AtkinsRéalis

# 2023/2024 Ground Investigation Report

Neath Port Talbot County Borough Council

November 2024

NE05-001-ATK-GEN-SWMWREC-RP-CE-00003

# GRANDISON BROOK FLOOD ALLEVIATION SCHEME

AtkinsRéalis - Sensitive / Sensible

# Notice

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## Client signoff

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| **Client** | Neath Port Talbot County Borough Council |
| **Project** | Grandison Brook Flood Alleviation Scheme |
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# 1. Introduction

AtkinsRéalis has been commissioned by Neath Port Talbot County Borough Council (NPTCBC) to undertake detailed design of a proposed flood alleviation scheme associated with Grandison Brook in the Pantyrheol area of Briton Ferry.

The Pantyrheol area of Briton Ferry has been subject to periodic flooding resulting from under-capacity of the Grandison Brook culvert, whereby residential and commercial properties are known to have flooded internally. The cause of the flooding has been identified as the under-capacity of the Grandison Brook culvert, forcing flows to the surface, through surcharged culvert inlets and drainage connections, which flow downhill and collects on the A474 before entering properties.

The purpose of this contract is to improve the hydraulic capacity of the existing watercourse, in turn managing the risk of flooding. The main works shall comprise of:

- Interception of surface water flows from an inclined footpath known as Rhodfa Clarke, Ynysymaerdy Road into a new culvert system through undertaking minor earthworks to top of low spots to an existing bank along the north side of the Rhodfa Clarke footpath.
- Placing a precast concrete inlet head wall at the western end of Rhodfa Clarke and a new ditch to pick up overland flows and construction of a new 600mm diameter culvert from the new headwall along Ynysymaerdy Road.
- Improvements to existing inlet structure of Ynysymaerdy Brook on Ynysymaerdy Road, including a galvanised steel trash screen and associated metal works items and accessories discussed below.
- Construction of a new 900mm diameter surface water culvert from the Ynysmaerdy Brook Inlet Structure along Ynysmaerdy Road and then through playing fields.
- Construction of a new 900mm diameter surface water culvert crossing across Old Road near the junction of Tyla Road and through the grounds of Ysgol Carreg Hir School.
- Construction of the new surface water culvert 1250 x 750mm across the A474 Pant yr Heol road and the lane through to Brook Court.
- Construction of new surface water culvert 1750 x 1000mm to the south of Brook Court to an existing culvert under the main rail line.
- Construction of new surface water culvert 1750x1000mm on Network Rail land between existing culverts under the main rail lines.
- Construction of new attenuation tanks within Jersey Park to allow for storm water storage

Proposed scheme drawings are presented in Appendix A.

Multiple phases of Ground Investigation (GI), designed and supervised by AtkinsRéalis, have been undertaken between 2021 and 20224 as follows:

- Phases 1/2 - Q00560/FR.01, undertaken 5th – 13th July, 29th July – 19th August, 18th October and 15th November 2021
- Phase 3 - Q1114/FR.01, undertaken 15th - 17th May 2023
- Phase 4 - Q1432GI/LR01, undertaken 23rd and 24th October 2023
- Jersey Park Boreholes - Q1484/FR.01, undertaken 6th - 8th March 2024

This report has been prepared to summarise the findings of the desk study and GI undertaken to inform the development of this scheme. The objectives of this report are to:

- Summarise existing geotechnical and geo-environmental desk study information;
- Describe the GI works carried out;
- Provide a summary of ground conditions recorded during the GI;

- Summarise the geotechnical and geo-environmental laboratory test results recorded;
- Summarise and interpret findings of subsequent instrumentation monitoring;
- Determine the geotechnical soil parameters to be adopted for design purposes;
- Provide a land contamination assessment to identify potential risks to human health and controlled waters, together with recommendations for mitigation and inform the potential for material reuse / waste disposal; and
- Identify geotechnical and geo-environmental risks to the project and recommendations for mitigation.

# 1.1 Description of project

## 1.1.1 Site description

The proposed site is located in the Pantyrheol area of Briton Ferry, Neath, Wales, as shown in **Figure 1-1**. The site is centred at National Grid Reference (NGR) 274680 E, 195180 N. The site is bounded by Briton Ferry Llansawel AFC football pitch and some vacant fields in the north. Part of Briton Ferry Llansawel AFC football pitch, Parc Jersey Park and Ynysymaerdy Road lie to the south, and part of the site is interspersed with residential dwellings and some vacant fields to the east. Old Road bounds the site to the northwest and a housing development off Manor Way bounds it to the southeast.

The majorly affected west part of the site marks Pantyrheol road (A474) and dense residential and commercial properties.

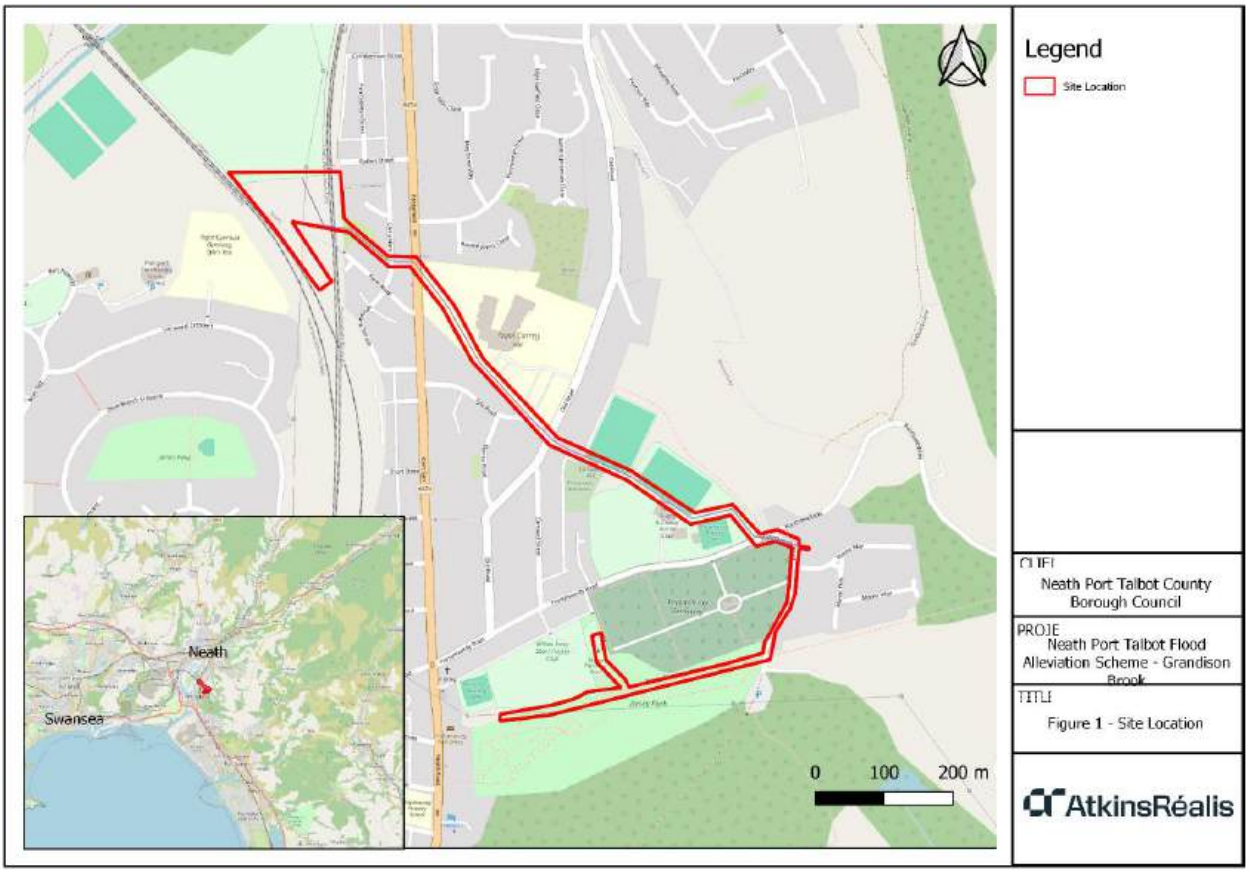



**Figure 1-1 - Site location plan**

## 1.2 Limitations

This ground investigation has been designed and performed to meet the client objectives. Additional investigations may be required depending on the findings of this investigation and are recommended in this report, if relevant.

This ground investigation has been designed and performed to meet the client objectives. Additional investigations may be required depending on the findings of this investigation and are recommended in this report, if relevant.

The findings, opinions and recommendations presented in this report are based on information obtained from a variety of third-party sources as detailed within this report. AtkinsRéalis has not independently verified third-party information and for the purposes of this assessment has assumed that such information is accurate and complete.

The report findings are based on the assessment of ground investigation data from exploratory holes. Although the locations of exploratory holes are targeted based on the conceptual site model, some parts of the site may have been inaccessible at the time of the investigation due to the presence of buildings, sensitive infrastructure, general storage, site / tenant operations, and buried utilities amongst others.

The investigation has been designed based on the conceptual site model and is proportionate to the levels of confidence regarding the ground conditions and current site knowledge. Inferences about subsurface conditions may involve assumptions and extrapolation between sampling points and the heterogeneity of the subsurface means that variable ground conditions may be encountered between the exploratory holes.

Site conditions are based on observations made at the time of the investigations and may be subject to temporal variability such as atmospheric, seasonal or other effects and further recommendations are provided where relevant.

No liability can be accepted for the retrospective effects of any future changes or amendments to current legislation and guidance.

# 2. Existing Information

The purpose of this section of the report is to summarise the currently available information that is considered directly relevant to the geotechnical and geo-environmental elements of the proposed scheme. The information will be used in the later sections of this report as background information to determine site conditions and aid the identification and determination of geotechnical/geo-environmental constraints and hazards that could impact on the proposed scheme.

## 2.1 Topography

The general topography of the site is such that it slopes down to the northwest, with an average elevation of 7 m Above Ordnance Datum (AOD) at the northwestern end and significantly higher elevation of 42 m AOD at the south-western boundary, at Grandison Brook culvert.

## 2.2 Site history

Using historical Ordnance Survey plans provided in the Envirocheck report [1], a summary of the historical development of the site and surrounding area within a radius of 500 m is provided in Table 2-1. The full Envirocheck report can be found in Appendix B.

**Table 2-1 - Summary of historical development**

| Date and scale | On-site features | Off-site features |
|---|---|---|
| 1878<br>1:2500 | The site was occupied by open fields.<br>Two unnamed roads cross the site, one on the far western edge of the site running north to south and another on the far eastern side of the site running north east to south west.<br>An unnamed watercourse enters the site on the eastern boundary and flows west alongside the southern boundary of the site. | Bryn Hyfryd House is located 60 m north of the site.<br>Dwellings associated with Ynysmaerdy are located 100 m south-west of the site.<br>Railway line is running ENE WSW 100 m south east of the site. |
| 1884<br>1:10,000 | No notable change. | Esgyn colliery, surrounded by a large area of woodland, is located 200 to 500 m north-east of the site and extended to 500 m south-east of the site.<br>A Railway line (Great Western Railway) was present 500 m west of the site. |
| 1899<br>1:2500<br>1900<br>1:10560 | No notable change. | Ynysmaerdy cemetery and chapel is located adjacent to the south of the site.<br>Old quarries are present 50 m and 150 m north east as well as 200 m east and 350 m south east of the site. |

| Date and scale | On-site features | Off-site features |
|---|---|---|
| | | A spring is located 100 m north of the site.<br>A row of houses is present 80 m south west of the site.<br>Court Sart Station is 200 m west of the site.<br>Old air shafts are located 200 m east of the site.<br>Esgyrn Colliery is identified as disused. |
| 1918<br>1:2500 | No notable change. | Cricket and football fields are located adjacent to the south of the site.<br>A school has been constructed adjacent to the west of the site.<br>Further residential development has occurred 200 m west and south west of the site.<br>The New Graded Infirmary is located 500 m north of the site. |
| 1921<br>1:10560 | No notable change. | No notable change. |
| 1936<br>1:2500<br>1:10560 | The unnamed watercourse alongside the southern boundary of the site is not shown.<br>A row of residential buildings had been constructed in the in the west of the site.<br>Three houses had been constructed in the east of the site.<br>A sports ground occupied the centre of the site.<br>A bowling green was located near the centre of the site, crossing the southern boundary of the site. | Allotment gardens are located 30 m west of the site.<br>The railway line to the south has been “dismantled”. |
| 1945-1949<br>Arial Photography | No notable change. | No notable change. |
| 1951<br>1:2500<br>1:10560 | Allotment gardens occupies a section of the south west section of the site. | A soft drinks factory was located 200 m south-west of the site.<br>Allotments gardens were located adjacent to the south west of the site and 30 m north west of the site.<br>Expansion of Pencaerau 300 m north of the site. |

| Date and scale | On-site features | Off-site features |
|---|---|---|
| 1964-1965<br>1:10000 | No notable change. | Neath hospital 400 m north of the site.<br>Expansion of Briton Ferry 500 m south west of the site. |
| 1970<br>1:2500<br>1970-1974<br>1:10000 | No notable change | No notable change. |
| 1980-1983<br>1:10000<br>1987 & 1989<br>1:1250 | No notable change. | A cluster of residential properties had been constructed adjacent to the east of the site. |
| 1993<br>1:1250<br>1992-1996<br>1:10000 | No notable change. | No notable change. |
| 1999<br>1:10000 | No notable change. | No notable change. |
| 2000<br>Aerial Photography | No notable change. | No notable change. |
| 2006<br>1:10000 | No notable change. | No notable change. |
| 2019<br>1:10000 | No notable change. | No notable change. |

## 2.3 Geology

The geology of the site was determined using the British Geological Society (BGS) 1:50,000 scale map sheet 247 Swansea [2] , and the BGS GeoIndex [3] .

### 2.3.1 Made ground

Made Ground is shown to underlie the site at the location of Ysgol Carreg Hir and Briton Ferry Rugby and Cricket Social Club. The BGS mapping records this as landscaped and artificially modified ground. It is anticipated that Made Ground will be present elsewhere across the site associated with the development of buildings and carriageways.

### 2.3.2 Superficial deposits

The available mapping indicates the superficial deposits at the site area to comprise Tidal Flat Deposits and Glacial Till. Tidal Flat deposits are described to typically comprise of unconsolidated sediment, mainly mud and/or sand. The Glacial Till is a diamicton described to typically comprise sandy clay with pebble to boulder-sized clasts.

### 2.3.3 Bedrock geology

The available mapping indicates the bedrock at the site area to comprise the Hughes Member Group to the north and Brithdir Member to the south. The Hughes Member Group contain two differentiated units; a sandstone unit and a mudstone, siltstone, sandstone unit. The lithological description of the Hughes Member is a green-grey lithic arenite with thin mudstone/siltstone and coal interbeds. The lithological description of the Brithdir Member is a green-grey lithic arenite with conglomerate lenses at the bases of units and containing mudstone siltstone and coal interbeds.

The geological maps indicate the presence of two inferred coal seams intersecting the site. One intersects the site at Ysgol Carreg Hir, the other runs along the trace of the site from Old Road to Ynysymaerdy Road.

### 2.3.4 Structural geology

Three normal faults are inferred to run near the site. To the east and west the faults are typically trending north to south, bounding the site. The nearest fault line passes approximately 150 m east of Ynysymaerdy Road, and downthrows to the west. The western fault line passes approximately 400 m west of the site, and downthrows to the east. The third fault line is approximately 125 m south of the western extent of the site. The fault is orientated southwest to northeast, and downthrows to the northwest. Further details regarding the faults, such as recorded displacement, are unknown.

## 2.4 Existing ground investigation data

### 2.4.1 Cwrt Sart Comprehensive School

Ground investigation information for Cwrt Sart Comprehensive School, located approximately 200m northwest of the site has been made available by Neath Port Talbot County Borough Council. The ground investigation recorded: Made Ground 0.7m to 1.45m thick comprising sandy gravel with low to medium cobble content; soft clay and peat deposits 0.3m to 2.15m thick overlying firm to stiff sandy gravelly clay and medium dense sandy gravel with low to medium cobble content with thin lenses of sand. The boreholes extended between 1.5 m below ground level (bgl) and 18 m bgl. The majority of the boreholes refused at shallow depths in gravels. No rock was encountered in the boreholes. Groundwater was recorded in two boreholes at 1.5 m bgl (in soft clay) and 2.3 m bgl (in sand).

### 2.4.2 Ysgol Carreg Hir School

No ground investigation work was undertaken as part of the Quantum Geotechnic Ltd 2021 to 2024 phases of works along the route of the proposed culvert within the Ysgol Carreg Hir School area. Various phases of ground investigation and remediation have taken place at the school alongside the redevelopment of the school circa 2017. A total of 10 positive asbestos samples were identified in previous ground investigations. A plan of the ground investigation locations is provided on the Sanctus Drawing (D2333-005) enclosed within Appendix H. A summary of the positive asbestos identifications is shown in Table 2-2 below.

An engineered cover system was put in place across the site by Sanctus Ltd in 2018 which comprised the burying of asbestos impacted material 300 to 400 mm below ground level which was covered with a high visibility marker liner and clean cover soil. A plan of the remediated landscaped areas of the site and post validations sample locations is shown in Sanctus Drawing (D2333-021 Rev C) enclosed within Appendix H.

**Table 2-2 - Summary of reported positive asbestos identifications across all phases of historical investigation (2016 – 2021)**

| Location | Depth (m bgl) | Asbestos Identification | Asbestos Type | Quantification (%) (wt/wt) |
|---|---|---|---|---|
| **Quantum Geotechnic Ltd 2016** | | | | |
| WS1 | 0.70 | Loose fibres | Chrysotile, Amosite | <0.001 |
| WS2 | 0.40 | Loose fibres | Amosite | <0.001 |
| WS3 | 0.50 | Loose fibres | Chrysotile, Amosite | <0.001 |
| WS5 | 0.80 | Loose fibres | Crocidolite | <0.001 |
| | 1.30 | Loose fibres, insulation lagging | Chrysotile, Crocidolite, Anthophyllite | 0.248 |
| **Ground Investigation Limited 2017** | | | | |
| WS03 | 0.30 – 1.00 | Loose fibre bundle | Amosite | Not reported |
| WS06 | 0.25 – 0.65 | Loose fibre bundle | Chrysotile | Not reported |
| WS10 | 0.20 – 0.60 | Loose fibre bundle | Chrysotile | Not reported |
| WS14 | 0.20 – 0.95 | Lagging | Chrysotile, Amosite | Not reported |
| WS20 | 0.20 – 1.00 | Lagging | Chrysotile, Amosite | Not reported |
| WS22 | 0.00 – 0.10 | Lagging | Chrysotile, Amosite | Not reported |

## 2.5 Records of mines and mineral deposits

The historical coal mining activity within the site area, as reported in the Coal Authority Envirocheck Screening Report [4], is summarised in Table 2-3.

**Table 2-3 – Coal Authority report summary**

| Coal Mining Activity/ Hazard | Description |
|---|---|
| Underground coal mining | The site is not within a surface area that could be affected by present underground mining. However, the site lies within an area which is believed to have coal at or close to the surface which may have been worked some time in the past. Therefore, there is the potential for the presence of coal workings at or close to the surface at the site. |

| | |
|---|---|
| | The site is not in an area likely to be affected from any planned future underground coal mining. However, reserves of coal exist in the local area which could be worked at some time in the future. |
| Mine entries | According to Coal Authority, there are no recorded coal mine entries known within or within 20 m of the boundary of the property. |
| Coal mining geology | The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining. |
| Opencast mining | The property is not within the boundary of an opencast site from which coal has been removed and does not lie within 200 m of a present opencast site.<br><br>There are no licence requests outstanding to remove coal by opencast methods within 800m of the boundary. |
| Coal mining subsidence | The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 m of the enquiry boundary, since 31 October 1994.<br>There is no current Stop Notice delaying the start of remedial works or repairs to the property.<br>The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. |
| Mine gas | The coal authority has no record of mine gas emission requiring action. |

## 2.6 Unexploded ordnance

The publicly available online Unexploded Bomb Risk mapping, produced by Zetica [5, 6], classifies the site as a low risk with less than 15 surveyed bomb strikes per 1000 acres. It should be noted that the risk map is not a risk assessment and does not consider other sources of UXO such as enemy or allied ground ordnance or other sources of ordnance. The UXO risk map and Pre-Desk Study Assessment for the site are provided in Appendix E.

## 2.7 Hydrogeology

### 2.7.1 Aquifer designation

With reference to the BGS onshore GeoIndex [3] and the Envirocheck report [1], the Glacial Till superficial deposits are classified as a secondary A undifferentiated aquifer. The Tidal Flat Deposits are classified as a secondary A aquifer. The Hughes Member bedrock is classified as a secondary A aquifer.

### 2.7.2 Licenced groundwater abstractions

There are no recorded groundwater abstraction licences within 1 km of the site [1].

### 2.7.3 Discharge consents to groundwater

There are no registered discharge consents within 500 m of the site [1].

## 2.8 Hydrology

With reference to the Natural Resources Wales online flood map [7], Lle map browser [8] and the Envirocheck report, the nearest surface water features are the Ynysymaerdy Brook and Grandison Brook which are located adjacent to the south and west of the site. General surface water flow is in a westerly direction towards the Neath River, located approximately 1.5 km to the west of the site.

### 2.8.1 Flood risk

The site is located in an area with a low risk of flooding from rivers with a less than 0.1% (1 in 1000) probability of flooding annually. The site is assessed as having potential for flooding to occur at surface as a result of high groundwater levels [1].

### 2.8.2 Licenced surface water abstractions

There are no recorded surface water abstraction licences within 1 km of the site [1].

### 2.8.3 Discharge consents to surface water

There are no registered discharge consents within 500 m of the site [1].

### 2.8.4 Pollution incidents to controlled waters

There are 10 recorded pollution incidents within 500 m of the site. Eight minor category 3 incidents have occurred, with particular notice to an on-site incident in 1994 relating to agricultural carcasses. One major category 1 incident occurred 219m northwest of the site in 1994 relating to cess pit contents, however no information is available relating to the receiving water. One category 2 significant pollution incident occurred 270 m northwest of the site in 1994 related to trade effluent sewage; however, no information is available regarding the receiving water [1] .

## 2.9 Environmentally sensitive land uses

According to Envirocheck records, areas of Ancient Woodland are located approximately 115 m to the east and 185 m south of the site [1].

## 2.10 Landfills

Envirocheck records indicate that there are no historical or current landfill sites within 500 m of the site [1].

## 2.11 Potentially infilled land

Potentially infilled land within 500 m of the site, not recorded or licenced as a historical landfill, is located 99 m east, 265 m east, 277 m east, 343 m east and 383 m northeast of the site. No details are available relating to these areas, but they may be associated with infilling of historical pits or quarries [1].

## 2.12 Active trades

The Envirocheck report provides a summary of historical and active trades registered on the site and in the surrounding area [1]. A summary of trades within 250 m of the site which may potentially give rise to contamination which may affect the site is provided below:

- Off-site: 200 to 250 m west – Three garage services (two active trades and one inactive trade).
- Off-site: 457 m north – Neath Hospital (inactive trade).

# 3. Field and laboratory studies

## 3.1 Geomorphological/geological and topographical mapping

No geomorphological or geological mapping was undertaken as part of this investigation.

## 3.2 Ground investigations

### 3.2.1 Description of fieldwork

Five phases of field works have been undertaken in 2021, 2023 and 2024. The initial two phases of Ground Investigation (GI) were undertaken between 5th – 13th July, 29th July – 19th August, 18th October and 15th November 2021 by Quantum Geotechnic Ltd. (Ref: Q00560/FR.01). The GI site works comprised the following:

- Five rotary percussive (dynamic sampled) boreholes extending to depths between 7.0 m bgl; and 8.0 m bgl;
- One super heavy dynamic probe test (GBDP05) to 10.0 m bgl;
- Five hand excavated trial trenches extending to a maximum depth of 1.2 m bgl;
- Eight machine excavated trial pits extending to depths between 1.4 m bgl and 3.0 m bgl;
- Two standpipe piezometer installations to allow groundwater and gas monitoring;
- Associated sampling and geotechnical / geo-environmental on-site and laboratory testing;
- Three subsequent installation monitoring visits completed; and
- Ground penetrating radar (GPR) surveys at five locations.

The third (Ref: Q114/FR0.1) and fourth (Ref:1432GI/LR01) phases of GI were designed and supervised by AtkinsRéalis and undertaken between 15th-17th May and 23rd-24th October 2023 by Quantum Geotechnic Ltd. the GI comprised the following works:

- Two windowless sample / dynamic sampled boreholes. (GB-BH07 & GB-BH09)
- One hand excavated trial trench (GB-HP06);
- One machine excavated trial pit (GB-TP11);
- Surface water sampling at two locations;
- In-situ testing and sampling;
- Post fieldwork groundwater and ground gas monitoring;
- Two hand & machine excavated shallow trial pits to locate sewage pipe;
- One concrete core; and
- Two stream silt samples for laboratory testing.

The most recent phase of GI was designed and supervised by AtkinsRéalis and undertaken during March 2024 by Spencer Quantum Geotechnic Ltd. (Ref: Q1484/FR.01). The GI focused on the area around Jersey Park and comprised the following works:

- Three dynamic sample boreholes;
- In-situ testing and sampling; and
- Post fieldwork groundwater and ground gas monitoring.

The exploratory hole location plan is enclosed within Appendix C and the exploratory hole logs are included in the Quantum Geotechnic Ltd. and Spencer Quantum Geotechnic Ltd. factual reports (Ref: Q00560/FR.01, Q1114/FR.01, Q1432GI/LR01 and Q1484/FR.01) in Appendix G of this report.

## 3.3 In-situ testing

Standard Penetration Tests (SPTs) were carried out in the rotary boreholes, with hand shear vane tests undertaken in all exploratory holes and trial pits on suitable cohesive materials. The test results recorded are included in the Quantum Geotechnic Ltd. and Spencer Quantum Geotechnic Ltd. factual reports (Ref: Q00560/FR.01, Q1114/FR.01, Q1432GI/LR01 and Q1484/FR.01) in Appendix G of this report.

## 3.4 Laboratory testing

Geotechnical, chemical, and contamination laboratory testing on selected samples retrieved during the ground investigation site works were scheduled by AtkinsRéalis. Geotechnical testing was undertaken by Geotechnics and Derwentside Environmental Testing Services Limited.

### 3.4.1 Geotechnical tests

The following geotechnical tests were undertaken in accordance with BS 1377 - 2 [11], unless stated otherwise:

- 45 Moisture content
- 25 Liquid limit, plastic limit and plasticity index
- 26 Particle size distribution by wet sieving
- 21 PSD – Sedimentation by Pipette
- Eight Suite D (Brownfield site pyrite present)
- 13 Organic Matter

### 3.4.2 Geo-environmental tests

Geo-environmental laboratory soil testing was designed to inform the land contamination assessment presented in Section 6 of this report.

Soil samples were selected for contamination laboratory analysis, informed by strata descriptions and visual and olfactory indicators of contamination recorded on the geological logs.

All analysis was scheduled by AtkinsRéalis and undertaken by Eurofins Chemtest Ltd (a UKAS and MCERTS accredited laboratory), with original laboratory certificates presented in the Quantum Geotechnic Ltd. and Spencer Quantum Geotechnic Ltd. factual reports (Ref: Q00560/FR.01, Q1114/FR.01, Q1432GI/LR01 and Q1484/FR.01) in Appendix G of this report.

Soils

A total of 26 soil samples and two silt samples were collected from 22 locations across the site and analysed for the following suite of determinands:

- asbestos screen (with quantification if asbestos positively identified);
- pH;
- sulphate, sulphide, nitrite, nitrate and ammoniacal nitrogen;
- total, complex and free cyanide;
- total phenols;
- organic matter;

- metals and metalloids – aluminium, antimony, arsenic, boron, barium, beryllium, cadmium, calcium, total chromium, chromium (VI), copper, iron, lead, manganese, magnesium, mercury, molybdenum, nickel, potassium, phosphorus, selenium, vanadium, and zinc;
- benzene, toluene, ethylbenzene and xylenes (BTEX);
- methyl-tert-butyl-ether (MTBE);
- speciated Polycyclic Aromatic Hydrocarbons (PAH): US EPA 16 and coronene; and
- speciated Total Petroleum Hydrocarbons Criteria Working Group (TPH CWG) speciated aliphatic and aromatic split $C_5$ – $C_{44}$.

Soil-Leachate

A total of 17 soil samples from 16 locations across the site were subject to leachate analysis for the following suite of determinands:

- pH;
- chemical oxygen demand;
- sulphate, sulphide, nitrite, nitrate and ammoniacal nitrogen;
- total, complex and free cyanide;
- total phenols;
- metals and metalloids – aluminium, antimony, arsenic, boron, barium, beryllium, cadmium, calcium, total chromium, chromium (VI), copper, iron, lead, manganese, magnesium, mercury, molybdenum, nickel, potassium, phosphorus, selenium, vanadium and zinc
- BTEX;
- MTBE;
- PAH: US EPA 16 and coronene; and
- TPH CWG speciated aliphatic and aromatic split $C_5$ – $C_{44}$.

Groundwater

Two groundwater samples were collected in total, one sample GBBH05 was was collected from the Quantum Geotechnic Ltd 2022 [9] and one sample from GBBH07 was collected from the Spencer Quantum Ltd 2024 investigations [12]. A total of four surface water samples (upstream and downstream) were collected and analysed during the Quantum Geotechnic Ltd 2022 [9] and 2023 ground investigations [10]. All samples were analysed for the following:

- pH;
- biochemical oxygen demand, alkalinity,
- total hardness, dissolved organic carbon, total organic carbon;
- ammonia (free), ammonium;
- sulphate, sulphide, chloride, nitrate and ammoniacal nitrogen;
- total, complex and free cyanide;
- total phenols;
- metals and metalloids – aluminium, antimony, arsenic, boron, barium, beryllium, cadmium, calcium, total chromium, chromium (VI), copper, iron, lead, manganese, magnesium, mercury, molybdenum, nickel, potassium, phosphorus, selenium, vanadium, and zinc
- BTEX;
- MTBE;
- PAH: US EPA 16 and coronene; and
- TPH CWG speciated aliphatic and aromatic split $C_5$ – $C_{44}$.

Waste Acceptance Testing

Three samples collected from GBH05 at 1.00 m bgl in the Quantum Geotechnic Ltd 2022 [9] ground investigation and from Silt 1 and Silt 2 in the Quantum Geotechnic Ltd 2024 [13] ground investigation were analysed for the following waste acceptance criteria (WAC) suite:

- metals and metalloids – Arsenic, barium, cadmium, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium and zinc;
- chloride, fluoride sulphate, total dissolved solids, phenol and dissolved organic carbon.

## 3.5 Drainage studies

No drainage tests were undertaken as part of the works.

## 3.6 Geophysical surveys

Whilst undertaking the above summarised ground investigation works, GPR surveys were undertaken during the 2021 GI at the locations of the trial trenches to confirm the presence, location and extents of buried services within the areas of interest.

## 3.7 Post ground investigation monitoring

Four post field work site monitoring visits were undertaken in 2021 to record land gas and groundwater levels within the installed borehole standpipes in GBBH04 and GBBH05 [9]. Three post field work site monitoring visits were undertaken in 2024 to record land gas and groundwater levels within the installed borehole standpipes in GBBH07 and GBBH09 [12].

Monitoring comprised ground water and ground gas monitoring, gas monitoring was undertaken by a GA2000 gas analyser to measure the following;

- Atmospheric pressure;
- Flow rates (L/hr);
- Methane;
- Carbon Dioxide;
- Oxygen;
- Carbon Monoxide; and
- Hydrogen Sulphide

Results of which can be found within the factual reports in Appendix G.

# 4. Ground conditions

The following section provides a summary of the laboratory testing to determine the classification of the materials encountered during the ground investigation, including the concrete classification recommendation based on chemical testing. The data summarised below, including the exploratory hole plan and reported logs for all GI locations, are provided by Quantum Geotechnic Ltd and Spencer Quantum Ltd and are included in the factual reports within Appendix G.

## 4.1 Made Ground

Made Ground, associated with road construction and landscaped ground was encountered at ground level (or directly underlying the road or topsoil). The Made Ground varies in thickness from 0.1 to 2.60 m and generally consists of dark grey silty slightly sandy gravel with low cobble content consisting of sandstone. The gravel is angular to sub angular fine to coarse sandstone, siltstone, ash, brick and concrete. Minimal geotechnical testing was instructed for the Made Ground material as this is likely to be fully excavated for the flood alleviation scheme.

## 4.2 Tidal Flat Deposits

Tidal Flat Deposits (TFD) were encountered across the whole site area but was more prominent to the north being recorded in GBBH04, GBBH05, GBTP04, GBTP05, GBTP06, GB-BH07 and GBTP11 towards the River Neath (refer to geological sections in Appendix D). The TFD generally consisted of soft clay, high in fines content with varying levels of brown peat from 0.3 to 5.5 m thick. GB-BH07 saw the thickest levels of TFD with the full thickness not being proven, at termination (8.2m) the TFD were recorded as 5.5 m thick.

The 2024 GI has been interpreted as encountering TFD at all locations. Within GB-BH11 the description is in line with the description of clay, GB-BH10 and 12 identified slightly clayey slightly silty sand, which within GB-BH10 was slightly organic. During the GB-BH10 Particle Size Distribution testing at 3 m bgl (within the TFD layer), the description was suggested as a clay as opposed to a sand, which further supports the interpretation as TFD. The material was present beneath the Made Ground, with thickness increasing in holes with less Made Ground. The base depth of the 2024 TFD was between 3.9 and 4.4 m bgl.

## 4.3 Glacial Till

Glacial Till was recorded in the majority of boreholes and trial pits (excluding GB-BH07, GB-TP11 and GB-HP06), and was encountered at shallower depths in the southeast of the site, recorded directly beneath the topsoil in GBBH01. The Till material generally consists of medium to dense silty sandy gravel with angular to sub angular sandstone.

Within the 2024 investigation, the glacial till was identified within all exploratory holes as clayey sandy gravel, and is present until termination in two of the exploratory holes. In GB-BH12 the hole identified sandstone beneath the gravel, giving a thickness of 3.9 m.

## 4.4 River Terrace Deposits

River Terrace Deposits were recorded exclusively in GB-BH09 underneath the made ground, during the 2023 GI. The deposits comprised gravelly organic clay overlying silty gravelly sand overlying silty sandy gravel and are associated with a small watercourse flowing through Jersey Park. Given the localised nature of these deposits close to a small watercourse, this could explain why they are not shown in published geological mapping.

## 4.5 Brithdir Sandstone Member

One exploratory hole from the 2024 investigation (GBBH12) identified bedrock at a depth of 7.8 m bgl. The description is grey sandstone, with arisings of grey angular gravel of sandstone.

## 4.6 Ground model

This section summarises the ground profile encountered across the site across all phases of ground investigation by Quantum Geotechnic Ltd. In general, the site is underlain by Topsoil, Made Ground, Tidal Flat Deposits and Glacial Till. The bedrock recorded by BGS as the Hughes formation was not encountered during the ground investigations, the Brithdir member underlying the south extent of the site was encountered once in the 2024 investigation, however, the other holes went to the same depth and did not identify the formation.

This site area has been divided into the North West and South East regions which correspond to the ground profiles presented in Table 4-1 and Table 4-2 . In addition to the ground profiles, geological sections are presented in Appendix D.

**Table 4-1 – North-west ground model**

| Stratum | Description | Depth to top of stratum (m bgl) | Depth to base of stratum (m bgl) | Maximum thickness encountered (m) |
|---|---|---|---|---|
| Tarmac | - | 0.00 | 0.20 | 0.20 |
| Topsoil | Turf over TOPSOIL: Dark to brown slightly gravelly clayey Sand with many rootlets. | 0.20 | 0.40 | 0.20 |
| Made Ground | Dark brown - grey slightly silty sandy Gravel with low to medium cobble content of sandstone, ash, brick and concrete.<br>Or<br>Black silty slightly sandy GRAVEL. Gravel is angular to sub angular fine to coarse siltstone, ash, brick, concrete, glass and tile. Sand is fine to coarse. | 0.40 | 2.80 | 2.60 |
| Tidal Flat Deposits | Soft grey slightly sandy slightly gravelly organic CLAY. Very soft brown very fibrous peat in areas. | 2.70 | 7.00 | 5.5 |
| Peat | Brown clayey pseudo-fibrous PEAT | 7.00 | 8.20* | 1.2 |
| Glacial Till | Medium dense grey slightly silty sandy GRAVEL with low cobble content of sandstone. | 2.30 | 8.00* | 5.70 |

*Depth not proven due to refusal or termination at scheduled depth

**Table 4-2 – South-east ground model**

| Stratum | Description | Depth to top of stratum (m bgl) | Depth to base of stratum (m bgl) | Maximum thickness encountered (m) |
|---|---|---|---|---|
| Tarmac | - | 0.00 | 0.20 | 0.20 |
| Topsoil | Turf over TOPSOIL: Dark to brown slightly gravelly clayey Sand with many rootlets. | 0.00 | 0.40 | 0.20 |
| Made Ground | Dark brown - grey slightly silty sandy Gravel with low to medium cobble content of sandstone and brick. | 0.40 | 0.90 | 0.50 |
| Tidal Flat Deposits | Soft grey slightly sandy slightly gravelly organic CLAY. Very soft brown very fibrous peat in areas. | 0.90 | 1.40 – 3.80* | 3.10 |
| River Terrace Deposits (localised to small watercourse in Jersy Park) | Brown sandy slightly gravelly organic CLAY. Gravel is sub rounded fine to coarse sandstone. Sand is fine to coarse.<br><br>Becoming<br><br>Grey slightly silty sandy GRAVEL. Gravel is sub angular to sub rounded fine to coarse sandstone and siltstone. Sand is fine to coarse. | 1.40 | 4.65** | 3.25 |
| Glacial Till | Medium dense grey slightly silty sandy GRAVEL with low cobble content of sandstone. | 1.40 – 3.80** | 8.00** | 7.30 |
| Brithdir Member | Grey sandstone | 8.00** | Unknown** | 0.20 |

***Range given due to variable nature across the site. Anticipated that the value will increase within the range from east to west.**

****Depth not proven due to refusal or scheduled hole termination**

Geological cross sections for the locations above are provided in Appendix D.

There is clearly a thicker unit of Made Ground and Tidal Flat deposits shown in the north-west geological section. The Tidal Flat deposits range from 0.0 – 0.50 m thick in the south-west site area to 0.20 – 5.5 m thick in the north-west site area. The Made Ground also has an increased thickness from approximately 0.5 m in the southwest to over 2.00 m in the northwest site area possibly associated with road works and with fill material from historic rail infrastructure in the area.

The 2024 GI in the south extent of the site identified thicker Made Ground than the original south-east ground model, however, this is due to the exploratory holes being within a footpath/play area. It also encountered sand overlying the glacial till, which has been interpreted as part of the tidal flat deposits with the clay, due to the lower strength of material and presence of organic matter.

## 4.7 Groundwater

A summary of the groundwater conditions encountered during the recent GI is provided in Table 4-3 below. It should be noted, however, that groundwater levels are subject to diurnal, seasonal and climatic variations and can also be affected by drainage conditions or other causes.

**Table 4-3 - Groundwater condition summary during the Ground Investigation**

| Borehole ID | Water strike m bgl / m AOD | Comment |
|---|---|---|
| GBBH03 | 2.50 / 20.40 | Medium groundwater ingress |
| GBBH04 | 1.20 / 3.79 | Slow groundwater ingress at base of pit |
| GBBH04 | 5.70 / -0.71 | Fast ground water ingress |
| GBBH05 | 4.00 / 1.79 | Medium groundwater ingress |
| GB-BH07 | 5.20 / -0.3 | Seepage |
| GB-BH09 | 1.20 / 13.62 | Fast groundwater ingress |
| GB-BH10 | 1.50 / 13.25 | Medium groundwater ingress |
| GB-BH12 | 1.20 / 13.10 | Slow groundwater ingress |
| GBHP05 | 0.60 / 5.00 | Water encountered around 7no clay ducts |
| GBTP02 | 1.70 / 16.45 | Seepage |
| GBTP02 | 1.90 / 16.25 | Slow groundwater ingress |
| GBTP05 | 1.20 / 4.27 | Medium groundwater ingress |
| GBTP05A | 1.10 / 4.00 | Seepage |
| GBTP05A | 1.30 / 3.80 | Slow water ingress |
| GBTP06 | 1.50 / 3.59 | Seepage |
| GBTP06A | 1.15 / 4.14 | Seepage, becoming very wet |
| GBTP10 | 1.90 / 2.98 | Fast groundwater ingress |
| GBTP10A | 1.50 / 3.81 | Fast groundwater ingress |
| GB-TP11 | 0.90 / 4.02 | Seepage |
| GB-TP11 | 1.60 – 3.50 / 3.32 – 1.42 | Many seepages |

Standpipe piezometers were installed in BH04, BH05, BH07, BH09, BH10, BH11 and BH12. Table 4-4 provides a summary of the groundwater information.

**Table 4-4 - Groundwater monitoring**

| Monitoring Round (Date) | Borehole ID | Groundwater monitoring m bgl / m AOD | Geological Strata | Response zone (m bgl) |
|---|---|---|---|---|
| 1 (21/12/21) | BH04 | 2.53 / 2.46 | Glacial Till | 1.0 – 8.0 |
| 2 (24/01/22) | | 2.46 / 2.53 | | 1.0 – 8.0 |
| 3 (24/02/22) | | 2.39 / 2.60 | | 1.0 – 8.0 |

| Monitoring Round (Date) | Borehole ID | Groundwater monitoring m bgl / m AOD | Geological Strata | Response zone (m bgl) |
|---|---|---|---|---|
| 1 (25/08/21) | BH05 | 3.62 / 2.17 | Tidal Flat Deposits | 3.0 – 4.0 |
| 2 (21/12/21) | | 3.21 / 2.58 | | 3.0 – 4.0 |
| 3 (24/01/22) | | 3.19 / 2.60 | | 3.0 – 4.0 |
| 4 (24/02/22) | | 3.06 / 2.73 | | 3.0 – 4.0 |
| 1 (31/5/23) | BH07 | 1.93 / 2.97 | Tidal Flat Deposits | 1.0 – 2.5 |
| 2 (19/06/23) | | 2.62 / 2.28 | | 1.0 – 2.5 |
| 3 (06/07/23) | | 2.88 / 2.02 | | 1.0 – 2.5 |
| 1 (31/5/23) | BH09 | Dry | River Terrace Deposits | 1.0 – 4.65 |
| 2 (19/06/23) | | 2.33 / 12.49 | | 1.0 – 4.65 |
| 3 (06/07/23) | | 2.28 / 12.54 | | 1.0 – 4.65 |
| 1 (26/03/24) | BH10 | 4.52 / 10.23 | Glacial Till | 2.0 – 8.0 |
| 2 (08/04/24) | | 4.24 / 10.51 | | 2.0 – 8.0 |
| 3 (22/04/24) | | 4.70 / 10.05 | | 2.0 – 8.0 |
| 1 (26/03/24) | BH11 | 6.10 / 8.32 | Glacial Till | 2.0 – 8.0 |
| 2 (08/04/24) | | 7.10 / 7.32 | | 2.0 – 8.0 |
| 3 (22/04/24) | | 7.12 / 7.30 | | 2.0 – 8.0 |
| 1 (26/03/24) | BH12 | 4.79 / 9.51 | Glacial Till | 1.0 – 8.0 |
| 2 (08/04/24) | | 4.93 / 9.37 | | 1.0 – 8.0 |
| 3 (22/04/24) | | 5.00 / 9.30 | | 1.0 – 8.0 |

Higher groundwater levels may be expected at different times of the year during higher rainfall periods.

## 4.8 Evidence of contamination

Visual observations of potential contamination were identified on the site during the 2022 and 2024 ground investigations [9], [13] and a summary is presented below in Table 4-5. The borehole logs are provided in the ground investigation factual reports in Appendix G.

Head-space screening for volatile organic compounds (VOCs) was undertaken during the 2022 ground investigation only using a photoionisation detector (PID) (MiniRAE 2000 VOC detector). A maximum recorded vapour concentration of 7.2 of parts per million (ppm) was identified at a depth of 0.07 to 0.12 m bgl in GBBH03, located in the southeast of the site. PID readings over 1 ppm are tabulated in Table 4-5.

Suspected asbestos containing materials (ACMs) were not visually identified within any locations excavated during the 2022, 2023 or 2024 ground investigations.

**Table 4-5 - Visual and olfactory observations and PID readings**

| Location | Area of the site | Strata | Strata Depth (m bgl) | Visual Observation | Max VOCs (ppm) in strata |
|---|---|---|---|---|---|
| GBBH01 | Central | Topsoil | 0.10 to 0.30 | - | 2.1 |
| GBBH02 | Central | Superficial | 0.40 to 0.80 | - | 1.2 |
| GBBH03 | South east | Made Ground | 0.08 to 0.12 | Fine to coarse slag gravel | 7.2 |

| Location | Area of the site | Strata | Strata Depth (m bgl) | Visual Observation | Max VOCs (ppm) in strata |
|---|---|---|---|---|---|
| | | | 0.12 to 0.50 | Rare fine to medium coal ash gravel | 4.2 |
| GBBH05 | North west | Made Ground | 0.35 to 0.70 | - | 2.7 |
| | | | 0.70 to 2.00 | Fine to coarse ash, slag and medium coal gravel | 5.6 |
| | | Superficial | 2.00 to 2.50 | - | 1.8 |
| GBHP01 | Central | Made Ground | 0.15 to 0.50 | Rare cobbles of slag. Fine to coarse ash and slag gravel | Not reported |
| GBHP01A | Central | Made Ground | 0.15 to 0.40 | Fine to coarse ash and slag gravel | Not reported |
| GBHP02 | South east | Made Ground | 0.30 to 0.70 | Low cobble content of slag. Fine to coarse ash and slag gravel | Not reported |
| GBHP03 | North west | Made Ground | 0.05 to 0.90 | Fine to coarse ash and slag gravel | Not reported |
| GBHP04 | North west | Made Ground | 0.15 to 0.80 | Low cobble content of slag. Fine to coarse ash and slag gravel | Not reported |
| GBHP05 | North west | Made Ground | 0.15 to 0.80 | Low cobble content of slag. Fine to coarse ash and slag gravel | Not reported |
| GBHP05A | North west | Made Ground | 0.15 to 0.80 | Low cobble content of slag. Fine to coarse ash and slag gravel | Not reported |
| GBTP02 | South east | Made Ground | 0.35 to 0.70 | - | 1.6 |
| GBTP03 | South east | Superficial | 0.45 to 0.80 | - | 2.3 |

| Location | Area of the site | Strata | Strata Depth (m bgl) | Visual Observation | Max VOCs (ppm) in strata |
|---|---|---|---|---|---|
| GBTP05 | North west | Made Ground | 0.40 to 2.50 | Fine to coarse ash and slag gravel | 4.9 |
| | | Superficial | 2.50 to 3.00 | - | 2.8 |
| GBTP05A | North West | Made Ground | 0.45 to 1.30 | Ash, slag and coal gravel | Not reported |
| GBTP06 | North west | Made Ground | 0.10 to 1.10 | - | 2.5 |
| | | | 1.10 to 1.50 | - | 2.5 |
| | | Superficial | 1.50 to 2.10 | - | 5.3 |
| GBTP06A | North West | Made Ground | 0.10 to 1.20 | Ash, slag and coal gravel | Not reported |
| GBTP10 | North west | Made Ground | 0.00 to 1.40 | Fine to coarse slag gravel | Not reported |
| GBTP10A | North west | Made Ground | 0.00 to 2.10 | Fine to coarse slag gravel | Not reported |

Note: '-' denotes that no visual observations of potential contamination were recorded.

# 5. Geotechnical parameters

## 5.1 Methodology

This section provides an assessment of the classification and geotechnical parameters of each stratum present at the Site for the purposes of informing future geotechnical design. Proposed geotechnical parameters have been determined primarily from interpretations of in situ and laboratory test data and recognised empirical relationships.

Consideration has also been given to values in published literature. Empirical relationships used for parameter derivation are summarised below:

- Weight densities have been based on material descriptions and recommendations in Figures 1 and 2 of BS8002:2015 [14].

- Undrained shear strength ($c_u$) has been determined for the cohesive material by in-situ hand vane tests and using correlations of the SPT N from Stroud and Butler (1975) and reported in in CIRIA guidance 143 [15]. Stroud and Butler suggest the relationship:

  $$c_u = f_1 \text{ , } \times N \text{ (kN/m}^2\text{)}$$

  where $c_u$ is the undrained shear strength (kN/m$^2$), N is the SPT blow count and $f_1$ , is a factor depending upon Tidal Flat Deposits (TFD) plasticity. For the TFD tested, the average $f_1$ ,value was 4.5

  $$c_u = 4.5 \times N \text{ (kN/m2)}$$

- Internal angle of friction, φ' – derived from standard relationships:
  - Granular soils – based on the relationships developed by Peck et al. (1974) and reported in Figure 36 of CIRIA 143 (1995) and the procedure outlined in BS8004 (2015) which considers grain angularity, uniformity coefficient of the soil grading and characteristic SPT 'N' values to determine the effective angle of shearing resistance.
  - Cohesive soils - where constant volume internal angle of friction, φ'cv, is derived from the equation provided by BS 8004 (2015), 42° – 12.5log10 (PI), where PI is the Plasticity Index.
  - Glacial till – angle of sharing resistance, $\varphi'_p$, has been derived from relationships with plasticity index reported in Figure 5.1 of CIRIA 504 (1999).

- Stiffness, Young's Modulus, E' – has been derived from SPT 'N' values, based on the relationships with undrained shear strength and plasticity index developed by Stroud (1974) and reported in CIRIA 143 (1995).
  - Granular soils, E' / N60 = 1 - 2 MPa. Conservatively taken as 1MPa for the purposes of this GIR.
  - Cohesive soils (predominantly London Clay), E' / N = 0.6 – 0.7 MPa, or based on correlation E' = 150Cu (Stroud and Butler, 1975).
  - Undrained Youngs Modulus has been derived based on correlations on the undrained shear strength (Cu) and the SPT N- value by Bowles [16]

- A concrete classification has been provided based on the design sulfate class (DS) and Aggressive Chemical Environment for Concrete (ACEC) classification for brownfield sites seen in table C2 within the BRE Special Digest [17]. The total potential sulfate ($SO_4$ %) and pH values acquired during the ground investigation have been used to determine the concrete classifications.

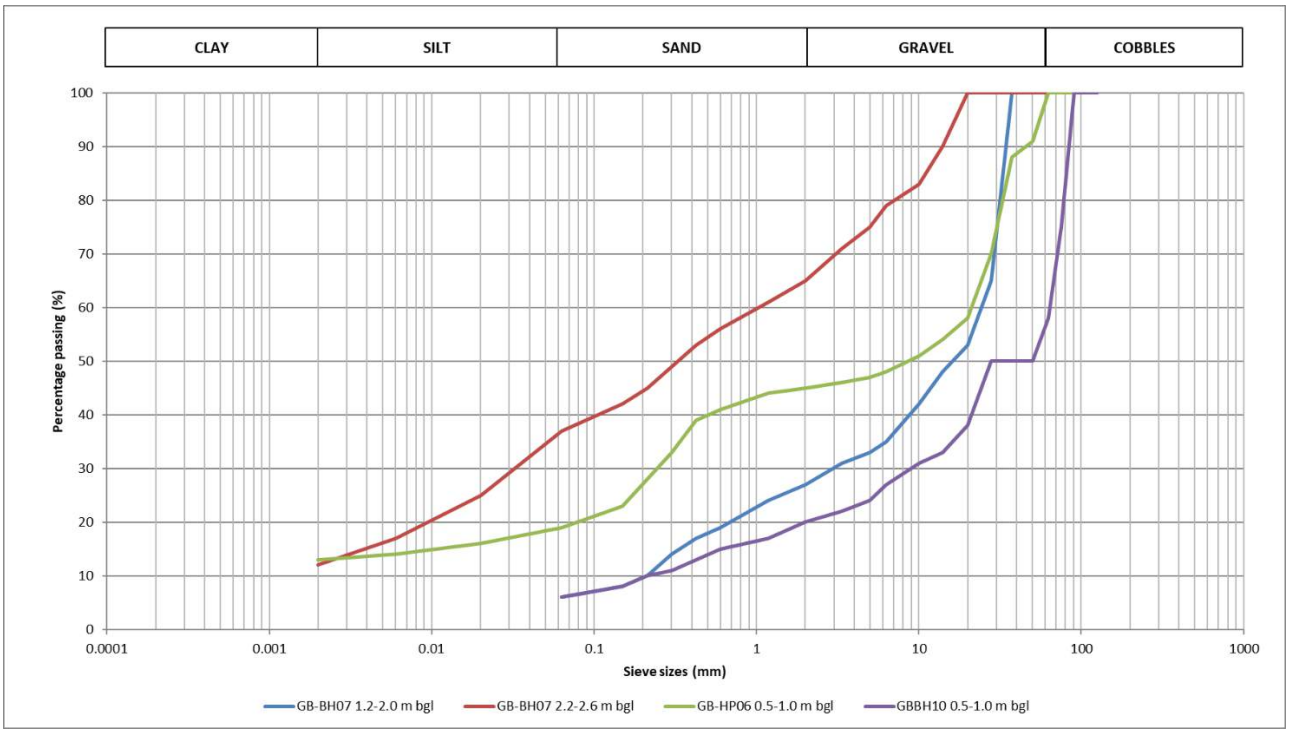
Third parties undertaking design based on the recommendations contained within this report, including the parameters, must satisfy themselves as to their accuracy, validity and applicability of the recommendations and parameters. Parameter plots are provided in Appendix F.

## 5.2 Made Ground - Granular

### 5.2.1 Classification

Four particle size distribution tests have been completed on the Made Ground in GB-BH07 and GB-HP06, during the 2023 GI, and GBBH10 in the 2024 GI. They are presented in Figure 5-1.

**Figure 5-1 - Particle size distribution in Made Ground**




The particle size distribution tests identified an overall majority gravels content. However, the sample from 2.2-2.6 m bgl in GB-BH07 identified a fines content of over 35%, therefore according to BS 6031:2009, it should classify as a fine soil. This was only encountered in one of the four samples so is not considered to be representative of the material. A cobbles content of 42% was identified in GBBH10, which can be associated with the Jersey Park play area. The majority of PSD tests and borehole log descriptions classify the made ground as granular, however, some cohesive material can be expected due to the variable nature of made ground.

The laboratory and in-situ test results undertaken on the Made Ground are summarised in Table 5-1 alongside chosen characteristic values.

**Table 5-1: Laboratory and in-situ test results in Made Ground**

| Laboratory / in-situ test results | | | Results range (no. of results/tests) | Characteristic value | Reference |
|---|---|---|---|---|---|
| Classification | Particle Size Distribution<br>*Cobbles (Co), Gravel (Gr), Sand (Sa), Fines (Fi), Silt (Si), Clay (Cl)* | % | Co = 42 (4)<br>Gr = 34 - 72 (4)<br>Sa = 14 - 29 (4)<br>Fi = 6 - 37 (4) | Co = 0-42<br>Gr = 34 – 72*<br>Sa = 14- 29*<br>Fi = 6-37* | |
| Classification | Moisture content | % | 14 - 43 (10) | 24 | |
| Classification | Liquid Limit | % | 34 - 86 (3) | 65 | |
| | Plastic Limit | % | 18 - 40 (3) | 30 | |
| | Plasticity Index | % | 16 - 46 (3) | 35 | |
| SPT N value | | Value | 2 – 50** (5) | 8 | |

*Material is highly heterogeneous and variable across site.
**SPT N of 50 is considered to be an outlier. The other four values can be found in the range of 2-14.

### 5.2.2 Effective stress parameters

The internal angle of friction, φ', has been interpreted from the relationships developed by Peck et al. (1974) and reported in Figure 36 of CIRIA 143 (1995). A characteristic constant volume angle of shearing resistance, φ' of 30° has been interpreted from a characteristic SPT N value of 8.

### 5.2.3 Bulk unit weight

No measurements of bulk unit weight were made on samples of Granular Made Ground. However, Tomlinson [18] suggests the bulk density of a gravel can range from 1.60 Mg/m$^3$ to 2.00 Mg/m$^3$. This equates to a range of bulk unit weight from 15.7 kN/m$^3$ to 19.6 kN/m$^3$. Figure 1 from BS 8004:2015 [19] suggests a range of unit weight for coarse engineered fill above the ground water table of 16 to 20 kN/m$^3$.

A characteristic value of 18 kN/m$^3$ is recommended for design.

### 5.2.4 Elastic modulus

No laboratory tests to determine elastic modulus were scheduled on samples of Made Ground.

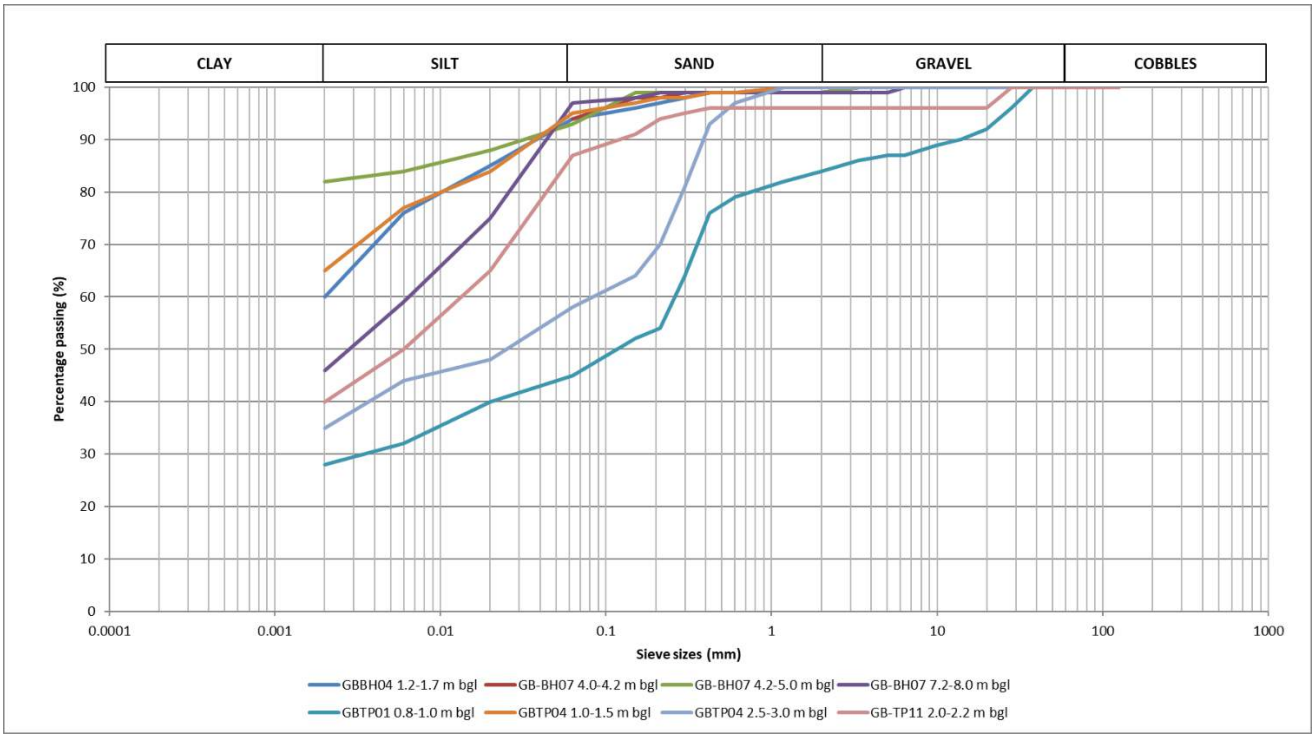
Drained elastic modulus has been estimated based on Ciria 143 [15] as E'= SPT $N_{60}$ value * 1. A characteristic SPT $N_{60}$ value of 8 has been used resulting in an E' value of 8 MPa.

## 5.3 Tidal Flat Deposits - Cohesive

### 5.3.1 Classification

Eight particle size distribution tests have been completed on the TFD in GBBH04, GB-BH07, GBTP01, GBTP04 and GB-TP11 from the 2021 and 2023 GIs. Five out of eight samples featured no gravel, and six out of eight samples had a fines content greater than 88%, indicating a highly cohesive material. The results of the particle size distribution tests are shown in Figure 5-2.

**Figure 5-2 Particle size distribution in Tidal Flat Deposit**




The in-situ SPT recorded three SPT N values of zero, indicating a very soft material. Two higher SPT N values of 21 and 26 were recorded. The SPT N of 21 in GBBH03 can be attributed to its proximity to the underlying dense gravel layer and the value of 26 in GBBH05 was recorded in peat, so it has been excluded from derivations. The laboratory and in-situ test results undertaken on the Tidal Flat Deposits are summarised in Table 5-2 alongside chosen characteristic values.

**Table 5-2: Laboratory and in-situ test results**

| Laboratory / in-situ test results | | | Results range (no. of results/tests) | Characteristic value | Reference |
|---|---|---|---|---|---|
| Classification | Particle Size Distribution<br>*Cobbles (Co), Gravel (Gr), Sand (Sa), Fines (Fi), Silt (Si), Clay (Cl)* | % | Gr = 0 - 16 (8)<br>Sa = 2 - 42 (8)<br>Fi = 45 - 98 (8) | Gr = 0<br>Sa = 7<br>Fi = 93 | |
| Classification | Moisture content | % | 18-529 (20) | 88 | |
| Classification | Liquid Limit | % | 38-110 (11) | 71 | |
| | Plastic Limit | % | 19-48 (11) | 34 | |
| | Plasticity Index | % | 19-62 (11) | 37 | |
| SPT N value | | Value | 0–26 (8) | 4 | |
| Hand shear vane | | kPa | Peak: 10-18 (6)<br>Residual: 6-10 (6) | Peak: 14<br>Residual: 8 | |
| BRE Classification | | Design Sulphate Class: DC-1<br>ACEC: AC-1 | | | [17] |

### 5.3.2 Effective stress parameters

The constant volume angle of shearing resistance has been calculated using the equation provided by BS 8002:2015, 42° – 12.5log10 (PI), where PI is the Plasticity Index. Based on the characteristic plasticity index of 37%, a characteristic constant volume angle of shearing resistance, $\varphi'_{cv}$ of 22° has been calculated.

### 5.3.3 Bulk unit weight

No measurements of bulk unit weight were made on samples of Tidal Flat Deposits. BS8002:2015 [20] suggests the bulk density of a medium to dense clay above the water table can range from 16.00 kN/m$^3$ to 20.00 kN/m$^3$.

A characteristic value of 18 kN/m$^3$ is recommended for design.

### 5.3.4 Undrained shear strength

Undrained shear strength was determined using the from Stroud and Butler (1975) method mentioned in 5.1. In total 8 SPT tests were carried out and 6 hand shear vane tests were carried out. A characteristic SPT N60 value of 4 correlates to an undrained shear strength of 18 kPa. A characteristic undrained shear strength, Cu, of 14 kPa can be determined from the hand shear vane tests.

Based on a combination of SPT correlations and hand shear vane tests, the characteristic undrained shear strength has been determined as 16 kPa for the purpose of this report.

### 5.3.5 Elastic modulus

No laboratory tests to determine elastic modulus were scheduled on samples of cohesive Tidal Flat Deposits.

The drained elastic modulus, E', has been estimated based on the characteristic value of plasticity index of 37% and an over consolidation ratio of 1 resulting in an Eu / Cu of 150 [15]. Therefore, an E' of 2.4 MPa has been derived.

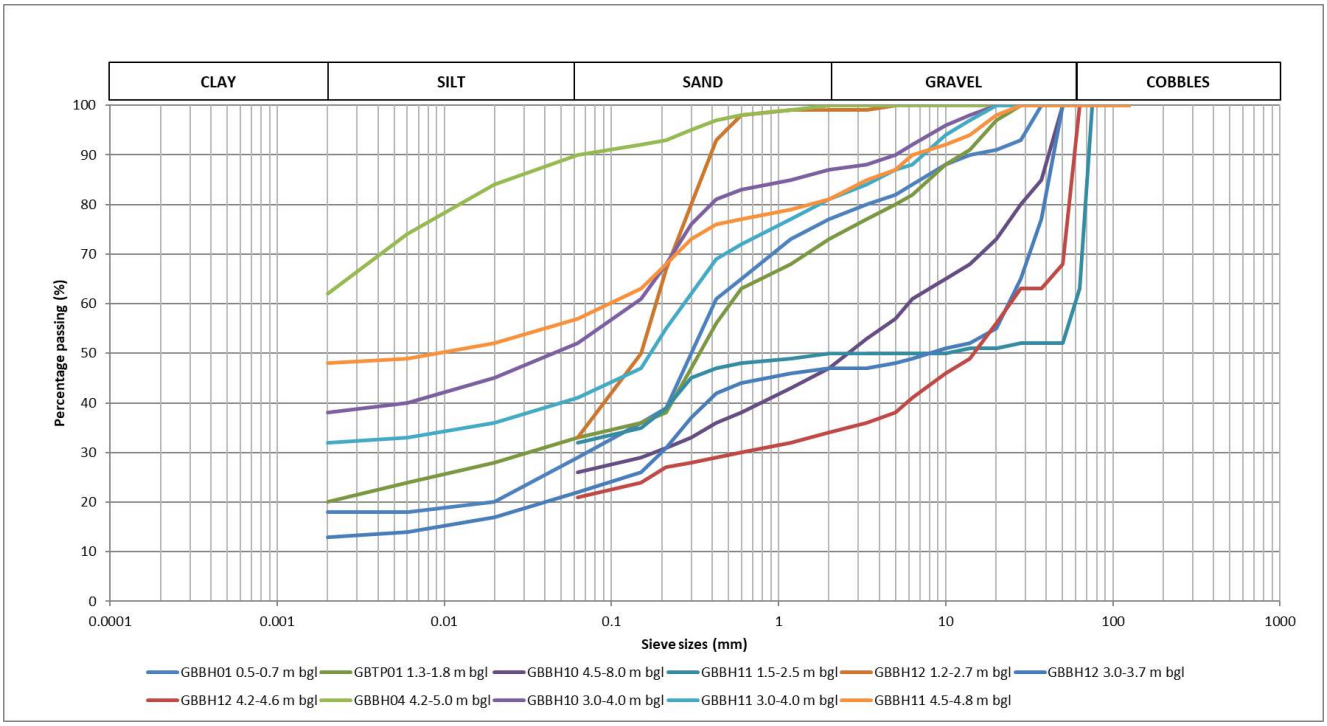
The undrained elastic modulus, Eu, has been derived from an Eu/Cu of 200 from Bowles, 1997 who describes normally consolidated sensitive clay to range from 200 to 500 x Cu. Therefore, the characteristic Cu value of 16 kPa for the TFD can be correlated to an Eu of 3.2 MPa.

## 5.4 Glacial Till Deposits

### 5.4.1 Classification

Due to the variable nature of Glacial Till, seven of the eleven particle size distribution tests completed in the Glacial Till deposits can be classified as granular and four as cohesive. The results of the particle size distribution tests are shown in Figure 5-3.

**Figure 5-3 Particle size distribution in the Till**




SPT N values varied within the heterogeneous material but were generally representative of a very stiff soil. SPT N results of 50 before going the full distance were found in 19 out of 31 of the tests.

The laboratory and in-situ test results undertaken on the Glacial Till Deposits are summarised in Table 5-3 alongside chosen characteristic values.

**Table 5-3: Laboratory and in-situ test results in TILL**

| Laboratory / in-situ test results | | | Results range (no. of results/tests) | Characteristic value | Reference |
|---|---|---|---|---|---|
| Classification | Particle Size Distribution<br>*Cobbles (Co), Gravel (Gr), Sand (Sa), Fines (Fi), Silt (Si), Clay (Cl)* | % | Gr = 0 – 66 (11)<br>Sa = 10 – 66 (11)<br>Fi = 21 – 90 (11) | No characteristic value – material is highly heterogeneous across the site | |
| Classification | Moisture Content | % | 1.5-22 (6) | 12 | |
| Classification | Liquid Limit | % | 33 (1) | 33 | |
| Classification | Plastic Limit | % | 21 (1) | 21 | |
| Classification | Plasticity Index | % | 12 (1) | 12 | |
| SPT N value | | Value | 0*-50 (31) | 40 | |
| BRE Classification | | Design Sulphate Class: DC-1<br>ACEC: AC-1 | | | [17] |

*SPT N of 0 encountered in GB-BH12 not considered representative.

### 5.4.2 Effective stress parameters

The internal angle of friction, $\varphi'_p$, has been interpreted from CIRIA 504. A characteristic plasticity index of 12 correlates to a peak internal angle of friction of 34º.

### 5.4.3 Bulk unit weight

No measurements of bulk unit weight were made on samples of Glacial Till deposits. BS8002:2015 [20] suggests the bulk density of a medium to dense gravel can range from 19.00 kN/m$^3$ to 23.00 kN/m$^3$.

A characteristic value of 20 kN/m$^3$ is recommended for design.

### 5.4.4 Elastic modulus

No laboratory tests to determine elastic modulus were scheduled on samples of Glacial Till deposits.

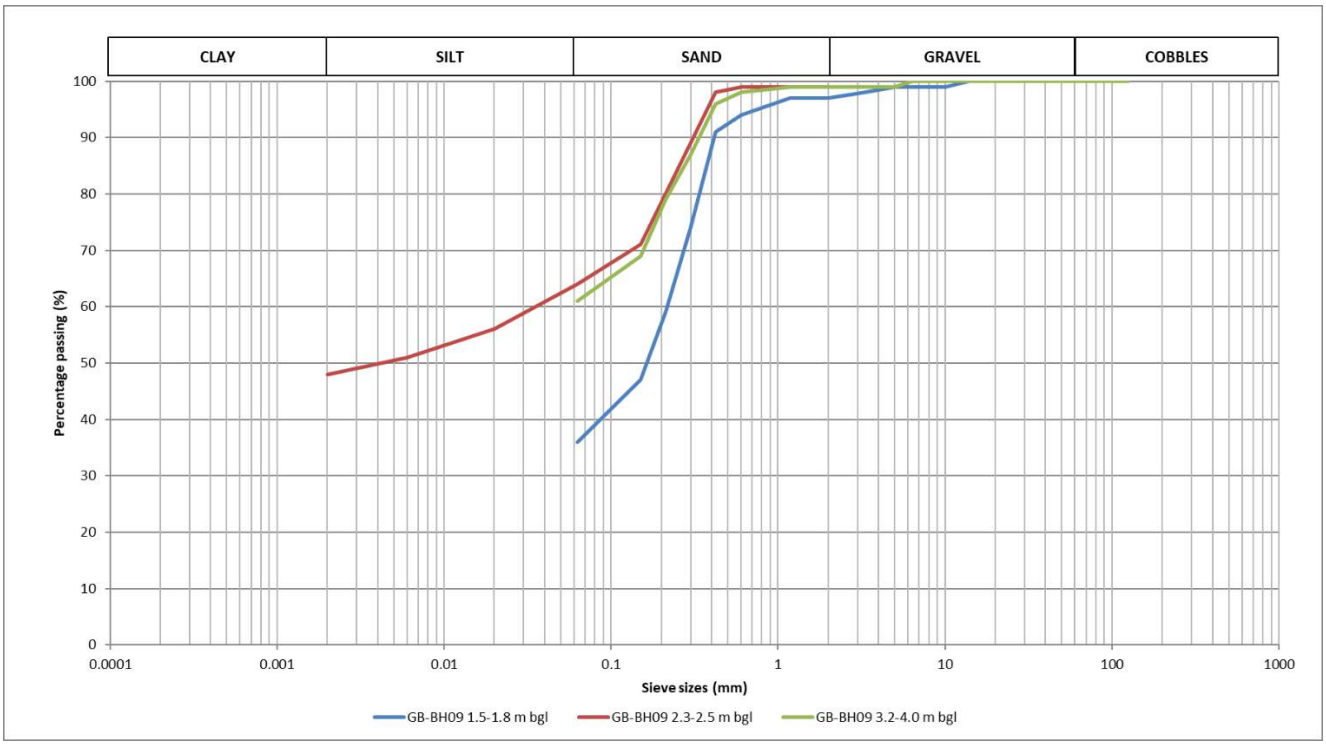
Drained elastic modulus has been estimated based on Ciria 143 [15] as E'= SPT N60 value * 1. A characteristic SPT N60 of 42 has been calculated from the lowest energy ratio recorded for the SPT test equipment used in glacial till, 64.13%, and the characteristic SPT N value of 40. Therefore, a drained elastic modulus of 42 MPa has been derived.

## 5.5 River Terrace Deposits - Cohesive

### 5.5.1 Classification

Three particle size distribution tests have been completed on the RTD in GB-BH09 during the 2023 GI. They are presented in Figure 5-4.

**Figure 5-4 Particle size distribution test in River Terrace Deposts**




The particle size distribution test identified an overall majority fines. SPT N values increased with depth as the superficial material transitioned from clay to gravel. SPT N values of 0 - 2 were recorded for the sand and clay, and values of 18 – 50 were recorded for the gravel. The soft layers of sand and clay were described as becoming gravel at 11.72 m AOD or 3.10 m bgl. This in contradiction to the results of the particle size distribution tests, however, corresponds to the change in SPT values observed.

The laboratory and in-situ test results undertaken on the River Terrace Deposits are summarised in Table 5-4 alongside chosen characteristic values.

**Table 5-4: Laboratory and in-situ test results River Terrace Deposts**

| Laboratory / in-situ test results | | | Results range (no. of results/tests) | Characteristic value | Reference |
|---|---|---|---|---|---|
| Classification | Particle Size Distribution<br>*Cobbles (Co), Gravel (Gr), Sand (Sa), Fines (Fi), Silt (Si), Clay (Cl)* | % | Gr = 0 – 2 (3)<br>Sa = 36 – 61 (3)<br>Fi = 37 – 62 (3) | Gr = 1<br>Sa = 44<br>Fi = 55 | |
| Classification | Moisture Content | % | 16-33 (2) | 25 | |
| Classification | Liquid Limit | % | 68 (1) | 68 | |
| Classification | Plastic Limit | % | 31 (1) | 31 | |
| Classification | Plasticity Index | % | 37 (1) | 37 | |
| SPT N value | | Value | 0 – 50 (5) | 15 | |

### 5.5.2 Effective stress parameters

The constant volume angle of shearing resistance has been calculated using the equation provided by BS 8002:2015, 42° – 12.5log10 (PI), where PI is the Plasticity Index. Based on the characteristic plasticity index of 37%, a characteristic constant volume angle of shearing resistance, $\varphi'_{cv}$ of 22° has been calculated.

### 5.5.3 Bulk unit weight

No measurements of bulk unit weight were made on samples of River Terrace Deposits. BS8002:2015 [20] suggests the bulk density of a medium to dense clay above the water table can range from 16.00 kN/m$^3$ to 20.00 kN/m$^3$.

A characteristic value of 18 kN/m$^3$ is recommended for design.

### 5.5.4 Undrained shear strength

The undrained shear strength, Cu, was determined using the from Stroud and Butler (1975) method mentioned in 5.1. In total five SPT tests were carried out. A characteristic SPT N60 of 18 has been calculated from the energy ratio recorded for the SPT test equipment used in TFD of 74.36%, and the characteristic SPT N value of 15. An SPT N60 value of 18 correlates to an undrained shear strength of 81 kPa.

### 5.5.5 Elastic modulus

No laboratory tests to determine elastic modulus were scheduled on samples of cohesive River Terrace Deposits.

The drained elastic modulus, E', has been estimated based on the characteristic value of plasticity index of 37% and an over consolidation ratio of 1 resulting in an Eu / Cu of 150 [15]. Therefore, an E' of 12.1 MPa has been derived.

The undrained elastic modulus, Eu, has been derived from an Eu/Cu of 200 from Bowles, 1997 who describes normally consolidated sensitive clay to range from 200 to 500 x Cu. Therefore, the characteristic Cu value of 81 kPa for the TFD can be correlated to an Eu value of 16.2 MPa.

## 5.6 Geotechnical parameter summary

Table 5-5 summarises the characteristic geotechnical parameters recommended for the strata identified in Section 4.

**Table 5-5: Recommended geotechnical parameters**

| Strata | | Shear strength | | | Stiffness | |
|---|---|---|---|---|---|---|
| | **Bulk Density, $\gamma$ ($kN/m^3$)** | **Effective angle of internal friction, $\varphi$' (°)** | **Effective cohesion, c' (kPa)** | **Undrained shear strength, $c_u$ (kPa)** | **Drained Young's Modulus, E' (MPa)** | **Undrained Young's Modulus, $E_u$ (MPa)** |
| Made Ground | 18 | 30 | 0 | - | 8 | - |
| Tidal Flat Deposits | 18 | 22 | 0 | 16 | 2.4 | 3.2 |
| Glacial Till | 20 | 34 | 0 | - | 42* | - |
| River Terrace Deposits | 18 | 22 | 0 | 81 | 12.1 | 16.2 |

*Highly variable material. See section 4.3 for Glacial Till description.

# 6. Land contamination assessment

## 6.1 Introduction

Land contamination is assessed though the development of a conceptual site model (CSM) which describes the links between contamination which may be present from current and historical activities on site (including any off-site activities from which contaminants may migrate onto a site), receptors to that contamination and pathways between the two.

Sources of contamination and associated contaminants, receptors to that contamination and the pathways are identified and assessed to determine whether all three are present or are likely to be present. If all three are present, then they form a potential contaminant linkage (PCL). These PCLs can then be subjected to the risk assessment process.

The approach adopted in this assessment is in accordance with the guidance presented in the Environment Agency Land Contamination: Risk Management (LCRM) document [21]. LCRM has been adopted by planning authorities and Natural Resources Wales for use in Wales.

LCRM provides a technical framework for identifying and remediating contamination through the application of a risk management process. The decision of whether a risk is unacceptable in a particular case involves not only scientific and technical assessment, but also appropriate criteria by which to judge the risk and conclude exactly what level of risk would be unacceptable. Decisions regarding a site may be informed by:

- Tier 1 preliminary risk assessment – typically a desk study review to develop a preliminary CSM (PCSM) with an assessment of risk considering the likelihood and severity of the potential consequences associated with the PCLs;
- Tier 2 Generic Quantitative Risk Assessment (GQRA), typically a review of ground investigation and monitoring data, development / refinement of the CSM with an assessment of risk using precautionary Generic Assessment Criteria (GAC) relevant to the PCLs that represent minimal or tolerable risk; and
- Tier 3 Detailed Quantitative Risk Assessment (DQRA).

A Tier 1 PCSM assessment was prepared as part of the AtkinsRéalis 2020 Desk Study [22] which is still considered to be releveant based on limited design scope change. This section comprises a Tier 2 GQRA which updates the PCSM by considering the potential risks to identified plausible receptors from contaminant concentrations detected in the 2022, 2023 and 2024 ground investigations.

It should be noted that under current health and safety legislation, construction and maintenance workers are required to carry out appropriate risk assessments and instigate appropriate mitigating measures to protect themselves, other human receptors and the environment from contamination that may be present. Such risks must be adequately mitigated by the measures required under current legislation, specifically the Construction Design Management (CDM) Regulations [23], which requires that potential risks to human health and the environment from construction activities are appropriately identified and all necessary steps taken to eliminate / manage that risk. On this basis, it been assumed that personal protective equipment (PPE) and health and safety best practices will be adopted during the construction works.

## 6.2 Preliminary conceptual site model

### 6.2.1 Potential sources of contamination

Based on the available information detailed in Section 2 and updated following the Quantum Geotechnic Ltd 2022, 2023, 2024 and Spencer Quantum Ltd 2024 ground investigations, the following sources of contamination have been identified:

#### 6.2.1.1 On-site

Historical and current potentially contaminative activities which could give rise to contaminants in, on, or under the ground comprise:

- Made Ground including asbestos with the south-western boundary of the Ysgol Carreg Hir site;
- Made Ground of unknown provenance from the construction of the existing culvert, general infrastructure, sports facilities and residential properties;
- spills/leaks of oils on roads/landscaped areas;
- atmospheric fall out of exhaust contaminants from road traffic comprising inorganics and heavy metals;
- Shallow soils in playing fields/parks that may contain a range of organic and inorganic contaminants; and,
- potentially contaminated perched water/groundwater underlying the site.

#### 6.2.1.2 Off-site

Contaminants from off-site sources would have to migrate to the site, generally in windblown, soil-derived dust, entrained in surface water run-off, in migrating groundwater and as migrating ground/landfill gas and vapours. Potential off-site sources of contamination which may have affected or affect the sites include:

- Made Ground of unknown provenance associated with the construction of nearby residential and commercial properties;
- Made Ground associated with decomposition in the cemetery adjacent to the south of the site which may contain a range of microbial, inorganic and metal contaminants and a source of ground gas;
- surface water run-off from nearby roads which may contain a range of organic contaminants;
- surface water run-off and shallow perched water / groundwater from the adjacent playing fields/parks; and,
- potentially contaminated groundwater associated with off-site industry (disused colliery north-east of the site).

### 6.2.2 Potential receptors

The potential receptors depend upon the current and proposed end use of the site. The site predominately comprises a residential suburban area with parks and is proposed to be used for surface water drainage with infrequent access for maintenance and use of sports fields and facilities. On this basis, the following receptors have been identified as having potential for impact.

#### 6.2.2.1 Human

Potential human receptors are considered to comprise:

- on-site users (pedestrians/users of playing fields/parks);
- on-site users (future maintenance / construction workers);
- on-site users on Ysgol Carreg Hir site (future maintenance / construction workers and,
- off-site users (users of adjacent residential properties, roads and playing fields).

It has been assumed that personal protective equipment (PPE) and health & safety best practices will be adopted during the construction works and therefore acute risks to construction workers / site visitors have not been considered further.

#### 6.2.2.2 Controlled waters

Potential controlled waters receptors are considered to comprise:

- surface watercourses (culverts, drains and nearby brooks);
- groundwater within the superficial (Glacial Till) Secondary Undifferentiated Aquifer;
- groundwater within the superficial (Tidal Flat Deposits) Secondary A Aquifer; and,
- groundwater within the bedrock (Pennant Sandstone Formation: Brithdir Member / Hughes Member) Secondary A Aquifer.

#### 6.2.2.3 Property

Potential property receptors are considered to comprise:

- existing and future below ground infrastructure (drainage); and,
- off-site properties (residential and commercial).

### 6.2.3 Potential migration / exposure pathways

The potential pathways depend upon the current and proposed end use of the site. The site predominately comprises open fields and tarmac roads. On this basis, the following potential pathways have been identified.

#### 6.2.3.1 Human health

The identified human receptors could be exposed to potential contamination through the following pathways:

- dermal contact / ingestion / inhalation of contaminants in soil and soil-derived dust;
- dermal contact / ingestion of contaminants in groundwater within excavations;
- Inhalation of ground gas / vapours; and
- off-site migration of contaminants in soil derived dust and run-off followed by dermal contact / inhalation / ingestion.

#### 6.2.3.2 Controlled waters

The identified controlled waters receptors may be affected by potential contamination by the following pathways:

- leaching or dissolution of contaminants in soils and subsequent migration of contaminants in groundwater;
- vertical migration of dissolved phase contaminants to the underlying groundwater;
- lateral migration of dissolved phase contaminants in groundwater to surface water;
- lateral migration of dissolved phase contaminants via preferential pathways such as drains; and,
- migration of contaminants in surface water runoff.

#### 6.2.3.3 Property

The identified property receptors may be affected by the following pathways:

- direct contact of contaminated soils/water with infrastructure, services and structures and subsequent chemical attack; and,
- direct contact of migrating contaminated groundwater within infrastructure, services and structures; and,
- migration of ground gases and accumulation in below ground chambers and infrastructure.

The Tier 1 PCSM presented in the AtkinsRéalis 2020 Desk Study [22] identified PCLs with low risks associated with human health and moderate risks associated with controlled waters receptors from Made Ground sources (on-site and off-site), based on a medium consequence and likely probability in accordance with risk assessment guidance in CIRIA 552 [24].

These risks are further assessed in the Tier 2 generic quantitative risk assessment presented in the sections below.

## 6.3 Generic quantitative risk assessment

### 6.3.1 Selection of human health Generic Assessment Criteria

In order to evaluate potential risks to human health from site soils via direct contact exposure (inhalation of dust, ingestion and dermal contact), soil data have been screened against Category 4 Screening Levels (C4SLs) and AtkinsRéalis' soil screening values (SSVs), collectively termed Generic Assessment Criteria

(GAC). Based on identified on-site and off-site human receptors under the current and proposed land use soil data have been screened against GAC deemed protective of a public open space (residential) land use.

AtkinsRéalis has produced SSVs for a variety of land uses based on soil organic matter (SOM) contents of 1 % and 6 %. The 1 % values provide more conservative SSVs and are based on a sandy soil type, whereas the 6 % values are based on a sandy loam soil type (the default within Science Report (SR) 3 [25]). A total of 28 soil samples from the current ground investigation were analysed for organic matter content. The mean organic matter content was 15.2%. The 6% SOM SSVs have therefore been applied to the assessment.

Category 4 Screening Levels (C4SLs) are modelled using Contaminated Land Exposure Assessment (CLEA) v1.07 for standard land uses and are concentrations of contamination in soil (with 6 % SOM) which are considered by DEFRA to represent a 'low risk' derived from updated exposure assessment parameters and toxicological data based on a 'Low Level of Toxicological Concern' [26]. As per the accompanying Policy Statement, DEFRA state that:

*"A Low Level of Toxicological Concern represents an exposure equivalent to an intake of low concern but that definitely does not approach an intake level that could be defined as causing a Significant Possibility of Significant Harm to human health".*

The C4SLs were derived based on remaining 'strongly precautionary' for the purposes of generic screening and with exception to benzene the change in SOM (to 6%) does not affect the criteria derivation. Therefore, where considered appropriate, AtkinsRéalis has adopted C4SLs for the nine contaminants for which data is available including: arsenic, benzene, cadmium, chromium VI, lead vinyl chloride, naphthalene, trichloroethylene (TCE) and tetrachloroethene (PCE).

PAHs have been assessed using benzo(a)pyrene (BaP) as a surrogate marker. The ratio of the concentrations of genotoxic PAH compounds has been compared against the upper and lower limits as set out on the C4SL guidance. The data indicate that the ratios to BaP are within the limits as defined in the toxicological study. Therefore, BaP is likely to be from the same source and so can be used as a marker compound for other genotoxic compounds in the assessment.

AtkinsRéalis has derived SSVs for a number of volatile and potentially volatile contaminants based on both soil saturation limits (where the contaminant will theoretically reach saturation and form free phase product), and health-based modelled values (given by the CLEA model [27]) which can be used where site conditions indicate saturation has not been reached and no free phase product exists. No free product was identified in the soils during the ground investigation, and therefore the health-based modelled values given by CLEA have been used.

Potential acute risks resulting from short term exposure of by construction workers to contamination involved with the proposed development cannot be assessed using these GACs because they relate to the long-term (chronic) risk. Risks to construction workers should be managed by the contractor through their Construction Environmental Management Plans (CEMPs) and as a minimum should include the use of appropriate Personal Protective Equipment (PPE) and appropriate working methods.

It should be noted that the GAC may change as new policy and technical guidance, including toxicological data, are published by Natural Resources Wales and other authoritative sources, but they are valid at the time of writing.

### 6.3.2 Comparison of soil concentration data with human health Generic Assessment Criteria

A total of 28 samples, collected between the depths of 0.3 and 1.50 m bgl, were screened against GAC considerate of a public open space (residential) land use. A total of 11 soil samples recorded concentrations to exceed the GAC for three constituents: arsenic, lead and aromatic TPH. A summary is provided in Table 6-1 below.

The soils screening assessment is provided in Appendix I.

**Table 6-1 - Summary of exceedances against GAC**

| Constituent | Unit | GAC (mg/kg) | No. of samples | Min value (mg/kg) | Max Value (mg/kg) | No. of exceedances | Locations and depth (m bgl) of exceedances |
|---|---|---|---|---|---|---|---|
| Arsenic | mg/kg | 79.1 | 26 | 2.5 | 1400 | 4 | GBBH10, 0.5m; GBBH11, 0.5m; GBBH12, 0.25m; GBBH12, 0.8m |
| Lead | mg/kg | 625 | 26 | 8.1 | 14000 | 6 | GBBH05, 1.00m; GBBH07, 1.20m; GBBH10, 0.5m; GBBH11, 0.5m; GBBH12, 0.25m; GBBH12, 0.8m |
| Aromatic TPH >C21-C35 | mg/kg | 3770 | 26 | <0.1 | 4900 | 1 | GBH03, 0.5m |

### 6.3.3 Asbestos

Asbestos screening was completed on all 28 soil samples analysed during the 2022, 2023 and 2024 ground investigations. No loose fibres or asbestos containing materials (ACMs) were identified within the soil matrix of the samples analysed.

## 6.4 Ground gas assessment

A preliminary ground gas risk assessment has been undertaken in accordance with BS 8485:2015+2019 [28] code of practice for design of protective measures for methane and carbon dioxide ground gases for buildings. This guidance provides a semi-quantitative assessment methodology for assessing the risk of permanent ground gas generation to buildings which is considered an appropriate approach for the proposed design.

BS8485:2015+2019 states that hazardous gas flow rates (Qhg) should be calculated for methane and carbon dioxide for every borehole for each visit and suggests the Qhgs be presented alongside the gas monitoring results in a database. Qhg is calculated using the maximum gas concentration recorded (unless lower values can be justified) and the steady state flow rate using the formula:

Qhg (l/hr) = flow rate (l/hr) x [gas concentration (%) / 100]

The Gas Screening Value (GSV) is the flow rate of a specific hazardous gas considered to be representative of a site, following assessment of all borehole concentrations and gas flow rates, whilst taking account of other influencing factors. Such factors being, for example, whether a response zone was completed flooded (which can compromise gas data), the temporal/spatial nature of the data set and the acute one-off nature of the risk.

A decision must be made to determine whether the maximum Qhg in the dataset is appropriate to represent the site (and thereby be selected as the GSV), or whether maximum gas concentrations and maximum steady state flow rates should be combined from any borehole/visit to derive a “worst case GSV”.

The GSV considered representative for the site is then used to select a Characteristic Situation (CS), which is the ground gas regime assumed for design of gas protection measures for new buildings in accordance with BS8485:2015+2019. The GSVs and CS are presented in Table 6-2.

Adopting a GSV based on peak flow measurements (i.e. those measured initially after the gas tap is opened) might result in a disproportionately high gas hazard prediction and assignment of an over-precautionary GSV and Characteristic Situation (CS), leading to overly conservative gas protection measures being incorporated into the development.

BS8485:2015+2019 does not include an approach for assessing carbon monoxide or hydrogen sulphide. The relevant Workplace Exposure Limits (WELs) as outlined within the HSE EH40/2005 (2012) document [29]has been adopted for use in a preliminary assessment of carbon monoxide and hydrogen sulphide. The WELs used for carbon monoxide and hydrogen sulphide have been provided below:

- carbon monoxide: 30 parts per million (ppm) for long-term (eight hours) exposure limit and 200 pp m for short-term (15 minutes) exposure limit.
- hydrogen sulphide: 5 ppm for the long-term exposure limit and 10 ppm for the short-term exposure limit.

**Table 6-2 – Site characteristic GSV and associated characteristic situation**

| CS | Risk Classification | GSV (l/hr) | Additional Factors |
|---|---|---|---|
| 1 | Very Low Risk | <0.07 | Typical methane <1 % and/or carbon dioxide <5 %. Otherwise consider increase to characteristic Situation 2. |
| 2 | Low Risk | <0.7 | Borehole air flow rate not to exceed 70 l/hr.<br>Otherwise consider increase to Characteristic Situation 3 |
| 3 | Moderate Risk | <3.5 | - |
| 4 | Moderate to High Risk | <15 | Quantitative risk assessment required to evaluate scope of protective measure |
| 5 | High Risk | <70 | - |
| 6 | Very High Risk | >70 | - |

Note: '-' denotes where a combination of protective measures are required

## 6.4.1 Carbon dioxide and methane results

Four rounds of ground gas monitoring were undertaken by Quantum Geotechnics Ltd in locations GBBH04 and GBBH05 during August 2021, December 2021, January 2022 and February 2022. Three rounds of ground gas monitoring were undertaken by Quantum Geotechnics Ltd in locations GBBH07 and GBBH09 in May 2023, July 2023 and July 2023. Ground gas monitoring records are provided within the ground investigation factual reports provided in Appendix G.

The Qhg of each monitoring well has been calculated and a summary of the maximum gas concentrations and steady state flow rates for each monitoring location is presented in Table 6-3.

**Table 6-3 – Ground gas assessment**

| Location | Max. Peak Recorded conc. (% v/v) | | Max. Steady State Flow Rate (l/hr) | Qhg (l/hr) calculated for each well* | | Gas Screening Value (l/hr) | Response Zone Flooded? |
|---|---|---|---|---|---|---|---|
| | Carbon Dioxide | Methane | | Carbon Dioxide | Methane | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| GBBH04 | 0.2 | 0.1 | 0.1 | 0.0002 | 0.0001 | <0.07 (CS1) | Partial |
| GBBH05 | 0.2 | 0.1 | 0.2 | 0.0004 | 0.002 | <0.07 (CS1) | No |
| GBBH07 | 4.1 | 0.1 | 0.4 | 0.00164 | 0.0004 | <0.07 (CS1) | No |
| GBBH09 | 3.7 | 0.1 | 0.5 | 0.0185 | 0.0005 | <0.07 (CS1) | Partial |

Note: '*' denotes that maximum gas concentrations combined with maximum steady state flow recorded on any site visit

Where methane rates were recorded as 0.0 % v/v, a value of 0.1 has been used to calculate the Qhg.

The potential sources of ground gas comprise the Made Ground and Peat underlying the site.

Methane concentrations were recorded as <0.1 % in all of the monitoring wells. The maximum carbon dioxide concentration was recorded as 4.1% in GBBH07 during the second monitoring round in June 2023.

The maximum flow rate of 0.5 l/hr was recorded within exploratory hole GBBH07 during monitoring round one in May 2023 which was a period of relatively high atmospheric pressure (1029 mBar). Atmospheric pressures ranged between 943 and 1012 mBar during the 2021 to 2022 monitoring rounds in periods of rising pressure. Atmospheric pressures ranged between 1011 and 1029 mBar during the 2023 monitoring during the monitoring rounds in periods of high atmospheric pressure.

In assessing the ground gas monitoring results, it should be considered that flooding of the response zone can affect the measured concentrations of gases through release of gases in the dissolved phase from groundwater, rather than from soils. Rising of groundwater levels can also result in an increase in recorded ground gas concentrations through displacement of gases from the soil matrix.

In GBBH04, the response zone, installed within sandstone, ranges between 1.00 and 8.00 m bgl and groundwater was recorded between 2.39 and 2.53 m bgl across the three monitoring rounds, indicating that the response zone was partially flooded.

The response zone for GBBH05, installed within peat ,was not flooded across the four monitoring rounds.

The response zones for GBBH07 and GBBH09 were installed within Made Ground between 1.00 and 4.65 m bgl and groundwater was recorded between 1.93 and 2.88 m bgl across the three monitoring rounds, indicating that the response zone was partially flooded.

Based on the results, the Characteristic Situation for the site has been assessed as CS1 (very low risk) and typically no special precautions against ground gas are required for new development for this category.

### 6.4.2 Carbon monoxide and hydrogen sulphide

The highest concentration of carbon monoxide recorded was 1 ppm during monitoring round one in GBBH05 and monitoring round two in GBBH04. Concentrations of hydrogen sulphide were recorded below the instrument's limit of detection in all other recorded monitoring locations in all monitoring rounds.

### 6.4.3 Summary of human health GQRA

There were 28 soil samples analysed for a range chemical analytes across the site. A total of 11 soil samples recorded concentrations to exceed the GAC for a public open space (parks) land use for arsenic, lead and TPH.

Lead was identified to exceed the GAC in GBBH05 at 1.00 m bgl located in the northwest of the site and in GBBH10 at 0.5 m bgl, GBBH11 at 0.5 m bgl, GBBH12 at 0.25 m and 0.8 m bgl, GBBH07 at 1.2 m bgl located in the south of the site. The highest reported lead concentration was 14,000 mg/kg in GBBH12 at 0.8 m which is two orders of magnitude above the GAC, 625 mg/kg.

It is considered that the Made Ground is the likely source of the lead exceedance across the site with slag identified within corresponding Made Ground locations . Topsoil was identified in GBBH05 to 0.30 m, tarmac was identified in GBBH10 and GBBH12 to 0.08 m and concrete in GBBH11 to 0.07 m bgl. The surface cover at each location would be expected to act as a potential pathway barrier to human health receptors through encapsulation of the underlying soils. It is understood that the surface cover post development will also comprise hardtsanding / and or vegetated landscaping.

Arsenic was identified to exceed the GAC in GBBH10 at 0.5 m bgl, GBBH11 at 0.5 m bgl, GBBH12 at 0.25 m and 0.8 m bgl, all located in the south of the site.  The highest reported arsenic concentration was 1,400 mg/kg, two orders of magnitude above the GAC, 79.1 mg/kg. It is considered that the Made Ground is the likely source of the arsenic exceedances across the site with slag identified within the Made Ground . Tarmac was identified at GBBH10 and GBBH12 to 0.08m and concrete at GBBH11 to 0.07 m bgl. The surface cover at each location acts as a potential pathway barrier to human health receptors through encapsulation of the underlying soils.

A single exceedance of aromatic TPH >C21-C35 was reported in a single isolated sample from GBBH03 at 0.5 m bgl, located in the south west of the site. The reported concentration was 4,900 mg/kg which is within the same order of magnitude of the GAC screening value of 3770 mg/kg. Rare gravel of ash and coal is reported within the exploratory log at GBBH03 within the depth range of the sample and is considered the likely source of the exceedance. Surface cover of tarmac was also identified at this location of 0.08 m in thickness, acting as a potential pathway barrier to human health receptors.

Considering the discussion above, the recorded concentrations of arsenic, lead and TPH in shallow soils is unlikely to pose an unacceptable risk to human health receptors.  Hardstanding is located across the site and is understood to remain in place under normal site conditions following development. The hardstanding will encapsulate the underlying soils and consequently, direct contact, ingestion and dust inhalation pathways to receptors would be absent.

The ground gas regime at the site has been classified as CS1 (very low risk), which typically does not require special gas protection measures to be incorporated within buildings / structures. The highest PID was recorded in GBBH03, located in the south east of the site at a depth of 0.08 m to 0.12 m bgl which recorded at 7.2 ppm. It is considered that the risk from vapours is low on the basis that no evidence of significant volatile contamination was reported in the logs, no readings over 10pm were reported and volatiles will likely vent naturally to the atmosphere.

## 6.5 Controlled waters Generic Quantitative Risk Assessment

The controlled waters GQRA has been designed to assess the potential risks posed to the identified controlled waters receptors from the migration of contaminants from identified on-site sources. To assess potential risks to the identified receptors, a comparison of soil leachate and groundwater analysis against pertinent water quality standards (WQS) has been undertaken.

The screening criteria for controlled waters assessment are dependent on the nature of the key receptor(s).

Superficial deposits underlying the site comprise Glacial Till and Tidal Flat Deposits which are classified as Secondary A aquifers. Bedrock underlying the site comprises the Pennant Sandstone Formation is classified as a Secondary A aquifer.

The nearest surface watercourses are the Ynysymaerdy Brook and Grandison Brook which are located adjacent to the south and west of the site respectively.

Considering the hydrological and hydrogeological regime as summarised above, both surface water and groundwater are primary receptors for potential contamination. Soil leachate and groundwater monitoring data has been screened against Water Quality Standards (WQS) comprising Environmental Quality Standards for inland freshwater (EQS) [30], protective of aquatic life in surface water and Drinking Water Standards (DWS) [31] protective of groundwater.

The bioavailability of certain metals (copper, lead, nickel, zinc) varies depending on the hydrochemical characteristics of the receiving surface water body. Published EQS values are unadjusted values which assume 100% bioavailability and are therefore highly conservative. Therefore, site specific Predicted No Effect Concentrations (PNEC) values have been derived using the WFD-UK rivers and lakes metal bioavailability assessment tool (mBAT) [32] to define site-specific EQS that accounts for the bioavailability for each relevant metal. The receiving water parameters were defined by surface water samples collected from the nearby brooks, upstream and downstream of the site. The location of the surface water samples taken are presented in within the Quantum Geotechnic Ltd 2022 report [9], included in Appendix G. The mBAT analysis is presented in Appendix I.

## 6.5.1 Comparison of soil leachate concentrations with WQS

There were 17 soil samples from the 2022, 2023 and 2024 ground investigations recovered from a range of depths between 0.3 and 1.20 m bgl in Made Ground and natural strata and subject to soil leachate analysis.

### 6.5.1.1 Comparison of soil leachate data with EQS values

The screening of the analytical results from the 17 soil-leachate samples shows that concentrations of ammoniacal nitrogen, nitrite, copper, mercury, manganese, nickel, lead, vanadium, zinc, iron, hexavalent chromium, fluoranthene, aliphatic TPH >$C_{21}$-$C_{35}$, aromatic TPH >$C_{12}$-$C_{16}$ and aromatic TPH >$C_{21}$-$C_{35}$ exceed the EQS values.

All of the soil leachate EQS exceedances are within one order of magnitude of the EQS screening value.

A summary of the EQS soil leachate exceedances are summarised in Table 6-4 below.

**Table 6-4 – Soil leachate EQS exceedances**

| Constituent | Units | EQS (mg/l) | Number of samples | Minimum concentration (mg/l) | Maximum concentration (mg/l) | Number of exceedances | Location & Depth (m bgl) |
|---|---|---|---|---|---|---|---|
| Ammoniacal Nitrogen | mg/l | 0.2 | 17 | <0.05 | 1.3 | 2 | GBBH02, 0.50m; GBBH12, 0.8m |
| Nitrite | mg/l | 0.01 | 17 | <0.02 | 0.038 | 3 | GBH01, 0.5m; GBBH02, 0.50m; GBH03, 0.5m |
| Copper | mg/l | 0.007 | 17 | 0.0016 | 0.11 | 5 | GBBH04, 0.5m, GBBH05,1.00m; HP05, 0.3m; GBTP04, |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | 0.5m;GBBH12, 0.8m |
| Mercury | mg/l | 0.00007 | 17 | <0.00005 | 0.00042 | 2 | GBH03, 0.5m; GBTP04, 0.5m |
| Manganese | mg/l | 0.18 | 17 | 0.00096 | 0.31 | 1 | GBBH02, 0.50m |
| Nickel | mg/l | 0.006 | 17 | <0.0005 | 0.013 | 2 | GBTP04, 0.5m; GBBH04, 0.5m; |
| Lead | mg/l | 0.00342 | 17 | <0.0005 | 0.093 | 7 | GBBH04, 0.5m; GBBH05, 1.00m; GBTP04, 0.5m; GBBH09, 0.7m; GBBH07, 0.3m; GBBH10, 0.5m; GBBH12, 0.8m |
| Vanadium | mg/l | 0.02 | 17 | <0.0005 | 0.024 | 1 | GBTP04, 0.5m |
| Zinc | mg/l | 0.019 | 17 | <0.0025 | 0.03 | 5 | GBBH04, 0.5m; GBTP04, 0.5m; GB-BH09, 0.7m; GB-BH07, 0.3m; GBBH10, 0.5m |
| Iron (Dissolved) | mg/l | 1 | 17 | <0.005 | 12 | 5 | GBBH02, 0.50m; GBH01, 0.5m; GBTP04, 0.5m; GBBH04, 0.5m GBBH12, 0.8m |
| Chromium (Hexavalent) | mg/l | 0.0034 | 17 | <0.02 | 0.022 | 1 | GBTP04, 0.5m |
| Fluoranthene | mg/l | 0.0000063 | 17 | <0.0001 | 0.0064 | 1 | GBBH10, 0.5m |
| Aliphatic TPH >$C_{21}$-$C_{35}$ | mg/l | 0.01 | 17 | <0.0001 | 0.12 | 3 | HP02, 0.50m; HP02, 1.00m; GBH01, 0.40m |
| Aromatic TPH >$C_{12}$-$C_{16}$ | mg/l | 0.01 | 17 | <0.0001 | 0.42 | 3 | HP02, 0.50m; HP02, 1.00m; GBH01, 0.40m |
| Aromatic TPH >$C_{21}$-$C_{35}$ | mg/l | 0.01 | 17 | <0.0001 | 1.5 | 3 | HP02, 0.50m; HP02, 1.00m; GBH01, 0.40m |

#### 6.5.1.2 Comparison of soil leachate data with DWS values

The screening of the analytical results from the 17 soil-leachate samples identified concentrations of ammoniacal nitrogen, cyanide (total), cyanide (complex), aluminium, arsenic, manganese, lead, antinomy, iron, aromatic TPH >$C_{12}$-$C_{16}$ and aromatic TPH >$C_{21}$-$C_{35}$ to exceed the DWS values.

