC 2032
Water Soluble Boron	TM222	100.5 86.05 : 109.75	102.5 86.05 : 109.75	103.5 86.05 : 109.75

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2050	QC 2091	QC 2099	QC 2054	QC 2073
Free Cyanide	TM153	90.1 87.89 : 117.58	95.2 87.89 : 117.58	91.6 87.89 : 117.58		
Free Cyanide (W)	TM227				101.25 93.25 : 112.75	102.5 93.25 : 112.75
Thiocyanate	TM153	91.62 89.81 : 110.19	91.02 89.81 : 110.19	91.62 89.81 : 110.19		



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

Cyanide Comp/Free/Total/Thiocyanate

		QC 2050	QC 2091	QC 2099	QC 2054	QC 2073
Thiocyanate (W)	TM227				106.5 96.25 : 111.25	106.0 96.25 : 111.25
Total Cyanide	TM153	97.86 90.21 : 112.50	101.43 90.21 : 112.50	101.43 90.21 : 112.50		
Total Cyanide (W)	TM227				104.75 92.25 : 111.75	104.75 92.25 : 111.75

Dissolved Metals by ICP-MS

Component	Method Code	QC 2031	QC 2042
Aluminium	TM152	102.67 94.19 : 114.31	107.67 94.19 : 114.31
Antimony	TM152	105.0 79.80 : 122.00	108.33 79.80 : 122.00
Arsenic	TM152	104.33 90.42 : 111.32	107.5 90.42 : 111.32
Barium	TM152	102.83 90.79 : 113.16	106.83 90.79 : 113.16
Beryllium	TM152	103.83 93.25 : 120.04	109.67 93.25 : 120.04
Bismuth	TM152	103.17 94.65 : 117.05	108.83 94.65 : 117.05
Borate	TM152	103.09 88.00 : 112.00	109.26 88.00 : 112.00
Boron	TM152	103.33 86.68 : 117.67	109.33 86.68 : 117.67
Cadmium	TM152	100.5 94.60 : 112.40	108.17 94.60 : 112.40
Calcium	TM152	102.67 83.40 : 121.11	104.0 83.40 : 121.11
Chromium	TM152	100.33 93.28 : 110.91	104.0 93.28 : 110.91
Cobalt	TM152	103.67 84.39 : 114.26	107.83 84.39 : 114.26
Copper	TM152	105.17 88.86 : 118.72	108.83 88.86 : 118.72
Iron	TM152	104.0 92.00 : 113.00	108.0 92.00 : 113.00
Lead	TM152	101.33 89.25 : 115.12	106.33 89.25 : 115.12
Lithium	TM152	100.33 89.26 : 119.04	106.33 89.26 : 119.04
Magnesium	TM152	100.67 86.35 : 113.36	104.0 86.35 : 113.36
Manganese	TM152	105.17 94.24 : 112.74	107.67 94.24 : 112.74
Molybdenum	TM152	94.17 87.00 : 108.89	97.83 87.00 : 108.89
Nickel	TM152	103.17 92.11 : 110.56	106.17 92.11 : 110.56
Phosphorus	TM152	102.67 90.52 : 115.47	106.0 90.52 : 115.47
Potassium	TM152	101.33 96.74 : 108.58	103.33 96.74 : 108.58



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

Dissolved Metals by ICP-MS

		QC 2031	QC 2042
Selenium	TM152	106.0 88.44 : 113.86	107.67 88.44 : 113.86
Silver	TM152	106.83 94.40 : 114.74	109.83 94.40 : 114.74
Sodium	TM152	100.0 94.80 : 110.03	104.67 94.80 : 110.03
Strontium	TM152	105.0 90.72 : 114.82	107.0 90.72 : 114.82
Tellurium	TM152	102.0 90.72 : 112.62	104.67 90.72 : 112.62
Thallium	TM152	99.0 86.08 : 122.48	104.5 86.08 : 122.48
Tin	TM152	102.0 91.00 : 109.00	105.83 91.00 : 109.00
Titanium	TM152	96.0 89.75 : 103.65	101.33 89.75 : 103.65
Tungsten	TM152	99.33 78.12 : 132.82	103.67 78.12 : 132.82
Uranium	TM152	100.17 90.58 : 113.28	104.33 90.58 : 113.28
Vanadium	TM152	104.0 88.43 : 114.30	107.33 88.43 : 114.30
Zinc	TM152	106.33 86.52 : 115.27	108.33 86.52 : 115.27

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2097	QC 2021	QC 2090
Dissolved Inorganic Carbon	TM090	99.0 91.27 : 109.87	103.17 93.58 : 112.28	105.67 93.58 : 112.28
Dissolved Organic Carbon	TM090	104.67 97.87 : 108.77	103.83 96.28 : 110.58	104.67 96.28 : 110.58

EPH CWG (Aliphatic) GC (S)

Component	Method Code	QC 2059	QC 2040	QC 2080	QC 2073	QC 2074	QC 2074
Total Aliphatics >C12-C35	TM173	81.88 66.17 : 105.28	79.58 70.76 : 104.69	85.42 70.61 : 106.16	78.96 70.76 : 104.69	92.71 70.71 : 106.26	81.25 70.61 : 106.16

EPH CWG (Aromatic) Filtered GC (W)

Component	Method Code	QC 2014	QC 2028
Total Aromatics >EC10-EC40	TM174	82.2 73.75 : 120.32	85.37 73.75 : 120.32

EPH CWG (Aromatic) GC (S)



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

EPH CWG (Aromatic) GC (S)

Component	Method Code	QC 2059	QC 2040	QC 2080	QC 2073	QC 2074	QC 2074
Total Aromatics >EC12-EC35	TM173	84.67 65.78 : 102.90	86.67 68.16 : 102.29	83.33 67.75 : 104.04	85.33 68.16 : 102.29	87.33 65.82 : 105.00	87.33 67.75 : 104.04

GRO by GC-FID (S)

Component	Method Code	QC 2021	QC 2068
QC	TM089	102.82 74.55 : 125.46	97.41 74.55 : 125.46

GRO by GC-FID (W)

Component	Method Code	QC 2091	QC 2002	QC 2042	QC 2030
Benzene by GC	TM245	103.0 81.54 : 119.70	111.5 81.54 : 119.70	108.5 83.48 : 117.21	107.0 83.48 : 117.21
Ethylbenzene by GC	TM245	103.5 80.99 : 121.09	114.0 80.99 : 121.09	106.5 84.11 : 114.89	105.0 84.11 : 114.89
m & p Xylene by GC	TM245	103.0 82.77 : 123.19	113.25 82.77 : 123.19	105.5 83.73 : 116.33	103.75 83.73 : 116.33
MTBE GC-FID	TM245	102.0 80.06 : 123.27	108.0 80.06 : 123.27	110.5 84.42 : 117.50	108.5 84.42 : 117.50
o Xylene by GC	TM245	103.0 84.26 : 121.50	112.0 84.26 : 121.50	106.5 85.03 : 117.59	104.5 85.03 : 117.59
QC	TM245	108.81 76.13 : 145.89	104.66 76.13 : 145.89	100.86 60.71 : 137.65	97.98 60.71 : 137.65
Toluene by GC	TM245	102.5 82.78 : 121.99	111.5 82.78 : 121.99	106.0 84.73 : 116.85	104.5 84.73 : 116.85

Hexavalent Chromium (s)

Component	Method Code	QC 2046	QC 2073	QC 2091
Hexavalent Chromium	TM151	94.0 90.20 : 107.00	96.0 90.20 : 107.00	96.0 90.20 : 107.00

Mercury Dissolved

Component	Method Code	QC 2073	QC 2026	QC 2046	QC 2008
Mercury Dissolved (CVAf)	TM183	96.0 75.00 : 111.00	95.8 75.00 : 111.00	101.0 76.80 : 117.12	95.3 74.00 : 116.00