All of the soil leachate DWS exceedances are within one order of magnitude of the DWS screening value.

A summary of the DWS soil leachate exceedances are summarised in Table 6-5 below.

**Table 6-5 – Soil leachate DWS exceedances**

| Constituent | Units | DWS (mg/l) | Number of samples | Minimum concentration (mg/l) | Maximum concentration (mg/l) | Number of exceedances | Location & Depth (m bgl) |
|---|---|---|---|---|---|---|---|
| Ammoniacal Nitrogen | mg/l | 0.39 | 17 | <0.05 | 1.3 | 2 | GBBH02, 0.50m; GBBH12, 0.8m |
| Cyanide (Total) | mg/l | 0.05 | 17 | <0.05 | 0.25 | 1 | GBTP04, 0.5m |
| Cyanide (Complex) | mg/l | 0.05 | 17 | <0.05 | 0.25 | 1 | GBTP04, 0.5m |
| Aluminium | mg/l | 0.2 | 17 | 0.0087 | 7.9 | 5 | GBBH02, 0.50m; GBH01, 0.5m; GBTP04, 0.5m; GBBH04, 0.5m; GBBH12, 0.8m |
| Arsenic | mg/l | 0.01 | 17 | 0.001 | 0.036 | 5 | GBH03, 0.5m; HP02, 0.50m; GBTP04, 0.5m; GBBH10, 0.5m; GBBH12, 0.8m |
| Manganese | mg/l | 0.05 | 17 | 0.00096 | 0.31 | 3 | GBBH02, 0.50m; GBTP04, 0.5m; GBBH12, 0.8m |
| Lead | mg/l | 0.01 | 17 | <0.0005 | 0.093 | 5 | GBBH04, 0.5m; GBTP04, 0.5m; GB-BH09, 0.7m; GB-BH07, 0.3m; GBBH10, 0.5m |
| Antimony | mg/l | 0.005 | 17 | <0.0005 | 0.013 | 4 | GBTP05, 1.20m; GBTP06, 1.20m; GBBH05, 1.00m; GBTP04, 0.5m |
| Iron (Dissolved) | mg/l | 0.2 | 17 | <0.005 | 12 | 5 | GBBH02, 0.50m; GBH01, 0.5m; GBTP04, 0.5m; GBBH04, 0.5m; GBBH12, 0.8m |
| Aromatic TPH >$C_{12}$-$C_{16}$ | mg/l | 0.09 | 17 | <0.0001 | 0.42 | 3 | HP02, 0.50m; HP02, 1.00m; GBH01, 0.40m |
| Aromatic TPH >$C_{21}$-$C_{35}$ | mg/l | 0.09 | 17 | <0.0001 | 1.5 | 3 | HP02, 0.50m; HP02, 1.00m; GBH01, 0.40m |

## 6.6 Comparison of groundwater data with controlled waters Generic Assessment Criteria

One groundwater sample was collected on 25 August 2021 from GBBH05 and a further samples was collected on 31 May 2023 from GBBH07; the analytical results from both samples was screened against EQS and DWS values.

The response zone of GBBH05 monitoring standpipe was installed at 3.00 to 4.00 m bgl within natural peat deposits. The response zone of GBBH07 monitoring standpipe was installed at 1.00 to 2.80 m bgl within Made Ground deposits.

### 6.6.1.1 Comparison of groundwater data with EQS values

The screening of the analytical results from the 17 soil-leachate samples identified concentrations of ammonium, ammoniacal nitrogen and zinc to exceed the groundwater EQS values.

A summary of the EQS groundwater exceedances are summarised in Table 6-6 below.

**Table 6-6 – Groundwater EQS exceedances**

| Constituent | Units | EQS (mg/l) | Number of samples | Minimum concentration (mg/l) | Maximum concentration (mg/l) | Number of exceedances | Location & Depth (m bgl) |
|---|---|---|---|---|---|---|---|
| Ammonium | mg/l | 0.26 | 2 | 0.3 | 2.0 | 2 | GBBH05; GBBH07 |
| Ammoniacal Nitrogen | mg/l | 0.2 | 2 | 0.26 | 1.6 | 2 | GBBH05; GBBH07 |
| Zinc | mg/l | 0.019 | 2 | 0.0039 | 0.023 | 1 | GBBH07 |

### 6.6.1.2 Comparison of groundwater data with DWS values

The screening of the analytical results from the 17 soil-leachate samples identified concentrations of ammonium and ammoniacal nitrogen and zinc to exceed the groundwater DWS values.

A summary of the DWS groundwater exceedances are summarised in Table 6-6 below.

**Table 6-7 – Groundwater DWS exceedances**

| Constituent | Units | DWS (mg/l) | Number of samples | Minimum concentration (mg/l) | Maximum concentration (mg/l) | Number of exceedances | Location & Depth (m bgl) |
|---|---|---|---|---|---|---|---|
| Ammonium | mg/l | 0.5 | 2 | 0.3 | 2.0 | 1 | GBBH07 |
| Ammoniacal Nitrogen | mg/l | 0.39 | 2 | 0.26 | 1.8 | 1 | GBBH07 |

## 6.7 Comparison of surface water data with controlled waters Generic Assessment Criteria

A total of four surface water samples were collected, one upstream and one downstream of the site from an unnamed watercourse in 2021 and again in 2023. The sample locations are shown on the exploratory plan within the Quantum Geotechnic 2023 exploratory plan  The analytical concentrations from the four samples were screened against EQS values and concentrations of ammonium and ammoniacal nitrogen were identified to exceed the criteria.

A summary of the EQS surface water exceedances are summarised in Table 6-8 below.

**Table 6-8 – Surface water  EQS Exceedances**

| Constituent | Units | EQS (mg/l) | Number of samples | Minimum concentration (mg/l) | Maximum concentration (mg/l) | Number of exceedances | Location & Depth (m bgl) |
|---|---|---|---|---|---|---|---|
| Ammonium | mg/l | 0.26 | 4 | 0.33 | 1.4 | 2 | Upstream; Downstream |
| Ammoniacal Nitrogen | mg/l | 0.2 | 4 | 0.3 | 1.2 | 2 | Upstream; Downstream |

### 6.7.1 Controlled waters discussion

The soil leachate screening assessment indicates that there are concentrations of ammoniacal nitrogen, nitrite, and metals (copper, mercury, manganese, nickel, lead, iron, hexavalent chromium, vanadium and zinc) and organics (TPH aliphatic TPH >$C_{21}$-$C_{35}$, aromatic TPH >$C_{12}$-$C_{16}$ and aromatic TPH >$C_{21}$-$C_{35}$) which exceed the EQS within Made Ground and natural strata across the site.

Concentrations exceeding the DWS screening criteria were identified for ammoniacal nitrogen, cyanide (total), cyanide (free), metals (aluminium, arsenic, manganese, lead, antimony, iron) and organics (TPH aromantic >$C_{12}$-$C_{16}$ and Aromatic >$C_{21}$-$C_{35}$).

Soil leachate concentrations for aluminium copper, aliphatic TPH >$C_{21}$-$C_{35}$, aromatic TPH >$C_{12}$-$C_{16}$ and aromatic TPH >$C_{21}$-$C_{35}$ were recorded above an order of magnitude of the EQS and aluminium, iron and aromatic TPH >$C_{21}$-$C_{35}$ were recorded above an order of magnitude of the DWS.

Groundwater samples are typically more representative of the risk posed to the identified controlled water receptors as it is reasonably assumed that the soils and groundwater are in equilibrium.

The results of the screening for groundwater sample indicated concentrations exceeding of the EQS and DWS for ammonium and ammoniacal nitrogen which were within the same order of magnitude of the screening values.  The results of the screening for surface water samples indicated exceedances of the freshwater EQS for the same constituents in both upstream and downstream samples which suggests these constituents may be indicative of background regional concentrations.

The concentrations of constituents in soil leachate are considered unlikely to present an unacceptable risk to controlled waters receptors for the following reasons:

- Direct comparison of soil leachate results with EQS and DWS, does not take into account the dilution and attenuation of contaminants that may occur along the pathway between the source and the nearest surface water receptors.
- Soil-leachate analysis is relatively aggressive, typically resulting in an over-estimation of the concentration of a contaminant which may leach from unsaturated soils under site conditions. This results in an inherently conservative assessment, which may not be representative of actual site conditions.
- Groundwater and surface water analysis identified exceedances of ammonium and ammoniacal nitrogen only. This indicates that the theoretical leaching of the metals, inorganic and organic constituents identified from analysis of soil leachate is not occurring to a degree that can be demonstrated to be affecting the chemistry of controlled waters receptors;
- The recorded ammonium and ammoniacal nitrogen concentrations in groundwater and surface water, both up and down hydraulic gradient of the site, are likely to be indicative of background regional concentrations.

## 6.8 Revised CSM

Based on the findings of the human health and controlled waters GQRAs presented above, the preliminary CSM presented in Section 6.2 has been revised based on the assessments completed.

The revised CSM resulting from the information discussed above is shown below in Table 6-9.

**Table 6-9 - Revised conceptual site model**

| Source | Receptor | Pathway | Potential Consequence | Probability | Risk Classification | Comments |
|---|---|---|---|---|---|---|
| <u>On-site</u><br><br>Made Ground of unknown provenance from the construction of the existing culvert, general infrastructure, sports facilities and residential properties;<br><br>Spills / leaks of oils on the carriageway / driveways / gardens;<br><br>atmospheric fall out of exhaust contaminants from road traffic comprising inorganics and heavy metals;<br><br>shallow soils in playing fields / park that may contain a range of organic and inorganic contaminants from the use of herbicides and pesticides;<br><br>potentially contaminated perched water/groundwater underlying the site.<br><br><u>Off-site</u><br><br>Made Ground of unknown provenance associated with the construction or nearby | On-site users (pedestrians / users of playing fields/parks) | dermal contact / ingestion / inhalation of contaminants in soil and soil-derived dust | Medium | Unlikely | Low | A total of 11 exceedances of the GAC were identified from 28 soil samples analysed as part of the investigations in 2022, 2023 and 2024. The concentrations recorded were typically isolated and likely to be associated with ash and coal fragments recorded within Made Ground strata on the site. No samples positively identified asbestos.<br><br>The site is understood to be covered in hardstanding or vegetated areas which will encapsulate and bind the soils and reduce the potential for generation of soil derived dusts. Under normal use, site users will be unlikely to come into contact with, or ingest, underlying soils.<br><br>Chemical analysis of soil samples from previous phases of ground investigation at the Ysgol Carreg Hir area of the site identified 10 positive asbestos samples. Remediation of the site in 2018 comprised the burying of asbestos impacted material 300 to 400 mm below ground level which was covered |
| | On-site future maintenance and construction workers | dermal contact / ingestion / inhalation of contaminants in soil and soil-derived dust<br><br>dermal contact / ingestion of contaminants in perched / groundwater within excavations<br><br>Inhalation of ground gas / vapours | Medium | Unlikely | Low | |
| | On-site future maintenance and construction workers on School site | | Severe | Likely | High | |
| | Off-site users of residential properties / playing fields | off-site migration of contaminants in soil derived dust and run-off followed by dermal contact / inhalation / ingestion | Medium | Unlikely | Low | |

| | | | |
|---|---|---|---|
| residential and commercial properties;<br><br>Made Ground associated with decomposition in the cemetery adjacent to the south of the site which may contain a range of inorganic and metal contaminants;<br><br>surface water run-off from nearby roads which may contain a range of organic contaminants;<br><br>surface water run-off and shallow perched water / groundwater from adjacent playing fields/park/allotments that may contain herbicides and pesticides;<br><br>potentially contaminated groundwater associate with off-site industry (disused colliery north-east of the site). | | | with a high visibility marker liner and clean cover soil. It is considered likely that excavation works along the southern boundary of the site in landscaped area below the visibility marker layer will encounter asbestos impacted soils.<br><br>Short term risks associated with construction/maintenance on the Ysgol Carreg Hir site should be managed by following Health and Safety at Work Act legislation, Construction Design and Management Regulations, use of a Construction Environmental Management Plan (CEMP), personal protective equipment and appropriate working practices such as dust mitigation measures.<br><br>Bare soils may be exposed during construction, increasing the short-term potential of soil derived dust and dermal contact with soils. Post construction, the groundcover at the site will predominantly comprise vegetation with some areas of open surface water. The vegetation would cover and bind the soil subsequently reducing the potential for direct contact / |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | ingestion of soils during normal use<br><br>Risks from ground gases are unlikely to be unacceptable as there are no anticipated enclosed structures as part of the proposed works. |
| Surface water in the on-site culvert | lateral migration of dissolved phase contaminants in groundwater to surface water<br><br>lateral migration of dissolved phase contaminants via preferential pathways such as drains<br><br>migration of contaminants in surface water runoff | Medium | Unlikely | Low | Soil leachate concentrations exceeded the EQS and DWS but were generally within the same order of magnitude as the screening criteria.<br><br>The concentrations exceeding the EQS and DWS in groundwater and surface water were limited to ammonium and ammoniacal nitrogen. The widespread on and off site occurrence of these constituents is likely to be indicative of background regional concentrations. |
| Groundwater in the underlying superficial and bedrock aquifers | leaching or dissolution of contaminants in soils and subsequent migration of contaminants in groundwater<br><br>vertical migration of dissolved phase | Medium | Unlikely | Low | There is a theoretical potential for leaching of metals, inorganic and organic constituents from on-site soils. However, the absence of exceedances in surface water and groundwater indicates that this is not occurring to a degree that can be demonstrated to be affecting |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | contaminants to the underlying groundwater | | | | the chemical quality of controlled waters receptors.<br><br>The proposed works could result in the mobilisation of contamination in unsaturated soils where soil is re-used on-site, through leaching/dissolution of, and subsequent migration into the identified receptors.<br><br>Implementation of mitigation measures is required to prevent silt entering the watercourses |
| | Existing and future below ground infrastructure | direct contact of contaminated soils/water with infrastructure, services and structures and subsequent chemical attack | Mild | Unlikely | Very Low | It is assumed that appropriate concrete classifications will be adopted for proposed underground structures and infrastructure as part of the design of the works.<br><br>Based on the results, the Characteristic Situation for the site has been assessed as CS1 (very low risk) and typically no special precautions against ground gas are required within any proposed work |

## 6.9 Material disposal and reuse

The primary aim of the intrusive investigation was to gather data for the geotechnical design and geo-environmental risk assessment. The investigation was not designed to provide sufficient data to suitably characterise waste / materials in accordance with Regulator's Guidance on the classification and assessment of waste (1st Edition v1.2GB) Technical Guidance WM3 [33] (known herein as WM3) for transfer off-site to a waste facility.

Material that the holder discards or intends or is required to discard, or material that has no legal mechanism for re-use either on- or off-site, is classified as a 'waste' and should be managed in accordance with the current relevant regulations and guidance. It is the waste producer's legal responsibility to accurately classify any waste arising from their works.

To classify waste materials, a number of steps should be undertaken in accordance WM3. The initial steps are to determine:

- if the materials are waste and whether classification is required;
- the relevant List of Waste (LoW) codes;
- the assessment needed to select the waste codes;
- the chemical composition of the material; and,
- if the substances in the waste are 'hazardous substances' or 'Persistent Organic Pollutants' and if they are present, what hazardous properties, if any, are associated with the waste.

Waste classification in the case of soils and excavated materials is undertaken on laboratory soils analysis, with Waste Acceptance Criteria (WAC) testing often undertaken in tandem to inform the type of landfill which would be considered suitable for the waste should this be the proposed management route. WAC analysis is not suitable to use as a standalone analysis for the assessment of waste.

There are a number of potential systems available to legally manage the re-use of site-won materials as part of any construction works if appropriate, such as CL:AIRE's Definition of Waste Code of Practice [34] through the production of a Materials Management Plan (MMP), specific registered waste exemptions, and/or operating under environmental permits. These approaches all require further consultation and specialist advice, which is outside the scope of this assessment and should be sought by the Client if required.

Should any material from the site be considered for removal off-site, liaison with any receiving facilities should be undertaken prior to transfer of the waste. Copies of the laboratory analysis undertaken to date should be presented to the facility operator(s) alongside any further testing completed by the waste producer so they can confirm their acceptance requirements; certain types of facilities may require waste acceptance criteria (WAC) testing to be undertaken prior to acceptance.

Any material, not solely excavated materials, that needs to be discarded during the project works is potentially designated a waste and should be managed in accordance with the current authoritative regulations, guidance and best practice.

The sampling and laboratory testing undertaken in the 2022, 2023 and 2024 ground investigations across the site comprised analysis on 28 soil samples. A Waste Acceptance Criteria (WAC) test was completed on three samples collected from GBH05 at 1.00 m bgl in Quantum Geotechnic Ltd 2022 [9] ground investigation and from Silt 1 and Silt 2 in the Quantum Geotechnic Ltd 2024 [13] ground investigation. The results indicate that, for this single soil sample, the criteria are within limits for acceptance at an inert landfill. However, a WAC test is not a waste classification and should be considered together with other lines of evidence and a full waste classification in accordance with the requirements of WM3. An inert WAC test cannot be used in isolation and is subject to further assessment and demonstration of absence of organic and other unacceptable materials.

# 6.10 Conclusions and recommendations

## 6.10.1 Conclusions

Based on the findings of the ground investigation and subsequent assessment detailed in Section 6.3 and summarised in the revised CSM in Table 6-9, the potential risks are considered to be:

- low to human health;
- low to controlled waters; and
- very low for property.

Potential risks to future on-site maintenance users within the Ysgol Carreg Hir section of the site are considered to be high. See Section 6.10.2 below for further information regarding this section of the site.

In relation to the proposed project, the following should be considered:

- adoption of appropriate health and safety measures, practices and procedures during construction to mitigate potential risks to construction workers and visitors;
- adoption of appropriate best practice environmental management during construction, e.g. minimisation of dust generation and migration, to mitigate potential risks to controlled waters, visitors and surrounding off-site users;
- Made Ground soils, asphalt/sub-base and natural soils should be handled and stockpiled separately to avoid cross contamination and to facilitate potential reuse or disposal.
- A watching brief should be implemented by an appropriately qualified land contamination specialist, to ensure unexpected contamination, if encountered, is recognised and appropriately assessed and mitigated.
- Vigilance is to be maintained throughout the works for potential asbestos containing material at surface or other unexpected contamination during site clearance and earthworks in areas not previously investigated.
- A waste classification assessment is outside the scope of this report. Suitability and classification for reuse and/or disposal will vary between material type. Soils should be handled and reused in accordance with a site-specific MMP and in accordance with the CL:AIRE Definition of Waste Code of Practice [34] or other relevant process or regime. Soils required to be removed off-site should be appropriately classified in accordance with the Environment Agency classification and assessment of waste (1st Edition v1.2GB) Technical Guidance WM3 [33].

## 6.10.2 Ysgol Carreg Hir specific conclusions

As summarised in Section 2.4.2, within the Ysgol Carreg Hir section of the site, an engineered cover system was put in place across the site by Sanctus in 2018 which comprised the burying of asbestos impacted material 300 to 400 mm below ground level and covered with a high visibility marker liner and clean cover soil.

Where the culvert is to be installed at a depth greater than 0.4 m bgl, excavation is understood to be required below the cover system layer in this area.

Specialist advice should be obtained from a competent asbestos specialist. The work should be undertaken in line with the Control of Asbestos Regulations 2012 (CAR2012), the CL:AIRE Joint Industry Working Group Decision Tool should be used to determine if the works are notifiable and what mitigation should be implemented for the protection of site workers. Risk assessments and method statements should consider the most appropriate mitigation measures to be implemented. Staff undertaken the works should hold suitable asbestos training.

Further details and recommendations for future development are provided in Sanctus' Engineered Cover System 2018 report [36].

# 7. Engineering assessment

## 7.1 Structures

At the time of writing this report a draft design has been proposed as described in Section 1 with the layout map presented in Appendix A.

When designing the proposed depths of the culvert structures, the presence of Tidal Flat Deposits should be considered as this is likely to cause bearing and settlement risk to structures and should not be used as load bearing strata. Where possible it is recommended that the material is excavated and replaced with a suitable material.

## 7.2 Excavations

Risks associated with the variability of Made Ground and the Glacial Till are expected, especially to the southeast of the site where Glacial Till is expected at a shallower depth. These relate to the heterogeneity of the materials comprising irregular boulders and cobbles, which may be encountered and effect the shape and size of the excavation and the excavatability of the material.

Soft soils and peat within the Tidal Flat deposits are likely to cause stability issues predominantly in the northwest of the site. The influence of groundwater will also be influential in the stability of the excavations within this strata.

An effective temporary support method such as trench sheeting is recommended to prevent open excavations from collapsing at the walls and damaging the culvert.

## 7.3 Coal mining

The Coal Authority report states that the site lies within an area which is believed to have coal at or close to the surface which may have been worked sometime in the past. Therefore, there is the potential for the presence of coal workings at or close to the surface at the site. However, there are no reported mine entries within 20 m of the site boundary and The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50m of the enquiry boundary relating to subsidence, since 31 October 1994 [6]. During the ground investigation no evidence of coal mining was encountered but workings in the vicinity of the site area cannot be discounted.

# 8. Geotechnical Risk Register

## 8.1 Geotechnical risk and risk matrix

For the purpose of report, geotechnical risk is defined as the possibility of an adverse consequence arising from a ground hazard or circumstance.

The Geotechnical Risk Register takes into account the identified geotechnical constraints, along with additional project details to ensure that all significant geotechnical risks are identified, recorded, analysed and controlled. The geotechnical risks are discussed in terms of probability, severity and risk, as defined below:

- Likelihood (L): The perceived likelihood of the identified geotechnical hazard actually occurring.
- Severity (S): The perceived severity, in terms of safety, financial, temporal, legal, or operational consequence, of the occurrence of the identified geotechnical hazard on the identified receptor(s)
- Risk (R): The perceived level of concern which should be assigned to the identified hazard, based on the likelihood of occurrence, and taking into due account the perceived severity of the impact.

The risk uses the following equation:

Degree of Risk (R) = Likelihood (L) x Severity (S)

The likelihood and severity values are detailed in Table 8-1.

**Table 8-1 - Likelihood and Severity rating**

| Likelihood | | Severity | | | |
|---|---|---|---|---|---|
| | | Health and Safety | | Operational | |
| 5 | Certain | 5 | Fatality | 5 | Fatality |
| 4 | Probable | 4 | Major injury | 4 | Irreversible Damage |
| 3 | Likely | 3 | Reportable injury | 3 | Major Damage |
| 2 | Unlikely | 2 | Lost time injury | 2 | Minor Damage |
| 1 | Negligible | 1 | Minor injury | 1 | No Effect |

**Table 8-2 - Risk matrix**

| | | | | | | |
|---|---|---|---|---|---|---|
| Likelihood | 5 | 5 | 10 | 15 | 20 | 25 |
| | 4 | 4 | 8 | 12 | 16 | 20 |
| | 3 | 3 | 6 | 9 | 12 | 15 |
| | 2 | 2 | 4 | 6 | 8 | 10 |
| | 1 | 1 | 2 | 3 | 4 | 5 |
| | | 1 | 2 | 3 | 4 | 5 |
| | Severity | | | | | |

**Table 8-3 - Perceived degree of risk**

| Risk Number | Risk Ranking | Comments |
|---|---|---|
| 20 - 25 | Unacceptable | Which cannot be justified except in extraordinary circumstances, where resources and finance are provided to control the risk irrespective of cost. |
| 15 - 19 | Substantial | Tolerable only if risk reduction is impracticable or if its cost is disproportionate to improvement. |
| 7 - 12 | Moderate Risk | Tolerable if cost of reduction would exceed the improvement gained in reducing the risk further. |
| 0 – 6 | Low | Tolerable |

## 8.2 Risk Register

The Geotechnical Risk Register comprises an initial assessment of the risks identified, prior to the application of risk mitigation measures, and shows how the risks can be reduced by the application of certain measures.

**Table 8-4 - Geotechnical Risk Register**

| | *Hazard/Risk* | *Consequence* | *Initial Risk* | | | *Mitigation Measures* | *Residual Risk* | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Presence of buried services. | Damage to unknown services causing delays, additional remedial costs, injury or death. | 3 | 4 | 12 | Designer to consider the presence of recorded buried services in their design.<br>Contractor to review the presence and location of recorded services, preparing a method statement for the avoidance, protection or diversion of buried services.<br>Contractor to conduct CAT scans of the surrounding area and take hand dug pits in case of unrecorded services prior to excavation works. | 2 | 4 | 8 |

| | *Hazard/Risk* | *Consequence* | *Initial Risk* | | | *Mitigation Measures* | *Residual Risk* | | |
|---|---|---|---|---|---|---|---|---|---|
| 2 | Variable groundwater level. | Groundwater levels higher than anticipated could cause difficult excavating conditions.<br>This could lead to delay and extra cost for provision of specific dewatering plant.<br>High groundwater levels could cause delay and extra cost associated with redesign. | 3 | 5 | 15 | Designer to assess the effect of high groundwater conditions on design options.<br>Contractor to consider undertaking construction in the summer when the floodplain may have lower groundwater levels. | 1 | 5 | 5 |

| | *Hazard/Risk* | *Consequence* | *Initial Risk* | | | *Mitigation Measures* | *Residual Risk* | | |
|---|---|---|---|---|---|---|---|---|---|
| 3 | Presence of soft / compressible strata | Presence of soft and compressible Tidal Flat Deposits may cause excessive settlement affecting the serviceability of the design solution and potentially causing extra cost and delay associated with redesign. | 3 | 4 | 12 | Designer to consider appropriate bearing strata for each design solution to avoid founding on compressible strata.<br>Contractor to consider excavating soft or loose patches at formation level with a suitable engineered fill. | 1 | 4 | 4 |

| | *Hazard/Risk* | *Consequence* | *Initial Risk* | | | *Mitigation Measures* | *Residual Risk* | | |
|---|---|---|---|---|---|---|---|---|---|
| 4 | Contaminated made ground | Potential risk to human health and the environment. Presence of contamination may also limit materials reuse / waste disposal costs Delays to the project from requirement to classify and remove contaminated materials | 4 | 3 | 12 | Made Ground identified as only potential source of contamination from desk study assessment and ground investigation.<br>The Contractor is to remain vigilant to any unexpected potential contamination and inform client if any visual or olfactory evidence of contamination is encountered.<br>The Contractor should ensure stockpiles of excavated soils are suitably managed to prevent run off / leaching to river.<br>Waste soils to be removed from site will require additional sampling for waste classification and landfill acceptance.<br>Good environmental management procedures should be utilised for future excavations, such as dampening down, to prevent migration of potentially contaminated dust. | 2 | 3 | 6 |
| 5 | Obstructing cobbles and boulders associated with Glacial Till | Excavations encountering obstructions required for culverts resulting in project delays. | 4 | 2 | 8 | Ensure contractor has prepared to excavate based on the reported ground conditions in the area. | 3 | 2 | 6 |

| | *Hazard/Risk* | *Consequence* | *Initial Risk* | | | *Mitigation Measures* | *Residual Risk* | | |
|---|---|---|---|---|---|---|---|---|---|
| 6 | Coal workings at or close to the surface at the site | Unrecorded mine workings encountered on site resulting in delays. | 3 | 4 | 12 | The Coal Authority report has shown no mine workings within 20m of the site area and no workings were encountered during the GI. If coal workings are encountered on site during excavations, stop work immediately for further investigation to take place. | 2 | 4 | 8 |

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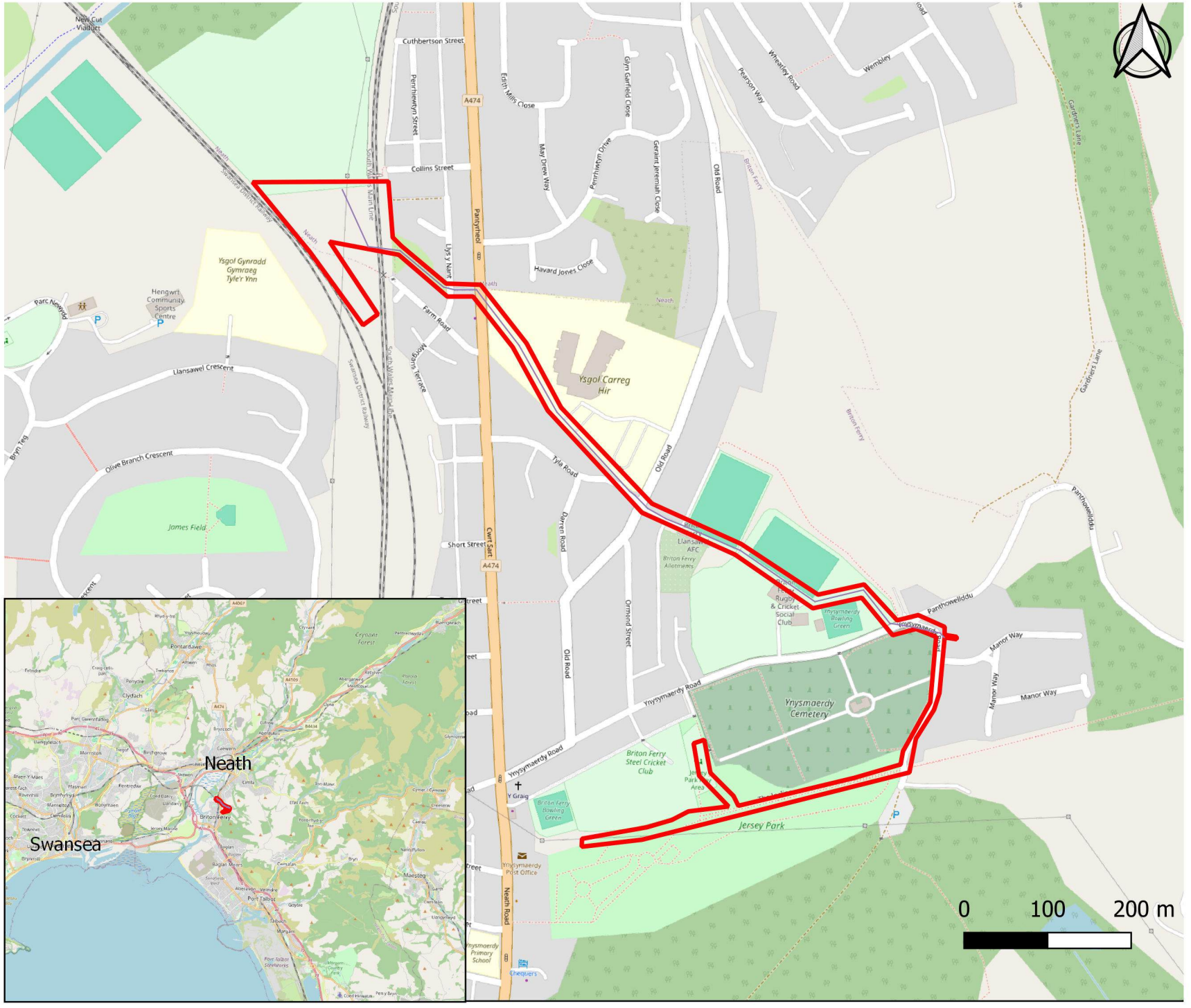
# APPENDICES

# Appendix A. Drawings

## A.1 Proposed scheme




## Legend

Site Location

CLIENT
Neath Port Talbot County Borough Council

PROJECT
Neath Port Talbot Flood Alleviation Scheme - Grandison Brook

TITLE
Figure 1 - Site Location

AtkinsRéalis

# Appendix B. Envirocheck Report

# Envirocheck® Report:

## Datasheet

### Order Details:

**Order Number:**
222284714_1_1

**Customer Reference:**
5192793

**National Grid Reference:**
274680, 195180

**Slice:**
A

**Site Area (Ha):**
2.5

**Search Buffer (m):**
1000

### Site Details:

Site at 274590, 195200

### Client Details:

Mr J Dyke
Atkins Ltd
Longcross Court
47 Newport Road
Cardiff
CF24 0AD

Envirocheck®
LANDMARK INFORMATION GROUP®

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| Data Currency | 63 |
| Data Suppliers | 68 |
| Useful Contacts | 69 |


**Introduction**

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination.
For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client.
In this datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.


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# Summary

| Data Type | Page Number | On Site | 0 to 250m | 251 to 500m | 501 to 1000m (*up to 2000m) |
|---|---|---|---|---|---|
| **Agency & Hydrological** | | | | | |
| BGS Groundwater Flooding Susceptibility | pg 1 | Yes | Yes | Yes | n/a |
| Contaminated Land Register Entries and Notices | | | | | |
| Discharge Consents | pg 2 | | | | 10 |
| Prosecutions Relating to Controlled Waters | | | n/a | n/a | n/a |
| Enforcement and Prohibition Notices | | | | | |
| Integrated Pollution Controls | | | | | |
| Integrated Pollution Prevention And Control | pg 5 | | 1 | | 2 |
| Local Authority Integrated Pollution Prevention And Control | | | | | |
| Local Authority Pollution Prevention and Controls | pg 5 | | | | 1 |
| Local Authority Pollution Prevention and Control Enforcements | | | | | |
| Nearest Surface Water Feature | | Yes | | | |
| Pollution Incidents to Controlled Waters | pg 6 | | 2 | 8 | 5 |
| Prosecutions Relating to Authorised Processes | pg 8 | | | | 1 |
| Registered Radioactive Substances | pg 8 | | | 7 | |
| River Quality | | | | | |
| River Quality Biology Sampling Points | | | | | |
| River Quality Chemistry Sampling Points | | | | | |
| Substantiated Pollution Incident Register | pg 9 | | | | 1 |
| Water Abstractions | pg 10 | | | | (*6) |
| Water Industry Act Referrals | | | | | |
| Groundwater Vulnerability Map | pg 11 | Yes | n/a | n/a | n/a |
| Bedrock Aquifer Designations | pg 12 | Yes | n/a | n/a | n/a |
| Superficial Aquifer Designations | pg 12 | Yes | n/a | n/a | n/a |
| Source Protection Zones | | | | | |
| Extreme Flooding from Rivers or Sea without Defences | pg 12 | | Yes | n/a | n/a |
| Flooding from Rivers or Sea without Defences | pg 12 | | Yes | n/a | n/a |
| Areas Benefiting from Flood Defences | | | | n/a | n/a |
| Flood Water Storage Areas | | | | n/a | n/a |
| Flood Defences | | | | n/a | n/a |
| OS Water Network Lines | pg 12 | 6 | 17 | 54 | 69 |

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# Summary

| Data Type | Page Number | On Site | 0 to 250m | 251 to 500m | 501 to 1000m (*up to 2000m) |
|---|---|---|---|---|---|
| **Waste** | | | | | |
| BGS Recorded Landfill Sites | pg 30 | | | | 1 |
| Historical Landfill Sites | pg 30 | | | | 1 |
| Integrated Pollution Control Registered Waste Sites | | | | | |
| Licensed Waste Management Facilities (Landfill Boundaries) | pg 30 | | | | 2 |
| Licensed Waste Management Facilities (Locations) | pg 30 | | | 1 | 5 |
| Local Authority Landfill Coverage | pg 32 | 1 | n/a | n/a | n/a |
| Local Authority Recorded Landfill Sites | pg 32 | | | | 1 |
| Potentially Infilled Land (Non-Water) | pg 32 | | 1 | 4 | 11 |
| Potentially Infilled Land (Water) | pg 33 | 1 | 3 | 1 | 12 |
| Registered Landfill Sites | | | | | |
| Registered Waste Transfer Sites | pg 34 | | | 2 | 1 |
| Registered Waste Treatment or Disposal Sites | pg 35 | | | 1 | |
| **Hazardous Substances** | | | | | |
| Control of Major Accident Hazards Sites (COMAH) | | | | | |
| Explosive Sites | | | | | |
| Notification of Installations Handling Hazardous Substances (NIHHS) | | | | | |
| Planning Hazardous Substance Consents | | | | | |
| Planning Hazardous Substance Enforcements | | | | | |

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# Summary

| Data Type | Page Number | On Site | 0 to 250m | 251 to 500m | 501 to 1000m (*up to 2000m) |
|---|---|---|---|---|---|
| **Geological** | | | | | |
| BGS 1:625,000 Solid Geology | pg 36 | Yes | n/a | n/a | n/a |
| BGS Estimated Soil Chemistry | pg 36 | Yes | Yes | Yes | Yes |
| BGS Recorded Mineral Sites | pg 41 | | 4 | 5 | 14 |
| BGS Urban Soil Chemistry | pg 45 | | Yes | Yes | Yes |
| BGS Urban Soil Chemistry Averages | pg 48 | Yes | | | |
| CBSCB Compensation District | | | n/a | n/a | n/a |
| Coal Mining Affected Areas | pg 48 | Yes | n/a | n/a | n/a |
| Mining Instability | pg 48 | Yes | n/a | n/a | n/a |
| Man-Made Mining Cavities | | | | | |
| Natural Cavities | | | | | |
| Non Coal Mining Areas of Great Britain | | | | n/a | n/a |
| Potential for Collapsible Ground Stability Hazards | pg 48 | Yes | Yes | n/a | n/a |
| Potential for Compressible Ground Stability Hazards | pg 48 | Yes | Yes | n/a | n/a |
| Potential for Ground Dissolution Stability Hazards | | | | n/a | n/a |
| Potential for Landslide Ground Stability Hazards | pg 49 | Yes | Yes | n/a | n/a |
| Potential for Running Sand Ground Stability Hazards | pg 50 | Yes | Yes | n/a | n/a |
| Potential for Shrinking or Swelling Clay Ground Stability Hazards | pg 50 | Yes | Yes | n/a | n/a |
| Radon Potential - Radon Affected Areas | pg 51 | Yes | n/a | n/a | n/a |
| Radon Potential - Radon Protection Measures | pg 51 | Yes | n/a | n/a | n/a |
| **Industrial Land Use** | | | | | |
| Contemporary Trade Directory Entries | pg 52 | | 7 | 4 | 19 |
| Fuel Station Entries | pg 54 | | | | 1 |
| Points of Interest - Commercial Services | pg 54 | | 6 | 1 | 8 |
| Points of Interest - Education and Health | pg 56 | | | 1 | |
| Points of Interest - Manufacturing and Production | pg 56 | | 2 | 4 | 6 |
| Points of Interest - Public Infrastructure | pg 57 | | 6 | 2 | 8 |
| Points of Interest - Recreational and Environmental | pg 58 | | | 3 | 2 |
| Gas Pipelines | | | | | |
| Underground Electrical Cables | | | | | |

# Summary

| Data Type | Page Number | On Site | 0 to 250m | 251 to 500m | 501 to 1000m (*up to 2000m) |
|---|---|---|---|---|---|
| **Sensitive Land Use** | | | | | |
| Ancient Woodland | pg 59 | | 3 | 5 | 35 |
| Areas of Adopted Green Belt | | | | | |
| Areas of Unadopted Green Belt | | | | | |
| Areas of Outstanding Natural Beauty | | | | | |
| Environmentally Sensitive Areas | | | | | |
| Forest Parks | | | | | |
| Local Nature Reserves | pg 62 | | | | 1 |
| Marine Nature Reserves | | | | | |
| National Nature Reserves | | | | | |
| National Parks | | | | | |
| Nitrate Sensitive Areas | | | | | |
| Nitrate Vulnerable Zones | | | | | |
| Ramsar Sites | | | | | |
| Sites of Special Scientific Interest | | | | | |
| Special Areas of Conservation | | | | | |
| Special Protection Areas | | | | | |
| World Heritage Sites | | | | | |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Potential for Groundwater Flooding to Occur at Surface | A13SE (SE) | 0 | 1 | 274677 195184 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A13SW (W) | 0 | 1 | 274650 195184 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Potential for Groundwater Flooding to Occur at Surface | A13SE (E) | 0 | 1 | 274800 195150 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A13SE (SE) | 1 | 1 | 274750 195100 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A13NW (N) | 6 | 1 | 274650 195300 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A13SW (W) | 7 | 1 | 274500 195184 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A13NE (N) | 12 | 1 | 274677 195250 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A13SE (SE) | 20 | 1 | 274850 195050 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A13SE (E) | 33 | 1 | 274900 195184 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A13NW (W) | 57 | 1 | 274400 195250 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A13SE (S) | 70 | 1 | 274700 195000 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level | A13NW (NW) | 101 | 1 | 274550 195400 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A13SE (E) | 106 | 1 | 275000 195100 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A13SE (E) | 110 | 1 | 275000 195184 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A13SE (SE) | 122 | 1 | 274800 194950 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A13SE (SE) | 123 | 1 | 275000 195050 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A13SE (S) | 132 | 1 | 274677 195000 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A13SE (SE) | 148 | 1 | 275000 195000 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A14SW (SE) | 191 | 1 | 275050 195000 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A13SE (SE) | 234 | 1 | 274950 194850 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level | A13SW (SW) | 238 | 1 | 274550 194950 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level | A12NE (W) | 257 | 1 | 274200 195250 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A14SW (SE) | 286 | 1 | 275100 194900 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A14NW (E) | 287 | 1 | 275100 195350 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A12SE (SW) | 296 | 1 | 274300 195000 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A12NE (W) | 307 | 1 | 274150 195250 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A13SW (S) | 310 | 1 | 274600 194850 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A14SW (E) | 326 | 1 | 275200 195000 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A8NE (SE) | 345 | 1 | 275000 194750 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A12SE (W) | 396 | 1 | 274150 195000 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A8NW (SW) | 396 | 1 | 274500 194800 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A14NW (E) | 416 | 1 | 275200 195400 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level | A8NW (SW) | 416 | 1 | 274450 194800 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A9NW (SE) | 425 | 1 | 275150 194750 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A8NW (SW) | 462 | 1 | 274450 194750 |
| 1 | **Discharge Consents**<br>Operator: Dwr Cymru Cyfyngedig<br>Property Type: Sewerage Network - Pumping Station - Water Company<br>Location: Saltings Ps<br>Authority: Natural Resources Wales<br>Catchment Area: Not Given<br>Reference: BO5114701<br>Permit Version: 1<br>Effective Date: 19th October 1989<br>Issued Date: 19th October 1989<br>Revocation Date: 31st March 2004<br>Discharge Type: Unspecified<br>Discharge Environment: Not Supplied<br>Receiving Water: River Neath<br>**Status: Revoked (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)**<br>Positional Accuracy: Located by supplier to within 100m | A12NW (W) | 703 | 2 | 273800 195500 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
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| 2 | **Discharge Consents**<br>Operator: Mr P Williams<br>Property Type: Undefined Or Other<br>Location: Eaglesbush Neath<br>Authority: Natural Resources Wales<br>Catchment Area: River Neath<br>Reference: Bb4003001<br>Permit Version: 1<br>Effective Date: 2nd April 1973<br>Issued Date: 2nd April 1973<br>Revocation Date: 13th November 1995<br>Discharge Type: Unspecified<br>Discharge Environment: Not Supplied<br>Receiving Water: Trib Of Crythan Brook<br>**Status: Consent expired**<br>Positional Accuracy: Located by supplier to within 10m | A18NE (N) | 774 | 2 | 274950 195940 |
| 3 | **Discharge Consents**<br>Operator: Dwr Cymru Cyfyngedig<br>Property Type: Sewerage Network - Pumping Staions<br>Location: Penrhiwtyn Ps Eo Neath Npt, Penrhiwtyn, Neath, Neath Port Talbot<br>Authority: Natural Resources Wales<br>Catchment Area: Not Supplied<br>Reference: Bo5110401<br>Permit Version: 2<br>Effective Date: 1st April 2006<br>Issued Date: 31st March 2005<br>Revocation Date: Not Supplied<br>Discharge Type: Sewage Discharges - Pumping Station - Water Company<br>Discharge Environment: Canal<br>Receiving Water: Neath Canal<br>**Status: Surrendered**<br>Positional Accuracy: Located by supplier to within 100m | A17NE (NW) | 850 | 2 | 274200 196100 |
| 3 | **Discharge Consents**<br>Operator: Dwr Cymru Cyfyngedig<br>Property Type: Sewerage Network - Pumping Staions<br>Location: Penrhiwtyn Ps Eo Neath Npt, Penrhiwtyn, Neath, Neath Port Talbot<br>Authority: Natural Resources Wales<br>Catchment Area: Not Supplied<br>Reference: Bo5110401<br>Permit Version: 2<br>Effective Date: 1st April 2006<br>Issued Date: 31st March 2005<br>Revocation Date: Not Supplied<br>Discharge Type: Sewage Discharges - Pumping Station - Water Company<br>Discharge Environment: Canal<br>Receiving Water: Neath Canal<br>**Status: Surrendered**<br>Positional Accuracy: Located by supplier to within 100m | A17NE (NW) | 850 | 2 | 274200 196100 |
| 3 | **Discharge Consents**<br>Operator: Dwr Cymru Cyfyngedig<br>Property Type: Sewerage Network - Pumping Staions<br>Location: Penrhiwtyn Ps Eo Neath Npt, Penrhiwtyn, Neath, Neath Port Talbot<br>Authority: Natural Resources Wales<br>Catchment Area: Not Supplied<br>Reference: Bo5110401<br>Permit Version: 2<br>Effective Date: 1st April 2006<br>Issued Date: 31st March 2005<br>Revocation Date: Not Supplied<br>Discharge Type: Sewage Discharges - Pumping Station - Water Company<br>Discharge Environment: Canal<br>Receiving Water: Neath Canal<br>**Status: Surrendered**<br>Positional Accuracy: Located by supplier to within 100m | A17NE (NW) | 850 | 2 | 274200 196100 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 3 | **Discharge Consents**<br>Operator: Dwr Cymru Cyfyngedig<br>Property Type: Sewerage Network - Pumping Staions<br>Location: Penrhiwtyn Ps Eo Neath Npt, Penrhiwtyn, Neath, Neath Port Talbot<br>Authority: Natural Resources Wales<br>Catchment Area: Not Supplied<br>Reference: Bo5110401<br>Permit Version: 2<br>Effective Date: 1st April 2006<br>Issued Date: 31st March 2005<br>Revocation Date: Not Supplied<br>Discharge Type: Sewage Discharges - Pumping Station - Water Company<br>Discharge Environment: Canal<br>Receiving Water: Neath Canal<br>**Status: Surrendered**<br>Positional Accuracy: Located by supplier to within 100m | A17NE (NW) | 850 | 2 | 274200 196100 |
| 3 | **Discharge Consents**<br>Operator: Dwr Cymru Cyfyngedig<br>Property Type: Sewerage Network - Pumping Station - Water Company<br>Location: Penrhiwtyn Ps Eo Neath Npt, Penrhiwtyn, Neath, Neath Port Talbot<br>Authority: Natural Resources Wales<br>Catchment Area: Not Given<br>Reference: BO5110401<br>Permit Version: 1<br>Effective Date: 19th October 1989<br>Issued Date: 19th October 1989<br>Revocation Date: 23rd March 2005<br>Discharge Type: Unspecified<br>Discharge Environment: Not Supplied<br>Receiving Water: Neath Canal<br>**Status: Revoked (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)**<br>Positional Accuracy: Located by supplier to within 100m | A17NE (NW) | 850 | 2 | 274200 196100 |
| 4 | **Discharge Consents**<br>Operator: Mr P E Woodhouse<br>Property Type: Domestic Property (Single)<br>Location: 3 Eaglesbush Cottage Gardners Lane, Gardners Lane Neath*<br>Authority: Natural Resources Wales<br>Catchment Area: River Neath<br>Reference: BM0049001<br>Permit Version: 1<br>Effective Date: 15th August 1985<br>Issued Date: 15th August 1985<br>Revocation Date: Not Supplied<br>Discharge Type: Unspecified<br>Discharge Environment: Into Land<br>Receiving Water: To Land<br>**Status: New Consent, by Application (Water Resources Act 1991, Section 88)**<br>Positional Accuracy: Located by supplier to within 100m | A18NE (N) | 854 | 2 | 274900 196050 |
| 5 | **Discharge Consents**<br>Operator: Neath Port Talbot Waste Management Co Ltd<br>Property Type: Household, Commercial and Industrial Waste Landfills<br>Location: D3 Ne Corner Giants Grave Landfill, De Ne Corner Giants Grave Lfill, Giants Grave Road, Briton Ferry Neath, Sa11<br>Authority: Natural Resources Wales<br>Catchment Area: Not Supplied<br>Reference: Bp027870101<br>Permit Version: 1<br>Effective Date: 9th November 1999<br>Issued Date: 9th November 1999<br>Revocation Date: Not Supplied<br>Discharge Type: Trade Discharges - Site Drainage<br>Discharge Environment: Saline Estuary<br>Receiving Water: Neath Estuary<br>**Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)**<br>Positional Accuracy: Located by supplier to within 10m | A17SW (NW) | 880 | 2 | 273800 195850 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 5 | **Discharge Consents**<br>Operator: Neath Port Talbot Waste Management Co Ltd<br>Property Type: Not Supplied<br>Location: D3 Ne Corner Giants Grave Landfill, De Ne Corner Giants Grave Lfill, Giants Grave Road, Briton Ferry Neath, Sa11<br>Authority: Natural Resources Wales<br>Catchment Area: Not Supplied<br>Reference: Bp0278701<br>Permit Version: 1<br>Effective Date: 9th November 1999<br>Issued Date: 9th November 1999<br>Revocation Date: Not Supplied<br>Discharge Type: Trade Discharges - Site Drainage<br>Discharge Environment: Saline Estuary<br>Receiving Water: Neath Estuary<br>**Status: Effective**<br>Positional Accuracy: Located by supplier to within 10m | A17SW (NW) | 880 | 2 | 273800 195850 |
| 6 | **Integrated Pollution Prevention And Control**<br>Name: Baglan Operations Ltd<br>Location: Old Road, Briton Ferry, PORT TALBOT, West Glamorgan, SA11 2S<br>Authority: Environment Agency, Welsh Region<br>Permit Reference: Bj7891<br>Original Permit Ref: Bj7891<br>Effective Date: 31st December 2001<br>**Status: Superseded By Variation**<br>Application Type: PPC APPLICATION<br>App. Sub Type: Not Supplied<br>Positional Accuracy: Manually positioned to the road within the address or location<br>Activity Code: 1.1 A(1) (A)<br>Activity Description: Combustion; Any Fuel Greater Or Equal To 50Mw<br>Primary Activity: Not Supplied | A13SW (W) | 142 | 3 | 274403 195119 |
| 7 | **Integrated Pollution Prevention And Control**<br>Name: Neath Port Talbot Waste Management Company Limited<br>Location: Giants Grave Landfill Site, Giants Grave Landfill, Giants Grave Road, SA11 2LN<br>Authority: Natural Resources Wales<br>Permit Reference: EP3831LW<br>Original Permit Ref: Hp3535ps<br>Effective Date: 4th January 2007<br>**Status: Superseded By Variation**<br>Application Type: Variation<br>App. Sub Type: Simple Standard Variation<br>Positional Accuracy: Manually positioned to the address or location<br>Activity Code: 5.2 A(1) (A)<br>Activity Description: Waste Landfilling; Greater Than 10 T/D With Capacity Greater Than 25,000T Excluding Inert Waste<br>Primary Activity: Y<br>Activity Code: 1.1 A(1) (A)<br>Activity Description: Combustion; Any Fuel Greater Or Equal To 50Mw<br>Primary Activity: N | A11SE (W) | 933 | 2 | 273555 195011 |
| 8 | **Integrated Pollution Prevention And Control**<br>Name: Neath Port Talbot Waste Management Co Ltd<br>Location: Giants Grave Landfill Site, Giants Grave Road, NEATH, West Glamorgan, SA11 2LN<br>Authority: Natural Resources Wales<br>Permit Reference: Hp3535ps<br>Original Permit Ref: Hp3535ps<br>Effective Date: 16th May 2005<br>**Status: Superseded By Variation**<br>Application Type: Application<br>App. Sub Type: New<br>Positional Accuracy: Automatically positioned to the address<br>Activity Code: 1.1 A(1) (A)<br>Activity Description: Combustion; Any Fuel Greater Or Equal To 50Mw<br>Primary Activity: N<br>Activity Code: 5.2 A(1) (A)<br>Activity Description: Waste Landfilling; Greater Than 10 T/D With Capacity Greater Than 25,000T Excluding Inert Waste<br>Primary Activity: Y | A11SE (W) | 960 | 2 | 273573 194877 |
| 9 | **Local Authority Pollution Prevention and Controls**<br>Name: Totalfinaelf Uk Ltd<br>Location: Neath Road, Briton Ferry, NEATH, West Glamorgan, SA11 2AX<br>Authority: Neath Port Talbot County Borough Council, Environmental Health Department<br>Permit Reference: E3/1/77<br>Dated: 25th June 1999<br>Process Type: Local Authority Air Pollution Control<br>Description: PG1/14 Petrol filling station<br>**Status: Authorisation has varied**<br>Positional Accuracy: Manually positioned to the road within the address or location | A7NE (SW) | 690 | 4 | 274314 194560 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Nearest Surface Water Feature** | A13SE (SE) | 0 | - | 274878 195094 |
| 10 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Pant Howel Ddu, Ynysmaerdy Road, Briton<br>Authority: Environment Agency, Welsh Region<br>Pollutant: Agricultural: Carcasses<br>Note: Not Supplied<br>Incident Date: 27th February 1995<br>Incident Reference: 23516<br>Catchment Area: Not Given<br>Receiving Water: Not Given<br>Cause of Incident: Unknown<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A13SE (SE) | 1 | 3 | 274800 195100 |
| 11 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Bt Manhole In<br>Authority: Environment Agency, Welsh Region<br>Pollutant: Cesspit Contents<br>Note: Not Supplied<br>Incident Date: 12th August 1994<br>Incident Reference: 20823<br>Catchment Area: Not Given<br>Receiving Water: Not Given<br>Cause of Incident: Unknown<br>Incident Severity: Category 1 - Major Incident<br>Positional Accuracy: Located by supplier to within 100m | A13NW (NW) | 219 | 3 | 274400 195500 |
| 12 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Grandison Park, NEATH<br>Authority: Environment Agency, Welsh Region<br>Pollutant: Sewage - Treated Effluent<br>Note: Not Supplied<br>Incident Date: 7th September 1994<br>Incident Reference: 21052<br>Catchment Area: Not Given<br>Receiving Water: Not Given<br>Cause of Incident: Unknown<br>Incident Severity: Category 2 - Significant Incident<br>Positional Accuracy: Located by supplier to within 100m | A12NE (NW) | 271 | 3 | 274300 195495 |
| 12 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Opposite Neath Hospital, By Footbridge<br>Authority: Environment Agency, Welsh Region<br>Pollutant: Unknown<br>Note: Not Supplied<br>Incident Date: 1st December 1994<br>Incident Reference: 21948<br>Catchment Area: Not Given<br>Receiving Water: Not Given<br>Cause of Incident: Unknown<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A12NE (NW) | 274 | 3 | 274300 195500 |
| 13 | **Pollution Incidents to Controlled Waters**<br>Property Type: Cess Pit<br>Location: Location Description Not Available<br>Authority: Environment Agency, Welsh Region<br>Pollutant: Cesspit Contents<br>Note: Neglect<br>Incident Date: 12th January 1996<br>Incident Reference: 27135<br>Catchment Area: Not Given<br>Receiving Water: Not Given<br>Cause of Incident: Overflow<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A13NE (NE) | 390 | 3 | 275001 195496 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 13 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Location Description Not Available<br>Authority: Environment Agency, Welsh Region<br>Pollutant: Crude Sewage<br>Note: Neglect<br>Incident Date: 15th January 1996<br>Incident Reference: 27134<br>Catchment Area: Not Given<br>Receiving Water: Not Given<br>Cause of Incident: Overflow<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A13NE (NE) | 392 | 3 | 275006 195496 |
| 13 | **Pollution Incidents to Controlled Waters**<br>Property Type: Cess Pit<br>Location: Adjacent To, Slurry Lagoon<br>Authority: Environment Agency, Welsh Region<br>Pollutant: Crude Sewage<br>Note: Neglect<br>Incident Date: 15th January 1996<br>Incident Reference: 27134<br>Catchment Area: Not Given<br>Receiving Water: Not Given<br>Cause of Incident: Overflow<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A13NE (NE) | 394 | 3 | 275001 195501 |
| 13 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Location Description Not Available<br>Authority: Environment Agency, Welsh Region<br>Pollutant: Cesspit Contents<br>Note: Neglect<br>Incident Date: 12th January 1996<br>Incident Reference: 27135<br>Catchment Area: Not Given<br>Receiving Water: Not Given<br>Cause of Incident: Overflow<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A13NE (NE) | 396 | 3 | 275006 195501 |
| 14 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Grandison Point<br>Authority: Environment Agency, Welsh Region<br>Pollutant: Unknown<br>Note: Not Supplied<br>Incident Date: 21st October 1994<br>Incident Reference: 21647<br>Catchment Area: Not Given<br>Receiving Water: Not Given<br>Cause of Incident: Unknown<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A17SE (NW) | 416 | 3 | 274200 195600 |
| 15 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Farm Road And, Grandison Pub<br>Authority: Environment Agency, Welsh Region<br>Pollutant: Algae<br>Note: Not Supplied<br>Incident Date: 13th July 1995<br>Incident Reference: 25165<br>Catchment Area: Not Given<br>Receiving Water: Not Given<br>Cause of Incident: Unknown<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A17SE (NW) | 442 | 3 | 274300 195700 |
| 16 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Garage Tended, Fire Service, Has Been Closed<br>Authority: Environment Agency, Welsh Region<br>Pollutant: Crude Sewage<br>Note: Blocked Sewer<br>Incident Date: 30th October 1994<br>Incident Reference: 21651<br>Catchment Area: Not Given<br>Receiving Water: Not Given<br>Cause of Incident: Unknown<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A17SE (NW) | 534 | 3 | 274300 195800 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 17 | **Pollution Incidents to Controlled Waters**<br>Property Type: Road (Lost Load)<br>Location: Maternity, Unit At Neath, General<br>Authority: Environment Agency, Welsh Region<br>Pollutant: Farm Effluent/Slurry<br>Note: Accidental Spillage/Leakage<br>Incident Date: 8th November 1994<br>Incident Reference: 21770<br>Catchment Area: Not Given<br>Receiving Water: Not Given<br>Cause of Incident: Spillage<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A17SE (NW) | 577 | 3 | 274200 195800 |
| 18 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: Lane Behind Giants Grave Road, BRITON FERRY<br>Authority: Environment Agency, Welsh Region<br>Pollutant: Sewage - Treated Effluent<br>Note: Blockage<br>Incident Date: 6th April 1997<br>Incident Reference: 31775<br>Catchment Area: Not Given<br>Receiving Water: Not Given<br>Cause of Incident: Overflow<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A17SW (NW) | 744 | 3 | 273800 195600 |
| 19 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: 100 Yards Upstream Tip Road, Between Mellon And, Briton Ferry<br>Authority: Environment Agency, Welsh Region<br>Pollutant: Miscellaneous - Tip Leachate<br>Note: Neath Canal Overflow; Run-Off<br>Incident Date: 19th November 1997<br>Incident Reference: 34266<br>Catchment Area: Not Given<br>Receiving Water: Not Given<br>Cause of Incident: Inadequate Design/Capacity<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A17NW (NW) | 840 | 3 | 273900 195900 |
| 20 | **Pollution Incidents to Controlled Waters**<br>Property Type: Not Given<br>Location: At Entrance To Giants Grave Site<br>Authority: Environment Agency, Welsh Region<br>Pollutant: Road Run-Off<br>Note: Inadequate Design; Neath Canal Overflow<br>Incident Date: 30th July 1998<br>Incident Reference: 36892<br>Catchment Area: Not Given<br>Receiving Water: Not Given<br>Cause of Incident: Runoff<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A11SE (W) | 973 | 3 | 273550 194900 |
| 21 | **Prosecutions Relating to Authorised Processes**<br>Location: Land At Rear Of Park View Terrace, Briton Ferry, Sa11<br>Prosecution Text: Storing controlled waste on land without a WML - 12 month community punishment order served<br>Prosecution Act: Epa90 S33 & S34<br>Hearing Date: 1st October 2008<br>Verdict: Guilty<br>Fine: 0<br>Costs: 0<br>Positional Accuracy: Manually positioned within the geographical locality | A7NE (SW) | 840 | 3 | 274018 194535 |
| 22 | **Registered Radioactive Substances**<br>Name: Abertawe Bro Morgannwg University Nhs Trust<br>Location: Penrhiwtyn, Neath, West Glamorgan, SA11 2LQ<br>Authority: Natural Resources Wales<br>Permit Reference: Bl0987<br>Dated: 31st July 2001<br>Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7)<br>Description: Minor variation to authorisation under RSA<br>**Status: Authorisation either revoked or cancelled**<br>Positional Accuracy: Automatically positioned to the address | A18SW (N) | 456 | 2 | 274445 195754 |

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|---|---|---|---|---|---|
| 22 | **Registered Radioactive Substances**<br>Name: Abertawe Bro Morgannwg University Nhs Trust<br>Location: Neath General Hospital, NEATH, West Glamorgan, SA11 2LQ<br>Authority: Natural Resources Wales<br>Permit Reference: Bh9957<br>Dated: 16th March 2000<br>Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7)<br>Description: Minor variation to authorisation under RSA<br>**Status: Authorisation superseded by a substantial or non substantial variation**<br>Positional Accuracy: Automatically positioned to the address | A18SW (N) | 456 | 2 | 274445 195754 |
| 22 | **Registered Radioactive Substances**<br>Name: Abertawe Bro Morgannwg University Nhs Trust<br>Location: Neath General Hospital, Penrhiwtyn, NEATH, West Glamorgan, SA11 2LQ<br>Authority: Natural Resources Wales<br>Permit Reference: AQ6813<br>Dated: 4th April 1995<br>Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7)<br>Description: Minor variation to authorisation under RSA<br>**Status: Authorisation superseded by a substantial or non substantial variation**<br>Positional Accuracy: Unknown | A18SW (N) | 456 | 2 | 274450 195754 |
| 22 | **Registered Radioactive Substances**<br>Name: Bro Morgannwg Nhs Trust<br>Location: Penrhiwtyn, Neath, West Glamorgan, SA11 2LQ<br>Authority: Environment Agency, Welsh Region<br>Permit Reference: Bt1797<br>Dated: Not Supplied<br>Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7)<br>Description: Substantial variation to authorisation under RSA<br>**Status: Application has met the requirements for authorisation (but not yet authorised)**<br>Positional Accuracy: Automatically positioned to the address | A18SW (N) | 456 | 3 | 274445 195754 |
| 22 | **Registered Radioactive Substances**<br>Name: Abertawe Bro Morgannwg University Nhs Trust<br>Location: Neath General Hospital, NEATH, West Glamorgan, SA11 2LQ<br>Authority: Natural Resources Wales<br>Permit Reference: AY1072<br>Dated: 28th February 1997<br>Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7)<br>Description: Minor variation to authorisation under RSA<br>**Status: Authorisation superseded by a substantial or non substantial variation**<br>Positional Accuracy: Unknown | A18SW (NW) | 457 | 2 | 274440 195754 |
| 22 | **Registered Radioactive Substances**<br>Name: Abertawe Bro Morgannwg University Nhs Trust<br>Location: Neath General Hospital, Penrhiwtyn, NEATH, West Glamorgan, SA11 2LQ<br>Authority: Natural Resources Wales<br>Permit Reference: AH7704<br>Dated: 14th July 1993<br>Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7)<br>Description: Authorisation under RSA<br>**Status: Authorisation superseded by a substantial or non substantial variation**<br>Positional Accuracy: Unknown | A18SW (N) | 457 | 2 | 274445 195754 |
| 22 | **Registered Radioactive Substances**<br>Name: Abertawe Bro Morgannwg University Nhs Trust<br>Location: Neath General Hospital, Penrhiwtyn, NEATH, West Glamorgan, SA11 2LQ<br>Authority: Natural Resources Wales<br>Permit Reference: AT7545<br>Dated: 3rd January 1996<br>Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7)<br>Description: Minor variation to authorisation under RSA<br>**Status: Authorisation superseded by a substantial or non substantial variation**<br>Positional Accuracy: Unknown | A18SW (N) | 461 | 2 | 274450 195759 |
| 23 | **Substantiated Pollution Incident Register**<br>Authority: Natural Resources Wales<br>Incident Date: 28th October 2001<br>Incident Reference: 39936<br>Water Impact: Category 2 - Significant Incident<br>Air Impact: Category 3 - Minor Incident<br>Land Impact: Category 2 - Significant Incident<br>Positional Accuracy: Located by supplier to within 10m<br>Pollutant: Oils - Diesel (Including Agricultural) | A17SE (NW) | 544 | 2 | 274213 195770 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Water Abstractions**<br>Operator: Hope Cement Limited<br>Licence Number: Wa/058/0072/0009<br>Permit Version: Not Supplied<br>Location: Neath Canal - Hope Cement, Wharf Road, Briton Ferry, Neath, Neath Port Talbot, Sa11 2lp<br>Authority: Natural Resources Wales<br>Abstraction: Mineral Products: General Use (Medium Loss)<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Surface<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A1NE (SW) | 1554 | 2 | 273419 194094 |
| | **Water Abstractions**<br>Operator: Tarmac Trading Limited<br>Licence Number: Wa/058/0072/0009<br>Permit Version: Not Supplied<br>Location: Neath Canal - Neath, Wharf Road, Briton Ferry, Neath, Neath Port Talbot, Sa11 2lp<br>Authority: Natural Resources Wales<br>Abstraction: Mineral Products: General Use (Medium Loss)<br>Abstraction Type: Water may be abstracted from any point within an area<br>Source: Surface<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A1NE (SW) | 1554 | 2 | 273419 194094 |
| | **Water Abstractions**<br>Operator: Hope Construction Materials Limited<br>Licence Number: 21/58/72/0036<br>Permit Version: 3<br>Location: Inland Water The Neath Canal<br>Authority: Natural Resources Wales<br>Abstraction: Mineral Products: General Use (Medium Loss)<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Surface<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 9th December 2014<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A1NE (SW) | 1563 | 2 | 273410 194090 |
| | **Water Abstractions**<br>Operator: Lafarge Spv Limited<br>Licence Number: 21/58/72/0036<br>Permit Version: 2<br>Location: Inland Water The Neath Canal<br>Authority: Natural Resources Wales<br>Abstraction: Mineral Products: General Use (Medium Loss)<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Surface<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 27th November 2012<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A1NE (SW) | 1563 | 2 | 273410 194090 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Water Abstractions**<br>Operator: Lafarge Aggregates Limited<br>Licence Number: 21/58/72/0036<br>Permit Version: 1<br>Location: Inland Water The Neath Canal<br>Authority: Environment Agency, Welsh Region<br>Abstraction: Mineral Products: General Use (Medium Loss)<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Surface<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 3rd February 2012<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A1NE (SW) | 1563 | 3 | 273410 194090 |
| | **Water Abstractions**<br>Operator: Mr A Thomas<br>Licence Number: 21/58/74/0016<br>Permit Version: 100<br>Location: Well At Cefn Crinallt<br>Authority: Environment Agency, Welsh Region<br>Abstraction: General Farming And Domestic<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Well At Cefn Crinallt<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 25th March 1966<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | (E) | 1929 | 3 | 276740 195680 |
| | **Groundwater Vulnerability Map**<br>Combined Classification: Secondary Bedrock Aquifer - Medium Vulnerability<br>Combined Vulnerability: Medium<br>Combined Aquifer: Productive Bedrock Aquifer, No Superficial Aquifer<br>Pollutant Speed: Low<br>Bedrock Flow: Well Connected Fractures<br>Dilution: >550 mm/year<br>Baseflow Index: <40%<br>Superficial Patchiness: <90%<br>Superficial Thickness: 3-10m<br>Superficial Recharge: No Data | A13NE (NE) | 0 | 2 | 274717 195208 |
| | **Groundwater Vulnerability Map**<br>Combined Classification: Secondary Bedrock Aquifer - Medium Vulnerability<br>Combined Vulnerability: Medium<br>Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer<br>Pollutant Speed: Low<br>Bedrock Flow: Well Connected Fractures<br>Dilution: >550 mm/year<br>Baseflow Index: <40%<br>Superficial Patchiness: <90%<br>Superficial Thickness: 3-10m<br>Superficial Recharge: No Data | A13SW (S) | 0 | 2 | 274663 195136 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Groundwater Vulnerability Map**<br>Combined Classification: Secondary Bedrock Aquifer - Medium Vulnerability<br>Combined Vulnerability: Medium<br>Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer<br>Pollutant Speed: Low<br>Bedrock Flow: Well Connected Fractures<br>Dilution: >550 mm/year<br>Baseflow Index: <40%<br>Superficial Patchiness: <90%<br>Superficial Thickness: 3-10m<br>Superficial Recharge: No Data | A13SE (SE) | 0 | 2 | 274677 195184 |
| | **Bedrock Aquifer Designations**<br>Aquifer Designation: Secondary Aquifer - A | A13SE (SE) | 0 | 2 | 274677 195184 |
| | **Superficial Aquifer Designations**<br>Aquifer Designation: Secondary Aquifer - A | A13SE (SE) | 0 | 2 | 274677 195184 |
| | **Superficial Aquifer Designations**<br>Aquifer Designation: Secondary Aquifer - Undifferentiated | A13SW (S) | 0 | 2 | 274663 195136 |
| | **Extreme Flooding from Rivers or Sea without Defences**<br>Type: Extent of Extreme Flooding from Rivers or Sea without Defences<br>Flood Plain Type: Tidal Models<br>Boundary Accuracy: As Supplied | A12NE (NW) | 185 | 2 | 274332 195399 |
| | **Extreme Flooding from Rivers or Sea without Defences**<br>Type: Extent of Extreme Flooding from Rivers or Sea without Defences<br>Flood Plain Type: Tidal Models<br>Boundary Accuracy: As Supplied | A12NE (NW) | 185 | 2 | 274332 195399 |
| | **Extreme Flooding from Rivers or Sea without Defences**<br>Type: Extent of Extreme Flooding from Rivers or Sea without Defences<br>Flood Plain Type: Tidal Models<br>Boundary Accuracy: As Supplied | A12NE (NW) | 209 | 2 | 274328 195435 |
| | **Extreme Flooding from Rivers or Sea without Defences**<br>Type: Extent of Extreme Flooding from Rivers or Sea without Defences<br>Flood Plain Type: Fluvial/Tidal Models<br>Boundary Accuracy: As Supplied | A12NE (NW) | 215 | 2 | 274312 195423 |
| | **Extreme Flooding from Rivers or Sea without Defences**<br>Type: Extent of Extreme Flooding from Rivers or Sea without Defences<br>Flood Plain Type: Tidal Models<br>Boundary Accuracy: As Supplied | A12NE (NW) | 231 | 2 | 274318 195457 |
| | **Flooding from Rivers or Sea without Defences**<br>Type: Extent of Flooding from Rivers or Sea without Defences<br>Flood Plain Type: Tidal Models<br>Boundary Accuracy: As Supplied | A12NE (NW) | 212 | 2 | 274314 195421 |
| | **Flooding from Rivers or Sea without Defences**<br>Type: Extent of Flooding from Rivers or Sea without Defences<br>Flood Plain Type: Fluvial/Tidal Models<br>Boundary Accuracy: As Supplied | A12NE (NW) | 244 | 2 | 274306 195463 |
| | **Areas Benefiting from Flood Defences**<br>None | | | | |
| | **Flood Water Storage Areas**<br>None | | | | |
| | **Flood Defences**<br>None | | | | |
| 24 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 3.8<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SE (SE) | 0 | 5 | 274831 195120 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 25 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 32.3<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SE (E) | 0 | 5 | 274834 195122 |
| 26 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 37.4<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 2 | A13SE (E) | 0 | 5 | 274834 195122 |
| 27 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 21.8<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SE (SE) | 0 | 5 | 274857 195099 |
| 28 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 125.8<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SE (SE) | 0 | 5 | 274878 195094 |
| 29 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 674.6<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13NE (NE) | 0 | 5 | 274699 195215 |
| 30 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 121.8<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 2 | A13SE (E) | 10 | 5 | 274867 195140 |
| 31 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 21.0<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SE (E) | 93 | 5 | 274987 195133 |
| 32 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 55.1<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SE (E) | 113 | 5 | 275006 195141 |
| 33 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 39.3<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 2 | A13NE (E) | 127 | 5 | 274944 195234 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 34 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 93.2<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SE (S) | 145 | 5 | 274723 194933 |
| 35 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 7.9<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SE (SE) | 145 | 5 | 274816 194935 |
| 36 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 60.7<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 2 | A13NE (E) | 150 | 5 | 274939 195261 |
| 37 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 42.1<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SE (SE) | 151 | 5 | 274818 194928 |
| 38 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 40.0<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SE (SE) | 153 | 5 | 274859 194917 |
| 39 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 8.0<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13NE (E) | 155 | 5 | 274963 195256 |
| 40 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 8.1<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13NE (E) | 162 | 5 | 274964 195263 |
| 41 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 173.4<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SW (E) | 163 | 5 | 275058 195128 |
| 42 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 23.2<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SE (SE) | 168 | 5 | 274896 194904 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 43 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 151.5<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SE (S) | 185 | 5 | 274723 194933 |
| 44 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 92.5<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SE (SE) | 186 | 5 | 274914 194890 |
| 45 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 124.6<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SE (S) | 198 | 5 | 274724 194918 |
| 46 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 61.6<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 2 | A13NE (E) | 204 | 5 | 274988 195298 |
| 47 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 161.1<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 2 | A13NE (NE) | 255 | 5 | 274997 195350 |
| 48 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 22.3<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SW (S) | 271 | 5 | 274579 194902 |
| 49 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 43.2<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SW (S) | 271 | 5 | 274579 194902 |
| 50 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 5.9<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SW (S) | 273 | 5 | 274603 194888 |
| 51 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 35.5<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A8NE (SE) | 273 | 5 | 274955 194811 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 52 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 18.2<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A8NE (SE) | 273 | 5 | 274955 194811 |
| 53 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 10.1<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A8NE (SE) | 286 | 5 | 274971 194802 |
| 54 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 96.7<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A8NE (SE) | 286 | 5 | 274971 194802 |
| 55 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 11.5<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A12NE (NW) | 296 | 5 | 274283 195514 |
| 56 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 12.6<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SW (SW) | 298 | 5 | 274541 194889 |
| 57 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 11.2<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A12NE (NW) | 305 | 5 | 274271 195516 |
| 58 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 215.3<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A8NE (SE) | 306 | 5 | 274954 194776 |
| 59 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 24.6<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SW (SW) | 309 | 5 | 274532 194880 |
| 60 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 147.5<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A12NE (NW) | 316 | 5 | 274262 195521 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 61 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 35.3<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SW (E) | 316 | 5 | 275207 195061 |
| 62 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 142.0<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13NE (NE) | 329 | 5 | 274970 195444 |
| 63 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 26.6<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13SW (SW) | 332 | 5 | 274531 194856 |
| 64 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 69.8<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SW (E) | 339 | 5 | 275223 195031 |
| 65 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 14.4<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SW (E) | 339 | 5 | 275223 195031 |
| 66 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 167.2<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SW (E) | 352 | 5 | 275237 195032 |
| 67 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 27.5<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SW (E) | 352 | 5 | 275237 195032 |
| 68 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 23.1<br>Watercourse Level: Not Supplied<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A8NW (SW) | 357 | 5 | 274512 194837 |
| 69 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 78.1<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9NW (SE) | 362 | 5 | 275027 194743 |

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| 70 | **OS Water Network Lines**<br>Watercourse Form: Lake<br>Watercourse Length: 31.6<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9NW (SE) | 362 | 5 | 275027 194743 |
| 71 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 77.1<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A8NW (SW) | 378 | 5 | 274495 194822 |
| 72 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 90.8<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SW (E) | 384 | 5 | 275248 194964 |
| 73 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 83.6<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9NW (SE) | 387 | 5 | 275056 194730 |
| 74 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 86.8<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13NE (NE) | 389 | 5 | 274973 195513 |
| 75 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 15.0<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SW (E) | 389 | 5 | 275258 194974 |
| 76 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 3.6<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 2 | A13NE (NE) | 390 | 5 | 274972 195509 |
| 77 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 1.4<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13NE (NE) | 393 | 5 | 274972 195513 |
| 78 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 91.4<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A13NE (NE) | 393 | 5 | 274972 195513 |

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| 79 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 26.9<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SW (E) | 400 | 5 | 275264 194961 |
| 80 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 7.7<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SW (E) | 400 | 5 | 275261 194954 |
| 81 | **OS Water Network Lines**<br>Watercourse Form: Lake<br>Watercourse Length: 16.1<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SW (SE) | 439 | 5 | 275279 194903 |
| 82 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 7.0<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A18SE (NE) | 449 | 5 | 274949 195584 |
| 83 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 400.6<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17SE (NW) | 449 | 5 | 274190 195637 |
| 84 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 4.4<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17SE (NW) | 449 | 5 | 274190 195637 |
| 85 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 13.4<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A8NW (SW) | 449 | 5 | 274442 194767 |
| 86 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 700.0<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SW (SE) | 450 | 5 | 275283 194888 |
| 87 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 11.2<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17SE (NW) | 452 | 5 | 274186 195637 |

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| 88 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 4.0<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A18SE (NE) | 455 | 5 | 274948 195591 |
| 89 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 5.0<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A18SE (NE) | 459 | 5 | 274948 195595 |
| 90 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 37.1<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17SE (NW) | 460 | 5 | 274175 195638 |
| 91 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 8.7<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A18SE (NE) | 462 | 5 | 274953 195597 |
| 92 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 165.9<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9NW (SE) | 463 | 5 | 275114 194676 |
| 93 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 20.1<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9NW (SE) | 463 | 5 | 275114 194676 |
| 94 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 41.1<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A8NW (SW) | 463 | 5 | 274437 194755 |
| 95 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 50.9<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A18SE (NE) | 470 | 5 | 274958 195603 |
| 96 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 137.6<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9NW (SE) | 474 | 5 | 275133 194676 |

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| 97 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 147.3<br>Watercourse Level: Not Supplied<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9NW (SE) | 474 | 5 | 275133 194676 |
| 98 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 6.8<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17SE (NW) | 484 | 5 | 274138 195635 |
| 99 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 87.3<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17SE (NW) | 489 | 5 | 274131 195635 |
| 100 | **OS Water Network Lines**<br>Watercourse Form: Lake<br>Watercourse Length: 18.0<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SE (E) | 492 | 5 | 275381 195035 |
| 101 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 590.3<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A8NW (SW) | 503 | 5 | 274412 194721 |
| 102 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 83.9<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SE (E) | 506 | 5 | 275397 195043 |
| 103 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 2.5<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A18SE (NE) | 513 | 5 | 274952 195653 |
| 104 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 4.6<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A18SE (NE) | 513 | 5 | 274950 195655 |
| 105 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 221.7<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A18SE (NE) | 514 | 5 | 274946 195657 |

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| 106 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 35.6<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17SE (NW) | 551 | 5 | 274044 195627 |
| 107 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 192.8<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SE (E) | 558 | 5 | 275453 195100 |
| 108 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 98.7<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SE (E) | 558 | 5 | 275453 195100 |
| 109 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 17.0<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9NW (SE) | 559 | 5 | 275280 194690 |
| 110 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 175.0<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9NW (SE) | 574 | 5 | 275296 194685 |
| 111 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 33.7<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9NW (SE) | 574 | 5 | 275296 194685 |
| 112 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 3.6<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17SE (NW) | 579 | 5 | 274008 195625 |
| 113 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 3.2<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17SE (NW) | 582 | 5 | 274005 195625 |
| 114 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 627.2<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17SE (NW) | 584 | 5 | 274002 195624 |

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| 115 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 233.2<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9NW (SE) | 605 | 5 | 275203 194565 |
| 116 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 66.7<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9NW (SE) | 605 | 5 | 275203 194565 |
| 117 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 35.0<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9NW (SE) | 606 | 5 | 275311 194655 |
| 118 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 26.3<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9NW (SE) | 606 | 5 | 275311 194655 |
| 119 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 5.2<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9NW (SE) | 625 | 5 | 275265 194586 |
| 120 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 6.4<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9NW (SE) | 625 | 5 | 275265 194586 |
| 121 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 54.4<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SE (E) | 633 | 5 | 275528 195155 |
| 122 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 49.0<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SE (E) | 633 | 5 | 275528 195155 |
| 123 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 57.4<br>Watercourse Level: Not Supplied<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SE (E) | 675 | 5 | 275567 195183 |

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| 124 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 35.9<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SE (E) | 686 | 5 | 275580 195166 |
| 125 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 28.9<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SE (E) | 686 | 5 | 275580 195166 |
| 126 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 201.3<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A18NE (N) | 694 | 5 | 274917 195867 |
| 127 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 189.7<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17NE (NW) | 701 | 5 | 274069 195863 |
| 128 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 21.6<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17NE (NW) | 707 | 5 | 274187 195939 |
| 129 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 135.3<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17SE (NW) | 708 | 5 | 274025 195835 |
| 130 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 284.8<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17SE (NW) | 708 | 5 | 274025 195835 |
| 131 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 18.8<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SE (E) | 709 | 5 | 275602 195183 |
| 132 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 14.7<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SE (E) | 709 | 5 | 275602 195183 |

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| 133 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 145.5<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SE (E) | 713 | 5 | 275606 195060 |
| 134 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 98.2<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14SE (E) | 713 | 5 | 275606 195060 |
| 135 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 10.1<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14NE (E) | 719 | 5 | 275607 195225 |
| 136 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 146.0<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17NE (NW) | 724 | 5 | 274168 195950 |
| 137 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 35.6<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14NE (E) | 725 | 5 | 275612 195233 |
| 138 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 34.6<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14NE (E) | 725 | 5 | 275610 195238 |
| 139 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 4.7<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 2 | A14NE (E) | 749 | 5 | 275631 195259 |
| 140 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 18.2<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14NE (E) | 749 | 5 | 275630 195266 |
| 141 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 8.5<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14NE (E) | 753 | 5 | 275635 195259 |

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| 142 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 12.0<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17NE (NW) | 756 | 5 | 274271 196024 |
| 143 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 4.4<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14NE (E) | 761 | 5 | 275642 195265 |
| 144 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 4.3<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14NE (E) | 761 | 5 | 275642 195265 |
| 145 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 6.8<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A14NE (E) | 761 | 5 | 275642 195265 |
| 146 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 66.0<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17NE (NW) | 787 | 5 | 274262 196054 |
| 147 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 40.7<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A15SW (E) | 817 | 5 | 275693 194942 |
| 148 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 32.0<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A15SW (E) | 818 | 5 | 275697 194952 |
| 149 | **OS Water Network Lines**<br>Watercourse Form: Canal<br>Watercourse Length: 2006.3<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Neath Canal<br>Catchment Name: Neath<br>Primacy: 1 | A17NE (NW) | 820 | 5 | 274005 195965 |
| 150 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 209.8<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9SW (SE) | 823 | 5 | 275310 194374 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
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| 151 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 1.7<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9SW (SE) | 824 | 5 | 275310 194373 |
| 152 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 347.1<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9SW (SE) | 825 | 5 | 275312 194373 |
| 153 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 10.8<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17NE (N) | 831 | 5 | 274298 196109 |
| 154 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 123.8<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17NE (N) | 831 | 5 | 274298 196109 |
| 155 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 16.1<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17NE (NW) | 832 | 5 | 274287 196107 |
| 156 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 24.3<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17NE (NW) | 841 | 5 | 274178 196082 |
| 157 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 171.5<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17NW (NW) | 848 | 5 | 273871 195883 |
| 158 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 555.5<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A17SW (NW) | 876 | 5 | 273777 195811 |
| 159 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 162.4<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A18NE (N) | 896 | 5 | 274998 196052 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 160 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 121.6<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A23SW (N) | 909 | 5 | 274378 196202 |
| 161 | **OS Water Network Lines**<br>Watercourse Form: Canal<br>Watercourse Length: 844.6<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Jersey Canal<br>Catchment Name: Neath<br>Primacy: 1 | A6NE (W) | 930 | 5 | 273627 194832 |
| 162 | **OS Water Network Lines**<br>Watercourse Form: Canal<br>Watercourse Length: 6.8<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Neath Canal<br>Catchment Name: Neath<br>Primacy: 1 | A11SE (W) | 942 | 5 | 273606 194848 |
| 163 | **OS Water Network Lines**<br>Watercourse Form: Canal<br>Watercourse Length: 721.3<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Neath Canal<br>Catchment Name: Neath<br>Primacy: 1 | A11SE (W) | 946 | 5 | 273600 194852 |
| 164 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 278.0<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Crythan Brook<br>Catchment Name: Neath<br>Primacy: 1 | A19NW (NE) | 951 | 5 | 275326 195965 |
| 165 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 496.2<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Crythan Brook<br>Catchment Name: Neath<br>Primacy: 1 | A19NE (NE) | 966 | 5 | 275462 195898 |
| 166 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 66.6<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9SE (SE) | 975 | 5 | 275505 194329 |
| 167 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 219.0<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 1 | A9SE (SE) | 975 | 5 | 275505 194329 |
| 168 | **OS Water Network Lines**<br>Watercourse Form: Canal<br>Watercourse Length: 230.9<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Neath Canal<br>Catchment Name: Neath<br>Primacy: 1 | A11NE (W) | 994 | 5 | 273468 195356 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 169 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 21.1<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Neath<br>Primacy: 2 | A11NE (W) | 994 | 5 | 273468 195356 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 170 | **BGS Recorded Landfill Sites**<br>Site Name: Giants Grave Tip<br>Location: Briton Ferry, NEATH, Glam<br>Authority: British Geological Survey, National Geoscience Information Service<br>Ground Water: Information not available<br>Surface Water: Information not available<br>Geology: N/A<br>Positional Accuracy: Positioned by the supplier<br>Boundary Accuracy: Moderate | A17SW (NW) | 853 | - | 273816 195826 |
| 171 | **Historical Landfill Sites**<br>Licence Holder: Neath Borough Council<br>Location: Briton Ferry, Neath, Glamorgan<br>Name: Giants Grave Tip<br>Operator Location: Not Supplied<br>Boundary Accuracy: As Supplied<br>Provider Reference: EAHLD31231<br>First Input Date: 30th June 1962<br>Last Input Date: 31st March 1993<br>Specified Waste Type: Deposited Waste included Inert, Industrial, Commercial, Household and Special Waste<br>EA Waste Ref: 0<br>Regis Ref: Not Supplied<br>WRC Ref: 6930/0006<br>BGS Ref: 2676<br>Other Ref: SWW-68-L | A17SW (NW) | 853 | 2 | 273816 195826 |
| 172 | **Licensed Waste Management Facilities (Landfill Boundaries)**<br>Name: Giants Grave Landfill<br>Licence Number: 34060<br>Location: The Saltings, Giants Grave Road, Briton Ferry, Neath, N P T, SA11 2LN<br>Licence Holder: Neath Port Talbot Waste Management Co Ltd<br>Authority: Natural Resources Wales<br>Site Category: Other Landfill Sites Taking Special Waste<br>Max Input Rate: Not Supplied<br>**Licence Status: Closure**<br>Issued: 1st April 1993<br>Positional Accuracy: Positioned by the supplier<br>Boundary Accuracy: As Supplied | A17SW (NW) | 859 | 2 | 273812 195831 |
| 173 | **Licensed Waste Management Facilities (Landfill Boundaries)**<br>Name: Giants Grave Landfill Site ( Ppc )<br>Licence Number: 34272<br>Location: Giants Grave, Giants Grave Road, Briton Ferry, Neath, N P T, SA11 2LN<br>Licence Holder: Neath Port Talbot Waste Management Co Ltd<br>Authority: Natural Resources Wales<br>Site Category: Household, Commercial And Industrial Waste Landfills<br>Max Input Rate: Not Supplied<br>**Licence Status: PPC**<br>Issued: 24th June 2005<br>Positional Accuracy: Positioned by the supplier<br>Boundary Accuracy: As Supplied | A11SE (W) | 918 | 2 | 273608 194900 |
| 174 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 34102<br>Location: Pant Yr Heol, Neath, N P T, SA11 2LQ<br>Operator Name: Glan Y Mor NHS Trust<br>Operator Location: Not Supplied<br>Authority: Natural Resources Wales<br>Site Category: Clinical Waste Transfer Stations<br>**Licence Status: Surrendered**<br>Issued: 8th July 1994<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: 7th December 2001<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | A18SW (N) | 401 | 2 | 274500 195700 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 175 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: YP3498FR<br>Location: Giants Grave Landfill Site ( Ppc ), Briton Ferry, Neath, N P T, Neath Port Talbot, SA11 2LN<br>Operator Name: Neath Port Talbot Waste Management Co Ltd<br>Operator Location: Not Supplied<br>Authority: Natural Resources Wales<br>Site Category: Not Supplied<br>**Licence Status: Expired**<br>Issued: 24th June 2005<br>Last Modified: Not Supplied<br>Expires: 25th June 2005<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A11SE (W) | 939 | 2 | 273598 194872 |
| 175 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 34272<br>Location: Giants Grave, Giants Grave Road, Briton Ferry, Neath, N P T, SA11 2LN<br>Operator Name: Neath Port Talbot Waste Management Co Ltd<br>Operator Location: Not Supplied<br>Authority: Natural Resources Wales<br>Site Category: Household, Commercial And Industrial Waste Landfills<br>**Licence Status: To PPC**<br>Issued: 24th June 2005<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: HP3535PS<br>Positional Accuracy: Located by supplier to within 10m | A11SE (W) | 939 | 2 | 273598 194872 |
| 176 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: ZP3198FN<br>Location: Briton Ferry Shipping Services Ltd, Briton Ferry Shipping Services Ltd, Giants Wharf, Briton Ferry, Neath, N P T, Neath Port Talbot, SA11 2LP<br>Operator Name: Briton Ferry Shipping Services Ltd<br>Operator Location: Not Supplied<br>Authority: Natural Resources Wales<br>Site Category: Not Supplied<br>**Licence Status: Effective**<br>Issued: 22nd September 2017<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A6NE (W) | 950 | 2 | 273609 194823 |
| 176 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: ZP3198FN<br>Location: Briton Ferry Shipping Services Ltd, Briton Ferry Shipping Services Ltd, Giants Wharf, Briton Ferry, Neath, N P T, Neath Port Talbot, SA11 2LP<br>Operator Name: Briton Ferry Shipping Services Ltd<br>Operator Location: Not Supplied<br>Authority: Natural Resources Wales<br>Site Category: Not Supplied<br>**Licence Status: Effective**<br>Issued: 22nd September 2017<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A6NE (W) | 950 | 2 | 273609 194823 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 176 | **Licensed Waste Management Facilities (Locations)**<br>Licence Number: 34183<br>Location: Briton Ferry Shipping Services Ltd, Giants Wharf, Briton Ferry, Neath, SA11 2LP<br>Operator Name: Briton Ferry Shipping Services Ltd<br>Operator Location: Not Supplied<br>Authority: Natural Resources Wales<br>Site Category: Special Waste Transfer Stations<br>**Licence Status: Issued**<br>Issued: 30th January 2001<br>Last Modified: Not Supplied<br>Expires: Not Supplied<br>Suspended: Not Supplied<br>Revoked: Not Supplied<br>Surrendered: Not Supplied<br>IPPC Reference: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A6NE (W) | 950 | 2 | 273609 194823 |
| | **Local Authority Landfill Coverage**<br>Name: Neath Port Talbot County Borough Council - Has supplied landfill data | | 0 | 4 | 274677 195184 |
| 177 | **Local Authority Recorded Landfill Sites**<br>Location: Landfill - Neath<br>Reference: Not Supplied<br>Authority: Neath Port Talbot County Borough Council, Environmental Health Department<br>**Last Reported Status: Not Supplied**<br>Types of Waste: Not Supplied<br>Date of Closure: Not Supplied<br>Positional Accuracy: Positioned by the supplier<br>Boundary Quality: Moderate | A17SW (NW) | 854 | 4 | 273819 195832 |
| 178 | **Potentially Infilled Land (Non-Water)**<br>Bearing Ref: E<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1992 | A13SE (E) | 99 | - | 274986 195077 |
| 179 | **Potentially Infilled Land (Non-Water)**<br>Bearing Ref: E<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1992 | A14NW (E) | 265 | - | 275085 195302 |
| 180 | **Potentially Infilled Land (Non-Water)**<br>Bearing Ref: N<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1992 | A13NE (N) | 277 | - | 274693 195511 |
| 181 | **Potentially Infilled Land (Non-Water)**<br>Bearing Ref: E<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1992 | A14SW (E) | 343 | - | 275238 195136 |
| 182 | **Potentially Infilled Land (Non-Water)**<br>Bearing Ref: NE<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1992 | A13NE (NE) | 383 | - | 275011 195484 |
| 183 | **Potentially Infilled Land (Non-Water)**<br>Bearing Ref: N<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1992 | A18NW (N) | 593 | - | 274556 195888 |
| 184 | **Potentially Infilled Land (Non-Water)**<br>Bearing Ref: S<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1980 | A8SW (S) | 688 | - | 274488 194486 |
| 185 | **Potentially Infilled Land (Non-Water)**<br>Bearing Ref: S<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1980 | A8SW (S) | 723 | - | 274538 194426 |
| 186 | **Potentially Infilled Land (Non-Water)**<br>Bearing Ref: W<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1992 | A11NE (W) | 855 | - | 273610 195370 |
| 187 | **Potentially Infilled Land (Non-Water)**<br>Bearing Ref: S<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1980 | A8SW (S) | 858 | - | 274436 194324 |

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|---|---|---|---|---|---|
| 188 | **Potentially Infilled Land (Non-Water)**<br>Bearing Ref: N<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1992 | A18NE (N) | 867 | - | 274797 196108 |
| 189 | **Potentially Infilled Land (Non-Water)**<br>Bearing Ref: S<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1980 | A8SW (S) | 920 | - | 274380 194280 |
| 190 | **Potentially Infilled Land (Non-Water)**<br>Bearing Ref: NE<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1992 | A19NW (NE) | 951 | - | 275179 196032 |
| 191 | **Potentially Infilled Land (Non-Water)**<br>Bearing Ref: N<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1992 | A23SW (N) | 954 | - | 274397 196249 |
| 192 | **Potentially Infilled Land (Non-Water)**<br>Bearing Ref: N<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1992 | A18NE (N) | 956 | - | 274824 196193 |
| 193 | **Potentially Infilled Land (Non-Water)**<br>Bearing Ref: N<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1992 | A23SE (N) | 1000 | - | 274722 196271 |
| 194 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1965 | A13SW (SW) | 0 | - | 274670 195169 |
| 195 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1964 | A13SE (SE) | 204 | - | 274897 194868 |
| 196 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1900 | A13NW (NW) | 226 | - | 274381 195499 |
| 197 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1940 | A18SW (NW) | 247 | - | 274385 195525 |
| 198 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1900 | A17SE (NW) | 467 | - | 274117 195584 |
| 199 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1940 | A17SE (NW) | 501 | - | 274091 195606 |
| 200 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1940 | A17SE (NW) | 575 | - | 274008 195617 |
| 201 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1884 | A17SE (NW) | 674 | - | 274026 195791 |
| 202 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1940 | A17SE (NW) | 691 | - | 274074 195857 |
| 203 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1940 | A17SW (NW) | 693 | - | 273845 195575 |
| 204 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1884 | A17SW (NW) | 716 | - | 273845 195621 |
| 205 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1938 | A17SW (W) | 766 | - | 273757 195562 |
| 206 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1938 | A7NE (SW) | 789 | - | 274063 194567 |

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| 207 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1940 | A17SW (NW) | 840 | - | 273692 195596 |
| 208 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1940 | A17SW (NW) | 883 | - | 273747 195781 |
| 209 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1940 | A23SW (N) | 951 | - | 274384 196245 |
| 210 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1884 | A16SE (W) | 957 | - | 273555 195570 |
| 211 | **Registered Waste Transfer Sites**<br>Licence Holder: Glan-Y-Mor Nhs Trust<br>Licence Reference: NBWD 3<br>Site Location: Neath General Hospital, Pant Yr Heol, NEATH, West Glamorgan, SA11 2LQ<br>Operator Location: 21 Orchard Street, SWANSEA, West Glamorgan, SA1 5AQ<br>Authority: Environment Agency Wales, South West Area<br>Site Category: Transfer<br>Max Input Rate: Very Small (Less than 10,000 tonnes per year)<br>Waste Source Restrictions: Waste produced/controlled by licence holder<br>Licence Status: Operational as far as is knownOperational<br>Dated: 24th September 1996<br>Preceded By Licence: NBWD 3<br>Superseded By Licence: Not Given<br>Positional Accuracy: Manually positioned to the road within the address or location<br>Boundary Quality: Not Supplied<br>Authorised Waste: Clinical Waste Max.Stor; Food Waste Max.Stor; Household Waste Max.Stor; Pharmaceuticals Max.Stor<br>Prohibited Waste: Highly Flam./Lpg Regs'72 Subs; Percussive/Explosive/Similar Waste; Special Wastes (As In '96 Regs) N.O.S; Sub'S Control. Radioactive Subs Act'60; Waste N.O.S. | A18SW (NW) | 253 | 3 | 274450 195550 |
| 211 | **Registered Waste Transfer Sites**<br>Licence Holder: West Glamorgan Health Authority<br>Licence Reference: NBWD 3<br>Site Location: Neath General Hospital, Pant Yr Heol, NEATH, West Glamorgan, SA11 2LQ<br>Operator Location: 36 Orchard Street, SWANSEA, West Glamorgan, SA1 5AQ<br>Authority: Environment Agency Wales, South West Area<br>Site Category: Transfer<br>Max Input Rate: Very Small (Less than 10,000 tonnes per year)<br>Waste Source Restrictions: No known restriction on source of waste<br>Licence Status: Record supersededSuperseded<br>Dated: 8th July 1994<br>Preceded By Licence: 12/88<br>Superseded By Licence: NBWD 3<br>Positional Accuracy: Manually positioned to the road within the address or location<br>Boundary Quality: Not Supplied<br>Authorised Waste: Clinical Wastes; Food Waste; Gen.Hosp'Waste/Bottle/Aerosol Max.Stor; Pharmaceuticals; Radioactive Cont.Glassware/Syringe/Etc; Sharps<br>Prohibited Waste: Highly Flam./Lpg Regs'72 Subs; Percussive/Explosive/Similar Waste; Special Wastes N.O.S.; Sub'S Control. Radioactive Subs Act'60; Waste N.O.S. | A18SW (NW) | 253 | 3 | 274450 195550 |

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| 212 | **Registered Waste Transfer Sites**<br>Licence Holder: Neath Waste Management Company Ltd<br>Licence Reference: NBWD 4<br>Site Location: Giant's Grave C.A.Site, Briton Ferry, NEATH, West Glamorgan, SA11 2LN<br>Operator Location: Giant's Grave Road, Briton Ferry, NEATH, West Glamorgan, SA11 2LN<br>Authority: Environment Agency Wales, South West Area<br>Site Category: Civic Amenity<br>Max Input Rate: Small (Equal to or greater than 10,000 and less than 25,000 tonnes per year)<br>Waste Source Restrictions: No known restriction on source of waste<br>Licence Status: OperationalOperational<br>Dated: 1st April 1993<br>Preceded By Licence: Not Given<br>Superseded By Licence: Not Given<br>Positional Accuracy: Manually positioned to the road within the address or location<br>Boundary Quality: Not Supplied<br>Authorised Waste: Household Waste<br>Commercial Waste<br>Hazardous Wastes<br>Industrial Wastes<br>Special Wastes<br>Prohibited Waste | A11SE (W) | 926 | 3 | 273600 194900 |
| 213 | **Registered Waste Treatment or Disposal Sites**<br>Licence Holder: West Glamorgan Area Health Authority<br>Licence Reference: 12/88<br>Site Location: Adj Outpatient Dept, Main Hospital Site, Neath, West Glamorgan<br>Operator Location: 36 Orchard Street, SWANSEA, West Glamorgan, SA1 5AQ<br>Authority: Environment Agency Wales, South West Area<br>Site Category: Incineration<br>Max Input Rate: Undefined<br>Waste Source Restrictions: No known restriction on source of waste<br>Licence Status: Record supersededSuperseded<br>Dated: 1st June 1988<br>Preceded By Licence: Not Given<br>Superseded By Licence: NBWD 3<br>Positional Accuracy: Manually positioned to the road within the address or location<br>Boundary Quality: Not Supplied<br>Authorised Waste: Hospital Wastes<br>Pathology Wastes Suitable For Inc'N<br>Sharps (Med./Surg./Vet)<br>Soiled Surgical Dress./Swaps/Cont.Wast<br>Solid Medicines & Injectables<br>Prohibited Waste: Broken Thermometers Contain. Mercury<br>Pharmaceutical Aerosols | A18SW (NW) | 253 | 3 | 274450 195550 |