Metals in solid samples by OES



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

Metals in solid samples by OES

Component	Method Code	QC 2055	QC 2034	QC 2057	QC 2059
Aluminium	TM181	83.54 77.84 : 119.01	92.04 77.84 : 119.01	87.26 77.84 : 119.01	88.14 77.84 : 119.01
Antimony	TM181	91.06 84.28 : 107.67	96.34 84.28 : 107.67	91.46 84.28 : 107.67	93.9 84.28 : 107.67
Arsenic	TM181	92.15 87.05 : 109.36	98.26 87.05 : 109.36	93.6 87.05 : 109.36	92.73 87.05 : 109.36
Barium	TM181	84.5 82.49 : 109.34	93.58 82.49 : 109.34	87.8 82.49 : 109.34	88.07 82.49 : 109.34
Beryllium	TM181	92.54 85.44 : 109.61	99.25 85.44 : 109.61	91.79 85.44 : 109.61	92.91 85.44 : 109.61
Boron	TM181	77.94 73.51 : 104.66	85.1 73.51 : 104.66	81.38 73.51 : 104.66	80.23 73.51 : 104.66
Cadmium	TM181	84.77 81.46 : 106.43	91.77 81.46 : 106.43	90.95 81.46 : 106.43	90.53 81.46 : 106.43
Chromium	TM181	86.41 82.26 : 104.55	92.7 82.26 : 104.55	86.21 82.26 : 104.55	89.25 82.26 : 104.55
Cobalt	TM181	84.28 80.74 : 99.26	88.68 80.74 : 99.26	84.59 80.74 : 99.26	84.28 80.74 : 99.26
Copper	TM181	85.56 82.40 : 105.45	94.01 82.40 : 105.45	87.15 82.40 : 105.45	88.73 82.40 : 105.45
Iron	TM181	88.89 82.95 : 110.58	93.65 82.95 : 110.58	89.68 82.95 : 110.58	89.68 82.95 : 110.58
Lead	TM181	84.68 78.24 : 104.05	90.09 78.24 : 104.05	84.68 78.24 : 104.05	84.46 78.24 : 104.05
Manganese	TM181	103.61 94.29 : 119.51	107.78 94.29 : 119.51	101.39 94.29 : 119.51	103.61 94.29 : 119.51
Mercury	TM181	86.47 83.74 : 105.34	90.58 83.74 : 105.34	88.41 83.74 : 105.34	89.13 83.74 : 105.34
Molybdenum	TM181	89.3 87.11 : 106.87	99.59 87.11 : 106.87	92.59 87.11 : 106.87	94.65 87.11 : 106.87
Nickel	TM181	82.89 81.92 : 102.18	91.93 81.92 : 102.18	86.31 81.92 : 102.18	87.78 81.92 : 102.18
Phosphorus	TM181	108.28 94.56 : 124.28	104.44 94.56 : 124.28	100.61 94.56 : 124.28	100.2 94.56 : 124.28
Selenium	TM181	90.59 86.28 : 110.48	99.61 86.28 : 110.48	92.94 86.28 : 110.48	93.73 86.28 : 110.48
Strontium	TM181	81.29 79.13 : 102.79	90.2 79.13 : 102.79	84.63 79.13 : 102.79	86.19 79.13 : 102.79
Thallium	TM181	91.15 82.94 : 111.86	59.29 82.94 : 111.86	92.48 82.94 : 111.86	92.48 82.94 : 111.86
Tin	TM181	92.02 90.25 : 108.86	97.72 90.25 : 108.86	95.44 90.25 : 108.86	93.16 90.25 : 108.86
Titanium	TM181	78.63 66.23 : 102.06	84.73 66.23 : 102.06	80.15 66.23 : 102.06	86.26 66.23 : 102.06
Vanadium	TM181	89.38 86.37 : 107.94	96.7 86.37 : 107.94	93.04 86.37 : 107.94	92.31 86.37 : 107.94
Zinc	TM181	92.2 84.68 : 113.99	96.1 84.68 : 113.99	92.2 84.68 : 113.99	92.4 84.68 : 113.99

PAH by GCMS



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

PAH by GCMS

Component	Method Code	QC 2024	QC 2072	QC 2036	QC 2077	QC 2056	QC 2086
Acenaphthene	TM218	95.0 76.79 : 103.90	87.0 76.79 : 103.90	94.0 70.00 : 130.00	90.5 76.79 : 103.90	105.5 76.82 : 113.72	90.0 80.97 : 105.99
Acenaphthylene	TM218	95.0 78.40 : 108.66	86.0 78.40 : 108.66	95.0 70.00 : 130.00	91.0 78.40 : 108.66	106.5 75.95 : 108.85	90.0 80.24 : 105.29
Anthracene	TM218	91.0 76.15 : 110.07	80.0 76.15 : 110.07	91.0 70.00 : 130.00	87.0 76.15 : 110.07	102.5 76.67 : 109.58	90.0 73.72 : 109.23
Benz(a)anthracene	TM218	91.5 73.77 : 119.26	80.5 73.77 : 119.26	98.5 68.12 : 118.39	89.0 73.77 : 119.26	93.0 70.05 : 119.30	97.5 79.72 : 116.84
Benzo(a)pyrene	TM218	88.5 73.20 : 114.18	81.5 73.20 : 114.18	93.5 71.72 : 115.31	80.0 73.20 : 114.18	91.5 68.22 : 116.60	93.5 69.58 : 110.26
Benzo(b)fluoranthene	TM218	87.0 75.36 : 117.58	75.5 75.36 : 117.58	98.0 66.89 : 120.40	81.5 75.36 : 117.58	90.0 75.44 : 113.45	97.5 77.35 : 112.97
Benzo(ghi)perylene	TM218	90.5 70.73 : 116.12	81.0 70.73 : 116.12	88.5 67.82 : 118.49	78.0 70.73 : 116.12	85.0 70.79 : 114.76	93.5 77.68 : 107.38
Benzo(k)fluoranthene	TM218	89.0 75.98 : 116.59	83.5 75.98 : 116.59	91.5 73.10 : 117.03	81.5 75.98 : 116.59	95.5 81.43 : 115.17	102.0 82.61 : 111.93
Chrysene	TM218	88.0 74.82 : 114.18	80.0 74.82 : 114.18	91.0 69.58 : 115.47	84.5 74.82 : 114.18	90.0 75.94 : 114.39	99.0 80.28 : 111.42
Dibenzo(ah)anthracene	TM218	85.5 69.17 : 115.30	80.5 69.17 : 115.30	89.5 67.32 : 121.35	80.0 69.17 : 115.30	88.5 71.87 : 118.97	90.5 79.17 : 106.41
Fluoranthene	TM218	92.0 75.88 : 112.84	79.0 75.88 : 112.84	96.5 75.16 : 117.28	87.5 75.88 : 112.84	102.5 77.92 : 113.69	99.0 79.07 : 112.75
Fluorene	TM218	95.5 78.50 : 114.02	86.0 78.50 : 114.02	93.0 70.00 : 130.00	90.5 78.50 : 114.02	106.0 82.02 : 108.34	91.0 80.52 : 110.90
Indeno(123cd)pyrene	TM218	93.5 70.26 : 117.95	79.0 70.26 : 117.95	100.0 68.91 : 117.62	83.0 70.26 : 117.95	76.5 67.80 : 113.60	97.0 76.97 : 113.36
Naphthalene	TM218	93.5 75.24 : 111.26	87.5 75.24 : 111.26	95.0 70.00 : 130.00	88.0 75.24 : 111.26	113.5 88.41 : 116.04	88.5 83.50 : 110.02
Phenanthrene	TM218	92.5 77.07 : 107.43	82.5 77.07 : 107.43	93.5 70.00 : 130.00	88.0 77.07 : 107.43	107.5 78.26 : 113.22	92.5 79.34 : 111.91
Pyrene	TM218	91.0 78.74 : 112.56	79.0 78.74 : 112.56	94.5 75.68 : 119.23	87.5 78.74 : 112.56	101.5 74.86 : 116.81	97.5 74.43 : 114.36

PAH in waters by GC-MS (diss.filt)

Component	Method Code	QC 2022	QC 2047
Acenaphthene (diss.filt)	TM178	109.6 94.00 : 120.40	110.8 94.00 : 120.40
Acenaphthylene (diss.filt)	TM178	104.4 91.20 : 117.60	107.6 91.20 : 117.60
Anthracene (diss.filt)	TM178	101.6 91.20 : 112.80	103.6 91.20 : 112.80
Benzo(a)anthracene (diss.filt)	TM178	96.4 86.80 : 115.60	99.6 86.80 : 115.60
Benzo(a)pyrene (diss.filt)	TM178	103.2 90.40 : 116.80	99.2 90.40 : 116.80
Benzo(b)fluoranthene (diss.filt)	TM178	96.8 86.40 : 117.60	96.4 86.40 : 117.60
Benzo(g,h,i)perylene (diss.filt)	TM178	101.2 87.60 : 121.20	103.6 87.60 : 121.20
Benzo(k)fluoranthene (diss.filt)	TM178	103.6 91.20 : 124.80	106.0 91.20 : 124.80
Chrysene (diss.filt)	TM178	105.2 95.20 : 124.00	108.0 95.20 : 124.00