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| | **BGS 1:625,000 Solid Geology**<br>Description: South Wales Upper Coal Measures Formation | A13SE (SE) | 0 | 1 | 274677 195184 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A13NE (NE) | 0 | 1 | 274717 195208 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 35 - 45 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A13SW (S) | 0 | 1 | 274663 195136 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 35 - 45 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A13SE (E) | 0 | 1 | 274844 195159 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 35 - 45 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A13NW (W) | 0 | 1 | 274532 195240 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A13SE (SE) | 0 | 1 | 274677 195184 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 35 - 45 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A13NW (NW) | 34 | 1 | 274548 195312 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A13SE (E) | 108 | 1 | 274996 195160 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 35 - 45 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A12NE (W) | 141 | 1 | 274320 195283 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 35 - 45 mg/kg<br>Cadmium Concentration: 1.8 - 2.2 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A13SE (SE) | 148 | 1 | 275000 195000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A14NW (E) | 228 | 1 | 275070 195302 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A14NW (E) | 370 | 1 | 275196 195356 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: 1.8 - 2.2 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A14SW (E) | 436 | 1 | 275315 195000 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 35 - 45 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A14NW (NE) | 437 | 1 | 275209 195453 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A7NE (SW) | 442 | 1 | 274335 194812 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 35 - 45 mg/kg<br>Cadmium Concentration: 1.8 - 2.2 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A14SE (E) | 525 | 1 | 275396 194959 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 45 - 60 mg/kg<br>Cadmium Concentration: 1.8 - 2.2 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A9NW (SE) | 612 | 1 | 275139 194520 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 35 - 45 mg/kg<br>Cadmium Concentration: 2.2 - 3.0 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A14SE (E) | 615 | 1 | 275500 195000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 45 - 60 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A18SE (N) | 647 | 1 | 274830 195854 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: 2.2 - 3.0 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A9NE (SE) | 677 | 1 | 275500 194811 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 35 - 45 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A14NE (E) | 687 | 1 | 275577 195202 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 45 - 60 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A18NE (N) | 701 | 1 | 274677 196000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 35 - 45 mg/kg<br>Cadmium Concentration: 2.2 - 3.0 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A9NE (SE) | 717 | 1 | 275500 194729 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: 2.2 - 3.0 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A14SE (E) | 736 | 1 | 275622 195000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: 1.8 - 2.2 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A7SE (SW) | 788 | 1 | 274208 194500 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 35 - 45 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A12SW (W) | 802 | 1 | 273733 194906 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 35 - 45 mg/kg<br>Cadmium Concentration: 2.2 - 3.0 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A15SW (E) | 818 | 1 | 275706 195000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: 2.2 - 3.0 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A17NW (NW) | 853 | 1 | 274000 196000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A18NE (N) | 898 | 1 | 274931 196084 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A6NE (W) | 908 | 1 | 273654 194827 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 35 - 45 mg/kg<br>Cadmium Concentration: 1.8 - 2.2 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A7SW (SW) | 938 | 1 | 273894 194500 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Sediment<br>Arsenic Concentration: 25 - 35 mg/kg<br>Cadmium Concentration: 1.8 - 2.2 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A8SW (S) | 996 | 1 | 274342 194214 |
| 214 | **BGS Recorded Mineral Sites**<br>Site Name: Tyla Morris<br>Location: Briton Ferry, Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 156550<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Hughes Member<br>Commodity: Sandstone<br>Positional Accuracy: Located by supplier to within 10m | A13SE (E) | 60 | 1 | 274890 195184 |
| 215 | **BGS Recorded Mineral Sites**<br>Site Name: Tyla Morris<br>Location: Briton Ferry, Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 156551<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Hughes Member<br>Commodity: Sandstone<br>Positional Accuracy: Located by supplier to within 10m | A14SW (E) | 138 | 1 | 275030 195148 |
| 216 | **BGS Recorded Mineral Sites**<br>Site Name: Esgyrn Colliery<br>Location: Briton Ferry, Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 156579<br>Type: Underground<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Brithdir Member<br>Commodity: Coal - Deep<br>Positional Accuracy: Located by supplier to within 10m | A14SW (E) | 141 | 1 | 275034 195087 |
| 217 | **BGS Recorded Mineral Sites**<br>Site Name: Tyla Morris<br>Location: Briton Ferry, Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 156549<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Hughes Member<br>Commodity: Sandstone<br>Positional Accuracy: Located by supplier to within 10m | A13NE (E) | 189 | 1 | 274971 195290 |
| 218 | **BGS Recorded Mineral Sites**<br>Site Name: Esgyrn Colliery<br>Location: Briton Ferry, Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 156578<br>Type: Underground<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Hughes Member<br>Commodity: Coal - Deep<br>Positional Accuracy: Located by supplier to within 10m | A14NW (E) | 253 | 1 | 275126 195222 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 219 | **BGS Recorded Mineral Sites**<br>Site Name: Ty-Nef<br>Location: Briton Ferry, Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 156577<br>Type: Underground<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Hughes Member<br>Commodity: Coal - Deep<br>Positional Accuracy: Located by supplier to within 10m | A14NW (E) | 286 | 1 | 275131 195279 |
| 220 | **BGS Recorded Mineral Sites**<br>Site Name: Garth-Mor<br>Location: Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 154446<br>Type: Underground<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Hughes Member<br>Commodity: Coal - Deep<br>Positional Accuracy: Located by supplier to within 10m | A18SE (N) | 295 | 1 | 274696 195529 |
| 221 | **BGS Recorded Mineral Sites**<br>Site Name: Esgyrn Colliery<br>Location: Briton Ferry, Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 156552<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Brithdir Member<br>Commodity: Sandstone<br>Positional Accuracy: Located by supplier to within 10m | A14SW (SE) | 369 | 1 | 275180 194869 |
| 222 | **BGS Recorded Mineral Sites**<br>Site Name: Garth-Mor<br>Location: Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 154430<br>Type: Underground<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Hughes Member<br>Commodity: Coal - Deep<br>Positional Accuracy: Located by supplier to within 10m | A14NW (NE) | 401 | 1 | 275028 195496 |
| 223 | **BGS Recorded Mineral Sites**<br>Site Name: Esgyrn Colliery<br>Location: Briton Ferry, Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 156580<br>Type: Underground<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Hughes Member<br>Commodity: Coal - Deep<br>Positional Accuracy: Located by supplier to within 10m | A14SE (E) | 506 | 1 | 275371 194943 |
| 224 | **BGS Recorded Mineral Sites**<br>Site Name: Garth-Mor<br>Location: Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 154431<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Hughes Member<br>Commodity: Sandstone<br>Positional Accuracy: Located by supplier to within 10m | A19SW (NE) | 531 | 1 | 275103 195605 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 225 | **BGS Recorded Mineral Sites**<br>Site Name: Esgyrn Colliery<br>Location: Briton Ferry, Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 156614<br>Type: Underground<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Hughes Member<br>Commodity: Coal - Deep<br>Positional Accuracy: Located by supplier to within 10m | A14SE (E) | 536 | 1 | 275428 195058 |
| 225 | **BGS Recorded Mineral Sites**<br>Site Name: Esgyrn Colliery<br>Location: Briton Ferry, Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 156553<br>Type: Underground<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Hughes Member<br>Commodity: Coal - Deep<br>Positional Accuracy: Located by supplier to within 10m | A14SE (E) | 555 | 1 | 275444 195032 |
| 226 | **BGS Recorded Mineral Sites**<br>Site Name: Esgyrn Colliery<br>Location: Briton Ferry, Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 156597<br>Type: Underground<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Hughes Member<br>Commodity: Coal - Deep<br>Positional Accuracy: Located by supplier to within 10m | A9NE (SE) | 561 | 1 | 275384 194841 |
| 227 | **BGS Recorded Mineral Sites**<br>Site Name: Pen-Rhiw-Tyn<br>Location: Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 154429<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Hughes Member<br>Commodity: Sandstone<br>Positional Accuracy: Located by supplier to within 10m | A18NW (N) | 606 | 1 | 274562 195901 |
| 228 | **BGS Recorded Mineral Sites**<br>Site Name: Eaglebush Cottage<br>Location: Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 154444<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Hughes Member<br>Commodity: Sandstone<br>Positional Accuracy: Located by supplier to within 10m | A19SW (NE) | 655 | 1 | 275021 195778 |
| 229 | **BGS Recorded Mineral Sites**<br>Site Name: Ty'N-Y-Daraenen<br>Location: Briton Ferry, Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 156586<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Brithdir Member<br>Commodity: Sandstone<br>Positional Accuracy: Located by supplier to within 10m | A9NE (SE) | 666 | 1 | 275445 194734 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 230 | **BGS Recorded Mineral Sites**<br>Site Name: Bay View<br>Location: Briton Ferry, Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 156556<br>Type: Underground<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Brithdir Member<br>Commodity: Coal - Deep<br>Positional Accuracy: Located by supplier to within 10m | A8SW (S) | 725 | 1 | 274496 194442 |
| 231 | **BGS Recorded Mineral Sites**<br>Site Name: Park Terrace<br>Location: Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 154428<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Hughes Member<br>Commodity: Sandstone<br>Positional Accuracy: Located by supplier to within 10m | A18NW (N) | 737 | 1 | 274471 196036 |
| 232 | **BGS Recorded Mineral Sites**<br>Site Name: Ty'N-Y-Ddraenen<br>Location: Briton Ferry, Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 156606<br>Type: Underground<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Hughes Member<br>Commodity: Coal - Deep<br>Positional Accuracy: Located by supplier to within 10m | A9NE (SE) | 830 | 1 | 275614 194701 |
| 233 | **BGS Recorded Mineral Sites**<br>Site Name: Graig House<br>Location: Briton Ferry, Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 156557<br>Type: Underground<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Brithdir Member<br>Commodity: Coal - Deep<br>Positional Accuracy: Located by supplier to within 10m | A8SW (S) | 859 | 1 | 274442 194320 |
| 234 | **BGS Recorded Mineral Sites**<br>Site Name: Eaglesbush House<br>Location: Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 154427<br>Type: Underground<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Hughes Member<br>Commodity: Coal - Deep<br>Positional Accuracy: Located by supplier to within 10m | A18NE (N) | 893 | 1 | 274807 196133 |
| 235 | **BGS Recorded Mineral Sites**<br>Site Name: Eaglebush House<br>Location: Neath, West Glamorgan<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 154445<br>Type: Underground<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Carboniferous<br>Geology: Hughes Member<br>Commodity: Coal - Deep<br>Positional Accuracy: Located by supplier to within 10m | A23SE (N) | 980 | 1 | 274847 196211 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 274750, 195250<br>Soil Sample Type: Topsoil<br>Sample Area: Swansea<br>Arsenic Measured Concentration: 93.00 mg/kg<br>Cadmium Measured Concentration: 5.70 mg/kg<br>Chromium Measured Concentration: 84.90 mg/kg<br>Lead Measured Concentration: 1072.30 mg/kg<br>Nickel Measured Concentration: 96.50 mg/kg | A13NE (NE) | 63 | 1 | 274750 195250 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 274230, 195250<br>Soil Sample Type: Topsoil<br>Sample Area: Swansea<br>Arsenic Measured Concentration: 23.50 mg/kg<br>Cadmium Measured Concentration: 2.60 mg/kg<br>Chromium Measured Concentration: 80.20 mg/kg<br>Lead Measured Concentration: 596.20 mg/kg<br>Nickel Measured Concentration: 45.30 mg/kg | A12NE (W) | 227 | 1 | 274230 195250 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 274750, 194780<br>Soil Sample Type: Topsoil<br>Sample Area: Swansea<br>Arsenic Measured Concentration: 139.50 mg/kg<br>Cadmium Measured Concentration: 0.50 mg/kg<br>Chromium Measured Concentration: 57.70 mg/kg<br>Lead Measured Concentration: 216.80 mg/kg<br>Nickel Measured Concentration: 38.10 mg/kg | A8NE (S) | 314 | 1 | 274750 194780 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 274250, 195740<br>Soil Sample Type: Topsoil<br>Sample Area: Swansea<br>Arsenic Measured Concentration: 84.60 mg/kg<br>Cadmium Measured Concentration: 2.00 mg/kg<br>Chromium Measured Concentration: 87.50 mg/kg<br>Lead Measured Concentration: 784.20 mg/kg<br>Nickel Measured Concentration: 115.50 mg/kg | A17SE (NW) | 500 | 1 | 274250 195740 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 274760, 195770<br>Soil Sample Type: Topsoil<br>Sample Area: Swansea<br>Arsenic Measured Concentration: 34.50 mg/kg<br>Cadmium Measured Concentration: 0.70 mg/kg<br>Chromium Measured Concentration: 56.40 mg/kg<br>Lead Measured Concentration: 99.70 mg/kg<br>Nickel Measured Concentration: 28.00 mg/kg | A18SE (N) | 541 | 1 | 274760 195770 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 274190, 194780<br>Soil Sample Type: Topsoil<br>Sample Area: Swansea<br>Arsenic Measured Concentration: 27.90 mg/kg<br>Cadmium Measured Concentration: 1.10 mg/kg<br>Chromium Measured Concentration: 95.60 mg/kg<br>Lead Measured Concentration: 387.70 mg/kg<br>Nickel Measured Concentration: 53.70 mg/kg | A7NE (SW) | 541 | 1 | 274190 194780 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 273750, 195230<br>Soil Sample Type: Topsoil<br>Sample Area: Swansea<br>Arsenic Measured Concentration: 78.80 mg/kg<br>Cadmium Measured Concentration: 3.10 mg/kg<br>Chromium Measured Concentration: 68.40 mg/kg<br>Lead Measured Concentration: 146.80 mg/kg<br>Nickel Measured Concentration: 39.00 mg/kg | A12NW (W) | 707 | 1 | 273750 195230 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 275250, 195740<br>Soil Sample Type: Topsoil<br>Sample Area: Swansea<br>Arsenic Measured Concentration: 75.90 mg/kg<br>Cadmium Measured Concentration: 1.90 mg/kg<br>Chromium Measured Concentration: 63.10 mg/kg<br>Lead Measured Concentration: 90.50 mg/kg<br>Nickel Measured Concentration: 28.70 mg/kg | A19SW (NE) | 717 | 1 | 275250 195740 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 273750, 194760<br>Soil Sample Type: Topsoil<br>Sample Area: Swansea<br>Arsenic Measured Concentration: 50.80 mg/kg<br>Cadmium Measured Concentration: 3.50 mg/kg<br>Chromium Measured Concentration: 102.80 mg/kg<br>Lead Measured Concentration: 338.00 mg/kg<br>Nickel Measured Concentration: 43.40 mg/kg | A7NW (SW) | 861 | 1 | 273750 194760 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 273760, 195770<br>Soil Sample Type: Topsoil<br>Sample Area: Swansea<br>Arsenic Measured Concentration: 43.80 mg/kg<br>Cadmium Measured Concentration: 5.10 mg/kg<br>Chromium Measured Concentration: 60.00 mg/kg<br>Lead Measured Concentration: 93.60 mg/kg<br>Nickel Measured Concentration: 71.60 mg/kg | A17SW (NW) | 866 | 1 | 273760 195770 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 274740, 194200<br>Soil Sample Type: Topsoil<br>Sample Area: Swansea<br>Arsenic Measured Concentration: 126.30 mg/kg<br>Cadmium Measured Concentration: 0.60 mg/kg<br>Chromium Measured Concentration: 48.30 mg/kg<br>Lead Measured Concentration: 193.30 mg/kg<br>Nickel Measured Concentration: 25.20 mg/kg | A8SE (S) | 880 | 1 | 274740 194200 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 274150, 196140<br>Soil Sample Type: Topsoil<br>Sample Area: Swansea<br>Arsenic Measured Concentration: 25.80 mg/kg<br>Cadmium Measured Concentration: 0.90 mg/kg<br>Chromium Measured Concentration: 77.50 mg/kg<br>Lead Measured Concentration: 146.60 mg/kg<br>Nickel Measured Concentration: 51.70 mg/kg | A17NE (NW) | 906 | 1 | 274150 196140 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 274290, 194270<br>Soil Sample Type: Topsoil<br>Sample Area: Swansea<br>Arsenic Measured Concentration: 59.50 mg/kg<br>Cadmium Measured Concentration: 2.80 mg/kg<br>Chromium Measured Concentration: 81.60 mg/kg<br>Lead Measured Concentration: 369.60 mg/kg<br>Nickel Measured Concentration: 50.20 mg/kg | A7SE (SW) | 966 | 1 | 274290 194270 |
| | **BGS Measured Urban Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Grid: 274750, 196240<br>Soil Sample Type: Topsoil<br>Sample Area: Swansea<br>Arsenic Measured Concentration: 73.90 mg/kg<br>Cadmium Measured Concentration: 1.20 mg/kg<br>Chromium Measured Concentration: 57.40 mg/kg<br>Lead Measured Concentration: 188.00 mg/kg<br>Nickel Measured Concentration: 33.20 mg/kg | A23SE (N) | 977 | 1 | 274750 196240 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Urban Soil Chemistry Averages**<br>Source: British Geological Survey, National Geoscience Information Service<br>Sample Area: Swansea<br>Count Id: 368<br>Arsenic Minimum Concentration: 8.00 mg/kg<br>Arsenic Average Concentration: 79.00 mg/kg<br>Arsenic Maximum Concentration: 2161.00 mg/kg<br>Cadmium Minimum Concentration: 0.10 mg/kg<br>Cadmium Average Concentration: 2.90 mg/kg<br>Cadmium Maximum Concentration: 61.90 mg/kg<br>Chromium Minimum Concentration: 13.00 mg/kg<br>Chromium Average Concentration: 72.00 mg/kg<br>Chromium Maximum Concentration: 562.00 mg/kg<br>Lead Minimum Concentration: 23.00 mg/kg<br>Lead Average Concentration: 413.00 mg/kg<br>Lead Maximum Concentration: 10000.00 mg/kg<br>Nickel Minimum Concentration: 8.00 mg/kg<br>Nickel Average Concentration: 52.00 mg/kg<br>Nickel Maximum Concentration: 384.00 mg/kg | A13SE (SE) | 0 | 1 | 274677 195184 |
| | **Coal Mining Affected Areas**<br>Description: In an area which may be affected by coal mining activity. It is recommended that a coal mining report is obtained from the Coal Authority. Contact details are included in the Useful Contacts section of this report. | A13SE (SE) | 0 | 6 | 274677 195184 |
| | **Mining Instability**<br>Mining Evidence: Inconclusive Coal Mining<br>Source: Ove Arup & Partners<br>Boundary Quality: As Supplied | A13SE (SE) | 0 | - | 274677 195184 |
| | **Non Coal Mining Areas of Great Britain**<br>No Hazard | | | | |
| | **Potential for Collapsible Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (SE) | 0 | 1 | 274677 195184 |
| | **Potential for Collapsible Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SW (S) | 0 | 1 | 274671 195149 |
| | **Potential for Collapsible Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (S) | 70 | 1 | 274677 195000 |
| | **Potential for Collapsible Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (E) | 104 | 1 | 275000 195184 |
| | **Potential for Collapsible Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (SE) | 148 | 1 | 275000 195000 |
| | **Potential for Compressible Ground Stability Hazards**<br>Hazard Potential: Moderate<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (NW) | 0 | 1 | 274556 195250 |
| | **Potential for Compressible Ground Stability Hazards**<br>Hazard Potential: Moderate<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (SE) | 0 | 1 | 274768 195108 |
| | **Potential for Compressible Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (SE) | 0 | 1 | 274677 195184 |
| | **Potential for Compressible Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (S) | 70 | 1 | 274677 195000 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Potential for Compressible Ground Stability Hazards**<br>Hazard Potential: Moderate<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 92 | 1 | 274367 195272 |
| | **Potential for Compressible Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (E) | 104 | 1 | 275000 195184 |
| | **Potential for Compressible Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (SE) | 148 | 1 | 275000 195000 |
| | **Potential for Ground Dissolution Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (SE) | 0 | 1 | 274677 195184 |
| | **Potential for Ground Dissolution Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (S) | 70 | 1 | 274677 195000 |
| | **Potential for Ground Dissolution Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (E) | 104 | 1 | 275000 195184 |
| | **Potential for Ground Dissolution Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (SE) | 148 | 1 | 275000 195000 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Moderate<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (E) | 0 | 1 | 274762 195160 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Moderate<br>Source: British Geological Survey, National Geoscience Information Service | A13NE (NE) | 0 | 1 | 274695 195208 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Low<br>Source: British Geological Survey, National Geoscience Information Service | A13NE (NE) | 0 | 1 | 274683 195194 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (SE) | 0 | 1 | 274677 195184 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (S) | 70 | 1 | 274701 194966 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (S) | 79 | 1 | 274677 195000 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (E) | 104 | 1 | 275000 195158 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (E) | 107 | 1 | 275000 195095 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (E) | 107 | 1 | 275000 195184 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (SE) | 148 | 1 | 275000 195000 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A14SW (SE) | 206 | 1 | 275067 195000 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Moderate<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (S) | 211 | 1 | 274744 194885 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Low<br>Source: British Geological Survey, National Geoscience Information Service | A14NW (E) | 225 | 1 | 275073 195294 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Low<br>Source: British Geological Survey, National Geoscience Information Service | A12NE (W) | 240 | 1 | 274216 195204 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Potential for Running Sand Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (S) | 0 | 1 | 274694 195084 |
| | **Potential for Running Sand Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (SE) | 0 | 1 | 274677 195184 |
| | **Potential for Running Sand Ground Stability Hazards**<br>Hazard Potential: Moderate<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (SE) | 0 | 1 | 274768 195108 |
| | **Potential for Running Sand Ground Stability Hazards**<br>Hazard Potential: Moderate<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (NW) | 0 | 1 | 274556 195250 |
| | **Potential for Running Sand Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (S) | 70 | 1 | 274677 195000 |
| | **Potential for Running Sand Ground Stability Hazards**<br>Hazard Potential: Moderate<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 92 | 1 | 274367 195272 |
| | **Potential for Running Sand Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (E) | 104 | 1 | 275000 195184 |
| | **Potential for Running Sand Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (E) | 107 | 1 | 275000 195095 |
| | **Potential for Running Sand Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (SE) | 148 | 1 | 275000 195000 |
| | **Potential for Running Sand Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A14SW (SE) | 181 | 1 | 275038 195000 |
| | **Potential for Running Sand Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (S) | 241 | 1 | 274688 194851 |
| | **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (SE) | 0 | 1 | 274677 195184 |
| | **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13NE (NE) | 17 | 1 | 274721 195239 |
| | **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (S) | 70 | 1 | 274677 195000 |
| | **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (E) | 104 | 1 | 275000 195158 |
| | **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (E) | 107 | 1 | 275000 195184 |
| | **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (E) | 107 | 1 | 275000 195095 |
| | **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (SE) | 148 | 1 | 275000 195000 |
| | **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A14SW (SE) | 181 | 1 | 275038 195000 |
| | **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A14NW (E) | 225 | 1 | 275073 195294 |
| | **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (S) | 241 | 1 | 274688 194851 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Radon Potential - Radon Affected Areas**<br>Affected Area: The property is an Intermediate probability radon area (3 to 5% of homes are estimated to be at or above the Action Level).<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (SE) | 0 | 1 | 274677 195184 |
| | **Radon Potential - Radon Affected Areas**<br>Affected Area: The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level).<br>Source: British Geological Survey, National Geoscience Information Service | A13SW (W) | 0 | 1 | 274648 195184 |
| | **Radon Potential - Radon Protection Measures**<br>Protection Measure: Basic radon protective measures are necessary in the construction of new dwellings or extensions<br>Source: British Geological Survey, National Geoscience Information Service | A13SE (SE) | 0 | 1 | 274677 195184 |
| | **Radon Potential - Radon Protection Measures**<br>Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions<br>Source: British Geological Survey, National Geoscience Information Service | A13SW (W) | 0 | 1 | 274648 195184 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 236 | **Contemporary Trade Directory Entries**<br>Name: Car Tec<br>Location: 1, Ormond Street, Neath, West Glamorgan, SA11 2TG<br>Classification: Car Body Repairs<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A13SW (SW) | 183 | - | 274461 195050 |
| 237 | **Contemporary Trade Directory Entries**<br>Name: Station Sprayers<br>Location: Station Road, Briton Ferry, Neath, West Glamorgan, SA11 2SU<br>Classification: Garage Services<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A12NE (W) | 218 | - | 274240 195229 |
| 237 | **Contemporary Trade Directory Entries**<br>Name: A & S Tyres Ltd<br>Location: Unit 1-5 Station Road, Briton Ferry, Neath, West Glamorgan, SA11 2SU<br>Classification: Tyre Dealers<br>**Status: Active**<br>Positional Accuracy: Manually positioned within the geographical locality | A12NE (W) | 219 | - | 274239 195235 |
| 237 | **Contemporary Trade Directory Entries**<br>Name: Double P Motors Ltd<br>Location: Station Road, Briton Ferry, Neath, SA11 2SU<br>Classification: Garage Services<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A12NE (W) | 219 | - | 274239 195235 |
| 238 | **Contemporary Trade Directory Entries**<br>Name: A & S Tyres Ltd<br>Location: Unit 1-5 Station Yard,Station Road, Briton Ferry, Neath, West Glamorgan, SA11 2SU<br>Classification: Garage Services<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned within the geographical locality | A12NE (W) | 225 | - | 274234 195275 |
| 238 | **Contemporary Trade Directory Entries**<br>Name: West Coastal White Line Co Ltd<br>Location: Station Road, Briton Ferry, Neath, West Glamorgan, SA11 2SU<br>Classification: Road Marking & Surfacing Equipment & Material Manufacturers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12NE (W) | 237 | - | 274226 195305 |
| 238 | **Contemporary Trade Directory Entries**<br>Name: A & S Tyre Services<br>Location: Station Road, Briton Ferry, Neath, West Glamorgan, SA11 2SU<br>Classification: Tyre Dealers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12NE (W) | 237 | - | 274226 195305 |
| 239 | **Contemporary Trade Directory Entries**<br>Name: Tarmac<br>Location: Briton Ferry, Neath, West Glamorgan, SA11 2HZ<br>Classification: Sand, Gravel & Other Aggregates<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned within the geographical locality | A17SE (NW) | 393 | - | 274252 195614 |
| 240 | **Contemporary Trade Directory Entries**<br>Name: Lodge Garage<br>Location: The Yard, Shelone Road, Neath, West Glamorgan, SA11 2NS<br>Classification: Car Dealers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12SE (SW) | 426 | - | 274195 194915 |
| 241 | **Contemporary Trade Directory Entries**<br>Name: Neath General Hospital<br>Location: Penrhiwtyn, Neath, West Glamorgan, SA11 2LQ<br>Classification: Hospitals<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A18SW (N) | 457 | - | 274445 195754 |
| 242 | **Contemporary Trade Directory Entries**<br>Name: Alter Kennys<br>Location: Neath Road, Briton Ferry, Neath, West Glamorgan, SA11 2AX<br>Classification: Garage Services<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned within the geographical locality | A8NW (SW) | 466 | - | 274356 194786 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 243 | **Contemporary Trade Directory Entries**<br>Name: Lafarge Readymix<br>Location: Old Iron Works,Briton Ferry, Neath, West Glamorgan, SA11 2LD<br>Classification: Concrete & Mortar Ready Mixed<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned within the geographical locality | A12SE (W) | 514 | - | 274007 195003 |
| 244 | **Contemporary Trade Directory Entries**<br>Name: Autocare Neath<br>Location: Neath Road, Briton Ferry, Neath, West Glamorgan, SA11 2AX<br>Classification: Garage Services<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A8NW (SW) | 522 | - | 274391 194710 |
| 244 | **Contemporary Trade Directory Entries**<br>Name: Neath Car Sales Ltd<br>Location: Neath Road, Briton Ferry, Neath, West Glamorgan, SA11 2AX<br>Classification: Car Dealers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A8NW (SW) | 522 | - | 274391 194710 |
| 245 | **Contemporary Trade Directory Entries**<br>Name: Neath Road Filling Station<br>Location: Neath Rd, Briton Ferry, Neath, West Glamorgan, SA11 2AX<br>Classification: Petrol Filling Stations<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A7NE (SW) | 542 | - | 274333 194714 |
| 246 | **Contemporary Trade Directory Entries**<br>Name: Kingfisher Mobile Tyre Services<br>Location: 53, Olive Branch Crescent, Neath, West Glamorgan, SA11 2UH<br>Classification: Tyre Dealers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12NW (W) | 590 | - | 273872 195324 |
| 246 | **Contemporary Trade Directory Entries**<br>Name: Kingfisher Mobile Tyre Services<br>Location: 53, Olive Branch Crescent, Neath, SA11 2UH<br>Classification: Tyre Dealers<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A12NW (W) | 590 | - | 273872 195324 |
| 247 | **Contemporary Trade Directory Entries**<br>Name: Camps Transport<br>Location: 33, Bryn Teg, Neath, SA11 2YH<br>Classification: Road Haulage Services<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A12NW (W) | 722 | - | 273746 195373 |
| 247 | **Contemporary Trade Directory Entries**<br>Name: J & J Skip Hire<br>Location: 33, Bryn Teg, Neath, West Glamorgan, SA11 2YH<br>Classification: Waste Disposal Services<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12NW (W) | 723 | - | 273745 195374 |
| 248 | **Contemporary Trade Directory Entries**<br>Name: Breeding Group<br>Location: Old Iron Works, Church Road, Neath, West Glamorgan, SA11 2LN<br>Classification: Concrete & Mortar Ready Mixed<br>**Status: Active**<br>Positional Accuracy: Manually positioned within the geographical locality | A12SW (W) | 787 | - | 273749 194908 |
| 249 | **Contemporary Trade Directory Entries**<br>Name: V I P Bin Cleaning<br>Location: 32, Giants Grave Road, Neath, West Glamorgan, SA11 2LS<br>Classification: Hygiene & Cleansing Services<br>**Status: Active**<br>Positional Accuracy: Automatically positioned to the address | A7NW (W) | 787 | - | 273796 194822 |
| 249 | **Contemporary Trade Directory Entries**<br>Name: Clean & Dry<br>Location: 32, Giants Grave Road, Neath, West Glamorgan, SA11 2LS<br>Classification: Carpet, Curtain & Upholstery Cleaners<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7NW (W) | 787 | - | 273796 194822 |
| 250 | **Contemporary Trade Directory Entries**<br>Name: Briton Ferry Salvage Ltd<br>Location: 61, Giants Grave Road, Neath, West Glamorgan, SA11 2LN<br>Classification: Scrap Metal Merchants<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A12SW (W) | 833 | - | 273688 194930 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 251 | **Contemporary Trade Directory Entries**<br>Name: M & M Motors<br>Location: Gower Yard, Lane Rear of 59 To 97 Hunter Street, Briton Ferry, SA11 2RT<br>Classification: Car & Commercial Repairs<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7SE (SW) | 834 | - | 274238 194436 |
| 251 | **Contemporary Trade Directory Entries**<br>Name: Top Grade Tyres<br>Location: 3, Caroline Street, NEATH, West Glamorgan, SA11 2RT<br>Classification: Tyre Dealers<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A7SE (SW) | 852 | - | 274241 194416 |
| 251 | **Contemporary Trade Directory Entries**<br>Name: Briton Ferry Tyre Service<br>Location: Gower Yard,Caroline St, Neath, West Glamorgan, SA11 2RT<br>Classification: Tyre Dealers<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A7SE (SW) | 871 | - | 274234 194398 |
| 251 | **Contemporary Trade Directory Entries**<br>Name: Top Grade Tyres<br>Location: Unit 3,Gower Yard,Caroline St, Neath, West Glamorgan, SA11 2RT<br>Classification: Tyre Dealers<br>**Status: Inactive**<br>Positional Accuracy: Manually positioned to the road within the address or location | A7SE (SW) | 878 | - | 274201 194405 |
| 252 | **Contemporary Trade Directory Entries**<br>Name: Stillman & Sons<br>Location: 82, Giants Grave Road, Neath, West Glamorgan, SA11 2LN<br>Classification: Scrap Metal Merchants<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11SE (W) | 897 | - | 273649 194863 |
| 253 | **Contemporary Trade Directory Entries**<br>Name: J F Coals<br>Location: 8, Herbert Road, Neath, West Glamorgan, SA11 2DN<br>Classification: Coal & Smokeless Fuel Merchants & Distributors<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A23SW (N) | 954 | - | 274513 196253 |
| 254 | **Contemporary Trade Directory Entries**<br>Name: Neath Port Talbot Waste Management Co Ltd<br>Location: Giants Grave Road, Neath, West Glamorgan, SA11 2LN<br>Classification: Waste Disposal Services<br>**Status: Inactive**<br>Positional Accuracy: Automatically positioned to the address | A11SE (W) | 960 | - | 273573 194877 |
| 255 | **Fuel Station Entries**<br>Name: Neath Road Filling Station<br>Location: Neath Road , Briton Ferry , Neath, Neath Port Talbot, SA11 2AX<br>Brand: Total<br>Premises Type: Not Applicable<br>**Status: Obsolete**<br>Positional Accuracy: Automatically positioned to the address | A8NW (SW) | 522 | - | 274391 194710 |
| 256 | **Points of Interest - Commercial Services**<br>Name: Car Tec<br>Location: 1 Ormond Street, Neath, SA11 2TG<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location | A13SW (SW) | 183 | 7 | 274461 195050 |
| 256 | **Points of Interest - Commercial Services**<br>Name: Car Tec<br>Location: 1 Ormond Street, Neath, SA11 2TG<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location | A13SW (SW) | 183 | 7 | 274461 195050 |
| 257 | **Points of Interest - Commercial Services**<br>Name: Station Sprayers<br>Location: Station House, Station Road, Briton Ferry, Neath, SA11 2SU<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location | A12NE (W) | 204 | 7 | 274264 195319 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 257 | **Points of Interest - Commercial Services**<br>Name: A & S Tyres<br>Location: Unit 6 West Coastal White Line Company, Station Road, Briton Ferry, SA11 2SU<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location | A12NE (W) | 230 | 7 | 274231 195290 |
| 258 | **Points of Interest - Commercial Services**<br>Name: Double P Motors Ltd<br>Location: Station Road, Briton Ferry, Neath, SA11 2SU<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location | A12NE (W) | 218 | 7 | 274240 195228 |
| 258 | **Points of Interest - Commercial Services**<br>Name: Station Sprayers<br>Location: Station Road, Briton Ferry, Neath, SA11 2SU<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location | A12NE (W) | 218 | 7 | 274240 195228 |
| 259 | **Points of Interest - Commercial Services**<br>Name: I M O Car Wash<br>Location: 117 Pant yr Heol, Neath, SA11 2HB<br>Category: Personal, Consumer and other Services<br>Class Code: Vehicle Cleaning Services<br>Positional Accuracy: Positioned to address or location | A17SE (NW) | 410 | 7 | 274279 195653 |
| 260 | **Points of Interest - Commercial Services**<br>Name: Dai-agnostics Mobile Motor Repairs<br>Location: 8 Clos Warren, Neath, SA11 2FF<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location | A18SE (N) | 550 | 7 | 274834 195746 |
| 261 | **Points of Interest - Commercial Services**<br>Name: Autocare Neath<br>Location: Neath Road, Briton Ferry, Neath, SA11 2AX<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location | A8NW (SW) | 557 | 7 | 274383 194675 |
| 261 | **Points of Interest - Commercial Services**<br>Name: Neath Car Sales Ltd<br>Location: Neath Road, Briton Ferry, Neath, SA11 2AX<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location | A8NW (SW) | 568 | 7 | 274362 194672 |
| 262 | **Points of Interest - Commercial Services**<br>Name: Camps Transport<br>Location: 33 Bryn Teg, Neath, SA11 2YH<br>Category: Transport, Storage and Delivery<br>Class Code: Distribution and Haulage<br>Positional Accuracy: Positioned to address or location | A12NW (W) | 722 | 7 | 273746 195373 |
| 263 | **Points of Interest - Commercial Services**<br>Name: Briton Ferry Salvage<br>Location: 61 Giants Grave Road, Neath, SA11 2LN<br>Category: Recycling Services<br>Class Code: Scrap Metal Merchants<br>Positional Accuracy: Positioned to address or location | A12SW (W) | 833 | 7 | 273688 194930 |
| 263 | **Points of Interest - Commercial Services**<br>Name: Briton Ferry Salvage Ltd<br>Location: 61 Giants Grave Road, Neath, SA11 2LN<br>Category: Recycling Services<br>Class Code: Scrap Metal Merchants<br>Positional Accuracy: Positioned to address or location | A12SW (W) | 834 | 7 | 273688 194929 |
| 263 | **Points of Interest - Commercial Services**<br>Name: Stillman & Sons<br>Location: 82 Giants Grave Road, Neath, SA11 2LN<br>Category: Recycling Services<br>Class Code: Scrap Metal Merchants<br>Positional Accuracy: Positioned to address or location | A11SE (W) | 897 | 7 | 273649 194863 |
| 263 | **Points of Interest - Commercial Services**<br>Name: Stillman & Sons<br>Location: 82 Giants Grave Road, Neath, SA11 2LN<br>Category: Recycling Services<br>Class Code: Scrap Metal Merchants<br>Positional Accuracy: Positioned to address or location | A11SE (W) | 897 | 7 | 273649 194863 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
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| 264 | **Points of Interest - Education and Health**<br>Name: Neath General Hospital<br>Location: Penrhiwtyn, Neath, SA11 2LQ<br>Category: Health Practitioners and Establishments<br>Class Code: Hospitals<br>Positional Accuracy: Positioned to address or location | A18SW (N) | 457 | 7 | 274445 195754 |
| 265 | **Points of Interest - Manufacturing and Production**<br>Name: Tank<br>Location: SA11<br>Category: Industrial Features<br>Class Code: Tanks (Generic)<br>Positional Accuracy: Positioned to an adjacent address or location | A13NE (NE) | 88 | 7 | 274796 195257 |
| 266 | **Points of Interest - Manufacturing and Production**<br>Name: Works<br>Location: Not Supplied<br>Category: Industrial Features<br>Class Code: Unspecified Works Or Factories<br>Positional Accuracy: Positioned to an adjacent address or location | A12NE (W) | 213 | 7 | 274248 195290 |
| 267 | **Points of Interest - Manufacturing and Production**<br>Name: Tanks<br>Location: SA11<br>Category: Industrial Features<br>Class Code: Tanks (Generic)<br>Positional Accuracy: Positioned to an adjacent address or location | A18SW (NW) | 393 | 7 | 274421 195687 |
| 268 | **Points of Interest - Manufacturing and Production**<br>Name: Works<br>Location: Not Supplied<br>Category: Industrial Features<br>Class Code: Unspecified Works Or Factories<br>Positional Accuracy: Positioned to an adjacent address or location | A12SE (SW) | 425 | 7 | 274268 194870 |
| 268 | **Points of Interest - Manufacturing and Production**<br>Name: Works<br>Location: SA11<br>Category: Industrial Features<br>Class Code: Unspecified Works Or Factories<br>Positional Accuracy: Positioned to an adjacent address or location | A12SE (SW) | 428 | 7 | 274263 194869 |
| 269 | **Points of Interest - Manufacturing and Production**<br>Name: L Williams<br>Location: Cimla, Neath, SA11 2HS<br>Category: Farming<br>Class Code: Livestock Farming<br>Positional Accuracy: Positioned to address or location | A14NW (E) | 450 | 7 | 275336 195212 |
| 270 | **Points of Interest - Manufacturing and Production**<br>Name: Esgyrn Colliery (Disused)<br>Location: SA11<br>Category: Extractive Industries<br>Class Code: Coal Mining<br>Positional Accuracy: Positioned to an adjacent address or location | A14SE (E) | 516 | 7 | 275371 194916 |
| 271 | **Points of Interest - Manufacturing and Production**<br>Name: Shaft (Disused)<br>Location: SA11<br>Category: Extractive Industries<br>Class Code: Unspecified Quarries Or Mines<br>Positional Accuracy: Positioned to an adjacent address or location | A14SE (E) | 533 | 7 | 275424 195048 |
| 272 | **Points of Interest - Manufacturing and Production**<br>Name: Quarry (Disused)<br>Location: SA11<br>Category: Extractive Industries<br>Class Code: Unspecified Quarries Or Mines<br>Positional Accuracy: Positioned to address or location | A18NW (N) | 712 | 7 | 274487 196011 |
| 273 | **Points of Interest - Manufacturing and Production**<br>Name: Tank<br>Location: SA11<br>Category: Industrial Features<br>Class Code: Tanks (Generic)<br>Positional Accuracy: Positioned to an adjacent address or location | A14NE (E) | 806 | 7 | 275686 195274 |
| 274 | **Points of Interest - Manufacturing and Production**<br>Name: Tank<br>Location: SA10<br>Category: Industrial Features<br>Class Code: Tanks (Generic)<br>Positional Accuracy: Positioned to an adjacent address or location | A17NW (NW) | 935 | 7 | 273850 195984 |

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|---|---|---|---|---|---|
| 275 | **Points of Interest - Manufacturing and Production**<br>Name: Tank<br>Location: SA11<br>Category: Industrial Features<br>Class Code: Tanks (Generic)<br>Positional Accuracy: Positioned to an adjacent address or location | A11NE (W) | 974 | 7 | 273491 195372 |
| 276 | **Points of Interest - Public Infrastructure**<br>Name: Chapel of Rest<br>Location: Not Supplied<br>Category: Infrastructure and Facilities<br>Class Code: Cemeteries and Crematoria<br>Positional Accuracy: Positioned to an adjacent address or location | A13SE (SE) | 82 | 7 | 274788 195016 |
| 276 | **Points of Interest - Public Infrastructure**<br>Name: Chapel of Rest<br>Location: SA11<br>Category: Infrastructure and Facilities<br>Class Code: Cemeteries and Crematoria<br>Positional Accuracy: Positioned to address or location | A13SE (SE) | 83 | 7 | 274788 195015 |
| 276 | **Points of Interest - Public Infrastructure**<br>Name: Ynysymaerdy Cemetery<br>Location: Not Supplied<br>Category: Infrastructure and Facilities<br>Class Code: Cemeteries and Crematoria<br>Positional Accuracy: Positioned to an adjacent address or location | A13SE (S) | 87 | 7 | 274729 195037 |
| 276 | **Points of Interest - Public Infrastructure**<br>Name: Ynysymaerdy Cemetery<br>Location: SA11<br>Category: Infrastructure and Facilities<br>Class Code: Cemeteries and Crematoria<br>Positional Accuracy: Positioned to an adjacent address or location | A13SE (S) | 87 | 7 | 274729 195037 |
| 276 | **Points of Interest - Public Infrastructure**<br>Name: Cemetery<br>Location: Not Supplied<br>Category: Infrastructure and Facilities<br>Class Code: Cemeteries and Crematoria<br>Positional Accuracy: Positioned to an adjacent address or location | A13SE (S) | 161 | 7 | 274679 194978 |
| 277 | **Points of Interest - Public Infrastructure**<br>Name: Chapel of Rest<br>Location: Not Supplied<br>Category: Infrastructure and Facilities<br>Class Code: Cemeteries and Crematoria<br>Positional Accuracy: Positioned to an adjacent address or location | A12NE (NW) | 234 | 7 | 274285 195417 |
| 278 | **Points of Interest - Public Infrastructure**<br>Name: Sluice<br>Location: SA11<br>Category: Water<br>Class Code: Weirs, Sluices and Dams<br>Positional Accuracy: Positioned to an adjacent address or location | A8NE (SE) | 327 | 7 | 274992 194767 |
| 279 | **Points of Interest - Public Infrastructure**<br>Name: Sluice<br>Location: SA11<br>Category: Water<br>Class Code: Weirs, Sluices and Dams<br>Positional Accuracy: Positioned to an adjacent address or location | A17SE (NW) | 478 | 7 | 274141 195630 |
| 280 | **Points of Interest - Public Infrastructure**<br>Name: Mortuary<br>Location: Not Supplied<br>Category: Infrastructure and Facilities<br>Class Code: Cemeteries and Crematoria<br>Positional Accuracy: Positioned to an adjacent address or location | A18SW (N) | 527 | 7 | 274456 195826 |
| 281 | **Points of Interest - Public Infrastructure**<br>Name: Briton Ferry Rail Station<br>Location: Rockingham Terrace (Teras Rockingham), SA11<br>Category: Public Transport, Stations and Infrastructure<br>Class Code: Railway Stations, Junctions and Halts<br>Positional Accuracy: Positioned to address or location | A7NE (SW) | 567 | 7 | 274139 194781 |
| 281 | **Points of Interest - Public Infrastructure**<br>Name: Briton Ferry Station<br>Location: Rockingham Terrace (Teras Rockingham), SA11<br>Category: Public Transport, Stations and Infrastructure<br>Class Code: Railway Stations, Junctions and Halts<br>Positional Accuracy: Positioned to address or location | A7NE (SW) | 567 | 7 | 274139 194781 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 282 | **Points of Interest - Public Infrastructure**<br>Name: J & J Skip Hire<br>Location: 33 Bryn Teg, Neath, SA11 2YH<br>Category: Infrastructure and Facilities<br>Class Code: Waste Storage, Processing and Disposal<br>Positional Accuracy: Positioned to address or location | A12NW (W) | 723 | 7 | 273745 195374 |
| 282 | **Points of Interest - Public Infrastructure**<br>Name: J & J Skip Hire<br>Location: 33 Bryn Teg, Neath, SA11 2YH<br>Category: Infrastructure and Facilities<br>Class Code: Waste Storage, Processing and Disposal<br>Positional Accuracy: Positioned to address or location | A12NW (W) | 723 | 7 | 273745 195374 |
| 283 | **Points of Interest - Public Infrastructure**<br>Name: Cemetery<br>Location: Not Supplied<br>Category: Infrastructure and Facilities<br>Class Code: Cemeteries and Crematoria<br>Positional Accuracy: Positioned to an adjacent address or location | A12SW (W) | 741 | 7 | 273767 194982 |
| 283 | **Points of Interest - Public Infrastructure**<br>Name: Cemetery<br>Location: SA11<br>Category: Infrastructure and Facilities<br>Class Code: Cemeteries and Crematoria<br>Positional Accuracy: Positioned to an adjacent address or location | A12SW (W) | 741 | 7 | 273767 194982 |
| 284 | **Points of Interest - Public Infrastructure**<br>Name: Briton Ferry Police Station<br>Location: Briton Ferry Police Station 155, Neath Road, Briton Ferry, Neath, SA11 2BX<br>Category: Central and Local Government<br>Class Code: Police Stations<br>Positional Accuracy: Positioned to address or location | A7SE (SW) | 831 | 7 | 274261 194430 |
| 285 | **Points of Interest - Recreational and Environmental**<br>Name: Playground<br>Location: Nr Ynysymaerdy Road, SA11<br>Category: Recreational<br>Class Code: Playgrounds<br>Positional Accuracy: Positioned to address or location | A13SW (S) | 252 | 7 | 274573 194925 |
| 286 | **Points of Interest - Recreational and Environmental**<br>Name: Playground<br>Location: Nr Neath Road, SA11<br>Category: Recreational<br>Class Code: Playgrounds<br>Positional Accuracy: Positioned to address or location | A13SW (SW) | 339 | 7 | 274496 194864 |
| 286 | **Points of Interest - Recreational and Environmental**<br>Name: Playground<br>Location: Not Supplied<br>Category: Recreational<br>Class Code: Playgrounds<br>Positional Accuracy: Positioned to an adjacent address or location | A13SW (SW) | 364 | 7 | 274460 194852 |
| 287 | **Points of Interest - Recreational and Environmental**<br>Name: Playground<br>Location: Not Supplied<br>Category: Recreational<br>Class Code: Playgrounds<br>Positional Accuracy: Positioned to an adjacent address or location | A7SW (SW) | 974 | 7 | 273966 194410 |
| 287 | **Points of Interest - Recreational and Environmental**<br>Name: Playground<br>Location: Jersey Terrace, SA11<br>Category: Recreational<br>Class Code: Playgrounds<br>Positional Accuracy: Positioned to address or location | A7SW (SW) | 974 | 7 | 273968 194409 |

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| 288 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 18279<br>Area(m²): 5962.42<br>Type: Ancient and Semi-Natural Woodland | A13SE (E) | 115 | 2 | 275008 195140 |
| 289 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 18275<br>Area(m²): 22753.28<br>Type: Ancient and Semi-Natural Woodland | A13SE (SE) | 187 | 2 | 274838 194886 |
| 290 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 11351<br>Area(m²): 143855.64<br>Type: Restored Ancient Woodland Site | A13SE (S) | 233 | 2 | 274788 194852 |
| 291 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 7495<br>Area(m²): 24539.37<br>Type: Ancient and Semi-Natural Woodland | A14NW (E) | 290 | 2 | 275127 195292 |
| 292 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 18278<br>Area(m²): 2474.75<br>Type: Ancient and Semi-Natural Woodland | A14SW (E) | 367 | 2 | 275263 195131 |
| 293 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 18274<br>Area(m²): 8554.76<br>Type: Ancient and Semi-Natural Woodland | A8NW (SW) | 389 | 2 | 274516 194800 |
| 294 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 10085<br>Area(m²): 16885.9<br>Type: Ancient and Semi-Natural Woodland | A14SW (E) | 394 | 2 | 275274 195005 |
| 295 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 8869<br>Area(m²): 8745.87<br>Type: Ancient and Semi-Natural Woodland | A14SW (SE) | 395 | 2 | 275237 194917 |
| 296 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 13984<br>Area(m²): 6897.75<br>Type: Ancient and Semi-Natural Woodland | A9NW (SE) | 504 | 2 | 275315 194834 |
| 297 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 42569<br>Area(m²): 6229.26<br>Type: Plantation on Ancient Woodland | A8NE (S) | 512 | 2 | 274880 194558 |
| 298 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 18276<br>Area(m²): 13901.34<br>Type: Ancient and Semi-Natural Woodland | A9NW (SE) | 515 | 2 | 275335 194846 |
| 299 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 7496<br>Area(m²): 1097.17<br>Type: Ancient and Semi-Natural Woodland | A19SW (NE) | 521 | 2 | 275084 195603 |
| 300 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 11352<br>Area(m²): 20063.95<br>Type: Restored Ancient Woodland Site | A19SW (NE) | 552 | 2 | 275045 195654 |
| 301 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 40179<br>Area(m²): 65776.62<br>Type: Plantation on Ancient Woodland | A8NE (S) | 559 | 2 | 274902 194512 |

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| 302 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 8866<br>Area(m²): 174943.76<br>Type: Ancient and Semi-Natural Woodland | A8NW (S) | 566 | 2 | 274581 194579 |
| 303 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 23143<br>Area(m²): 2723.57<br>Type: Restored Ancient Woodland Site | A19SW (NE) | 578 | 2 | 275097 195660 |
| 304 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 18281<br>Area(m²): 2902.32<br>Type: Ancient and Semi-Natural Woodland | A18SE (NE) | 627 | 2 | 274973 195769 |
| 305 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 10335<br>Area(m²): 19680.91<br>Type: Restored Ancient Woodland Site | A9NE (SE) | 646 | 2 | 275362 194652 |
| 306 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 13980<br>Area(m²): 3642.68<br>Type: Ancient and Semi-Natural Woodland | A9SW (SE) | 662 | 2 | 275219 194507 |
| 307 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 13983<br>Area(m²): 1571.73<br>Type: Ancient and Semi-Natural Woodland | A9NW (SE) | 668 | 2 | 275350 194604 |
| 308 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 47954<br>Area(m²): 404.07<br>Type: Ancient Woodland Site of Unknown Category | A8SE (S) | 668 | 2 | 274968 194409 |
| 309 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 7875<br>Area(m²): 73126.59<br>Type: Ancient and Semi-Natural Woodland | A8SW (S) | 696 | 2 | 274621 194420 |
| 310 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 18277<br>Area(m²): 2683.96<br>Type: Ancient and Semi-Natural Woodland | A14SE (E) | 698 | 2 | 275591 195053 |
| 311 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 48719<br>Area(m²): 4672.72<br>Type: Ancient Woodland Site of Unknown Category | A8SE (S) | 699 | 2 | 274993 194382 |
| 312 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 18280<br>Area(m²): 4537.47<br>Type: Ancient and Semi-Natural Woodland | A14NE (E) | 725 | 2 | 275610 195239 |
| 313 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 47954<br>Area(m²): 74.54<br>Type: Ancient Woodland Site of Unknown Category | A8SE (S) | 728 | 2 | 275009 194356 |
| 314 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 13982<br>Area(m²): 3114.06<br>Type: Ancient and Semi-Natural Woodland | A9NE (SE) | 731 | 2 | 275470 194652 |
| 315 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 13976<br>Area(m²): 14463.66<br>Type: Ancient and Semi-Natural Woodland | A8SW (SW) | 734 | 2 | 274374 194485 |

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|---|---|---|---|---|---|
| 316 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 47721<br>Area(m²): 13816.26<br>Type: Ancient Woodland Site of Unknown Category | A8SW (S) | 743 | 2 | 274659 194335 |
| 317 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 41930<br>Area(m²): 813.35<br>Type: Plantation on Ancient Woodland | A14SE (E) | 763 | 2 | 275653 195025 |
| 318 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 8058<br>Area(m²): 87385.89<br>Type: Ancient and Semi-Natural Woodland | A19SW (NE) | 764 | 2 | 275282 195776 |
| 319 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 47954<br>Area(m²): 284.26<br>Type: Ancient Woodland Site of Unknown Category | A8SE (S) | 783 | 2 | 275013 194300 |
| 320 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 23142<br>Area(m²): 41356.7<br>Type: Restored Ancient Woodland Site | A7NW (SW) | 848 | 2 | 273880 194630 |
| 321 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 18283<br>Area(m²): 10328.45<br>Type: Ancient and Semi-Natural Woodland | A14NE (E) | 859 | 2 | 275659 195511 |
| 322 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 7497<br>Area(m²): 1939.69<br>Type: Ancient and Semi-Natural Woodland | A19NW (NE) | 876 | 2 | 275281 195903 |
| 323 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 10335<br>Area(m²): 21420.78<br>Type: Restored Ancient Woodland Site | A9SW (SE) | 910 | 2 | 275273 194255 |
| 324 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 13978<br>Area(m²): 3864.45<br>Type: Ancient and Semi-Natural Woodland | A9SE (SE) | 915 | 2 | 275455 194366 |
| 325 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 12254<br>Area(m²): 9319.44<br>Type: Ancient and Semi-Natural Woodland | A19NW (NE) | 932 | 2 | 275291 195960 |
| 326 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 18282<br>Area(m²): 2805.64<br>Type: Ancient and Semi-Natural Woodland | A15NW (E) | 956 | 2 | 275767 195508 |
| 327 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 23144<br>Area(m²): 5257.17<br>Type: Restored Ancient Woodland Site | A18NE (N) | 959 | 2 | 274973 196133 |
| 328 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 7498<br>Area(m²): 19059.96<br>Type: Ancient and Semi-Natural Woodland | A19NE (NE) | 976 | 2 | 275364 195975 |
| 329 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 40179<br>Area(m²): 574.15<br>Type: Plantation on Ancient Woodland | A9SE (SE) | 982 | 2 | 275394 194239 |

# Sensitive Land Use

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 330 | **Ancient Woodland**<br>Name: Not Supplied<br>Reference: 40575<br>Area(m²): 6005.47<br>Type: Plantation on Ancient Woodland | A4NW (SE) | 995 | 2 | 275277 194162 |
| 331 | **Local Nature Reserves**<br>Name: Eaglesbush Valley<br>Multiple Area: N<br>Area (m2): 79888.24<br>Source: Neath Port Talbot County Borough Council<br>Designation Date: 31st December 2008 | A19NW (NE) | 841 | 8 | 275257 195876 |

| Agency & Hydrological | Version | Update Cycle |
|---|---|---|
| **Contaminated Land Register Entries and Notices** | | |
| City and County of Swansea - Environmental Health Department | January 2015 | Annual Rolling Update |
| Neath Port Talbot County Borough Council - Environmental Health Department | March 2015 | Annual Rolling Update |
| **Discharge Consents** | | |
| Environment Agency - Welsh Region | August 2014 | Quarterly |
| Natural Resources Wales | July 2019 | Quarterly |
| **Enforcement and Prohibition Notices** | | |
| Environment Agency - Welsh Region | March 2013 | Annual Rolling Update |
| **Integrated Pollution Controls** | | |
| Environment Agency - Welsh Region | October 2008 | Variable |
| **Integrated Pollution Prevention And Control** | | |
| Natural Resources Wales | April 2019 | Quarterly |
| Environment Agency - Welsh Region | July 2019 | Quarterly |
| **Local Authority Integrated Pollution Prevention And Control** | | |
| Swansea Bay Port Health Authority | April 2014 | Variable |
| Neath Port Talbot County Borough Council - Environmental Health Department | August 2012 | Variable |
| City and County of Swansea - Environmental Health Department | June 2014 | Variable |
| **Local Authority Pollution Prevention and Controls** | | |
| Swansea Bay Port Health Authority | April 2014 | Annually |
| City and County of Swansea - Environmental Health Department | June 2014 | Annual Rolling Update |
| Neath Port Talbot County Borough Council - Environmental Health Department | March 2014 | Annual Rolling Update |
| **Local Authority Pollution Prevention and Control Enforcements** | | |
| Swansea Bay Port Health Authority | April 2014 | Variable |
| City and County of Swansea - Environmental Health Department | June 2014 | Variable |
| Neath Port Talbot County Borough Council - Environmental Health Department | March 2014 | Variable |
| **Nearest Surface Water Feature** | | |
| Ordnance Survey | September 2019 | |
| **Pollution Incidents to Controlled Waters** | | |
| Environment Agency - Welsh Region | December 1998 | Not Applicable |
| **Prosecutions Relating to Authorised Processes** | | |
| Environment Agency - Welsh Region | March 2013 | Annual Rolling Update |
| Natural Resources Wales | March 2013 | Annual Rolling Update |
| **Prosecutions Relating to Controlled Waters** | | |
| Environment Agency - Welsh Region | March 2013 | Annual Rolling Update |
| Natural Resources Wales | March 2013 | Annual Rolling Update |
| **Registered Radioactive Substances** | | |
| Natural Resources Wales | January 2015 | Annually |
| Environment Agency - Welsh Region | June 2016 | |
| **Substantiated Pollution Incident Register** | | |
| Environment Agency Wales - South West Area | July 2019 | Quarterly |
| Natural Resources Wales | July 2019 | Quarterly |
| **Water Abstractions** | | |
| Environment Agency - Welsh Region | July 2019 | Quarterly |
| Natural Resources Wales | July 2019 | Quarterly |
| **Water Industry Act Referrals** | | |
| Natural Resources Wales | July 2019 | Quarterly |
| Environment Agency - Welsh Region | October 2017 | Quarterly |
| **Groundwater Vulnerability Map** | | |
| Natural Resources Wales | June 2018 | As notified |
| **Bedrock Aquifer Designations** | | |
| Natural Resources Wales | January 2018 | Annually |

# Data Currency

| Agency & Hydrological | Version | Update Cycle |
|---|---|---|
| **Superficial Aquifer Designations**<br>Natural Resources Wales | January 2018 | Annually |
| **Source Protection Zones**<br>Natural Resources Wales | November 2016 | Annual Rolling Update |
| **Extreme Flooding from Rivers or Sea without Defences**<br>Natural Resources Wales | August 2019 | Quarterly |
| **Flooding from Rivers or Sea without Defences**<br>Natural Resources Wales | August 2019 | Quarterly |
| **Areas Benefiting from Flood Defences**<br>Natural Resources Wales | August 2019 | Quarterly |
| **Flood Water Storage Areas**<br>Natural Resources Wales | August 2019 | Quarterly |
| **Flood Defences**<br>Natural Resources Wales | August 2019 | Quarterly |
| **OS Water Network Lines**<br>Ordnance Survey | July 2019 | Quarterly |
| **Surface Water 1 in 30 year Flood Extent**<br>Natural Resources Wales | October 2013 | Annually |
| **Surface Water 1 in 100 year Flood Extent**<br>Natural Resources Wales | October 2013 | Annually |
| **Surface Water 1 in 1000 year Flood Extent**<br>Natural Resources Wales | October 2013 | Annually |
| **Surface Water Suitability**<br>Natural Resources Wales | October 2013 | Annually |
| **BGS Groundwater Flooding Susceptibility**<br>British Geological Survey - National Geoscience Information Service | May 2013 | Annually |

| Waste | Version | Update Cycle |
|---|---|---|
| **BGS Recorded Landfill Sites** | | |
| British Geological Survey - National Geoscience Information Service | June 1996 | Not Applicable |
| **Historical Landfill Sites** | | |
| Natural Resources Wales | July 2017 | Quarterly |
| **Integrated Pollution Control Registered Waste Sites** | | |
| Environment Agency - Welsh Region | October 2008 | Not Applicable |
| **Licensed Waste Management Facilities (Landfill Boundaries)** | | |
| Environment Agency Wales - South West Area | July 2018 | Quarterly |
| Natural Resources Wales | July 2018 | Quarterly |
| **Licensed Waste Management Facilities (Locations)** | | |
| Environment Agency Wales - South West Area | July 2019 | Quarterly |
| Natural Resources Wales | July 2019 | Quarterly |
| **Local Authority Landfill Coverage** | | |
| City and County of Swansea - Environmental Health Department | May 2000 | Not Applicable |
| Neath Port Talbot County Borough Council - Environmental Health Department | May 2000 | Not Applicable |
| **Local Authority Recorded Landfill Sites** | | |
| City and County of Swansea - Environmental Health Department | May 2000 | Not Applicable |
| Neath Port Talbot County Borough Council - Environmental Health Department | September 2003 | Not Applicable |
| **Potentially Infilled Land (Non-Water)** | | |
| Landmark Information Group Limited | December 1999 | Not Applicable |
| **Potentially Infilled Land (Water)** | | |
| Landmark Information Group Limited | December 1999 | Not Applicable |
| **Registered Landfill Sites** | | |
| Environment Agency Wales - South West Area | March 2003 | Not Applicable |
| **Registered Waste Transfer Sites** | | |
| Environment Agency Wales - South West Area | March 2003 | Not Applicable |
| **Registered Waste Treatment or Disposal Sites** | | |
| Environment Agency Wales - South West Area | March 2003 | Not Applicable |
| **Hazardous Substances** | **Version** | **Update Cycle** |
| **Control of Major Accident Hazards Sites (COMAH)** | | |
| Health and Safety Executive | April 2018 | Bi-Annually |
| **Explosive Sites** | | |
| Health and Safety Executive | March 2017 | Annually |
| **Notification of Installations Handling Hazardous Substances (NIHHS)** | | |
| Health and Safety Executive | November 2000 | Not Applicable |
| **Planning Hazardous Substance Enforcements** | | |
| City and County of Swansea - Planning Department | January 2016 | Variable |
| Neath Port Talbot County Borough Council - Planning Department | October 2015 | Variable |
| **Planning Hazardous Substance Consents** | | |
| City and County of Swansea - Planning Department | January 2016 | Variable |
| Neath Port Talbot County Borough Council - Planning Department | October 2015 | Variable |

# Data Currency

| Geological | Version | Update Cycle |
|---|---|---|
| **BGS 1:625,000 Solid Geology**<br>British Geological Survey - National Geoscience Information Service | January 2009 | Not Applicable |
| **BGS Estimated Soil Chemistry**<br>British Geological Survey - National Geoscience Information Service | October 2015 | Annually |
| **BGS Recorded Mineral Sites**<br>British Geological Survey - National Geoscience Information Service | April 2019 | Bi-Annually |
| **BGS Urban Soil Chemistry**<br>British Geological Survey - National Geoscience Information Service | October 2015 | Annually |
| **BGS Urban Soil Chemistry Averages**<br>British Geological Survey - National Geoscience Information Service | October 2015 | Annually |
| **CBSCB Compensation District**<br>Cheshire Brine Subsidence Compensation Board (CBSCB) | August 2011 | Not Applicable |
| **Coal Mining Affected Areas**<br>The Coal Authority - Property Searches | March 2014 | Annual Rolling Update |
| **Mining Instability**<br>Ove Arup & Partners | October 2000 | Not Applicable |
| **Non Coal Mining Areas of Great Britain**<br>British Geological Survey - National Geoscience Information Service | May 2015 | Not Applicable |
| **Potential for Collapsible Ground Stability Hazards**<br>British Geological Survey - National Geoscience Information Service | January 2019 | Annually |
| **Potential for Compressible Ground Stability Hazards**<br>British Geological Survey - National Geoscience Information Service | January 2019 | Annually |
| **Potential for Ground Dissolution Stability Hazards**<br>British Geological Survey - National Geoscience Information Service | January 2019 | Annually |
| **Potential for Landslide Ground Stability Hazards**<br>British Geological Survey - National Geoscience Information Service | January 2019 | Annually |
| **Potential for Running Sand Ground Stability Hazards**<br>British Geological Survey - National Geoscience Information Service | January 2019 | Annually |
| **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>British Geological Survey - National Geoscience Information Service | January 2019 | Annually |
| **Radon Potential - Radon Affected Areas**<br>British Geological Survey - National Geoscience Information Service | July 2011 | Annually |
| **Radon Potential - Radon Protection Measures**<br>British Geological Survey - National Geoscience Information Service | July 2011 | Annually |

| Industrial Land Use | Version | Update Cycle |
|---|---|---|
| **Contemporary Trade Directory Entries**<br>Thomson Directories | July 2019 | Quarterly |
| **Fuel Station Entries**<br>Catalist Ltd - Experian | September 2019 | Quarterly |
| **Gas Pipelines**<br>National Grid | July 2014 | |
| **Points of Interest - Commercial Services**<br>PointX | September 2019 | Quarterly |
| **Points of Interest - Education and Health**<br>PointX | September 2019 | Quarterly |
| **Points of Interest - Manufacturing and Production**<br>PointX | September 2019 | Quarterly |
| **Points of Interest - Public Infrastructure**<br>PointX | September 2019 | Quarterly |
| **Points of Interest - Recreational and Environmental**<br>PointX | September 2019 | Quarterly |
| **Underground Electrical Cables**<br>National Grid | December 2015 | |
| **Sensitive Land Use** | **Version** | **Update Cycle** |
| **Ancient Woodland**<br>Natural Resources Wales | August 2018 | Bi-Annually |
| **Areas of Adopted Green Belt**<br>City and County of Swansea | March 2019 | As notified |
| **Areas of Outstanding Natural Beauty**<br>Natural Resources Wales | June 2019 | Bi-Annually |
| **Environmentally Sensitive Areas**<br>The National Assembly for Wales - GI Services (Department of Planning & Countryside) | January 2017 | |
| **Forest Parks**<br>Forestry Commission | April 1997 | Not Applicable |
| **Local Nature Reserves**<br>City and County of Swansea<br>Neath Port Talbot County Borough Council | August 2018<br>August 2018 | Bi-Annually<br>Bi-Annually |
| **Marine Nature Reserves**<br>Natural Resources Wales | August 2018 | Bi-Annually |
| **National Nature Reserves**<br>Natural Resources Wales | June 2019 | Bi-Annually |
| **National Parks**<br>Natural Resources Wales | August 2018 | Annually |
| **Nitrate Vulnerable Zones**<br>Natural Resources Wales<br>The National Assembly for Wales - GI Services (Department of Planning & Countryside) | July 2019<br>October 2005 | Bi-Annually |
| **Ramsar Sites**<br>Natural Resources Wales | July 2019 | Bi-Annually |
| **Sites of Special Scientific Interest**<br>Natural Resources Wales | March 2019 | Bi-Annually |
| **Special Areas of Conservation**<br>Natural Resources Wales | August 2018 | Bi-Annually |
| **Special Protection Areas**<br>Natural Resources Wales | August 2018 | Bi-Annually |

# Data Suppliers

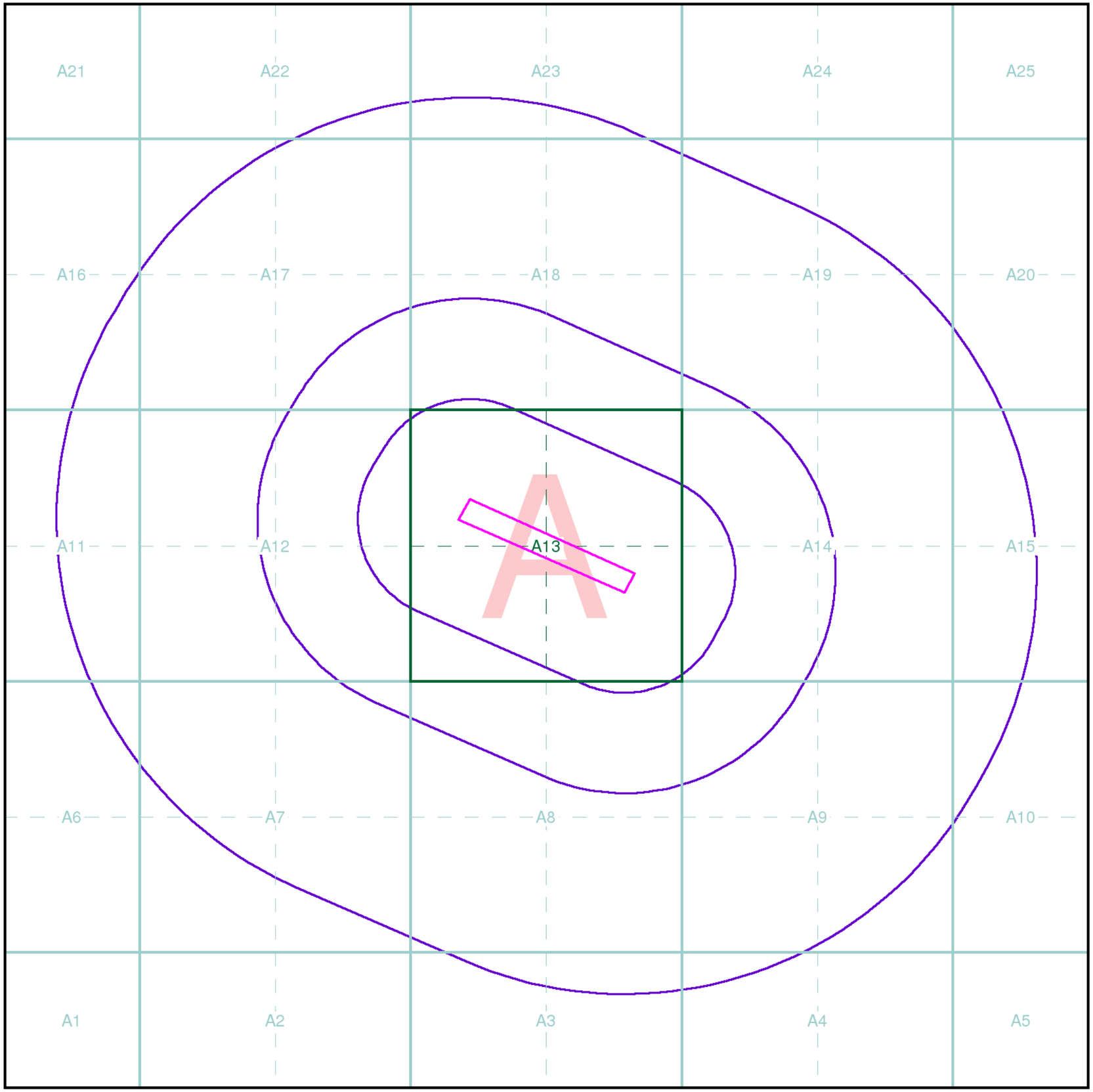
A selection of organisations who provide data within this report

| Data Supplier | Data Supplier Logo |
|---|---|
| **Ordnance Survey** | Map data |
| **Environment Agency** | Environment Agency |
| **Scottish Environment Protection Agency** | SEPA Scottish Environment Protection Agency |
| **The Coal Authority** | The Coal Authority |
| **British Geological Survey** | British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL |
| **Centre for Ecology and Hydrology** | CEH Centre for Ecology & Hydrology NATURAL ENVIRONMENT RESEARCH COUNCIL |
| **Natural Resources Wales** | Cyfoeth Naturiol Cymru Natural Resources Wales |
| **Scottish Natural Heritage** | SCOTTISH NATURAL HERITAGE |
| **Natural England** | NATURAL ENGLAND |
| **Public Health England** | Public Health England |
| **Ove Arup** | ARUP |
| **Peter Brett Associates** | pba peterbrett |

# Useful Contacts

| Contact | Name and Address | Contact Details |
|---|---|---|
| 1 | **British Geological Survey - Enquiry Service**<br>British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG | Telephone: 0115 936 3143<br>Fax: 0115 936 3276<br>Email: enquiries@bgs.ac.uk<br>Website: www.bgs.ac.uk |
| 2 | **Natural Resources Wales**<br>Ty Cambria, 29 Newport Road, Cardiff, CF24 0TP | Telephone: 0300 065 3000<br>Email: enquiries@naturalresourceswales.gov.uk |
| 3 | **Environment Agency - National Customer Contact Centre (NCCC)**<br>PO Box 544, Templeborough, Rotherham, S60 1BY | Telephone: 03708 506 506<br>Email: enquiries@environment-agency.gov.uk |
| 4 | **Neath Port Talbot County Borough Council - Environmental Health Department**<br>Room 322, Neath Civic Centre, Neath, West Glamorgan, SA11 3QZ | Telephone: 01639 763333<br>Fax: 01693 763444<br>Website: www.neath-porttalbot.gov.uk |
| 5 | **Ordnance Survey**<br>Adanac Drive, Southampton, Hampshire, SO16 0AS | Telephone: 03456 05 05 05<br>Email: customerservices@ordnancesurvey.co.uk<br>Website: www.ordnancesurvey.gov.uk |
| 6 | **The Coal Authority - Property Searches**<br>200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG | Telephone: 0345 762 6848<br>Fax: 01623 637 338<br>Email: groundstability@coal.gov.uk<br>Website: www2.groundstability.com |
| 7 | **PointX**<br>7 Abbey Court, Eagle Way, Sowton, Exeter, Devon, EX2 7HY | Website: www.pointx.co.uk |
| 8 | **Neath Port Talbot County Borough Council**<br>Civic Centre, Port Talbot, West Glamorgan, SA13 1PJ | Telephone: 01639 763333<br>Fax: 01693 763444<br>Website: www.neath-porttalbot.gov.uk |
| - | **Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards**<br>Chilton, Didcot, Oxfordshire, OX11 0RQ | Telephone: 01235 822622<br>Fax: 01235 833891<br>Email: radon@phe.gov.uk<br>Website: www.ukradon.org |
| - | **Landmark Information Group Limited**<br>Imperium, Imperial Way, Reading, Berkshire, RG2 0TD | Telephone: 0844 844 9952<br>Fax: 0844 844 9951<br>Email: customerservices@landmarkinfo.co.uk<br>Website: www.landmarkinfo.co.uk |

Please note that the Environment Agency / Natural Resources Wales / SEPA have a charging policy in place for enquiries.

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## Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

**Slice**
Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

**Segment**
A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

**Quadrant**
A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:

Map data

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Cyfoeth Naturiol Cymru
Natural Resources Wales

Envirocheck reports are compiled from 136 different sources of data.

## Client Details

Mr J Dyke, Atkins Ltd, Longcross Court, 47 Newport Road, Cardiff, CF24 0AD

## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195190 |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 274590, 195200

**Full Terms and Conditions can be found on the following link:**
http://www.landmarkinfo.co.uk/Terms/Show/515

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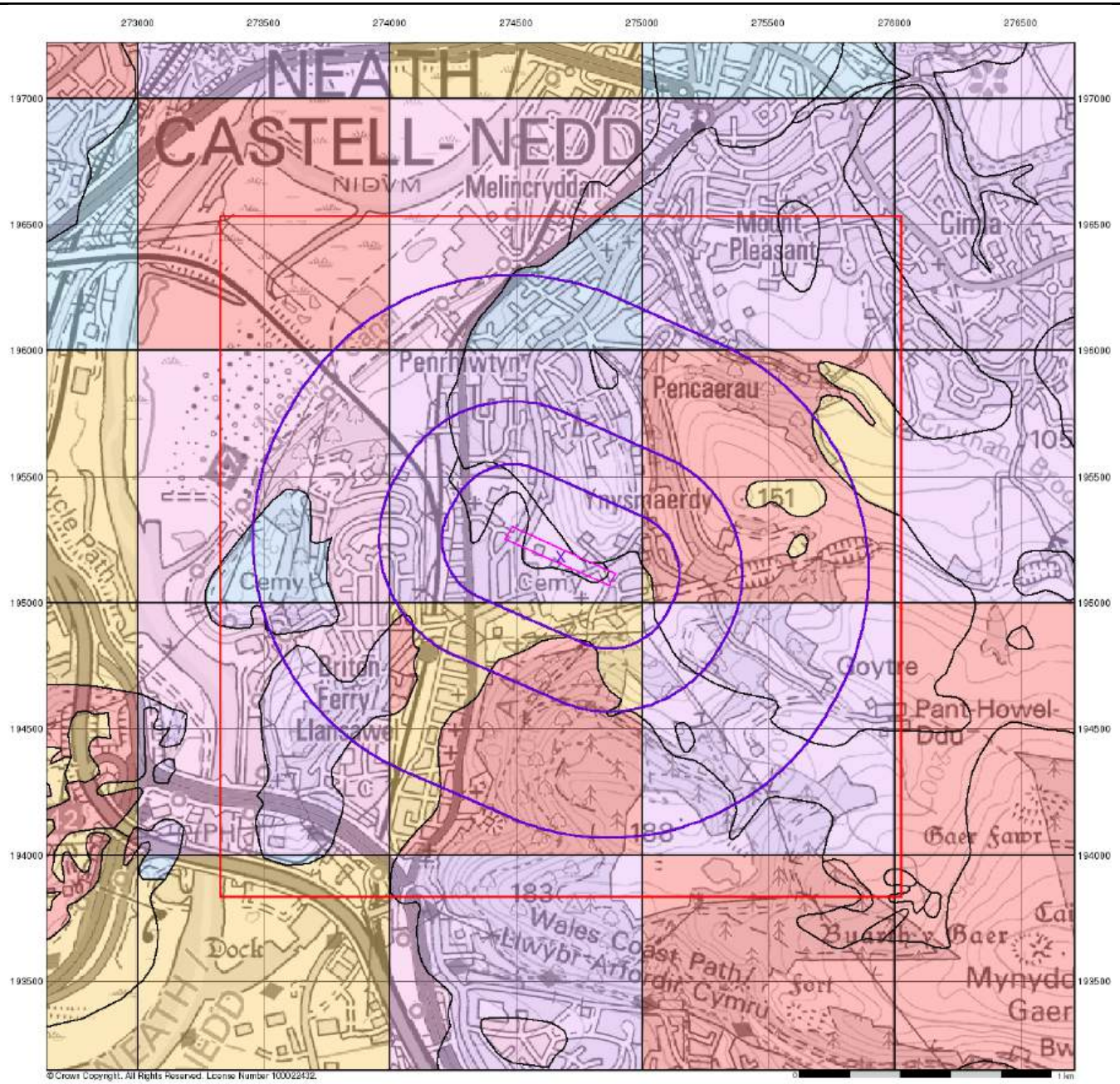


# Envirocheck®

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## Groundwater Vulnerability

### General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

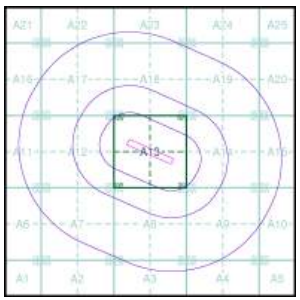
### Agency and Hydrological

| Bedrock Aquifers | Superficial Aquifers |
|---|---|
| High Vulnerability, Principal Aquifer | High Vulnerability, Principal Aquifer |
| High Vulnerability, Secondary Aquifer | High Vulnerability, Secondary Aquifer |
| Medium Vulnerability, Principal Aquifer | Medium Vulnerability, Principal Aquifer |
| Medium Vulnerability, Secondary Aquifer | Medium Vulnerability, Secondary Aquifer |
| Low Vulnerability, Principal Aquifer | Low Vulnerability, Principal Aquifer |
| Low Vulnerability, Secondary Aquifer | Low Vulnerability, Secondary Aquifer |

Unproductive Aquifer

Soluble Rock

### Site Sensitivity Context Map - Slice A




### Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

### Site Details

Site at 274590, 195200

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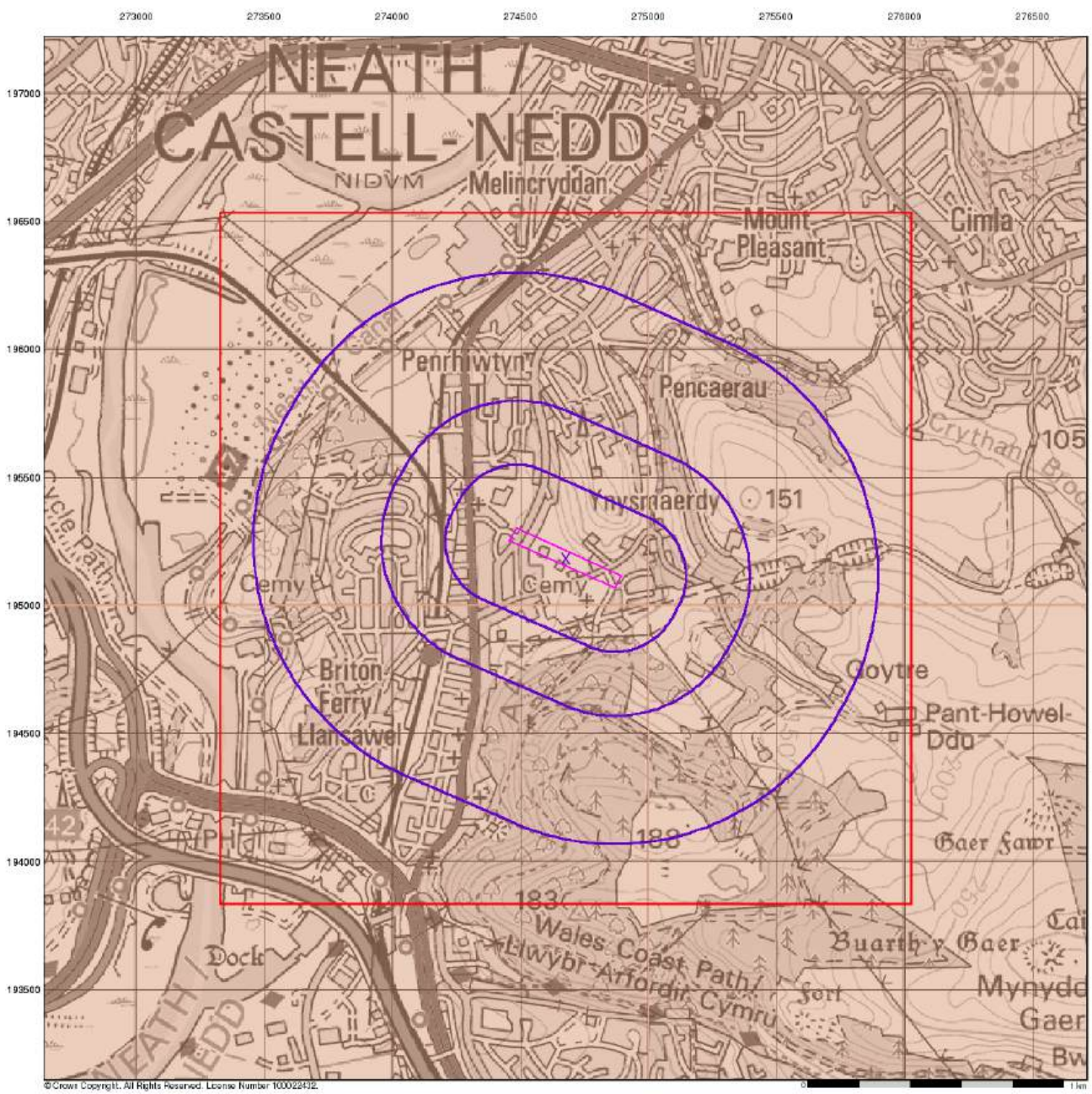


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## Bedrock Aquifer Designation

### General

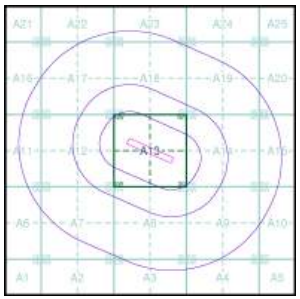
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

### Agency and Hydrological

**Geological Classes**

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

### Site Sensitivity Context Map - Slice A




### Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

### Site Details

Site at 274590, 195200

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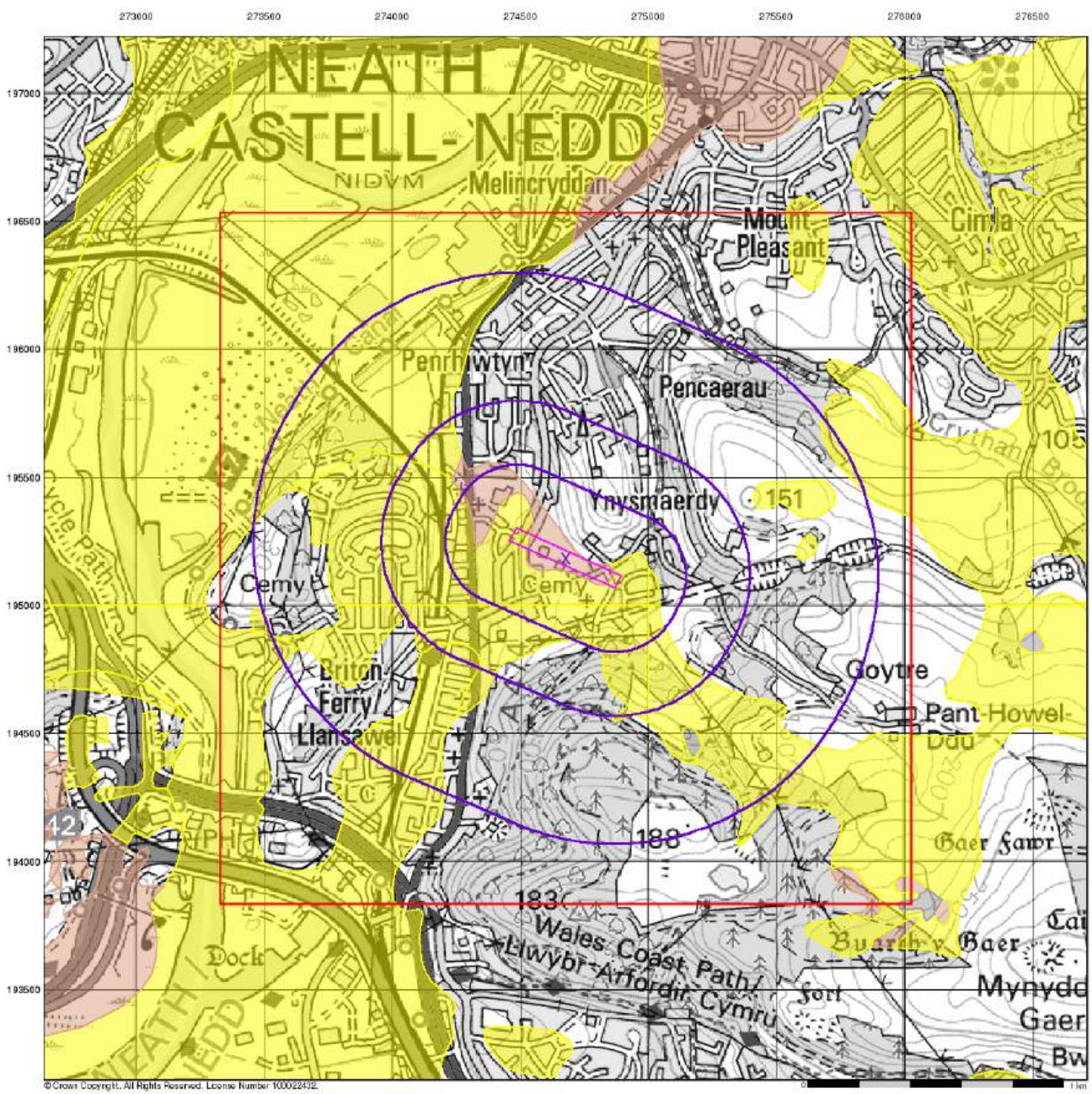


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## Superficial Aquifer Designation

### General

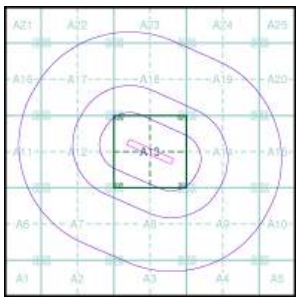
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

### Agency and Hydrological

**Geological Classes**

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

### Site Sensitivity Context Map - Slice A



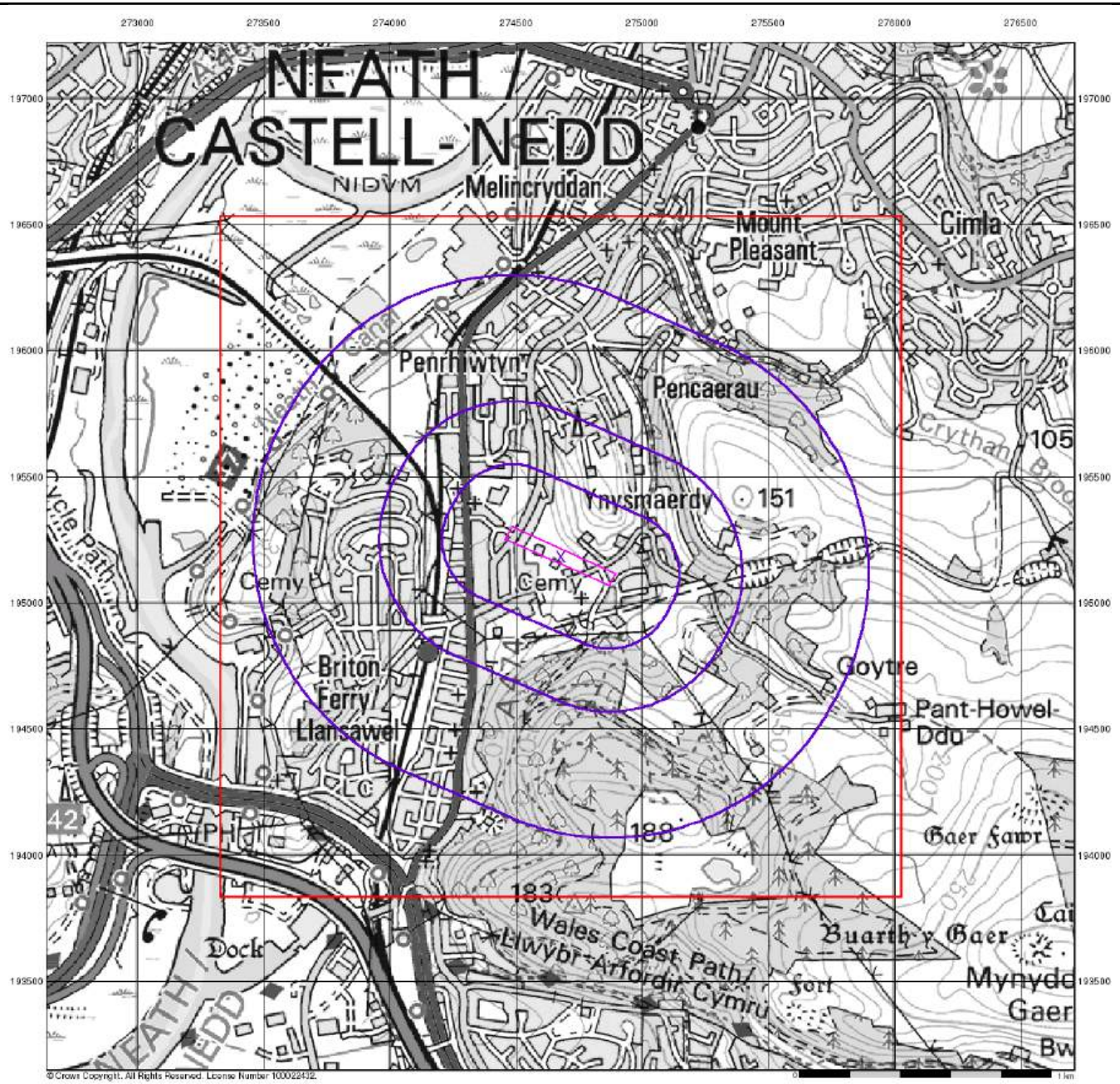

### Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

### Site Details

Site at 274590, 195200

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk




# Envirocheck®

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## Source Protection Zones

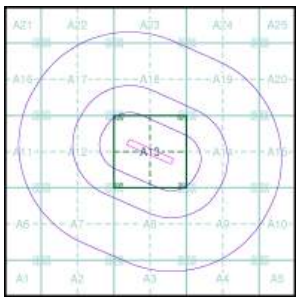
### General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

### Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)

### Site Sensitivity Context Map - Slice A

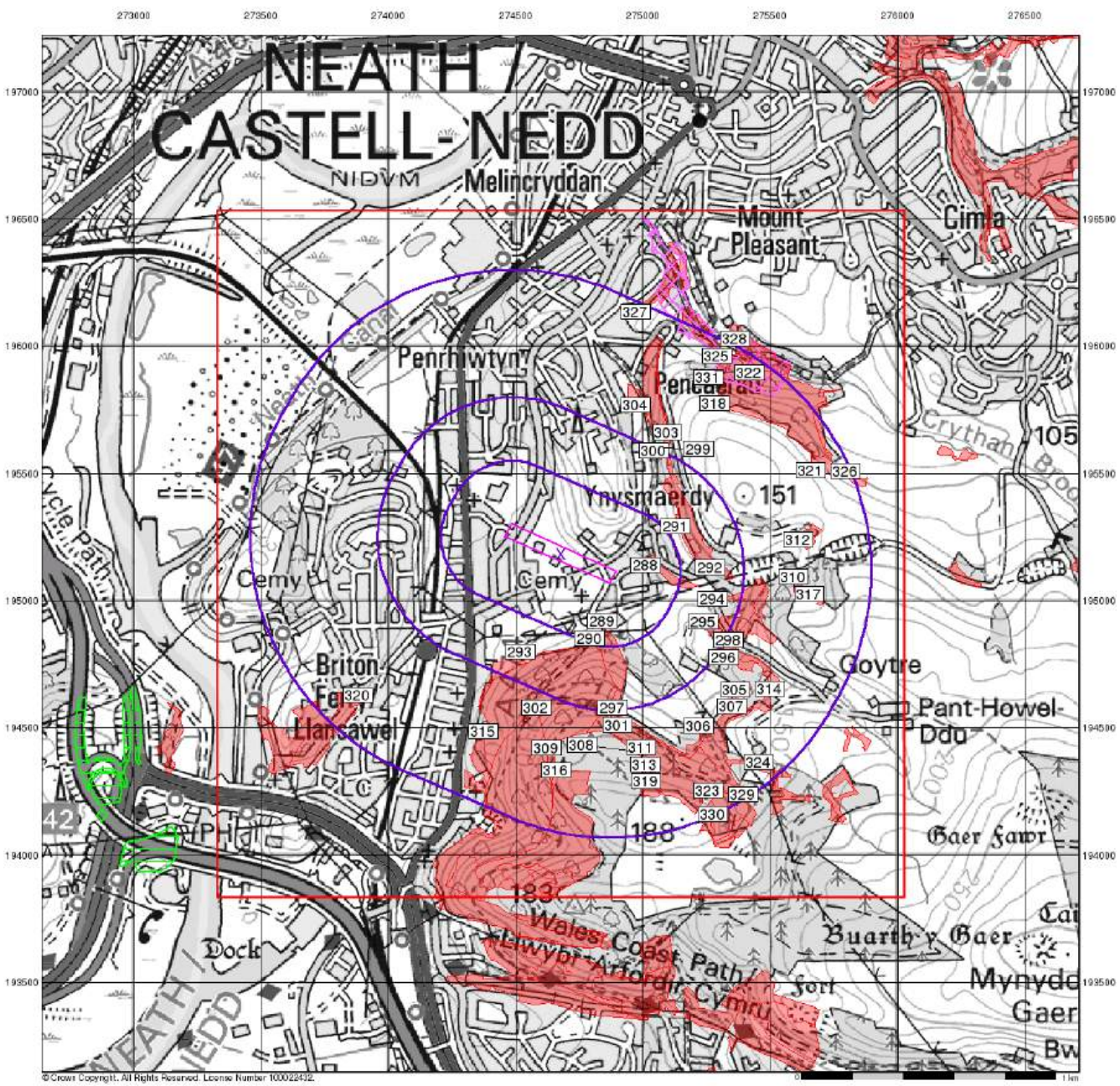



### Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

### Site Details

Site at 274590, 195200

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LANDMARK INFORMATION GROUP®

## Sensitive Land Uses

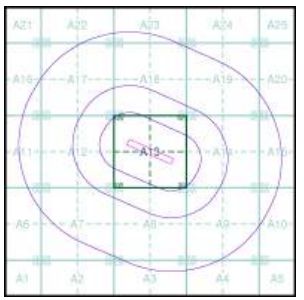
### General

Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

### Sensitive Land Uses

- Ancient Woodland
- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area
- World Heritage Sites

### Site Sensitivity Context Map - Slice A



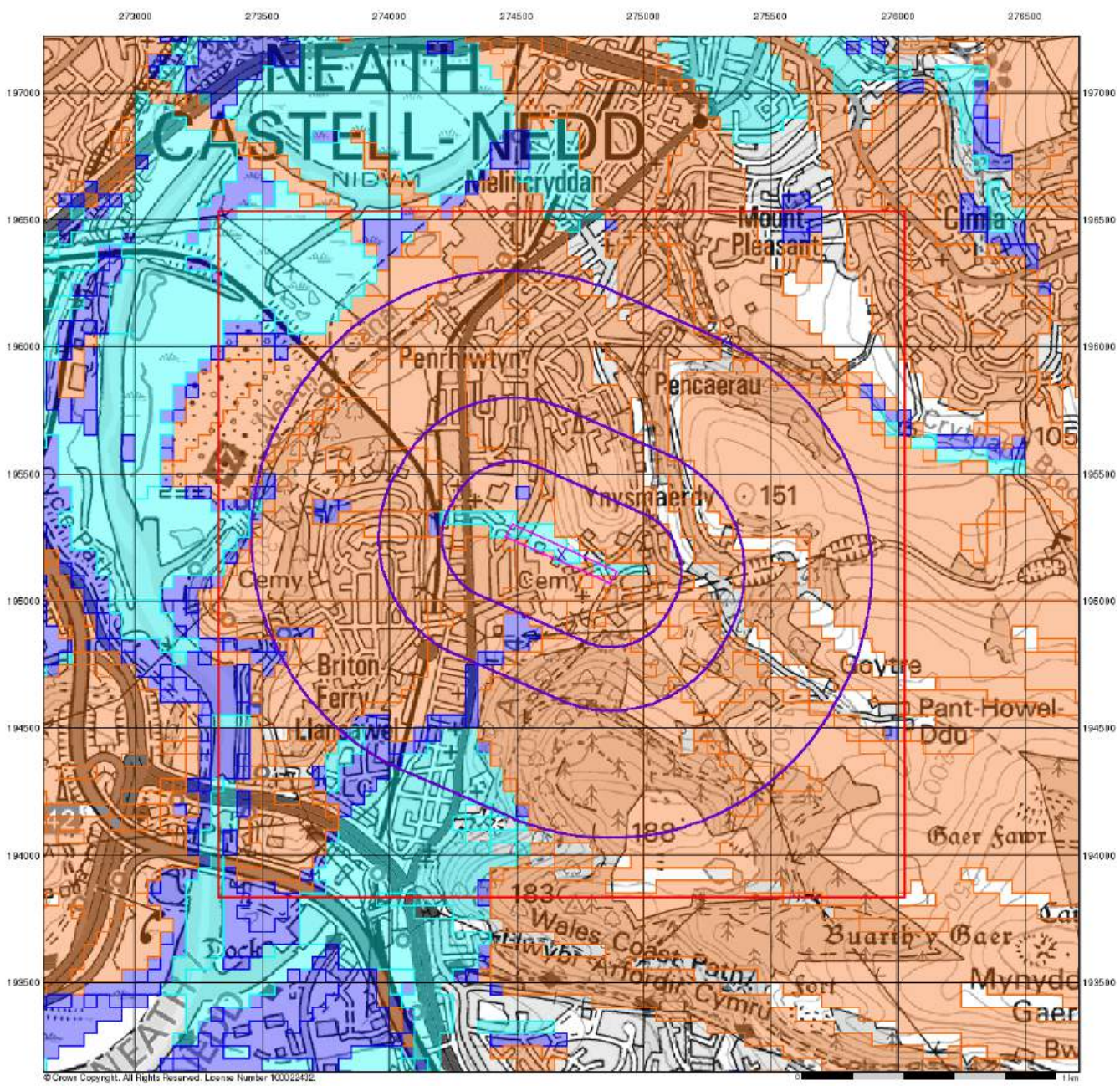

### Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

### Site Details

Site at 274590, 195200

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk




# Envirocheck®

LANDMARK INFORMATION GROUP®

## BGS Flood GFS Data

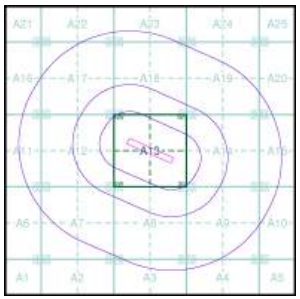
### General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice

### Agency and Hydrological (Flood)

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

## Site Sensitivity Context Map - Slice A




## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 274590, 195200

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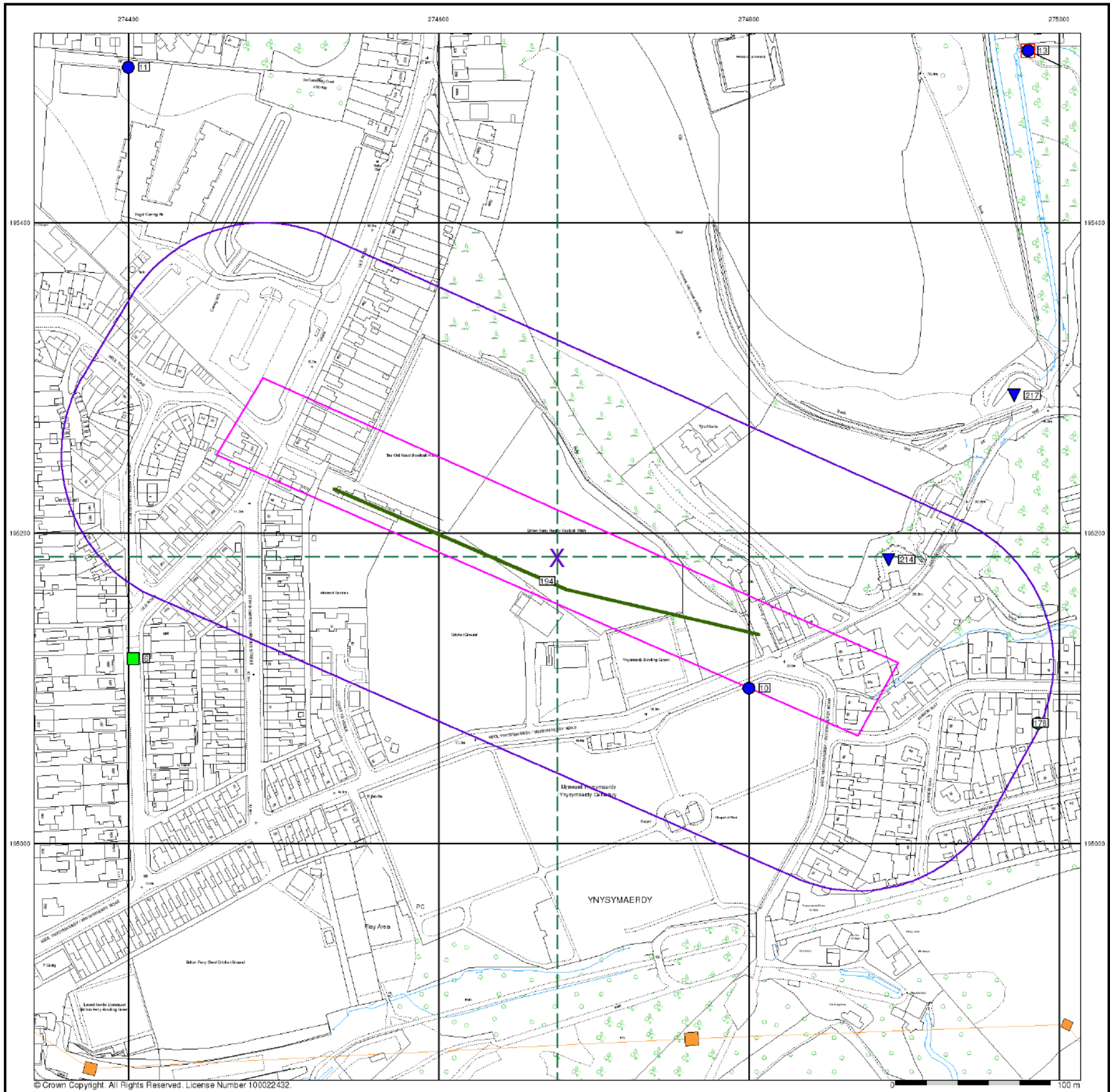


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# Envirocheck®

LANDMARK INFORMATION GROUP®

## General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location
- Pylon
- Overhead Transmission Line

## Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

## Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

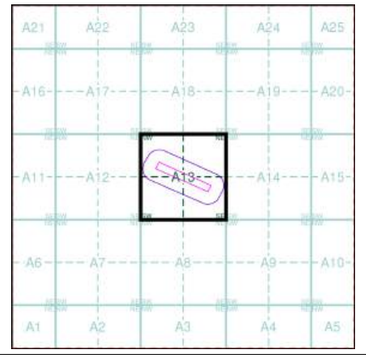
## Geological

- BGS Recorded Mineral Site

## Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

## Site Sensitivity Map - Segment A13




## Order Details

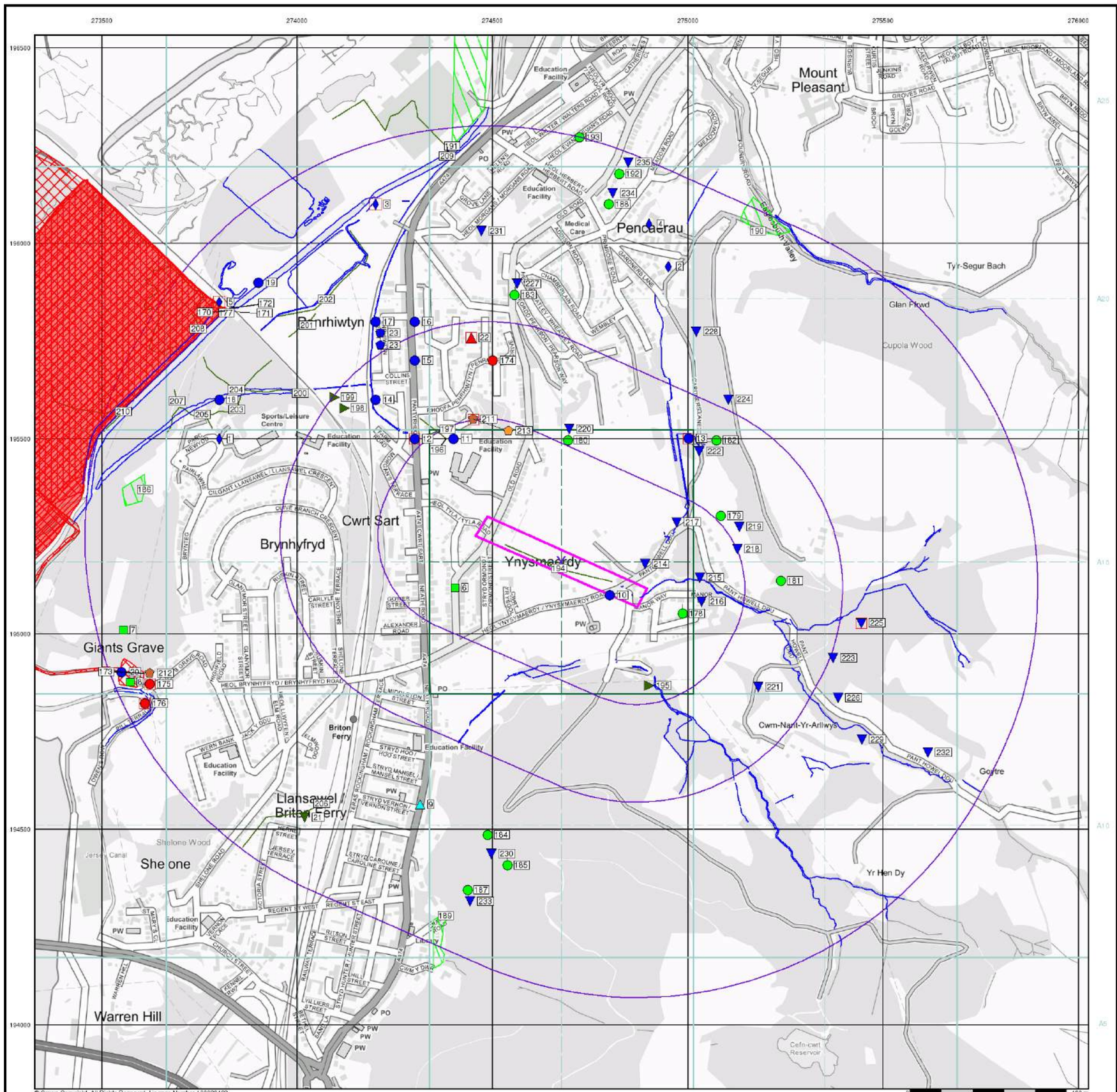
| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Plot Buffer (m): | 100 |

## Site Details

Site at 274590, 195200

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk




# Envirocheck®

LANDMARK INFORMATION GROUP®

## General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

## Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
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## Hazardous Substances

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## Geological

- BGS Recorded Mineral Site

## Waste

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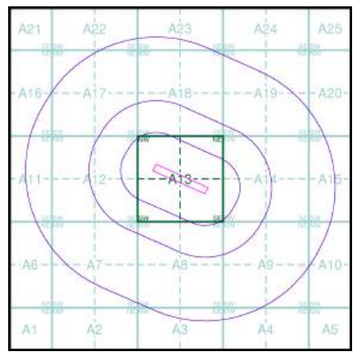
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

## Site Sensitivity Map - Slice A



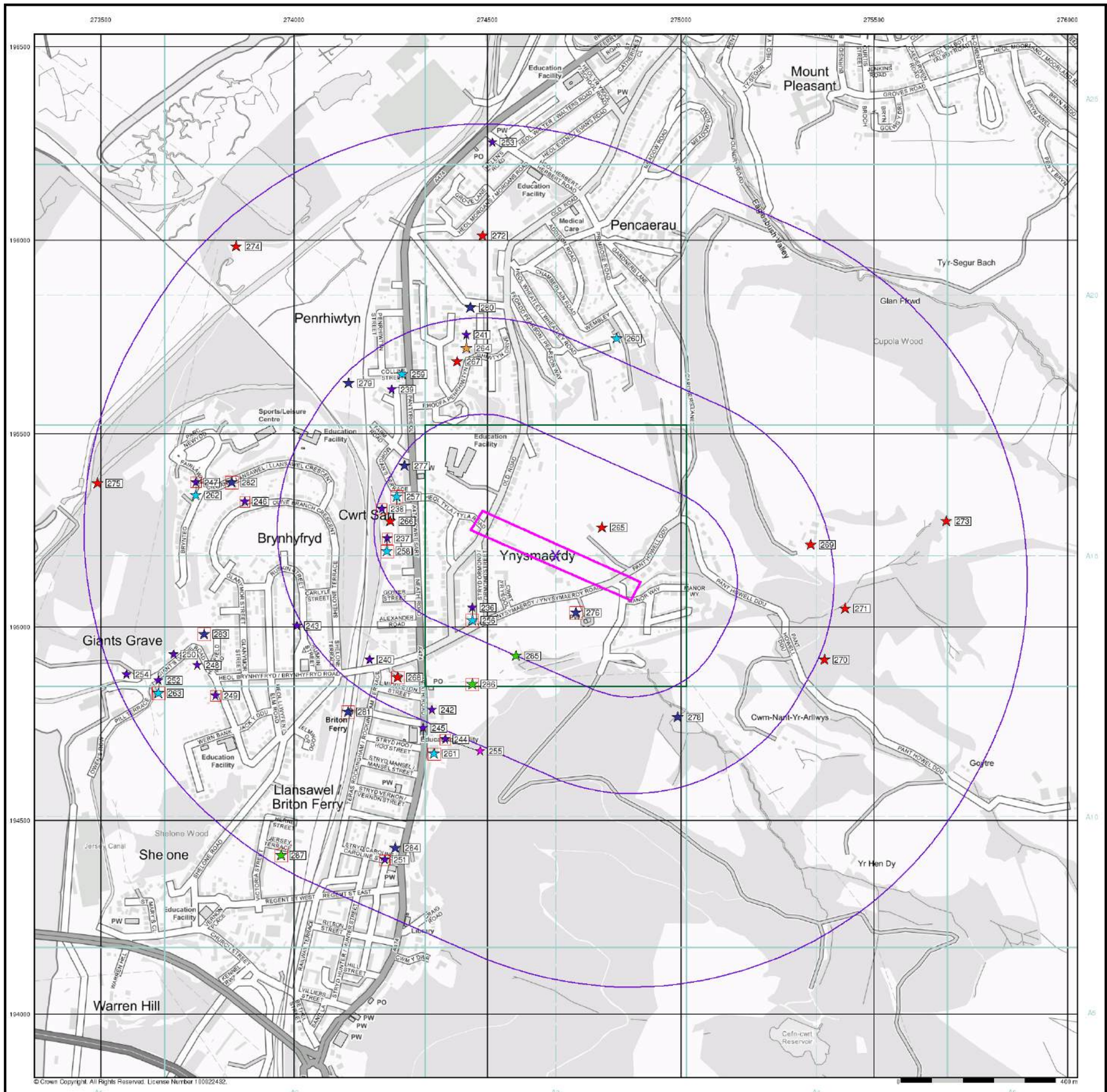

## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 274590, 195200

Landmark® INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk




# Envirocheck®

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## Industrial Land Use Map

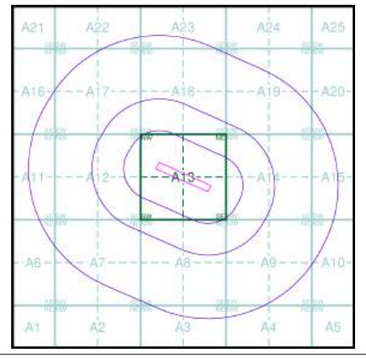
### General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

### Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry
- Gas Pipeline
- Points of Interest - Commercial Services
- Points of Interest - Education and Health
- Points of Interest - Manufacturing and Production
- Points of Interest - Public Infrastructure
- Points of Interest - Recreational and Environmental
- Underground Electrical Cables

## Industrial Land Use Map - Slice A




## Order Details

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|---|---|
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| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 274590, 195200

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
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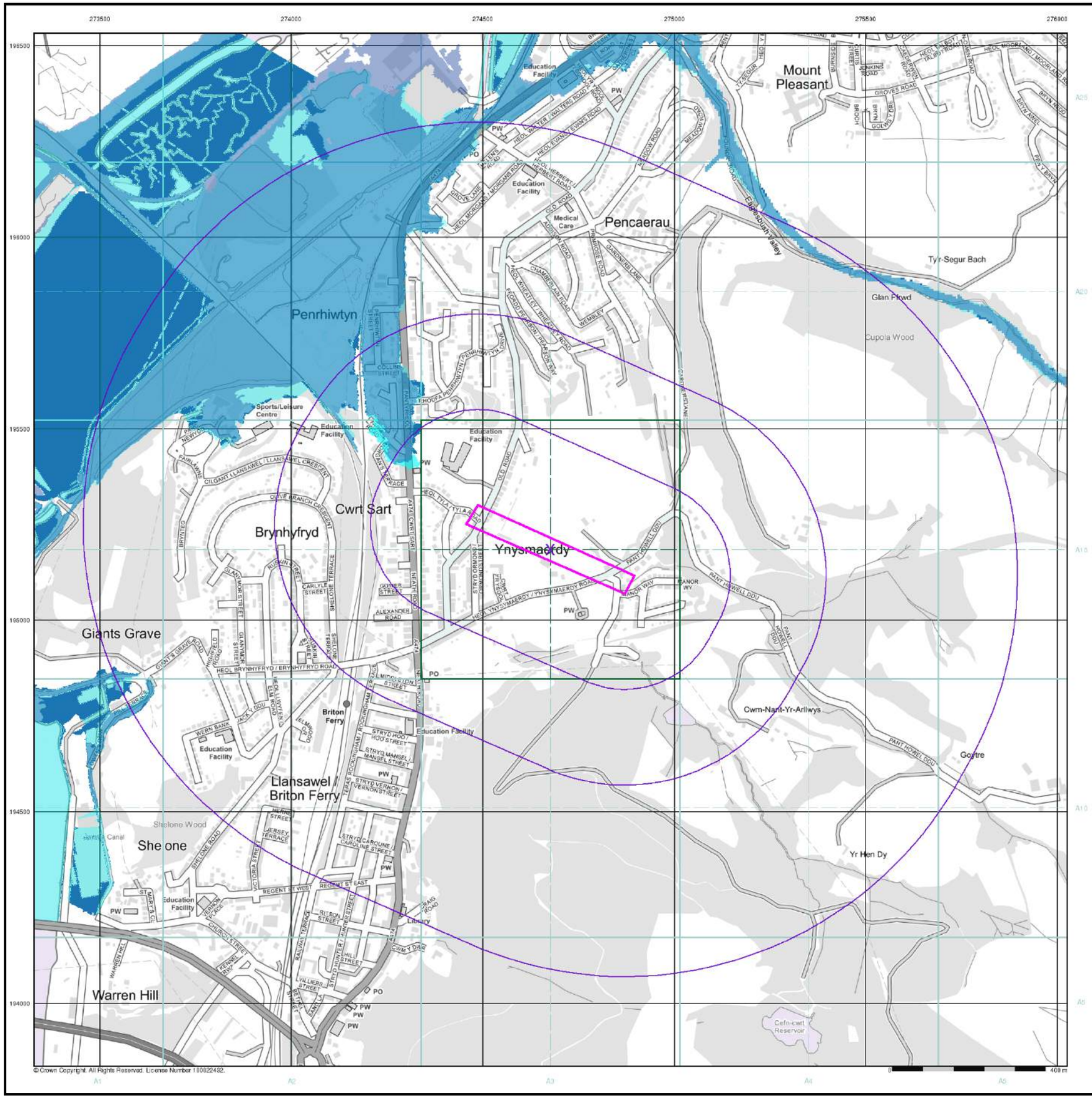


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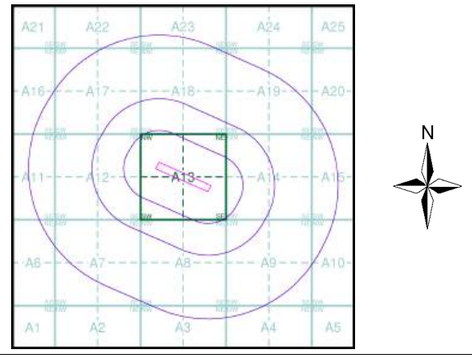
## General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

## Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

## Flood Map - Slice A




## Order Details

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|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 274590, 195200

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Fax: 0844 844 9951
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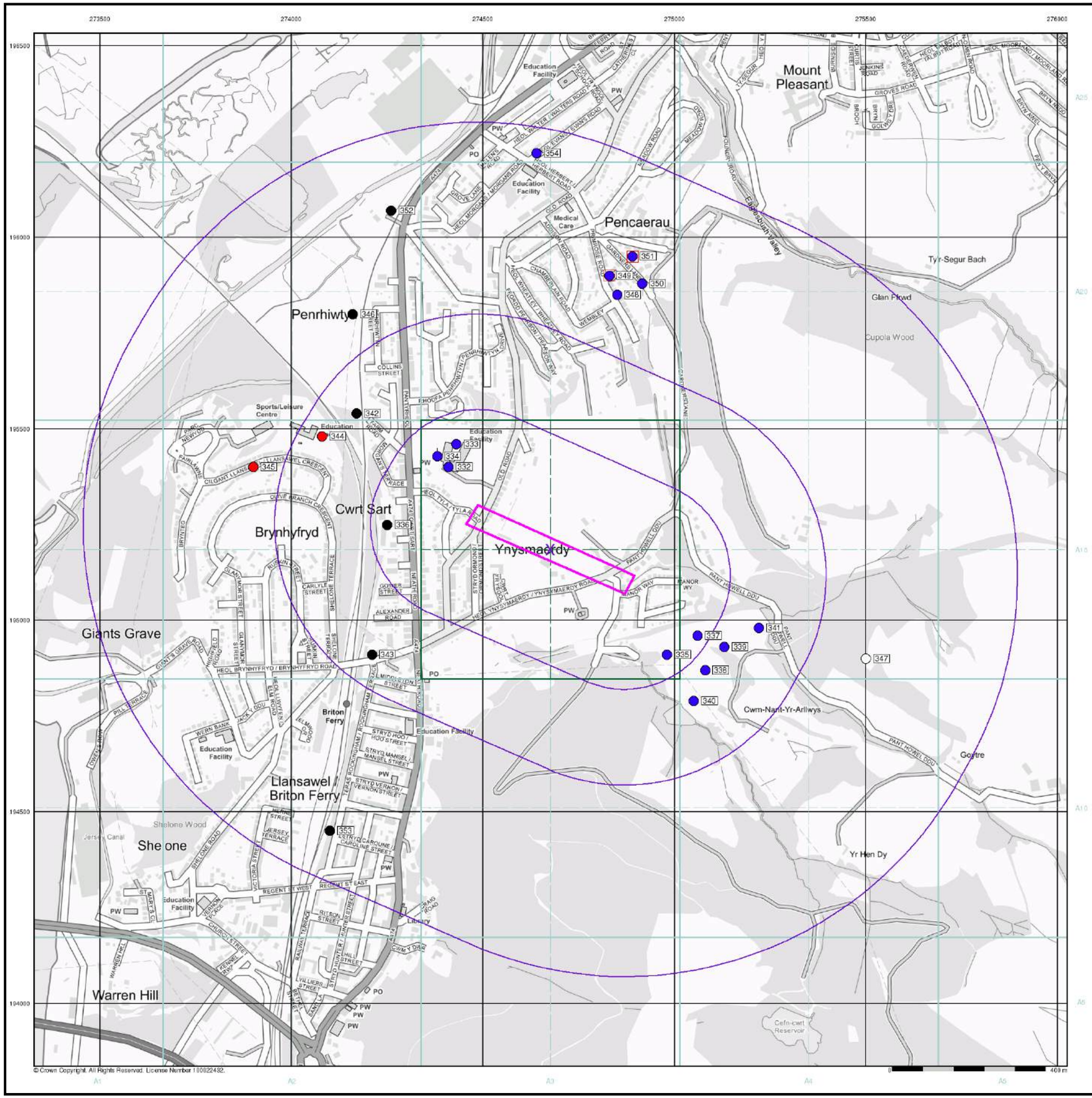


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LANDMARK INFORMATION GROUP®

## General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

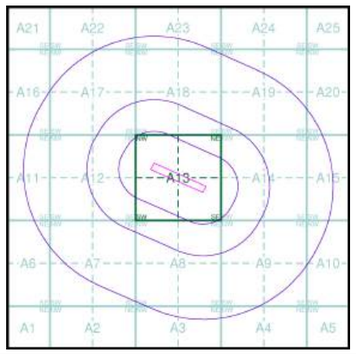
## Agency and Hydrological (Boreholes)

- BGS Borehole Depth 0 - 10m
- BGS Borehole Depth 10 - 30m
- BGS Borehole Depth 30m +
- Confidential
- Other

For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

## Borehole Map - Slice A




## Order Details

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| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 274590, 195200

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Tel: 0844 844 9952
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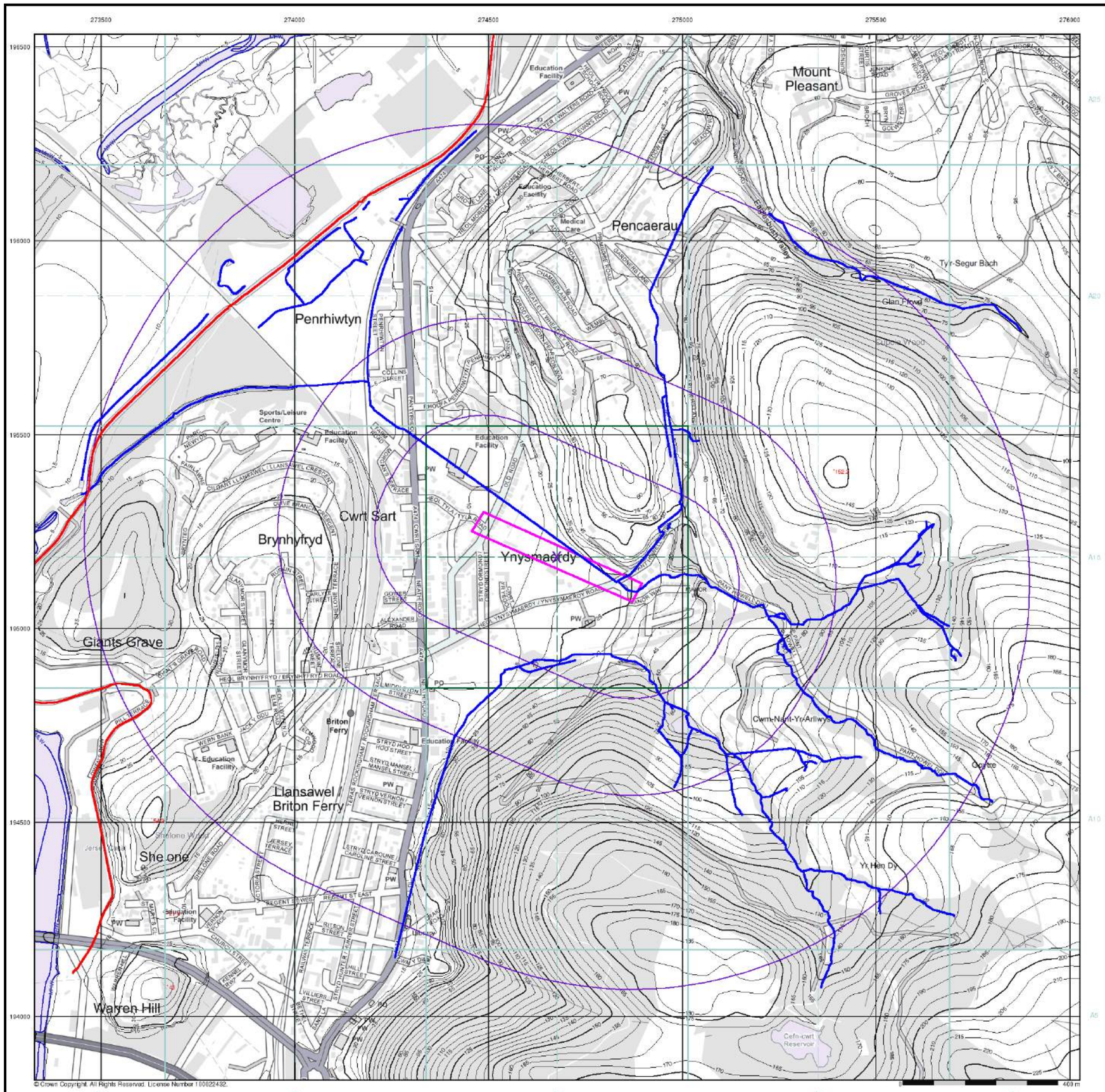


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## General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

## OS Water Network Data

- Canal
- Reservoir
- Foreshore
- Marsh
- Tidal River
- Inland River
- Drain
- Other
- Lake
- Transfer
- Lock Or Flight Of Locks
- Sea

## Contours (height in meters)

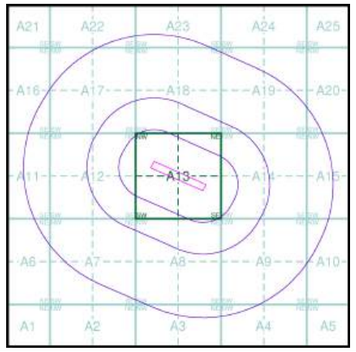
Standard Contour 105 100 95

Master Contour

Spot Height 167.3

- MLW Mean Low Water
- MHW Mean High Water

## OS Water Network Map - Slice A

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## Site Details

Site at 274590, 195200

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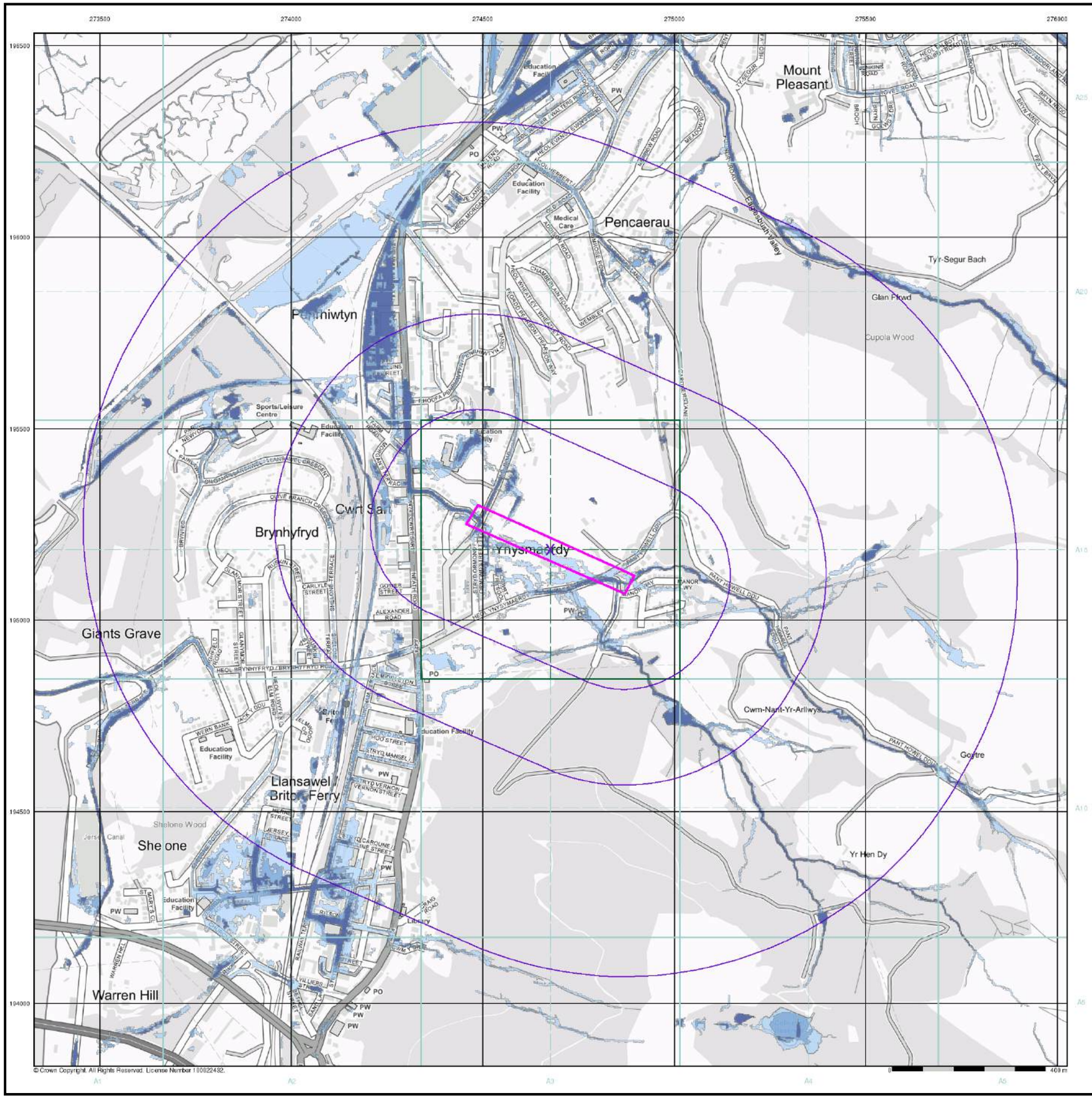


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## General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

## Risk of Flooding from Surface Water

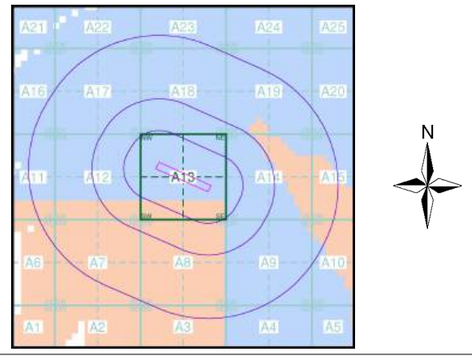
- High - 30 Year Return
- Medium - 100 Year Return
- Low - 1000 Year Return

## Suitability

See the suitability map below

- National to county
- County to town
- Town to street
- Street to parcels of land
- Property

## EA/NRW Suitability Map - Slice A

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## Site Details

Site at 274590, 195200


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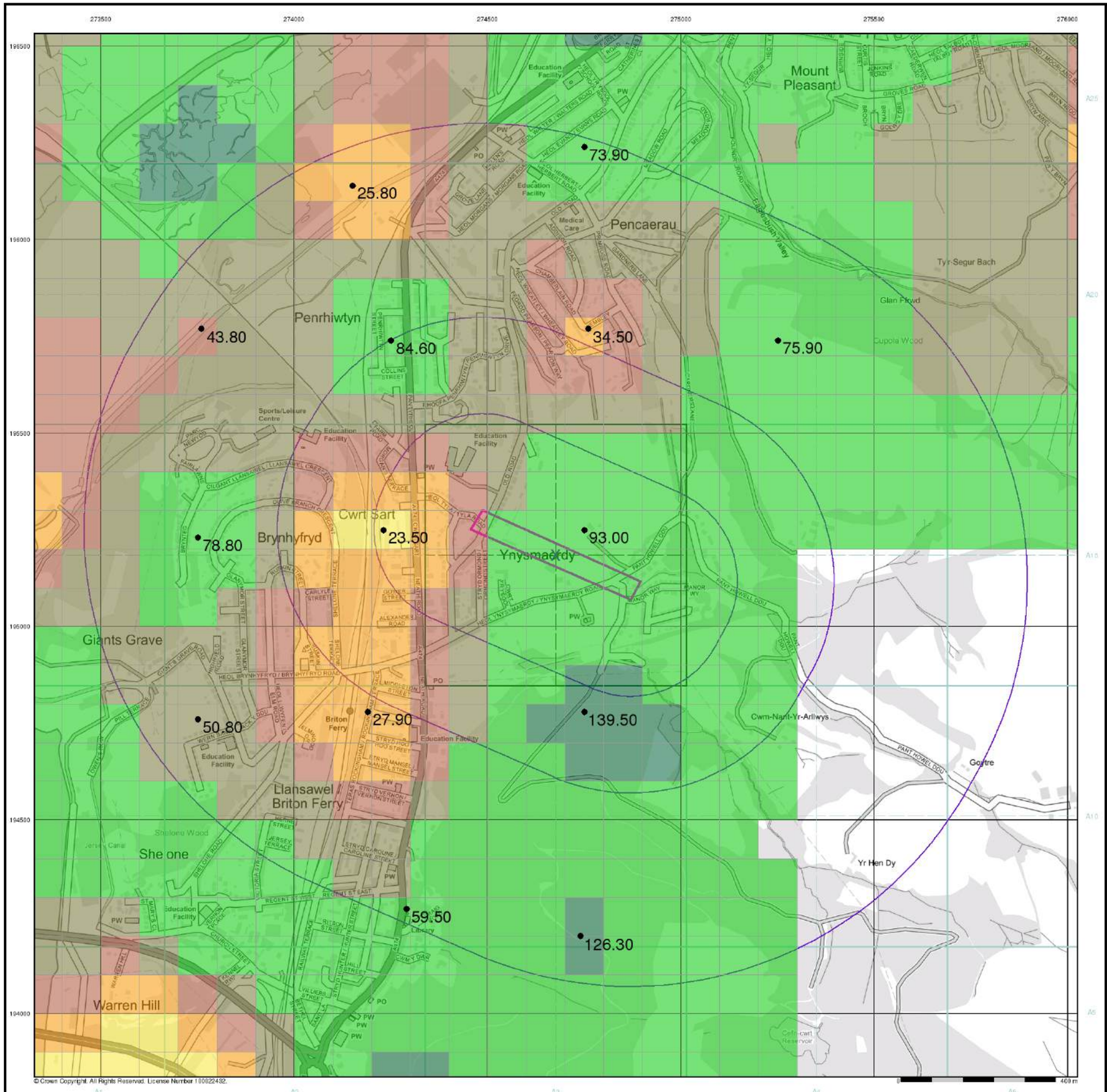

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## General

Specified Site | Specified Buffer(s) | X Bearing Reference Point

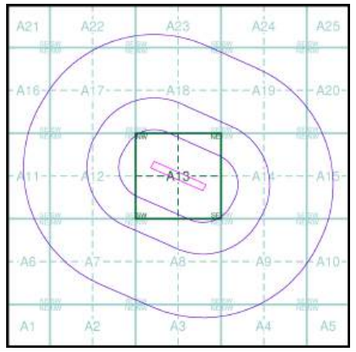
## Urban Soil Chemistry Arsenic

● BGS Urban Soil Chemistry Measured Concentration Values (mg/kg)

Arsenic Concentrations mg/kg

- < 15
- 15 - 25
- 25 - 35
- 35 - 45
- 45 - 60
- 60 - 120
- > 120

## Urban Soil Chemistry Arsenic - Slice A




## Order Details

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| Order Details: | 222284714_1_1 |
| Customer Ref: | 5192793 |
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| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search buffer (m): | 1000 |

## Site Details

Site at 274590, 195200

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Tel: 0844 844 9952
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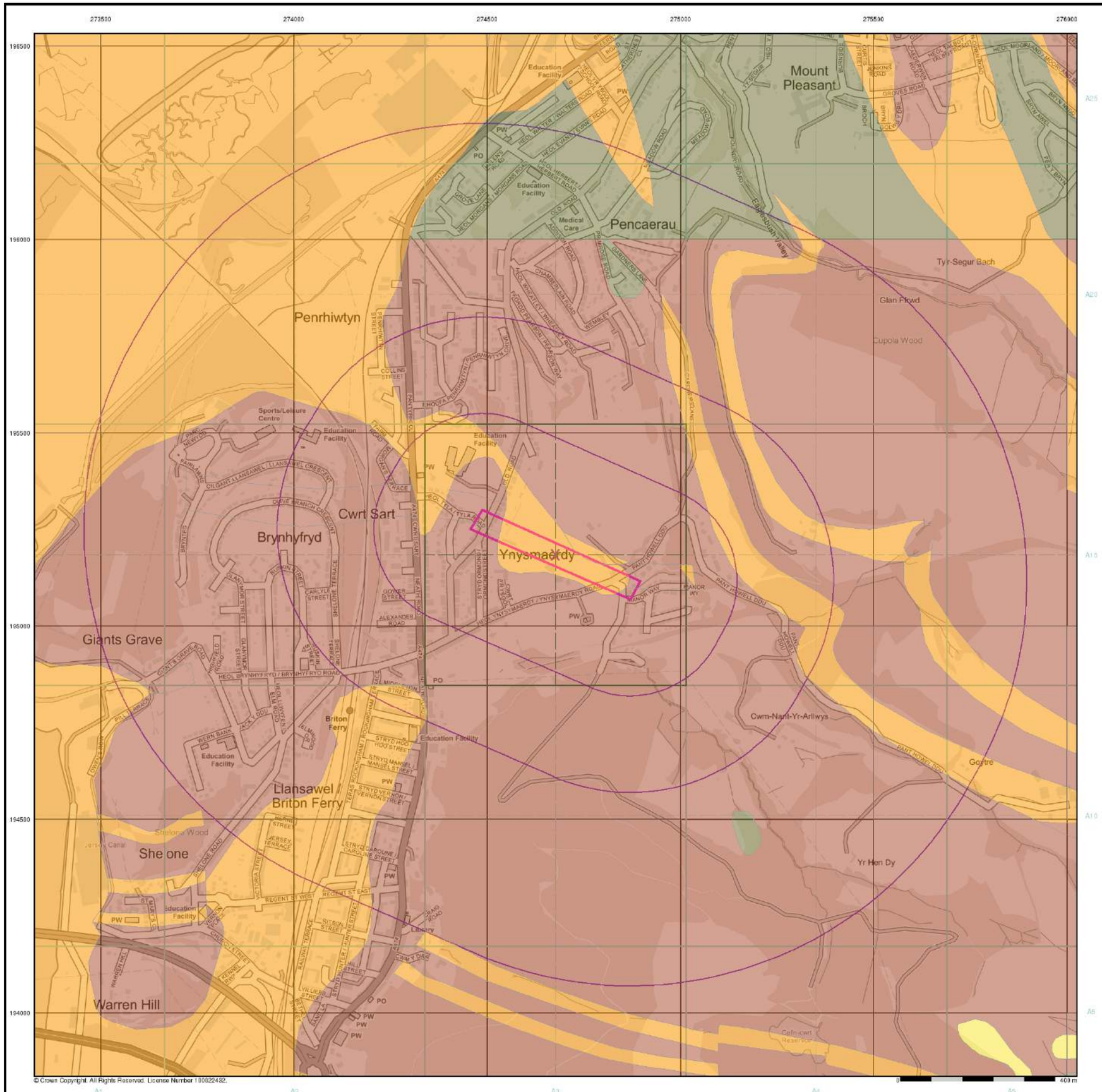



Envirocheck®

LANDMARK INFORMATION GROUP®

## General

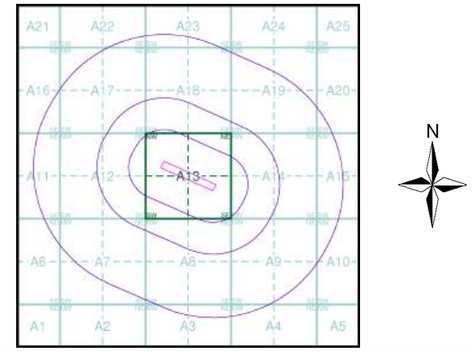
Specified Site | Specified Buffer(s) | X Bearing Reference Point

## Estimated Soil Chemistry Arsenic

Arsenic Concentrations mg/kg

- < 15
- 15 - 25
- 25 - 35
- 35 - 45
- 45 - 60
- 60 - 120
- > 120

## Estimated Soil Chemistry Arsenic - Slice A

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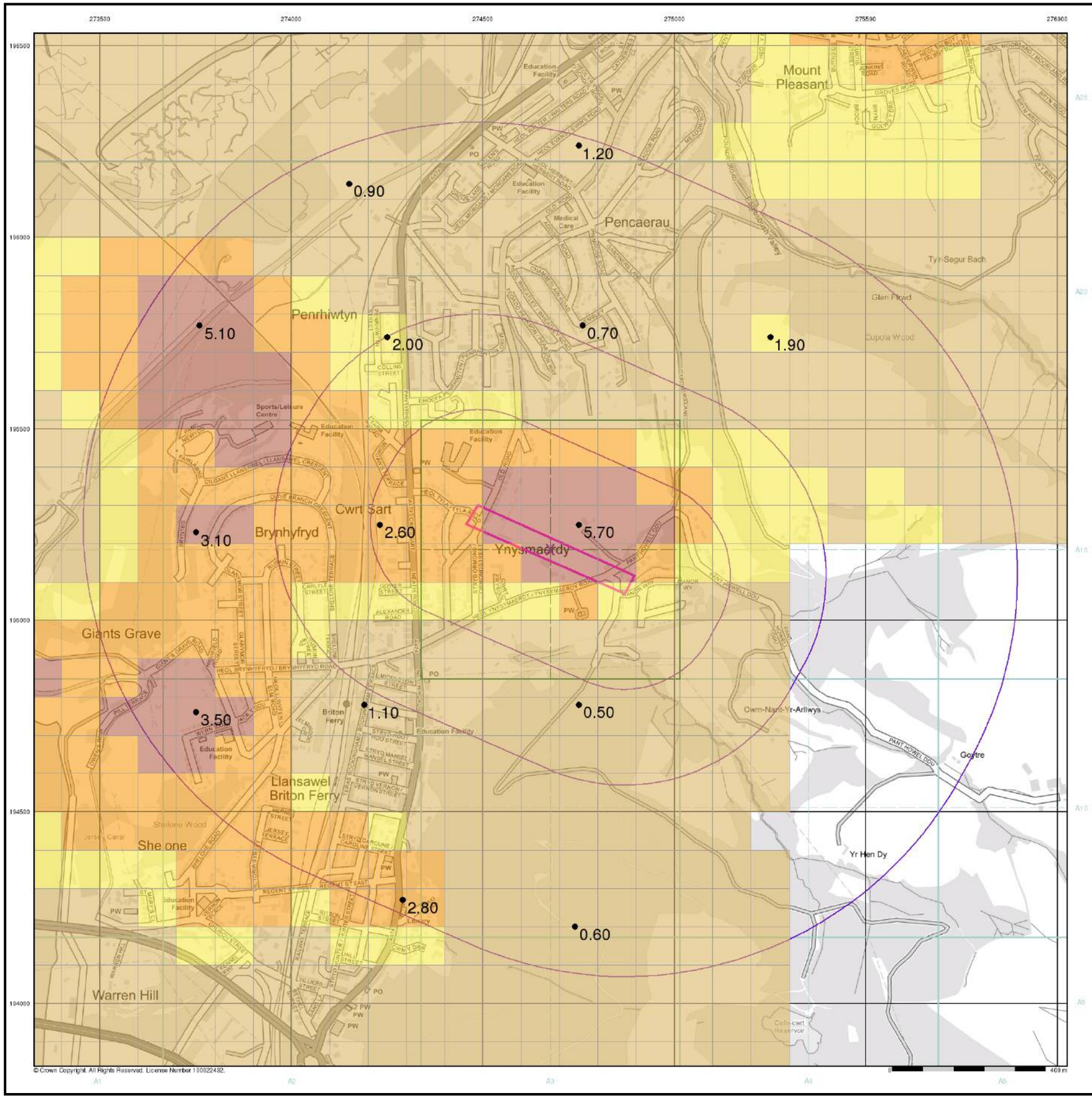


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## General

Specified Site  Specified Buffer(s)  Bearing Reference Point

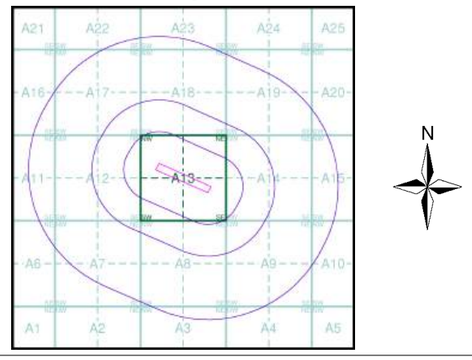
## Urban Soil Chemistry Cadmium

BGS Urban Soil Chemistry Measured Concentration Values (mg/kg)

Cadmium Concentrations mg/kg

- < 1.8
- 1.8 - 2.2
- 2.2 - 3.0
- > 3.0

## Urban Soil Chemistry Cadmium - Slice A

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| National Grid Reference: | 274680, 195180 |
| Slice: | A |
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Site at 274590, 195200


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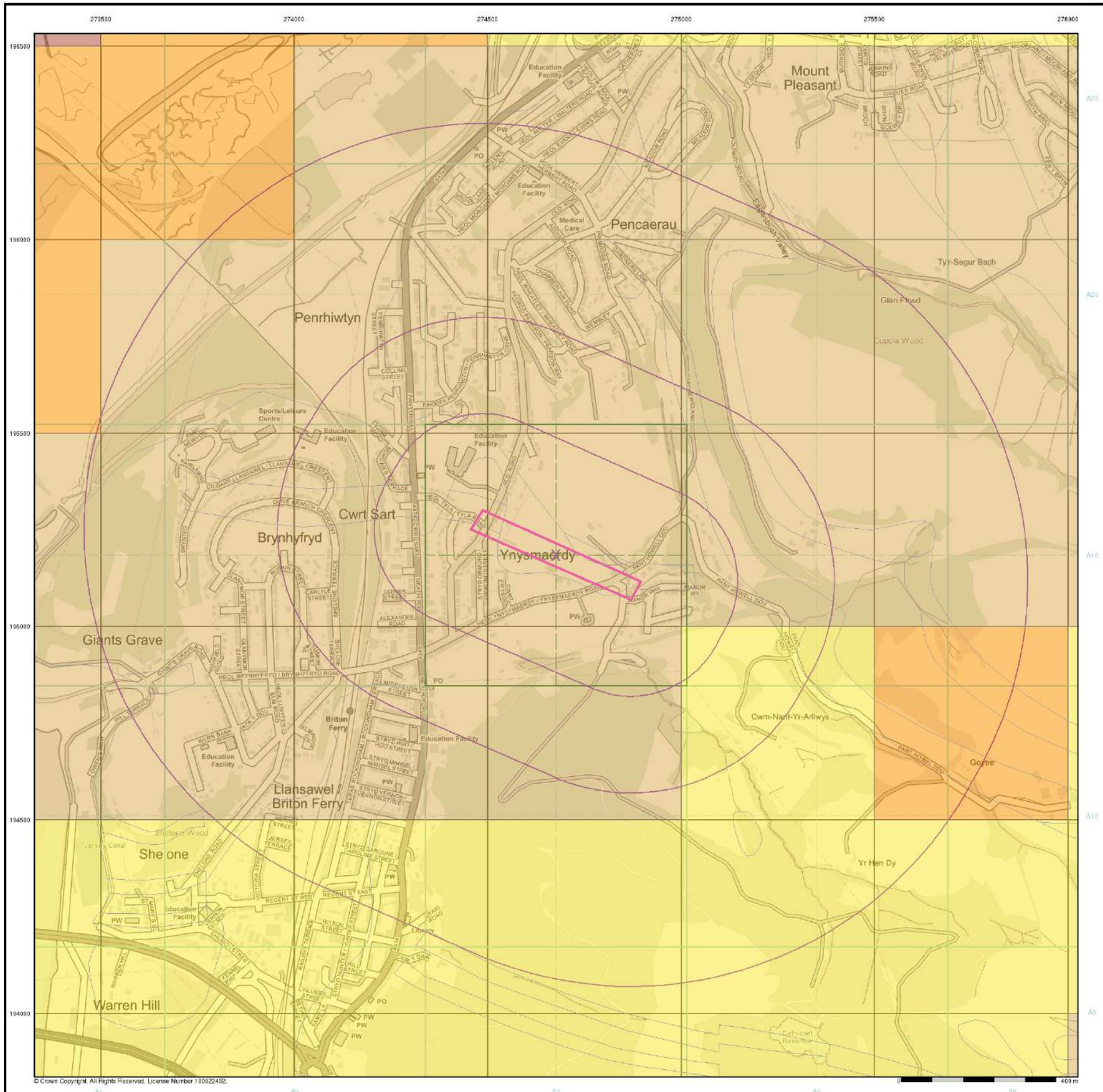


# Envirocheck®

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## General

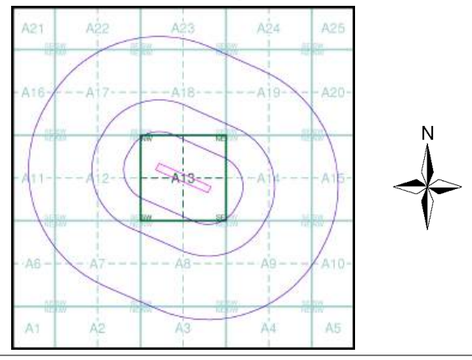
Specified Site | Specified Buffer(s) | X Bearing Reference Point

## Estimated Soil Chemistry Cadmium

Cadmium Concentrations mg/kg

- < 1.8
- 1.8 - 2.2
- 2.2 - 3.0
- > 3.0

## Estimated Soil Chemistry Cadmium - Slice A



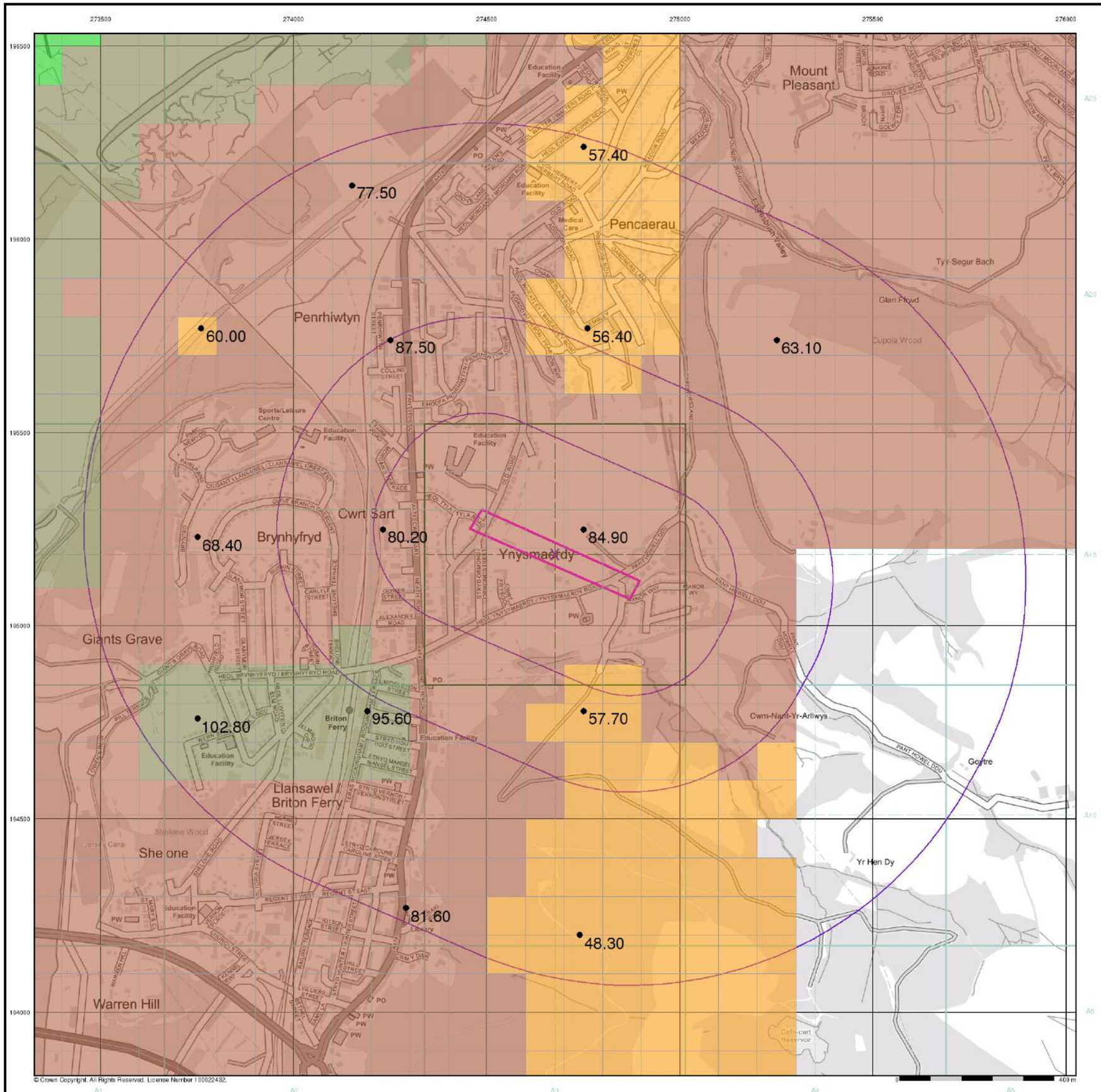

## Order Details

| | |
|---|---|
| Order Details: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search buffer (m): | 1000 |

## Site Details

Site at 274590, 195200

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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## General

Specified Site | Specified Buffer(s) | X Bearing Reference Point

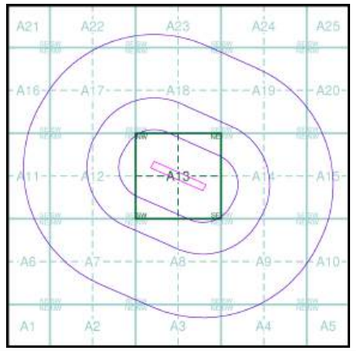
## Urban Soil Chemistry Chromium

● BGS Urban Soil Chemistry Measured Concentration Values (mg/kg)

Chromium Concentrations mg/kg

- < 20
- 20 - 40
- 40 - 60
- 60 - 90
- 90 - 120
- 120 - 180
- > 180

## Urban Soil Chemistry Chromium - Slice A

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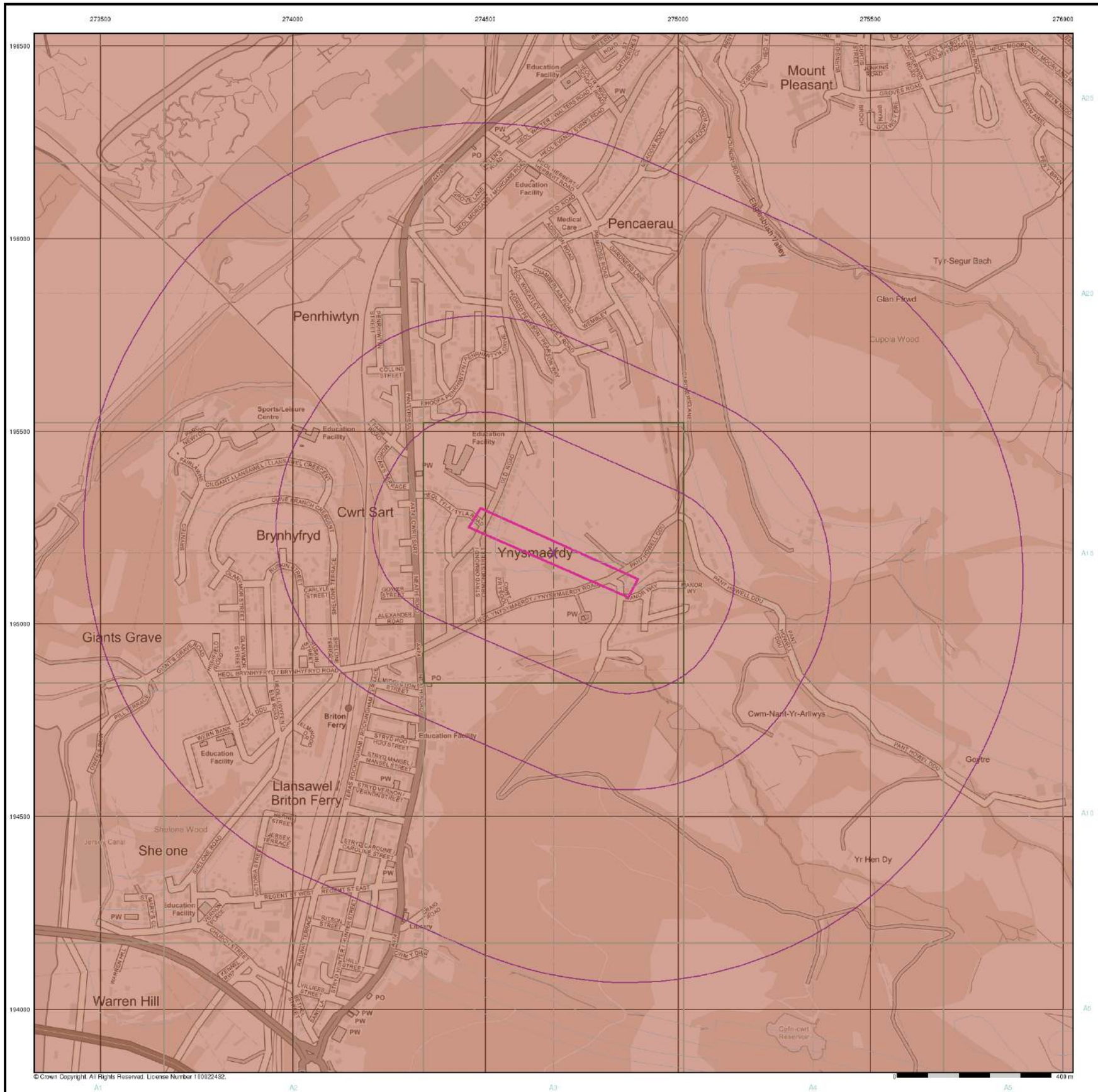



# Envirocheck®

LANDMARK INFORMATION GROUP®

## General

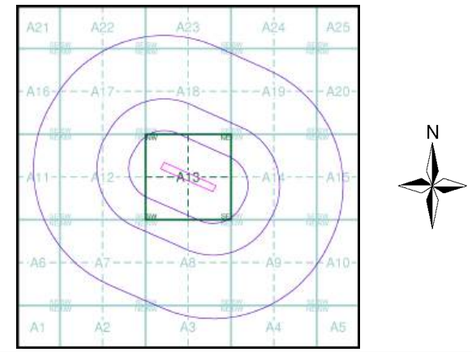
Specified Site | Specified Buffer(s) | X Bearing Reference Point

## Estimated Soil Chemistry Chromium

Chromium Concentrations mg/kg

- < 20
- 20 - 40
- 40 - 60
- 60 - 90
- 90 - 120
- 120 - 180
- > 180

## Estimated Soil Chemistry Chromium - Slice A

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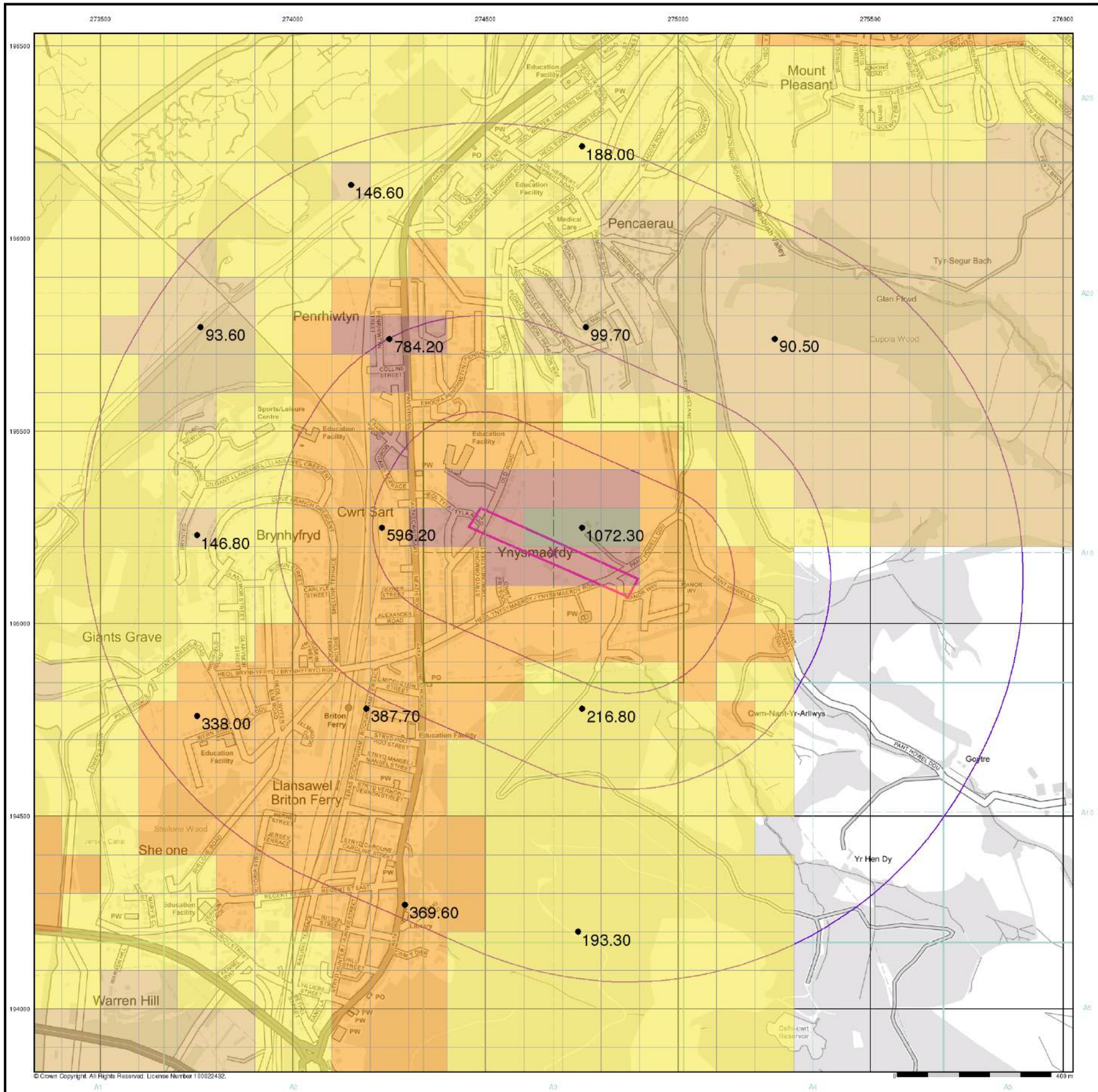


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## General

Specified Site | Specified Buffer(s) | X Bearing Reference Point

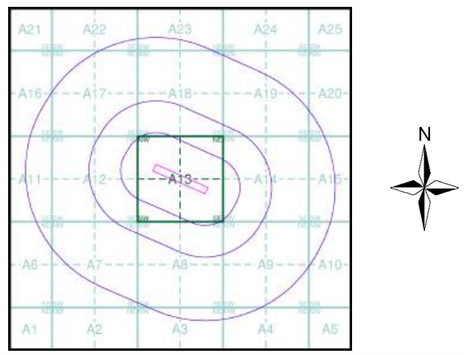
## Urban Soil Chemistry Lead

● BGS Urban Soil Chemistry Measured Concentration Values (mg/kg)

Lead Concentrations mg/kg

- < 150
- 150 - 300
- 300 - 600
- 600 - 900
- > 900

## Urban Soil Chemistry Lead - Slice A

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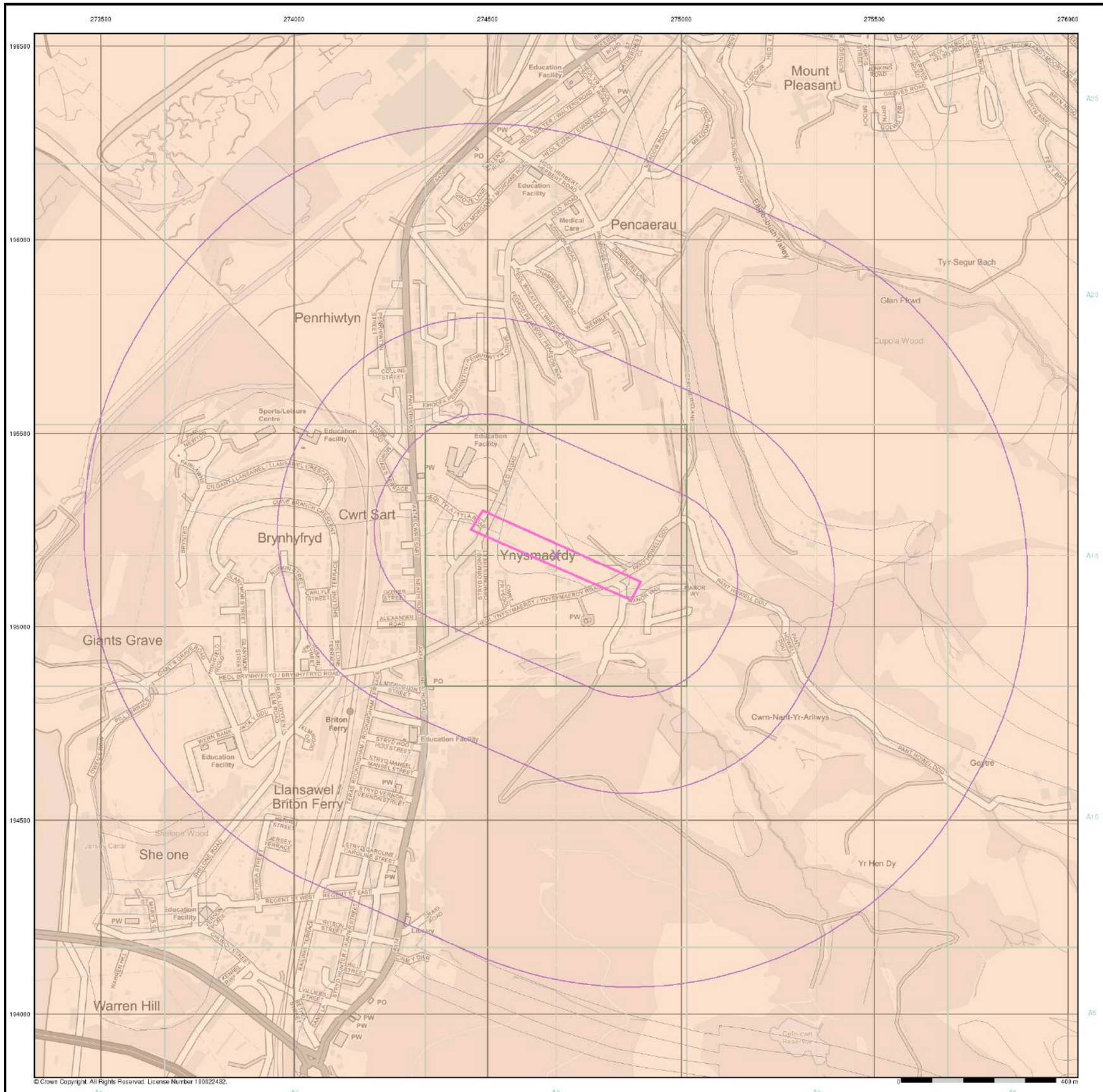


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## General

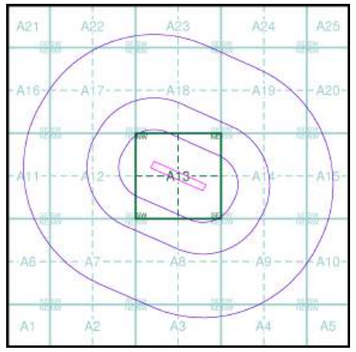
Specified Site | Specified Buffer(s) | X Bearing Reference Point

## Estimated Soil Chemistry Lead

Lead Concentrations mg/kg

- <100 mg/kg
- 100 - 200
- 200 - 300
- 300 - 600
- 600 - 1200
- >1200

## Estimated Soil Chemistry Lead - Slice A

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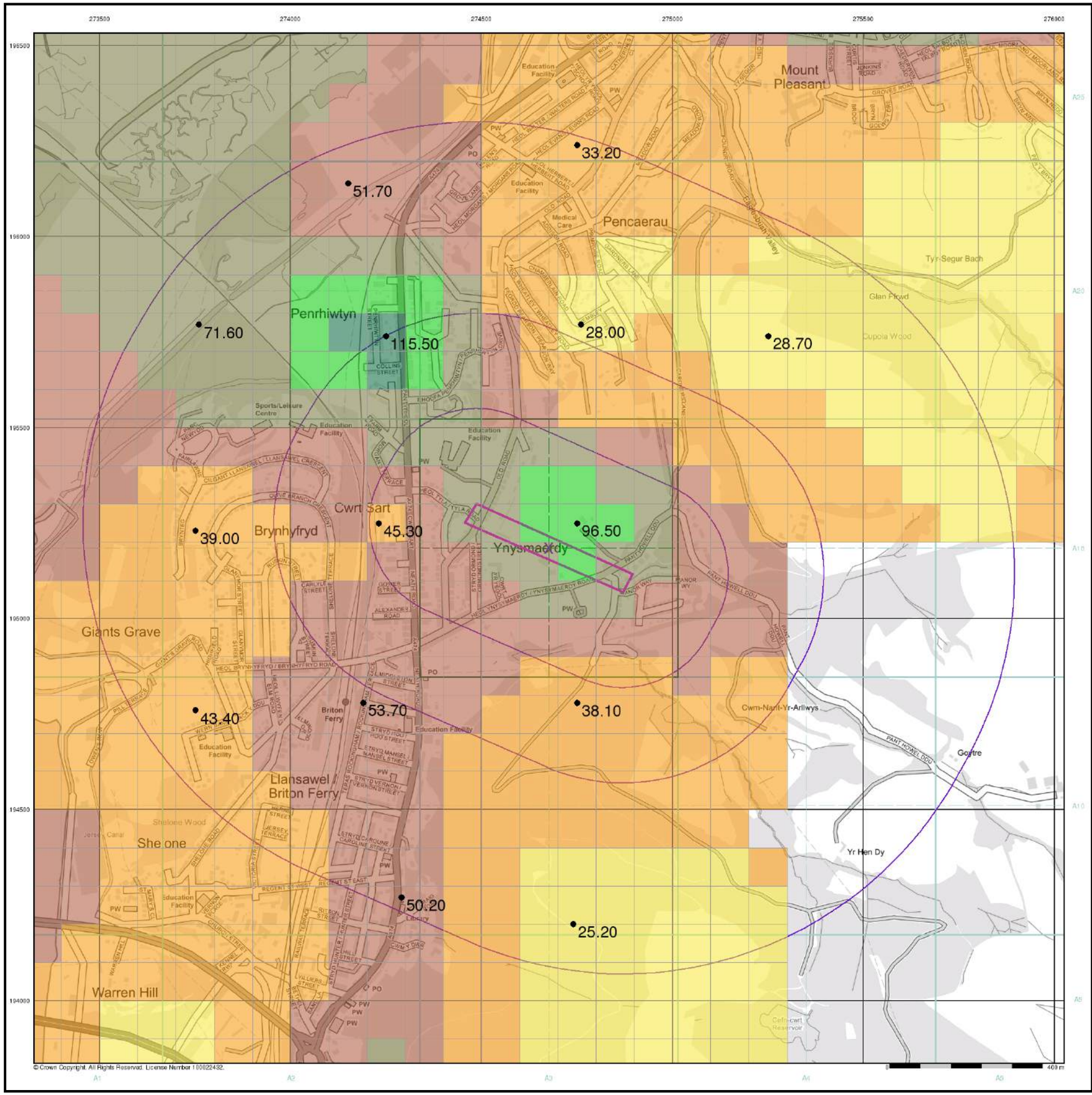


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## General

Specified Site | Specified Buffer(s) | X Bearing Reference Point

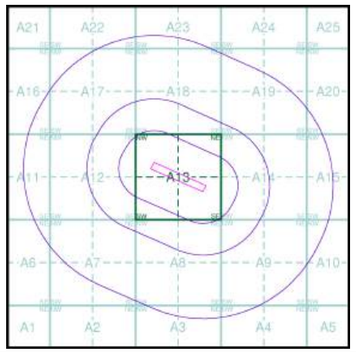
## Urban Soil Chemistry Nickel

● BGS Urban Soil Chemistry Measured Concentration Values (mg/kg)

Nickel Concentrations mg/kg

- < 15
- 15 - 30
- 30 - 45
- 45 - 60
- 60 - 80
- 80 - 100
- > 100

## Urban Soil Chemistry Nickel - Slice A

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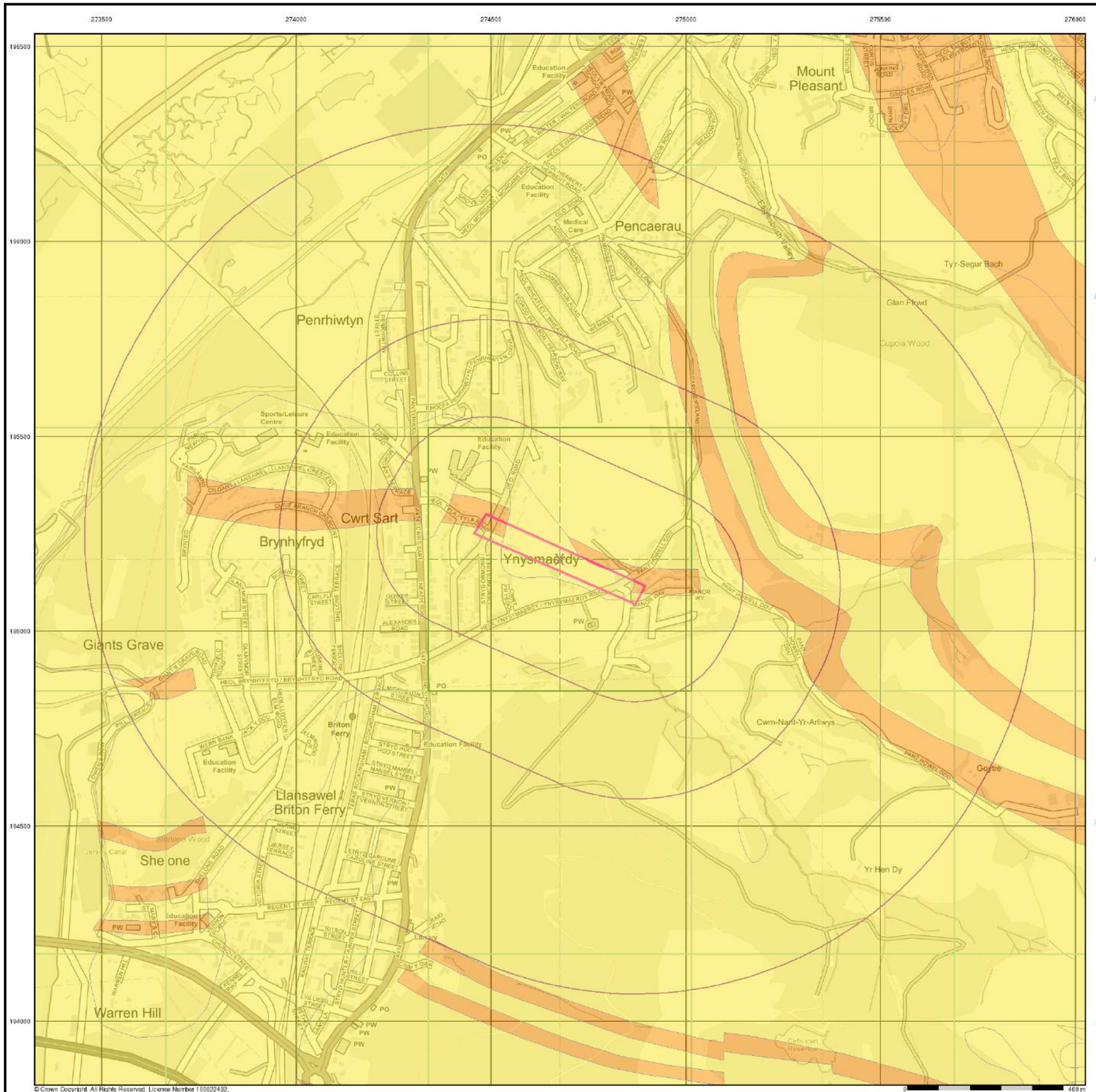
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search buffer (m): | 1000 |

## Site Details

Site at 274590, 195200



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# Envirocheck®

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## General

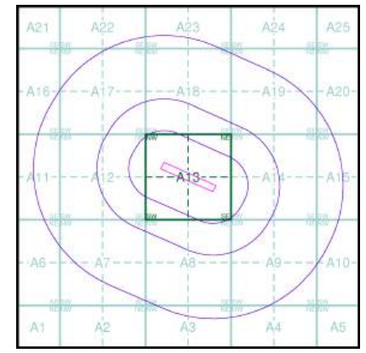
Specified Site  Specified Buffer(s)  X Bearing Reference Point

## Estimated Soil Chemistry Nickel

Nickel Concentrations mg/kg

- < 15
- 15 - 30
- 30 - 45
- 45 - 60
- 60 - 80
- 80 - 100
- > 100

## Estimated Soil Chemistry Nickel - Slice A

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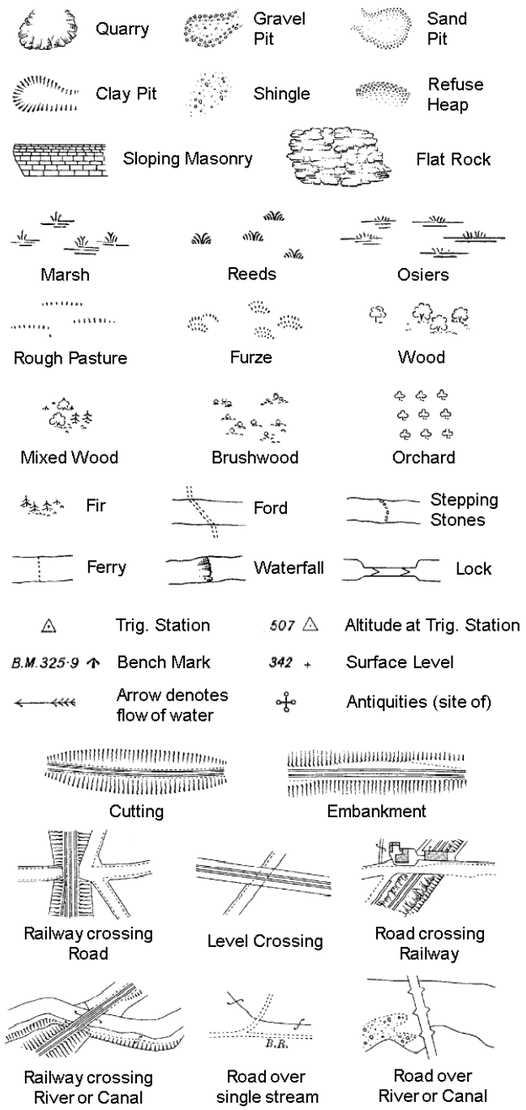
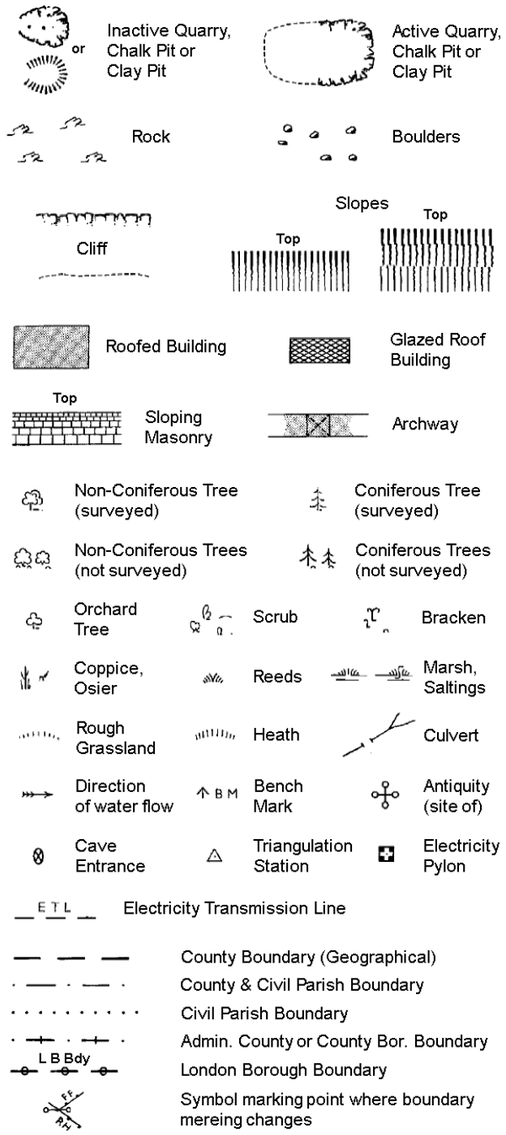
# Historical Mapping Legends

## Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



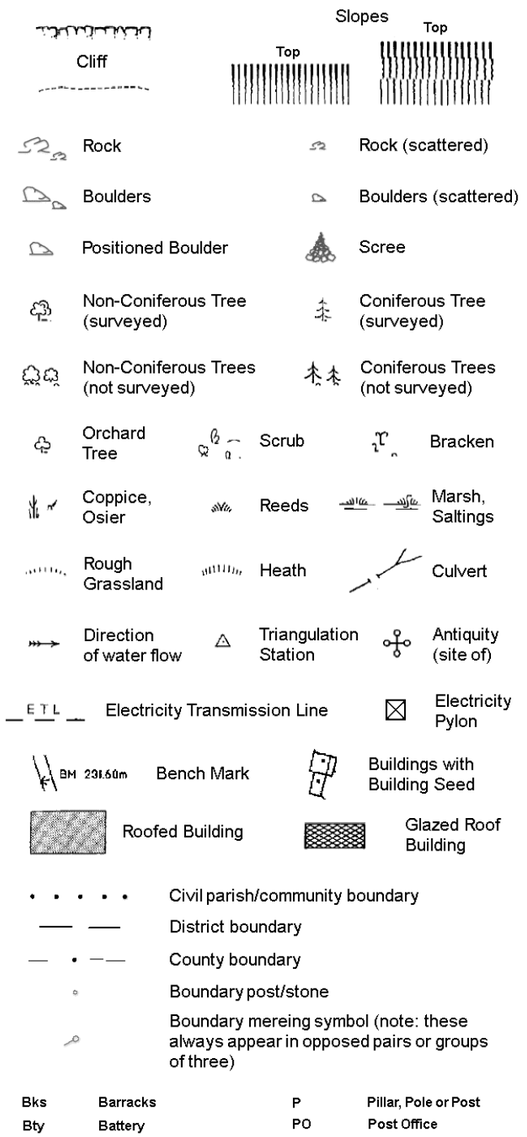

| | | | |
|---|---|---|---|
| B P B S | Boundary Post or Stone | P.C.B | Police Call Box |
| B.R. | Bridle Road | P | Pump |
| E.P | Electricity Pylon | S.P | Signal Post |
| F.B. | Foot Bridge | St. | Sluice |
| F.P. | Foot Path | Sp. | Spring |
| G.P | Guide Post or Board | T.C.B | Telephone Call Box |
| M.S | Mile Stone | Tr. | Trough |
| M.P M.R | Mooring Post or Ring | W | Well |

## Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250




| | | | |
|---|---|---|---|
| BH | Beer House | P | Pillar, Pole or Post |
| BP, BS | Boundary Post or Stone | PO | Post Office |
| Cn, C | Capstan, Crane | PC | Public Convenience |
| Chy | Chimney | PH | Public House |
| D Fn | Drinking Fountain | Pp | Pump |
| El P | Electricity Pillar or Post | SB, S Br | Signal Box or Bridge |
| FAP | Fire Alarm Pillar | SP, SL | Signal Post or Light |
| FB | Foot Bridge | Spr | Spring |
| GP | Guide Post | Tk | Tank or Track |
| H | Hydrant or Hydraulic | TCB | Telephone Call Box |
| LC | Level Crossing | TCP | Telephone Call Post |
| MH | Manhole | Tr | Trough |
| MP | Mile Post or Mooring Post | Wr Pt, Wr T | Water Point, Water Tap |
| MS | Mile Stone | W | Well |
| NTL | Normal Tidal Limit | Wd Pp | Wind Pump |

## Large-Scale National Grid Data 1:2,500 and 1:1,250




| | | | |
|---|---|---|---|
| Bks | Barracks | P | Pillar, Pole or Post |
| Bty | Battery | PO | Post Office |
| Cemy | Cemetery | PC | Public Convenience |
| Chy | Chimney | Pp | Pump |
| Cis | Cistern | Ppg Sta | Pumping Station |
| Dismtd Rly | Dismantled Railway | PW | Place of Worship |
| El Gen Sta | Electricity Generating Station | Sewage Ppg Sta | Sewage Pumping Station |
| El P | Electricity Pole, Pillar | SB, S Br | Signal Box or Bridge |
| El Sub Sta | Electricity Sub Station | SP, SL | Signal Post or Light |
| FB | Filter Bed | Spr | Spring |
| Fn / D Fn | Fountain / Drinking Ftn. | Tk | Tank or Track |
| Gas Gov | Gas Valve Compound | Tr | Trough |
| GVC | Gas Governer | Wd Pp | Wind Pump |
| GP | Guide Post | Wr Pt, Wr T | Water Point, Water Tap |
| MH | Manhole | Wks | Works (building or area) |
| MP, MS | Mile Post or Mile Stone | W | Well |

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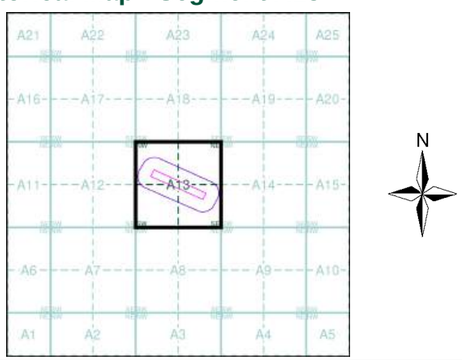
## Historical Mapping & Photography included:



| Mapping Type | Scale | Date | Pg |
|---|---|---|---|
| Glamorganshire | 1:2,500 | 1878 - 1882 | 2 |
| Glamorganshire | 1:2,500 | 1899 | 3 |
| Glamorganshire | 1:2,500 | 1918 - 1919 | 4 |
| Glamorganshire | 1:2,500 | 1935 - 1941 | 5 |
| Ordnance Survey Plan | 1:1,250 | 1951 | 6 |
| Ordnance Survey Plan | 1:2,500 | 1952 - 1971 | 7 |
| Ordnance Survey Plan | 1:1,250 | 1959 - 1967 | 8 |
| Ordnance Survey Plan | 1:1,250 | 1967 - 1968 | 9 |
| Ordnance Survey Plan | 1:2,500 | 1970 | 10 |
| Additional SIMs | 1:1,250 | 1979 - 1989 | 11 |
| Additional SIMs | 1:1,250 | 1987 - 1989 | 12 |
| Additional SIMs | 1:1,250 | 1989 | 13 |
| Large-Scale National Grid Data | 1:1,250 | 1993 | 14 |
| Large-Scale National Grid Data | 1:2,500 | 1993 | 15 |
| Large-Scale National Grid Data | 1:1,250 | 1994 | 16 |
| Historical Aerial Photography | 1:2,500 | 2000 | 17 |



## Historical Map - Segment A13

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| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 100 |

## Site Details

Site at 274590, 195200


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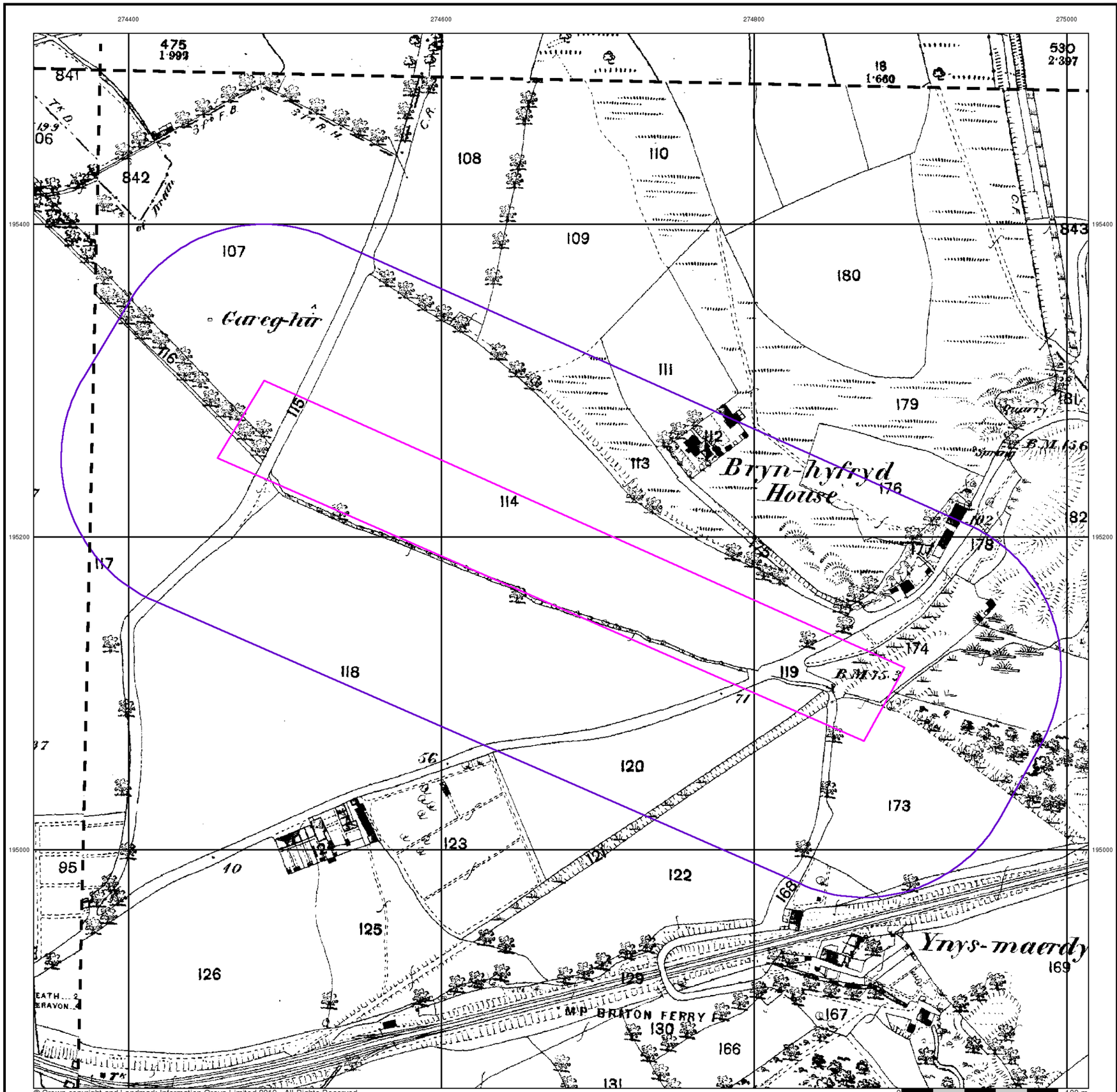


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0 100 m

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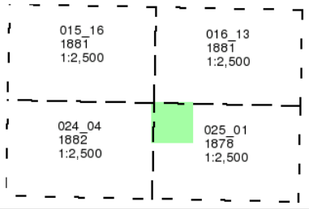
## Glamorganshire

**Published 1878 - 1882**

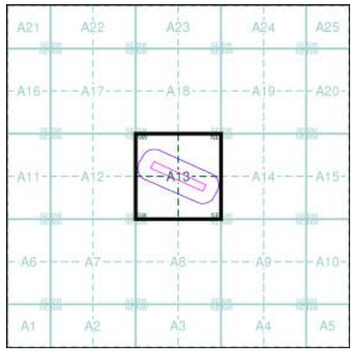
**Source map scale - 1:2,500**

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

## Map Name(s) and Date(s)




## Historical Map - Segment A13

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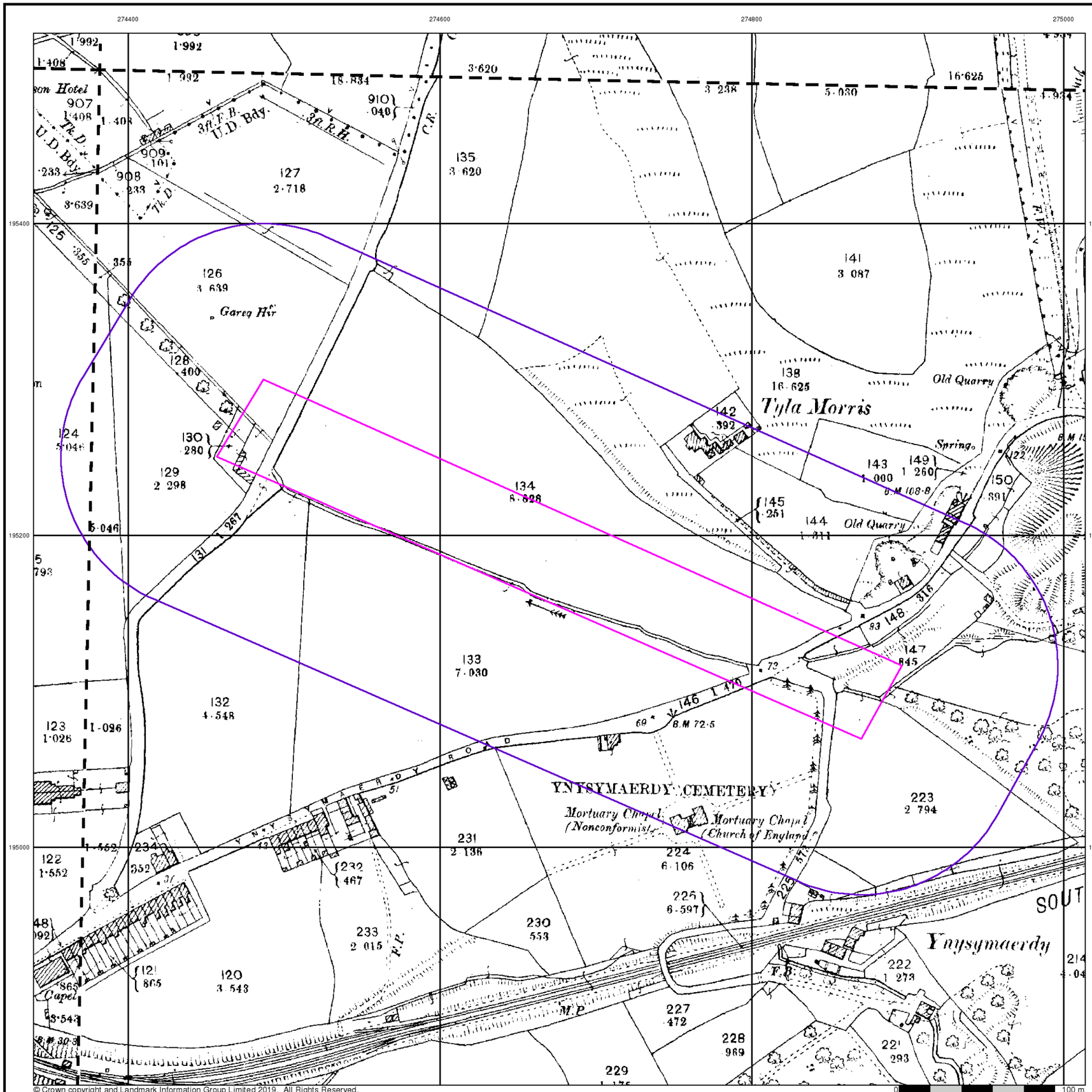

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## Glamorganshire

**Published 1899**

**Source map scale - 1:2,500**

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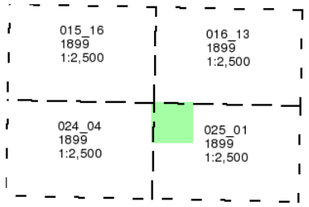
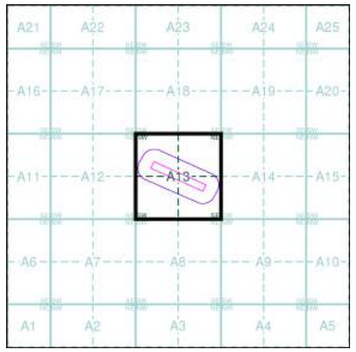



## Historical Map - Segment A13

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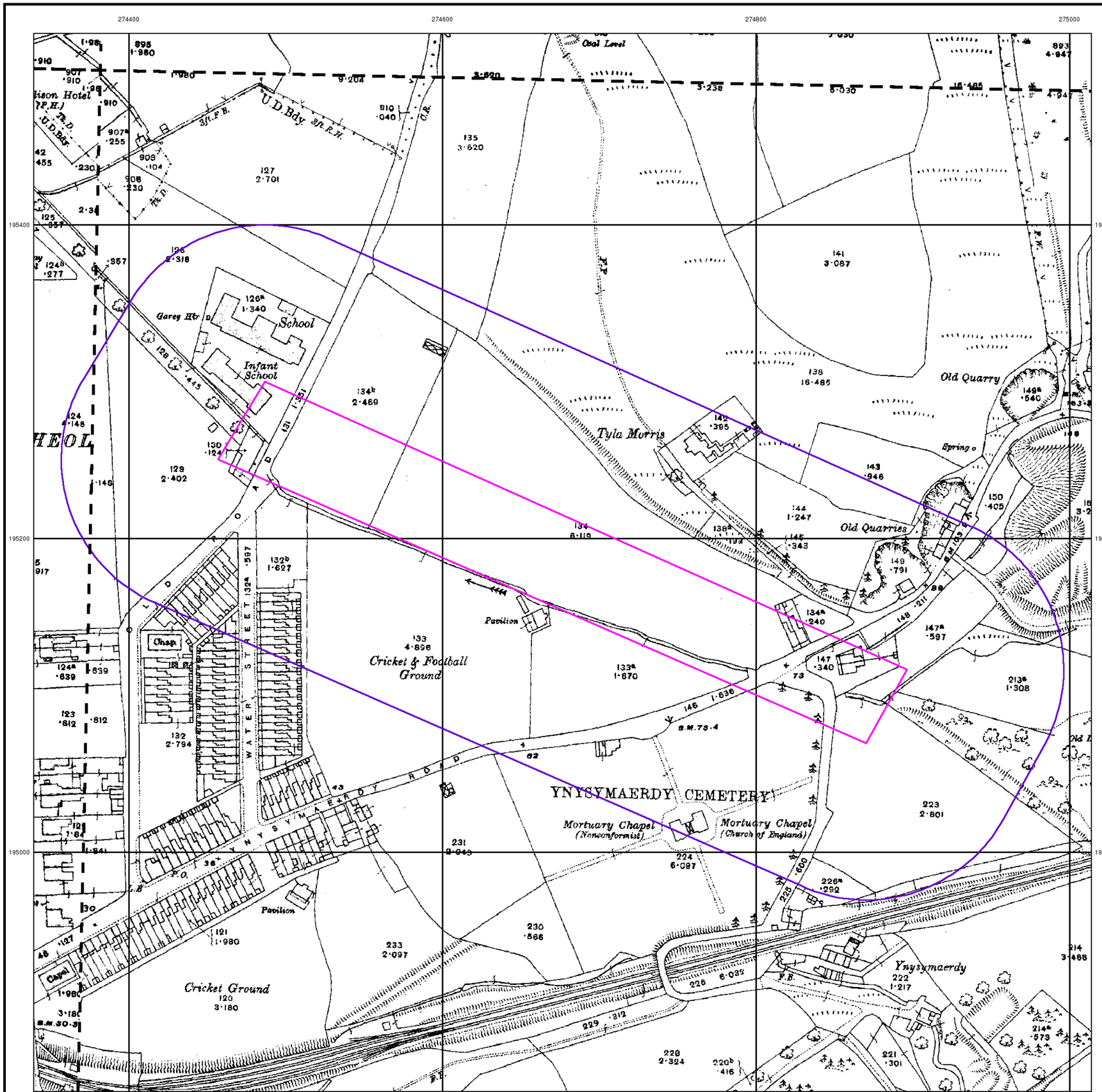


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## Glamorganshire

## Published 1918 - 1919

## Source map scale - 1:2,500

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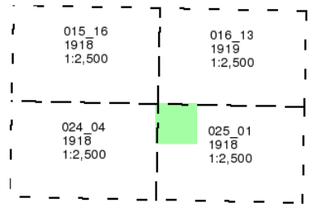
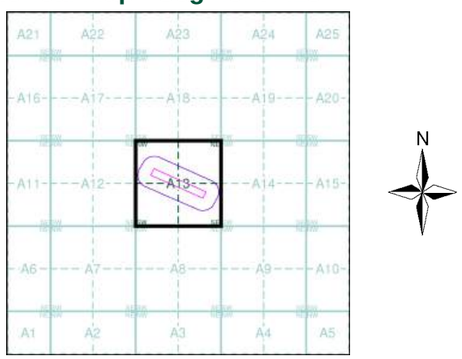



## Historical Map - Segment A13

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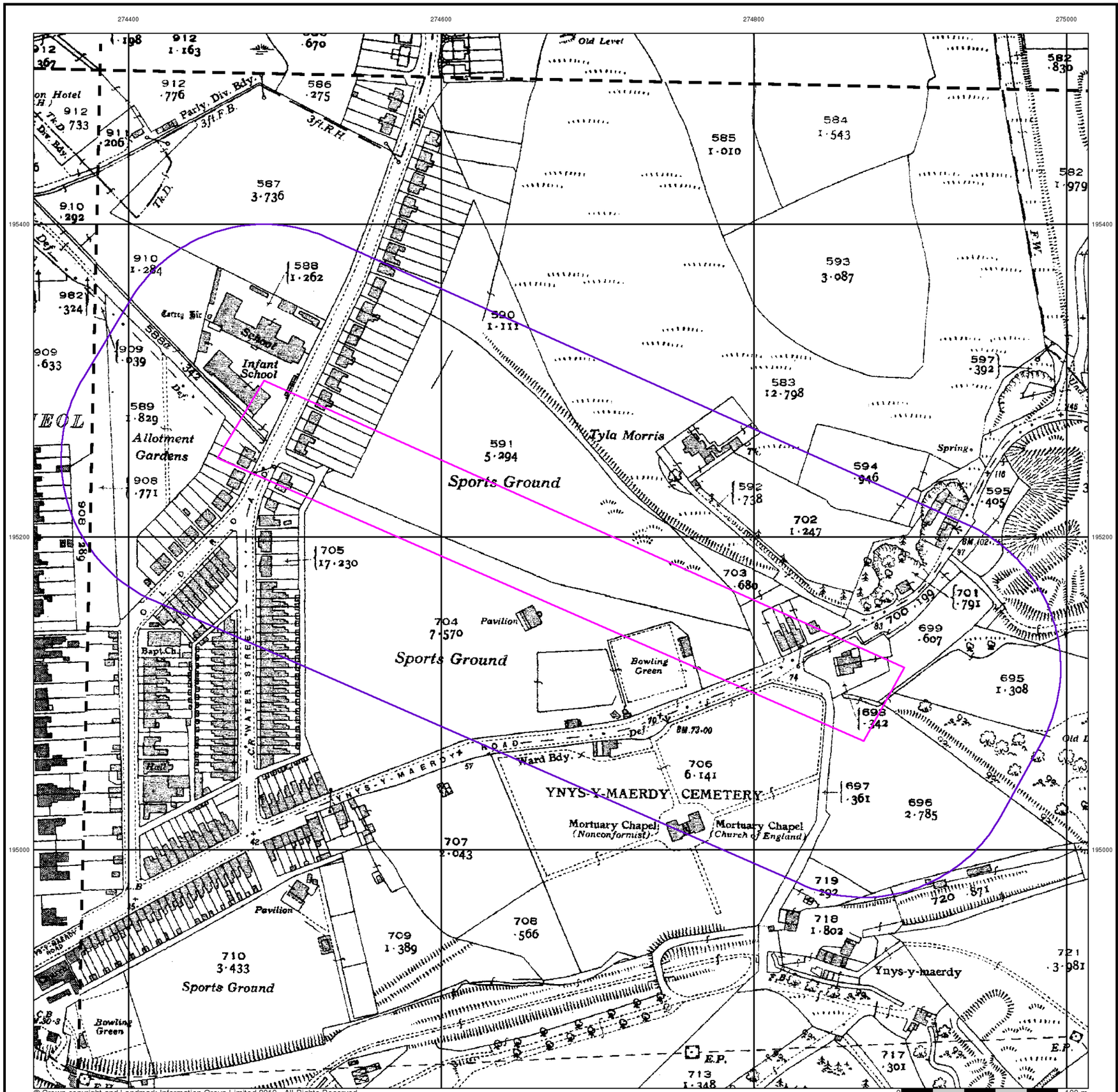


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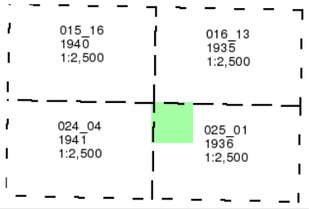
## Glamorganshire

**Published 1935 - 1941**

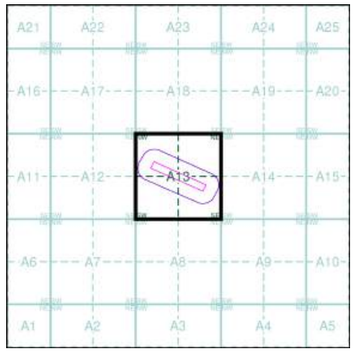
**Source map scale - 1:2,500**

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

## Map Name(s) and Date(s)




## Historical Map - Segment A13




## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 100 |

## Site Details

Site at 274590, 195200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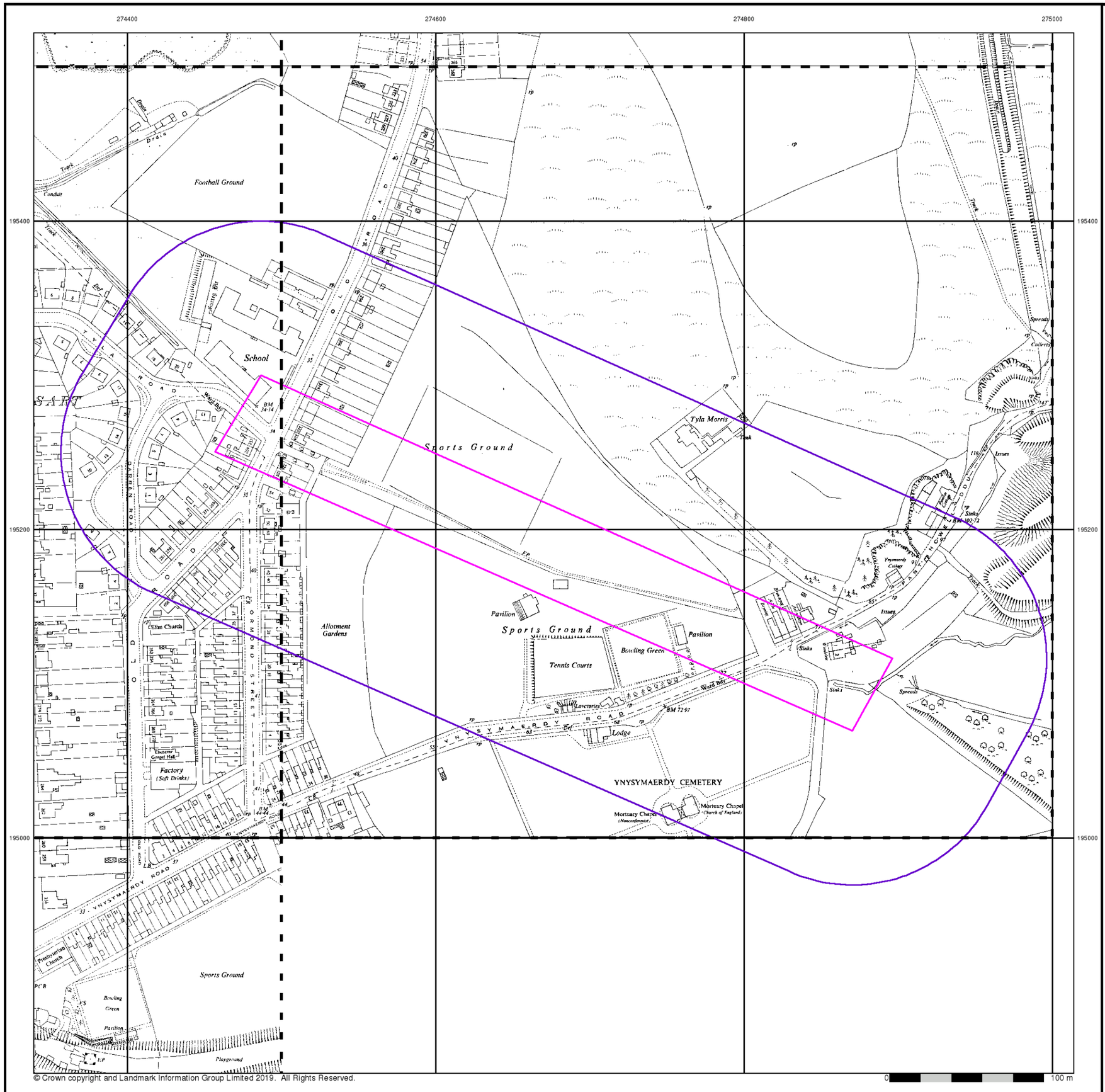
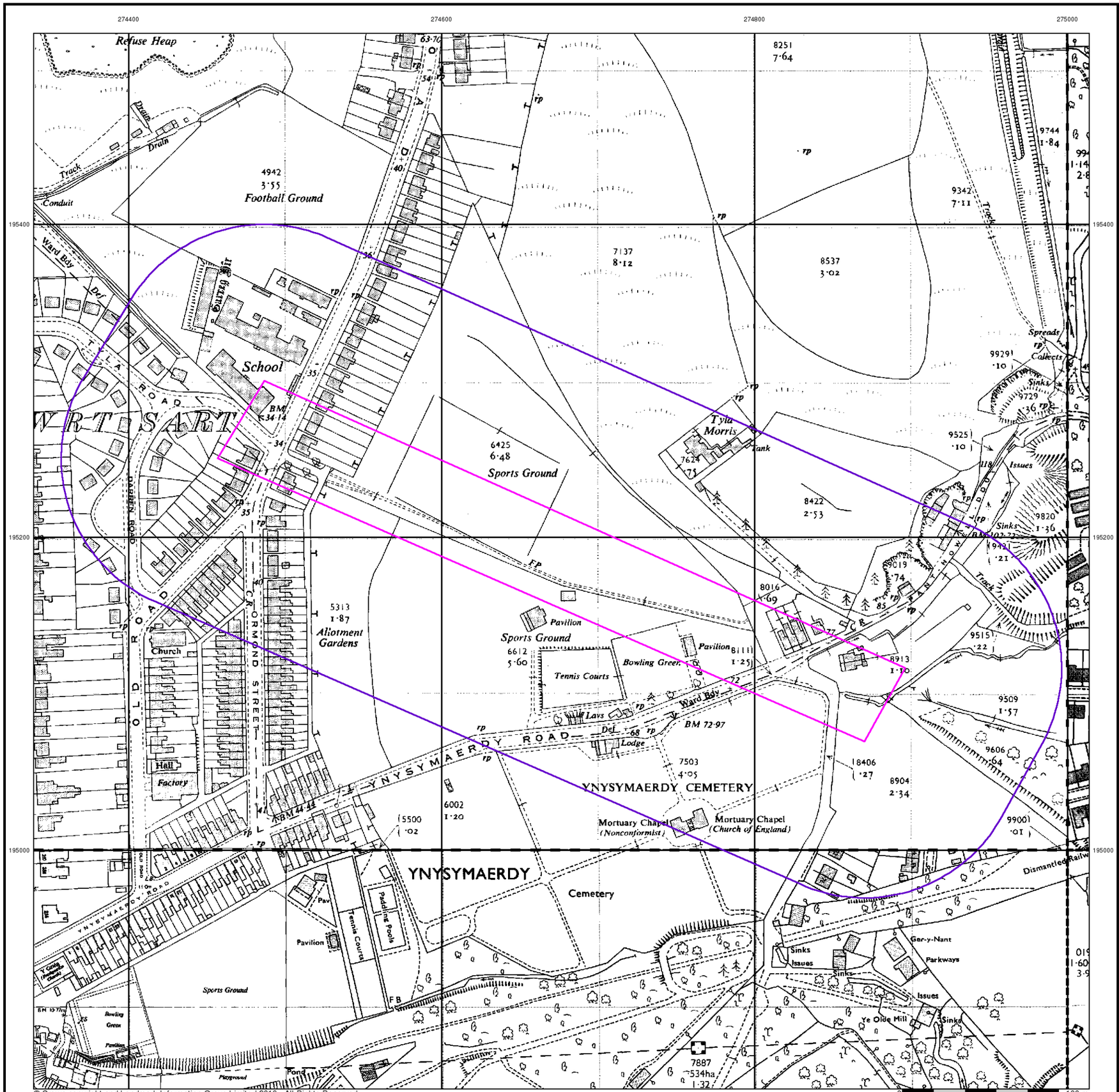