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

PAH in waters by GC-MS (diss.filt)

		QC 2022	QC 2047
Dibenzo(a,h)anthracene (diss.filt)	TM178	94.4 84.80 : 118.40	99.2 84.80 : 118.40
Fluoranthene (diss.filt)	TM178	108.4 91.20 : 120.00	111.2 91.20 : 120.00
Fluorene (diss.filt)	TM178	109.2 93.20 : 119.60	112.0 93.20 : 119.60
Indeno(1,2,3-cd)pyrene (diss.filt)	TM178	102.0 86.80 : 115.60	100.4 86.80 : 115.60
Naphthalene (diss.filt)	TM178	108.4 90.40 : 126.40	108.8 90.40 : 126.40
Phenanthrene (diss.filt)	TM178	104.4 94.40 : 118.40	110.0 94.40 : 118.40
Pyrene (diss.filt)	TM178	109.2 93.60 : 120.00	110.8 93.60 : 120.00

pH

Component	Method Code	QC 2044	QC 2047	QC 2063	QC 2026
pH	TM133	98.95 98.24 : 100.97	99.19 97.69 : 101.15	99.3 97.57 : 101.94	98.95 97.69 : 101.15

pH Value of Filtered Water

Component	Method Code	QC 2096	QC 2004
pH Value of Filtered Water	TM256	100.4 99.73 : 102.16	100.54 99.73 : 102.16

Phenols by HPLC (S)

Component	Method Code	QC 2094	QC 2070	QC 2079	QC 2049	QC 2063
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	104.55 66.00 : 84.00	103.25 66.00 : 84.00	110.39 83.23 : 109.71	102.6 66.00 : 84.00	101.3 83.23 : 109.71
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	102.92 86.25 : 116.25	104.68 86.25 : 116.25	101.17 76.34 : 104.11	100.0 86.25 : 116.25	86.55 76.34 : 104.11
Catechol by HPLC (S)	TM062 (S)	87.62 19.39 : 135.70	83.81 19.39 : 135.70	75.24 22.43 : 157.02	71.43 19.39 : 135.70	82.86 22.43 : 157.02
Cresols by HPLC (S)	TM062 (S)	108.56 84.53 : 106.34	108.77 84.53 : 106.34	106.05 89.80 : 112.60	105.01 84.53 : 106.34	96.24 89.80 : 112.60
Napthol by HPLC (S)	TM062 (S)	120.71 57.50 : 102.50	123.57 57.50 : 102.50	126.43 75.62 : 124.38	116.43 57.50 : 102.50	124.29 75.62 : 124.38
Phenol by HPLC (S)	TM062 (S)	108.61 95.33 : 123.33	109.93 95.33 : 123.33	101.32 79.53 : 120.47	105.96 95.33 : 123.33	93.38 79.53 : 120.47
Resorcinol HPLC (S)	TM062 (S)	101.26 69.99 : 127.22	103.77 69.99 : 127.22	100.63 71.43 : 129.59	96.86 69.99 : 127.22	95.6 71.43 : 129.59
Xylenols by HPLC (S)	TM062 (S)	103.54 90.22 : 114.22	104.17 90.22 : 114.22	104.17 89.90 : 107.23	100.42 90.22 : 114.22	96.35 89.90 : 107.23

Phenols by HPLC (W)



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

Phenols by HPLC (W)

Component	Method Code	QC 2074	QC 2058
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	100.0 93.10 : 108.70	103.0 93.10 : 108.70
2-Isopropyl Phenol by HPLC (W)	TM259	101.0 90.00 : 114.00	102.0 90.00 : 114.00
Cresols by HPLC (W)	TM259	105.0 90.02 : 130.15	107.33 90.02 : 130.15
Napthol by HPLC (W)	TM259	116.0 94.72 : 118.72	112.0 94.72 : 118.72
Phenol by HPLC (W)	TM259	99.0 85.89 : 109.89	103.0 85.89 : 109.89
Xylenols by HPLC (W)	TM259	103.5 98.67 : 108.67	103.83 98.67 : 108.67

Total Organic Carbon

Component	Method Code	QC 2039	QC 2009	QC 2065	QC 2009
Total Organic Carbon	TM132	80.47 69.88 : 102.67	82.81 69.88 : 102.67	82.42 69.88 : 102.67	82.81 69.88 : 102.67