274400
274600
274800
275000
195400
195200
195000
Football Ground
School
Sports Ground
Tyla Morris
Allotment Gardens
Pavilion
Sports Ground
Bowling Green
Tennis Courts
Pavilion
Lodge
YNYSYMAERDY CEMETERY
Mortuary Chapel (Nonconformist)
Mortuary Chapel (Church of England)
Factory (Soft Drinks)
Elim Church
Presbyterian Church
Sports Ground
Bowling Green
Pavilion
Playground
Issues
Sinks
Spreads
Collieries
Yr Hendy
Yr Hendy Cottage
Yr Hendy Farm
Yr Hendy Cottages
Yr Hendy Cottage
Yr Hendy Cottage
Yr Hendy Cottage



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## Ordnance Survey Plan

**Published 1952 - 1971**

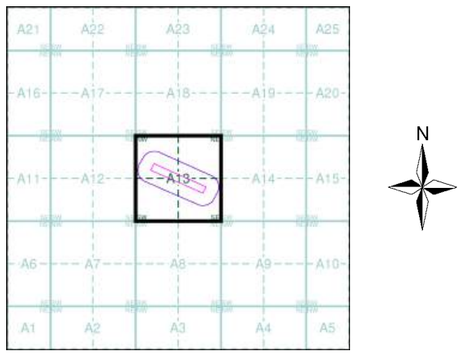
**Source map scale - 1:2,500**

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

## Map Name(s) and Date(s)

| | |
|---|---|
| SS7495 1952 1:2,500 | SS7595 1970 1:2,500 |
| SS7494 1971 1:2,500 | SS7594 1971 1:2,500 |

## Historical Map - Segment A13




## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 100 |

## Site Details

Site at 274590, 195200

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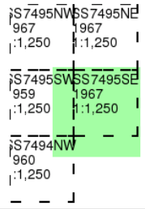
## Ordnance Survey Plan

**Published 1959 - 1967**

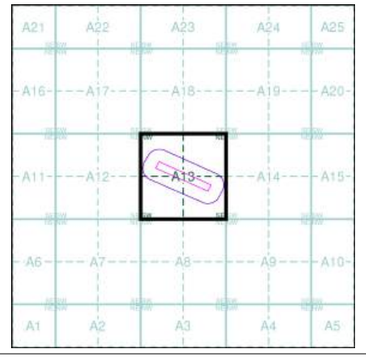
**Source map scale - 1:1,250**

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

## Map Name(s) and Date(s)




## Historical Map - Segment A13




## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 100 |

## Site Details

Site at 274590, 195200

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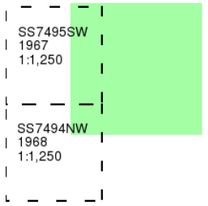
## Ordnance Survey Plan

### Published 1967 - 1968

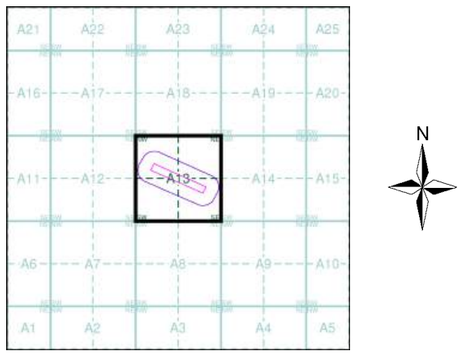
### Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

## Map Name(s) and Date(s)




## Historical Map - Segment A13




## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 100 |

## Site Details

Site at 274590, 195200

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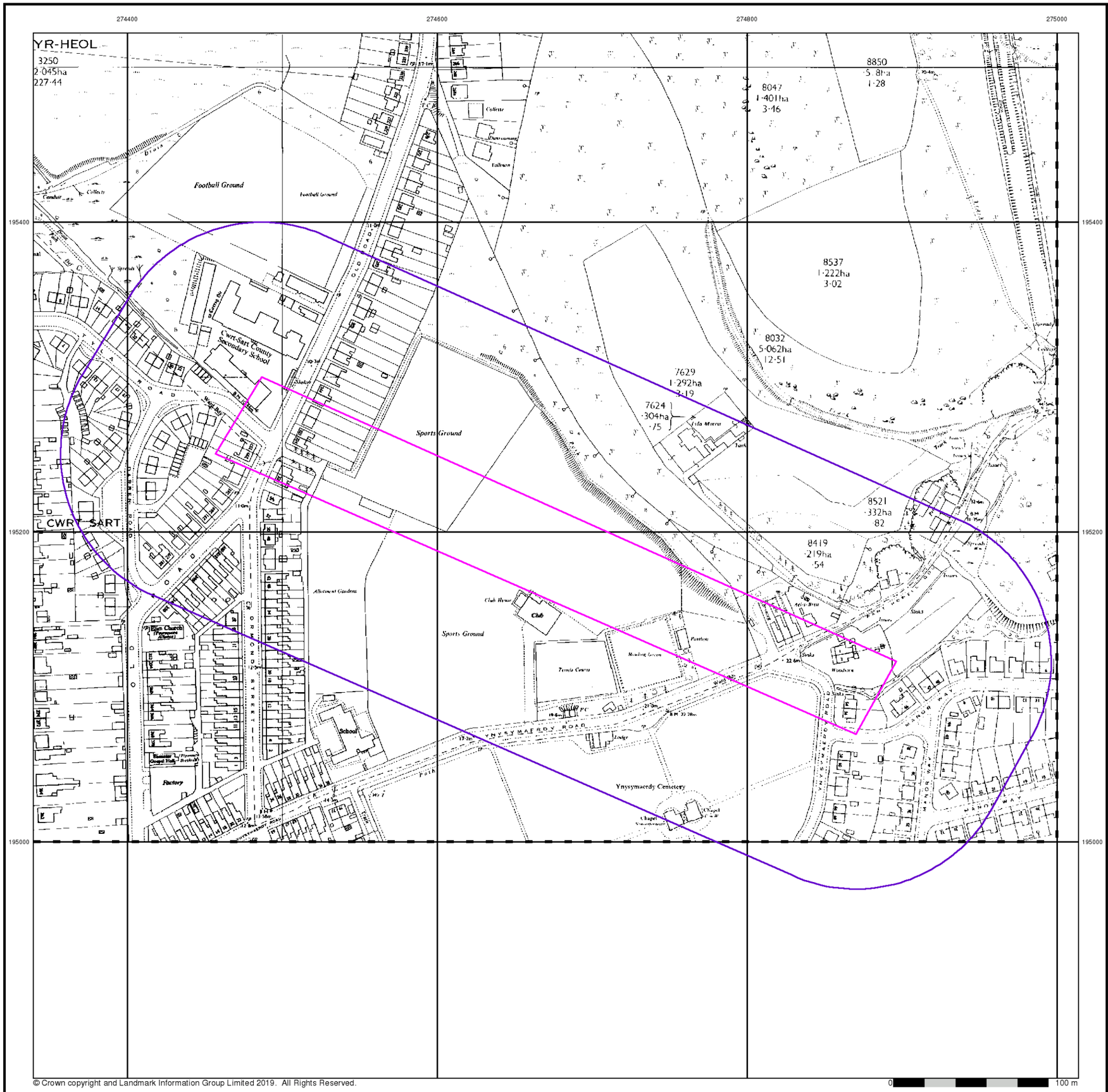


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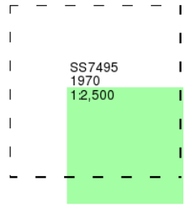
## Ordnance Survey Plan

**Published 1970**

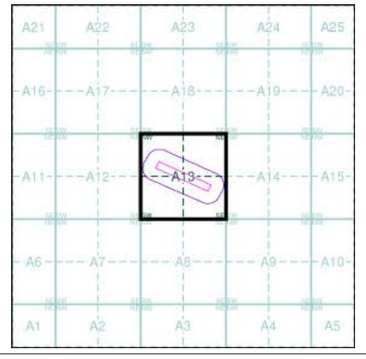
**Source map scale - 1:2,500**

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

## Map Name(s) and Date(s)




## Historical Map - Segment A13




## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 100 |

## Site Details

Site at 274590, 195200

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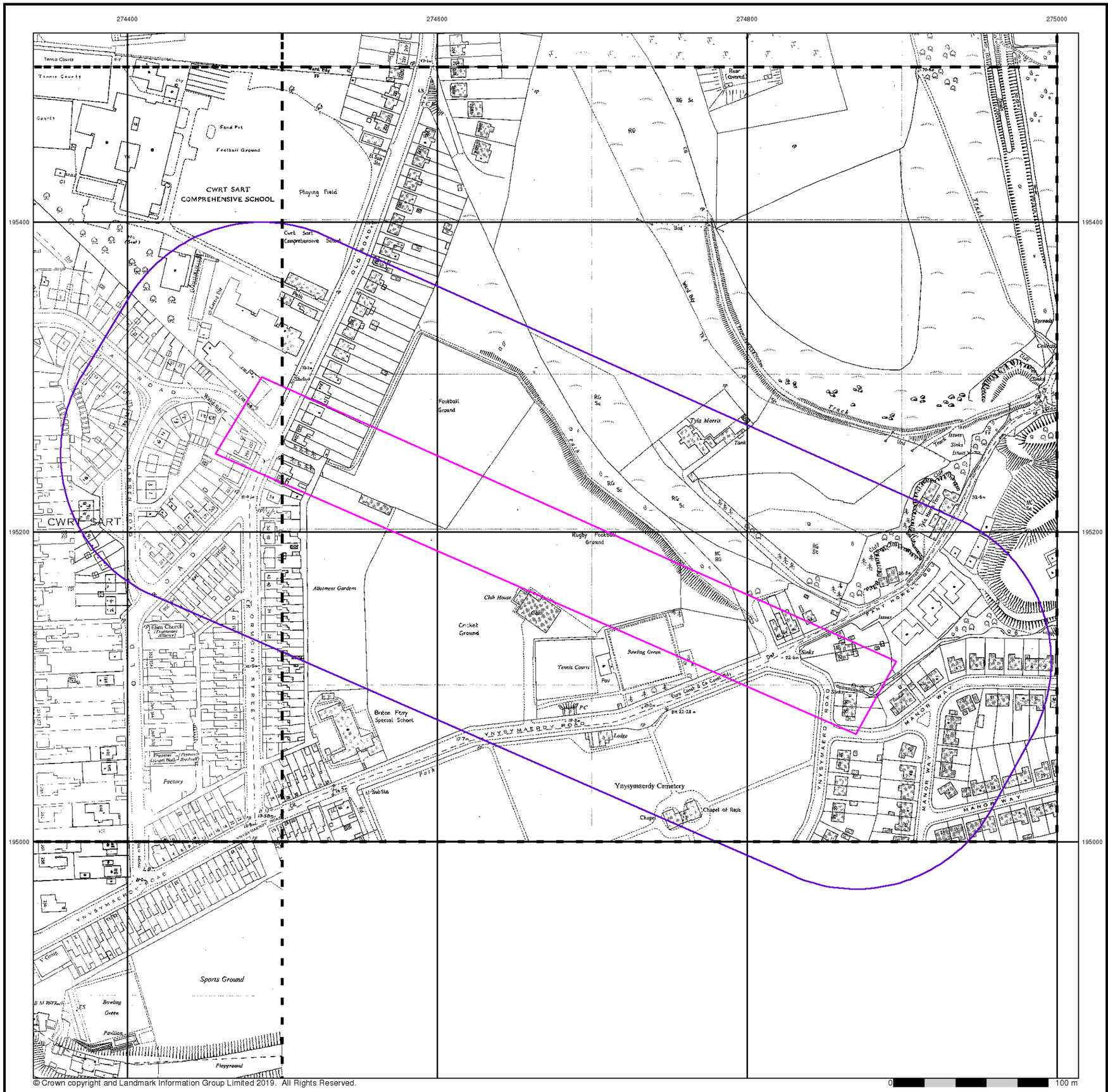

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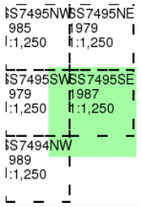
## Additional SIMs

**Published 1979 - 1989**

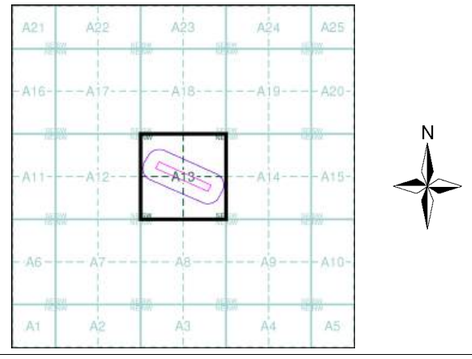
**Source map scale - 1:1,250**

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

## Map Name(s) and Date(s)




## Historical Map - Segment A13




## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 100 |

## Site Details

Site at 274590, 195200

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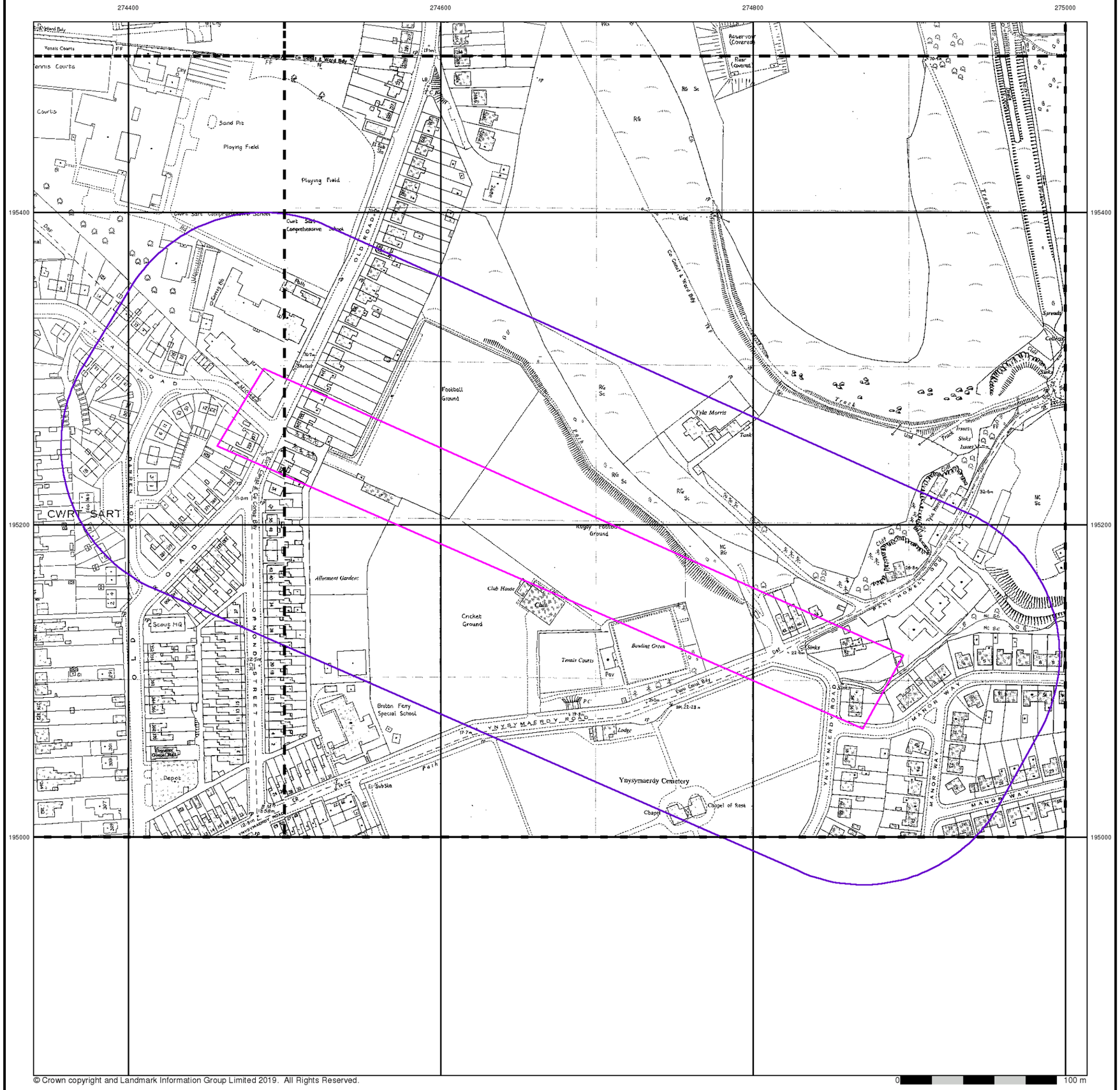
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

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## Additional SIMs

**Published 1987 - 1989**

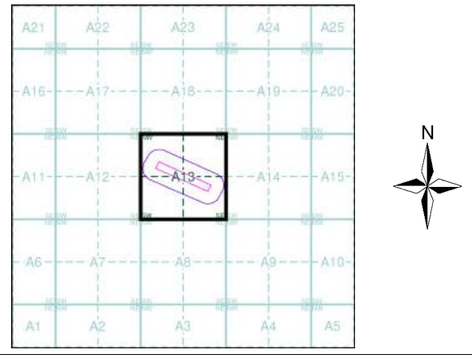
**Source map scale - 1:1,250**

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

## Map Name(s) and Date(s)

| | |
|---|---|
| SS7495NW 1989 1:1,250 | SS7495NE 1987 1:1,250 |
| SS7495SW 1987 1:1,250 | SS7495SE 1989 1:1,250 |

## Historical Map - Segment A13




## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 100 |

## Site Details

Site at 274590, 195200

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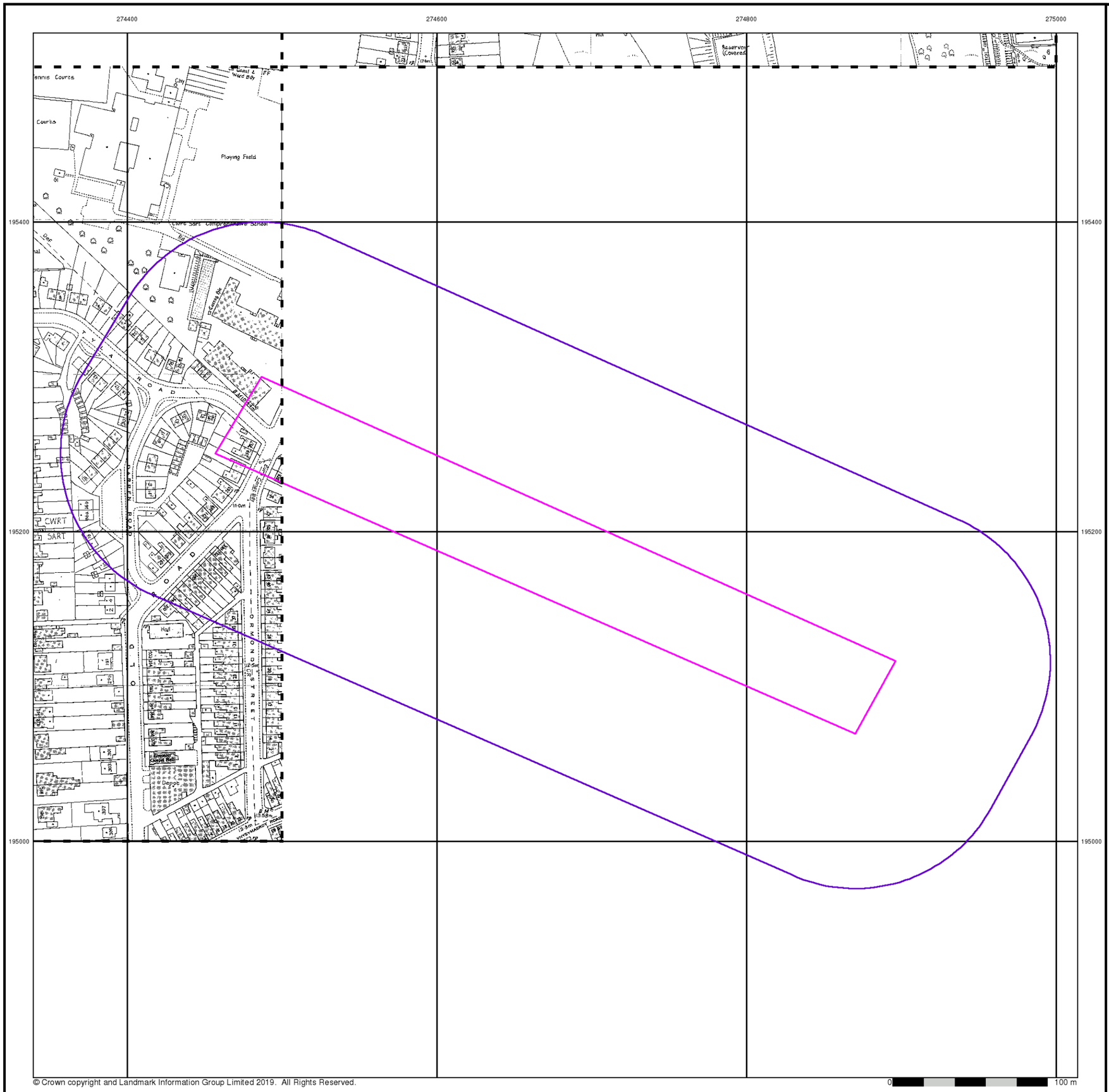
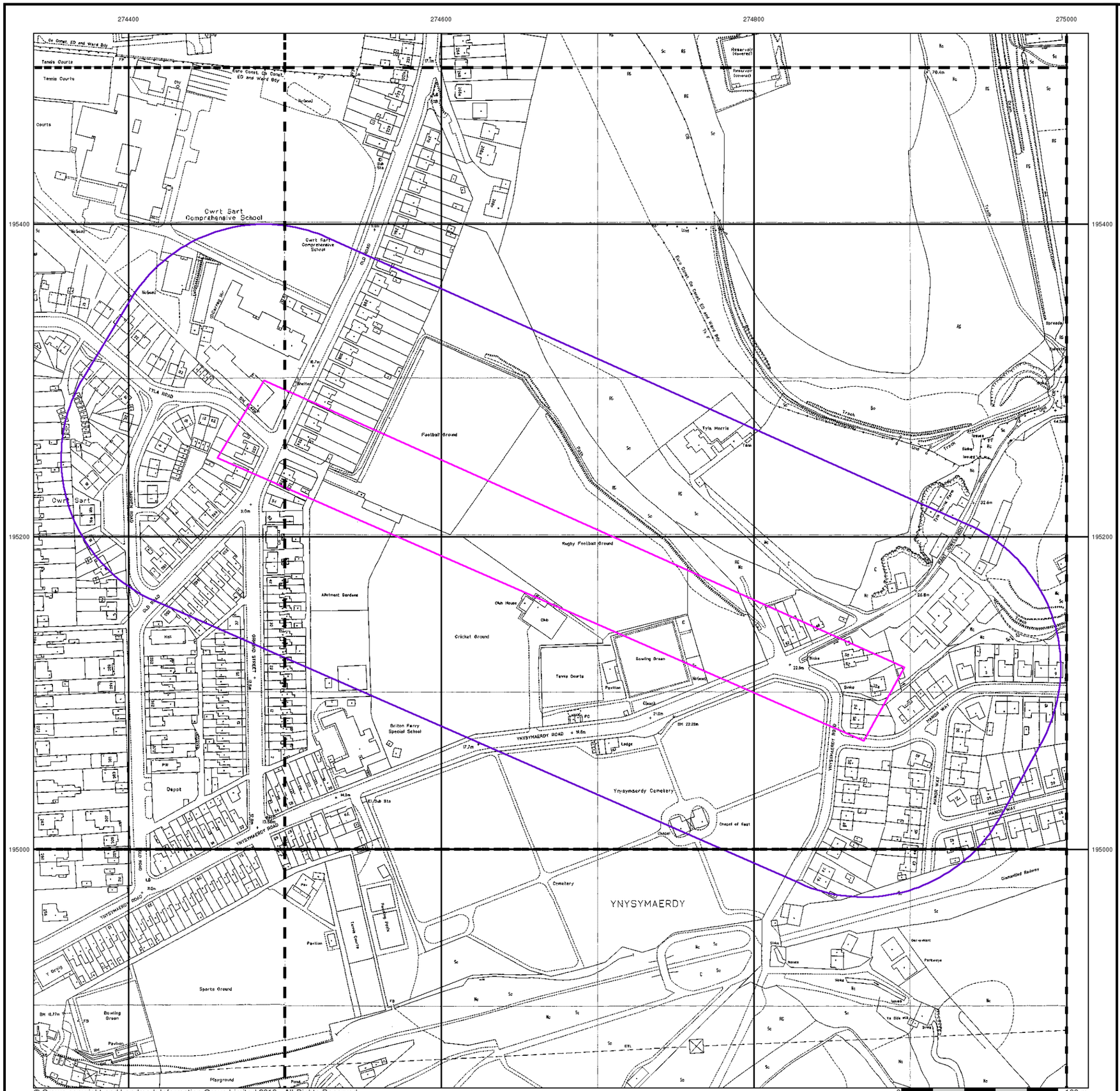

274400
274600
274800
275000
195400
195200
195000
Playing Field
Tennis Courts
CWRT
SART
ROAD
ORMONDS STREET
Hall
Depot
Drain
Ref
Ref
Ref



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## Large-Scale National Grid Data

**Published 1993**

**Source map scale - 1:1,250**

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

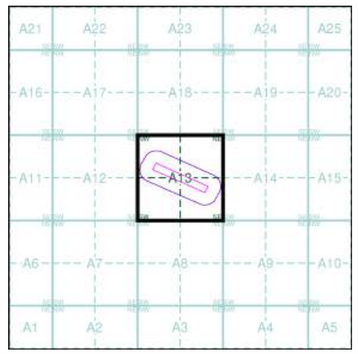
## Map Name(s) and Date(s)

SS7495NW 1993 1:1,250 | SS7495NE 1993 1:1,250

SS7495SW 1993 1:1,250 | SS7495SE 1993 1:1,250

SS7494NW 1993 1:1,250 | SS7494NE 1993 1:1,250

## Historical Map - Segment A13




## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 100 |

## Site Details

Site at 274590, 195200

Landmark INFORMATION GROUP

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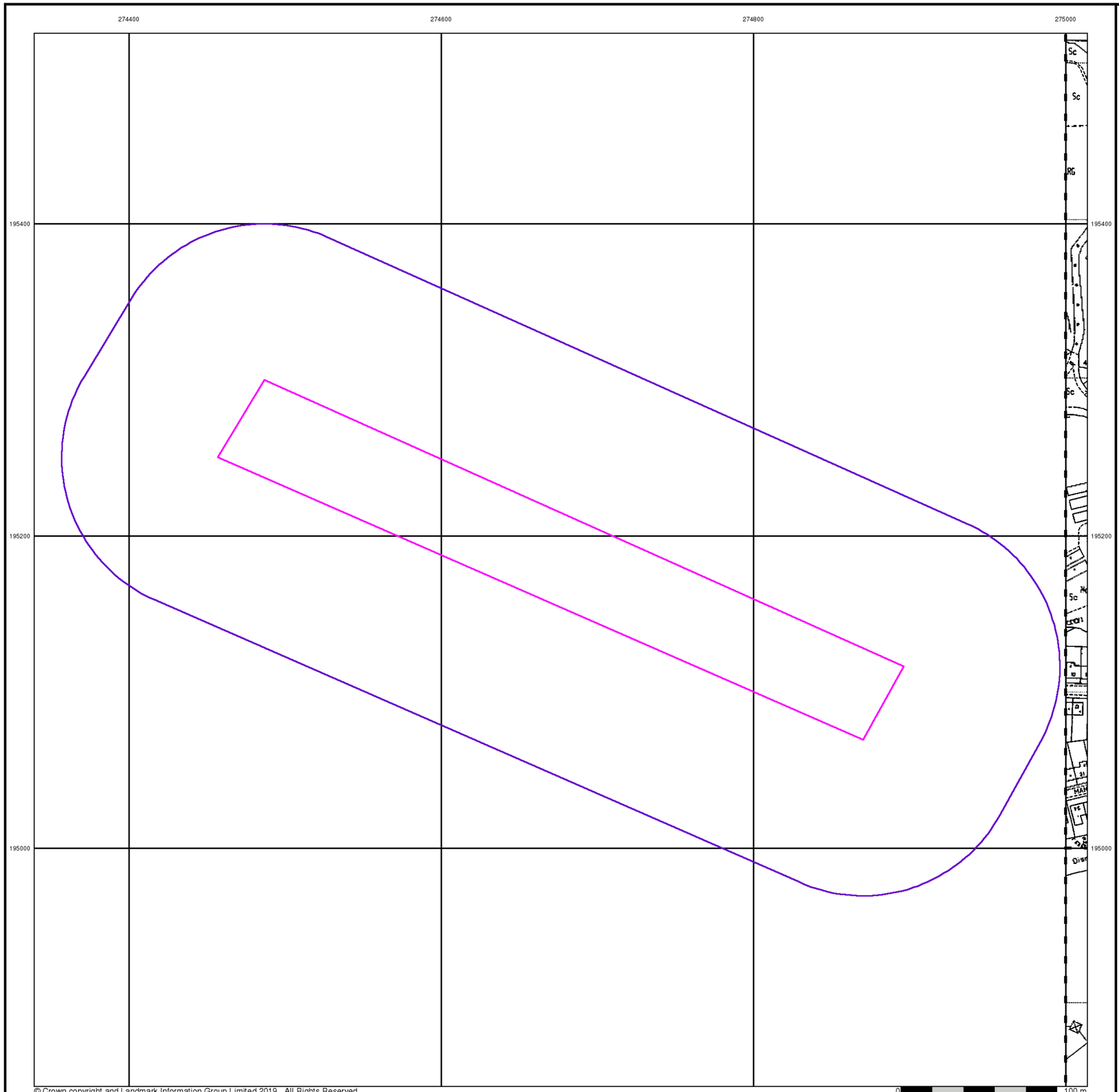
Web: www.envirocheck.co.uk

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LANDMARK INFORMATION GROUP®

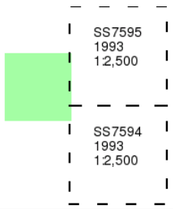
## Large-Scale National Grid Data

**Published 1993**

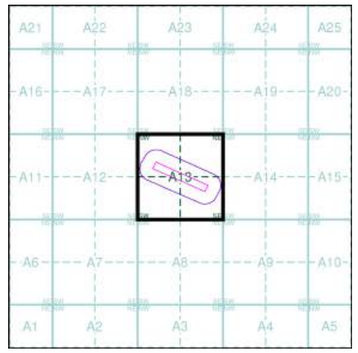
**Source map scale - 1:2,500**

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

## Map Name(s) and Date(s)




## Historical Map - Segment A13




## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 100 |

## Site Details

Site at 274590, 195200

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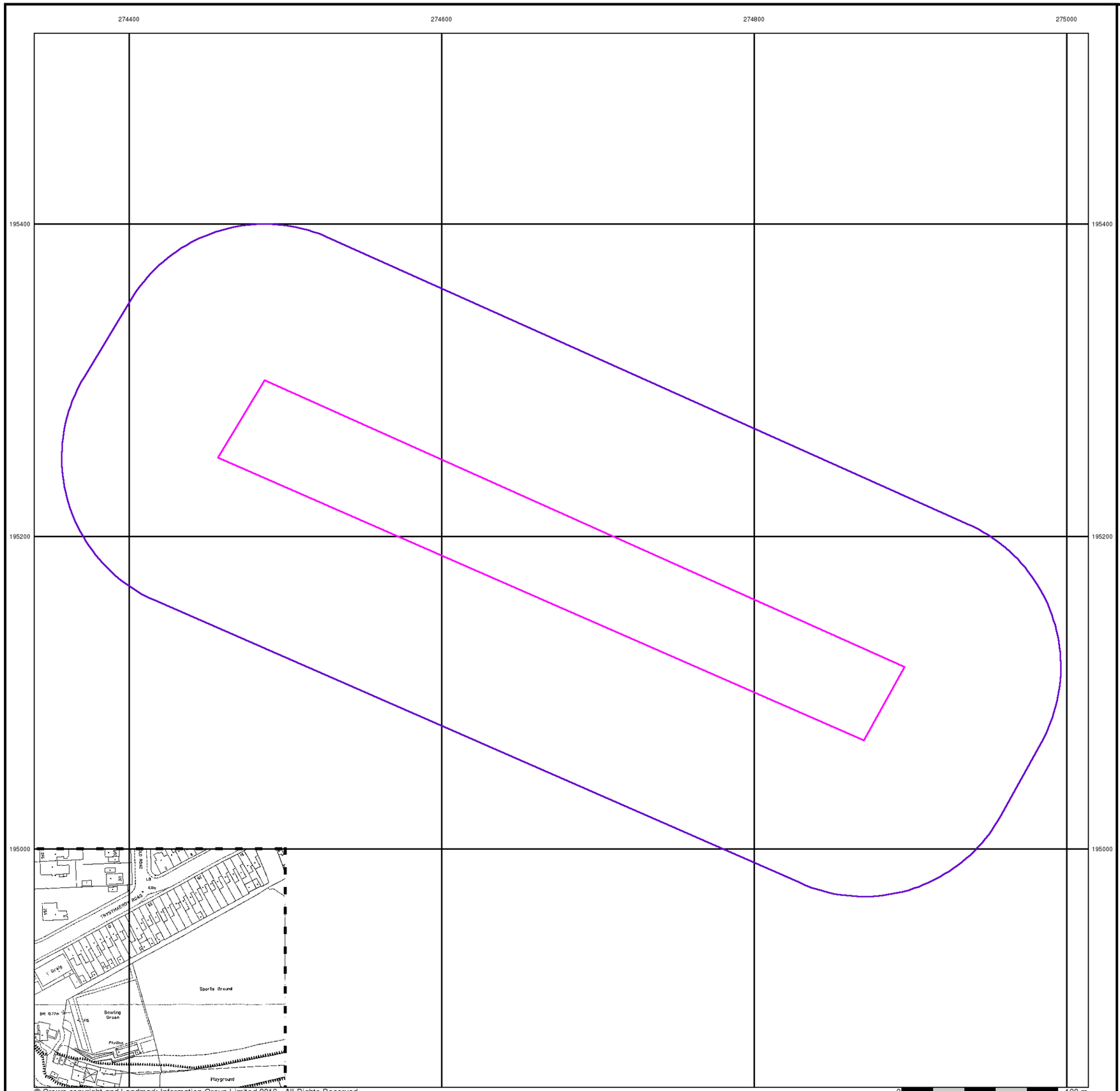


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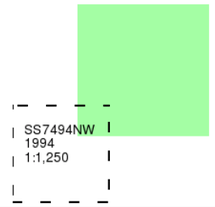
## Large-Scale National Grid Data

**Published 1994**

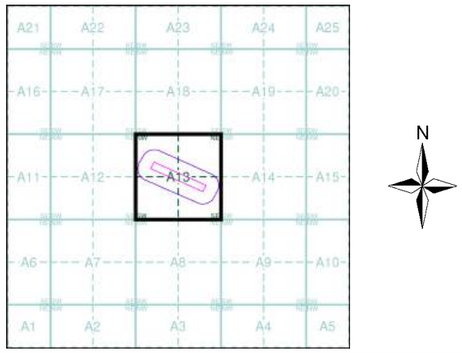
**Source map scale - 1:1,250**

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

## Map Name(s) and Date(s)




## Historical Map - Segment A13




## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 100 |

## Site Details

Site at 274590, 195200

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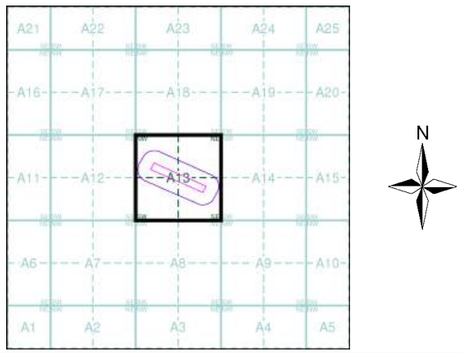
## Historical Aerial Photography

### Published 2000

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

## Historical Aerial Photography - Segment A13




## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 100 |

## Site Details

Site at 274590, 195200

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# Historical Mapping Legends

## Ordnance Survey County Series 1:10,560

Gravel Pit
Sand Pit
Other Pits
Quarry
Shingle
Orchard
Osiers
Reeds
Marsh
Mixed Wood
Deciduous
Brushwood
Fir
Furze
Rough Pasture
Arrow denotes flow of water
Trigonometrical Station
Site of Antiquities
Bench Mark
Pump, Guide Post, Signal Post
Well, Spring, Boundary Post
·285 Surface Level
Sketched Contour
Instrumental Contour
Main Roads
Fenced
Un-Fenced
Minor Roads
Fenced
Un-Fenced
Sunken Road
Raised Road
Road over Railway
Railway over River
Railway over Road
Level Crossing
Road over River or Canal
Road over Stream
Road over Stream
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
Co. Boro. Bdy. County Borough Boundary (England)
Co. Burgh Bdy. County Burgh Boundary (Scotland)
R.D. Bdy. Rural District Boundary
Civil Parish Boundary

## Ordnance Survey Plan 1:10,000

Chalk Pit, Clay Pit or Quarry
Gravel Pit
Sand Pit
Disused Pit or Quarry
Refuse or Slag Heap
Lake, Loch or Pond
Dunes
Boulders
Coniferous Trees
Non-Coniferous Trees
Orchard
Scrub
Coppice
Bracken
Heath
Rough Grassland
Marsh
Reeds
Saltings
Building
Direction of Flow of Water
Shingle
Sand
Glasshouse
Pylon
Electricity Transmission Line
Pole
Sloping Masonry
Cutting
Embankment
Standard Gauge Multiple Track
Road Under
Road Over
Level Crossing
Foot Bridge
Standard Gauge Single Track
Siding, Tramway or Mineral Line
Narrow Gauge
Geographical County
Administrative County, County Borough or County of City
Municipal Borough, Urban or Rural District, Burgh or District Council
Borough, Burgh or County Constituency
Shown only when not coincident with other boundaries
Civil Parish
Shown alternately when coincidence of boundaries occurs

| | | | |
|---|---|---|---|
| BP, BS | Boundary Post or Stone | Pol Sta | Police Station |
| Ch | Church | PO | Post Office |
| CH | Club House | PC | Public Convenience |
| F E Sta | Fire Engine Station | PH | Public House |
| FB | Foot Bridge | SB | Signal Box |
| Fn | Fountain | Spr | Spring |
| GP | Guide Post | TCB | Telephone Call Box |
| MP | Mile Post | TCP | Telephone Call Post |
| MS | Mile Stone | W | Well |

## 1:10,000 Raster Mapping

Gravel Pit
Refuse tip or slag heap
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Shingle
Mud
Sand
Sand Pit
Slopes
Top of cliff
General detail
Underground detail
Overhead detail
Narrow gauge railway
Multi-track railway
Single track railway
County boundary (England only)
Civil, parish or community boundary
District, Unitary, Metropolitan, London Borough boundary
Constituency boundary
Area of wooded vegetation
Non-coniferous trees
Non-coniferous trees (scattered)
Coniferous trees
Coniferous trees (scattered)
Positioned tree
Orchard
Coppice or Osiers
Rough Grassland
Heath
Scrub
Marsh, Salt Marsh or Reeds
Water feature
Flow arrows
MHW(S) Mean high water (springs)
MLW(S) Mean low water (springs)
Telephone line (where shown)
Electricity transmission line (with poles)
BM 123.45 m Bench mark (where shown)
Triangulation station
Point feature (e.g. Guide Post or Mile Stone)
Pylon, flare stack or lighting tower
Site of (antiquity)
Glasshouse
General Building
Important Building

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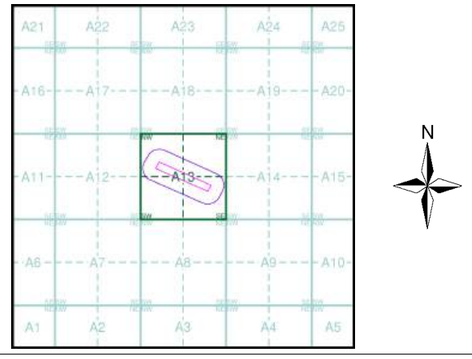
## Historical Mapping & Photography included:

| Mapping Type | Scale | Date | Pg |
|---|---|---|---|
| Glamorganshire | 1:10,560 | 1884 | 3 |
| Glamorganshire | 1:10,560 | 1900 | 4 |
| Glamorganshire | 1:10,560 | 1921 | 5 |
| Glamorganshire | 1:10,560 | 1921 | 6 |
| Glamorganshire | 1:10,560 | 1936 | 7 |
| Glamorganshire | 1:10,560 | 1938 - 1951 | 8 |
| Historical Aerial Photography | 1:10,560 | 1945 - 1949 | 9 |
| Glamorganshire | 1:10,560 | 1951 - 1952 | 10 |
| Ordnance Survey Plan | 1:10,000 | 1964 - 1965 | 11 |
| Ordnance Survey Plan | 1:10,000 | 1970 - 1974 | 12 |
| Swansea | 1:10,000 | 1976 | 13 |
| Ordnance Survey Plan | 1:10,000 | 1980 - 1983 | 14 |
| Ordnance Survey Plan | 1:10,000 | 1992 - 1996 | 15 |
| 10K Raster Mapping | 1:10,000 | 1999 | 16 |
| 10K Raster Mapping | 1:10,000 | 2006 | 17 |
| VectorMap Local | 1:10,000 | 2019 | 18 |

## Historical Map - Slice A

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| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 274590, 195200


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# Russian Military Mapping Legends

## 1:5,000 and 1:10,000 mapping

a. Not drawn to scale b. Drawn to scale

- Government and Administrative Buildings
- Military and Industrial Buildings
- Military and Communication Areas
- Subway Entrance
- Fireproof Building
- Prominent Fireproof Building
- Non-fireproof Building
- Non-fireproof Building (non-dwelling)
- Factory, mill, and flour mill, with chimneys
- Factory, mill, and flour mill, without chimneys
- Power Station, drawn to scale
- Hydroelectric Power Station
- Radio Station, drawn to scale
- Telephone Station, drawn to scale
- Abandoned Open-pit Mine or Quarry
- Open-pit Salt Mine
- Pit
- Oil Deposit or Well
- Oil Seepage
- Tailings Pile
- Fuel Storage Tanks
- Natural Gas Tank
- Bench Mark
- Drill Hole
- Burial Mound
- Triangulation Point on Burial Mound
- Single-track Railroad
- Double-track Railroad and Station Building
- Coniferous Forest
- Deciduous Forest
- Mixed Forest
- Lawns
- Citrus Orchard
- Wet Ground
- Scattered Vegetation

243,8 — Values for prominent elevations

186.0 — Numbers for spot elevations, depth soundings, contour lines, etc.

0,2 — Velocity of the current, width of river bed, depth of river

Fractional terms: length and capacity of bridges; depth of fords and condition of the river bottom; height of forest and the diameter of trees

### Russian Alphabet (For reference and phonetic interpretation of map text)

| | | | |
|---|---|---|---|
| А а (A) | З з (Z) | П п (P) | Ч ч (CH) |
| Б б (B) | И и (I) | Р р (R) | Ш ш (SH) |
| В в (V) | Й й (Y) | С с (S) | Щ щ (SHCH) |
| Г г (G) | К к (K) | Т т (T) | ъ (–) |
| Д д (D) | Л л (L) | У у (U) | ы (Y) |
| Е е (E) | М м (M) | Ф ф (F) | ь (') |
| Ё ё (YO) | Н н (N) | Х х (KH) | Э э (E) |
| Ж ж (ZH) | О о (O) | Ц ц (TS) | Ю ю (YU or IU) |
| | | | Я я (YA or IA) |

## 1:25,000 mapping

a. Not drawn to scale b. Drawn to scale

- Government and Administrative Buildings
- Military and Industrial Buildings
- Military and Communication Areas
- Subway Entrance
- Partly Demolished Buildings
- Demolished Buildings
- Built-Up Area with Fireproof Buildings Predominant
- Built-Up Area with Non-Fireproof Buildings Predominant
- Individual Fireproof Building
- Prominent Industrial Building
- Individual Dwelling, Fireproof
- Ruins of an Individual Dwelling
- Factory or Mill Chimney
- Factory or Mill with Chimney
- Factory or Mill without Chimney
- Mine or Open Pit Mine
- Operating Shaft or Mine
- Non-Operating Shaft or Mine
- Salt Mine
- Tailings Pile
- Pit
- Stone Quarry
- Gas Pump or Service Station
- Fuel Storage or Natural Gas Tank
- Oil or Natural Gas Derrick
- Small Hydroelectric Power Station
- Power Station
- Transformer Station
- Cemetery
- Burial Mound (height in metres)
- Triangulation Point on Burial Mound
- Triangulation Point
- Bench Mark
- Bench Mark (monumented)
- Telegraph Office
- Telephone Station
- Radio Station
- Radio Tower
- Airfield or Seaplane Base
- Landing Strip
- Main Highway
- Highway under Construction
- Improved Dirt Road (former truck road)
- Double-track Railroad with First Class Station
- Dismantled Railroad
- Railroad Under Construction
- Shore Embankment
- River or Ditch with Embankment
- Well
- Water Reservoir or Rain Water Pit
- Spring
- Isobath with value
- Heavy (Index) Contour Line
- Contour Line and Value
- Half Contour Line
- Spot Elevation Value
- Coniferous
- Deciduous
- Mixed
- Scrub

## Key to Numbers on Mapping

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## Historical Mapping & Photography included:

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| Glamorganshire | 1:10,560 | 1884 | 3 |
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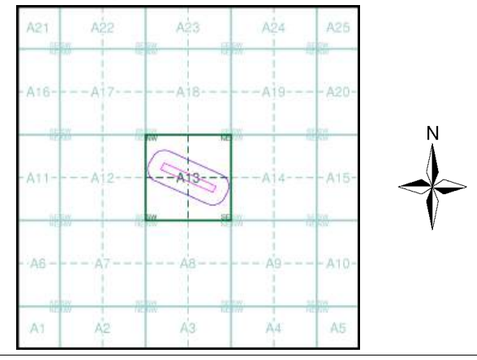
| Glamorganshire | 1:10,560 | 1936 | 7 |
| Glamorganshire | 1:10,560 | 1938 - 1951 | 8 |
| Historical Aerial Photography | 1:10,560 | 1945 - 1949 | 9 |
| Glamorganshire | 1:10,560 | 1951 - 1952 | 10 |
| Ordnance Survey Plan | 1:10,000 | 1964 - 1965 | 11 |
| Ordnance Survey Plan | 1:10,000 | 1970 - 1974 | 12 |
| Swansea | 1:10,000 | 1976 | 13 |
| Ordnance Survey Plan | 1:10,000 | 1980 - 1983 | 14 |
| Ordnance Survey Plan | 1:10,000 | 1992 - 1996 | 15 |
| 10K Raster Mapping | 1:10,000 | 1999 | 16 |
| 10K Raster Mapping | 1:10,000 | 2006 | 17 |
| VectorMap Local | 1:10,000 | 2019 | 18 |

## Russian Map - Slice A




## Order Details

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## Site Details

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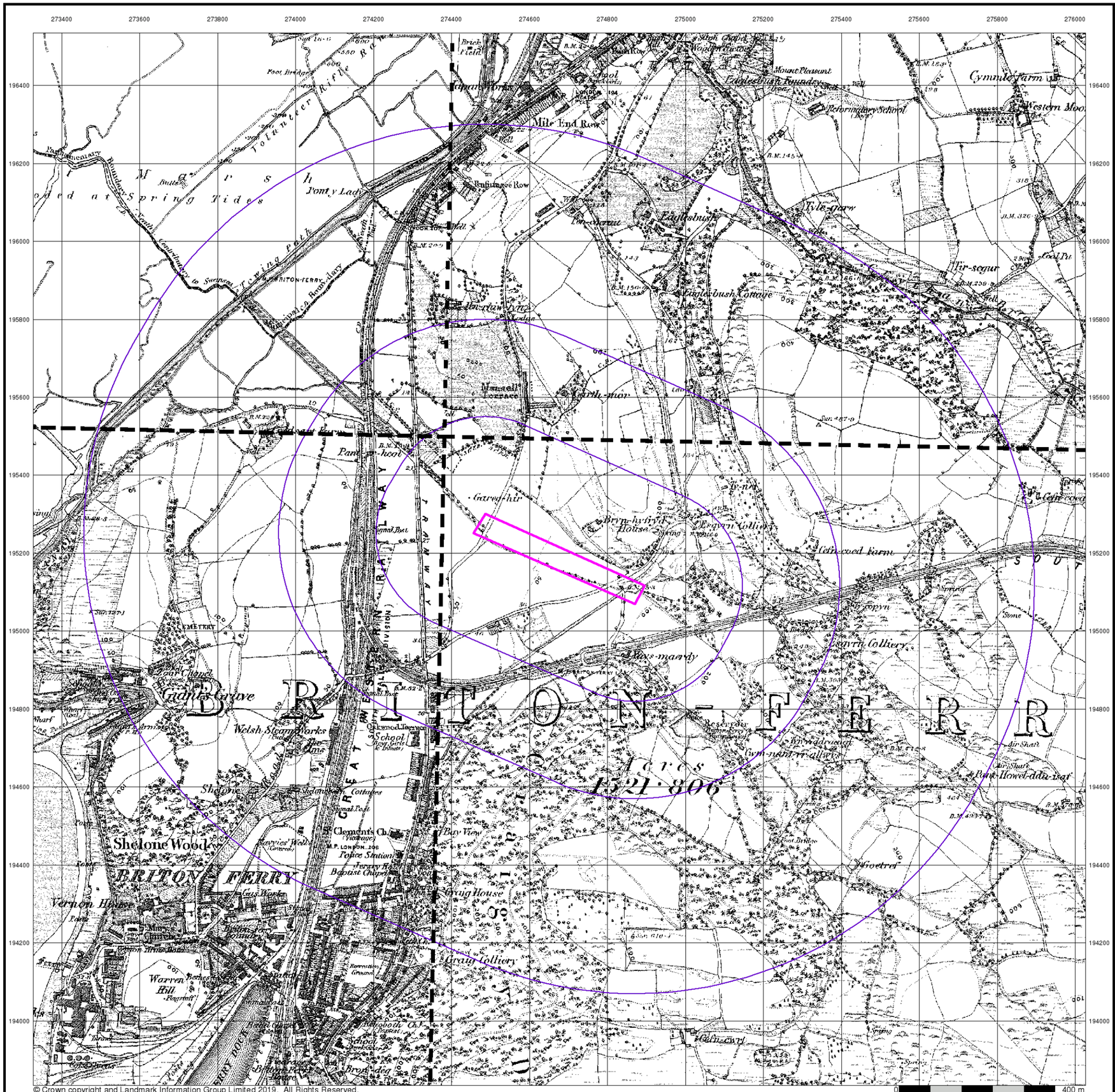
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196400
196200
196000
195800
195600
195400
195200
195000
194800
194600
194400
194200
194000
Mile End Row
Pontlady
Tyle-garw
Eaglebush
Eaglebush Cottage
Tir-segur
Earth-mor
Garreg-hir
Bryn-hyfryd House
Eaglebush Colliery
Cefn-coed Farm
Cymmla Farm
Fabian's Bay Iron Foundry
Mount Pleasant
Reformatory School
Western Moor
Penhuarce Row
Pen-clawdd
Pen-y-cae-mawr
Pant-howel-ddu-isaf
Pen-rhiw
Pen-y-graig
Pen-y-cae
Pen-y-bryn
Pen-y-waun
Pen-y-bont
Pen-y-fan
Pen-y-lan
Pen-y-ffordd
Pen-y-garn
Pen-y-gaer
Pen-y-coed
Pen-y-llan
Pen-y-maes
Pen-y-dre

BRITON FERRY U.D.
BRITON FERRY
(Llansawel)
MELIN DRYTHAN
PENCAERAU
PANT-TWLLHEOL
Cwmola Wood
Shelone Wood
Craig-y-Daren
Acres 1644.748
G. W. R. Locomotive & Carriage Repairing Works
Court Sart Station
Court-Sart Farm
Eastbourne Terrace
Mansell Terrace
Park Terrace
Richmond Terrace
Eaglesbush House
Eaglesbush Colliery
Eaglesbush Grove
Eaglesbush Cottage
Reformatory School
Western Moor
Western Moor Cottages
Cambrian Brick Works
Old Coal Level
Old Quarry
Quarries
Springs
Stone
Reservoir
Ynysymaerdy
Ynysymaerdy Chapel
Ynysymaerdy Colliery (Disused)
Ty Copyn
Ty-segur
Ty'r-segur
Tyle-garw
Tyle-mawr
Tyla Morris
Gareg Hir
Garth-mor
Pen-rhiw-tyn
Pant-Howel-ddu Isaf
Pant-Howel-ddu Uchaf
Cefncoed Farm
Cefncoed-uchaf
Cefn-coed
Defu-coed
Cwm-nant-yr-arlwyn
Tyn-y-ddraenog
Craig Colliery (Disused)
Clondare Quarry
Old Coal Levels
Old Coal Pits
Old Air Shafts
Old Level
Bay View
Goytre
Grange House
Vernon House
Vernon Arms Hotel
Warren Hill
Shelone Road
Mawes' Well
Gas Works
Hospital
Giant's Grave
Giant's Arms P.H.
St. John the Baptist's Church
Zoar Chapel
Jehoboth Chapel
Ynysymaerdy Chapel
St. Catherine's Church
Eagle Tin Plate Wks.
Stloh Chapel
Woollen Factory
Eaglesbush Foundry
Clay Pit
Pont y Lody
Post Office
Museum
Lodge
Hotel
Church
School
Cemetery
Neath Abbey Iron Works
Neath Canal
Parly. & Mun. Bdys.
Rhondda & Swansea Bay Railway
Neath Branch
South Wales Mineral Railway
Tramway
Foot Path
Mud
Sand & Mud
Carlsworth Plate Whs
Tir-y-Cwm
Llan
Ch
Chy
Bdy
Ho
Sta
Q
Pt
Sp
Spr
U.D. Bdy
U.D.Cs By.
B.M. 19·7
B.M. 18·9
B.M. 24·3
B.M. 101·4
B.M. 20·9
B.M. 149
B.M. 220·7
B.M. 304·0
B.M. 388·8
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B.M. 30·9
B.M. 31·0
B.M. 31·1
B.M. 31·2
B.M. 31·3
B.M. 31·4
B.M. 31·5
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B.M. 31·8
B.M. 31·9
B.M. 32·0
B.M. 32·1
B.M. 32·2
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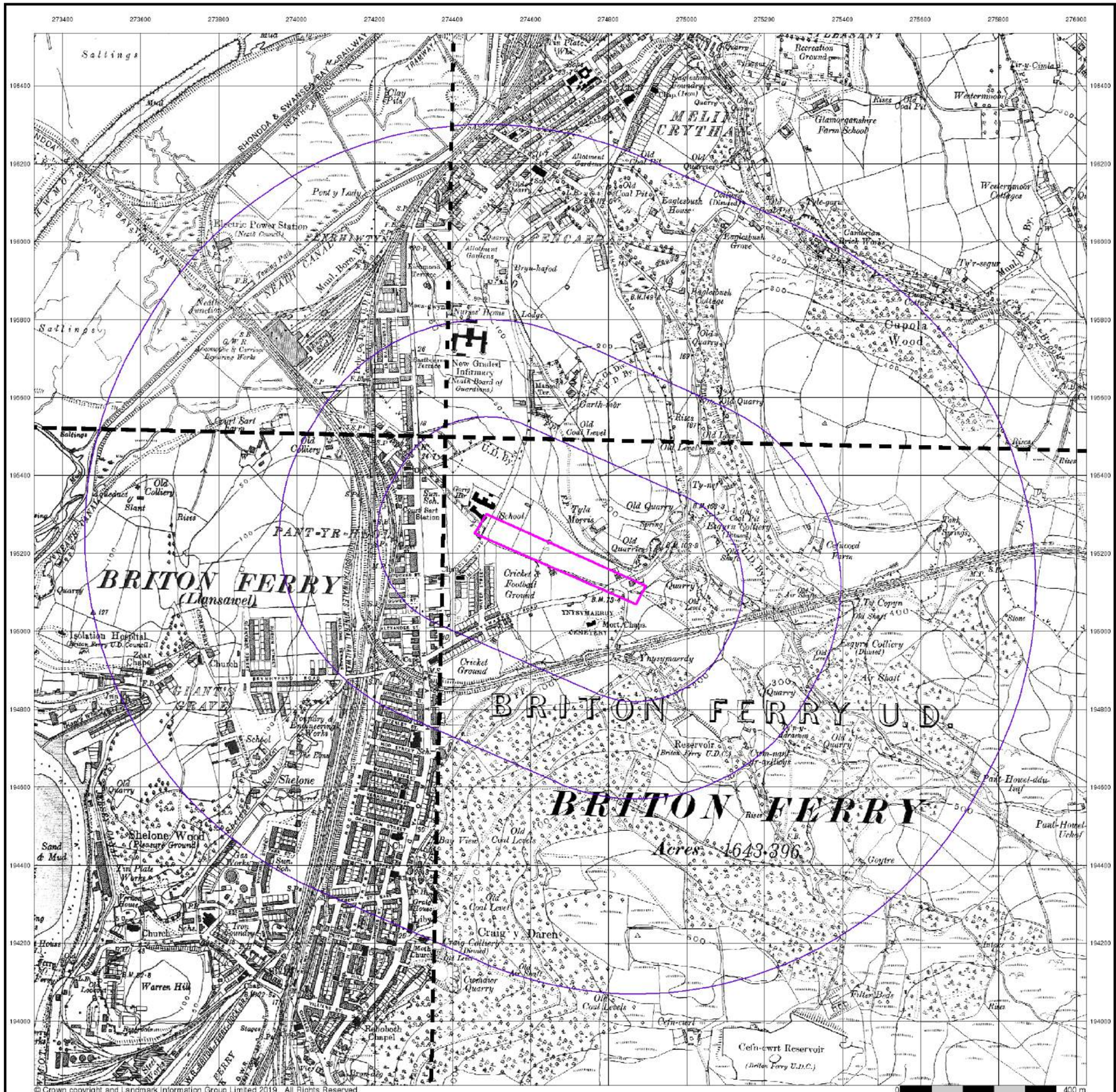
B.M.


BRITON FERRY
(Llansawel)
BRITON FERRY U.D.
BRITON FERRY
Acres 1643·396
Saltings
Pont y Lady
Electric Power Station
(Neath Council)
PENRHIWTYN
NEATH CANAL
MELIN CRYTHAN
PENCAER
Eaglesbush House
Eaglesbush Grove
Eaglesbush Cottage
Glamorganshire Farm School
Western Moor
Western Moor Cottages
Cambrian Brick Works
Cupola Wood
New Graded Infirmary
(Neath Board of Guardians)
Nurses' Home
Lodge
Old Colliery
Old Quarry
Old Coal Pit
Old Coal Level
Old Coal Travel
Old Quarries
Allotment Gardens
Cricket & Football Ground
Cricket Ground
Isolation Hospital
(Briton Ferry U.D. Council)
Zion Chapel
Church
GIANT'S GRAVE
Shelone
Shelone Wood
(Pleasure Ground)
Tin Plate Works
Gas Works
Iron Foundry
Warren Hill
Rehoboth Chapel
Tyla Morris
Craig y Daren
Craig Colliery
(Disused)
Cefn-gwrt Reservoir
(Briton Ferry U.D.C.)
Reservoir
(Briton Ferry U.D.C.)
Ynysmardy
Ynysmardy Colliery
(Disused)
Cefn-gwrt Colliery
(Disused)
Coed-nant-ar-arthog
Cefn-nant-ar-arthog
Pant-Howel-ddu Inf
Pant-Howel-Uchaf
Goytre
Cefn-coed Farm
Tank Springs
Tir-y-Cimla
Rises
Quarry
Tip
Spring
Air Shaft
Level
Stone
Mort. Chapel
CEMETERY
PANT-YR-HYD
Court Sart Station
Sun. Sch.
School
Bay View
Ty-ne
Ty Copyn
Old Shaft
Old Level
Old Coal Levels
Old Coal Travel
Old Quarries
Fiddler Beds
Intake
Sand & Mud
Mud
Clay Pits
Allotment Gardens
Brynhafod
Garth-mor
Ty'r-segur
Tyle-garw
Tyle-garw Inf
Penlan
Penlan Terrace
Court Sart Terrace
Nelson Terrace
Ferndale Terrace
Ferndale House
Lily
Grove House
Rhyd-y-Carnau
Rhyd-y-Carnau Terrace
Rhyd-y-Carnau Cottages
Rhyd-y-Carnau Farm
Rhyd-y-Carnau Quarry
Rhyd-y-Carnau Old Quarry
Rhyd-y-Carnau Old Coal Pit
Rhyd-y-Carnau Old Coal Level
Rhyd-y-Carnau Old Coal Travel
Rhyd-y-Carnau Old Quarries
Rhyd-y-Carnau Old Coal Levels
Rhyd-y-Carnau Old Coal Travel
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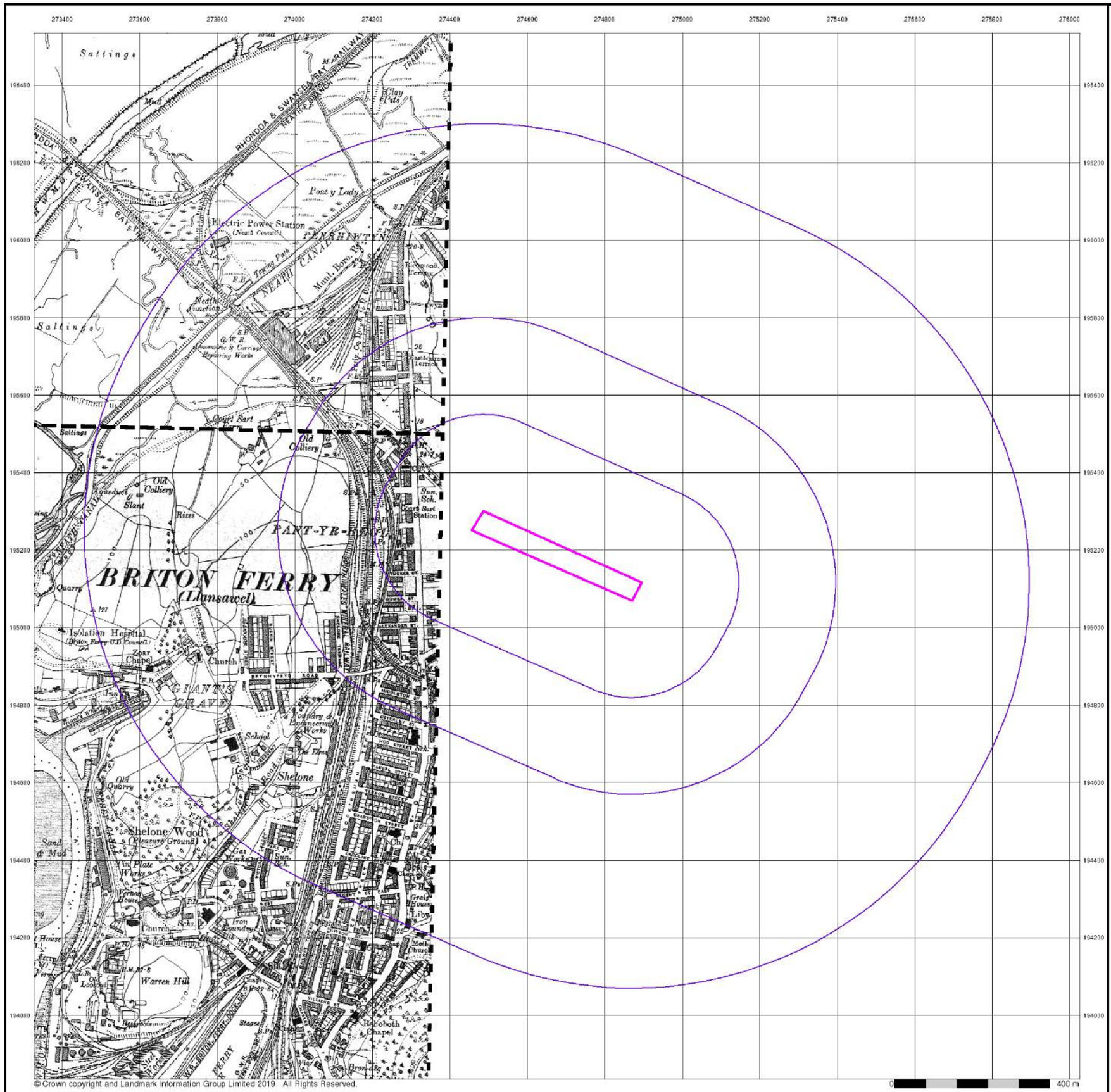
Rhyd-y-Carnau Old Coal Travel
Rhyd-y-Carnau Old Coal Levels



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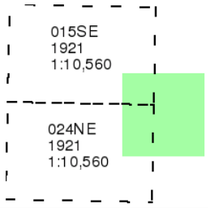
## Glamorganshire

## Published 1921

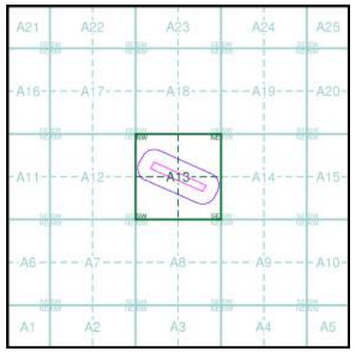
## Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

## Map Name(s) and Date(s)




## Historical Map - Slice A

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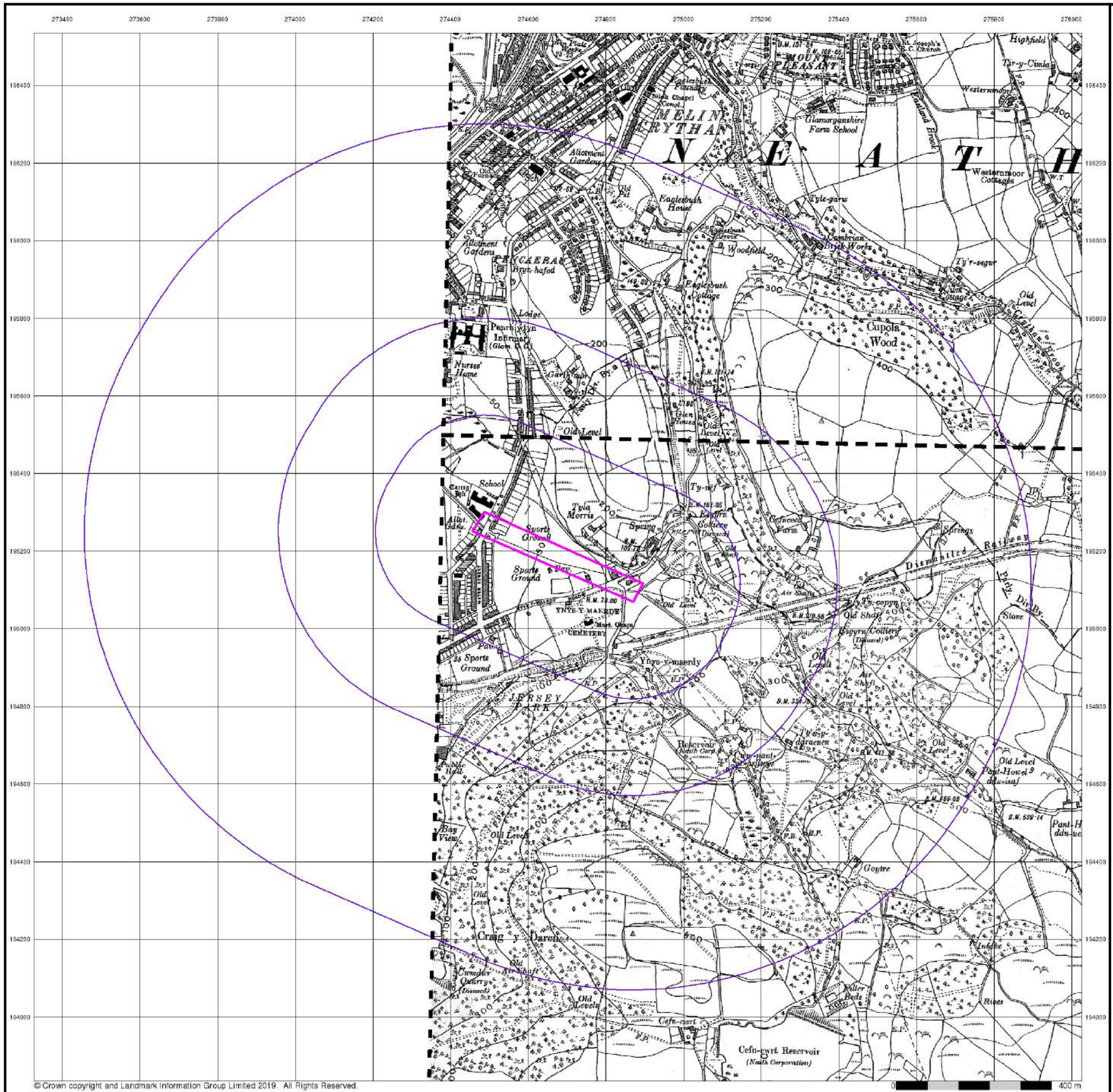
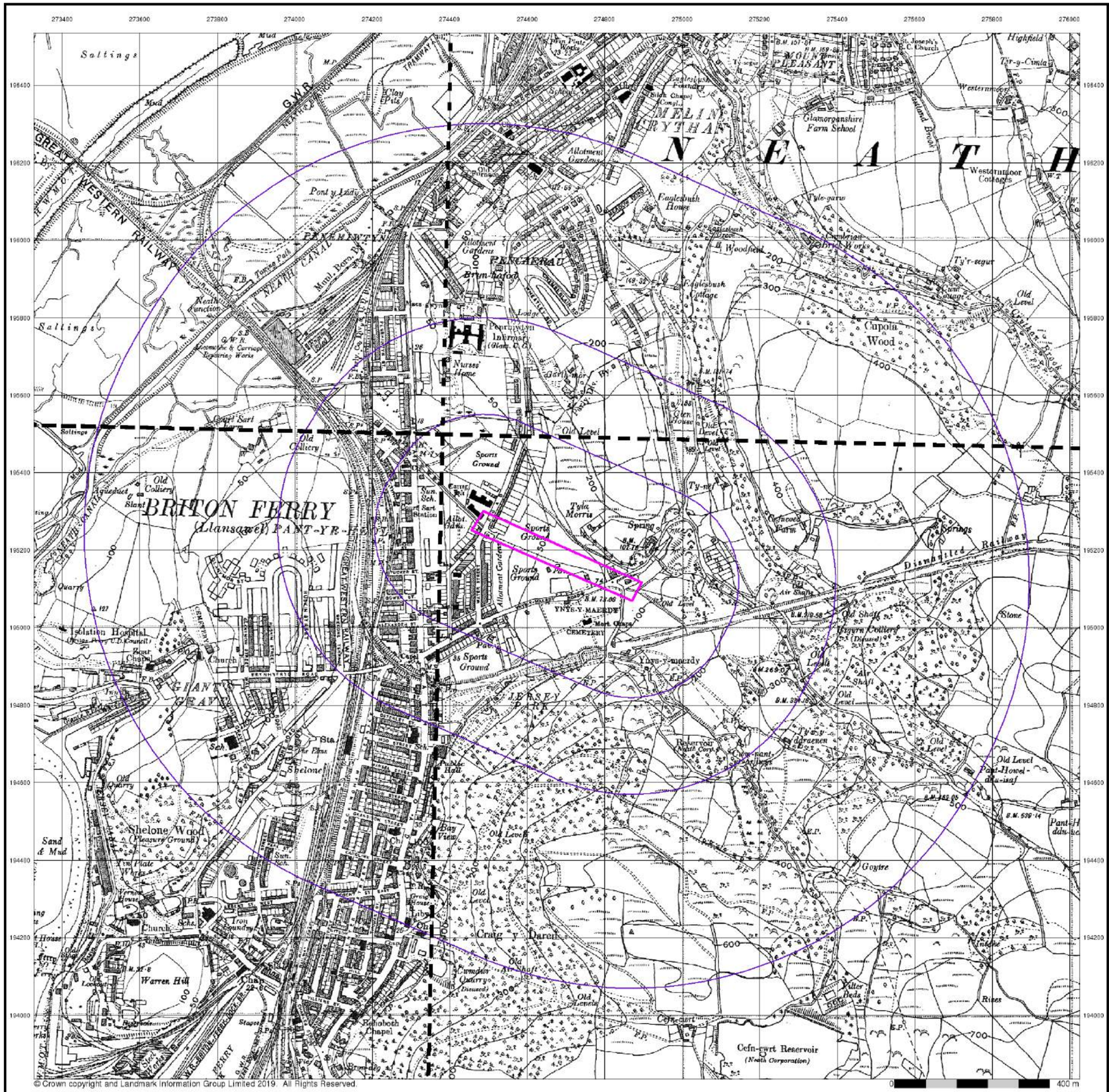
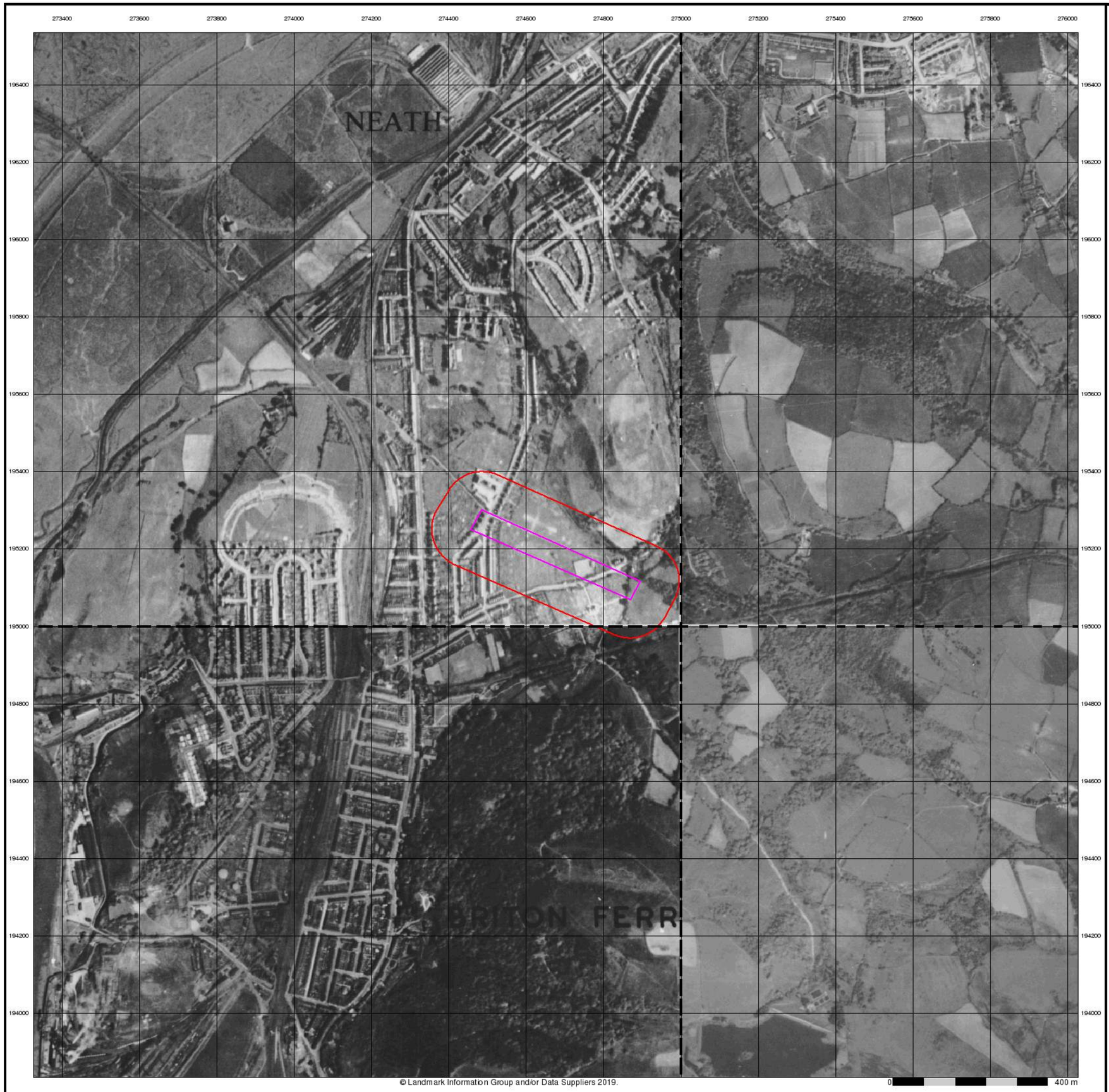

MELIN-CRYTHAN
NEATH
Glamorganshire Farm School
Eaglesbush Hotel
Eaglesbush Cottage
Eaglesbush Grove
Woodfield
Cambrian Brick Works
Ty'r-segur
Old Level
Cupola Wood
Penrhiwfyn Infirmary (Glam. C.C.)
Nurses' Home
Old Level
Tyla Morris
Sports Ground
Ynys-y-maerdy
CEMETERY
JERSEY PARK
Reservoir (Neath Corp.)
Old Level
Goytre
Craig y Dare
Old Air Shaft
Crumlyn Quarry (Disused)
Old Levels
Cefn-cwrt
Cefn-cwrt Reservoir (Neath Corporation)
Old Level
Pant-Howel's ddu-isaf
Old Shaft
Ynys-coyrn Colliery (Disused)
Old Level
Air Shaft
Old Level
Tyle-garw
Western Moor Cottages
Highfield
Tyr-y-Cinda
Eastland Brook
Dismantled Railway
Derly Dis.Bar
Stone
Springs
Rises
Fuller Beds
Tyle-garw
Ty'n-y-ddraenen
Pant-Howel's ddu-isaf
Old Level
Old Level
Old Level


BRITON FERRY
(Llansawel) PANT-YR-HWCH
NEATH
MELIN GRYTHAN
PENGELLIAU
PENRHEIWTYN
Saltings
Mud
GREAT WESTERN RAILWAY
G.W.R.
NEATH CANAL
Pont y Lady
Allotment Gardens
Brim-hafod
Eagleshush House
Eagleshush Cottage
Capoln Wood
Old Level
Old Colliery
Sports Ground
Tyle Morris
Springs
Dismantled Railway
Isolation Hospital
Church
GIANT'S GRAVE
Shelone
Shelone Wood
(Pleasure Ground)
Sand & Mud
Craig y Dareu
Warren Hill
Bethesda Chapel
Cefn-gwrt Reservoir
(Neath Corporation)
Glamorganshire Farm School
Western Moor Cottages
Tyle-garw
Ty'r-ysgol
Goytre
Rises
Stone
Quarry
Old Quarry
Old Shaft
Air Shaft
Sports Ground
Allotment Gardens
Nurses' Home
Public Hall
Bay View
Tinplate Works
Iron Foundry
Glen House
Penrhiwtyn Infirmary
Reservoir
Old Level
Pant-Howel-ddu-isaf
Ynys-y-maerdy
FYNY-Y-MAERDY
CEMETERY
Mort Quarry
Tinplate
Gelfaweb Farm
Ty'n-y-caeau
Ty'n-y-waun
Eaglesbush Foundry
Ditch (Disused)
Clay Pits
Tramway
Tunnel Path
Mund. Boro. Ditch
Engine Shed
Locomotive & Carriage Repairing Works
Neath Junction
Gas Works
Tramway
Sch.
Ch.
P.H.
Sta.
Pav.
Cott.
Ho.
Fm.
Ter.
Rly.
Wks.
Yd.
Gdns.
Rec. Ground
Sewage Works
Tank
Aqueduct
Slant
Level
Colliery
Shaft
Adit
Workings
Refuse Heap
Tip
Pond
Spring
Stream
Brook
Bridge
Road
Path
Boundary
Contour
Trig. Point
B.M.
F.B.
S.P.
Gas Holder
Reservoir
Cemetery
Chapel
Public Hall
Nurses' Home
Infirmary
Foundry
Colliery
Quarry
Tramway
Railway
Canal
Bridge
Tunnel
Aqueduct
Slant
Level
Shaft
Adit
Workings
Refuse Heap
Tip
Pond
Spring
Stream
Brook

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## Historical Aerial Photography

**Published 1945 - 1949**

**Source map scale - 1:10,560**

The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending preparation of conventional mapping, due to post war resource shortages. New security measures in the 1950's meant that every photograph was re-checked for potentially unsafe information with security sites replaced by fake fields or clouds. The original editions were withdrawn and only later made available after a period of fifty years although due to the accuracy of the editing, without viewing both revisions it is not easy to spot the edits. Where available Landmark have included both revisions.

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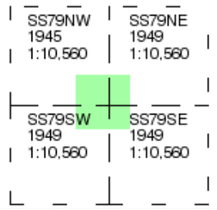
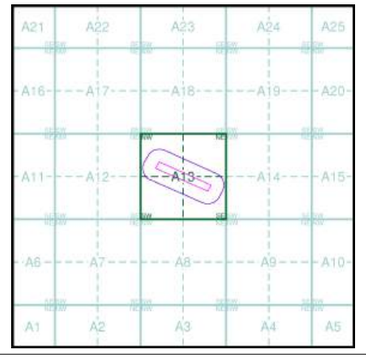
## Map Name(s) and Date(s)




## Historical Aerial Photography - Slice A




## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 274590, 195200

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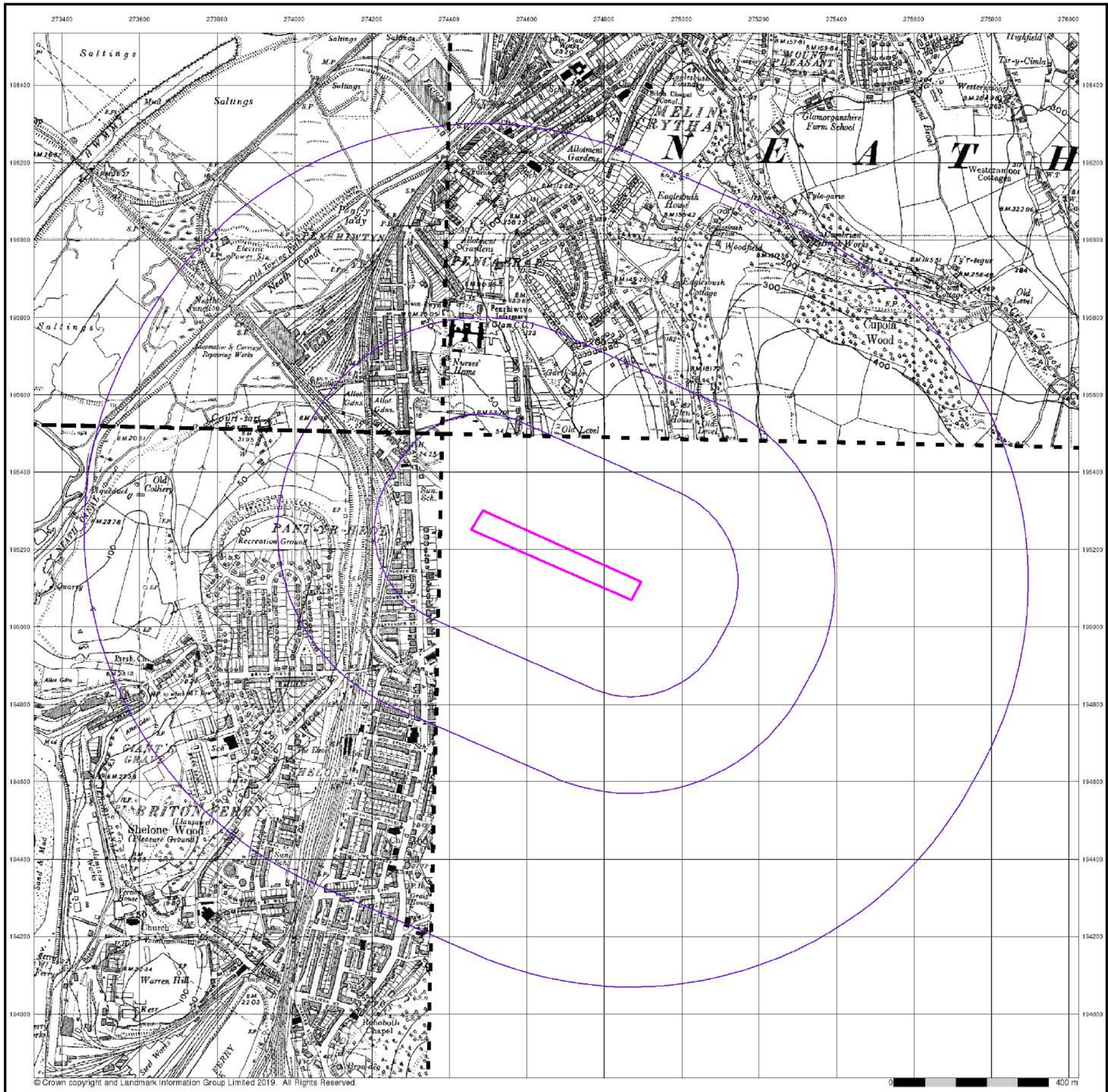
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198400
198200
198000
195800
195600
195400
195200
195000
194800
194600
194400
194200
194000
Saltings
Mud
Old Colliery
Aqueduct
Neath Canal
Old Tower & Pole
Electric Power Sta.
Neath Junction
Locomotive & Carriage Repairing Works
Court-Sart
Allot. Gdns.
Allotment Gardens
Nurses' Home
Pentrhiwtyn Infirmary (Glam.C.C.)
Old Level
Eaglesbush Foundry
Eaglesbush House
Eaglesbush Cottage
Glamorganshire Farm School
Tyle-garw
Cambrian Brick Works
Woodfield
Capola Wood
Western Moor Cottages
Tŷr-y-Cinla
Highfield
Mount Pleasant
Melin Erythan
Pentrhiwtyn
Old Quarry
Recreation Ground
Presb. Ch.
Sun. Sch.
Chapel
Shelone Wood
(Pleasure Ground)
Aluminium Works
Tinplate Works
Church
Warren Hill
Rest.
Rehoboth Chapel
Tramroad
Railroad
Brook
Ch
P.O.
Sch.
Ref.
Quarry
Works
Ho.
Cott.
Gdns.
Grd.
Grdns.
Ter.
Pl.
Rd.
St.
Ave.
Cres.
Gro.
Mon.
Obsn.
Stn.
Yd.
Fm.
Ind. Est.
Trad. Est.
Retail Pk.
Bus. Pk.
Sta.
Sub Sta.
Pol.
Liby.
Inst.
Coll.
Hosp.
Cem.
Crem.
Mem.
Ind.
Comm.
Recn.
Gnd.
Pk.
Sch.
Ch.
Meth.
Cong.
Bapt.
Presb.
Wes.
Mus.
Gal.
Cas.
Ant.
Hist.
Arch.
Tech.
Coll.
Univ.
Lib.
Inst

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## Ordnance Survey Plan

### Published 1964 - 1965

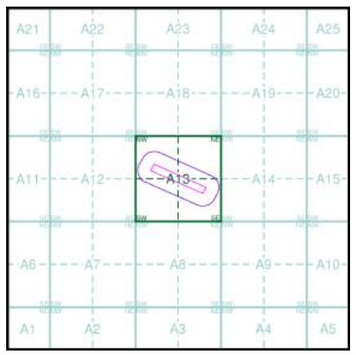
### Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

## Map Name(s) and Date(s)

| | |
|---|---|
| SS79NW 1965 1:10,560 | SS79NE 1964 1:10,560 |
| SS79SW 1964 1:10,560 | SS79SE 1964 1:10,560 |

## Historical Map - Slice A




## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 274590, 195200

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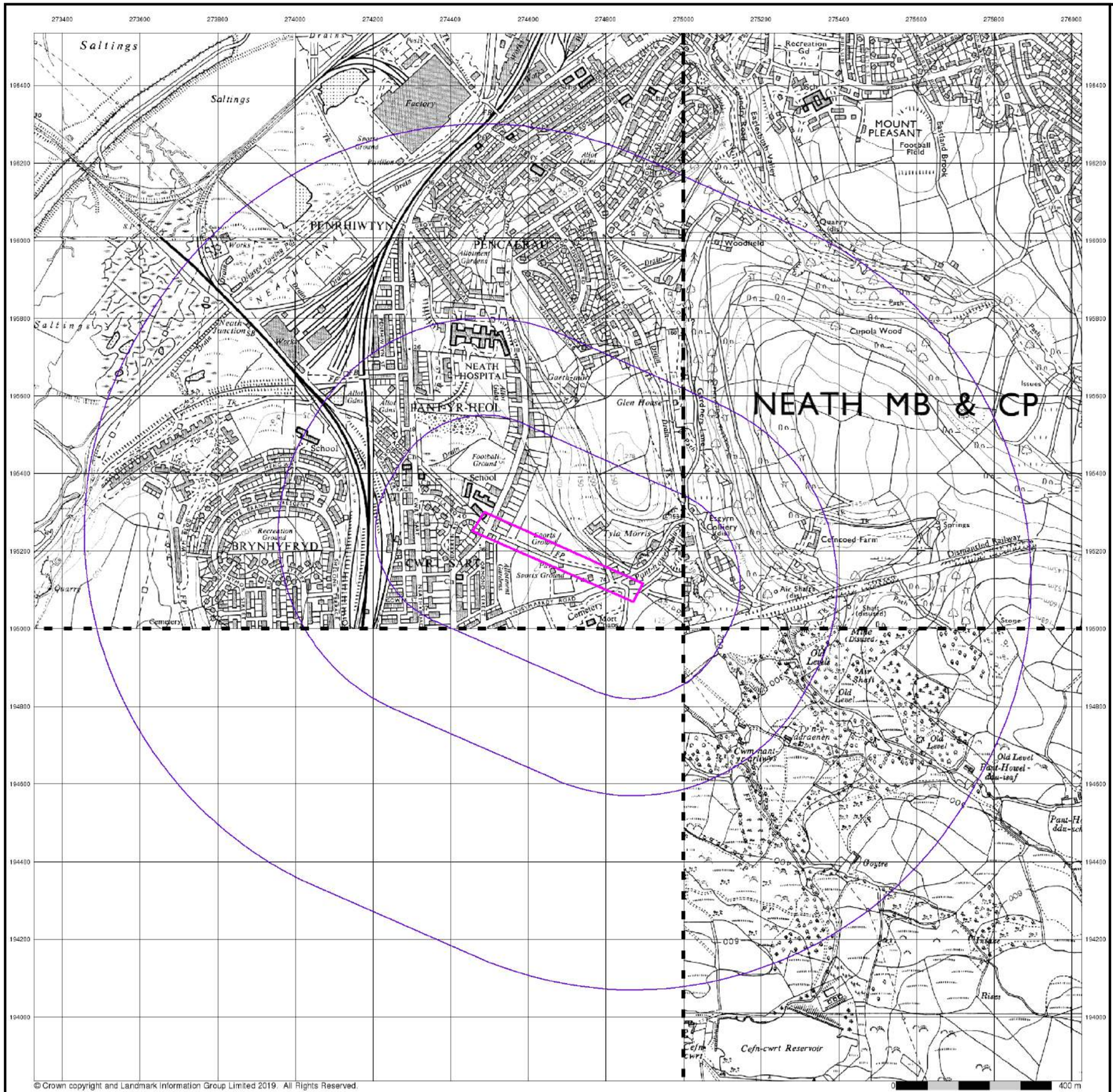


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## Ordnance Survey Plan

### Published 1970 - 1974

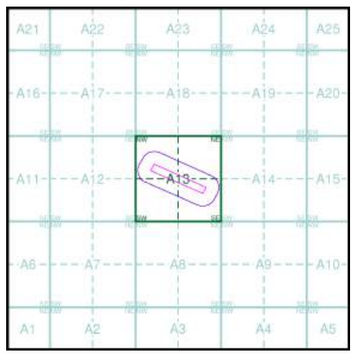
### Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

## Map Name(s) and Date(s)

SS79NW 1970 1:10,560
SS79NE 1973 1:10,000
SS79SE 1974 1:10,560

## Historical Map - Slice A




N

## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 274590, 195200

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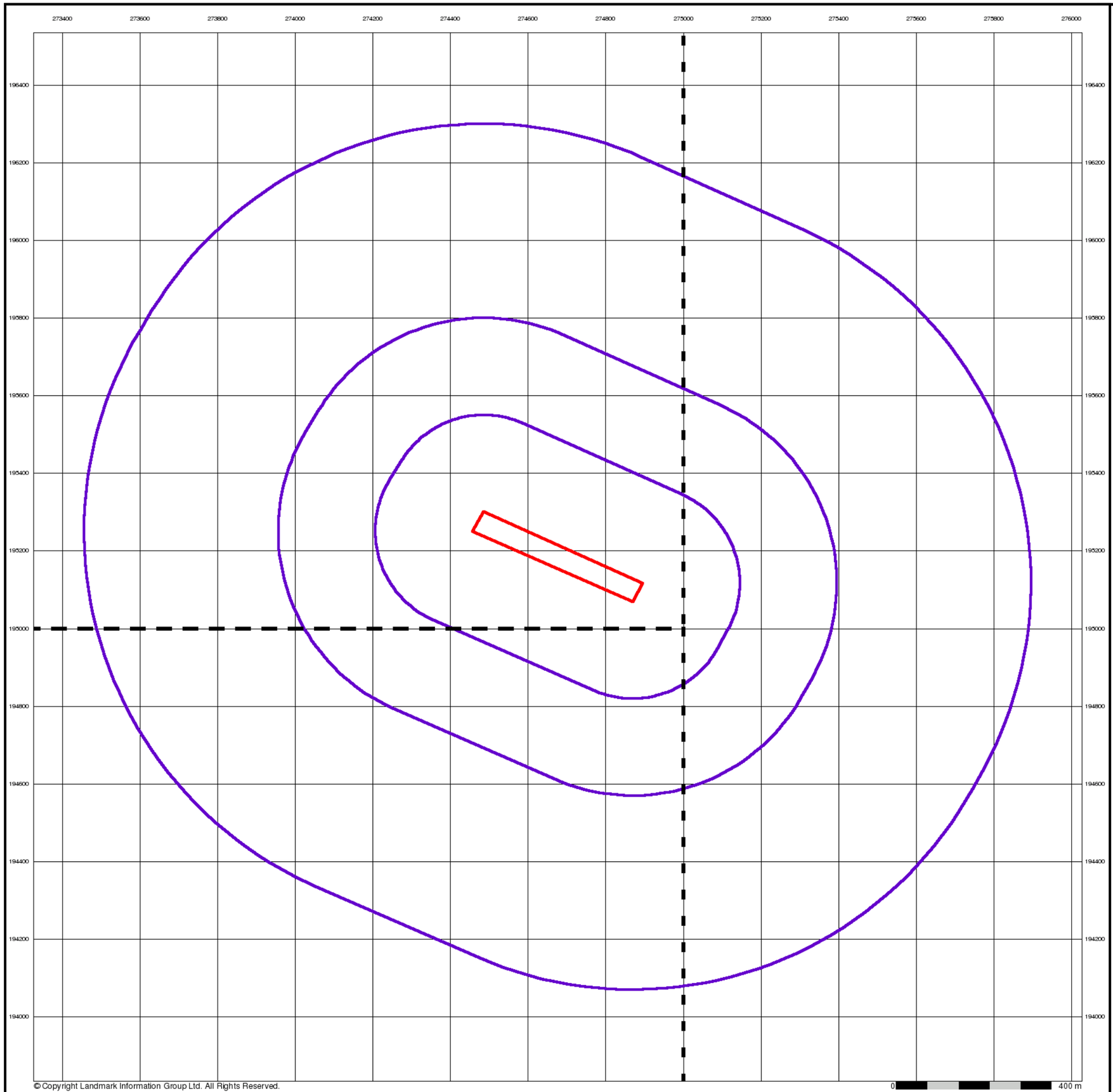

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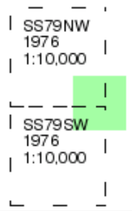
## Swansea

## Published 1976

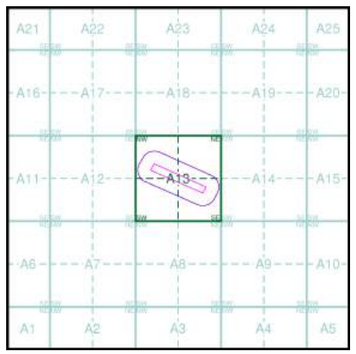
## Source map scale - 1:10,000

These maps were produced by the Russian military during the Cold War between 1950 and 1997, and cover 103 towns and cities throughout the U.K. The maps are produced at 1:25,000, 1:10,000 and 1:5,000 scale, and show detailed land use, with colour-coded areas for development, green areas, and non-developed areas. Buildings are coloured black and important building uses (such as hospitals, post offices, factories etc.) are numbered, with a numbered key describing their use.
They were produced by the Russians for the benefit of navigation, as well as strategic military sites and transport hubs, for use if they were to have invaded the U.K. The detailed information provided indicates that the areas were surveyed using land-based personnel, on the ground, in the cities that are mapped.

### Map Name(s) and Date(s)




### Russian Map - Slice A




### Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

### Site Details

Site at 274590, 195200

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Penrhiwtyn
Pencaerau
Mount Pleasant
Woodfield
Cupola Wood
NEATH C
Hospital
Pantyr-Heol
Brynhyfryd
Recreation Ground
Sports Ground
Playing Field
Church
School
Cwrt Sart
Tyla Morris
Egwrn Colliery (dis)
Celncoed Farm
Dismantled Railway
Cemetery
Jersey Park
Briton Ferry (Llansawel)
Shelone Wood (Pleasure Ground)
Shelone
Craig Home
Craig-y-darren
Warren Hill
Celn-cwrt Resr
Pant-Howel-Ddu
Neath Canal
Neath Junction
Foundry Road
Eastland Brook
Football Field
Quarry (dis)
Level (disused)
Issues
Springs
Stone
Dock
Railway
Basin
Allot Gdns
Tennis Courts
Club
Chapel
Clinic
Tk
Path
Track
Drains
Works
Sch
Ch
Cem
Resr
Pond
Boy View
Jersey Park
Glyn Egwrn Colliery (disused)
Air Shafts (dis)
Level (dis)
Goyt
Filter Beds
Craig-y-darren Quarry (disused)
Air Shaft (disused)
Shaft (dis)
Warren Hill
Rear Reservoir
Sewage Works
Gas Governor
Gorse
Bay View
Craig Home
Shelone Wood (Pleasure Ground)
Recreation Gd
Foundry Road
Eastland Brook
Football Field
Quarry (dis)
Level (disused)
Issues
Springs
Stone
Dismantled Railway
Pant-Howel-Ddu
Celncoed Farm
Egwrn Colliery (dis)
Shaft (dis)
Tyla Morris
Cwrt Sart
Hospital
Pantyr-Heol
Football Gd
Sports Ground
Playing Field
Church
School
Cemetery
Clinic
Quarry (dis)
Allot Gdns
Neath Canal
Neath Junction
El Sub Sta

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## Ordnance Survey Plan

### Published 1992 - 1996

### Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

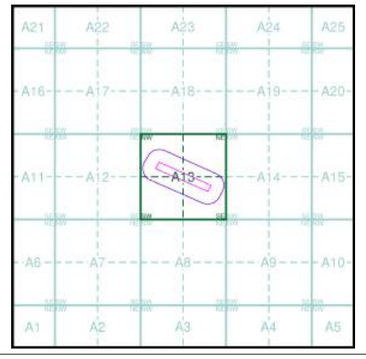
## Map Name(s) and Date(s)

SS79NW 1992 1:10,000

SS79NE 1992 1:10,000

SS79SE 1996 1:10,000

## Historical Map - Slice A

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## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 274590, 195200

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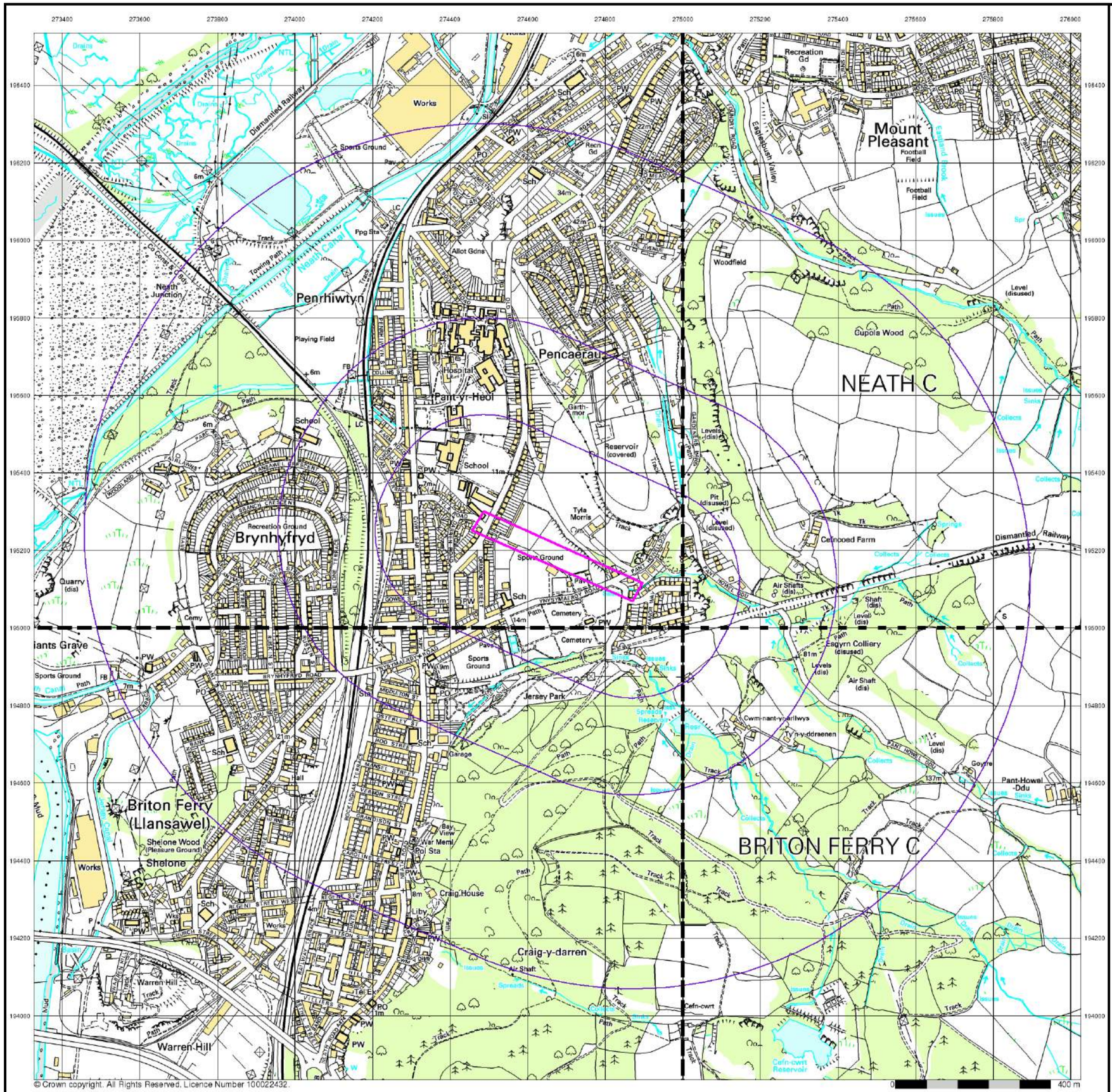


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## 10k Raster Mapping

**Published 1999**

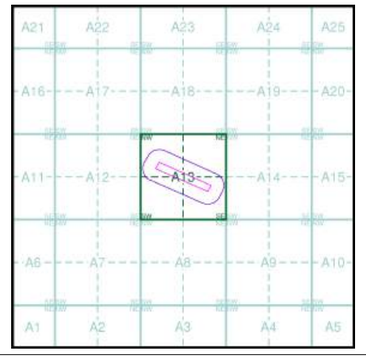
**Source map scale - 1:10,000**

The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

## Map Name(s) and Date(s)

| | |
|---|---|
| SS79NW 1999 1:10,000 | SS79NE 1999 1:10,000 |
| SS79SW 1999 1:10,000 | SS79SE 1999 1:10,000 |

## Historical Map - Slice A




## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 274590, 195200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## 10k Raster Mapping

**Published 2006**

**Source map scale - 1:10,000**

The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

## Map Name(s) and Date(s)

| | |
|---|---|
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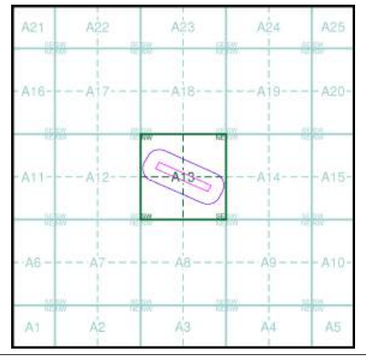
| SS79SW 2006 1:10,000 | SS79SE 2006 1:10,000 |

## Historical Map - Slice A




## Order Details

| | |
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| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 274590, 195200

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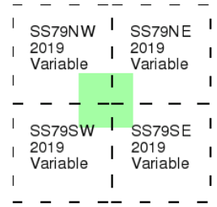
## VectorMap Local

**Published 2019**

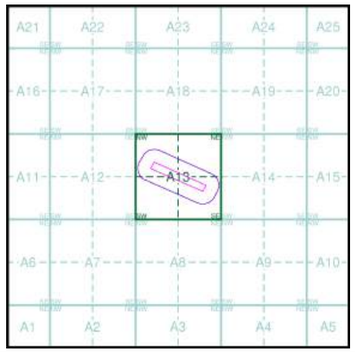
**Source map scale - 1:10,000**

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities),1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

## Map Name(s) and Date(s)




## Historical Map - Slice A




## Order Details

| | |
|---|---|
| Order Number: | 222284714_1_1 |
| Customer Ref: | 5192793 |
| National Grid Reference: | 274680, 195180 |
| Slice: | A |
| Site Area (Ha): | 2.5 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 274590, 195200

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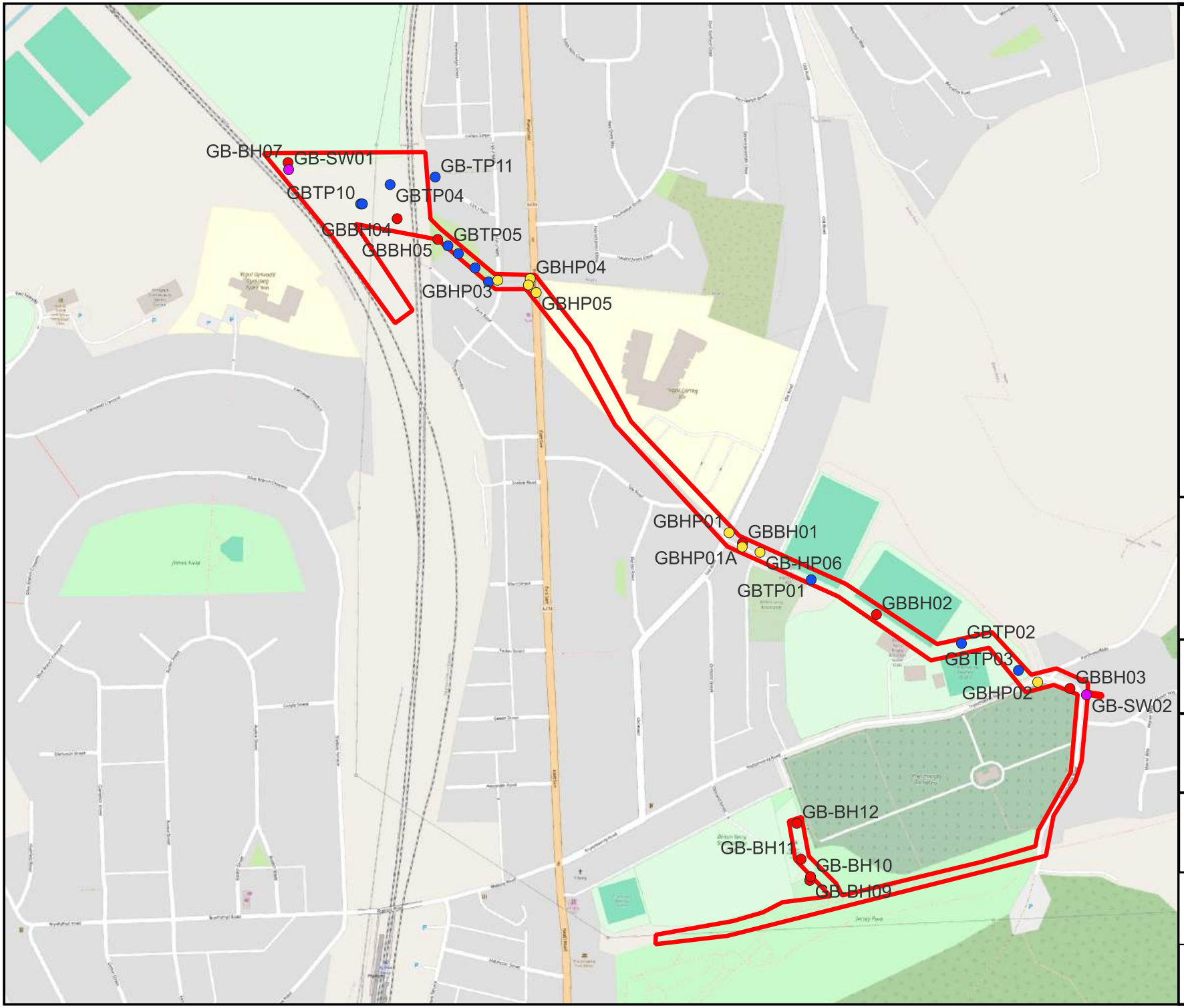
# Appendix C. GI Layout Drawing




## LEGEND

**Site**

- Site Extents

**Exploratory Holes**

- Borehole Locations
- Trial Pit Locations
- Hand Pit Locations
- Surface Water Sampling

AtkinsRéalis

2 Capital Quarter, Tyndall Street
Cardiff
CF10 4BZ

CLIENT
Neath Port Talbot County Borough Council

PROJECT
Neath Port Talbot Flood Alleviation Scheme - Grandison Brook

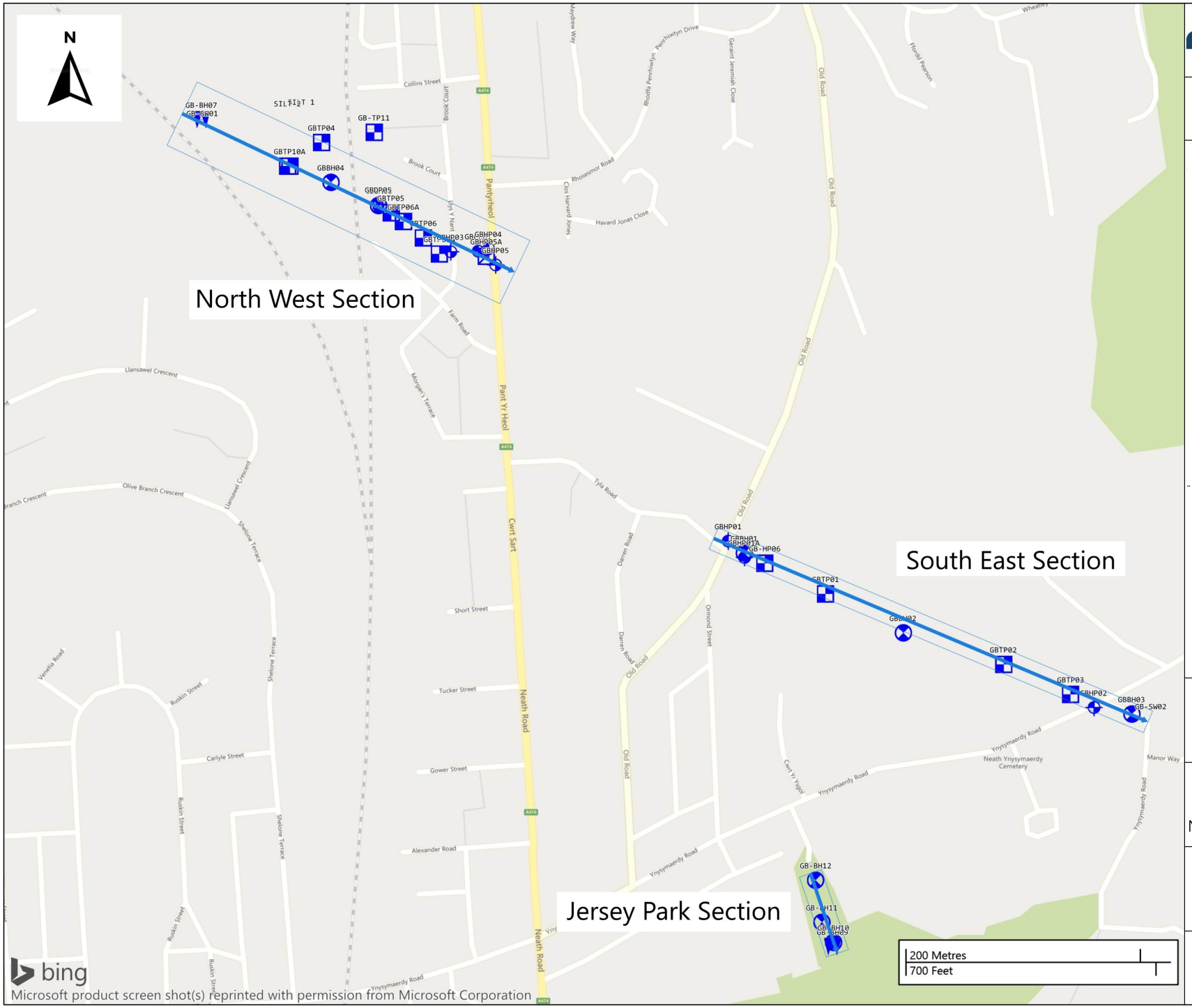
TITLE
Ground Investigation Location Plan

| DRAWN: | CHECK: | REV: | AUTH: |
|---|---|---|---|
| RE | TC | DATE: | DATE: |

DATE: 22/11/24

# Appendix D. Geological Long Sections

## D.1 Geological Section Plan




AtkinsRéalis

**Scale**

1:4500

Legend Key

- DP
- OP
- RC
- TP
- TR

**Project Title**

Grandison Brook

**Client**

Neath and Port Talbot County Council

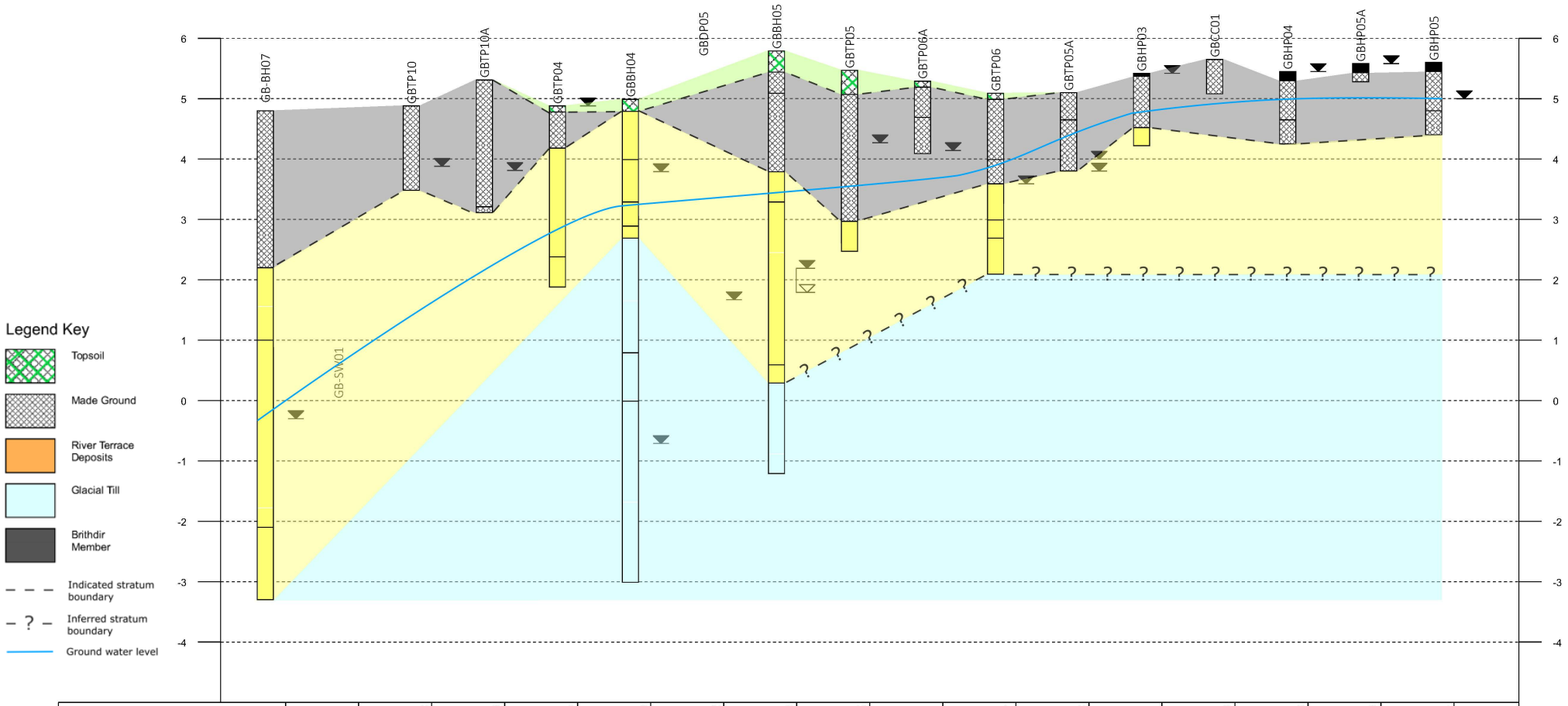
**Engineer**

Atkins

**D.1 Geological Section Plan**

# D.2 North-west Section Line

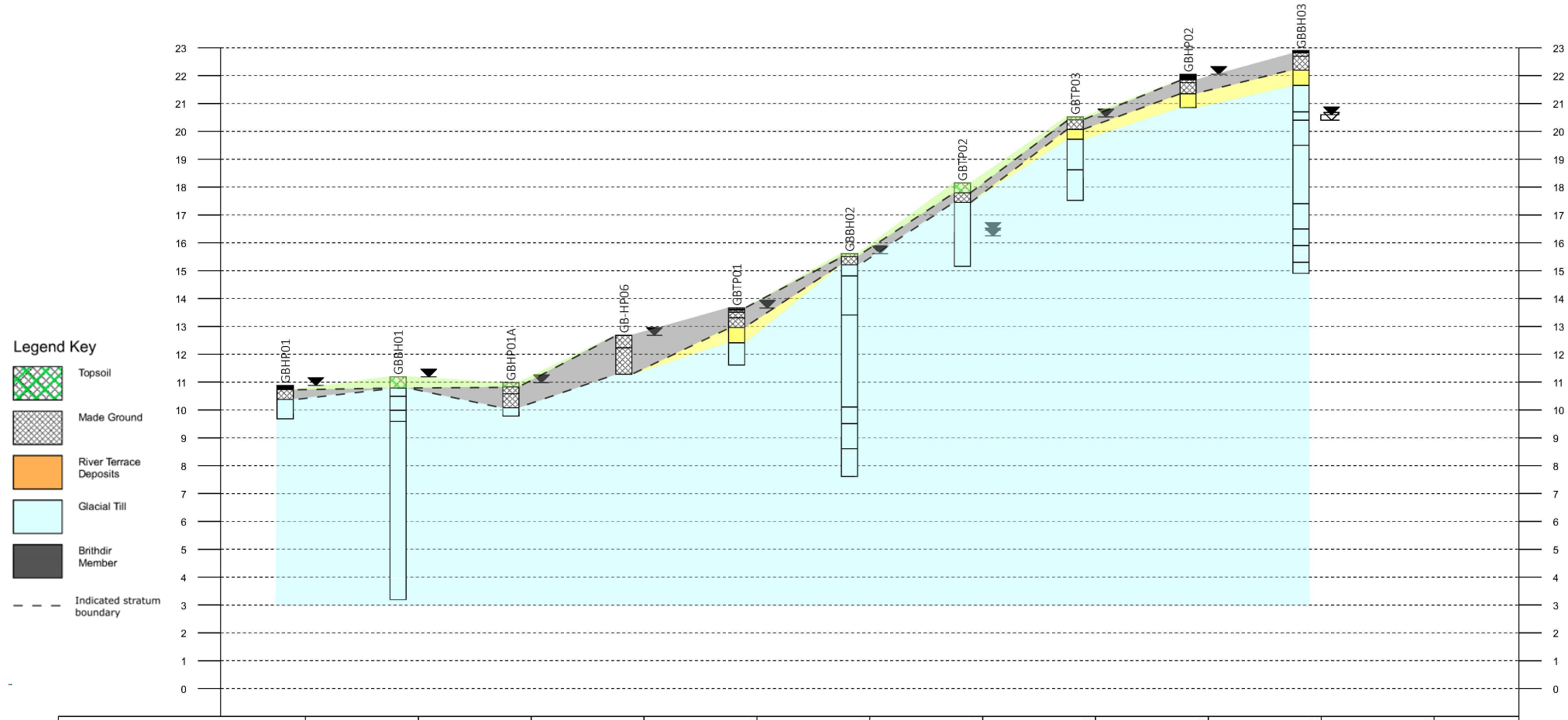
| Project ID | Client | Figure D.2 - North West Section line | AtkinsRéalis | |
|---|---|---|---|---|
| 20191395 | Neath and Port Talbot County Council | | | |
| **Project Title** | **Engineer** | | **Vertical Scale** | **Horizontal Scale** |
| Grandison Brook | Atkins | | 1:97 | Not to scale |




| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chainage (m) | 17.47 | 21.23 | 101.32 | 102.95 | 118.98 | 140.79 | 185.82 | 186.58 | 198.65 | 211.51 | 232.97 | 251.42 | 259.01 | 280.46 | 287.33 | 288.55 | 298.94 |
| Offset (m) | 2.42 | 3.64 | 1.76 | 0.94 | 28.97 | 1.57 | 2.02 | 1.34 | 0.24 | 1.98 | 7.25 | 13.71 | 8.06 | 2.67 | 8.19 | 1.66 | 1.61 |
| Elevation (mAOD) | 4.90 | | 4.88 | 5.31 | 4.88 | 4.99 | 5.67 | 5.79 | 5.47 | 5.29 | 5.09 | 5.10 | 5.42 | 5.65 | 5.45 | 5.58 | 5.60 |

# D.3 South-east Line Section

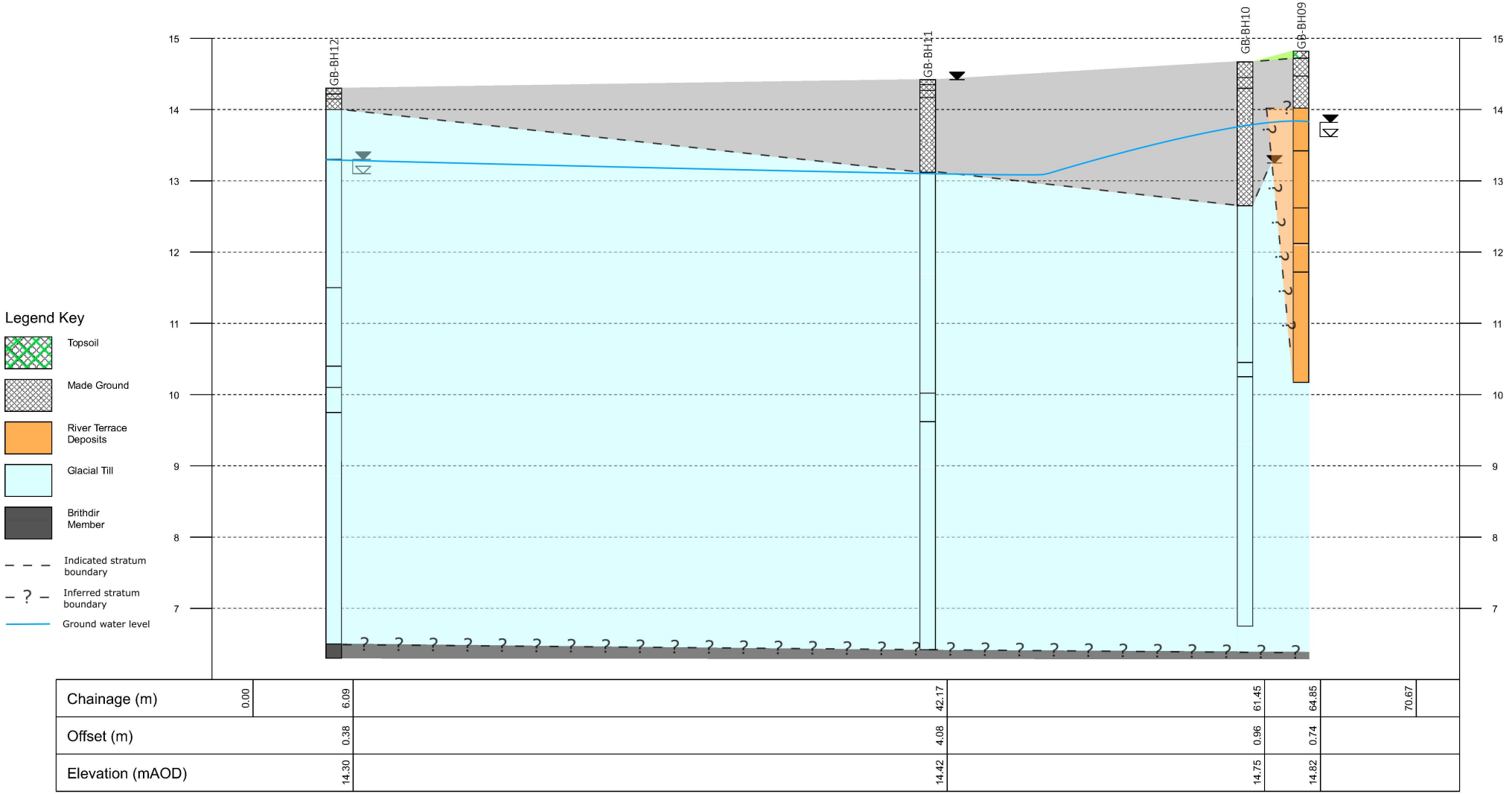
| Project ID | Client | Figure D.3 - South East Section Line | AtkinsRéalis | |
|---|---|---|---|---|
| 20191395 | Neath and Port Talbot County Council | | | |
| **Project Title** | **Engineer** | | **Vertical Scale** | **Horizontal Scale** |
| Grandison Brook | Atkins | | 1:210 | Not to scale |




| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chainage (m) | 19.20 | 35.74 | 37.10 | 55.58 | 113.78 | 187.88 | 277.89 | 341.13 | 363.56 | 395.82 | 413.48 |
| Offset (m) | 5.98 | 1.78 | 1.78 | 0.50 | 3.91 | 9.42 | 1.49 | 3.17 | 6.10 | 1.15 | 2.00 |
| Elevation (mAOD) | 10.88 | 11.19 | 10.98 | 12.68 | 13.66 | 15.61 | 18.15 | 20.52 | 22.05 | 22.90 | |

# D.4 Jersey Park Section

| Project ID | Client | Figure D.4 - Jersey Park Section Line | | |
|---|---|---|---|---|
| 20191395 | Neath and Port Talbot County Council | | | |
| **Project Title** | **Engineer** | | **Vertical Scale** | **Horizontal Scale** |
| Grandison Brook | Atkins | | 1:79 | Not to scale |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Chainage (m) | 0.00 | 6.09 | 42.17 | 61.45 | 64.85 | 70.67 | |
| Offset (m) | 0.38 | 4.08 | 0.96 | 0.74 | | | |
| Elevation (mAOD) | 14.30 | 14.42 | 14.75 | 14.82 | | | |

# Appendix E. UXO Survey

# Pre-Desk Study Assessment

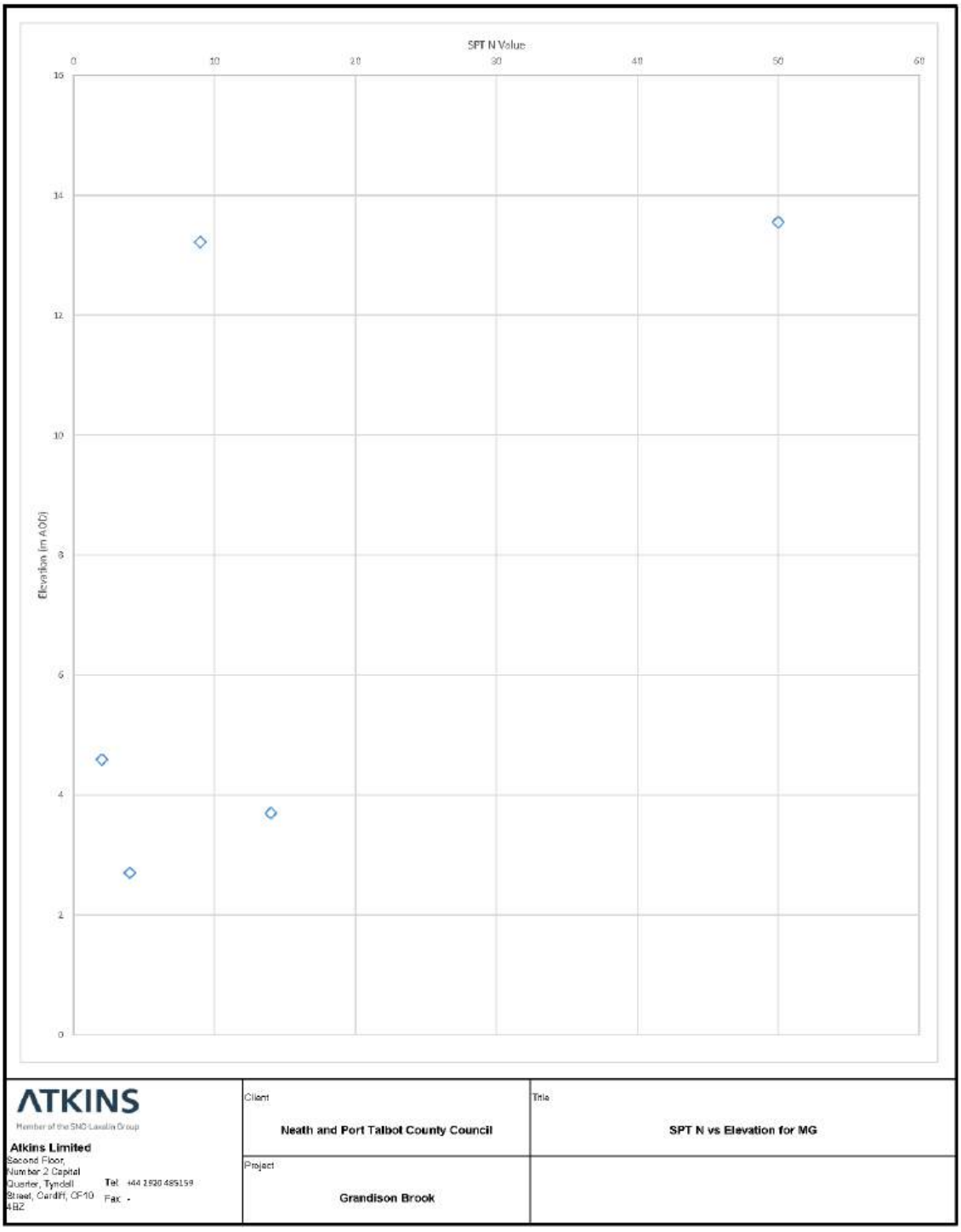
| | |
|---|---|
| **Site:** | Briton Ferry Llansawel AFC, Old Road, Neath, Wales |
| **Client:** | Atkins Global |
| **Contact:** | Ed Lupton |
| **Date:** | 23rd October 2019 |
| | |
| Pre-WWI Military Activity on or Affecting the Site | None identified. |
| WWI Military Activity on or Affecting the Site | None identified. |
| WWI Strategic Targets (within 5km of Site) | The following strategic targets were located in the vicinity of the Site:<br>■ Docks and wharves on the River Neath.<br>■ Industries important to the war effort, including metal works.<br>■ Military camps and training areas.<br>■ Transport infrastructure and public utilities. |
| WWI Bombing | None identified on the Site. |
| Interwar Military Activity on or Affecting the Site | None identified. |
| WWII Military Activity on or Affecting the Site | None identified. |
| WWII Strategic Targets (within 5km of Site) | The following strategic targets were located in the vicinity of the Site:<br>■ Docks and wharves on the River Neath.<br>■ Industries important to the war effort, including chemical and metal works.<br>■ Military camps and training areas.<br>■ Transport infrastructure and public utilities.<br>■ Anti-Aircraft (AA) and anti-invasion defences |
| WWII Bombing Decoys (within 5km of Site) | 1No. located approximately 3.1km southeast of the Site. |
| WWII Bombing | During WWII the Site was located in the Municipal Borough (MB) of Neath, which officially recorded 59No. High Explosive (HE) bombs with a bombing density of 13.6 bombs per 405 hectares (ha).<br><br>Readily available records indicate that several HE bombs fell in close proximity to the Site. |
| Post-WWII Military Activity on or Affecting the Site | None identified. |
| Recommendation | It is recommended that a detailed desk study is commissioned to assess, and potentially zone, the Unexploded Ordnance (UXO) hazard level on the Site. |

This summary is based on a cursory review of readily available records. Caution is advised if you plan to action work based on this summary.

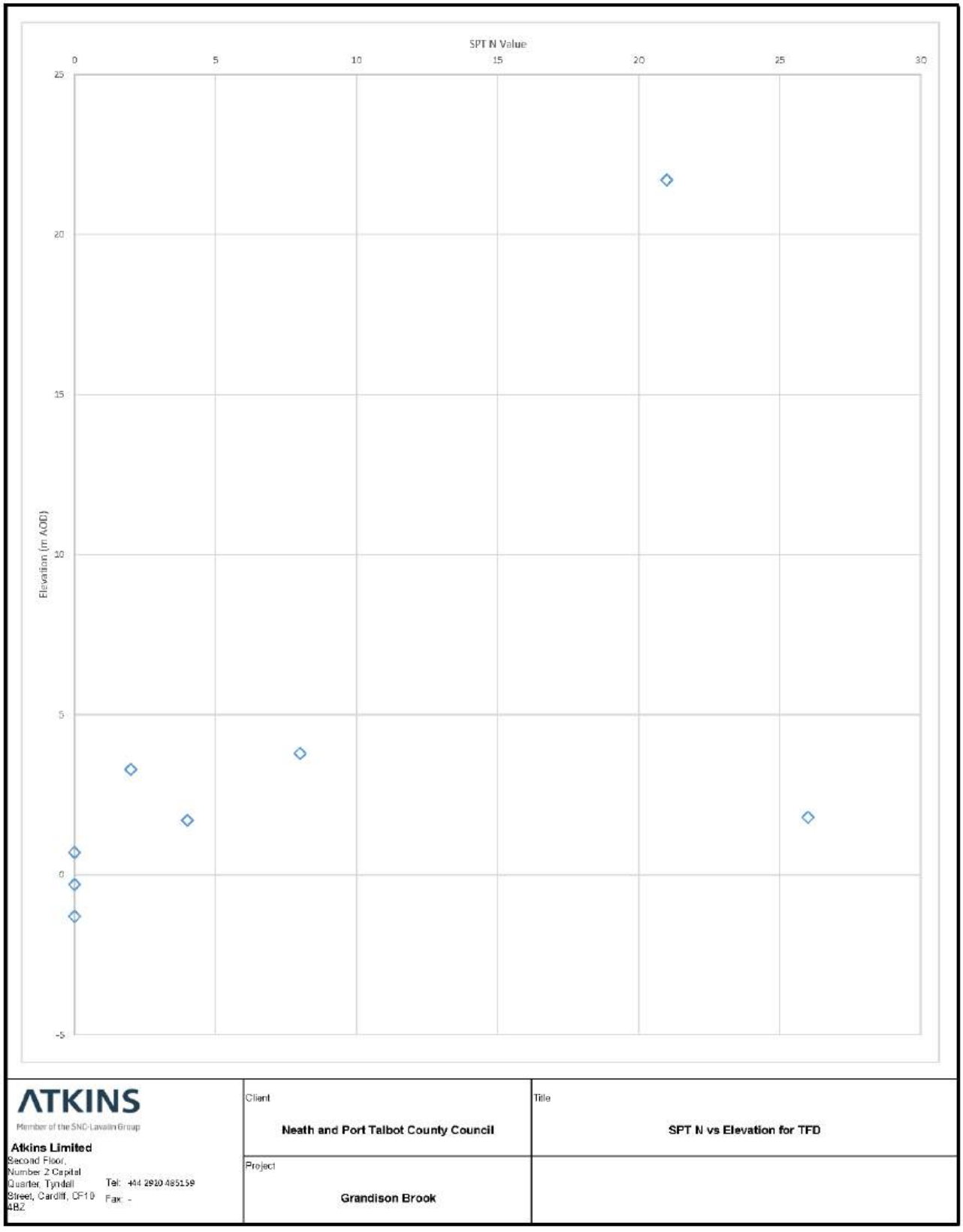
It should be noted that where a potentially significant source of UXO hazard has been identified on the Site, the requirement for a detailed desk study and risk assessment has been confirmed and no further research will be undertaken at this stage. It is possible that further in-depth research as part of a detailed UXO desk study and risk assessment may identify other potential sources of UXO hazard on the Site.

# Appendix F. Geotechnical parameter plots

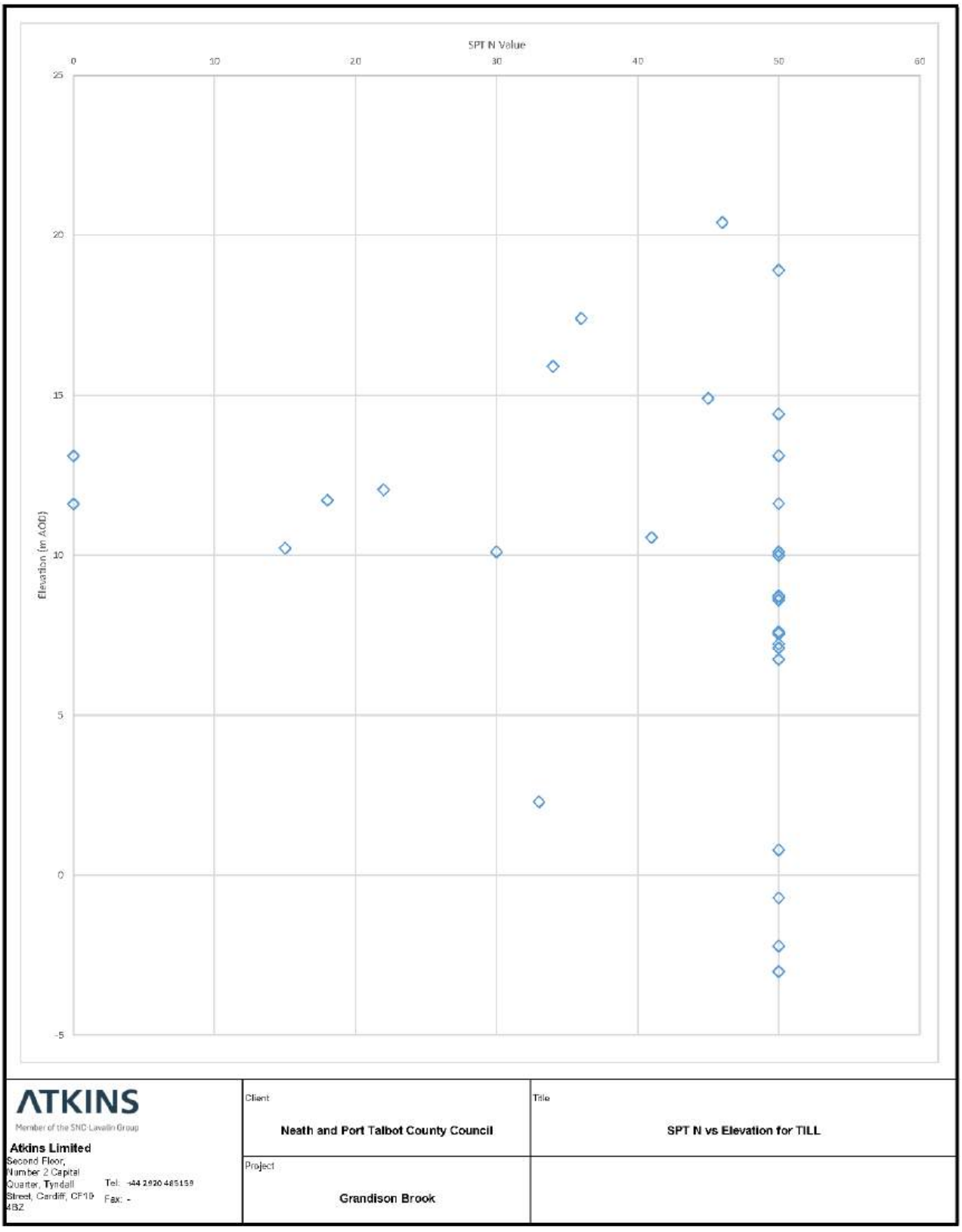
## F.1 Made Ground SPT



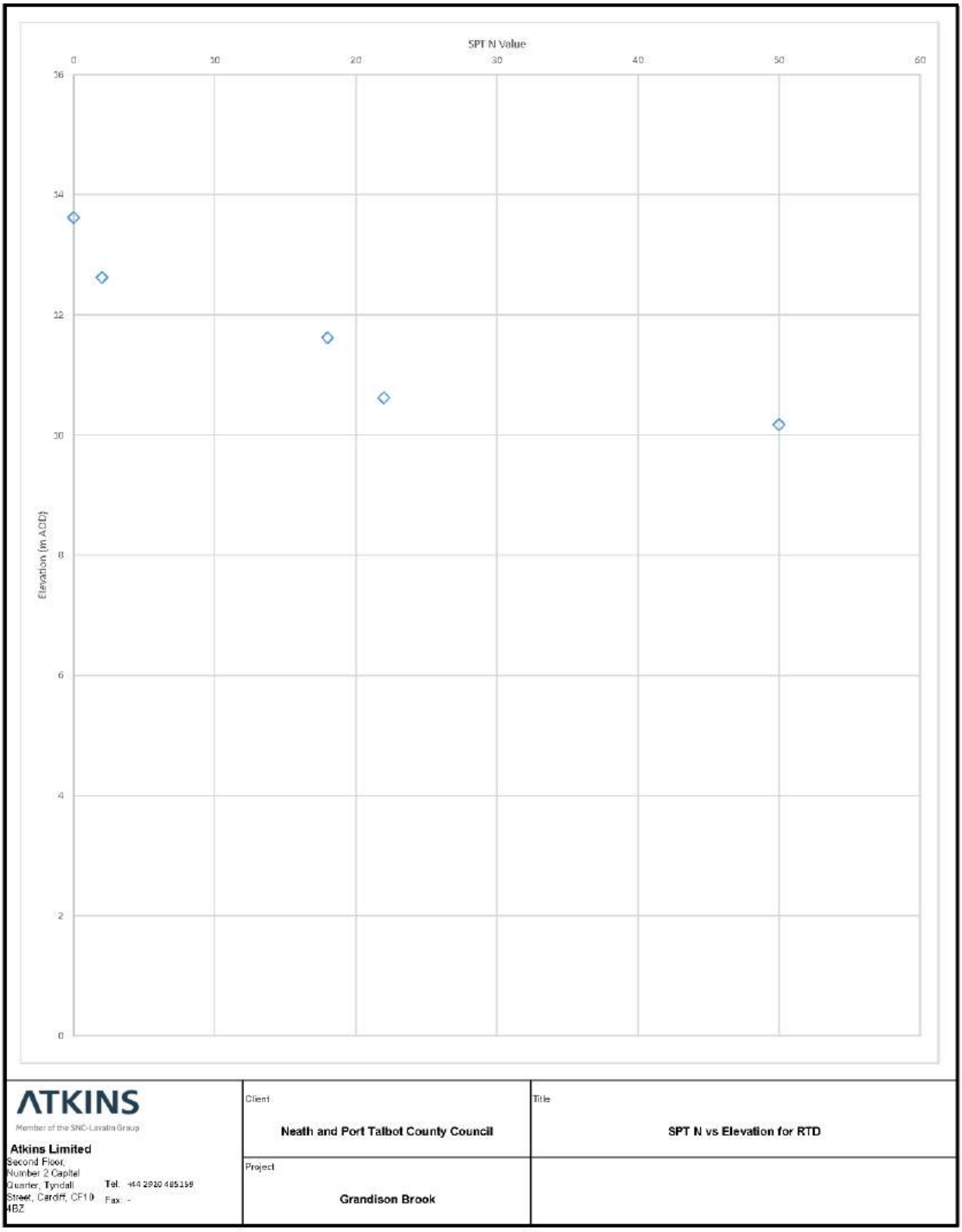
# F.2 Tidal Flat Deposit SPT



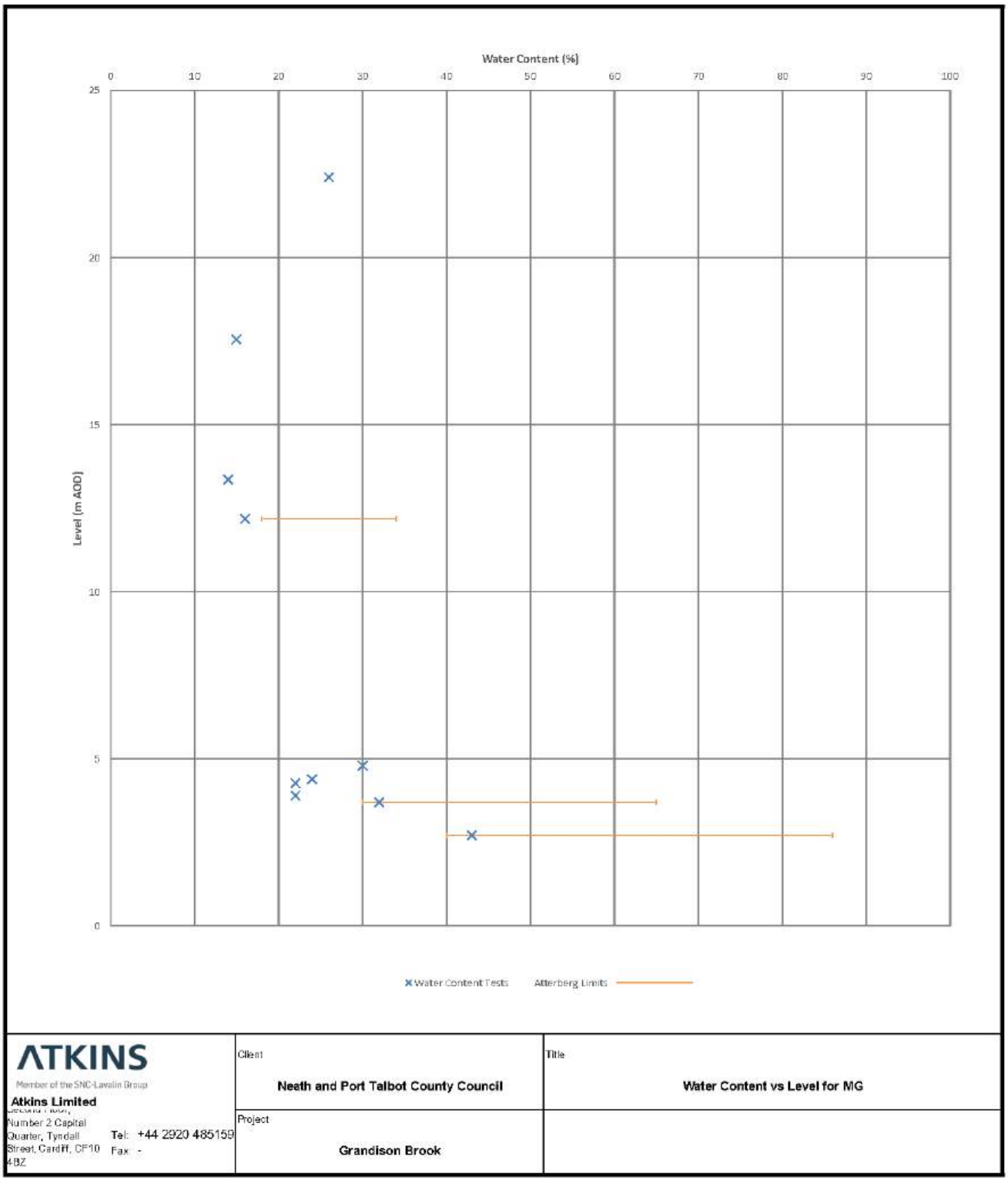
# F.3 Glacial Till SPT



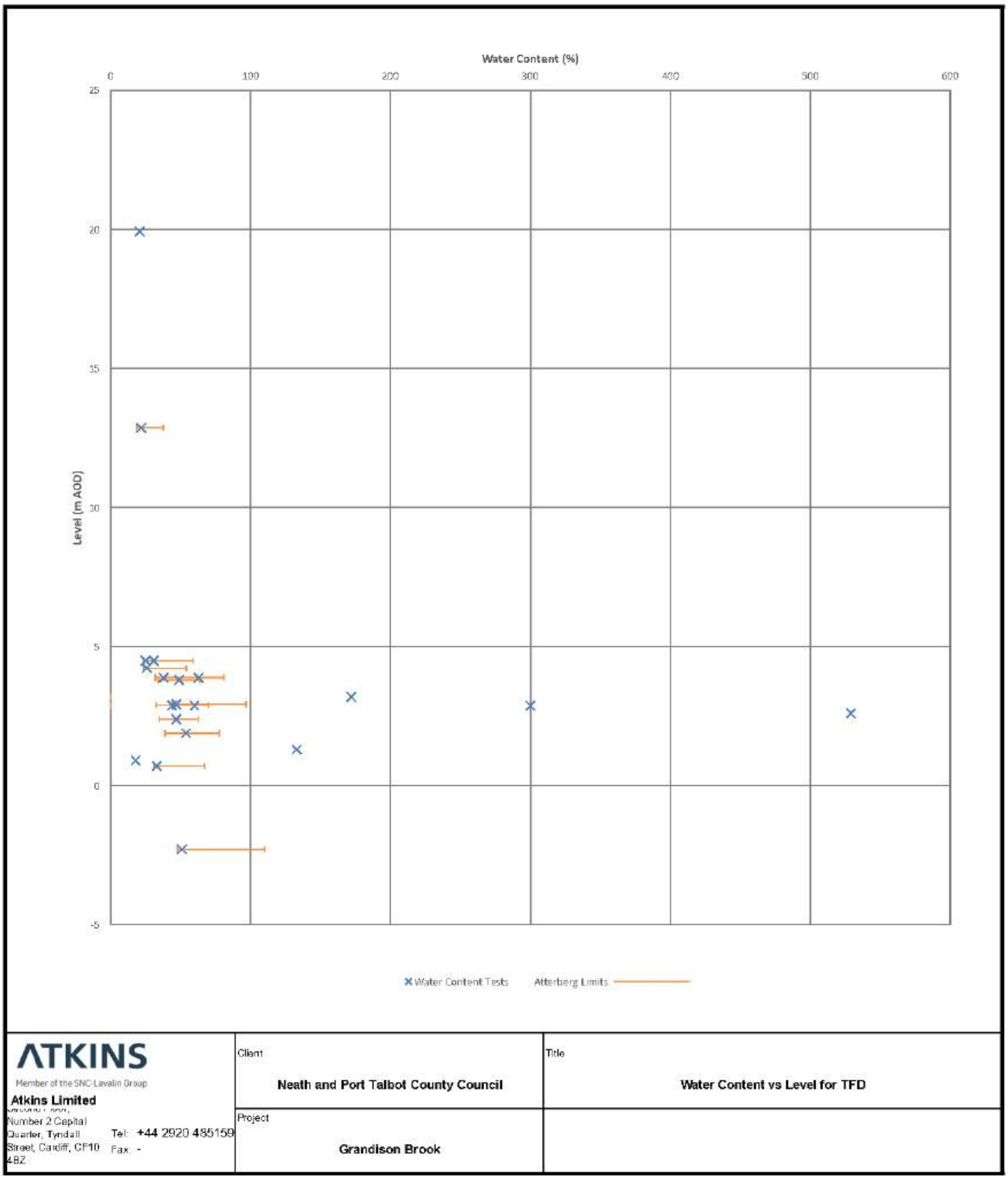
# F.4 River Terrace Deposits SPT



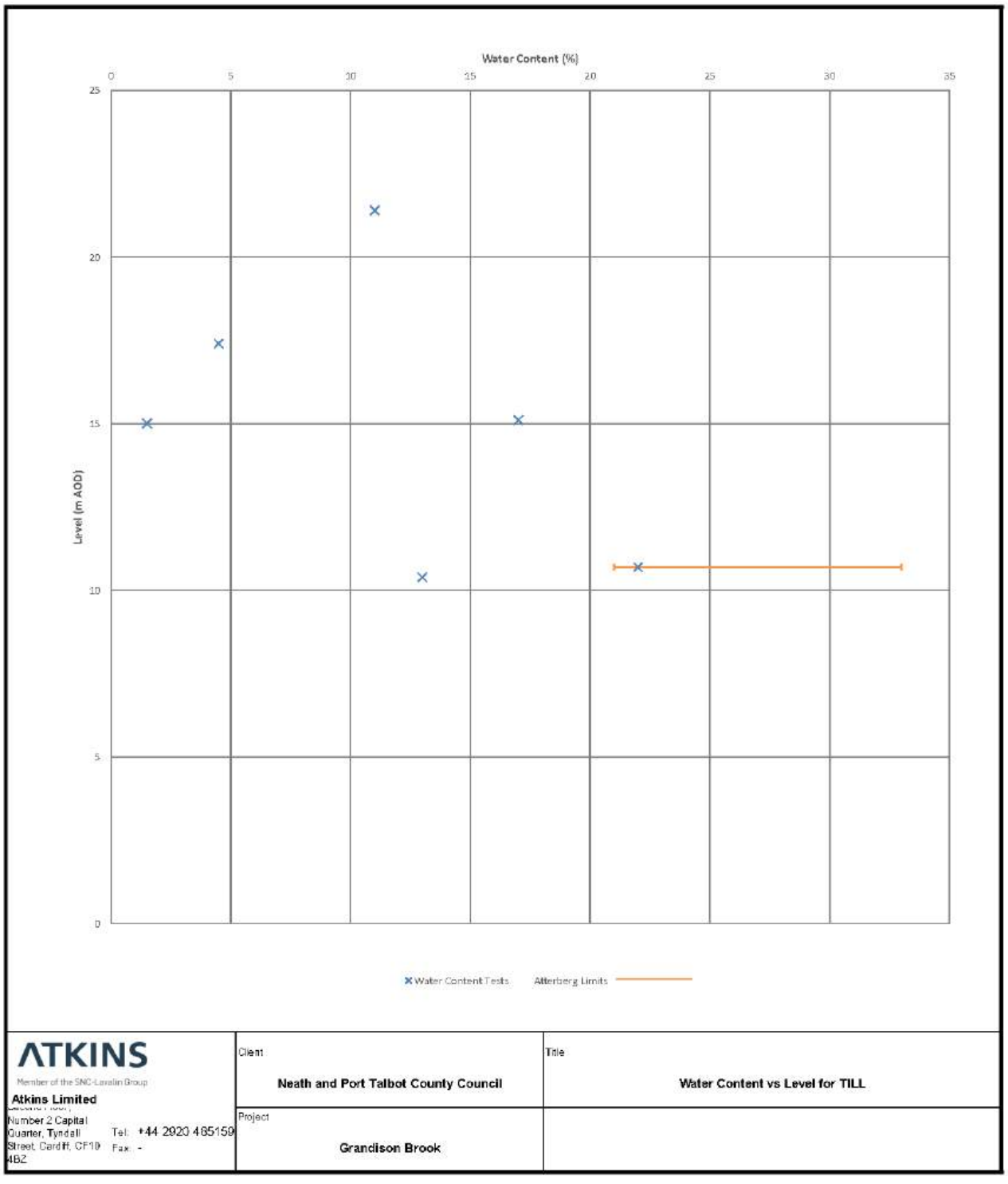
# F.5 Moisture content - Made Ground



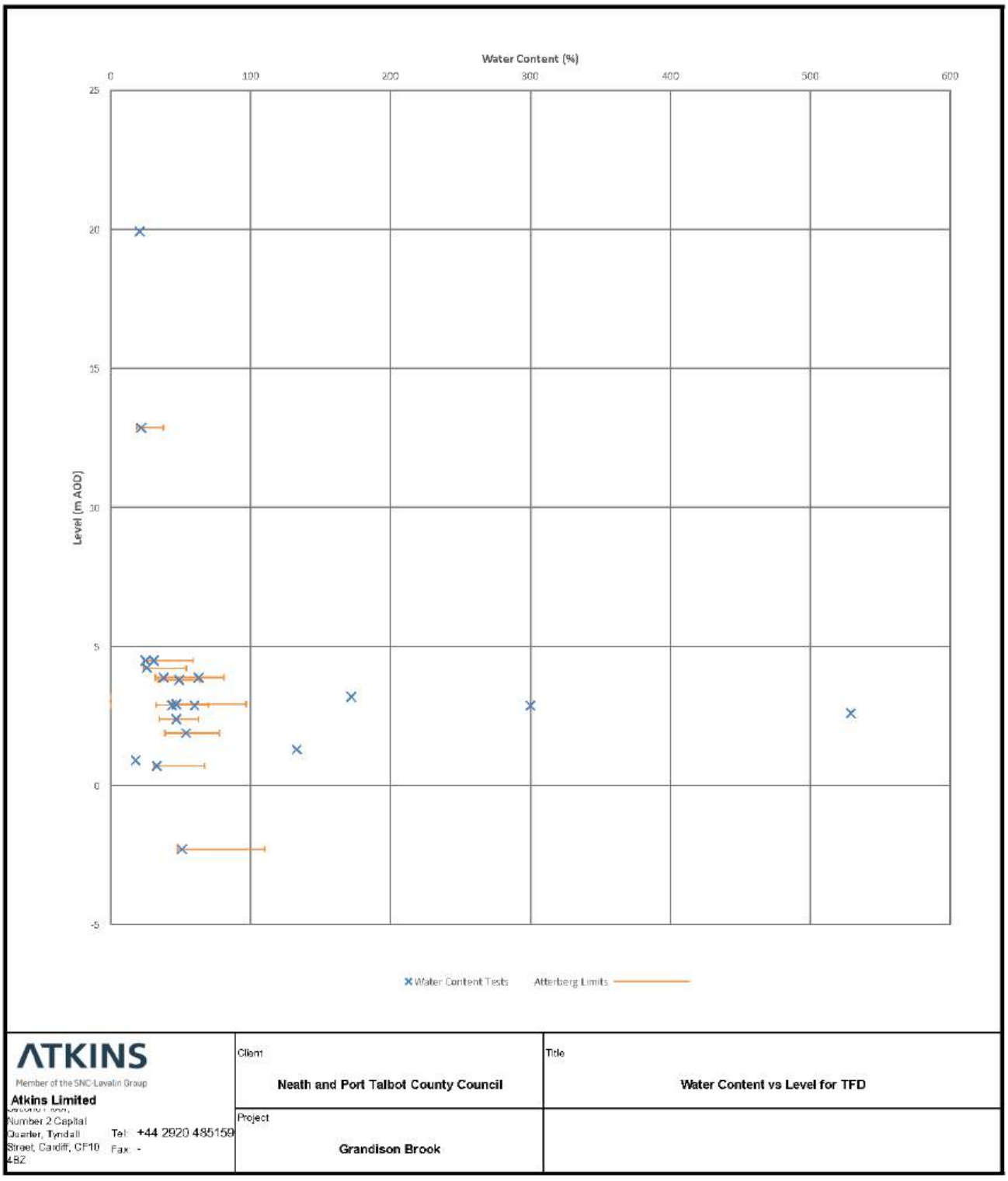
# F.6 Moisture content - Tidal Flat Deposits



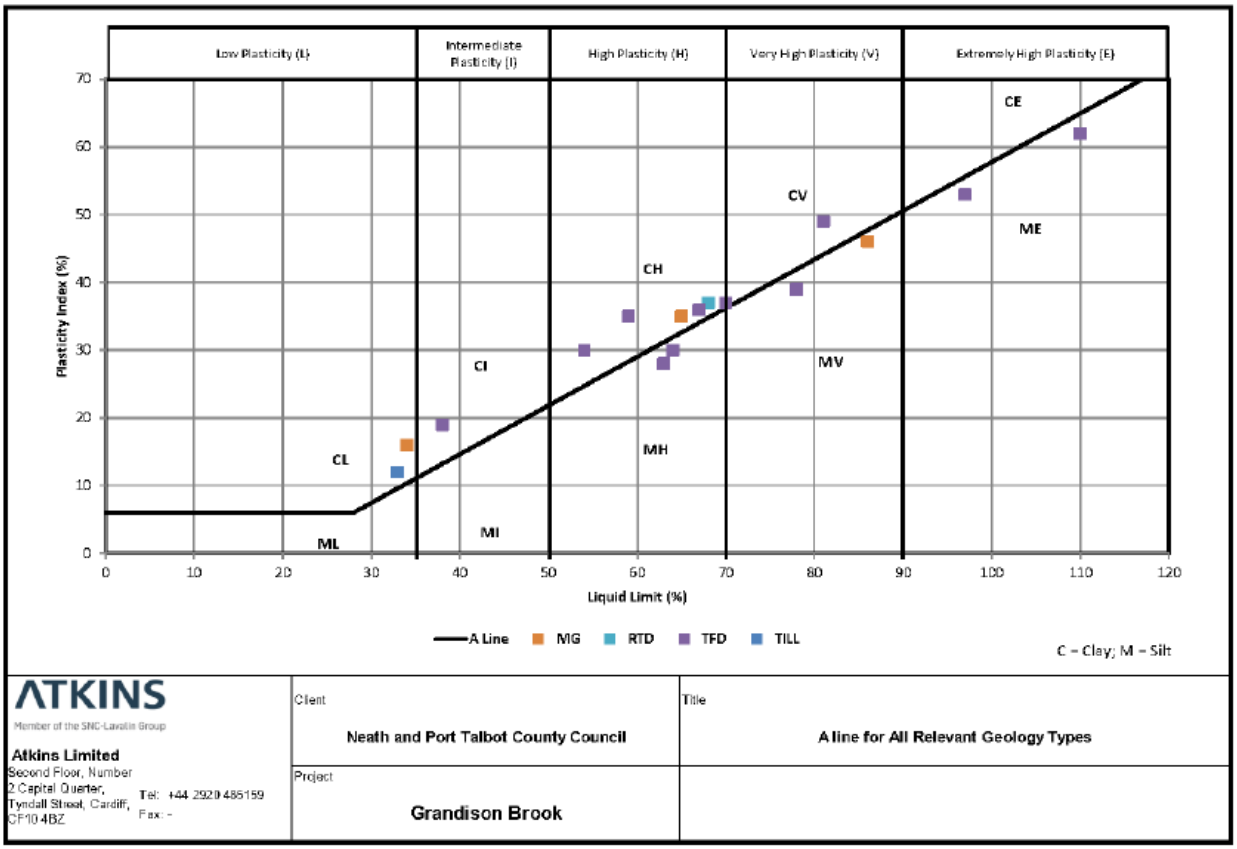
# F.7 Moisture content - Glacial Till



# F.8 Moisture content – Tidal Flat Deposits



# F.9 Classification – A line by geology (All Strata)



# Appendix G. Factual reports

# GRANDISON BROOK FLOOD ALEVIATION SCHEME

## GROUND INVESTIGATION
## FACTUAL REPORT

**Report No.**
**Q00560/FR.01**

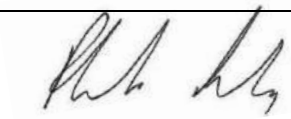
# GRANDISON BROOK FLOOD ALEVIATION SCHEME

# GROUND INVESTIGATION FACTUAL REPORT

# Report No. Q0560/FR.01 March 2022

## DOCUMENT CONTROL

| | |
|---|---|
| **Contract Name:** | **Grandison Brook Flood Alleviation Scheme** |
| **Contract Reference:** | **Q0560** |
| **Report Type:** | **Ground Investigation Factual Report** |
| **Report Reference:** | **Q0560/FR.01** |
| **Date of Report Production:** | **March 2022** |
| **Client:** | **Atkins** |

| Version: | Date: | Prepared by: | Checked by: | Approved by: |
|---|---|---|---|---|
| 1 | 30/03/22 | A Jones | P. Darby | J. Stark |
| | | |  | |
| | | Project Manager | Senior Engineering Geologist *B.Sc.(Hons).,M.Sc., C.Geol., F.G.S.* | *Technical Manager B.Sc.(Hons.),M.Sc., C.Geol., F.G.S.* |

*Disclaimer: Quantum Geotechnic Limited has prepared this report in accordance with the instructions of the above named Client for their sole and specific use. Any third parties who may use the information contained herein do so at their own risk.*

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Website: http://www.quantumgeotech.co.uk/

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## 0.0 FOREWORD

The following Conditions and Notes on Site Investigation Procedures should be read in conjunction with this report.

### 0.1 General

Recommendations made and opinions expressed in the report are based on the strata observed in the excavations, together with the results of site and laboratory tests. No responsibility can be held for conditions which have not been revealed by the Exploratory Holes or which occur between Exploratory Holes. Whilst the report may suggest the likely configuration of strata, both between Exploratory Holes and below the maximum depth of investigation, this is only indicative and liability cannot be accepted for its accuracy.

Unless specifically stated, no account has been taken of possible subsidence due to mineral extraction below or close to the site.

### 0.2 Investigation Procedures

Rotary Percussive (dynamic sampled) Boreholes, Hand and Machine excavated pitting techniques for ground investigation have been employed within the project. All Exploratory Hole operations, sampling and logging of soils, rocks and in-situ testing complies with the recommendations of the British Code of Practice BS 5930: 2015 'Site Investigations', British Code of Practice BS 10175: A2:2017 'Investigation of Potentially Contaminated Sites' and BS 1377: 1990, 'Methods of Test for Soils for Engineering Purposes'.

### 0.3 Routine Sampling

Representative bulk disturbed and environmental samples of the different strata are taken following completion of logging. These samples are sealed and labelled in clear plastic bags and 2kg plastic tubs. Soil samples obtained for environmental testing are sampled and sealed in borosilicate amber jars or in specialist vessels where required. Ground Water samples were sampled and sealed in borosilicate amber bottles or in specialist vessels where required All samples are returned from site to QGL's laboratory for controlled storage within 24 hours of sampling to await test scheduling/requirements.

### 0.4 In-Situ Testing, Surveying & Instrumentation

In-situ testing comprised:

- Standard Penetration Testing within Boreholes (SPT)
- All exploratory hole locations to be surveyed for location and elevation.
- GPR Survey
- PID testing

### 0.5 Groundwater

Where possible, the depth of entry of any influx of groundwater is recorded during the course of excavation or boring operations. The rate of inflow into the excavation or borehole is monitored during the course of the excavation or during boring procedures. Upon encountering any water strikes, work is temporarily halted and the water levels monitored for a standard twenty-minute period recording the change in water level at the end of the twenty minutes.

Groundwater conditions observed in the excavations are those appertaining to the period of investigation. It should be noted, however, that groundwater levels are subject to diurnal, seasonal and climatic variations and can also be affected by drainage conditions or other causes.

### 0.6 Retention of Samples

After satisfactory completion of all the scheduled laboratory tests on any sample, the remaining material is discarded. Further to notifying the Engineer/ Client with one week's notice all soil and/or rock samples not tested will be discarded 28 days after submission of the approved final report.

## 1.0 INTRODUCTION

### 1.1 General

Upon the instructions of Atkins, the scheme Engineer / Investigation Supervisor / Client, Quantum Geotechnic Limited (QGL) was commissioned to undertake a ground investigation for the proposed flood alleviation scheme for Grandison Brook, Briton Ferry.

The siteworks were carried out between, 5th – 13th July, 29th July – 19th August, 18th October and 15th November 2021.

This report presents a factual account of the fieldwork carried out, includes descriptions of the strata encountered, available groundwater observations, details of in-situ testing undertaken, location of services encountered and provides results of subsequent laboratory testing of samples obtained from the investigation.

General notes on the techniques employed by QGL are described in the Foreword together with the limitations inherent in carrying out site investigation work.

### 1.2 Purpose of Ground Investigation

The purpose of the ground investigation is to determine the existing ground conditions on the site, together with details and location of services along the proposed culvert route to allow the design of the proposed culvert improvement works.

The purpose of the proposed work is to improve the hydraulic conveyance capacity of the existing water course whilst maintaining the current alignment.

The work shall comprise the construction of a new inlet structure to accommodate a new, larger culvert, the construction of 400m of a new 900mm internal diameter culvert and the connection between the new culvert and the existing surface water drainage and downstream 1050mm diameter culvert.

### 1.3 Initial Scope of Work

The aim of the ground investigation is to:

- Determine the nature and thickness of any Made Ground;
- Determine the nature and thickness of the Superficial Deposits;
- Determine the depth to Bedrock and thickness of any weathered horizon;
- Recover suitable samples for geotechnical; and geo-environemntal laboratory testing;
- Locate presence, size and depth of services on site.

The initial scope of works entails the following:

- 6 no. Percussive Rotary Boreholes
- 5 no. Hand Excavated Pits / Trenches
- 9 no. Machine Excavated Trial Pits
- In-Situ Testing
- PAS-B and GPR Survey to identify underground services.

General

- Geotechnical and Geo-environmental Laboratory Testing.
- Provide a factual report detailing the investigation.

General notes on the techniques employed by Quantum are described in the Foreword together with the limitations inherent in carrying out ground investigation work.

## 2.0 SITE DETAIL

### 2.1 Site Description

The site is located in the Pantyrheol area of Briton Ferry, Neath, Wales and passes through residential areas, sports fields, Ysgol Carreg Hir, across the A474 and through railway land. The site is bounded by Briton Ferry Llansawel AFC football pitch and some vacant fields in the north. Briton Ferry Llansawel AFC football pitch, Parc Jersey Park and Ynysymaerdy road lie to the south, and part of the site is interspersed with residential dwellings and some vacant fields to the east. Old Road bounds the site to the northwest and a housing development off of Manor Way bounds it to the southeast

The site is located at Ordnance Survey National Grid reference 274680E and 195180N.

Where necessary trial pits, hand pits, boreholes and a GPR Survey were carried out under traffic management supplied by Amberon as QGLs approved traffic management supplier. These areas were re-instated to NRSWA standard.

Access to GBBH04, GBTP04, GBTP10 and GBTP10A is via Network Rail owned land and assets which required Network rail supervision. In addition, vegetation clearance was undertaken to allow access to these exploratory holes.

Due to access restrictions relating to current site usage, GBBH06, GBTP07, GBTP08 and GBTP09 originally scheduled within the grounds of Ysgol Carreg Hir Primary School were cancelled by the Investigation Supervisor.

Trial Pits GBTP10 and GBTP10A were additional trial pits instructed by the Investigation Supervisor.

QGL were the appointed Contractor for the works, under order number 5192793-001 issued on 21st June 2021. The works were commissioned in order to establish general ground conditions and locate live services across the proposed route of a new culvert.

The general extent of the site is shown in Figure 1 in Appendix I.

### 2.2 Statutory Service Information

All service information was held by the client with the relevant plans and information made available to QGL prior to commencement of the intrusive works.

A permit to excavate was issued by QGL for all exploratory holes. Standard QGL procedures for breaking ground were followed and all areas were scanned using a cable avoidance tool. A hand dug trial pit was

excavated to 1.2m prior to commencement of drilling where services may be at risk. All hand excavation was undertaken using insulated digging tools.

GPR surveys were undertaken at specified locations to help establish the locations and depths of known buried services. The Survey was undertaken by Intersect Surveys. Following completion of the GPR surveys, hand excavated trial pits / trenches were undertaken to prove the location of buried services.

### 2.3 Published Geology

Details of the published and inferred geology of the site are summarised as followed:

The British Geological Survey (BGS) sheet 1:50,000 247 (Swansea) indicates

*Superficial Deposits*

The site is predominantly underlain by Glacial Till deposits. Tidal Flat deposits are mapped along the northern boundary of the site.

*Bedrock Geology*

The site is mapped to be underlain by interbedded sandstone, siltstone and mudstone with coal seams of the Hughes Member and Brithdir Member.

*Client Supplied Information*

“Ground Investigation information for Cwrt Sart Comprehensive School, located approximately 200m north west of the site has been made available by Neath Port Talbot County Borough Council. The ground investigation found Made Ground between 0.7m and 1.45m thick comprising sandy gravel with low to medium cobble content, soft clay and peat between 0.3m and 2.15m thick overlying firm to stiff sandy gravelly clay and medium dense sandy gravel with low to medium cobble content with thin lenses of sand…… Groundwater was recorded in two boreholes at 1.5m and 2.3m”.

## 3.0 FIELDWORK

### 3.1 General

A summary of the works completed and covered by this report are given below:

- 5 No. Rotary Percussive (dynamic sampled) boreholes. (GBBH01- GBBH05, note GBBH06 not undertaken due to access restrictions)
- 1 No. Super Heavy Dynamic Probe
- 5 No. Hand Excavated Trial Pits (GBHP01 – GBHP05, note GBHP01A & GBHP05A undertaken in two sections)
- 8 No. Machine Excavated Trial Pits (GBTP01 – GBTP06, GBTP10 & GBTP10A, note GBTP07 – GBTP09 not undertaken due to access restrictions)
- In-situ testing and sampling.
- Post fieldwork groundwater and ground gas monitoring.
- GPR surveys at 5 No locations

Full time site supervision and attendance from QGL was undertaken on all aspects of the site works and subsequent reinstatement works of all exploratory hole locations. Reinstatement of the exploratory holes within the highway was undertaken in accordance with NRSWA requirements. All service plans were held onsite, with all site personnel inducted by QGL and briefed of the pertinent Risk Assessments and Method Statements relating to the tasks to be undertaken.

The borehole locations were subject to a 1.2m deep service / utility inspection pit prior to any drilling. Also, each area of investigation was fully eCAT4+ ('Cable Avoidance Tool') scanned prior to breaking ground.

### 3.2 Exploratory Hole Locations

The exploratory hole locations were specified by Atkins and set out on site by QGL using the co-ordinates provided.

Exploratory Hole Location Plans are presented as Figure 2 in Appendix I and the Exploratory Hole co-ordinates and levels are detailed within Table 1.

***Table 1:*** *Exploratory Hole Co-Ordinates & Levels*

| Exploratory Hole | Easting | Northing | Height (mAOD) |
|---|---|---|---|
| GBBH01 | 274510.52 | 195251.98 | 11.19 |
| GBBH02 | 274645.15 | 195180.25 | 15.61 |
| GBBH03 | 274839.63 | 195105.88 | 22.9 |
| GBBH04 | 274163.57 | 195578.11 | 4.99 |
| GBBH05 | 274204.33 | 195557.24 | 5.79 |
| GBDP05 | 274203.96 | 195558.19 | 5.67 |
| GBHP01 | 274497.09 | 195262.51 | 10.88 |
| GBHP01A | 274510.32 | 195248.18 | 10.98 |
| GBHP02 | 274807.19 | 195112.28 | 22.05 |
| GBHP03 | 274264.72 | 195516.16 | 5.42 |
| GBHP04 | 274297.33 | 195517.88 | 5.45 |
| GBHP05 | 274303.273 | 195503.9 | 5.6 |
| GBHP05A | 274295.47 | 195511.51 | 5.58 |
| GBTP01 | 274579.60 | 195215.24 | 13.66 |
| GBTP02 | 274730.69 | 195151.13 | 18.15 |
| GBTP03 | 274787.85 | 195124.03 | 20.52 |
| GBTP04 | 274156.48 | 195612.41 | 4.88 |
| GBTP05 | 274214.61 | 195550.81 | 5.47 |
| GBTP06 | 274241.85 | 195528.64 | 5.09 |
| GBTP10 | 274126.85 | 195592.95 | 4.88 |
| GBTP10A | 274128.68 | 195592.95 | 5.31 |

## 3.3 Boreholes

***Percussive Rotary (Dynamic Sampling) Boreholes***

A Commachio MC205 rubber track-mounted rotary drilling rig was used to progress the boreholes to depths of between 7.0 and 8.0mbgl (below ground level). Due to difficult drilling conditions ("blowing sands") GBBH05 did not reach the scheduled depth and dynamic probing was undertaken.

Each Borehole was drilled using dynamic sampling methods through the superficial deposits with an ODEX casing system. Dynamic Sampling is a technique whereby a hydraulically driven percussive hammer attached to the head of the drill rig mast is used to drive a 1.00m length, 101mm diameter, steel sampling tube through the soils to obtain undisturbed samples within 87mm core liner.

On encountering an obstruction or refusal of the Dynamic sample barrel, all boreholes were continued and kept open using an ODEX casing system of 115mm diameter. A combined air/mist flush was used to clear the hole of returns and debris.

In-situ testing was carried out in all boreholes (see section 3.4.1.).

Borehole RS-BH01 was located within the pavement and reinstated to NRSWA requirements on completion of the borehole.

Dynamic Probe GBDP05 was undertaken adjacent to GBBH05 as the GBBH05 was terminated at 7.0mbgl due to 'blowing sands'. Details of the Dynamic Probe methodology are presented within Section 3.6.4.

Details of the exploratory holes, including final depths in metres below ground level (mbgl) and SPT Hammer used are provided below in Table 2.

***Table 2:*** *Borehole details*

| Exploratory Hole ID | Drilling method | SPT Hammer Reference | Termination Depth (mbgl) | Notes/Reason for Termination |
|---|---|---|---|---|
| GBBH01 | DS / ODEX | Q2 | 8.0 | Scheduled Depth |
| GBBH02 | DS / ODEX | Q2 | 8.0 | Scheduled Depth |
| GBBH03 | DS / ODEX | Q2 | 8.0 | Scheduled Depth |
| GBBH04 | DS / ODEX | Q3 | 8.0 | Scheduled Depth |
| GBBH05 | DS / ODEX | Q2 | 7.0 | "Blowing Sand". Unable to progress |
| GBDP05 | DP | TERRIER | 10.1 | Scheduled Depth. Undertaken adjacent to GBBH05 |

The Engineering Geologist's borehole logs are presented within Appendix II.

A 50mm dual gas and groundwater monitoring standpipe was installed in boreholes GB-BH04 & GB-BH05, records of the post fieldwork monitoring are presented in Appendix VIII.

### 3.4 Hand Excavated Service Trial Pits

6 No. Hand Excavated Trial Pits were formed using insulated Hand Digging Tools and the assistance of a two tonne excavator to determine the locations of the underground services present together with shallow ground conditions. The positions are shown on the exploratory hole location plan in Appendix I.

This method of investigation allows a safe method of excavation around services together with direct sampling of the near surface deposits for identification purposes, as well as assessment of any salient features and Made Ground or disturbed ground. The trial pits were logged in accordance with BS5930:2015; BS EN ISO 14688-1:2002 and BS EN ISO 14688-2:2004 and supervised at all times by an Engineering Geologist from QGL. All of the trial pits were backfilled with compacted layers of arisings upon completion with suitable surface reinstatement where required.

Details of the Hand Pits including final depths in metres below ground level (mbgl) are provided below in Table 3.

***Table 3:*** *Hand Pit details*

| Exploratory Hole ID | Exploratory Hole Type | Termination Depth (mbgl) | Notes/Reason for Termination |
|---|---|---|---|
| GBHP01 | Hand Excavated Trial Pit | 1.2 | Scheduled Depth |
| GBHP01A | Hand Excavated Trial Pit | 1.2 | Scheduled Depth |
| GBHP02 | Hand Excavated Trial Pit | 1.2 | Scheduled Depth |
| GBHP03 | Hand Excavated Trial Pit | 1.2 | Scheduled Depth |
| GBHP04 | Hand Excavated Trial Pit | 1.2 | Scheduled Depth |
| GBHP05 | Hand Excavated Trial Pit | 1.2 | Scheduled Depth |
| GBHP05A | Hand Excavated Trial Pit | 0.3 | Services Located |

A complete set of Engineering Geologist Trial Pit logs are presented within Appendix III whilst the results.

Surface reinstatement was undertaken in accordance with NRSWA where required.

### 3.5 Machine Excavated Trial Pits

8 No. trial pits were excavated using an 8 tonne excavator owned and operated by Spencer ECA as an approved plant supplier to QGL. The exploratory hole positions are shown on the exploratory hole location

plan in Figure 2 in Appendix I.

This method of investigation allows direct sampling of the near surface deposits for identification purposes, locating of buried services, as well as assessment of any salient features and Made Ground or disturbed ground. The trial pits were logged in accordance with BS5930:2015; BS EN ISO 14688-1:2002 and BS EN ISO 14688-2:2004,and supervised at all times by an Engineering Geologist from QGL.

All trial trenches were backfilled with compacted layers of arisings upon completion. Surface reinstatement was undertaken in accordance with NRSWA where required.

Geotechnical and Environmental samples were taken within the superficial deposits for laboratory testing purposes.

Details of the Trial pits including final depths in metres below ground level (mbgl) are provided in Table 4.

***Table 4:*** *Trial Pit Detail*

| Exploratory Hole ID | Exploratory Hole Type | Final Length (mbgl) | Reason for termination |
|---|---|---|---|
| GBTP01 | Machine Excavated Trial Pit | 2.05 | Maximum reach of excavator |
| GBTP02 | Machine Excavated Trial Pit | 3.0 | Scheduled Depth |
| GBTP03 | Machine Excavated Trial Pit | 3.0 | Scheduled Depth |
| GBTP04 | Machine Excavated Trial Pit | 3.0 | Scheduled Depth |
| GBTP05 | Machine Excavated Trial Pit | 3.0 | Scheduled Depth |
| GBTP06 | Machine Excavated Trial Pit | 3.0 | Scheduled Depth |
| GBTP10 | Machine Excavated Trial Pit | 1.4 | Rapid Groundwater Inflow and Significant Instability |
| GBTP10A | Machine Excavated Trial Pit | 2.2 | Rapid Groundwater Inflow and Significant Instability |

A complete set of Engineering Geologist's Test Hole logs are presented within Appendix III.

## 3.6 In-Situ Testing

### *3.6.1 Standard Penetration Testing*

Standard penetration tests (SPTs) were undertaken within all boreholes, at intervals specified by Redstart.

This is a dynamic test as described in BS EN ISO 22476-3:2005 + A1:2011. Within fine grained or cohesive soils, the test incorporates a small diameter tube (650mm length, 50mm external diameter and 35mm

internal diameter) with a cutting shoe known as the 'split barrel sampler'. The sampler is forced into the soil dynamically using blows from a 63.5kg hammer dropped through 760mm. The sampler is initially advanced 150mm into the soil with seating blows, then the number of blows required to advance the sampler each 75mm increment up to a depth of 300mm is recorded. This cumulative total number of blows over the 300mm test is referred to as the "N" value. For coarse gravels and bedrock the split barrel is replaced by a 60° cone (SPT(C) - Standard Penetration Test (Cone)). SPT/SPT(C) results are detailed within the relevant borehole Logs. The SPT calibration certificate for the SPT hammer used during this investigation is presented in Appendix II.

#### *3.6.2 Ground Penetrating Radar Survey*

A Ground Penetrating Radar (GPR) survey was undertaken by Intersect to identify the underground services in areas as requested by the client.

Figure 1 presented in Appendix V was produced by Intersect showing the services identified during the survey.

#### *3.6.3 Headspace Testing*

All environmental soil samples collected were screened using a calibrated Photoionisation Detector onsite to measure isobutylene, prior to being sent to the laboratory.

Soil is placed in a sealed plastic bag, half-filled to allow airspace above the soil and left a period of no less than one hour prior to screening.

Measurements are detailed within the exploratory hole logs included within Appendix II and Appendix III.

#### *3.6.4 Dynamic Probes*

A single super heavy dynamic probe holes were undertaken adjacent to Borehole GBBH05 with the results included within Appendix II.

Super Heavy Dynamic Probe testing involves recording the blow counts for every 100mm of driving (N100), using the automated 63.5kg drop hammer and 15cm$^2$ cone point with sacrificial cones. Dynamic probing determines the resistance of soils in-situ to the intermittent penetration of a 90$^o$ cone when driven dynamically in a standard manner, a continuous record is provided with respect to depth of the resistance of the cone. The information submitted is recorded as the number of blows to drive the cone each 100mm increment. The Dynamic Probe holes were backfilled with Bentonite pellets.

### 3.7 Soil Sampling

Disturbed samples of soil were taken in clear sealed plastic bags and white plastic tubs. Environmental samples were taken at various depths as noted on the relevant logs.

The environmental samples were dispatched to Chemtest, Coventry using a daily courier service for storage awaiting testing instructions from the Engineer. Environmental soil samples were taken in amber glass jars, vials and plastic tubs provided by the laboratory to suit the anticipated testing.

Geotechnical samples were returned from site to QGL's laboratory for controlled storage to await test scheduling/requirements. For specific details of laboratory testing see Section 4.0.

## 4.0 LABORATORY TESTING

### 4.1 General

The laboratory testing was scheduled by Atkins and comprised a number of geotechnical classification and performance tests as well as chemical testing on selected soil samples and ground water samples recovered from the investigation.

### 4.2 Geotechnical Testing

Geotechnical classification and performance testing was undertaken at QGL's approved UKAS accredited laboratory at GSTL, Llanelli.

Geotechnical tests undertaken on selected soil samples are listed below. All the geotechnical soil testing work was carried out in accordance with the procedures stipulated in the various sections of BS 1377:1990 "Methods of test for soils for civil engineering purposes" and to UKAS accreditation where applicable and chemical testing carried out in accordance with BRE Special Digest 1:2005 "Concrete in aggressive ground".

Geotechnical soil testing undertaken:

- 19 No. Moisture content
- 8 No. Liquid limit, plastic limit and plasticity index
- 7 No. Particle size distribution by wet sieving
- 7 No. PSD – Sedimentation by Pipette
- 6 No. Suite D (Brownfield site pyrite present)
- 7 No. Organic Matter

Geotechnical Laboratory Test results are presented in Appendix VI.

### 4.3 Geo-Environmental Testing

Geo-Environmental chemical testing was undertaken at Eurofins Chemtest ltd, Coventry. All testing was scheduled by Atkins. The following suites of testing were scheduled:

- 13 No Suite E (Soil)
- 10 No. Suite F (Leachate)
- 4 No Suite H (Water samples)

Chemical Laboratory Test results are presented in Appendix VII.

## 5.0 REFERENCES

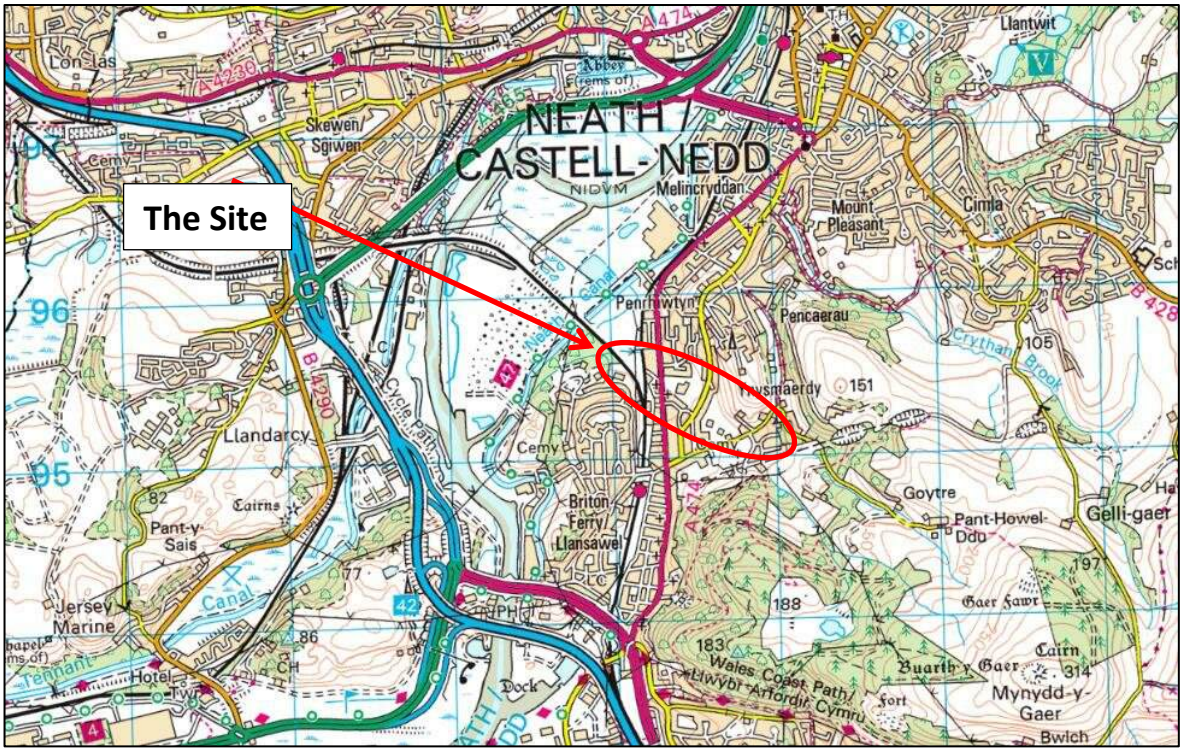
British Geological Survey:

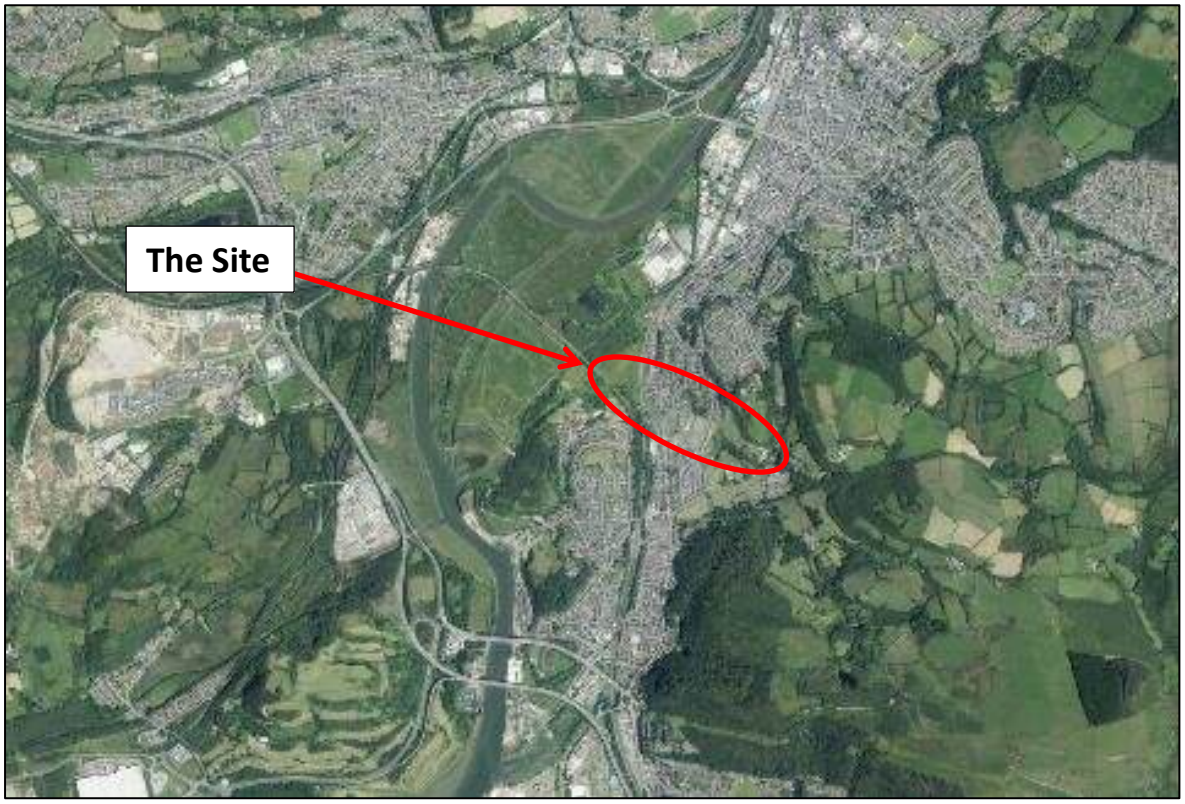
- The British Geological Survey (BGS) sheet 1:50,000 247 (Swansea)
- BGS Geology of Britain Viewer (www.bgs.ac.uk)

Specialist Publications:-

- British Code of Practice BS 5930:2015 *'Code of Practice for Site Investigations'*
- British Code of Practice BS 1377:1990 *'Methods of test for soils for civil engineering purposes'.*
- British Code of Practice BS EN ISO 14688-1:2002+A2:2013 investigation and testing. Identification and classification of soil. Identification and description
- British Code of Practice BS EN ISO 14688-2:2004+A2:2013 Geotechnical investigation and testing. Identification and classification of soil. Principles for a classification.
- British Code of Practice BS EN ISO 14689-1:2003 Ground Investigation and Testing – Identification and classification of rock
- Health and Safety Executive Guidance Note EH40/90
- *CIRIA Report 143* 'The Standard Penetration Test (SPT): Methods and Use', 1995.
- BRE (2005) Special Digest 1:2005, 3rd Edition, Concrete in aggressive ground. BRE, Garston.
- BS 6031: 2009 Code of Practice for Earthworks.
- Workmanship for excavation shall comply with BS 8000: 1989 Part 1, Sections 3.1, 3.2 and 3.3.
- Specification for Highway Works (MCHW 1), Volume 1, Series 600 & Series 800, 2006 with Amendment 2016
- ICE UK Specification for Ground Investigation Second Edition.
- Design Manual for Roads and Bridges: Volume 7 Pavement Design and Maintenance
- Specification for Highways Works Series 600 Earthworks
- Highways Agency Interim Advice Note 73/06, Rev 1 2009, Clause 7.7

# APPENDIX I – **SITE PLANS AND FIGURES**



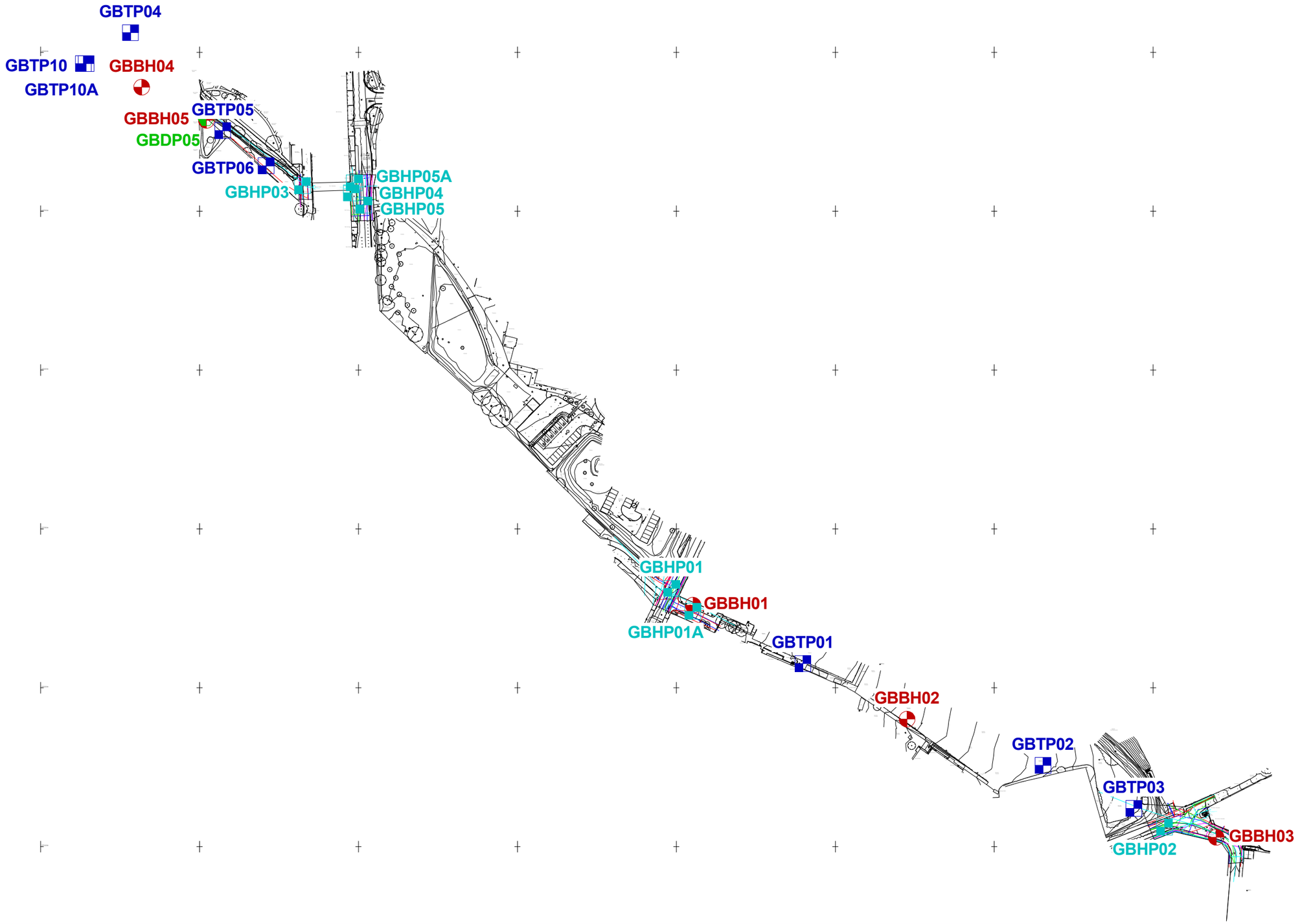




Mapping sourced from www.bing.com

Quantum Geotech
Plas
SA4 0FQ
Tel: 01554 744880
Fax: 01554 776150
Email: enquiries@quantumgeotech.co.uk

**FIGURE 1**

| | |
|---|---|
| **Project:** | **Grandison Brook, Britton Ferry** |
| **Job No:** | **Q0560** |
| **Drawing Title:** | **Site Location Plan** |




Quantum
Plas Newydd
Swansea
Tel: 01554744880
Fax:
Email: enquiries@quantumgeotechnic.co.uk

KEY
Borehole | Trial Pit | Dynamic Probe | In-situ Test
Window Sample | Sampling Point | Historical Borehole

**PROJECT**
**GRANDISON BROOK**

**DRAWING TITLE:**
**EXPLORATORY HOLE LOCATION PLAN**

| JOB NO. | FIGURE NO. |
|---|---|
| Q0560 | 2 |
| DATE | SCALE |
| 07/03/22 | 1:2500 |

# APPENDIX II – **BOREHOLE LOGS**

**Contract : Grandison Brook**

**Client : ATKINS**

**Borehole No.**
**GBBH01**

Dates : 13/7/21 - 13/7/21

Location : Entrance to Llansawel FC

Job Number : Q0560

Engineer : ATKINS

Ground Level : 11.19 m A.O.D.
*Level to Ordnance Datum*

Coordinates: 274510.52 E
195251.98 N
*Co-ordinates to National Grid*

| m B.G.L. | Run Details: Core Run | Run Details: TCR % | Run Details: SCR % | Run Details: RQD % | Fractures: Min Avg Max | Fractures: FI | Insitu Tests: Depth | Insitu Tests: Test Results | Samples: Depth | Samples: Type No. Blows | Strata: Depth (Thick-ness) | Strata: Description | Strata: Legend | Strata: Red. Level A.O.D. | Water |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | 0.10 - 0.30 | B1 | (0.40) | Turf over TOPSOIL: Dark brown sandy slightly gravelly SILT with low cobble content of sandstone and many rootlets. PID @ 0.3mbgl = 2.1ppm | | 10.79 | |
| | | | | | | | | | 0.30 | ES2 | 0.40 | | | | |
| | | | | | | | | | 0.50 | ES3 | (0.30) | | | | |
| | | | | | | | | | 0.50 - 0.70 | B4 | 0.70 | Soft brown sandy gravelly CLAY. Gravel is angular to sub angular fine to coarse sandstone. PID @0.5mbgl = 0.6ppm | | 10.49 | |
| 1 | | | | | | | | | 0.80 - 1.20 | B5 | (0.50) | | | | |
| | 1.20 | | | | | | 1.2 | SPT (S) 50/110mm (8-13-**25-25/35mm**--) | 1.20 | SPTLS ES6 | 1.20 | | | 9.99 | |
| | 1.25 | 0 | | | | | | | 1.50 - 2.50 | D* | (0.40) | | | | |
| 2 | | | | | | | | | | | 1.60 | Very dense orange brown slightly clayey sandy GRAVEL with low cobble content of sandstone. Gravel is angular to sub rounded fine to coarse sandstone. PID @ 1.2mbgl = 0.2ppm | | 9.59 | |
| | | | | | | | 2.5 | SPT (C) 50/15mm (25/10mm-**50/15mm**---) | 2.50 - 3.00 | D* | | **DRILLERS DESCRIPTION (Sampler refused) - Brown clayey sandy Gravel with cobbles. Arisigs logged as: Very dense orange brown slightly clayey sandy GRAVEL. Gravel is angular to sub rounded fine to coarse sandstone. | | | |
| 3 | | | | | | | | | 3.00 - 4.00 | D* | | **DRILLERS DESCRIPTION (sampler and casing refused) - Gravel, cobbles and boulders. Arisings logged as: Very dense grey slightly clayey slightly sandy GRAVEL. Gravel is angular to sub angular fine to coarse sandstone. | | | |
| 4 | | | | | | | | | 4.00 - 5.00 | D* | | | | | |
| | | | | | | | | | | | (6.40) | | | | |
| 5 | | | | | | | | | 5.00 - 6.00 | D* | | | | | |
| 6 | | | | | | | | | 6.00 - 7.00 | D* | | | | | |
| 7 | | | | | | | | | 7.00 - 8.00 | D* | | | | | |
| 8 | | | | | | | | | | | 8.00 | Borehole terminated at 8.0mbgl | | 3.19 | |

**Hole Progress / Water Obs**

| Date / Time | H. Depth | C. Depth | Water |
|---|---|---|---|
| 13/07/2021 15:00 | 8.00 | 2.50 | DRY |

**Casing**

| Depth | Diam. |
|---|---|
| 2.50 | 115.00 |

**Groundwater**

| Struck | Rose To | Behaviour | Sealed |
|---|---|---|---|
| | | No groundwater encountered | |

**Flush**

| Depth | Type | Returns |
|---|---|---|
| 0.00 - 8.00 | Air Mist | |

**Plant:** MC205

**Remarks:** Hole marked out using co-ordinates supplied by client. Area CAT and Genny scanned, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with bentonite pellets with turf at surface. No SPTs beyond 2.5m as unable to case dense material. *Pot sample of arrisings **Drillers Description - Sampler refused, borehole continued by open hole hammer, arisings logged.