VOC MS (S)

Component	Method Code	QC 2001	QC 2042	QC 2092	QC 2078	QC 2084
1,1,1,2-tetrachloroethane	TM116	105.6 79.10 : 119.66	107.6 77.47 : 121.29	106.8 77.56 : 115.55	109.6 77.56 : 115.55	92.0 79.10 : 119.66
1,1,1-Trichloroethane	TM116	102.2 87.51 : 115.37	107.6 88.88 : 119.66	105.0 73.73 : 118.05	98.6 73.73 : 118.05	93.2 87.51 : 115.37
1,1,2-Trichloroethane	TM116	94.2 75.16 : 112.70	98.8 75.16 : 112.70	100.2 77.12 : 116.04	102.6 77.12 : 116.04	83.2 75.16 : 112.70
1,1-Dichloroethane	TM116	106.2 89.44 : 121.71	105.2 77.84 : 124.12	112.4 74.46 : 129.15	103.6 74.46 : 129.15	100.0 89.44 : 121.71
1,2-Dichloroethane	TM116	107.6 86.58 : 129.62	115.2 86.58 : 129.62	113.4 92.38 : 131.65	113.0 92.38 : 131.65	96.8 86.58 : 129.62
1,4-Dichlorobenzene	TM116	113.2 84.04 : 124.40	100.0 71.61 : 124.63	117.0 72.76 : 126.34	123.2 72.76 : 126.34	102.6 84.04 : 124.40
2-Chlorotoluene	TM116	102.4 66.81 : 118.43	95.0 66.81 : 118.43	111.8 72.40 : 116.20	107.6 72.40 : 116.20	89.0 66.81 : 118.43
4-Chlorotoluene	TM116	96.4 65.88 : 114.76	90.2 65.88 : 114.76	113.2 66.90 : 112.46	104.2 66.90 : 112.46	88.2 65.88 : 114.76
Benzene	TM116	99.4 88.07 : 111.17	105.4 93.16 : 123.63	106.8 91.01 : 117.67	101.6 91.01 : 117.67	90.4 88.07 : 111.17
Carbon Disulphide	TM116	105.0 75.11 : 124.81	101.8 75.11 : 124.81	111.2 74.91 : 122.14	101.4 74.91 : 122.14	98.4 75.11 : 124.81
Carbontetrachloride	TM116	104.2 82.35 : 126.46	106.2 82.35 : 126.46	106.4 80.31 : 124.50	106.4 80.31 : 124.50	96.8 82.35 : 126.46
Chlorobenzene	TM116	105.6 82.88 : 122.42	104.0 82.88 : 122.42	113.0 75.00 : 115.53	111.4 75.00 : 115.53	94.0 82.88 : 122.42
Chloroform	TM116	108.0 91.34 : 123.04	105.2 82.52 : 123.25	112.4 87.40 : 122.49	106.6 87.40 : 122.49	97.6 91.34 : 123.04
Chloromethane	TM116	121.6 52.88 : 131.36	116.8 55.37 : 133.35	124.0 65.05 : 142.63	114.8 65.05 : 142.63	99.2 52.88 : 131.36



CERTIFICATE OF ANALYSIS

Validated

SDG: 190904-93
Location: Trelewis School

Client Reference: A113930
Order Number: C19/900

Report Number: 522273
Superseded Report: 521233

VOC MS (S)