Quantum Geotech
Plas Newydd, Llanedi, Pontarddulais, Swansea
SA4 0FQ
Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated |
|---|---|---|---|---|
| GB & GB | A Jones | 1 Of 1 | 8.5 | |

AGS

**Contract : Grandison Brook**

**Client : ATKINS**

**Borehole No. GBBH02**

Dates : 5/7/21 - 5/7/21

Location : Briton Ferry RFC

Job Number : Q0560

Engineer : ATKINS

Ground Level : 15.61 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274645.15 E 195180.25 N *Co-ordinates to National Grid*

| m B.G.L. | Run Details: Core Run | TCR % | SCR % | RQD % | Fractures: Min Avg Max | FI | Insitu Tests: Depth | Test Results | Samples: Depth | Type No. Blows | Strata: Depth (Thick-ness) | Description | Legend | Red. Level A.O.D. | Water |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | 0.10 - 0.30 | B1 | (0.10) | Turf over TOPSOIL: Dark brown slightly gravelly silty Sand. | | 15.51 | |
| | | | | | | | | | 0.30 | ES2 | 0.10 | | | | |
| | | | | | | | | | 0.50 | ES3 | (0.30) | MADE GROUND: Dark brown slightly silty sandy Gravel with low cobble content of sandstone and brick. Gravel is angular to sub angular fine to coarse sandstone and brick with glass. PID @0.3mbgl = 0.1ppm | | 15.21 | |
| | | | | | | | | | 0.50 - 0.70 | B4 | 0.40 | | | | |
| | | | | | | | | | 0.80 - 1.20 | B5 | (0.40) | | | 14.81 | |
| 1 | | | | | | | | | 1.00 | ES6 | 0.80 | | | | |
| | 1.20 | | | | | | 1.2 | SPT (S) 50/190mm (2-2-**3-6-41/40mm**-) | 1.20 | SPTLS | | | | | |
| | | | | | | | | | 1.20 - 2.20 | B7 | | | | | |
| | | 70 | | | | | | | | | (1.40) | Soft gey slightly gravelly sandy SILT with low cobble content of sandstone. PID @0.5mbgl = 1.2ppm | | | |
| 2 | | | | | | | | | | | | Dense orange brown slightly silty sandy GRAVEL with low cobble content of sandstone. Gravel is angular to sub angular fine to coarse sandstone. PID @1.0mbgl = 0.0ppm | | | |
| | | | | | | | | | | | 2.20 | | | 13.41 | |
| | | | | | | | 2.5 | SPT (C) 50/175mm (5-8-**5-10-35/25mm**-) | 2.50 - 4.00 | D* | | **DRILLERS DESCRIPTION** (Sampler refused) Sandy Gravel with cobbles and boulders. Arisings logged as dense grey brown slightly silty sandy GRAVEL. Gravel is angular to sub rounded fine to coarse sandstone. | | | |
| 3 | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 4 | | | | | | | 4 | SPT (C) 50/90mm (14-11/5mm-**31-19/15mm**--) | 4.00 - 5.50 | D* | (3.30) | | | | |
| | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | |
| | 5.50 | | | | | | 5.5 | SPT (C) 30 (9-10-**7-7-6-10**) | 5.50 - 6.10 | B8 | 5.50 | Dense orange brown slightly silty sandy GRAVEL with low cobble content of sandstone. Gravel is angular to sub angular fine to coarse sandstone. | | 10.11 | |
| | | 83 | | | | | | | | | (0.60) | | | | |
| 6 | | | | | | | | | 6.10 - 7.00 | D* | 6.10 | **DRILLERS DESCRIPTION** (Sampler refused) Sandy Gravel with cobbles and boulders. Arisings logged as Dense grey brown slightly silty sandy GRAVEL. Gravel is angular to sub rounded fine to coarse sandstone. | | 9.51 | |
| | | | | | | | | | | | (0.90) | | | | |
| 7 | 7.00 | | | | | | 7 | SPT (C) 50/4mm (25/2mm-**50/4mm**---) | 7.00 - 8.00 | B9 | 7.00 | Dense orange brown slightly silty sandy GRAVEL with low cobble content of sandstone. Gravel is angular to sub angular fine to coarse sandstone. | | 8.61 | |
| | | 60 | | | | | | | | | (1.00) | | | | |
| 8 | 8 | | | | | | 8 | SPT (C) 50/260mm (18-7/20mm-**15-12-12-11/35mm**) | | | 8.00 | Borehole terminated at 8.0mbgl | | 7.61 | |

**Hole Progress / Water Obs**

| Date / Time | H. Depth | C. Depth | Water |
|---|---|---|---|
| 05/07/2021 15:30 | 8.00 | 8.00 | DRY |

**Casing**

| Depth | Diam. |
|---|---|
| 8.00 | 115.00 |

**Groundwater**

| Struck | Rose To | Behaviour | Sealed |
|---|---|---|---|
| | | No groundwater encountered | |

**Flush**

| Depth | Type | Returns |
|---|---|---|
| 1.20 - 8.00 | Air Mist | |

**Plant:** MC205 tracked rig

**Remarks:** Hole marked out using co-ordinates supplied by client. Area CAT and Genny scanned, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with bentonite pellets with turf at surface.

*Pot sample of arrisings

**Drillers Description - Sampler refused, borehole continued by ODEX, arisings logged.

Quantum Geotech
Unit 1 Mayfield, Llanrhidian, Penmaenderas, Swansea
SA4 0FQ
Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

| Operator: | Logged By: | Sheet No. | m Per Page | |
|---|---|---|---|---|
| GB & GB | A Jones | 1 Of 1 | 8.5 | All measurements in metres unless otherwise stated |

AGS

**Contract : Grandison Brook**

**Client : ATKINS**

**Borehole No. GBBH03**

Dates : 12/7/21 - 12/7/21

Location : Ynysmaerdy Road / Pant howel Ddu Junction

Job Number : Q0560

Engineer : ATKINS

Ground Level : 22.90 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274839.63 E 195105.88 N *Co-ordinates to National Grid*

| m B.G.L. | Run Details: Core Run | TCR % | SCR % | RQD % | Fractures: Min Avg Max | FI | Insitu Tests: Depth | Test Results | Samples: Depth | Type No. Blows | Strata: Depth (Thick-ness) | Description | Legend | Red. Level A.O.D. | Water |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | 0.10 - 0.20 | B1 | (0.08) | TARMAC | | 22.82 | |
| | | | | | | | | | 0.15 | ES2 | 0.08 | MADE GROUND: Pale reddish brown slightly silty slightly sandy Gravel. Gravel is angular fine to coarse slag. PID @0.15mbgl = 7.2ppm | | 22.70 | |
| | | | | | | | | | 0.50 | ES3 | (0.12) | | | | |
| | | | | | | | | | 0.50 - 0.70 | B4 | 0.20 | MADE GROUND: Dark grey silty slightly sandy Gravel with low cobble content sandstone. Gravel is angular to sub angular fine to coarse sandstone and siltstone with rare angular fine to medium coal and ash. PID @0.5mbgl = 4.2ppm | | 22.20 | |
| | | | | | | | | | 0.80 - 1.20 | B5 | (0.50) | | | | |
| 1 | | | | | | | | | 1.10 | ES6 | 0.70 | | | | |
| | 1.20 | | | | | | 1.2 | SPT (S) 21 (4-6-**5-4-5-7**) | 1.20 | SPTLS | (0.55) | | | | |
| | | | | | | | | | 1.50 - 2.20 | B7 | 1.25 | | | 21.65 | |
| | | 80 | | | | | | | | | (0.95) | | | | |
| 2 | | | | | | | | | | | | Brown sandy slightly gravelly SILT. PID @1.1mbgl =0.2ppm | | | |
| | | | | | | | | | 2.20 - 2.50 | D* | 2.20 | | | 20.70 | 1 |
| | 2.50 | | | | | | 2.5 | SPT (S) 46 (5-9-**9-15-12-10**) | 2.50 | SPTLS | (0.30) | Medium dense orange brown slightly silty sandy GRAVEL with low cobble content of sandstone. Gravel is angular to sub rounded fine to coarse sandstone and siltstone. | | 20.40 | |
| | | | | | | | | | 2.50 - 3.40 | B8 | 2.50 | | | | |
| 3 | | 100 | | | | | | | | | (0.90) | | | | |
| | | | | | | | | | | | 3.40 | **DRILLERS DESCRIPTION (Sampler refused): Grey sandy Gravel with cobbles Arisings logged as: Medium dense grey slightly silty sandy GRAVEL. Gravel is angular to sub rounded fine to coarse sandstone. | | 19.50 | |
| 4 | | | | | | | 4 | SPT (S) 50/190mm (7-11-**12-22-16/40mm**-) | 4.00 | SPTLS | | | | | |
| | | | | | | | | | 4.00 - 5.50 | D* | | | | | |
| | | | | | | | | | | | (2.10) | Medium dense grey slightly silty sandy GRAVEL with low cobble content of sandstone. Gravel is sub angular to sub rounded fine to coarse sandstone. | | | |
| 5 | | | | | | | | | | | | **DRILLERS DESCRIPTION (Sampler refused): Grey sandy Gravel with cobbles Arisings logged as: Dense grey slightly silty sandy GRAVEL. Gravel is angular to sub rounded fine to coarse sandstone. | | | |
| | 5.50 | | | | | | 5.5 | SPT (S) 36 (2-9-**11-9-8-8**) | 5.50 | SPTLS | 5.50 | | | 17.40 | |
| | | | | | | | | | 5.50 - 6.40 | B9 | (0.90) | | | | |
| 6 | | 56 | | | | | | | | | | Medium dense grey slightly silty sandy GRAVEL with low cobble content of sandstone. Gravel is sub angular to sub rounded fine to coarse sandstone. | | | |
| | | | | | | | | | 6.40 - 7.00 | D* | 6.40 | | | 16.50 | |
| | | | | | | | | | | | (0.60) | **DRILLERS DESCRIPTION (Sampler refused): Grey sandy Gravel with cobbles Arisings logged as: Medium dense grey slightly silty sandy GRAVEL. Gravel is angular to sub rounded fine to coarse sandstone. | | | |
| 7 | 7.00 | | | | | | 7 | SPT (S) 34 (6-4-**6-9-9-10**) | 7.00 | SPTLS | 7.00 | | | 15.90 | |
| | | | | | | | | | 7.00 - 7.50 | B10 | (0.60) | | | | |
| | | 70 | | | | | | | | | 7.60 | | | 15.30 | |
| | | | | | | | | | | | (0.40) | Medium dense grey slightly silty sandy GRAVEL with low cobble content of sandstone. Gravel is sub angular to sub rounded fine to coarse sandstone. | | | |
| 8 | 8 | | | | | | 8 | SPT (S) 45 (11-9-**12-10-12-11**) | 7.90 - 8.00 | D11 | 8.00 | | | 14.90 | |
| | | | | | | | | | 8.00 | SPTLS | | | | | |

## Hole Progress / Water Obs

| Date / Time | H. Depth | C. Depth | Water |
|---|---|---|---|
| 12/07/2021 15:00 | 8.00 | 7.00 | |

## Casing

| Depth | Diam. |
|---|---|
| 7.00 | 115.00 |

## Groundwater

| Struck | Rose To | Behaviour | Sealed |
|---|---|---|---|
| 2.50 | 2.30 | Medium groundwater ingress at 2.5mbgl | |

## Flush

| Depth | Type | Returns |
|---|---|---|
| 0.00 - 7.50 | Air | |

**Plant:** MC205

**Remarks:** Hole marked out using co-ordinates supplied by client. Area CAT and Genny scanned, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with bentonite pellets with concrete to 0.1mbgl and Tarmac to surface.
**Drillers Description - Sampler refused, borehole continued by ODEX, arisings logged.

Quantum Geotech
Plas Newydd, Llanedi, Pontarddulais, Swansea SA4 0FQ
Tel: 01554 744880
email: enquieries@quantumgeotech.co.uk

| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| GB & AJ | A Jones | 1 Of 2 | 8.5 | All measurements in metres unless otherwise stated |

AGS

**Contract :** Grandison Brook

**Client :** ATKINS

**Borehole No.** GBBH03

Dates : 12/7/21 - 12/7/21

Location : Ynysmaerdy Road / Pant howel Ddu Junction

Job Number : Q0560

Engineer : ATKINS

Ground Level : 22.90 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274839.63 E 195105.88 N *Co-ordinates to National Grid*

| m B.G.L. | Run Details: Core Run | TCR % | SCR % | RQD % | Fractures: Min Avg Max | FI | Insitu Tests: Depth | Test Results | Samples: Depth | Type No. Blows | Strata: Depth (Thick-ness) | Description | Legend | Red. Level A.O.D. | Water |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | | | | | | | | | | | | Medium Dense dark grey slightly silty slightly gravelly SAND. Sand is fine to coarse. | | | |
| | | | | | | | | | | | | Borehole terminated at 8.0mbgl | | | |
| 10 | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | |

| Hole Progress / Water Obs | | | | Casing | | Groundwater | | | | Flush | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date / Time | H. Depth | C. Depth | Water | Depth | Diam. | Struck | Rose To | Behaviour | Sealed | Depth | Type | Returns |
| | | | | | | | | | | | | |

**Plant:** MC205

**Remarks:** Hole marked out using co-ordinates supplied by client. Area CAT and Genny scanned, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with bentonite pellets with concrete to 0.1mbgl and Tarmac to surface.
**Drillers Description - Sampler refused, borehole continued by ODEX, arisings logged.

Quantum Geotech
Plas Newydd, Llanedi, Pontarddulais, Swansea
SA4 0FQ
Tel: 01554 744880
email: enquieries@quantumgeotech.co.uk

| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| GB & AJ | A Jones | 2 Of 2 | 8.5 | All measurements in metres unless otherwise stated |

AGS

**Contract : Grandison Brook**

**Client : ATKINS**

**Borehole No. GBBH04**

Dates : 15/11/21 - 15/11/21

Location : Land west of railway line

Job Number : Q0560

Engineer : ATKINS

Ground Level : 4.99 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274163.57 E 195578.11 N *Co-ordinates to National Grid*

| m B.G.L. | Run Details: Core Run | TCR % | SCR % | RQD % | Fractures: Min Avg Max | FI | Insitu Tests: Depth | Test Results | Samples: Depth | Type No. Blows | Strata: Depth (Thick-ness) | Description | Legend | Red. Level A.O.D. | Water | Install/ Backfill |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | (0.20) | TOPSOIL: Black sandy clayey SILT with rootlets. | | 4.79 | | |
| | | | | | | | | | 0.50 | ES1 | 0.20 | Soft grey slightly silty slightly sandy CLAY. | | | | |
| | | | | | | | | | 0.50 - 1.00 | B2 | (0.80) | PID @ 0.5mbgl = 0.0ppm | | | | |
| 1 | 1.20 | | | | | | 1.2 | SPT (S) 8 (2-1-**2-2-2-2**) | 1.20 | ES3 | 1.00 | Soft grey slightly silty slightly sandy slightly gravelly CLAY. | | 3.99 | ▼ | |
| | | | | | | | | | 1.20 - 1.70 | B5 | (0.70) | PID @ 0.5mbgl = 0.0ppm | | | | |
| | | 73 | | | | | | | 1.80 - 2.00 | B6 | 1.70 | Brown PEAT | | 3.29 | | |
| 2 | | | | | | | | | 2.10 - 2.30 | D7 | (0.40) | | | | | |
| | | | | | | | | | | | 2.10 | Soft grey slightly sandy slightly gravelly organic CLAY | | 2.89 | | |
| | 2.70 | 0 | | | | | 2.7 | SPT (S) 33 (7-3-**3-4-9-17**) | | | (0.20) | | | 2.69 | | |
| 3 | | | | | | | | | | | 2.30 | ** DRILLERS DESCRIPTION: Sandy GRAVEL with cobbles Arrisings logged as: Medium dense brownish grey slightly silty sandy GRAVEL. Gravel is angular to sub rounded fine to coarse sandstone. | | | | |
| | | | | | | | | | | | (1.90) | | | | | |
| 4 | 4.20 | | | | | | 4.2 | SPT (S) 50/23mm (25-**50/23mm**---) | 4.20 - 5.00 | B8 | 4.20 | Dense brownish grey slightly silty sandy GRAVEL. Gravel is sub angular to sub rounded fine to coarse sandstone. | | 0.79 | | |
| | | 38 | | | | | | | | | (0.80) | | | | | |
| 5 | | | | | | | | | | | 5.00 | ** DRILLERS DESCRIPTION: Sandy GRAVEL with cobbles Arrisings logged as: Dense brownish grey slightly silty sandy GRAVEL. Gravel is angular to sub rounded fine to coarse sandstone. | | -0.01 | ▼ | |
| | 5.70 | 0 | | | | | 5.7 | SPT (S) 50/10mm (4-20-**38/10mm-12/mm**--) | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | (3.00) | | | | | |
| 7 | | | | | | | | | | | | | | | | |
| | 7.20 7.25 | 0 | | | | | 7.2 | SPT (S) 50/10mm (9-16-**45/10mm-5/mm**--) | | | | | | | | |
| 8 | | | | | | | 8 | SPT (S) 50/5mm (11-14-**26/5mm-20/mm-4/mm**-) | | | 8.00 | Borehole terminated at scheduled depth, 8.0mbgl | | -3.01 | | |

## Hole Progress / Water Obs

| Date / Time | H. Depth | C. Depth | Water |
|---|---|---|---|
| 15/11/2021 14:00 | 8.00 | 8.00 | |

## Casing

| Depth | Diam. |
|---|---|
| 8.00 | 115.00 |

## Groundwater

| Struck | Rose To | Behaviour | Sealed |
|---|---|---|---|
| 1.20 | | Slow groundwater ingress at base of pit, 1.2mbgl; | |
| 5.70 | | Fast ground water ingress at 5.7mbgl | |

## Flush

| Depth | Type | Returns |
|---|---|---|
| | | |

**Plant:** Commachio 205

**Remarks:** Hole marked out with client. Area CAT and Genny scanned, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with bentonite pellets with turf at surface.

*Pot sample of arrisings

**Drillers Description - Sampler refused, borehole continued by open hole hammer, arisings logged.

Quantum Geotech
Unit 4 Mayfield, Llanrhidian, Penmaenderas, Swansea
SA4 0FQ
Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

| Operator: | Logged By: | Sheet No. | m Per Page | |
|---|---|---|---|---|
| M OB & DJ | A Jones | 1 Of 1 | 8.5 | All measurements in metres unless otherwise stated |

AGS

**Contract : Grandison Brook**

**Client : ATKINS**

**Borehole No. GBBH05**

Dates : 6/7/21 - 7/7/21

Location : Land to rear of Farm Rd.

Job Number : Q0560

Engineer : ATKINS

Ground Level : 5.79 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274204.33 E 195557.24 N *Co-ordinates to National Grid*

| m B.G.L. | Run Details: Core Run | TCR % | SCR % | RQD % | Fractures: Min Avg Max | FI | Insitu Tests: Depth | Test Results | Samples: Depth | Type No. Blows | Strata: Depth (Thick-ness) | Description | Legend | Red. Level A.O.D. | Water | Install/ Backfill |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | 0.10 | D1 | (0.35) | Turf over TOPSOIL: Brown slightly gravelly clayey Sand with many rootletts. PID @0.3mbgl = 0.0ppm | | | | |
| | | | | | | | | | 0.30 | ES2 | 0.35 | | | 5.44 | | |
| | | | | | | | | | 0.50 | ES3 | (0.35) | | | | | |
| | | | | | | | | | 0.50 - 0.60 | B4 | 0.70 | MADE GROUND: Dark brown sandy slightly gravelly Clay with low cobble content of brick and plastic. PID @0.5mbgl = 2.7ppm | | 5.09 | | |
| 1 | | | | | | | | | 0.80 - 1.20 | B5 | | | | | | |
| | | | | | | | | | 1.00 | ES6 | | | | | | |
| | 1.20 | | | | | | 1.2 | SPT (S) 2 (1-0-**1-0-1-0**) | 1.20 | SPTLS | | | | | | |
| | | | | | | | | | 1.20 - 1.80 | B7 | (1.30) | | | | | |
| | | 77 | | | | | | | | | | MADE GROUND: Black silty slightly sandy Gravel with low cobble content of siltstone, brick and slag. Gravel is angular to sub angular fine to coarse siltstone, sandstone, ash, slag, brick and concrete, angular fine to medium coal with glass bottles and plastic PID @1.0mbgl = 5.6ppm | | | | |
| 2 | | | | | | | | | 2.00 - 2.50 | B8 | 2.00 | | | 3.79 | | |
| | | | | | | | | | 2.30 | ES9 | (0.50) | | | | | |
| | 2.50 | | | | | | 2.5 | SPT (S) 2 (1-0-**1-0-1-0**) | 2.50 | SPTLS | 2.50 | | | 3.29 | | |
| | | | | | | | | | 2.80 | 10 | | | | | | |
| 3 | | | | | | | | | 3.00 - 4.00 | B11 | | Very soft dark brown slightly sandy slightly gravelly organic CLAY. PID @2.3mbgl = 1.8ppm | | | | |
| | | 67 | | | | | | | | | | | | | 1 | |
| | | | | | | | | | | | (2.70) | Very soft brown very fibrous PEAT. | | | | |
| 4 | 4.00 | | | | | | 4 | SPT (S) 26 (25-**12-6-4-4**) | 4.00 | SPTLS | | | | | 1 | |
| | | | | | | | | | 4.20 | D12 | | | | | | |
| | | | | | | | | | 4.50 - 5.00 | B13 | | | | | | |
| | | 73 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | 5.20 - 5.50 | B12 | 5.20 | Soft brown slightly clayey sandy SILT. | | 0.59 | | |
| | 5.5 | | | | | | | | 5.50 - 6.00 | D* | (0.30) | | | | | |
| | | | | | | | | | | | 5.50 | **DRILLERS DESCRIPTION** SAND and Gravel with cobbles. Arisings logged as Brown grey SAND and GRAVEL. Sand is fine to coarse. Gravel is angular to sub rounded fine to coarse sandstone. | | 0.29 | | |
| 6 | | | | | | | | | 6.00 - 7.00 | D* | (1.50) | | | | | |
| 7 | | | | | | | | | | | 7.00 | Borehole terminated at 7.0mbgl due to sand rising up casing blocking equipment. GBDP05 carried out adjacent to borehole as instructed by engineer. | | -1.21 | | |
| 8 | | | | | | | | | | | | | | | | |

## Hole Progress / Water Obs

| Date / Time | H. Depth | C. Depth | Water |
|---|---|---|---|
| 06/07/2021 16:00 | 5.00 | 7.00 | 3.60 |

## Casing

| Depth | Diam. |
|---|---|
| 7.00 | 115.00 |

## Groundwater

| Struck | Rose To | Behaviour | Sealed |
|---|---|---|---|
| 4.00 | 3.60 | Medium groundwater ingress at 4.0mbgl | 4.00 |

## Flush

| Depth | Type | Returns |
|---|---|---|
| 0.00 - 7.00 | Air Mist | |

**Plant:** MC205 tracked rig

**Remarks:** Hole marked out using co-ordinates supplied by client. Area CAT and Genny scanned, STATS plans checked and permit to excavate issued by QGL. Hole terminated due to sand blowing back inside casing. On completion hole installed as required by engineer.

*Pot sample of arrisings

**Drillers Description - Sampler refused, borehole continued by ODEX, arisings logged.

Quantum Geotech
Unit 1 Mayfield, Llanelli, Pontarddulais, Swansea
SA4 0FQ
Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

| Operator: | Logged By: | Sheet No. | m Per Page | |
|---|---|---|---|---|
| GB & GB | A Jones | 1 Of 1 | 8.5 | All measurements in metres unless otherwise stated |

AGS

**Contract : Grandison Brook**

**Client : ATKINS**

**Dynamic Probe**
**GBDP05**

Dates : 7/7/21 - 7/7/21

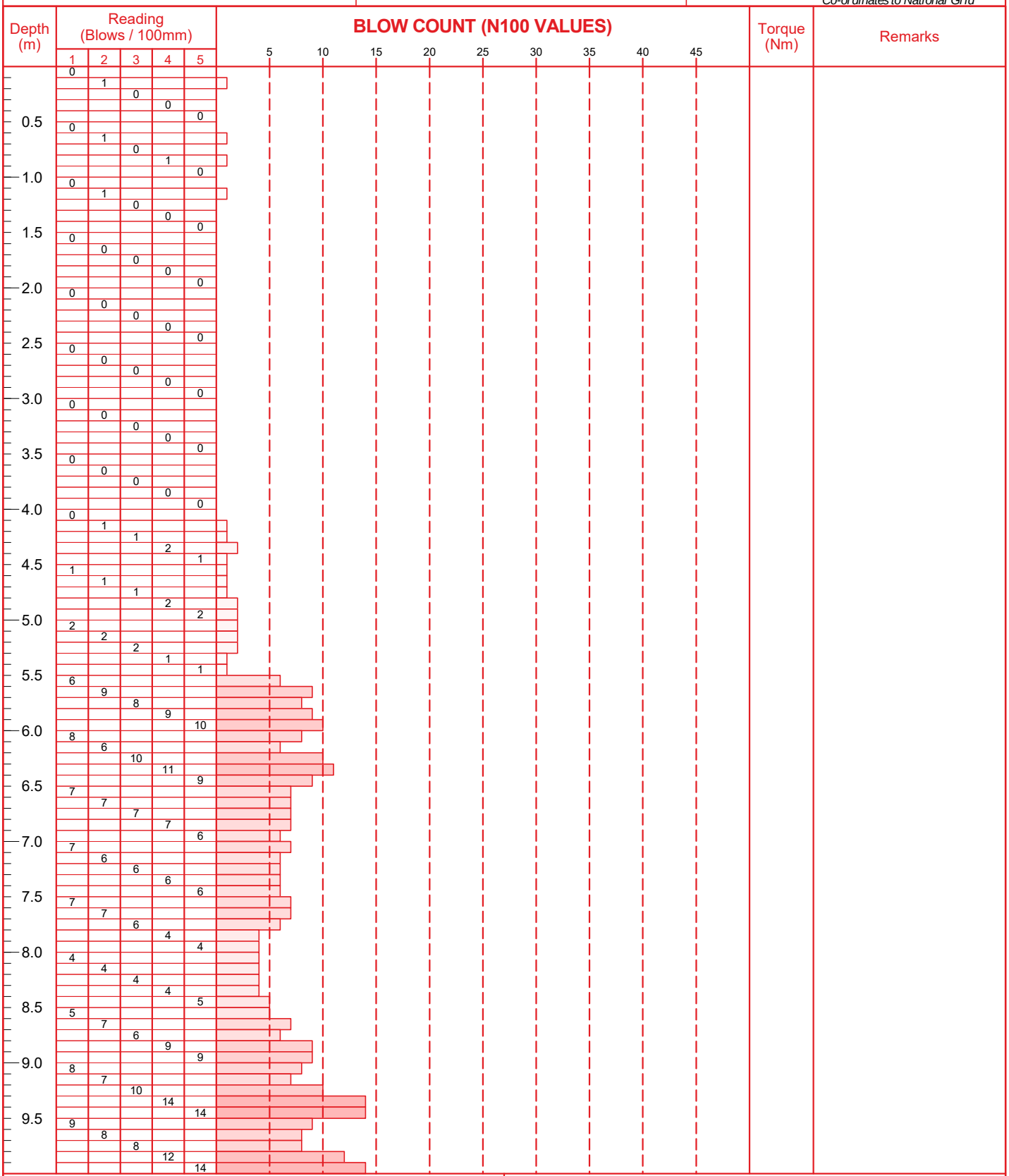
Location : Land to rear of Farm Rd.

Job Number : Q0560

Engineer : ATKINS

Ground Level : 5.67 m A.O.D.
*Level to Ordnance Datum*

Coordinates: 274203.96 E
195558.19 N
*Co-ordinates to National Grid*




**Equipment:** Dando Terrier

Test carried out in accordance with BS 1377 (1990):Part 9, Sect.3.2

**Comments:** Hole positioned adjacent to GBBH05. Area CAT and Genny scanned, STATS plans checked and permit to excavate issued by QGL. Test carried out to provide test data to area rotary drilling failed.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Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk


| Operator | Logged By | Sheet No. | m Per Page | |
|---|---|---|---|---|
| GB | A Jones | 1 Of 2 | 10 | All measurements in metres unless otherwise stated |

AGS

**Contract : Grandison Brook**

**Client : ATKINS**

**Dynamic Probe**
**GBDP05**

Dates : 7/7/21 - 7/7/21

Location : Land to rear of Farm Rd.

Job Number : Q0560

Engineer : ATKINS

Ground Level : 5.67 m A.O.D.
*Level to Ordnance Datum*

Coordinates: 274203.96 E
195558.19 N
*Co-ordinates to National Grid*

| Depth (m) | Reading (Blows / 100mm) 1 | 2 | 3 | 4 | 5 | BLOW COUNT (N100 VALUES) 5 10 15 20 25 30 35 40 45 | Torque (Nm) | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 15 | | | | | | | |
| 10.5 | | | | | | | | |
| 11.0 | | | | | | | | |
| 11.5 | | | | | | | | |
| 12.0 | | | | | | | | |
| 12.5 | | | | | | | | |
| 13.0 | | | | | | | | |
| 13.5 | | | | | | | | |
| 14.0 | | | | | | | | |
| 14.5 | | | | | | | | |
| 15.0 | | | | | | | | |
| 15.5 | | | | | | | | |
| 16.0 | | | | | | | | |
| 16.5 | | | | | | | | |
| 17.0 | | | | | | | | |
| 17.5 | | | | | | | | |
| 18.0 | | | | | | | | |
| 18.5 | | | | | | | | |
| 19.0 | | | | | | | | |
| 19.5 | | | | | | | | |

**Equipment:** Dando Terrier

Test carried out in accordance with BS 1377 (1990):Part 9, Sect.3.2

**Comments:** Hole positioned adjacent to GBBH05. Area CAT and Genny scanned, STATS plans checked and permit to excavate issued by QGL. Test carried out to provide test data to area rotary drilling failed.

Quantum Geotech
Plas Newydd, Llanedi, Pontarddulais, Swansea
SA4 0FQ
Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated | AGS |
|---|---|---|---|---|---|
| GB | A Jones | 2 Of 2 | 10 | | |

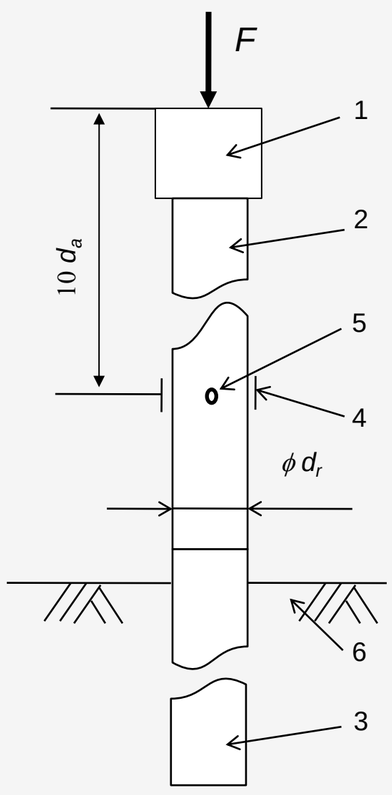
# SPT Calibration Report

## Hammer Energy Measurement Report

| | | |
|---|---|---|
| **Type of Hammer** | | SPT HAMMER |
| **Test No** | | EQU2808 |
| **Client** | | QUANTUM GEOTECHNIC |
| **Test Depth (m)** | | 9.80 |
| **Mass of hammer** | $m$ = | 63.5kg |
| **Falling height** | $h$ = | 0.76m |
| $E_{theor}$ = | $m \times g \times h$ = | 473J |

## Characteristics of the instrumented rod

| | | |
|---|---|---|
| **Diameter** | $d_r$ = | 0.052 m |
| **Length of instrumented rod** | | 0.558 m |
| **Area** | A = | 11.61 cm² |
| **Modulus** | $E_a$ = | 206843 MPa |




**Key**

1 Anvil
2 Part of instrumented rod
3 Drive Rod
4 Strain Gauge
5 Accelerometer
6 Ground

$F$ Force
$d_r$ Diameter of rod

Fig. B.1 and B.2
BS EN ISO 22476-3 : 2005 + A1 : 2011

| DATE OF TEST | VALID UNTIL | HAMMER ID |
|---|---|---|
| 21/04/2021 | 21/04/2022 | Q2 AR830 |

$E_{meas}$ = **0.320** kN-m

$E_{theor}$ = **0.473** kN-m

Comments

**Energy Ratio (Er)** = $\frac{E_{meas}}{E_{theor}}$ **67.69%**

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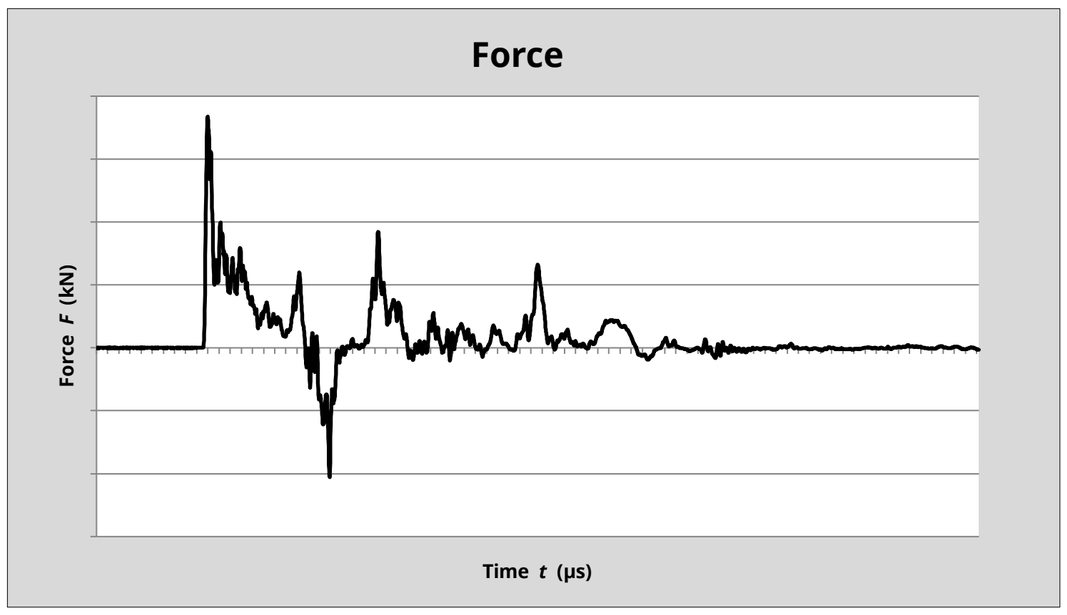


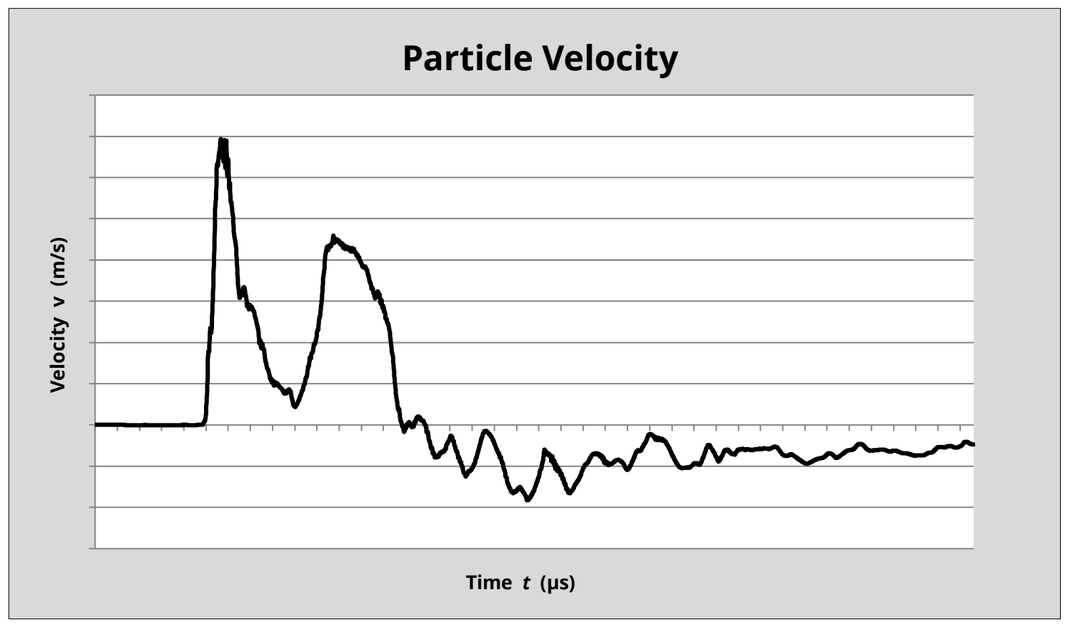


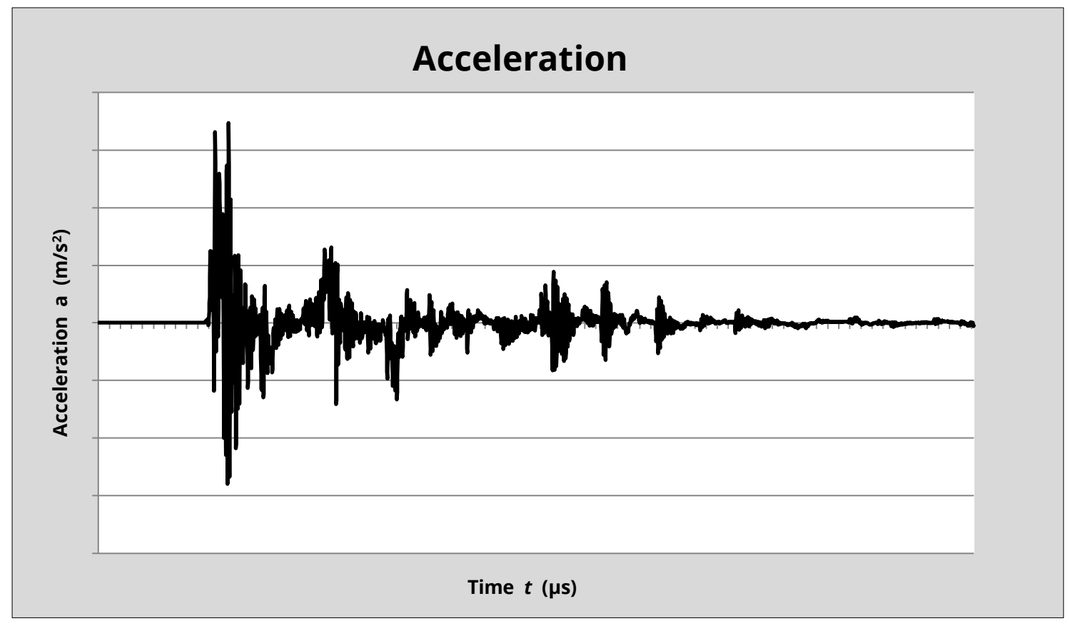


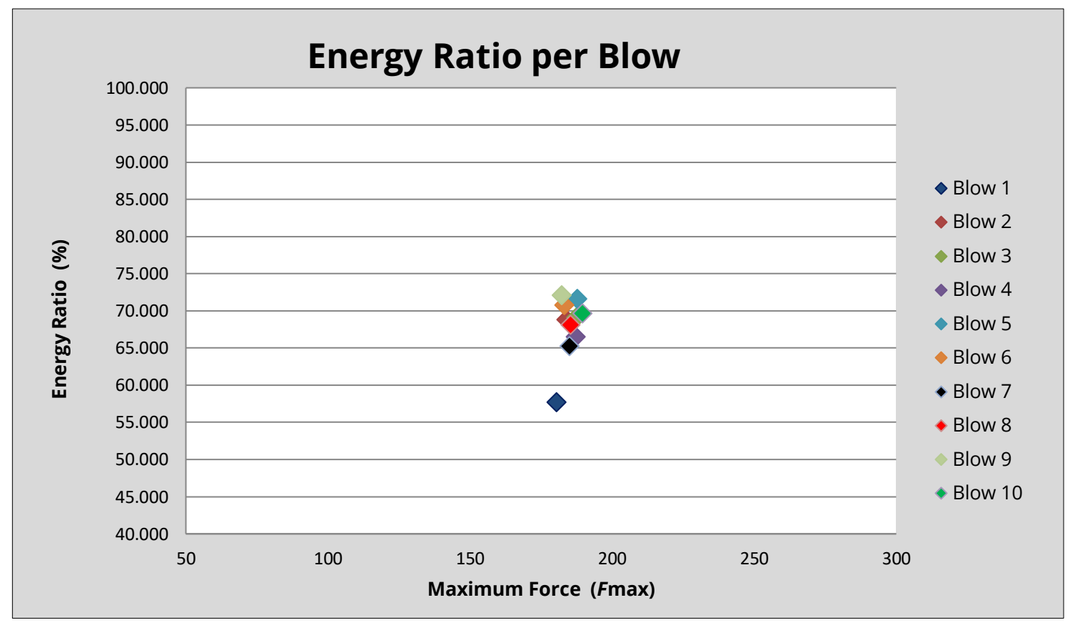


| Equipe SPT Analyzer Operator | Certificate prepared by | Certificate checked by | Certificate date |
|---|---|---|---|
| JL | 27/04/2021 | 27/04/2021 | 27/04/2021 |

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Tel: +44 (0)1295 670990 Fax: +44 (0)1295 678232 Email: info@equipegroup.com

# SPT Calibration Report

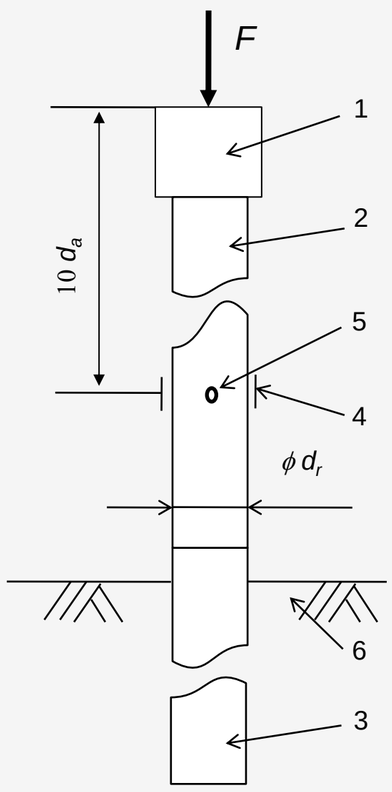
## Hammer Energy Measurement Report

| | |
|---|---|
| **Type of Hammer** | TERRIER |
| **Test No** | EQU2635 |
| **Client** | QUANTUM GEOTECH |

| | | |
|---|---|---|
| **Test Depth (m)** | | 9.60 |
| **Mass of hammer** | $m$ = | 63.5kg |
| **Falling height** | $h$ = | 0.76m |
| $E_{theor}$ = | $m \times g \times h$ = | 473J |

## Characteristics of the instrumented rod

| | | |
|---|---|---|
| **Diameter** | $d_r$ = | 0.052 m |
| **Length of instrumented rod** | | 0.558 m |
| **Area** | A = | 11.61 cm² |
| **Modulus** | $E_a$ = | 206843 MPa |




**Key**

1 Anvil
2 Part of instrumented rod
3 Drive Rod
4 Strain Gauge
5 Accelerometer
6 Ground

$F$ Force
$d_r$ Diameter of rod

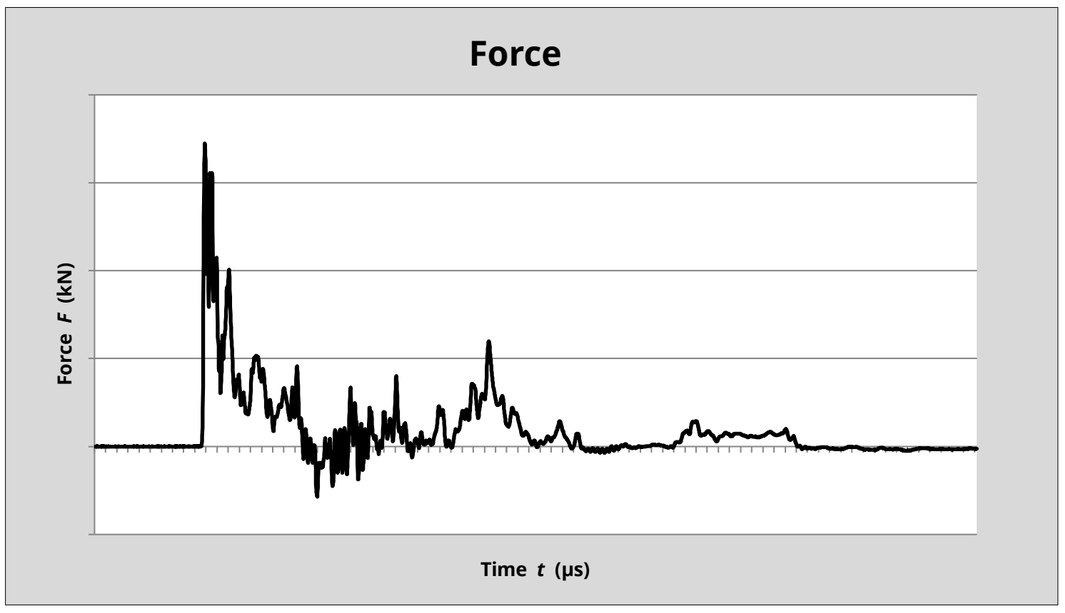
Fig. B.1 and B.2
BS EN ISO 22476-3 : 2005 + A1 : 2011

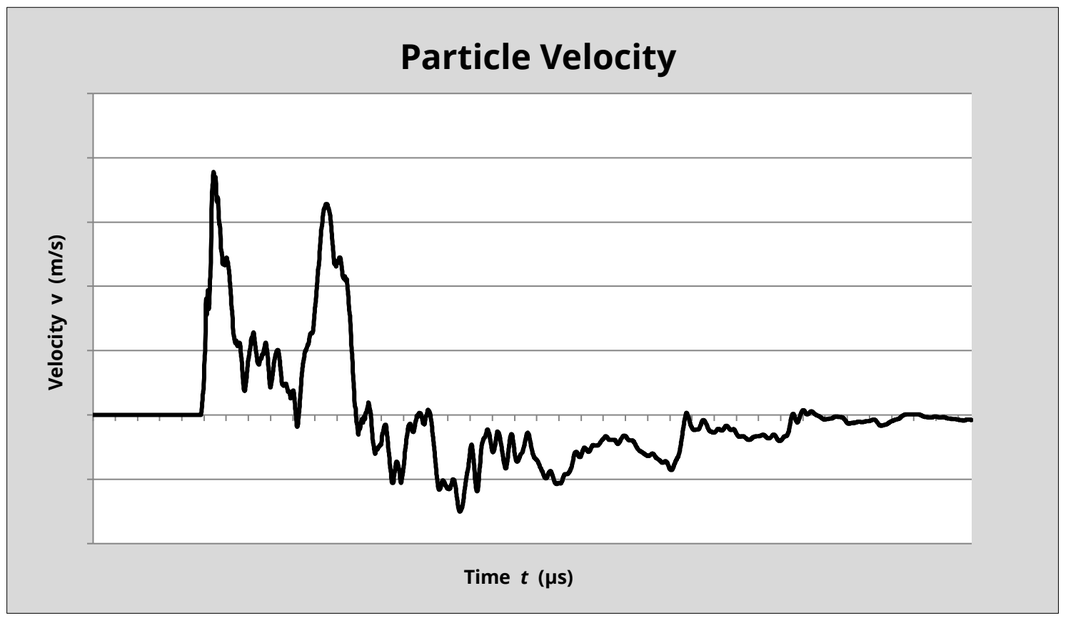
| DATE OF TEST | VALID UNTIL | HAMMER ID |
|---|---|---|
| 23/10/2020 | 23/10/2021 | DT/13137 |

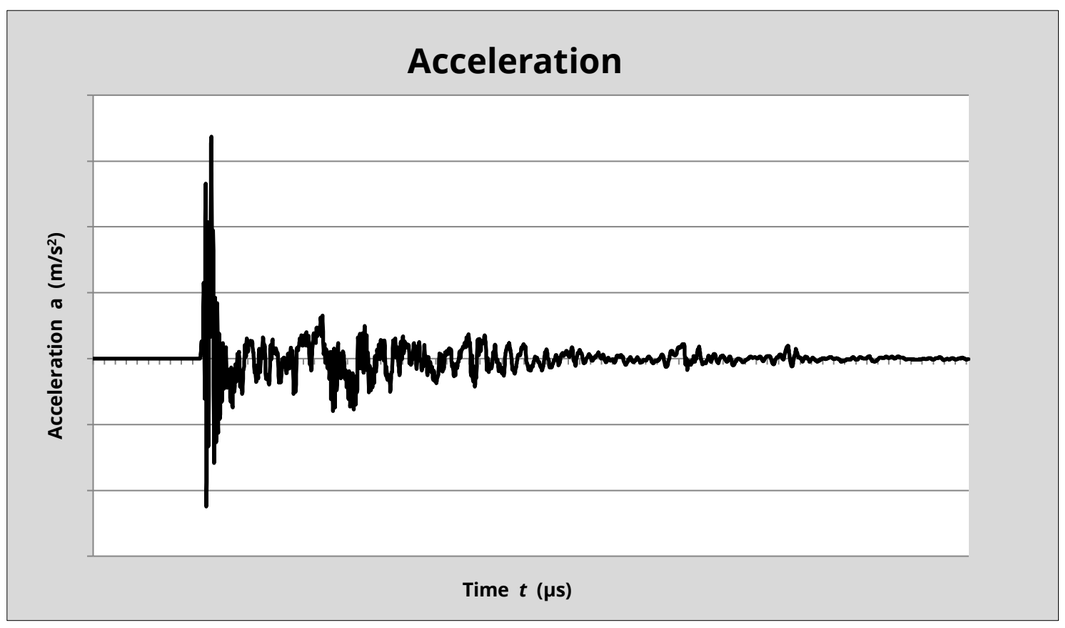
$E_{meas}$ = **0.338** kN-m

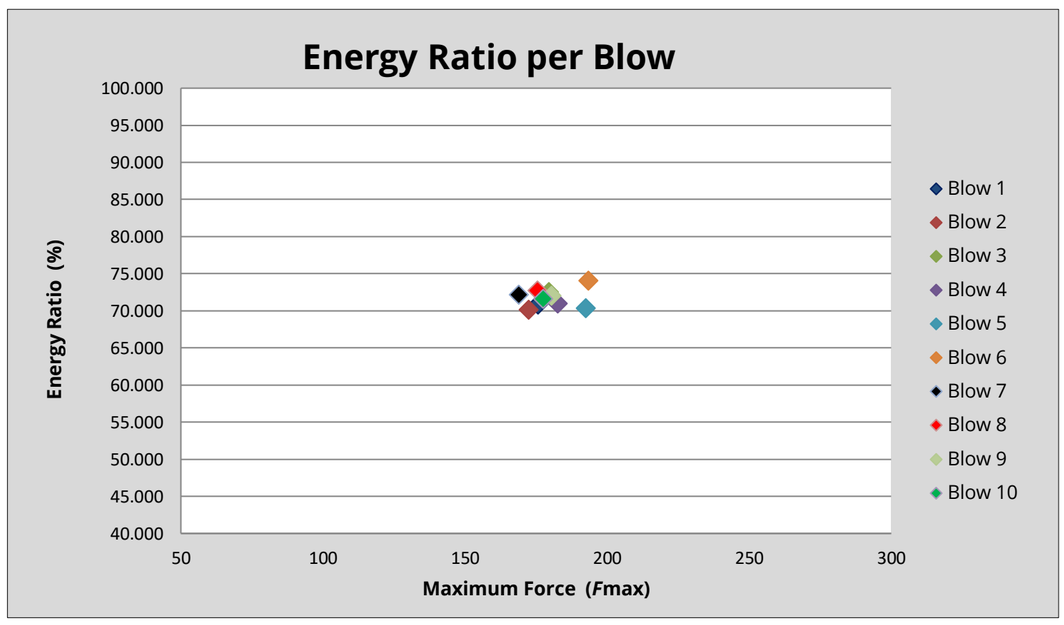
$E_{theor}$ = **0.473** kN-m

Comments




**Energy Ratio (Er) =** $\frac{E_{meas}}{E_{theor}}$ **71.45%**

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| Equipe SPT Analyzer Operator | Certificate prepared by | Certificate checked by | Certificate date |
|---|---|---|---|
| AF | | | 23/10/2020 |

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Tel: +44 (0)1295 670990 Fax: +44 (0)1295 678232 Email: info@equipegroup.com

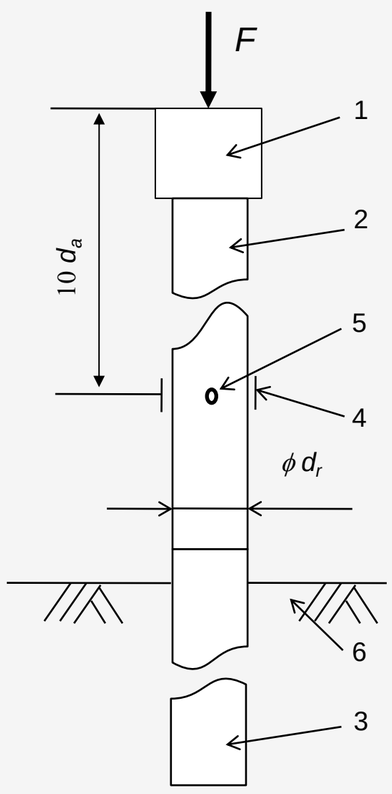
# SPT Calibration Report

## Hammer Energy Measurement Report

| | | |
|---|---|---|
| **Type of Hammer** | | SPT HAMMER |
| **Test No** | | EQU2811 |
| **Client** | | QUANTUM GEOTECHNIC |
| **Test Depth (m)** | | 9.80 |
| **Mass of hammer** | $m$ = | 63.5kg |
| **Falling height** | $h$ = | 0.76m |
| $E_{theor}$ = | $m \times g \times h$ = | 473J |

## Characteristics of the instrumented rod

| | | |
|---|---|---|
| **Diameter** | $d_r$ = | 0.052 m |
| **Length of instrumented rod** | | 0.558 m |
| **Area** | A = | 11.61 cm² |
| **Modulus** | $E_a$ = | 206843 MPa |




**Key**

1 Anvil
2 Part of instrumented rod
3 Drive Rod
4 Strain Gauge
5 Accelerometer
6 Ground

$F$ Force
$d_r$ Diameter of rod

Fig. B.1 and B.2
BS EN ISO 22476-3 : 2005 + A1 : 2011

| DATE OF TEST | VALID UNTIL | HAMMER ID |
|---|---|---|
| 21/04/2021 | 21/04/2022 | Q3 |

$E_{meas}$ = **0.315** kN-m

$E_{theor}$ = **0.473** kN-m

Comments

**Energy Ratio (Er) =** $\frac{E_{meas}}{E_{theor}}$ **66.51%**

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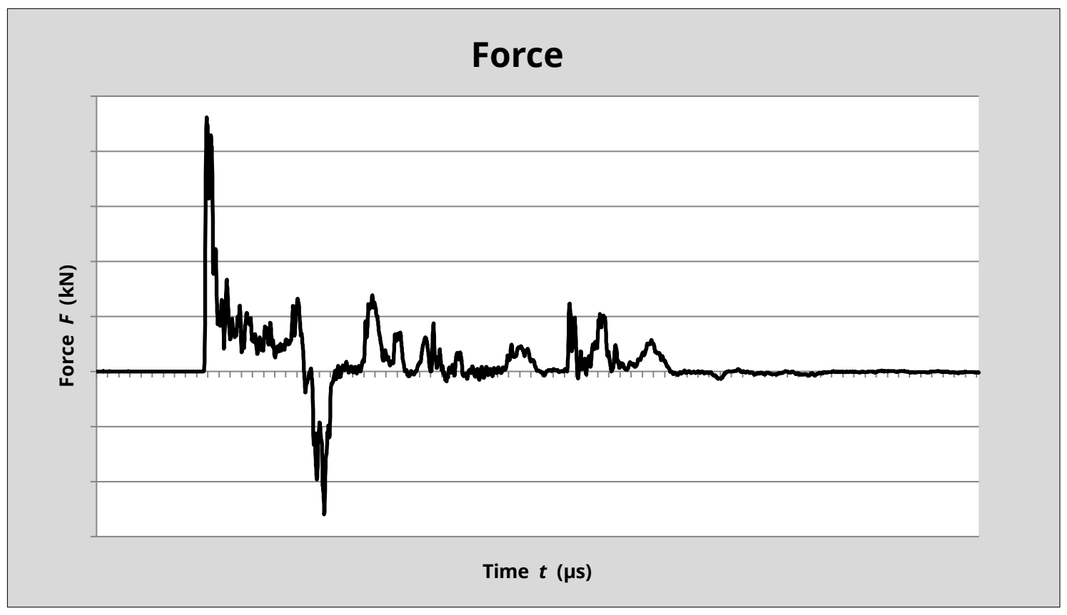


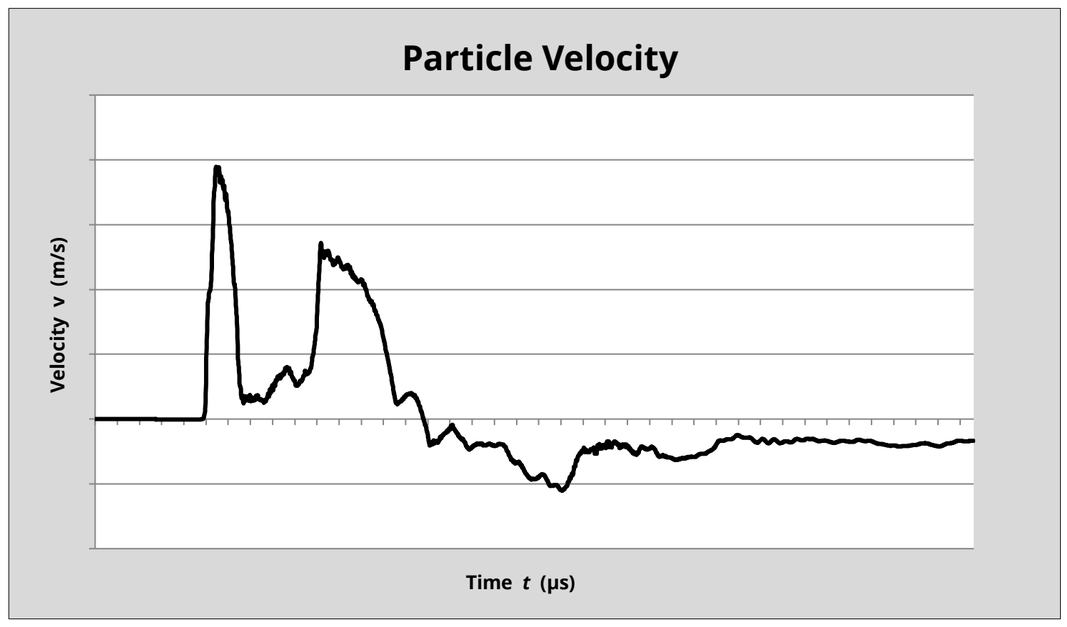


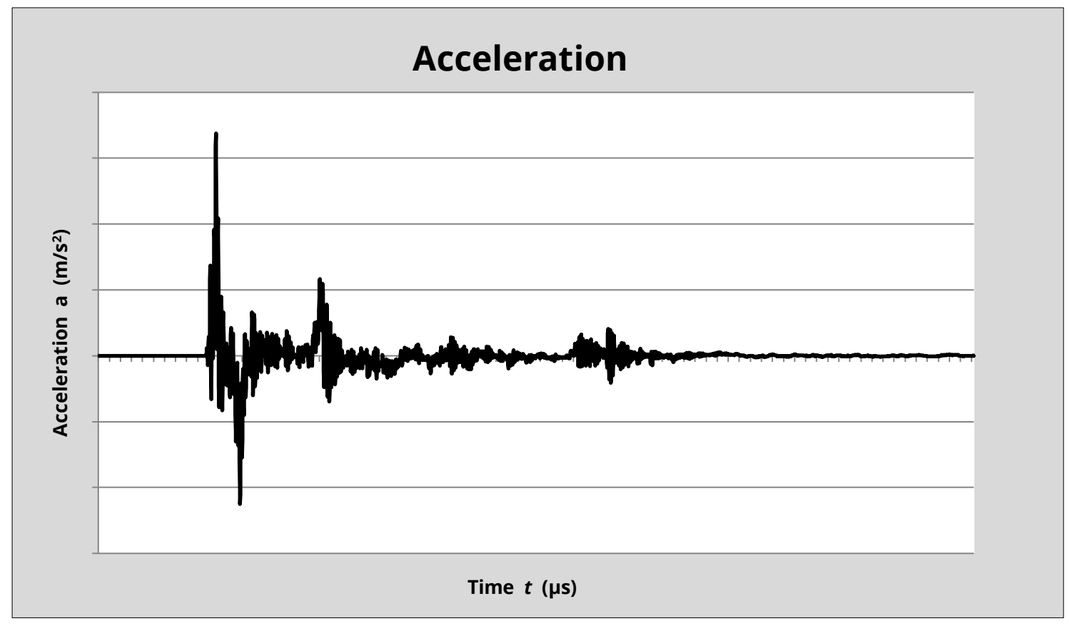


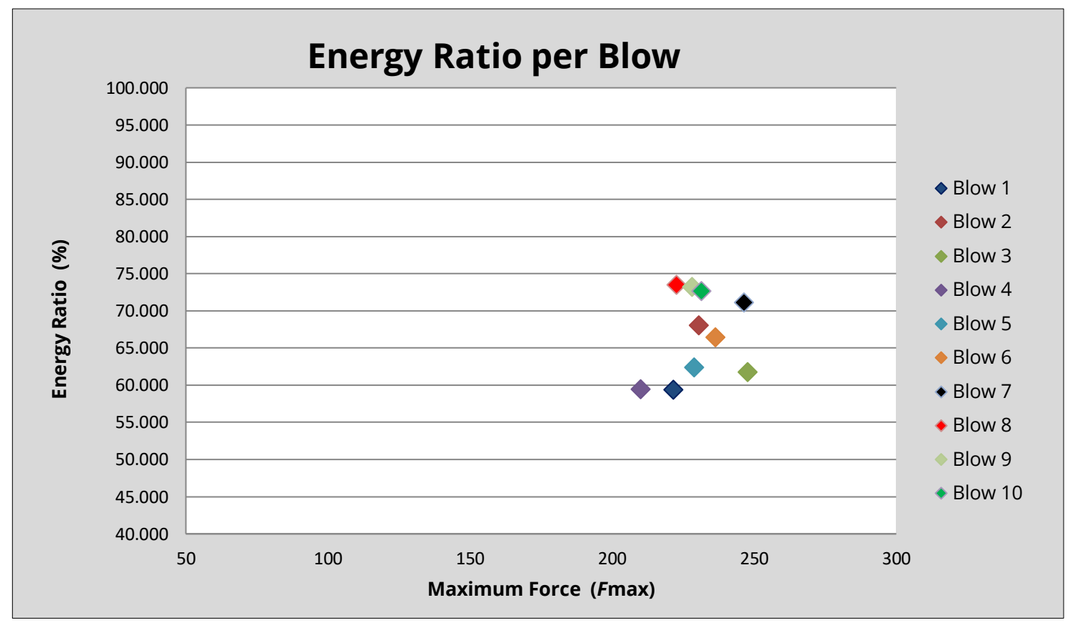


| Equipe SPT Analyzer Operator | Certificate prepared by | Certificate checked by | Certificate date |
|---|---|---|---|
| JL | | | 27/04/2021 |

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# APPENDIX III – **HAND EXCAVATED SERVICE TRIAL PIT LOGS**

**Contract : Grandison Brook**

**Client : ATKINS**

**Trench No. GBHP01**

Dates : 10/8/21 - 12/8/21

Location : Old Road / Tyla Road

Job Number : Q0560

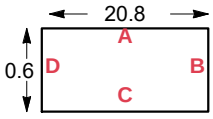
Engineer : ATKINS

Ground Level : 10.88 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274497.09 E 195262.51 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.15 | TARMAC | | | |
| | | | | | 0.15<br>0.35 | MADE GROUND: Black slightly silty slightly sandy Gravel with high cobble content of sandstone and rare cobbles of slag. Gravel is angular to sub angualr fine to coarse sandstone, siltstone, ash and slag. | | 10.73 | |
| 1 | | | | | 0.50<br>0.70 | Orange brown slightly silty gravelly CLAY with low cobble content of sandstone. Gravel is sub angular to sub rounded fine to coarse sandstone. | | 10.38 | |
| | | | | | 1.20 | Trial trench terminated at 1.2mbgl. | | 9.68 | |

**PLAN**




Groundwater: No groundwater encountered

Stability: Stable

Shoring: None

Remarks: Hole marked out using co-ordinates and plan supplied by client. Area CAT and Genny scanned together with PAS128 Survey, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with suitable arisings and type 1 imported sub-base compacted in layers with hot rolled asphalt at surface.

Equipment Used: 2Tonne tracked excavator and Various hand tools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email: enquiries@quantumgeotech.co.uk


| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated | AGS |
|---|---|---|---|---|---|
| JL & AW | A Jones | 1 Of 3 | 3.5 | | |

| Contract : Grandison Brook<br>Client : ATKINS | | Trench No.<br>GBHP01 |
|---|---|---|
| Dates : 10/8/21 - 12/8/21<br>Location : Old Road / Tyla Road | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 10.88 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274497.09 E 195262.51 N *Co-ordinates to National Grid* |

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|---|---|---|---|---|
| JL & AW | A Jones | 2 Of 3 | 3.5 | All measurements in metres unless otherwise stated |

| Contract : Grandison Brook<br>Client : ATKINS | | | Trench No.<br>GBHP01 |
|---|---|---|---|
| Dates : 10/8/21 - 12/8/21<br>Location : Old Road / Tyla Road | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 10.88 m A.O.D.<br>*Level to Ordnance Datum* | |
| | | Coordinates: 274497.09 E<br>195262.51 N<br>*Co-ordinates to National Grid* | |

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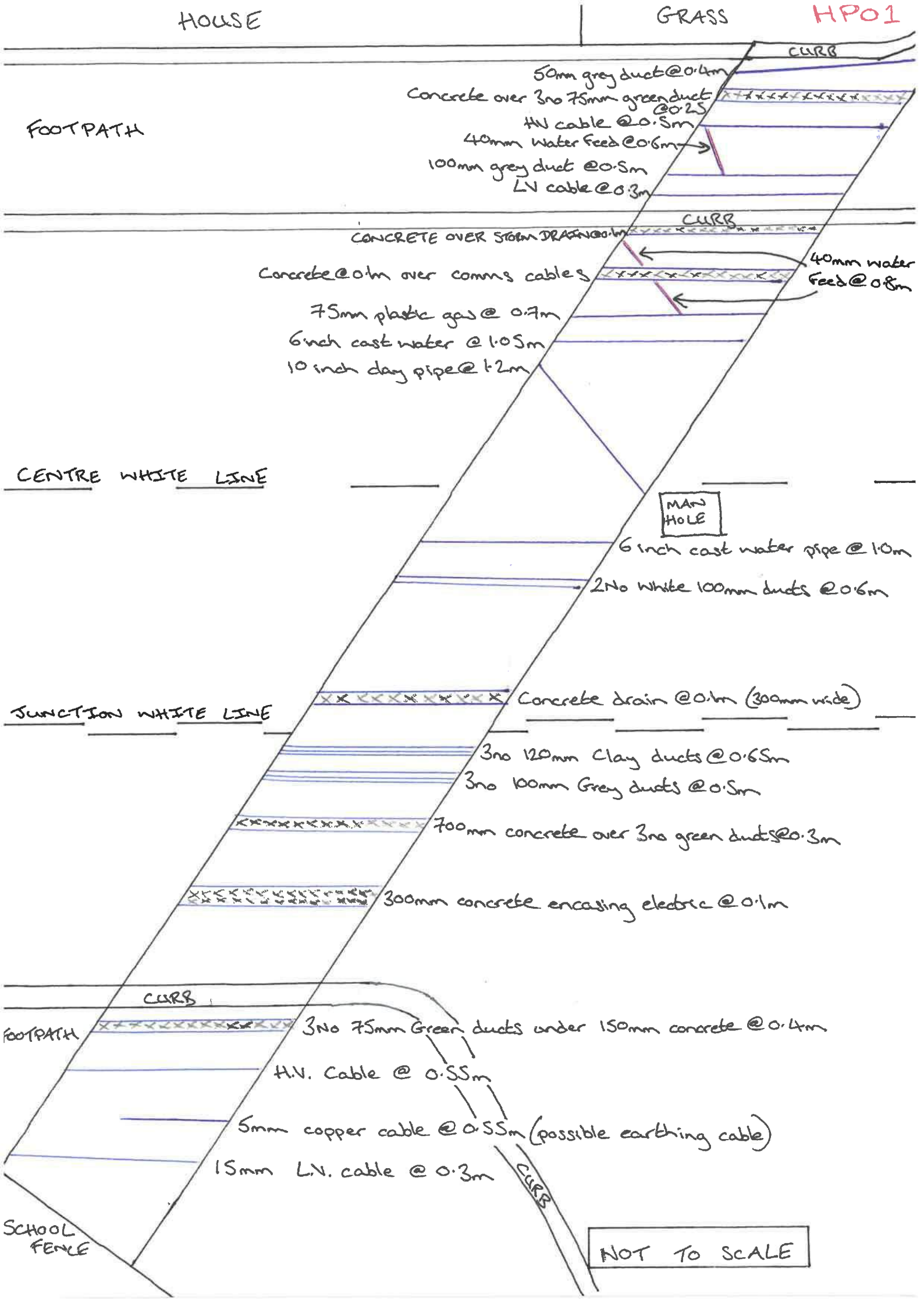
| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| JL & AW | A Jones | 3 Of 3 | 3.5 | All measurements in metres unless otherwise stated |


HOUSE
GRASS
HP01
CURB
50mm grey duct @0.4m
Concrete over 3no 75mm green duct @0.25
FOOTPATH
HV cable @0.5m
40mm Water Feed @0.6m
100mm grey duct @0.5m
LV cable @0.3m
CURB
CONCRETE OVER STORM DRAIN @0.1m
40mm water Feed @0.8m
Concrete @0.1m over comms cables
75mm plastic gas @ 0.7m
6 inch cast water @ 1.05m
10 inch day pipe @ 1.2m
CENTRE WHITE LINE
MAN HOLE
6 inch cast water pipe @ 1.0m
2No White 100mm ducts @0.6m
Concrete drain @0.1m (300mm wide)
JUNCTION WHITE LINE
3no 120mm Clay ducts @0.65m
3no 100mm Grey ducts @0.5m
700mm concrete over 3no green ducts @0.3m
300mm concrete encasing electric @0.1m
CURB
FOOTPATH
3No 75mm Green ducts under 150mm concrete @0.4m
H.V. Cable @ 0.55m
5mm copper cable @ 0.55m (possible earthing cable)
15mm L.V. cable @ 0.3m
CURB
SCHOOL FENCE
NOT TO SCALE

**Contract : Grandison Brook**

**Client : ATKINS**

**Trench No. GBHP01A**

Dates : 12/8/21 - 13/8/21

Location : Entrance to Llansawel FC

Job Number : Q0560

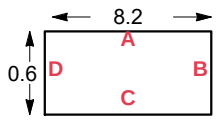
Engineer : ATKINS

Ground Level : 10.98 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274510.32 E 195248.18 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.15 | TOPSOIL: Brown silty slightly gravelly Sand. Sand is fine to coarse. (Verge only) | | | |
| | | | | | 0.15 | TARMAC in track from 0-0.15mbgl | | 10.83 | |
| | | | | | 0.25 | MADE GROUND: Dark grey slightly silty sandy Gravel with medium cobble content of sandstone. Gravel is angular to sub angular fine to coarse sandstone, ash and slag. | | | |
| | | | | | 0.40 | MADE GROUND: Dark brownish grey slightly sandy slightly gravelly Silt / Clay with low cobble content of sandstone. Gravel is angular to sub angular fine to coarse sandstone, tile, clay pipe and plastic. | | 10.58 | |
| | | | | | 0.50 | | | | |
| 1 | | | | | 0.90 | Orange brown slightly clayey slightly sandy GRAVEL with high cobble and low boulder content of sandstone. Gravel is sub angular to sub rounded fine to coarse sandstone. | | 10.08 | |
| | | | | | 0.30 | | | | |
| | | | | | 1.20 | Trench terminated at 1.2mbgl | | 9.78 | |

**PLAN**




Groundwater: No groundwater encountered

Stability: Stable

Shoring: None

Remarks: Hole marked out using co-ordinates and plan supplied by client. Area CAT and Genny scanned together with PAS128 Survey, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with suitable arisings and type 1 imported sub-base compacted in layers with hot rolled asphalt at surface.

Equipment Used: 2Tonne tracked excavator and Various hand tools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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| JL & AW | A Jones | 1 Of 3 | 3.5 | All measurements in metres unless otherwise stated |

AGS

| | | |
|---|---|---|
| **Contract : Grandison Brook**<br>**Client : ATKINS** | | **Trench No.**<br>**GBHP01A** |
| Dates : 12/8/21 - 13/8/21<br>Location : Entrance to Llansawel FC | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 10.98 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274510.32 E 195248.18 N *Co-ordinates to National Grid* |

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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| JL & AW | A Jones | 2 Of 3 | 3.5 | All measurements in metres unless otherwise stated |

| Contract : Grandison Brook<br>Client : ATKINS | | Trench No.<br>GBHP01A |
|---|---|---|
| Dates : 12/8/21 - 13/8/21<br>Location : Entrance to Llansawel FC | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 10.98 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274510.32 E 195248.18 N *Co-ordinates to National Grid* |

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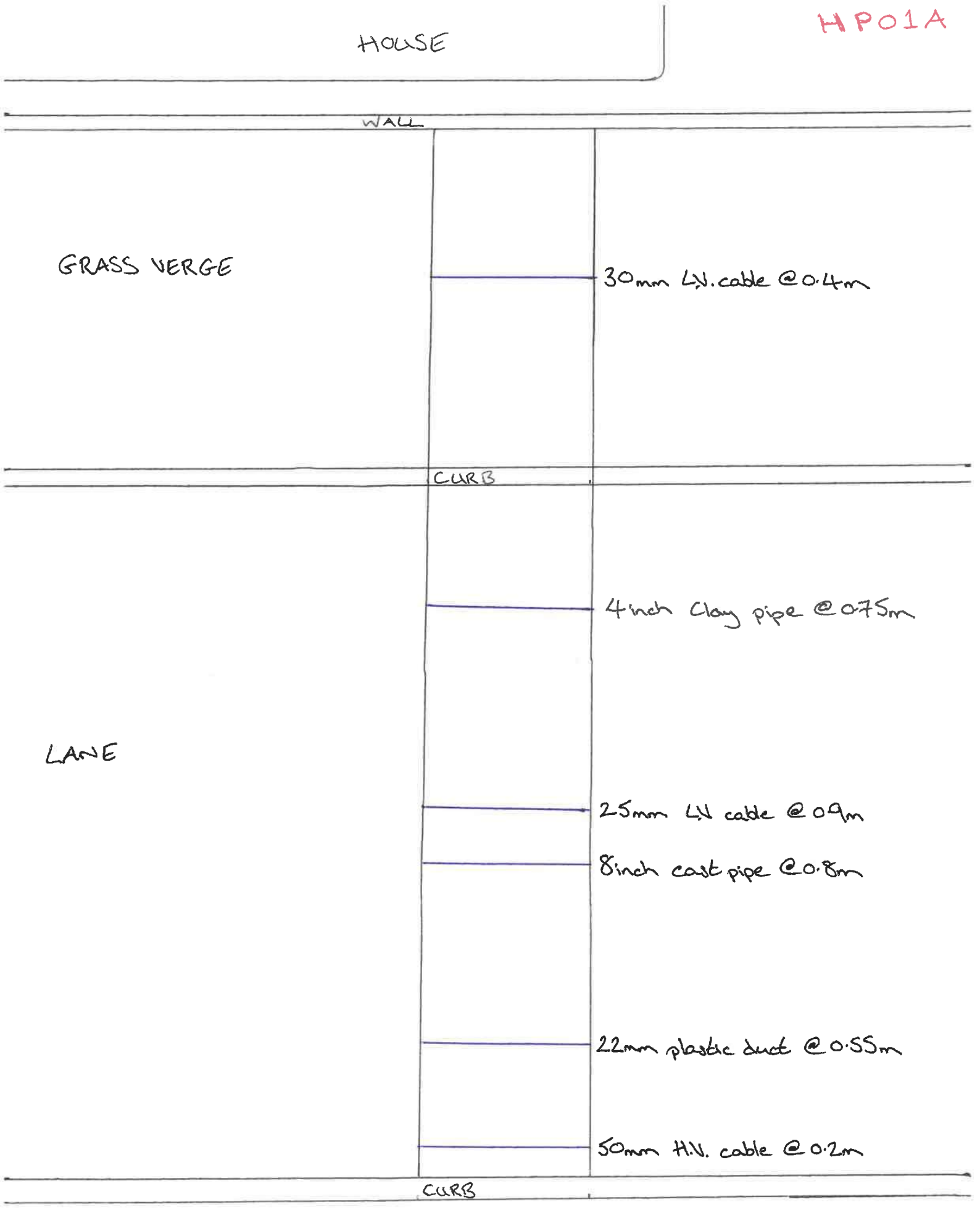
| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| JL & AW | A Jones | 3 Of 3 | 3.5 | All measurements in metres unless otherwise stated |

HP01A




NOT TO SCALE

**Contract : Grandison Brook**

**Client : ATKINS**

**Trench No. GBHP02**

Dates : 16/8/21 - 17/8/21

Location : Ynysmaerdy Road

Job Number : Q0560

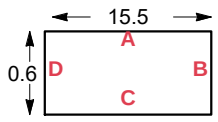
Engineer : ATKINS

Ground Level : 22.05 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274807.19 E 195112.28 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.20 | TARMAC | | | |
| | | | | | 0.20<br>0.10 | MADE GROUND: Pale brownish grey slightly silty slightly sandy Gravel. Gravel is angular to sub angular fine to coarse sandstone. (Sub-Base) | | 21.85 | |
| | 0.50 - | ES1 | | | 0.30<br>0.40 | MADE GROUND: Black slightly silty slightly sandy Gravel with low cobble content of sandstone and slag. Gravel is angular to sub angualr fine to coarse sandstone, siltstone, ash and slag.<br>PID @ 0.5mbgl = 2.3ppm | | 21.75 | |
| 1 | 1.00 - | ES2 | | | 0.70<br>0.50 | Brown silty slightly gravelly SAND. Sand is fine to coarse.<br>PID @ 1.0mbgl = 0.1ppm | | 21.35 | |
| | | | | | 1.20 | Trial trench terminated at 1.2mbgl.<br>Western half of pit Sub-base from 0.2m to 1.2mbgl, over plastic drainage pipe. | | 20.85 | |

**PLAN**




Groundwater: No groundwater encountered

Stability: Stable

Shoring: None

Remarks: Hole marked out using co-ordinates and plan supplied by client. Area CAT and Genny scanned together with PAS128 Survey, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with suitable arisings and type 1 imported sub-base compacted in layers with hot rolled asphalt at surface.

Equipment Used: 2Tonne tracked excavator and Various hand tools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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| JL & AW | A Jones | 1 Of 3 | 3.5 | All measurements in metres unless otherwise stated |

AGS

| Contract : Grandison Brook<br>Client : ATKINS | | Trench No.<br>GBHP02 |
|---|---|---|
| Dates : 16/8/21 - 17/8/21<br>Location : Ynysmaerdy Road | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 22.05 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274807.19 E 195112.28 N *Co-ordinates to National Grid* |

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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| JL & AW | A Jones | 2 Of 3 | 3.5 | All measurements in metres unless otherwise stated |

| Contract : Grandison Brook<br>Client : ATKINS | | Trench No.<br>GBHP02 |
|---|---|---|
| Dates : 16/8/21 - 17/8/21<br>Location : Ynysmaerdy Road | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 22.05 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274807.19 E 195112.28 N *Co-ordinates to National Grid* |

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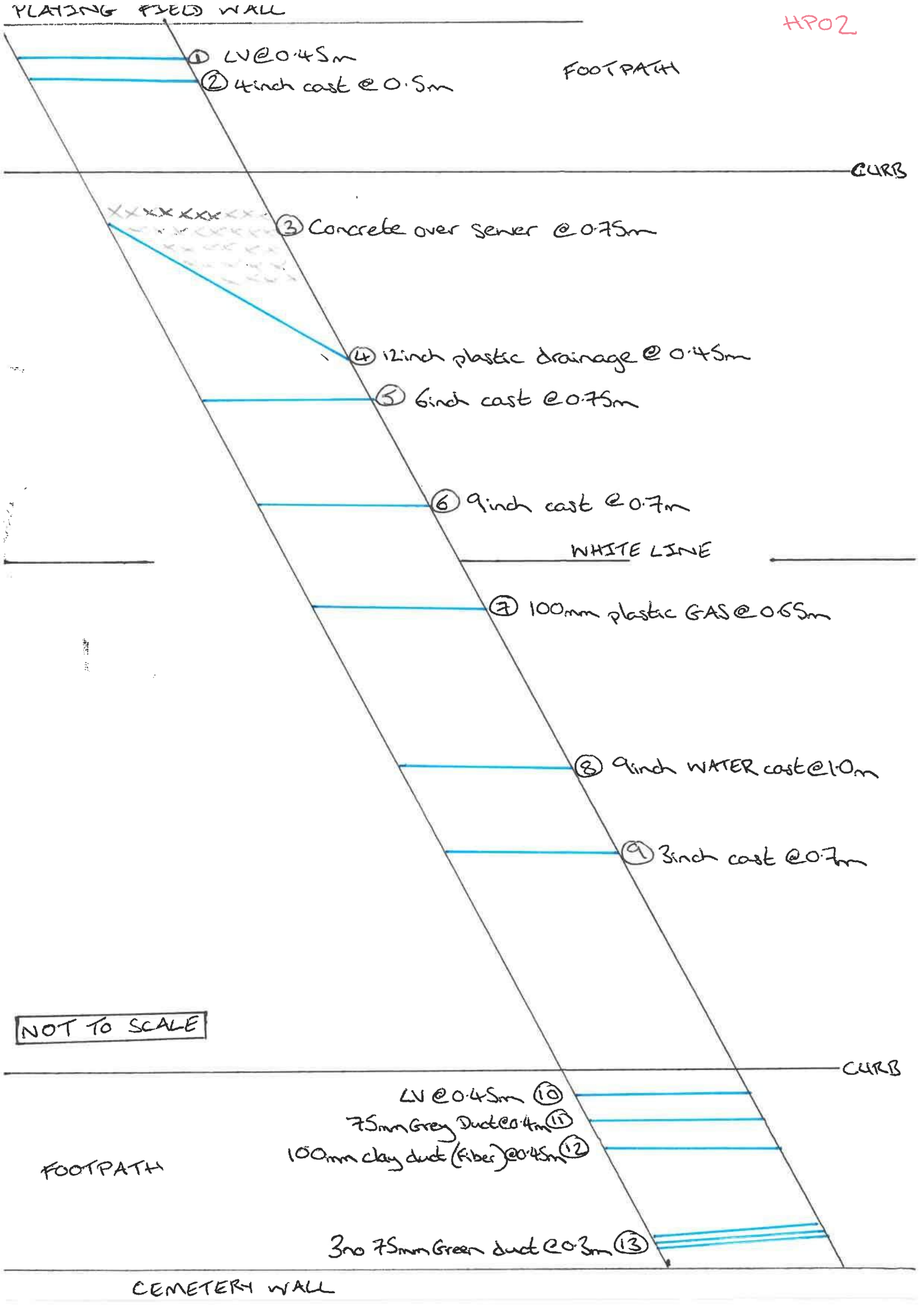
| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| JL & AW | A Jones | 3 Of 3 | 3.5 | All measurements in metres unless otherwise stated |

HP02


PLAYING FIELD WALL
1 LV@0.45m
2 4inch cast @0.5m
FOOTPATH
CURB
3 Concrete over sewer @0.75m
4 12inch plastic drainage @0.45m
5 6inch cast @0.75m
6 9inch cast @0.7m
WHITE LINE
7 100mm plastic GAS @0.65m
8 9inch WATER cast@1.0m
9 3inch cast @0.7m
NOT TO SCALE
CURB
LV @0.45m 10
75mm Grey Duct@0.4m 11
100mm clay duct (Fiber)@0.45m 12
FOOTPATH
3no 75mm Green duct @0.3m 13
CEMETERY WALL

**Contract : Grandison Brook**

**Client : ATKINS**

**Trench No. GBHP03**

Dates : 18/8/21 - 19/8/21

Location : Brook Crescent

Job Number : Q0560

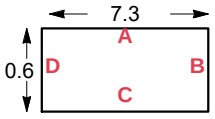
Engineer : ATKINS

Ground Level : 5.42 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274264.72 E 195516.16 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.05 | TARMAC | | | |
| | | | | | 0.05 | MADE GROUND: Black slightly silty slightly sandy GRAVEL with low cobble content. Gravel is angular to sub angular fine to coarse sandstone, siltstone, ash and slag. | | 5.37 | |
| | 0.40 - | ES1 | | | 0.85 | PID @ 0.4mbgl = 2.1ppm | | | |
| 1 | | | | | 0.90 | Dark grey slightly silty sandy organic CLAY with peat. | | 4.52 | |
| | | | | | 0.30 | | | | |
| | | | | | 1.20 | Trial pit terminated at 1.2mbgl (In | | 4.22 | |

**PLAN**




Groundwater: No groundwater encountered

Stability: Stable

Shoring: None

Remarks: Hole marked out using co-ordinates and plan supplied by client. Area CAT and Genny scanned together with PAS128 Survey, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with suitable arisings and type 1 imported sub-base compacted in layers with hot rolled asphalt at surface.

Equipment Used: 2Tonne tracked excavator and Various hand tools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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| JL & AW | A Jones | 1 Of 3 | 3.5 | All measurements in metres unless otherwise stated |

AGS

| Contract : Grandison Brook<br>Client : ATKINS | | Trench No.<br>GBHP03 |
|---|---|---|
| Dates : 18/8/21 - 19/8/21<br>Location : Brook Crescent | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 5.42 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274264.72 E 195516.16 N *Co-ordinates to National Grid* |

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| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated | AGS |
|---|---|---|---|---|---|
| JL & AW | A Jones | 2 Of 3 | 3.5 | | |

| Contract : Grandison Brook<br>Client : ATKINS | | | Trench No.<br>GBHP03 |
|---|---|---|---|
| Dates : 18/8/21 - 19/8/21<br>Location : Brook Crescent | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 5.42 m A.O.D.<br>*Level to Ordnance Datum* | |
| | | Coordinates: 274264.72 E<br>195516.16 N<br>*Co-ordinates to National Grid* | |

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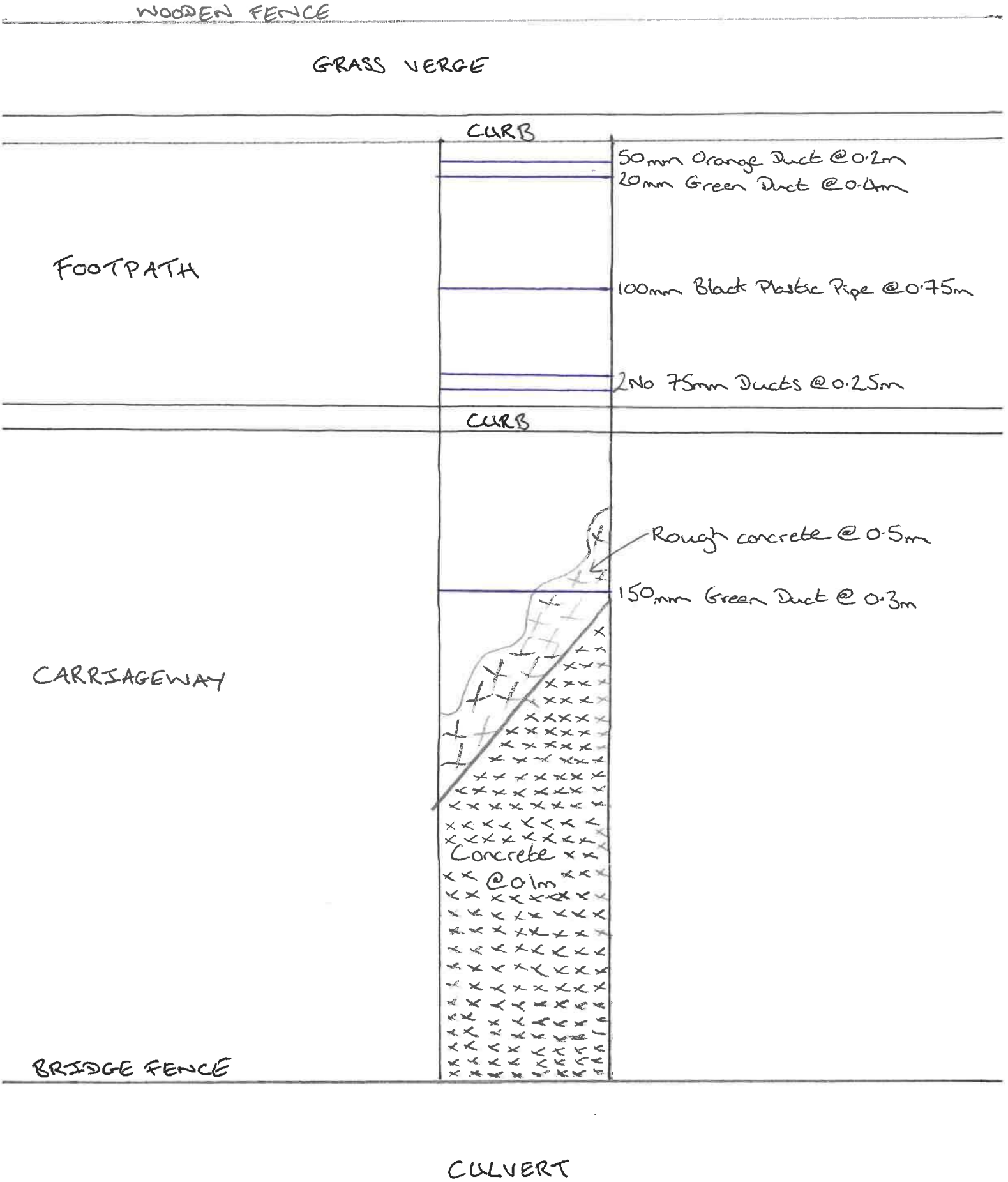
| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| JL & AW | A Jones | 3 Of 3 | 3.5 | All measurements in metres unless otherwise stated |

HP03




NOT TO SCALE

**Contract : Grandison Brook**

**Client : ATKINS**

**Trench No. GBHP04**

Dates : 5/8/21 - 6/8/21

Location : A474 Pant yr Heol

Job Number : Q0560

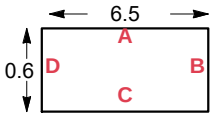
Engineer : ATKINS

Ground Level : 5.45 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274297.33 E 195517.88 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.15 | TARMAC | | | |
| | | | | | 0.15<br>0.65 | MADE GROUND: Black slightly silty sandy Gravel with medium cobble content of sandstone and slag. Gravel is angular to sub angular fine to coarse sandstone, ash and slag. | | 5.30 | |
| 1 | | | | | 0.80<br>0.40 | MADE GROUND: Brown slightly silty sandy Gravel with low cobble content of sandstone. Gravel is angular to sub angular fine to coarse sandstone and siltstone with rare ash and clay pipe. | | 4.65 | |
| | | | | | 1.20 | Trial Trench terminated at 1.2mbgl<br><br>In eastern edge of trench (under carriageway, concrete encountered at 0.1mbgl, breaking of concrete terminated at 0.5mbgl to avoid damage to gas main recorded. | | 4.25 | |

**PLAN**




Groundwater: No groundwater encountered

Stability: Stable

Shoring: None

Remarks: Hole marked out using co-ordinates and plan supplied by client. Area CAT and Genny scanned together with PAS128 Survey, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with suitable arisings and type 1 imported sub-base compacted in layers with hot rolled asphalt at surface.

Equipment Used: 2Tonne tracked excavator and Various hand tools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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| JL & AW | A Jones | 1 Of 2 | 3.5 | All measurements in metres unless otherwise stated |

AGS

| | |
|---|---|
| **Contract : Grandison Brook**<br>**Client : ATKINS** | **Trench No.**<br>**GBHP04** |

| | | |
|---|---|---|
| Dates : 5/8/21 - 6/8/21<br>Location : A474 Pant yr Heol | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 5.45 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274297.33 E 195517.88 N *Co-ordinates to National Grid* |

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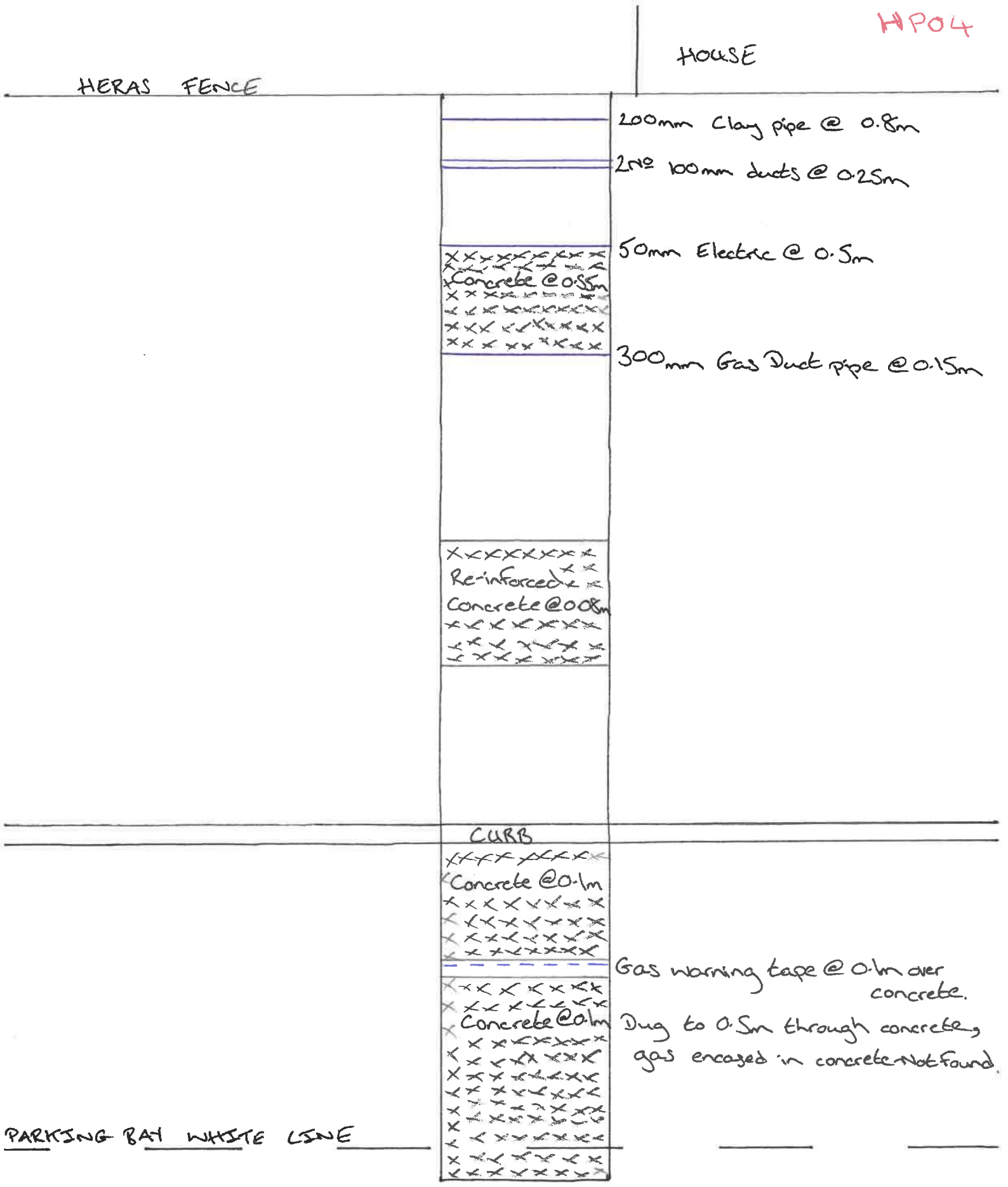
| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| JL & AW | A Jones | 2 Of 2 | 3.5 | All measurements in metres unless otherwise stated |

AGS

HP04




NOT TO SCALE

**Contract : Grandison Brook**

**Client : ATKINS**

**Trench No. GBHP05**

Dates : 4/8/21 - 6/8/21

Location : A474 Pant yr Heol

Job Number : Q0560

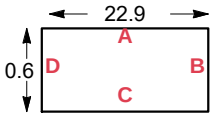
Engineer : ATKINS

Ground Level : 5.60 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274303.27 E 195503.90 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.15 | TARMAC | | | |
| | | | | | 0.15<br>0.65 | MADE GROUND: Black slightly silty sandy Gravel with medium cobble content of sandstone and slag. Gravel is angular to sub angular fine to coarse sandstone, ash and slag.<br>PID @ 0.5mbgl = 1.8ppm | | 5.45 | ▼1 |
| 1 | | | | | 0.80<br>0.40 | MADE GROUND: Brown slightly silty sandy Gravel with low cobble content of sandstone. Gravel is angular to sub angular fine to coarse sandstone and siltstone with rare ash and clay pipe. | | 4.80 | |
| | | | | | 1.20 | Trial Trench terminated at 1.2mbgl<br><br>In eastern edge of trench terminated at 0.6mbgl unable to proceed safely through fused slag. | | 4.40 | |

**PLAN**




Groundwater: Water encountered around 7no clay ducts at 0.6mbgl

Stability: Stable

Shoring: None

Remarks: Hole marked out using co-ordinates and plan supplied by client. Area CAT and Genny scanned together with PAS128 Survey, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with suitable arisings and type 1 imported sub-base compacted in layers with hot rolled asphalt at surface.

Equipment Used: 2Tonne tracked excavator and Various hand tools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| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated |
|---|---|---|---|---|
| JL & AW | A Jones | 1 Of 3 | 3.5 | |

AGS

| Contract : Grandison Brook<br>Client : ATKINS | | | Trench No.<br>GBHP05 |
|---|---|---|---|
| Dates : 4/8/21 - 6/8/21<br>Location : A474 Pant yr Heol | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 5.60 m A.O.D.<br>*Level to Ordnance Datum* | |
| | | Coordinates: 274303.27 E<br>195503.90 N<br>*Co-ordinates to National Grid* | |

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|---|---|---|---|---|
| JL & AW | A Jones | 2 Of 3 | 3.5 | All measurements in metres unless otherwise stated |

| Contract : Grandison Brook<br>Client : ATKINS | | | Trench No.<br>GBHP05 |
|---|---|---|---|
| Dates : 4/8/21 - 6/8/21<br>Location : A474 Pant yr Heol | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 5.60 m A.O.D.<br>*Level to Ordnance Datum* | |
| | | Coordinates: 274303.27 E<br>195503.90 N<br>*Co-ordinates to National Grid* | |

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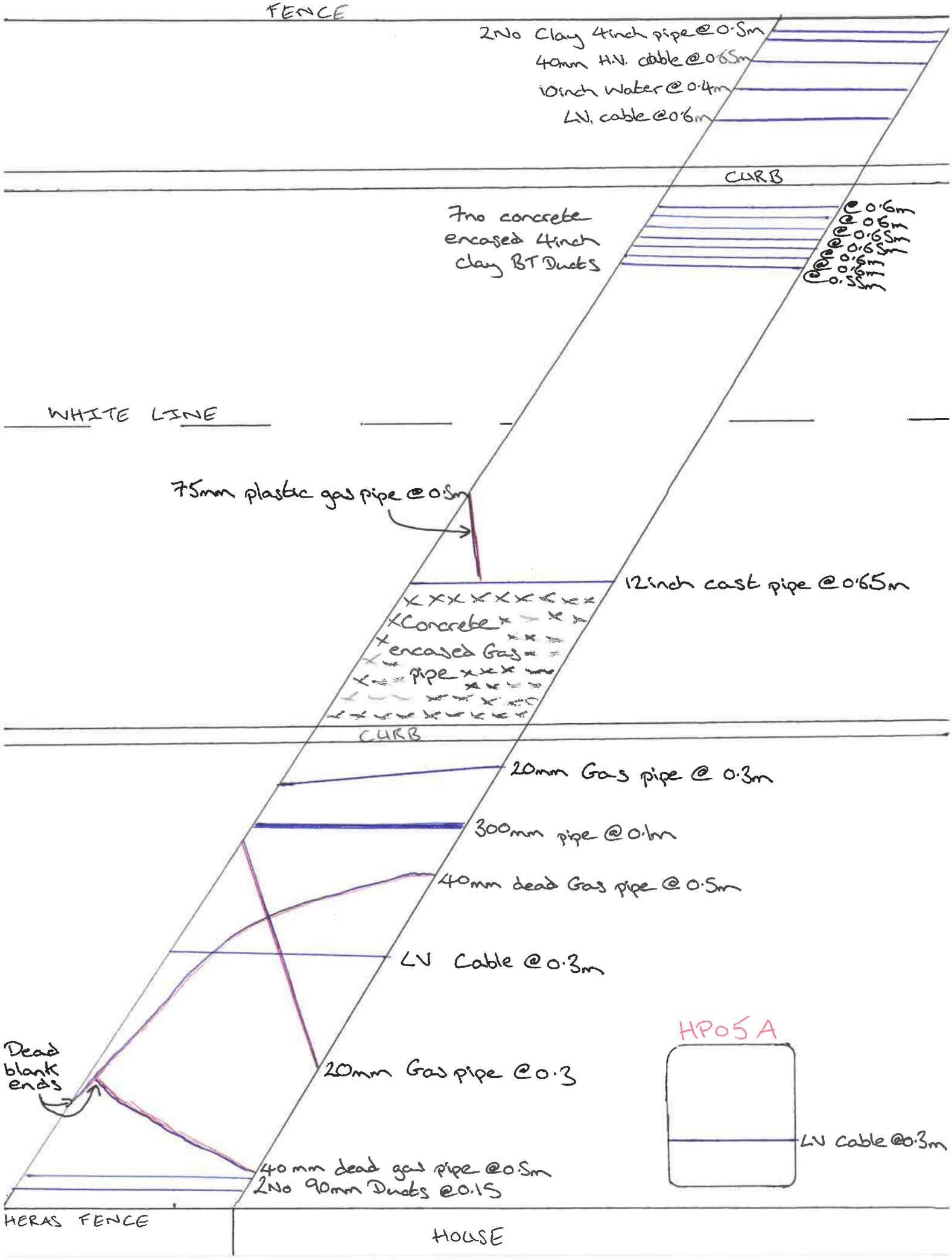
|---|---|---|---|---|
| JL & AW | A Jones | 3 Of 3 | 3.5 | All measurements in metres unless otherwise stated |

HP05

NOT TO SCALE

SCHOOL GROUNDS




HP05A

**Contract : Grandison Brook**

**Client : ATKINS**

**Trench No. GBHP05A**

Dates : 18/8/21 - 18/8/21

Location : A474 Pant yr Heol

Job Number : Q0560

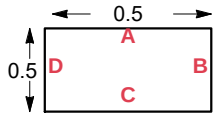
Engineer : ATKINS

Ground Level : 5.58 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274295.47 E 195511.51 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.15 | TARMAC | | | |
| | | | | | 0.15 | MADE GROUND: Black slightly silty sandy Gravel with medium cobble content of sandstone and slag. Gravel is angular to sub angular fine to coarse sandstone, ash and slag. | | 5.43 | |
| | | | | | 0.15 | | | | |
| | | | | | 0.30 | Pit terminated at 0.3mbgl on location of service. | | 5.28 | |

**PLAN**




Groundwater: No groundwater encountered

Stability: Stable

Shoring: None

Remarks: Hole marked out using co-ordinates and plan supplied by client. Area CAT and Genny scanned together with PAS128 Survey, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with suitable arisings and type 1 imported sub-base compacted in layers with hot rolled asphalt at surface.

Equipment Used: Various hand tools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| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated |
|---|---|---|---|---|
| JL & AW | A Jones | 1 Of 1 | 3.5 | |

AGS

| | | |
|---|---|---|
| **Contract : Grandison Brook**<br>**Client : ATKINS** | | **Trench No.**<br>**GBHP05A** |
| Dates : 18/8/21 - 18/8/21<br>Location : A474 Pant yr Heol | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 5.58 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274295.47 E 195511.51 N *Co-ordinates to National Grid* |

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|---|---|---|---|---|
| JL & AW | A Jones | 2 Of 2 | 3.5 | All measurements in metres unless otherwise stated |

# APPENDIX IV – **MACHINE EXCAVATED TRIAL PIT LOGS**

**Contract : Grandison Brook**

**Client : ATKINS**

**Trial Pit No. GBTP01**

Dates : 7/7/21 - 7/7/21

Location : Llansawel F.C.

Job Number : Q0560

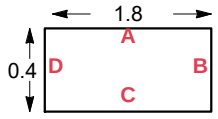
Engineer : ATKINS

Ground Level : 13.66 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274579.60 E 195215.24 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Legend | Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.05 | Artificial grass over MADE GROUND: Grey GRAVEL. Gravel is angular fine to medium limestone. | | 13.61 | |
| | | | | | 0.05 | | | | |
| | | | | | 0.03 | MADE GROUND: Broken CONCRETE slabs. | | 13.58 | |
| | 0.20 - 0.30 | B1 | | | | | | | |
| | 0.30 - | ES2 | | | 0.08 | MADE GROUND: Orange brown slightly silty Sand. Sand is fine to coarse | | 13.51 | |
| | | | | | 0.07 | | | | |
| | | | | | 0.15 | MADE GROUND: Grey clayey slightly sandy Gravel with low cobble content of sandstone and brick. Gravel is angular to sub angular fine to coarse sandstone and siltstone. | | 13.31 | |
| | | | | | 0.20 | | | | |
| | 0.50 - | ES3 | | | 0.35 | PID @0.3mbgl = 0.0ppm | | | |
| | 0.50 - 0.70 | B4 | | | 0.35 | MADE GROUND: Dark grey slightly clayey slightly;y sandy gravelly Silt. Gravel is angular to sub angular fine to coarse sandstone and siltstone with glass and fine coal. | | | |
| | | | | | 0.70 | PID @0.5mbgl = 0.3ppm | | 12.96 | |
| | 0.80 - 1.00 | B5 | | | | Orange brown sandy slightly gravelly SILT with low cobble content of sandstone. | | | |
| 1 | | | | | 0.55 | | | | |
| | 1.10 - | ES6 | | | | PID @1.1mbgl = 0.0ppm | | | |
| | 1.30 - 1.80 | B7 | | | 1.25 | Orange brown slightly silty sandy GRAVEL with low cobble content of sandstone. Gravel is angular to sub rounded fine to coarse sandstone. | | 12.41 | |
| | | | | | 0.80 | | | | |
| 2 | | | | | 2.05 | Trial pit terminated at 2.05mbgl at maximum reach of excavator. | | 11.61 | |

**PLAN**




Groundwater: No groundwater encountered

Stability: Stable

Shoring: None

Remarks: Hole marked out using co-ordinates supplied by client. Area CAT and Genny scanned, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with arisings compacted in layers with astro turf replaced at surface.