		QC 2001	QC 2042	QC 2092	QC 2078	QC 2084
Cis-1,2-Dichloroethene	TM116	103.8 78.27 : 128.90	108.4 78.27 : 128.90	117.0 80.67 : 126.72	110.8 80.67 : 126.72	90.2 78.27 : 128.90
Dibromomethane	TM116	97.4 71.69 : 119.43	93.8 77.47 : 121.29	103.8 67.80 : 121.75	110.2 67.80 : 121.75	82.8 71.69 : 119.43
Dichloromethane	TM116	120.2 89.49 : 128.89	118.8 81.68 : 125.21	126.0 81.11 : 133.25	121.4 81.11 : 133.25	99.6 89.49 : 128.89
Ethylbenzene	TM116	93.4 70.95 : 113.07	98.4 83.56 : 122.99	103.2 75.92 : 110.41	102.2 75.92 : 110.41	85.4 70.95 : 113.07
Hexachlorobutadiene	TM116	78.8 7.32 : 139.00	92.2 7.32 : 139.00	76.8 12.82 : 152.73	62.6 12.82 : 152.73	70.8 7.32 : 139.00
Isopropylbenzene	TM116	86.8 52.15 : 132.52	94.0 52.15 : 132.52	104.0 54.21 : 117.17	97.0 54.21 : 117.17	78.0 52.15 : 132.52
Naphthalene	TM116	108.4 80.29 : 135.77	96.6 79.29 : 125.59	120.2 80.86 : 128.81	120.2 80.86 : 128.81	96.6 80.29 : 135.77
o-Xylene	TM116	86.8 68.16 : 107.61	97.8 68.16 : 107.61	98.4 69.99 : 108.74	98.0 69.99 : 108.74	82.0 68.16 : 107.61
p/m-Xylene	TM116	88.9 73.52 : 108.71	95.6 77.41 : 112.71	99.8 68.32 : 108.91	99.2 68.32 : 108.91	82.6 73.52 : 108.71
Sec-Butylbenzene	TM116	90.6 49.79 : 125.67	90.8 44.71 : 117.87	99.4 44.91 : 118.40	86.2 44.91 : 118.40	80.0 49.79 : 125.67
Tetrachloroethene	TM116	108.4 81.43 : 126.65	110.6 81.43 : 126.65	112.8 76.95 : 121.02	117.0 76.95 : 121.02	94.6 81.43 : 126.65
Toluene	TM116	91.6 85.50 : 114.89	94.8 87.82 : 116.21	98.0 74.24 : 107.42	93.8 74.24 : 107.42	84.6 85.50 : 114.89
Trichloroethene	TM116	96.6 79.80 : 112.33	103.6 79.80 : 112.33	102.6 77.61 : 111.54	100.8 77.61 : 111.54	87.6 79.80 : 112.33
Trichlorofluoromethane	TM116	107.6 88.86 : 128.82	109.2 80.52 : 132.12	109.8 84.55 : 133.27	104.0 84.55 : 133.27	104.2 88.86 : 128.82
Vinyl Chloride	TM116	105.2 69.66 : 136.55	106.4 58.08 : 128.58	107.4 70.29 : 138.58	98.2 70.29 : 138.58	106.8 69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

SDG:	190904-93	Client Reference:	A113930	Report Number:	522273
Location:	Trelewis School	Order Number:	C19/900	Superseded Report:	521233

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2107).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

APPENDIX G – CIRIA C552 RISK METHODOLOGY

The following tables are derived from CIRIA C552 and have been used to define the risk rating presented in the Qualitative Risk Assessment matrix.

Classification of consequence

Classification	Definition
Severe	Short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short term risk of pollution (note; Water ResouRHes Act contains no scope for considering significant pollution) of sensitive water resouRHe. Catastrophic damage to building/property. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem. (Note the definitions of ecological systems within the Draft CiRHular on Contaminated Land DETR, 2000).
Medium	Chronic damage to human health ('significant harm', as defined In DETR, 2000). Pollution of sensitive water resouRHes (note; Water ResouRHes Act contains no scope for considering significant pollution). A significant change in a particular ecosystem, or an organism forming part of such an ecosystem. (Note the definitions of ecological systems within the Draft CiRHular on Contaminated Land DETR, 2000).
Mild	Pollution of non-sensitive water resouRHes. Significant damage to crops, buildings, structures and services ('significant harm', as defined In DETR, 2000). Damage to sensitive buildings/structures/services or the environment.
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc). Easily repairable effects of damage to buildings, structures and services.

Classification of probability

Classification	Definition
High likelihood	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution.
Likely	There is a pollutant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. CiRHumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low likelihood	There is a pollution linkage and ciRHumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period that such an event would take place, and is even less likely in the shorter term.
Unlikely	There is a pollution linkage but ciRHumstances are such that it is improbable that an event would occur even in the very long term.

Matrix of consequence against probability to gain a risk classification

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate/Low Risk
	Likely	High Risk	Moderate Risk	Moderate/Low Risk	Low Risk
	Low likelihood	Moderate Risk	Moderate/Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate/Low Risk	Low Risk	Very Low Risk	Very Low Risk