Equipment Used: 3T 360 tracked excavator (Toothless bucket)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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| KC | A Jones | 1 Of 2 | 3.5 | All measurements in metres unless otherwise stated |

AGS

| Contract : Grandison Brook<br>Client : ATKINS | | Trial Pit No.<br>GBTP01 |
|---|---|---|
| Dates : 7/7/21 - 7/7/21<br>Location : Llansawel F.C. | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 13.66 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274579.60 E 195215.24 N *Co-ordinates to National Grid* |

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|---|---|---|---|---|
| KC | A Jones | 2 Of 2 | | All measurements in metres unless otherwise stated |

AGS

**Contract : Grandison Brook**

**Client : ATKINS**

**Trial Pit No. GBTP02**

Dates : 5/7/21 - 5/7/21

Location : Briton Ferry RFC

Job Number : Q0560

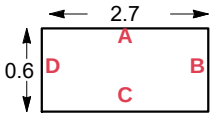
Engineer : ATKINS

Ground Level : 18.15 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274730.69 E 195151.13 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Turf over TOPSOIL: Dark brown slightly gravelly silty Sand. | | | |
| | | | | | 0.35 | | | | |
| | 0.30 - | ES1 | | | | PID @0.3mbgl = 0.0ppm | | | |
| | 0.40 - 0.60 | B2 | | | 0.35 | MADE GROUND: Brown sandy slightly gravelly SILT / CLAY with low cobble content of brick. | | 17.80 | |
| | | | | | 0.35 | | | | |
| | 0.60 - | ES3 | | | | PID @0.6mbgl = 1.6ppm | | | |
| | | | | | 0.70 | Orange brown slightly silty sandy GRAVEL with low cobble content of sandstone. Gravel is angular to sub angular fine to coarse sandstone. | | 17.45 | |
| 1 | 1.00 - | ES4 | | | | PID @1.0mbgl = 0.0ppm | | | |
| | 1.00 - 1.50 | B5 | | | | | | | |
| | | | | | | with low boulder content of sandstone from 1.7mbgl | | | |
| | | | | | 2.30 | | | | |
| | 1.90 - 2.40 | B6 | | | | from 1.9mbgl gravel becoming sub angular to sub rounded sandstone with medium cobble content. | | | |
| 2 | | | | | | | | | |
| | 2.80 - 3.00 | B7 | | | | | | | |
| 3 | | | | | 3.00 | Trial Pit terminated at 3.0mbgl (scheduled depth) | | 15.15 | |

**PLAN**




Groundwater: Seepage at 1.7mbgl;, Slow groundwater ingress at 1.9mbgl.

Stability: Slight collapse to sides below 2.0mbgl

Shoring: None

Remarks: Hole marked out on site with clients engineer. Area CAT and Genny scanned, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with arisings compacted in layers with turf at surface.

Equipment Used: 8T 360 wheeled excavator (toothless bucket)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| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated |
|---|---|---|---|---|
| KC | A Jones | 1 Of 2 | 3.5 | |

AGS

| Contract : Grandison Brook<br>Client : ATKINS | | Trial Pit No.<br>GBTP02 |
|---|---|---|
| Dates : 5/7/21 - 5/7/21<br>Location : Briton Ferry RFC | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 18.15 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274730.69 E 195151.13 N *Co-ordinates to National Grid* |

**Contract : Grandison Brook**

**Client : ATKINS**

**Trial Pit No. GBTP03**

Dates : 5/7/21 - 5/7/21

Location : Briton Ferry RFC

Job Number : Q0560

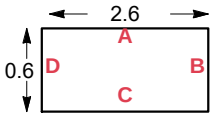
Engineer : ATKINS

Ground Level : 20.52 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274787.85 E 195124.03 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.10 | Turf over TOPSOIL: Dark brown slightly gravelly silty Sand. | | | |
| | | | | | 0.10 | MADE GROUND: Dark brown slightly silty sandy Gravel with low cobble content of sandstone and brick. Gravel is angular to sub angular fine to coarse sandstone and brick with glass. | | 20.42 | |
| | 0.30 - 0.30 - 0.40 | ES1 B2 | | | 0.35 | PID @0.3mbgl = 0.0ppm | | | |
| | 0.50 - | D3 | | | 0.45 | Pale brown slightly gravelly sandy SILT with low cobble content of sandstone. | | 20.07 | |
| | 0.60 - 0.60 - 0.80 | ES4 B5 | | | 0.35 | PID @0.6mbgl = 2.3ppm | | | |
| | | | | | 0.80 | Orange brown slightly silty sandy GRAVEL with low cobble content of sandstone. Gravel is angular to sub angular fine to coarse sandstone. | | 19.72 | |
| 1 | 1.00 - 1.00 - 1.50 | ES6 B7 | | | | PID @1.0mbgl = 0.0ppm | | | |
| | | | | | 1.10 | | | | |
| | | | | | 1.90 | Grey slightly silty sandy GRAVEL with medium cobble content of sandstone. Gravel is sub angular to sub rounded fine to coarse sandstone. | | 18.62 | |
| 2 | 2.00 - 2.50 | B8 | | | 1.10 | | | | |
| 3 | | | | | 3.00 | Trial Pit terminated at 3.0mbgl (scheduled depth) | | 17.52 | |

**PLAN**




Groundwater: No groundwater encountered

Stability: Stable

Shoring: None

Remarks: Hole marked out using co-ordinates supplied by client. Area CAT and Genny scanned, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with arisings compacted in layers with turf at surface.

Equipment Used: 8T 360 wheeled excavator (toothless bucket)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|---|---|---|---|---|
| KC | A Jones | 1 Of 2 | 3.5 | |

AGS

| Contract : Grandison Brook<br>Client : ATKINS | | Trial Pit No.<br>GBTP03 |
|---|---|---|
| Dates : 5/7/21 - 5/7/21<br>Location : Briton Ferry RFC | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 20.52 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274787.85 E 195124.03 N *Co-ordinates to National Grid* |

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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| KC | A Jones | 2 Of 2 | | All measurements in metres unless otherwise stated |

**Contract : Grandison Brook**

**Client : ATKINS**

**Trial Pit No.**
**GBTP04**

Dates : 15/11/21 - 15/11/21

Location : Land west of railway line

Job Number : Q0560

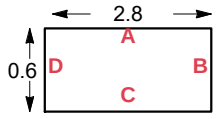
Engineer : ATKINS

Ground Level : 4.88 m A.O.D.
*Level to Ordnance Datum*

Coordinates: 274156.48 E
195612.41 N
*Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.10 | TOPSOIL: Black sandy clayey SILT with rootlets. | | | |
| | 0.20 - 0.50 | B1 | | | 0.10 | MADE GROUND: Dark grey silty slightly sandy gravelly CLAY. Gravel is angular to sub angular fine to medium siltstone, sandstone, coal and rare pottery. | | 4.78 | |
| | 0.50 - | ES7 | | | 0.60 | PID @ 0.5mbgl = 0.9ppm | | | |
| | | | | | 0.70 | Very Soft grey slightly silty slightly organic CLAY. | | 4.18 | |
| 1 | 1.00 - | ES2 | | | | PID @ 1.0mbgl = 0.0ppm | | | |
| | 1.00 - 1.50 | B3 | | | | | | | |
| | | | | | 1.80 | | | | |
| 2 | 2.00 - | D4 | 2 | Vane - P=10 - R=6kN/m2<br>Vane - P=12 - R=8kN/m2<br>Vane - P=16 - R=8kN/m2 | | | | | |
| | 2.50 - 3.00 | B5 | | | 2.50 | Very Soft grey slightly silty sandy slightly organic CLAY. | | 2.38 | |
| | | | | | 0.50 | | | | |
| 3 | 3.00 - | D6 | 3 | Vane - P=18 - R=10kN/m2<br>Vane - P=12 - R=8kN/m2<br>Vane - P=14 - R=8kN/m2 | 3.00 | Hole terminated at scheduled depth of 3.0mbgl | | 1.88 | |

**PLAN**




Groundwater: No groundwater encountered

Stability: Stable

Shoring: None

Remarks: Hole marked out on site with clients engineer. Area CAT and Genny scanned, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with arisings compacted in layers with turf at surface.

Equipment Used: 9 tonne tracked excavator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|---|---|---|---|---|
| DD | A Jones | 1 Of 2 | 3.5 | All measurements in metres unless otherwise stated |

AGS

| | |
|---|---|
| **Contract : Grandison Brook**<br>**Client : ATKINS** | **Trial Pit No.**<br>**GBTP04** |

| | | |
|---|---|---|
| Dates : 15/11/21 - 15/11/21<br>Location : Land west of railway line | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 4.88 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274156.48 E 195612.41 N *Co-ordinates to National Grid* |

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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| DD | A Jones | 2 Of 2 | | All measurements in metres unless otherwise stated |

**Contract : Grandison Brook**

**Client : ATKINS**

**Trial Pit No. GBTP05**

Dates : 6/7/21 - 6/7/21

Location : Land to rear of Farm Rd.

Job Number : Q0560

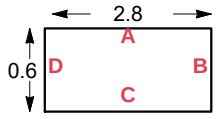
Engineer : ATKINS

Ground Level : 5.47 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274214.61 E 195550.81 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | 0.10 - 0.30 | B1 | | | 0.40 | Turf over TOPSOIL: Brown slightly gravelly clayey Sand with many rootletts. | | | |
| | 0.30 - | ES2 | | | | PID @0.3mbgl = 0.0ppm | | | |
| | 0.50 - | ES3 | | | 0.40 | MADE GROUND: Black silty slightly sandy Gravel with low cobble content of siltstone, brick and slag. Gravel is angular to sub angular fine to coarse siltstone, sandstone, ash, slag, brick and concrete, angular fine to medium coal with glass bottles and plastic. | | 5.07 | |
| | 0.50 - 1.00 | B4 | | | | PID @0.5mbgl = 0.9ppm | | | |
| 1 | | | | | | | | | |
| | 1.20 - | ES5 | | | | PID @1.2mbgl = 4.9ppm | | | ▼ |
| | 1.50 - 2.00 | B6 | | | 2.10 | | | | |
| 2 | | | | | | | | | |
| | 2.20 - | ES7 | | | | PID @2.2mbgl = 4.5ppm | | | |
| | 2.60 - 3.00 | B8 | | | 2.50 | Brown very fibrous PEAT. | | 2.97 | |
| | 2.80 - | ES9 | | | 0.50 | PID @2.8mbgl = 2.8ppm | | | |
| 3 | 3.00 - | D10 | | | 3.00 | Trial Pit terminated at 3.0mbgl (scheduled depth) | | 2.47 | |

**PLAN**




Groundwater: Medium groundwater ingress at 1.2mbgl

Stability: Sides collapsing from 1.2-2.5mbgl

Shoring: None

Remarks: Hole marked out using co-ordinates supplied by client. Area CAT and Genny scanned, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with arisings compacted in layers with turf at surface.

Equipment Used: 8T 360 wheeled excavator (toothless bucket)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email: enquieries@quantumgeotech.co.uk


| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| KC | A Jones | 1 Of 2 | 3.5 | All measurements in metres unless otherwise stated |

AGS

| Contract : Grandison Brook<br>Client : ATKINS | | Trial Pit No.<br>GBTP05 |
|---|---|---|
| Dates : 6/7/21 - 6/7/21<br>Location : Land to rear of Farm Rd. | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 5.47 m A.O.D.<br>*Level to Ordnance Datum*<br>Coordinates: 274214.61 E<br>195550.81 N<br>*Co-ordinates to National Grid* |

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| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated | AGS |
|---|---|---|---|---|---|
| KC | A Jones | 2 Of 2 | | | |

**Contract : Grandison Brook**

**Client : ATKINS**

**Trial Pit No. GBTP06**

Dates : 6/7/21 - 6/7/21

Location : Land to rear of Farm Rd.

Job Number : Q0560

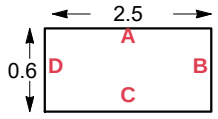
Engineer : ATKINS

Ground Level : 5.09 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274241.85 E 195528.64 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.10 | Turf over TOPSOIL: Brown slightly gravelly clayey Sand with many rootletts. | | | |
| | | | | | 0.10 | MADE GROUND: Black silty slightly sandy Gravel with low cobble content of sandstone, brick and concrete. Gravel is angular to sub angular fine to coarse siltstone, sandstone, ash, brick and concrete, angular fine to medium coal with glass bottles and plastic. PID @0.3mbgl = 0.8ppm PID @0.5mbgl = 2.5ppm | | 4.99 | |
| | 0.30 - | ES1 | | | | | | | |
| | 0.50 - 0.50 - 1.00 | ES B2 | | | 1.00 | | | | |
| 1 | | | | | | | | | |
| | | | | | 1.10 | MADE GROUND: Black sandy slightly gravelly SILT with low cobble content of brick. Gravel is angular to sub angular fine to coarse siltstone, sandstone and Fine coal with timber. ...with pocket of red sand at 1.2-1.4mbgl in south west corner of pit. PID @1.2mbgl = 5.3ppm | | 3.99 | |
| | 1.20 - 1.20 - 1.50 | ES3 B4 | | | 0.40 | | | | |
| | | | | | 1.50 | Brown very fibrous PEAT. | | 3.59 | |
| | 1.80 - 1.80 - 2.00 | ES5 B6 | | | 0.60 | PID @2.2mbgl = 3.6ppm | | | |
| 2 | | | | | | | | | |
| | | | | | 2.10 | Brown clayey slightly sandy fibrous PEAT | | 2.99 | |
| | 2.20 - | D7 | | | 0.30 | | | | |
| | | | | | 2.40 | Brown very fibrous PEAT. | | 2.69 | |
| | 2.50 - 3.00 | B8 | | | 0.60 | | | | |
| 3 | | | | | | | | | |
| | | | | | 3.00 | Trial Pit terminated at 3.0mbgl (scheduled depth) | | 2.09 | |

**PLAN**




Groundwater: Seepage at 1.5mbgl.

Stability: Stable

Shoring: None

Remarks: Hole marked out using co-ordinates supplied by client. Area CAT and Genny scanned, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with arisings compacted in layers with turf at surface.

Equipment Used: 8T 360 wheeled excavator (toothless bucket)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| Operator: | Logged By. | Sheet No. | m Per Page |
|---|---|---|---|
| KC | A Jones | 1 Of 2 | 3.5 |

All measurements in metres unless otherwise stated

AGS

| Contract : Grandison Brook<br>Client : ATKINS | | | Trial Pit No.<br>GBTP06 |
|---|---|---|---|
| Dates : 6/7/21 - 6/7/21<br>Location : Land to rear of Farm Rd. | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 5.09 m A.O.D.<br>*Level to Ordnance Datum* | |
| | | Coordinates: 274241.85 E<br>195528.64 N<br>*Co-ordinates to National Grid* | |

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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| KC | A Jones | 2 Of 2 | | All measurements in metres unless otherwise stated |

**Contract : Grandison Brook**

**Client : ATKINS**

**Trial Pit No. GBTP10**

Dates : 15/11/21 - 15/11/21

Location : Land west of railway line

Job Number : Q0560

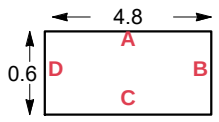
Engineer : ATKINS

Ground Level : 4.88 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274126.85 E 195592.95 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | 1.40 | MADE GROUND: Dark brown slightly silty sandy GRAVEL with high cobble content of concrete and brick. Gravel is angular to sub angular fine to coarse sandstone, limestone, concrete, brick and slag with fine coal and timber. | | | |
| | | | | | 1.40 | Hole terminated at 1.4mbgl unable to proceed due to fast groundwater ingress and sides collapsing. | | 3.48 | |

**PLAN**




Groundwater: Fast groundwater ingress at 1.9mbgl

Stability: Sides collapsing from 1.0

Shoring: None

Remarks: Hole marked out on site with clients engineer. Area CAT and Genny scanned, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with arisings compacted in layers with turf at surface.

Unable to locate service, hole terminated due to fast groundwater ingress.

Equipment Used: 9 tonne tracked excavator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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| DD | A Jones | 1 Of 2 | 3.5 | All measurements in metres unless otherwise stated |

AGS

| Contract : Grandison Brook<br>Client : ATKINS | | Trial Pit No.<br>GBTP10 |
|---|---|---|
| Dates : 15/11/21 - 15/11/21<br>Location : Land west of railway line | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 4.88 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274126.85 E 195592.95 N *Co-ordinates to National Grid* |

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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| DD | A Jones | 2 Of 2 | | All measurements in metres unless otherwise stated |

**Contract : Grandison Brook**

**Client : ATKINS**

**Trial Pit No. GBTP10A**

Dates : 15/11/21 - 15/11/21

Location : Land west of railway line

Job Number : Q0560

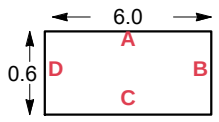
Engineer : ATKINS

Ground Level : 5.31 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274128.68 E 195592.95 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | MADE GROUND: Dark brown slightly silty sandy GRAVEL with high cobble content of concrete and brick. Gravel is angular to sub angular fine to coarse sandstone, limestone, concrete, brick and slag with fine coal and timber. | | | |
| 1 | | | | | 2.10 | | | | |
| 2 | | | | | 2.10 | MADE GROUND: Dark grey slightly silty slightly sandy CLAY with timber. | | 3.21 | |
| | | | | | 0.10 | Unknown cast pipe at 2.1mbgl | | 3.11 | |
| | | | | | 2.20 | Hole terminated at 2.2mbgl unable to proceed due to fast groundwater ingress and sides collapsing. | | | |

**PLAN**




Groundwater: Fast groundwater ingress at 1.5mbgl

Stability: Sides collapsing from 1.0mbgl

Shoring: None

Remarks: Hole marked out on site with clients engineer. Area CAT and Genny scanned, STATS plans checked and permit to excavate issued by QGL. On completion hole backfilled with arisings compacted in layers with turf at surface.
6" unknown cast pipe located at 2.1m bgl.
Unable to locate service requiered, hole terminated due to fast groundwater ingress.

Equipment Used: 9 tonne tracked excavator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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| DD | A Jones | 1 Of 3 | 3.5 | All measurements in metres unless otherwise stated |

AGS

| | |
|---|---|
| **Contract : Grandison Brook**<br>**Client : ATKINS** | **Trial Pit No.**<br>**GBTP10A** |

| | | |
|---|---|---|
| Dates : 15/11/21 - 15/11/21<br>Location : Land west of railway line | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 5.31 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274128.68 E 195592.95 N *Co-ordinates to National Grid* |

| Contract : Grandison Brook<br>Client : ATKINS | | | Trial Pit No.<br>GBTP10A |
|---|---|---|---|
| Dates : 15/11/21 - 15/11/21<br>Location : Land west of railway line | Job Number : Q0560<br>Engineer : ATKINS | Ground Level : 5.31 m A.O.D.<br>*Level to Ordnance Datum* | |
| | | Coordinates: 274128.68 E<br>195592.95 N<br>*Co-ordinates to National Grid* | |

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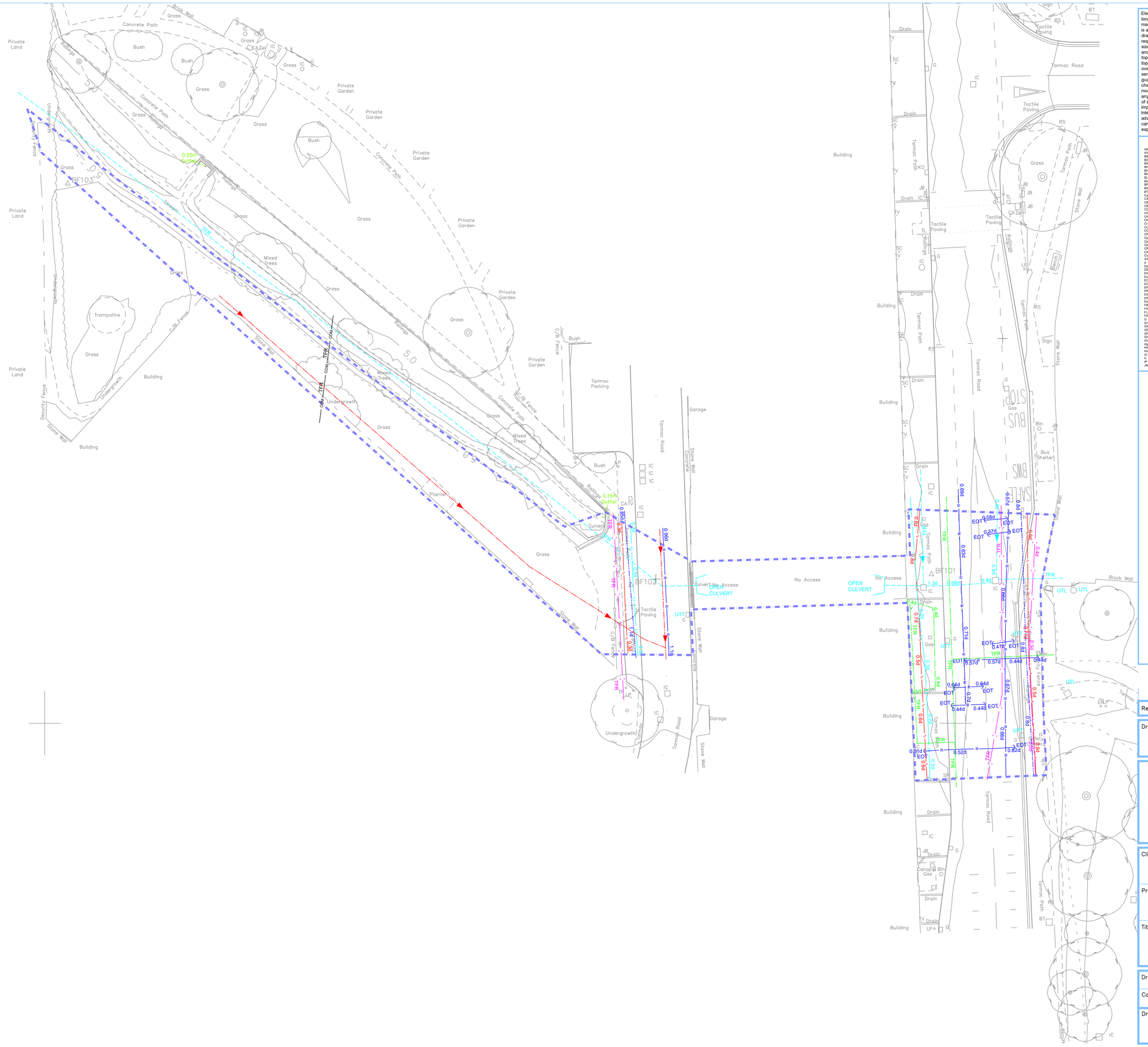
| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| DD | A Jones | 3 Of 3 | | All measurements in metres unless otherwise stated |

AGS

# APPENDIX V – **GPR SURVEY DRAWINGS**




Electromagnetic and/or Ground Penetrating Radar techniques have been used to locate/map underground utilities and features on this drawing. Intersect Surveys Ltd has made every endeavour to make sure that the information contained within this drawing is accurate and of the highest quality. Intersect Surveys Ltd has used any record drawings provided by the client or by the Statutory Utility Providers, at the client's request, at the time of the survey. Any information taken from these drawings (e.g. pipe sizes and position) is not guaranteed. Historic record information is often incomplete and inaccurate and cannot be relied upon. Intersect Surveys Ltd is not liable for any topographical survey that has not been undertaken by us. Any inaccuracies relating to topographical plans/development plans/Ordnance Survey data that we have no control over is the liability of the customer. Where quoted, depth information of underground services/features is stated. Depths are generally within +/10% accurate, but cannot be guaranteed. Any depths shown on drains are usually to invert (base of drainage channel) unless otherwise stated. At Intersect Surveys Ltd we use skilled staff and modern, calibrated equipment to perform our surveys. However, the completeness of any underground survey cannot be 100% guaranteed and the results from these types of surveys are not infallible. If the location or depth of services/features is of particular importance to a project then it is strongly recommended that discussions are held with Intersect Surveys Ltd regarding any possible limitations or anomalies. It is also strongly advised that trial excavations should be undertaken to confirm survey results. We cannot be held responsible for any inaccuracies beyond those that could be reasonably expected by a competent company.

## ABBREVIATIONS (Land & Utilities)

| | | | | | |
|---|---|---|---|---|---|
| AR | ASSUMED ROUTE | KO | KERB OUTLET | SL | SIGNAL LOST |
| AV | AIR VALVE | Lby | LIFEBUOY | SP | SIGN POST |
| BB | BELISHA BEACON | Lck | LOCK GATE | SPil | SHEET PILING |
| BO | BACKDROP | Ldr | LADDER | Spr | SPRING |
| BS | BOLLARD | LP | LAMP POST | SPT | SOUNDING POINT |
| BH | BOREHOLE | LP | LAMP POST | ST | STOP TAP |
| BHch | BASEMENT HATCH COVER | LV | LOW VOLTAGE | Stc | STILE |
| Bin | LITTER / GRIT SALT BIN | MgP | MOORING POST | Stl | STRUCTURE TOP LEVEL |
| BL | BASEMENT LIGHT | mH | METERS HIGH | Stp | STUMP (TREE) |
| Bol | BOLLARD | Mchy | MACHINERY | StP | STAND PIPE |
| BP | BOUNDARY POST | MH | MANHOLE | StPo | STAY POST |
| BT | BT POST | MkP | MARKER POST | SV | STOP VALVE |
| BTIC | BRITISH TELECOM CHAMBER | MkE | MARKER POST (ELECTRIC) | SV | STOP VALVE |
| Cat\. | CATENARY LEVEL | MkG | MARKER POST (GAS) | SVP | SOIL VENT PIPE |
| CATV | CABLE TV COVER | MkR | MARKER POST (RAILWAY) | TBM | TEMPORARY BENCH MARK |
| CB | CONTROL BOX | MkT | MARKER POST (TELECOM) | TCB | TELEPHONE CALL BOX |
| CBB | CONVEYOR BELT | MkW | MARKER POST (WATER) | TCL | TELECOM CHAMBER COVER |
| CCTV | CCTV CAMERA | MP | MILE POST | TFR | TAKEN FROM RECORDS |
| CGnt | CATTLE GRID | MP | MOORING PILE | TL | TRAFFIC LIGHT |
| CHL | CHANNEL LEVEL | NL | NOT LOCATED | TL | TRAFFIC LIGHT |
| Chy | CHIMNEY | NP | NAME PLATE | TP | TELEGRAPH POLE |
| CI | CAST IRON | OSA | OUTSIDE SURVEY AREA | Tpl | TRIAL PIT |
| CL | COVER LEVEL | OSBM | O.S BENCH MARK | Tr | TROUGH |
| CL | CENTRE LINE | OUC | OVERGROWN UNIDENTIFIED | UF | UNABLE TO FIND |
| CP | CABLE PYE | OHC | OVERHEAD CABLE (UNIDENTIFIED) | UTA | UNABLE TO GAIN ACCESS |
| CpL | COPING LEVEL | OHE | OVERHEAD CABLE (ELECTRIC) | UTL | UNABLE TO LIFT |
| Cpst | CAPSTAN | OHG | OVERHEAD GANTRY | UTR | UNABLE TO ROD |
| Cpst | CAMERA POST | OHP | OVERHEAD PIPE | UTS | UNABLE TO SURVEY |
| CR | CABLE RISER | OHT | OVERHEAD CABLE (TELECOM) | UTT | UNABLE TO TRACE |
| CrL | CROWN LEVEL | OP | OUTLET PIPE | VC | VITREOUS CLAY |
| CS | CONCRETE SETT | OP | OIL PIPE | VP | VENT PIPE |
| CWM | CABLE WINDING MACHINERY | Pb | PARK BENCH | VR | VAPOUR RECOVERY |
| d | DEPTH | PB | POST BOX | VS | VENTILATION SHAFT |
| Dia | DIAMETER | PCrg | PEDESTRIAN CROSSING | VW | VALVE / SLUICE WHEEL |
| DS | DIRECTION SIGN | PE | POLYETHALINE | WB | WEIGHBRIDGE |
| EIC | ELECTRIC INSPECTION COVER | Pf | PITCH FIBER | WL | WATER LEVEL |
| EoC | EDGE OF CANOPY | PI | PILE | WM | WATER METER |
| EOC | EDGE OF CONCRETE | PI | PAVEMENT DETECTOR | WO | WASH OUT VALVE |
| EOT | END OF TRACE | Pmd | PLANT MOTOR DRIVE | Ww | WELL |
| EP | ELECTRICITY POLE | PP | PETROL / DIESEL PUMP | WL | WEIR LEVEL |
| ER | EARTH ROD | PR | PIPE RISER | WR | WEIR PLATE (TOP) |
| ESher | EMERGENCY SHOWER | Psk | PENSTOCK | WWP | WASTE WATER PIPE |
| ESP | ELECTRICITY SUPPLY POINT | PU | PUMP | | |
| Esw | ELECTRICAL SWITCH | PV | PIPE (VERTICAL) | FENCE TYPES: | |
| EV | EXHAUST VENT | PVC | POLYVINYL CHLORIDE | AMF | ARMCO |
| FH | FIRE HYDRANT | Pyl | PYLON | BWF | BARBED WIRE |
| FL | FLOOR LEVEL | Pz | PIEZOMETER | CBF | CLOSE BOARDED |
| FS | FLAG STAFF / POLE | RE | RODDING EYE | CIF | CORRUGATED IRON |
| G | GULLY | RG | RAIN GAUGE | CLF | CHAIN LINK |
| G= | GIRTH | RMP | RESERVOIR MONITORING PNT | CPF | CHESTNUT PALING |
| GP | GAS MARKER POST | RP | REFLECTOR POST | IRF | IRON RAILING |
| GP | GAS PRESSURE POST | RP | RODDING POINT | PBF | POST & BARBED |
| GPR | TRACED BY G.P.R | RSP | RAILWAY SIGNAL POST | POF | POST & CHAIN |
| Gri | GRILLE | RWP | RAIN WATER PIPE | PIF | POST & IRON RAIL |
| GV | GAS VALVE | S | SPREAD | PRF | POST & RAIL |
| Hgt | HEIGHT | SA | SURVEY ABANDONED | PWF | POST & WIRE |
| HY | HANDRAIL | SB | SIGN BOARD | SPF | STEEL PALLISADE |
| HV | HIGH VOLTAGE | Shlt | SHELTER (BUS / TRAM) | WMF | WIRE MESH |
| IC | INSPECTION CHAMBER | SI | SOIL PIPE | | |
| IL | INVERT LEVEL | SL | SOFFIT LEVEL | | |
| IP | INLET PIPE | SIL | SILT LEVEL (TOP) | | |
| JN | JUNCTION | SMP | SETTLEMENT MONITORING PNT | | |

## KEY

- TV — CCTV / CABLE TELEVISION
- 450 — COMBINED DRAINAGE
- COM — COMMUNICATIONS CABLE
- A — COMPRESSED AIR
- DUCTING
- E — EARTH CABLE
- ELECTRIC CABLE
- EOT — END OF TRACE
- 150 — FOUL DRAINAGE
- F — FUEL PIPE
- GAS PIPE
- G — GAUGE LINE
- H — HEATING
- O — OFFSET FILL PIPE
- PUMPING MAIN
- R — RADAR AREA ANOMALY
- R — RADAR UTILITY TRACE
- 300 — SURFACE DRAINAGE
- SURVEY BOUNDARY
- TL — TELECOM CABLE
- TRAFFIC LIGHTS
- U — UNIDENTIFIED
- VR — VAPOUR RECOVERY
- V — VENT PIPE
- WATER PIPE
- O.S BENCH MARK
- SURVEY CONTROL STATION

| Revision | Description | Date |
|---|---|---|

Drawing Status: INFORMATION

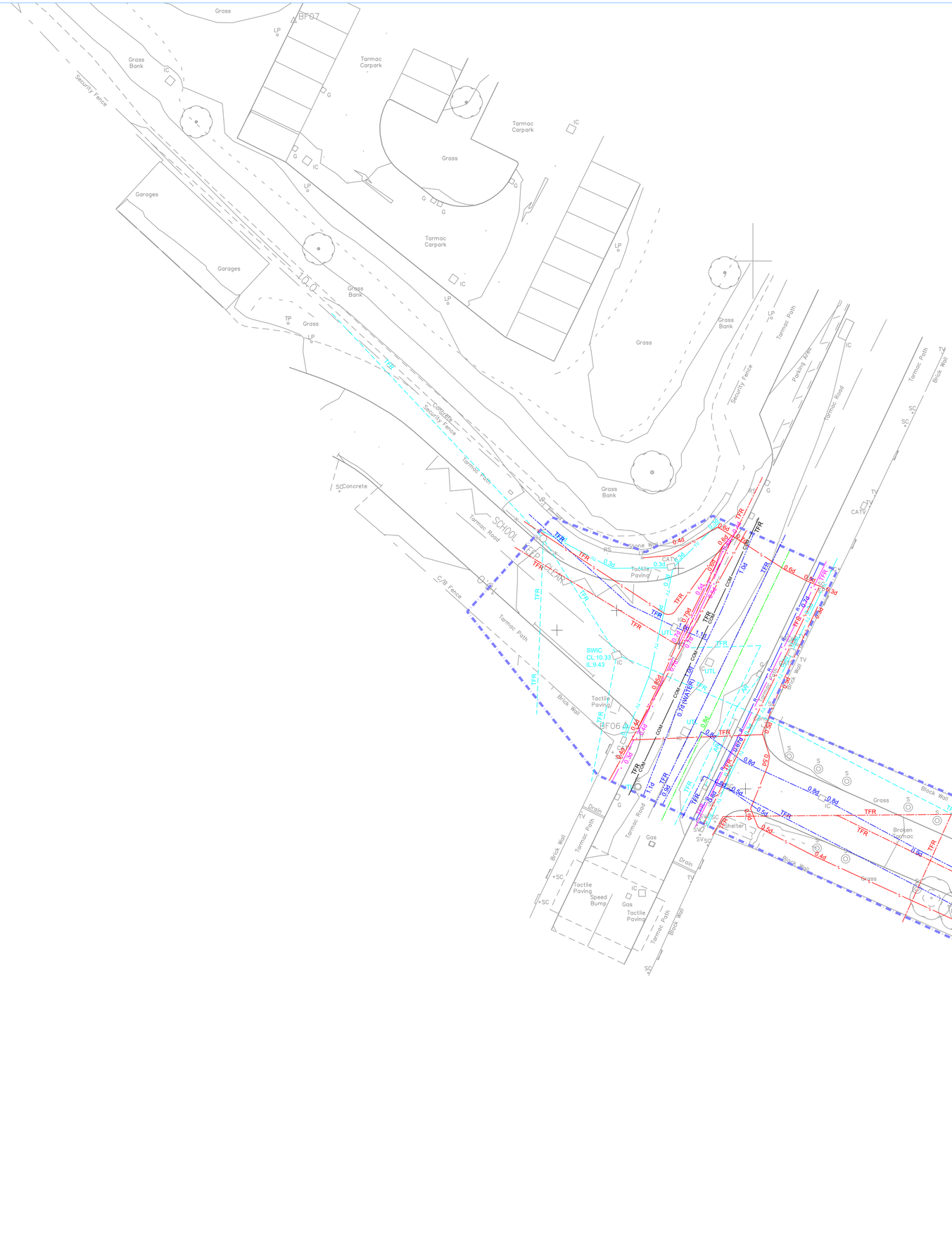

INTERSECT SURVEYS
T: 0208 399 3851 M: 07535 236 812
www.intersectsurveys.co.uk


Client: QUANTUM GEOTECH

Project: GRANDISON BROOK SITE 1

Title: UNDERGROUND UTILITY SERVICES LAYOUT

| Drawn | Surveyed: | Date |
|---|---|---|
| A.J.O. | A.S. | AUG'21 |
| Cad File: 001 | | Scale 1:200@A1 |
| Drawing Number 45134-001 | | Revision |

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## ABBREVIATIONS (Land & Utilities)

| | | | | | |
|---|---|---|---|---|---|
| AR | ASSUMED ROUTE | KO | KERB OUTLET | SL | SIGNAL LOST |
| AV | AIR VALVE | Lby | LIFEBOUY | SP | SIGN POST |
| BB | BELISHA BEACON | Lck | LOCK GATE | SPil | SHEET PILING |
| BO | BACKDROP | Ldr | LADDER | Spr | SPRING |
| BS | BOLLARD | LP | LAMP POST | SPT | SOIL SAMPLING POINT |
| BH | BOREHOLE | LP | LAMP POST | ST | STOP TAP |
| BHch | BASEMENT HATCH COVER | LV | LOW VOLTAGE | Stl | STILE |
| Bin | LITTER / GRIT SALT BIN | MgP | MOORING POST | Stl | STRUCTURE TOP LEVEL |
| BL | BASEMENT LIGHT | mH | METERS HIGH | Stp | STUMP (TREE) |
| Bol | BOLLARD | Mchy | MACHINERY | StP | STAND PIPE |
| BP | BOUNDARY POST | MH | MANHOLE | StPs | STAY POST |
| BT | BUTT | Mk | MARKER POST | SV | STOP VALVE |
| BTIC | BRITISH TELECOM CHAMBER | MkE | MARKER POST (ELECTRIC) | SV | STOP VALVE |
| Cat\. | CATENARY LEVEL | MkG | MARKER POST (GAS) | SVP | SOIL VENT PIPE |
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| CB | CONTROL BOX | MkT | MARKER POST (TELECOM) | TCB | TELEPHONE CALL BOX |
| CBt | CONVEYOR BELT | MkW | MARKER POST (WATER) | TCL | TELECOM CHAMBER COVER |
| CH | CHAINAGE | MP | MILE POST | TFR | TAKEN FROM RECORDS |
| CGrd | CATTLE GRID | MP | MILE POST | TL | TRAFFIC LIGHT |
| ChL | CHANNEL LEVEL | NL | NOT LOCATED | TL | TRAFFIC LIGHT |
| Chy | CHIMNEY | NP | NAME PLATE | TP | TELEGRAPH POLE |
| CI | CAST IRON | OSA | OUTSIDE SURVEY AREA | Tpl | TRIAL PIT |
| CL | COVER LEVEL | OSBM | O.S BENCH MARK | Tr | TROUGH |
| CP | CABLE PIT | OvP | OVERGROUND PIPE | TS | TRIG STATION FOUND |
| CP | CABLE PIT | OHC | OVERHEAD CABLE(UNIDENTIFIED) | UTA | UNABLE TO GAIN ACCESS |
| CpL | COPING LEVEL | OHE | OVERHEAD CABLE (ELECTRIC) | UTL | UNABLE TO LIFT |
| Cpst | CAPSTAN | OHG | OVERHEAD GANTRY | UTR | UNABLE TO ROD |
| Cpst | CAMERA POST | OHP | OVERHEAD PIPE | UTS | UNABLE TO SURVEY |
| CR | CABLE RISER | OHT | OVERHEAD CABLE (TELECOM) | UTT | UNABLE TO TRACE |
| CrL | CROWN LEVEL | OP | OUTLET PIPE | VC | VITREOUS CLAY |
| CTV | CCTV CAMERA | P | PIPE | VP | VENT PIPE |
| CWM | CABLE WINDING MACHINERY | Pb | PARK BENCH | VR | VAPOUR RECOVERY |
| d | DEPTH | PB | POST BOX | VS | VENTILATION SHAFT |
| Dia | DIAMETER | PCrg | PEDESTRIAN CROSSING | VW | VALVE / SLUICE WHEEL |
| DS | DIRECTION SIGN | PE | POLYETHALINE | WB | WEIGHBRIDGE |
| EIC | ELECTRIC INSPECTION COVER | PF | PITCH FIBER | WL | WATER LEVEL |
| EoC | EDGE OF CANOPY | PI | PILE | WM | WATER METER |
| EOB | EDGE OF BUILDINGS | PI | PAVEMENT DETECTOR | WO | WASH OUT VALVE |
| EOT | END OF TRACE | Prod | PLANT MOTOR DRIVE | Ww | WELR |
| EP | ELECTRICITY POLE | PP | PETROL / DIESEL PUMP | WL | WEIR LEVEL |
| ER | EARTH ROD | PR | PIPE RISER | WR | WEIR PLATE (TOP) |
| ESher | EMERGENCY SHOWER | Psk | PENSTOCK | WWP | WASTE WATER PIPE |
| ESP | ELECTRICITY SUPPLY POINT | PU | PUMP | | |
| Esw | ELECTRICAL SWITCH | PV | PIPE (VERTICAL) | FENCE TYPES: | |
| F | FENCE | PVC | POLYVINYL CHLORIDE | AMF | ARMCO |
| FH | FIRE HYDRANT | Py | PYLON | BWF | BARBED WIRE |
| FL | FLOOR LEVEL | Pz | PIEZOMETER | CBF | CLOSE BOARDED |
| FS | FLAG STAFF / POLE | RE | RODDING EYE | CIF | CORRUGATED IRON |
| G | GULLY | RG | RAIN GAUGE | CLF | CHAIN LINK |
| G= | GIRTH | RMP | RESERVOIR MONITORING PNT | CPF | CHESTNUT PALING |
| GP | GAS BLANKET PIPE | RP | REFLECTOR POST | IRF | IRON RAILING |
| GPR | GAS PROBE POST | RP | RADAR POST | PAL | PALISADE FENCE |
| GPR | TRACED BY G.P.R | RSP | RAILWAY SIGNAL POST | POF | POST & CHAIN |
| Gri | GRISLE | RWP | RAIN WATER PIPE | PIF | POST & IRON RAIL |
| GV | GAS VALVE | S | SPREAD | PRF | POST & RAIL |
| Hgt | HEIGHT | SA | SURVEY ABANDONED | PWF | POST & WIRE |
| HrI | HANDRAIL | SB | SIGN BOARD | SPF | STEEL PALLISADE |
| HV | HIGH VOLTAGE | Shlt | SHELTER (BUS / TRAM) | WMF | WIRE MESH |
| IC | INSPECTION CHAMBER | SI | SOIL PIPE | | |
| IL | INVERT LEVEL | SL | SPIRIT LEVEL | | |
| IP | INLET PIPE | SIL | SILT LEVEL (TOP) | | |
| JN | JUNCTION | SMP | SETTLEMENT MONITORING PNT | | |

## KEY

- CCTV / CABLE TELEVISION
- COMBINED DRAINAGE
- COMMUNICATIONS CABLE
- COMPRESSED AIR
- DUCTING
- EARTH CABLE
- ELECTRIC CABLE
- END OF TRACE
- FOUL DRAINAGE
- FUEL PIPE
- GAS PIPE
- GAUGE LINE
- HEATING
- OFFSET FILL PIPE
- PUMPING MAIN
- RADAR AREA ANOMALY
- RADAR UTILITY TRACE
- SURFACE DRAINAGE
- SURVEY BOUNDARY
- TELECOM CABLE
- TRAFFIC LIGHTS
- UNIDENTIFIED
- VAPOUR RECOVERY
- VENT PIPE
- WATER PIPE
- O.S BENCH MARK
- SURVEY CONTROL STATION

| Revision | Description | Date |
|---|---|---|

Drawing Status: INFORMATION


INTERSECT SURVEYS
T: 0208 399 3851 M: 07535 236 812
www.intersectsurveys.co.uk


Client: QUANTUM GEOTECH

Project: GRANDISON BROOK SITE 2

Title: UNDERGROUND UTILITY SERVICES LAYOUT

| Drawn | Surveyed: | Date |
|---|---|---|
| A.J.O. | A.S. | AUG'21 |
| Cad File: 001 | | Scale 1:200@A1 |
| Drawing Number 45134-002 | | Revision |

Electromagnetic and/or Ground Penetrating Radar techniques have been used to locate/map underground utilities and features on this drawing. Intersect Surveys Ltd has made every endeavour to make sure that the information contained within this drawing is accurate and of the highest quality. Intersect Surveys Ltd has used any record drawings provided by the client or by the Statutory Utility Providers, at the client's request, at the time of the survey. Any information taken from these drawings (e.g. pipe sizes and position) is not guaranteed. Historic record information is often incomplete and inaccurate and cannot be relied upon. Intersect Surveys Ltd is not liable for any topographical survey that has not been undertaken by us. Any inaccuracies relating to topographical plans/development plans/Ordnance Survey data that we have no control over is the liability of the customer. Where quoted, depth information of underground services/features is stated. Depths are generally within +/10% accurate, but cannot be guaranteed. Any depths shown on drains are usually to invert (base of drainage channel) unless otherwise stated. At Intersect Surveys Ltd we use skilled staff and modern, calibrated equipment to perform our surveys. However, the completeness of any underground survey cannot be 100% guaranteed and the results from these types of surveys are not infallible. If the location or depth of services/features is of particular importance to a project then it is strongly recommended that discussions are held with Intersect Surveys Ltd regarding any possible limitations or anomalies. It is also strongly advised that trial excavations should be undertaken to confirm survey results. We cannot be held responsible for any inaccuracies beyond those that could be reasonably expected by a competent company.

## ABBREVIATIONS (Land & Utilities)

| | | | | | |
|---|---|---|---|---|---|
| AR | ASSUMED ROUTE | KO | KERB OUTLET | SIL | SIGNAL LOST |
| AV | AIR VALVE | Lby | LIFEBOUY | SP | SIGN POST |
| BB | BELISHA BEACON | Lck | LOCK GATE | SPil | SHEET PILING |
| BO | BACKDROP | Ldr | LADDER | Spr | SPRING |
| BS | BOLLARD | LP | LAMP PICKLE | SPT | STANDPIPE TO POINT |
| BH | BOREHOLE | LP | LAMP POST | ST | STOP TAP |
| BHch | BASEMENT HATCH COVER | LV | LOW VOLTAGE | Stc | STILE |
| Bin | LITTER / GRIT SALT BIN | MgP | MOORING POST | Stl | STRUCTURE TOP LEVEL |
| BL | BASEMENT LIGHT | mH | METERS HIGH | Stp | STUMP (TREE) |
| Bol | BOLLARD | Mchy | MACHINERY | StP | STAND PIPE |
| BP | BOUNDARY POST | MH | MANHOLE | StPp | STAY POST |
| BT | BT POST | MkP | MARKER POST | Sty | STILE STEPS |
| BTIC | BRITISH TELECOM CHAMBER | MkE | MARKER POST (ELECTRIC) | SV | STOP VALVE |
| Cat\. | CATENARY LEVEL | MkG | MARKER POST (GAS) | SVP | SOIL VENT PIPE |
| CATV | CABLE TV COVER | MkR | MARKER POST (RAILWAY) | TBM | TEMPORARY BENCH MARK |
| CB | CONTROL BOX | MkT | MARKER POST (TELECOM) | TCB | TELEPHONE CALL BOX |
| CBt | CONVEYOR BELT | MkW | MARKER POST (WATER) | TCL | TELECOM CHAMBER COVER |
| CH | CABLE HUT | MP | MILE POST | TFR | TAKEN FROM RECORDS |
| CGrd | CATTLE GRID | MR | MAST RADIO | TL | TRAFFIC LIGHT |
| CnL | CHANNEL LEVEL | NL | NOT LOCATED | TL | TRAFFIC LIGHT |
| Chy | CHIMNEY | NP | NAME PLATE | TP | TELEGRAPH POLE |
| CI | CAST IRON | OSA | OUTSIDE SURVEY AREA | Tpl | TRIAL PIT |
| CL | COVER LEVEL | OSBM | O.S BENCH MARK | Tr | TROUGH |
| CP | CONCRETE POST | OuP | OVERGROUND PIPE | TS | TOTAL STATION FIND |
| CP | CABLE PIT | OHC | OVERHEAD CABLE (UNIDENTIFIED) | UTA | UNABLE TO GAIN ACCESS |
| CpL | COPING LEVEL | OHE | OVERHEAD CABLE (ELECTRIC) | UTL | UNABLE TO LIFT |
| Cpst | CAPSTAN | OHG | OVERHEAD GANTRY | UTR | UNABLE TO ROD |
| Cpst | CAMERA POST | OHP | OVERHEAD PIPE | UTS | UNABLE TO SURVEY |
| CR | CABLE RISER | OHT | OVERHEAD CABLE (TELECOM) | UTT | UNABLE TO TRACE |
| CrL | CROWN LEVEL | OP | OUTLET PIPE | VC | VITREOUS CLAY |
| CS | CONCRETE SPIPE | P | PUMP | VP | VENT PIPE |
| CWM | CABLE WINDING MACHINERY | Pb | PARK BENCH | VR | VAPOUR RECOVERY |
| d | DEPTH | PB | POST BOX | VS | VENTILATION SHAFT |
| Dia | DIAMETER | PCrg | PEDESTRIAN CROSSING | VW | VALVE / SLUICE WHEEL |
| DS | DIRECTION SIGN | PE | POLYETHALINE | WB | WEIGHBRIDGE |
| EIC | ELECTRIC INSPECTION COVER | PF | PITCH FIBER | WL | WATER LEVEL |
| EoC | EDGE OF CANOPY | PI | PILE | WM | WATER METER |
| EOT | END OF TRACE | PI | PAVEMENT DETECTOR | WO | WASH OUT VALVE |
| EOT | END OF TRACE | Pmd | PLANT MOTOR DRIVE | Ww | WEIR |
| EP | ELECTRICITY POLE | PP | PETROL / DIESEL PUMP | WL | WEIR LEVEL |
| ER | EARTH ROD | PR | PIPE RISER | WR | WEIR PLATE (TOP) |
| EShwr | EMERGENCY SHOWER | Psk | PENSTOCK | WWP | WASTE WATER PIPE |
| ESP | ELECTRICITY SUPPLY POINT | PU | PUMP | | |
| Esw | ELECTRICAL SWITCH | PVC | PIPE (VERTICAL) | FENCE TYPES: | |
| Ex | EXISTING | PVC | POLYVINYL CHLORIDE | AMF | ARMCO |
| FH | FIRE HYDRANT | Pyl | PYLON | BWF | BARBED WIRE |
| FL | FLOOR LEVEL | Pz | PIEZOMETER | CBF | CLOSE BOARDED |
| FS | FLAG STAFF / POLE | RE | RODDING EYE | CIF | CORRUGATED IRON |
| G | GULLY | RG | RAIN GAUGE | CLF | CHAIN LINK |
| G= | GIRTH | RMP | RESERVOIR MONITORING PNT | CPF | CHESTNUT PALING |
| GP | GAS BLAST PIPE | RP | REFLECTOR POST | IRF | IRON RAILING |
| GP | GAS MARKER POST | RP | RODDING POINT | PCF | PRECAST CONC |
| GPR | TRACED BY G.P.R | RSP | RAILWAY SIGNAL POST | POF | POST & CHAIN |
| Gri | GRILLE | RWP | RAIN WATER PIPE | PIF | POST & IRON RAIL |
| GV | GAS VALVE | S | SPREAD | PRF | POST & RAIL |
| Hgt | HEIGHT | SA | SURVEY ABANDONED | PWF | POST & WIRE |
| Hrl | HANDRAIL | SB | SIGN BOARD | SPF | STEEL PALLISADE |
| HV | HIGH VOLTAGE | Shlt | SHELTER (BUS / TRAM) | WMF | WIRE MESH |
| IC | INSPECTION CHAMBER | SL | SOFFIT LEVEL | | |
| IL | INVERT LEVEL | SL | SOFFIT LEVEL | | |
| IP | INLET PIPE | SIL | SILT LEVEL (TOP) | | |
| JN | JUNCTION | SMP | SETTLEMENT MONITORING PNT | | |

## KEY

- CCTV / CABLE TELEVISION
- COMBINED DRAINAGE (450)
- COMMUNICATIONS CABLE
- COMPRESSED AIR
- DUCTING
- EARTH CABLE
- ELECTRIC CABLE
- END OF TRACE
- FOUL DRAINAGE (150)
- FUEL PIPE
- GAS PIPE
- GAUGE LINE
- HEATING
- OFFSET FILL PIPE
- PUMPING MAIN
- RADAR AREA ANOMALY
- RADAR UTILITY TRACE
- SURFACE DRAINAGE (300)
- SURVEY BOUNDARY
- TELECOM CABLE
- TRAFFIC LIGHTS
- UNIDENTIFIED
- VAPOUR RECOVERY
- VENT PIPE
- WATER PIPE
- O.S BENCH MARK
- SURVEY CONTROL STATION

| Revision | Description | Date |
|---|---|---|

Drawing Status: INFORMATION


INTERSECT SURVEYS
T: 0208 399 3851 M: 07535 236 812
www.intersectsurveys.co.uk


Client: QUANTUM GEOTECH

Project: GRANDISON BROOK SITE 3

Title: UNDERGROUND UTILITY SERVICES LAYOUT

| | | | |
|---|---|---|---|
| Drawn: A.J.O. | Surveyed: A.S. | Date: AUG'21 | |
| Cad File: 001 | | Scale: 1:200@A1 | |
| Drawing Number: 45134-003 | | Revision: | |

# APPENDIX VI – **GEOTECHNICAL LABORATORY TEST RESULTS**

# Laboratory Report

2788

GEO Site & Testing Services Ltd

## Contract Number: 55495

Client Ref: **Q0560**
Client PO:

Report Date: **15-09-2021**

Client **Quantum Geotechnic Ltd**
**Plas Newydd**
**Llanedi**
**Pontarddulais**
**Swansea**
**SA4 0FQ**

Contract Title: **Grandison Brook**
For the attention of: **Arwel Jones**

Date Received: **25-08-2021**
Date Completed: **15-09-2021**

| Test Description | Qty |
|---|---|
| **Moisture Content of Soil**<br>BS1377 : Part 2 : Clause 3.2 : 1990 - * UKAS | 11 |
| **4 Point Liquid & Plastic Limit**<br>BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS | 2 |
| **PSD Wet & Dry Sieve method**<br>BS 1377:1990 - Part 2 : 9.2 - * UKAS | 3 |
| **PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected)**<br>BS 1377:1990 - Part 2 : 9.4 - * UKAS | 3 |
| **Organic Matter Content-dichromate method**<br>Sub-contracted Test | 2 |
| **BRE Suite D Brownfield Site (pyrite present)**<br>**includes pH, water & acid soluble sulphate, total sulphur, magnesium, chloride and nitrate**<br>Sub-contracted Test - @ Non Accredited Test | 4 |

**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 (Business Support Manager) - Paul Evans (Director) - Richard John (Quality/Technical Manager)
Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager) - Wayne Honey (Quality Assistant / Administrator / Health and Safety Coordinator)

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

# Laboratory Report

2788

GEO Site & Testing Services Ltd

## Contract Number: 55495

| Test Description | Qty |
|---|---|
| **Samples Received**<br>- @ Non Accredited Test | 46 |
| **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 (Business Support Manager) - Paul Evans (Director) - Richard John (Quality/Technical Manager)
Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager) - Wayne Honey (Quality Assistant / Administrator / Health and Safety Coordinator)

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

| GSTL | Natural Moisture Content<br>( BS 1377:1990 - Part 2 : 3.2 )<br>DESCRIPTIONS | |
|---|---|---|
| Contract Number | 55495 | |
| Site Name | Grandison Brook | |
| Date Tested | 09/09/2021 | |
| | | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Descriptions |
|---|---|---|---|---|---|---|
| GBBH01 | 5 | B | 0.80 | - | 1.20 | Brown fine to coarse gravelly silty sandy CLAY |
| GBBH03 | 4 | B | 0.50 | - | 0.70 | Brown fine to coarse gravelly silty CLAY |
| GBBH03 | 7 | B | 1.50 | - | 2.20 | Brown fine to coarse gravelly silty sandy CLAY |
| GBBH03 | 9 | B | 5.50 | - | 6.40 | Brown fine to coarse gravelly silty sandy CLAY |
| GBBH03 | 11 | D | 7.90 | - | 8.00 | Brown silty clayey fine to coarse GRAVEL |
| GBBH05 | 13 | B | 4.50 | - | 5.00 | Black PEAT |
| GBTP01 | 7 | B | 1.30 | - | 1.80 | Brown silty clayey fine to coarse gravelly SAND |
| GBTP05 | 8 | B | 2.60 | - | 3.00 | Black PEAT |
| GBTP06 | 8 | B | 2.50 | - | 3.00 | Black PEAT |
| | | | | - | | |
| | | | | - | | |
| | | | | - | |

| GSTL | Natural Moisture Content<br>( BS 1377:1990 - Part 2 : 3.2 ) | |
|---|---|---|
| Contract Number | 55495 | |
| Site Name | Grandison Brook | |
| Date Tested | 09/09/2021 | |
| | | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Moisture Content % | Remarks |
|---|---|---|---|---|---|---|---|
| GBBH01 | 5 | B | 0.80 | - | 1.20 | 13 | |
| GBBH03 | 4 | B | 0.50 | - | 0.70 | 26 | |
| GBBH03 | 7 | B | 1.50 | - | 2.20 | 11 | |
| GBBH03 | 9 | B | 5.50 | - | 6.40 | 4.5 | |
| GBBH03 | 11 | D | 7.90 | - | 8.00 | 1.5 | |
| GBBH05 | 13 | B | 4.50 | - | 5.00 | 133 | |
| GBTP01 | 7 | B | 1.30 | - | 1.80 | 20 | |
| GBTP05 | 8 | B | 2.60 | - | 3.00 | 300 | |
| GBTP06 | 8 | B | 2.50 | - | 3.00 | 529 | |
| | | | | - | | | |
| | | | | - | | | |
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| GSTL | NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377:1990 - Part 2 : 4.3 & 5.3 ) | |
|---|---|---|
| Contract Number | 55495 | |
| Site Name | Grandison Brook | |
| Date Tested | 09/09/2021 | |
| | **DESCRIPTIONS** | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Descriptions |
|---|---|---|---|---|---|---|
| GBBH01 | 4 | B | 0.50 | - | 0.70 | Brown silty clayey fine to coarse gravelly SAND |
| GBTP01 | 5 | B | 0.80 | - | 1.00 | Brown silty clayey fine to coarse gravelly SAND |
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| Operators | Checked | 15/09/2021 | Richard John (Advanced Testing Manager) |
|---|---|---|---|
| Clayton Jenkins | Approved | 15/09/2021 | Paul Evans (Quality/Technical Manager) |

UKAS TESTING 2788

| GSTL | NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377:1990 - Part 2 : 4.3 & 5.3 ) | |
|---|---|---|
| Contract Number | 55495 | |
| Project Location | Grandison Brook | |
| Date Tested | 09/09/2021 | |
| | | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Moisture Content % | Liquid Limit % | Plastic Limit % | Plasticity index % | Passing 0.425mm % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GBBH01 | 4 | B | 0.50 | - | 0.70 | 22 | 33 | 21 | 12 | 61 | CL Low Plasticity |
| GBTP01 | 5 | B | 0.80 | - | 1.00 | 22 | 38 | 19 | 19 | 76 | CI Intermediate Plasticity |
| | | | | - | | | | | | | |
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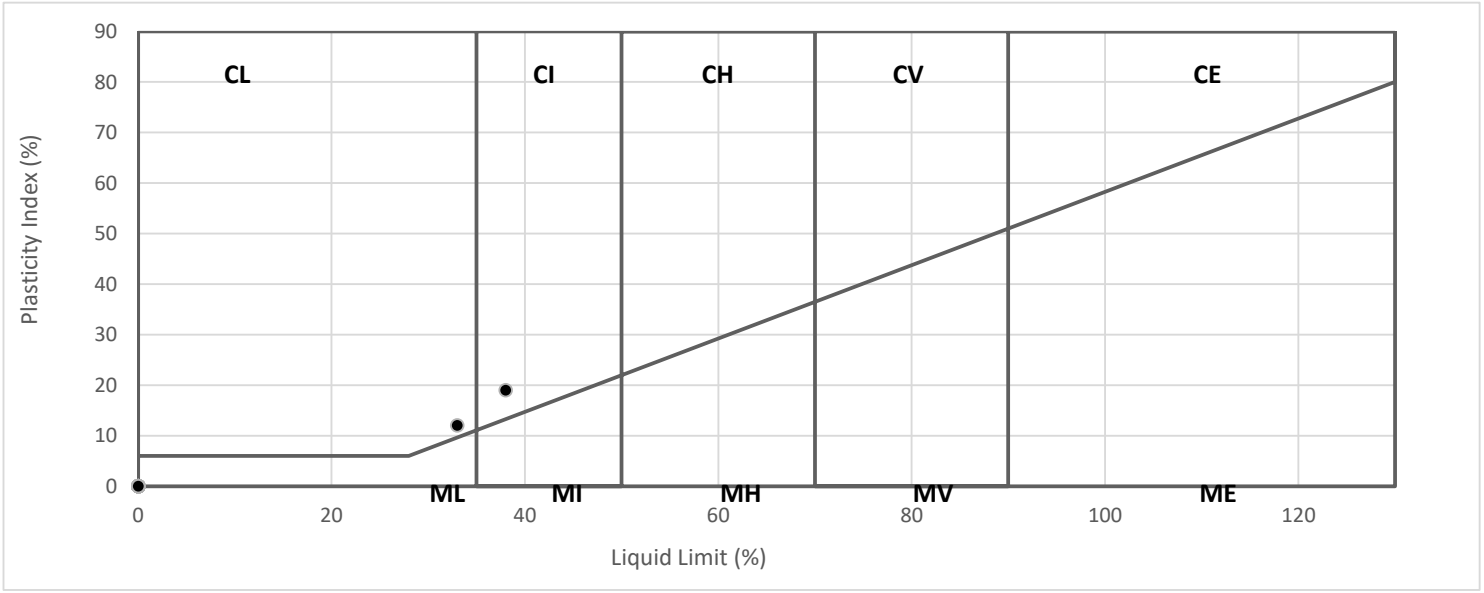
Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

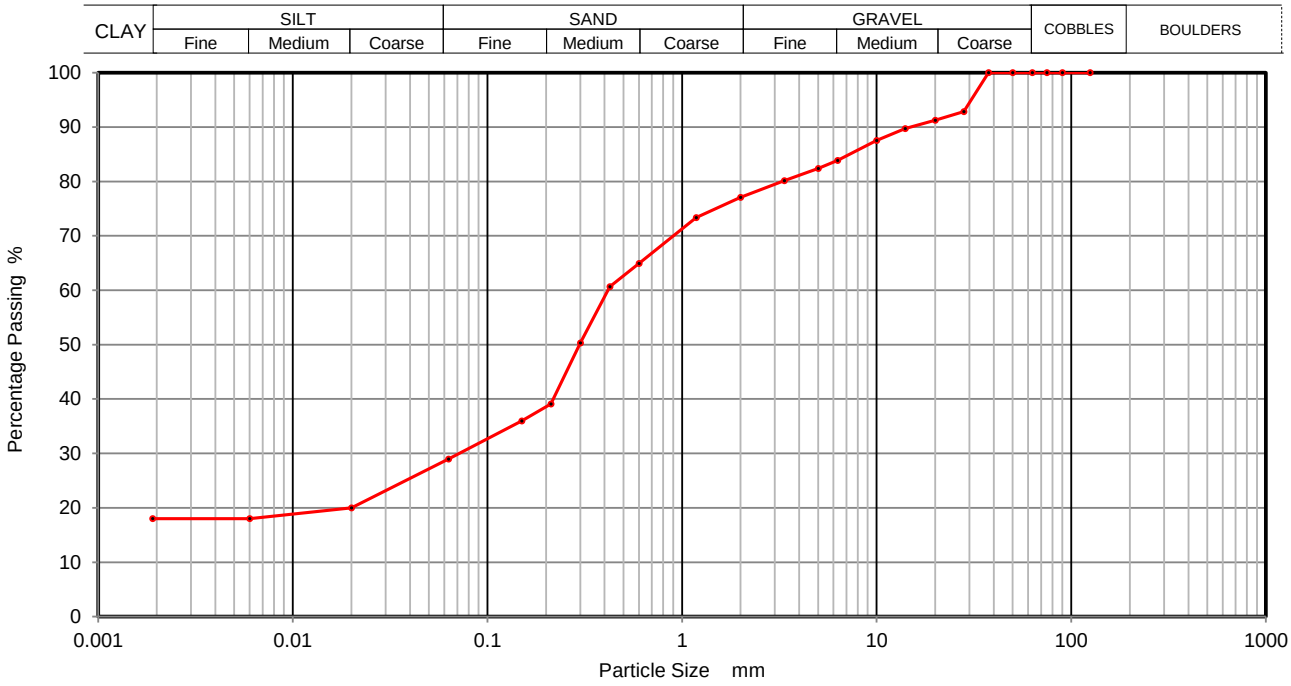
**PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION**
**BS 5930:1999+A2:2010**




| Operators | Checked | 15/09/2021 | Richard John (Advanced Testing Manager) |
|---|---|---|---|
| Clayton Jenkins | Approved | 15/09/2021 | Paul Evans (Quality/Technical Manager) |

UKAS TESTING
2788

| GSTL | PARTICLE SIZE DISTRIBUTION<br>BS 1377 Part 2:1990<br>Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4 | Contract Number | 55495 |
|---|---|---|---|
| | | Borehole/Pit No. | GBBH01 |
| Site Name | Grandison Brook | Sample No. | 1 |
| Soil Description | Brown silty clayey fine to coarse gravelly SAND | Depth Top | 0.50 |
| | | Depth Base | 0.70 |
| Date Tested | 09/09/2021 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | 0.0200 | 20 |
| 90 | 100 | 0.0060 | 18 |
| 75 | 100 | 0.0020 | 18 |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 93 | | |
| 20 | 91 | | |
| 14 | 90 | | |
| 10 | 88 | | |
| 6.3 | 84 | | |
| 5 | 82 | | |
| 3.35 | 80 | | |
| 2 | 77 | | |
| 1.18 | 73 | | |
| 0.6 | 65 | | |
| 0.425 | 61 | | |
| 0.3 | 50 | | |
| 0.212 | 39 | | |
| 0.15 | 36 | | |
| 0.063 | 29 | | |

| Sample Proportions | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 23 |
| Sand | 48 |
| Silt | 11 |
| Clay | 18 |
| | |

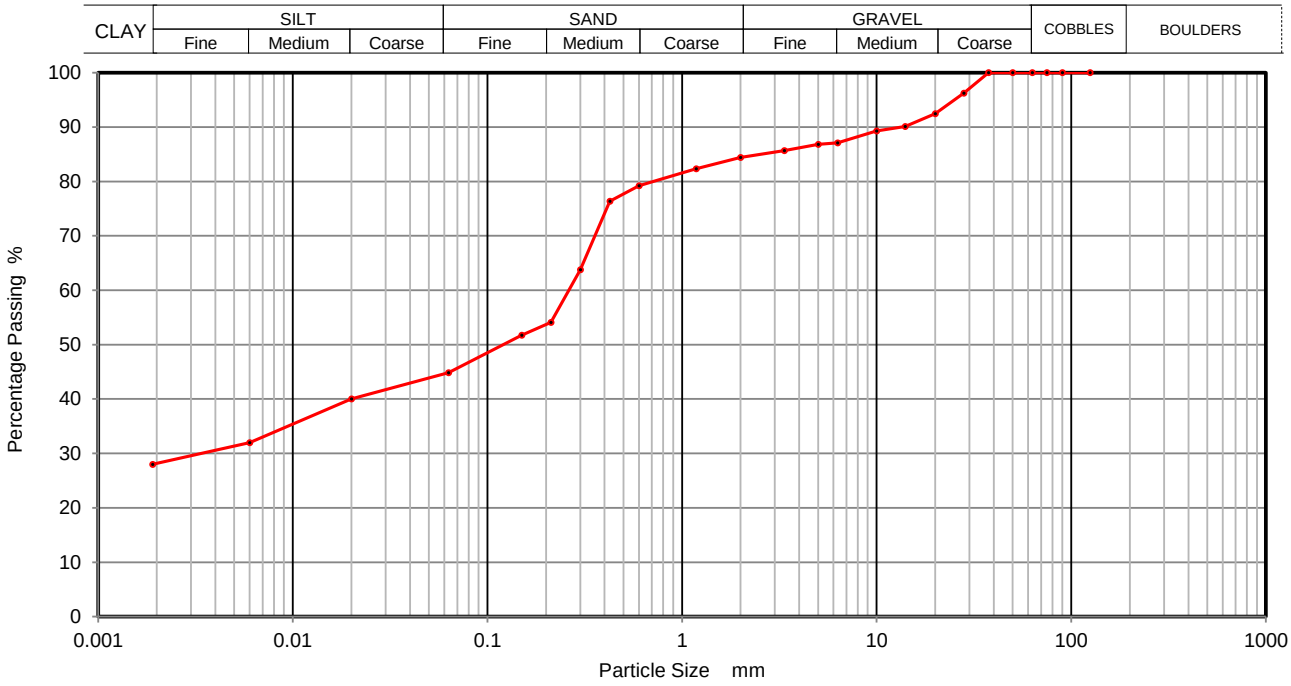
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| | | | | |
|---|---|---|---|---|
| Operator | Checked | 14/09/2021 | Richard John | |
| David | Approved | 15/09/2021 | Paul Evans | |

UKAS TESTING 2788

| GSTL | PARTICLE SIZE DISTRIBUTION<br>BS 1377 Part 2:1990<br>Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4 | Contract Number | 55495 |
|---|---|---|---|
| | | Borehole/Pit No. | GBTP01 |
| Site Name | Grandison Brook | Sample No. | 5 |
| Soil Description | Brown silty clayey fine to coarse gravelly SAND | Depth Top | 0.80 |
| | | Depth Base | 1.00 |
| Date Tested | 09/09/2021 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | 0.0200 | 40 |
| 90 | 100 | 0.0060 | 32 |
| 75 | 100 | 0.0020 | 28 |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 96 | | |
| 20 | 92 | | |
| 14 | 90 | | |
| 10 | 89 | | |
| 6.3 | 87 | | |
| 5 | 87 | | |
| 3.35 | 86 | | |
| 2 | 84 | | |
| 1.18 | 82 | | |
| 0.6 | 79 | | |
| 0.425 | 76 | | |
| 0.3 | 64 | | |
| 0.212 | 54 | | |
| 0.15 | 52 | | |
| 0.063 | 45 | | |

| Sample Proportions | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 16 |
| Sand | 39 |
| Silt | 17 |
| Clay | 28 |
| | |

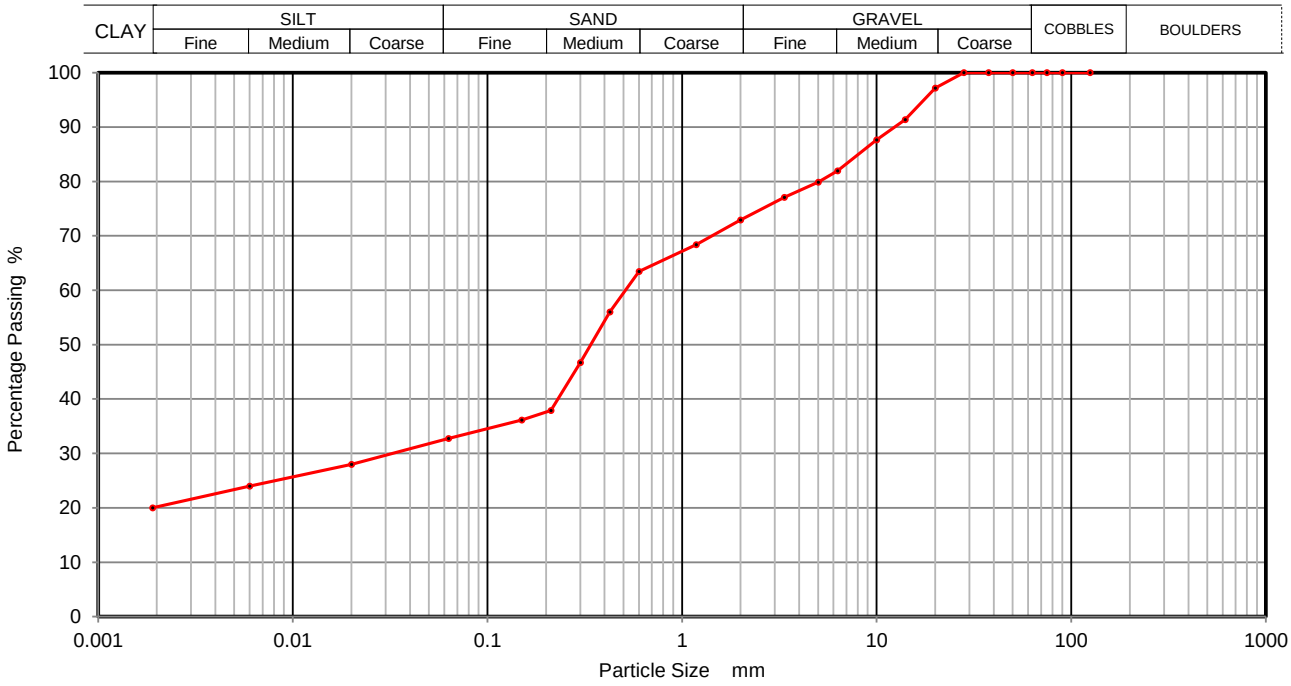
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| | | | | |
|---|---|---|---|---|
| Operator | Checked | 14/09/2021 | Richard John | |
| David | Approved | 15/09/2021 | Paul Evans | |

UKAS TESTING 2788

| GSTL | PARTICLE SIZE DISTRIBUTION<br>BS 1377 Part 2:1990<br>Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4 | Contract Number | 55495 |
|---|---|---|---|
| | | Borehole/Pit No. | GBTP01 |
| Site Name | Grandison Brook | Sample No. | 7 |
| Soil Description | Brown silty clayey fine to coarse gravelly SAND | Depth Top | 1.30 |
| | | Depth Base | 1.80 |
| Date Tested | 09/09/2021 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | 0.0200 | 28 |
| 90 | 100 | 0.0060 | 24 |
| 75 | 100 | 0.0020 | 20 |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 97 | | |
| 14 | 91 | | |
| 10 | 88 | | |
| 6.3 | 82 | | |
| 5 | 80 | | |
| 3.35 | 77 | | |
| 2 | 73 | | |
| 1.18 | 68 | | |
| 0.6 | 63 | | |
| 0.425 | 56 | | |
| 0.3 | 47 | | |
| 0.212 | 38 | | |
| 0.15 | 36 | | |
| 0.063 | 33 | | |

| Sample Proportions | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 27 |
| Sand | 40 |
| Silt | 13 |
| Clay | 20 |
| | |

Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator | Checked | 14/09/2021 | Richard John | |
|---|---|---|---|---|
| David | Approved | 15/09/2021 | Paul Evans | |

UKAS TESTING 2788

# Certificate of Analysis

| | | | |
|---|---|---|---|
| *Certificate Number* | 21-18799 | *Issued:* | 13-Sep-21 |

*Client* GEO Site and Testing Services Ltd
Unit 4
Heol Aur
Dafen Ind Est
Dafen
Carmarthenshire
SA14 8QN

*Our Reference* 21-18799

*Client Reference* 55495

*Order No* (not supplied)

*Contract Title* Grandison Brook

*Description* 6 Soil samples.

*Date Received* 06-Sep-21

*Date Started* 06-Sep-21

*Date Completed* 13-Sep-21

*Test Procedures* Identified by prefix DETSn (details on request).

*Notes* Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. 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 By*

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

# Summary of Chemical Analysis
# Soil Samples

*Our Ref* 21-18799
*Client Ref* 55495
*Contract Title* Grandison Brook

| | Lab No | 1899706 | 1899707 | 1899708 | 1899709 | 1899710 | 1899711 |
|---|---|---|---|---|---|---|---|
| | .Sample ID | GBBH01 | GBBH03 | GBTP01 | GBTP05 | GBTP06 | GBBH05 |
| | Depth | 0.80-1.20 | 1.50-2.20 | 0.80-1.00 | 2.60-3.00 | 2.50-3.00 | 1.20-1.80 |
| | Other ID | 5 | 7 | 5 | 8 | 8 | 7 |
| | Sample Type | B | B | B | B | B | B |
| | Sampling Date | n/s | n/s | n/s | n/s | n/s | n/s |
| | Sampling Time | n/s | n/s | n/s | n/s | n/s | n/s |
| **Test** | **Method** | **LOD** | **Units** | | | | |
| **Metals** | | | | | | | |
| Magnesium Aqueous Extract | DETSC 2076* | 10 | mg/l | < 10 | < 10 | < 10 | | | 17 |
| **Inorganics** | | | | | | | |
| pH | DETSC 2008# | | pH | 6.9 | 7.6 | 7.5 | | | 6.0 |
| Organic matter | DETSC 2002# | 0.1 | % | | | | 0.3 | 13 | |
| Chloride Aqueous Extract | DETSC 2055 | 1 | mg/l | 3.8 | 9.4 | 5.6 | | | 6.2 |
| Nitrate Aqueous Extract as NO3 | DETSC 2055 | 1 | mg/l | 6.2 | 2.1 | 4.4 | | | 5.8 |
| Sulphate Aqueous Extract as SO4 | DETSC 2076# | 10 | mg/l | 16 | 16 | 11 | | | 490 |
| Sulphur as S, Total | DETSC 2320 | 0.01 | % | 0.02 | < 0.01 | 0.01 | | | 0.22 |
| Sulphate as SO4, Total | DETSC 2321# | 0.01 | % | 0.04 | 0.01 | 0.03 | | | 0.21 |

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

# Information in Support of the Analytical Results

*Our Ref* 21-18799
*Client Ref* 55495
*Contract* Grandison Brook

## Containers Received & Deviating Samples

| Lab No | Sample ID | Date Sampled | Containers Received | Holding time exceeded for tests | Inappropriate container for tests |
|---|---|---|---|---|---|
| 1899706 | GBBH01 0.80-1.20 SOIL | | PT 1L | Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days) | |
| 1899707 | GBBH03 1.50-2.20 SOIL | | PT 1L | Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days) | |
| 1899708 | GBTP01 0.80-1.00 SOIL | | PT 1L | Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days) | |
| 1899709 | GBTP05 2.60-3.00 SOIL | | PT 1L | Sample date not supplied, Organic Matter (Manual) (28 days) | |
| 1899710 | GBTP06 2.50-3.00 SOIL | | PT 1L | Sample date not supplied, Organic Matter (Manual) (28 days) | |
| 1899711 | GBBH05 1.20-1.80 SOIL | | PT 1L | Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days) | |

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

## Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

## Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

# Laboratory Report

2788

GEO Site & Testing Services Ltd

## Contract Number: 57020

Client Ref: **Q0560**
Client PO:

Report Date: **20-12-2021**

Client **Quantum Geotechnic Ltd**
**Plas Newydd**
**Llanedi**
**Pontarddulais**
**Swansea**
**SA4 0FQ**

Contract Title: **Grandison Brook**
For the attention of: **Arwel Jones**

Date Received: **03-12-2021**
Date Completed: **20-12-2021**

| Test Description | Qty |
|---|---|
| **Moisture Content of Soil**<br>BS1377 : Part 2 : Clause 3.2 : 1990 - * UKAS | 8 |
| **4 Point Liquid & Plastic Limit**<br>BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS | 6 |
| **PSD Wet & Dry Sieve method**<br>BS 1377:1990 - Part 2 : 9.2 - * UKAS | 4 |
| **PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected)**<br>BS 1377:1990 - Part 2 : 9.4 - * UKAS | 4 |
| **Organic Matter Content-dichromate method**<br>Sub-contracted Test | 3 |
| **BRE Full Suite**<br>**includes pH, water & acid soluble sulphate, total sulphur, magnesium, chloride and nitrate**<br>Sub-contracted Test | 2 |

**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 (Business Support Manager) - Paul Evans (Director) - Richard John (Quality/Technical Manager)
Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager) - Wayne Honey (Quality Assistant / Administrator / Health and Safety Coordinator)

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

# Laboratory Report

2788

GEO Site & Testing Services Ltd

## Contract Number: 57020

| Test Description | Qty |
|---|---|
| **Samples Received**<br>- @ Non Accredited Test | 22 |
| **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 (Business Support Manager) - Paul Evans (Director) - Richard John (Quality/Technical Manager)
Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager) - Wayne Honey (Quality Assistant / Administrator / Health and Safety Coordinator)

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

| GSTL | NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377:1990 - Part 2 : 4.3 & 5.3 ) | |
|---|---|---|
| Contract Number | 57020 | |
| Site Name | Grandison Brook | |
| Date Tested | 15/12/2021 | |
| | **DESCRIPTIONS** | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Descriptions |
|---|---|---|---|---|---|---|
| GBTP04 | 3 | B | 1.00 | - | 1.50 | Brown silty CLAY. |
| GBTP04 | 4 | D | 2.00 | - | | Grey silty CLAY. |
| GBTP04 | 5 | B | 2.50 | - | 3.00 | Grey sandy silty CLAY. |
| GBTP04 | 6 | D | 3.00 | - | | Grey silty CLAY. |
| GBBH04 | 2 | B | 0.50 | - | 1.00 | Brown gravelly sandy silty CLAY. |
| GBBH04 | 5 | B | 1.20 | - | 1.70 | Brown silty CLAY. |
| GBBH04 | 6 | B | 1.80 | - | 2.00 | Brown silty CLAY. |
| GBBH04 | 7 | D | 2.10 | - | 2.30 | Brown gravelly sandy silty CLAY. |
| | | | | - | | |
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| Operators | Checked | 20/12/2021 | Richard John (Advanced Testing Manager) |
|---|---|---|---|
| Conor Davison | Approved | 20/12/2021 | Paul Evans (Quality/Technical Manager) |

UKAS TESTING
2788

| GSTL | NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377:1990 - Part 2 : 4.3 & 5.3 ) | |
|---|---|---|
| Contract Number | 57020 | |
| Project Location | Grandison Brook | |
| Date Tested | 15/12/2021 | |
| | | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Moisture Content % | Liquid Limit % | Plastic Limit % | Plasticity index % | Passing 0.425mm % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GBTP04 | 3 | B | 1.00 | - | 1.50 | 63 | 81 | 32 | 49 | 100 | CV Very High Plasticity |
| GBTP04 | 4 | D | 2.00 | - | | 60 | | | | | |
| GBTP04 | 5 | B | 2.50 | - | 3.00 | 47 | 63 | 35 | 28 | 100 | MH High Plasticity |
| GBTP04 | 6 | D | 3.00 | - | | 54 | 78 | 39 | 39 | 100 | MV Very High Plasticity |
| GBBH04 | 2 | B | 0.50 | - | 1.00 | 31 | 59 | 24 | 35 | 96 | CH High Plasticity |
| GBBH04 | 5 | B | 1.20 | - | 1.70 | 49 | 64 | 34 | 30 | 100 | MH High Plasticity |
| GBBH04 | 6 | B | 1.80 | - | 2.00 | 172 | | | | | |
| GBBH04 | 7 | D | 2.10 | - | 2.30 | 44 | 70 | 33 | 37 | 87 | CH/V High/HighPlasticity |
| | | | | - | | | | | | | |
| | | | | - | | | | | | | |
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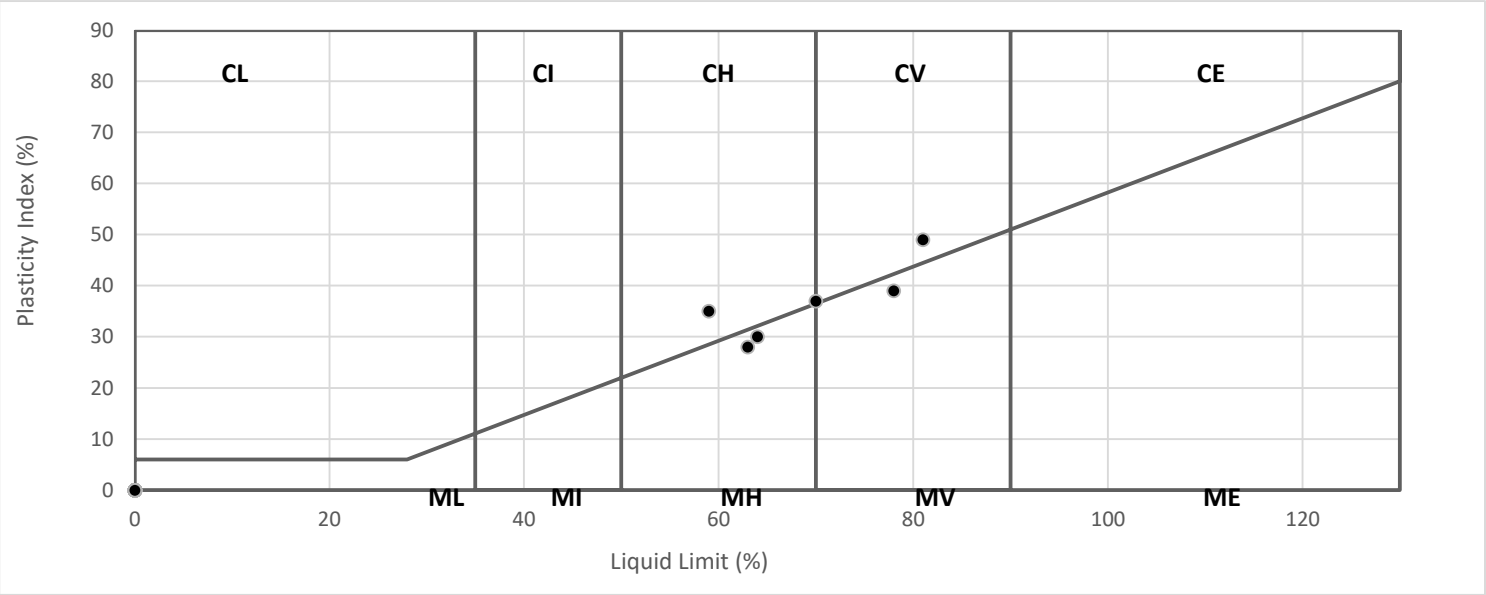
| | | | | - | | | | | | | |

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

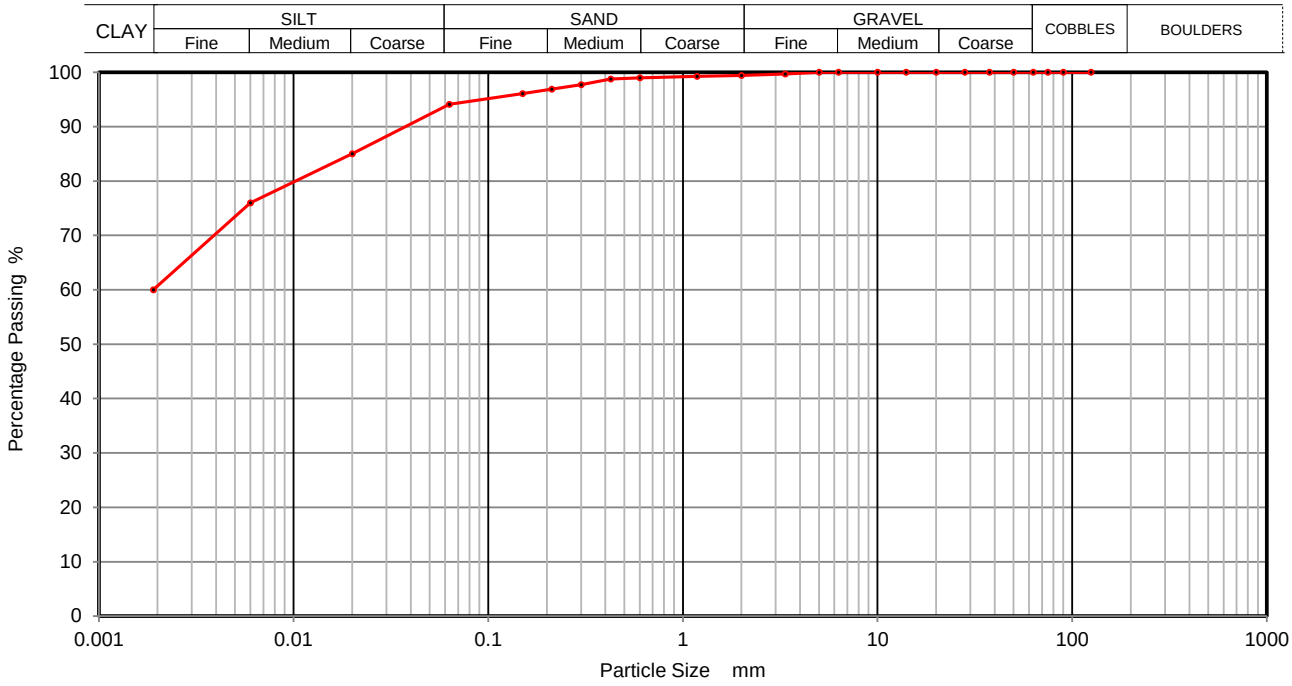
**PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION**
**BS 5930:1999+A2:2010**




| Operators | Checked | 20/12/2021 | Richard John (Advanced Testing Manager) |
|---|---|---|---|
| Conor Davison | Approved | 20/12/2021 | Paul Evans (Quality/Technical Manager) |

UKAS TESTING
2788

| GSTL | PARTICLE SIZE DISTRIBUTION<br>BS 1377 Part 2:1990<br>Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4 | Contract Number | 57020 |
|---|---|---|---|
| | | Borehole/Pit No. | GBBH04 |
| Site Name | Grandison Brook | Sample No. | 5 |
| Soil Description | Grey sandy silty CLAY. | Depth Top | 1.20 |
| | | Depth Base | 1.70 |
| Date Tested | 18/12/2021 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | 0.0200 | 85 |
| 90 | 100 | 0.0060 | 76 |
| 75 | 100 | 0.0020 | 60 |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 100 | | |
| 2 | 99 | | |
| 1.18 | 99 | | |
| 0.6 | 99 | | |
| 0.425 | 99 | | |
| 0.3 | 98 | | |
| 0.212 | 97 | | |
| 0.15 | 96 | | |
| 0.063 | 94 | | |

| Sample Proportions | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 1 |
| Sand | 5 |
| Silt | 34 |
| Clay | 60 |
| | |

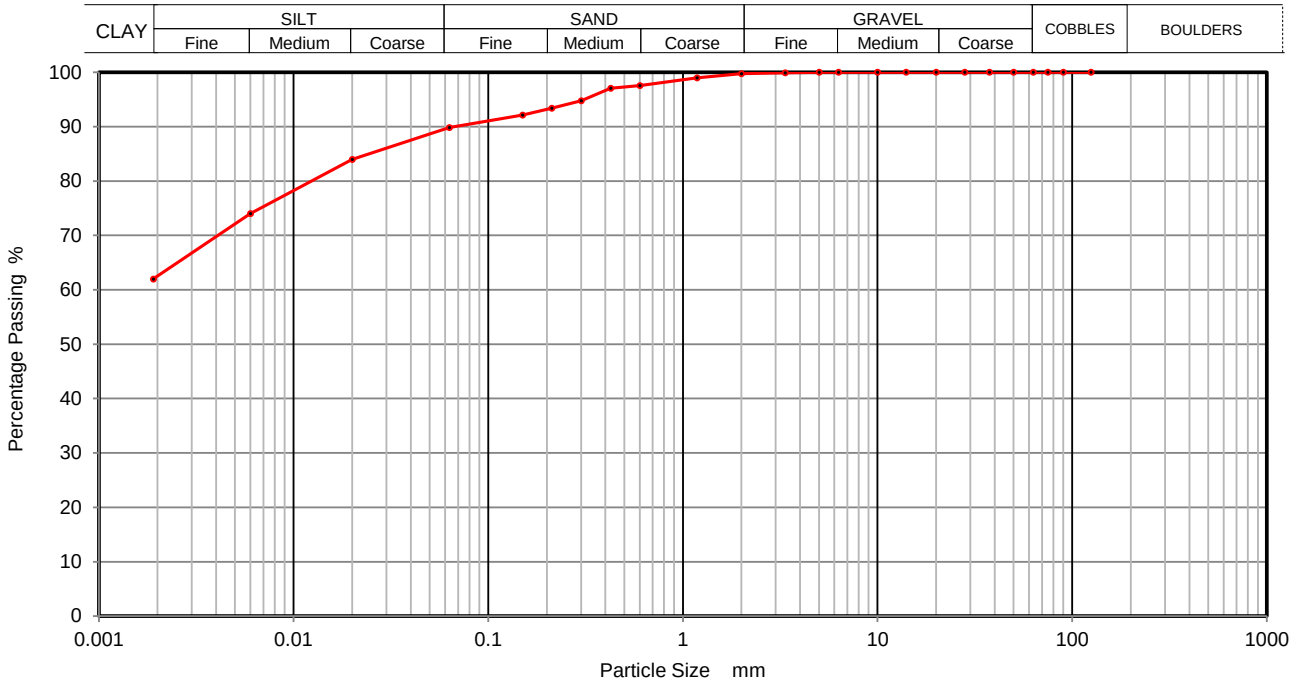
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| | | | | |
|---|---|---|---|---|
| Operator | Checked | 19/12/2021 | Richard John | |
| David | Approved | 20/12/2021 | Paul Evans | |

UKAS TESTING 2788

| GSTL | PARTICLE SIZE DISTRIBUTION<br>BS 1377 Part 2:1990<br>Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4 | Contract Number | 57020 |
|---|---|---|---|
| | | Borehole/Pit No. | GBBH04 |
| Site Name | Grandison Brook | Sample No. | 8 |
| Soil Description | Grey sandy silty CLAY. | Depth Top | 4.20 |
| | | Depth Base | 5.00 |
| Date Tested | 18/12/2021 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | 0.0200 | 84 |
| 90 | 100 | 0.0060 | 74 |
| 75 | 100 | 0.0020 | 62 |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 100 | | |
| 2 | 100 | | |
| 1.18 | 99 | | |
| 0.6 | 98 | | |
| 0.425 | 97 | | |
| 0.3 | 95 | | |
| 0.212 | 93 | | |
| 0.15 | 92 | | |
| 0.063 | 90 | | |

| Sample Proportions | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 0 |
| Sand | 10 |
| Silt | 28 |
| Clay | 62 |
| | |

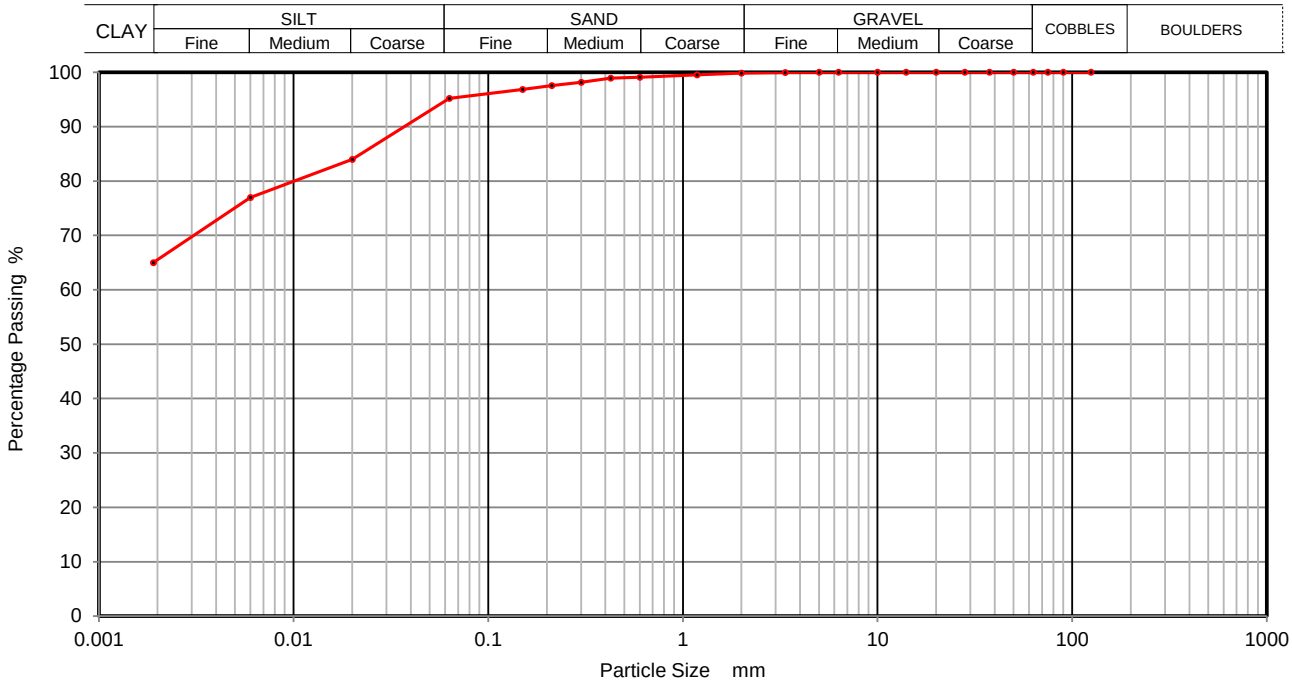
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| | | | | |
|---|---|---|---|---|
| Operator | Checked | 19/12/2021 | Richard John | |
| David | Approved | 20/12/2021 | Paul Evans | |

UKAS TESTING 2788

| GSTL | PARTICLE SIZE DISTRIBUTION<br>BS 1377 Part 2:1990<br>Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4 | Contract Number | 57020 |
|---|---|---|---|
| | | Borehole/Pit No. | GBTP04 |
| Site Name | Grandison Brook | Sample No. | 3 |
| Soil Description | Grey slightly sandy silty CLAY. | Depth Top | 1.00 |
| | | Depth Base | 1.50 |
| Date Tested | 18/12/2021 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | 0.0200 | 84 |
| 90 | 100 | 0.0060 | 77 |
| 75 | 100 | 0.0020 | 65 |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | | |
| 0.6 | 99 | | |
| 0.425 | 99 | | |
| 0.3 | 98 | | |
| 0.212 | 98 | | |
| 0.15 | 97 | | |
| 0.063 | 95 | | |

| Sample Proportions | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 0 |
| Sand | 5 |
| Silt | 30 |
| Clay | 65 |
| | |

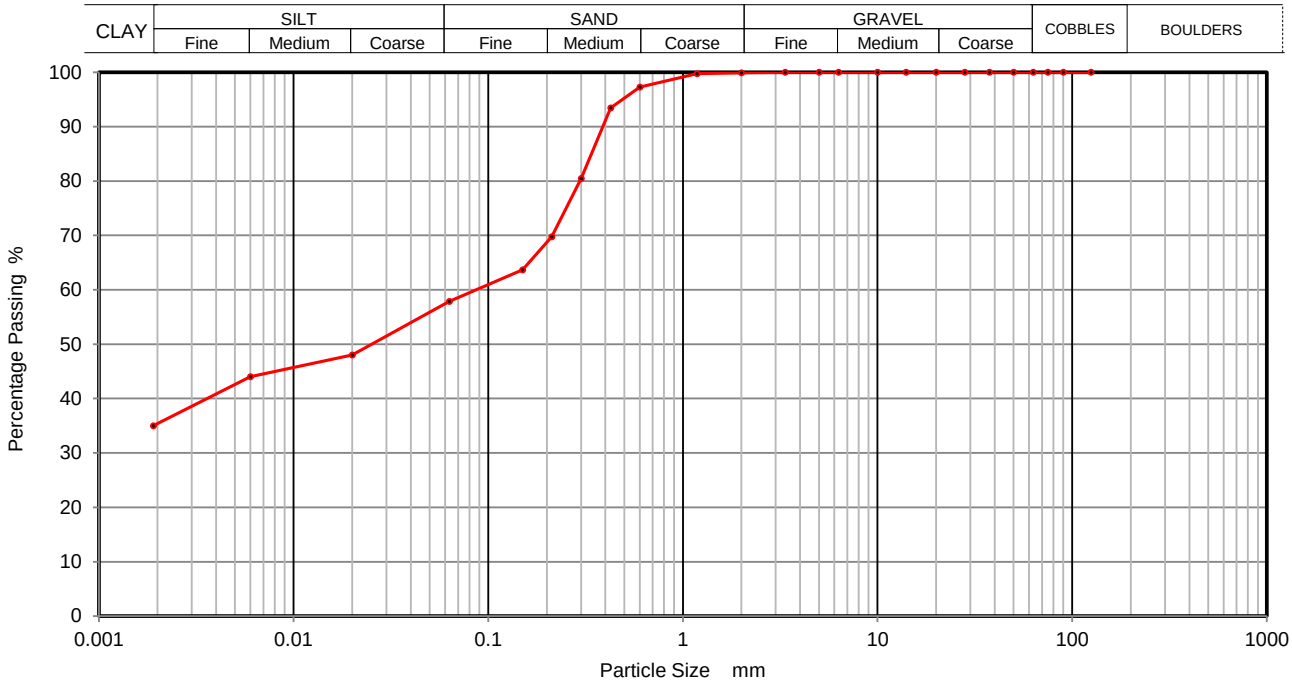
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator | Checked | 19/12/2021 | Richard John | |
|---|---|---|---|---|
| David | Approved | 20/12/2021 | Paul Evans | |

UKAS TESTING 2788

| GSTL | PARTICLE SIZE DISTRIBUTION<br>BS 1377 Part 2:1990<br>Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4 | Contract Number | 57020 |
|---|---|---|---|
| | | Borehole/Pit No. | GBTP04 |
| Site Name | Grandison Brook | Sample No. | 5 |
| Soil Description | Grey sandy silty CLAY. | Depth Top | 2.50 |
| | | Depth Base | 3.00 |
| Date Tested | 18/12/2021 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | 0.0200 | 48 |
| 90 | 100 | 0.0060 | 44 |
| 75 | 100 | 0.0020 | 35 |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | | |
| 0.6 | 97 | | |
| 0.425 | 93 | | |
| 0.3 | 81 | | |
| 0.212 | 70 | | |
| 0.15 | 64 | | |
| 0.063 | 58 | | |

| Sample Proportions | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 0 |
| Sand | 42 |
| Silt | 23 |
| Clay | 35 |
| | |

Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator | Checked | 19/12/2021 | Richard John | |
|---|---|---|---|---|
| David | Approved | 20/12/2021 | Paul Evans | |

UKAS TESTING 2788

2531

# ANALYTICAL TEST REPORT

**Contract no:** 103691

**Contract name:** Grandison Brook

**Client reference:** Q0560

**Clients name:** Geo Site & Testing Services

**Clients address:** Unit 3 and 4 Heol Aur
Dafen Industrial Estate, Dafen
Llanelli, Carmarthenshire
SA14 8QN

**Samples received:** 09 December 2021

**Analysis started:** 09 December 2021

**Analysis completed:** 20 December 2021

**Report issued:** 20 December 2021

**Key**

| | |
|---|---|
| U | UKAS accredited test |
| M | MCERTS & UKAS accredited test |
| $ | Test carried out by an approved subcontractor |
| I/S | Insufficient sample to carry out test |
| N/S | Sample not suitable for testing |

**Approved by:**

Rachael Burton

Reporting Team Lead

# Chemtech Environmental Limited

# SOILS

| **Lab number** | | | 103691-1 | 103691-2 | 103691-3 | 103691-4 | 103691-5 |
|---|---|---|---|---|---|---|---|
| **Sample id** | | | GBTP04 | GBTP04 | GBBH04 | GBBH04 | GBBH04 |
| **Depth (m)** | | | 2.00 | 2.50-3.00 | 1.20-1.70 | 1.80-2.00 | 2.10-2.30 |
| **Sample Type** | | | D4 | B5 | B5 | B6 | D7 |
| **Date sampled** | | | - | - | - | - | - |
| **Test** | **Method** | **Units** | | | | | |
| pH | CE004 [U] | units | - | 7.8 | 6.4 | - | - |
| Magnesium (2:1 water soluble) | CE061 | mg/l Mg | - | 17 | 18 | - | - |
| Chloride (2:1 water soluble) | CE049 [U] | mg/l Cl | - | 15 | 13 | - | - |
| Nitrate (2:1 water soluble) | CE049 [U] | mg/l $NO_3$ | - | <1 | <1 | - | - |
| Sulphate (2:1 water soluble) | CE061 [U] | mg/l $SO_4$ | - | 201 | 176 | - | - |
| Sulphate (total) | CE062 [U] | mg/kg $SO_4$ | - | 706 | 645 | - | - |
| Sulphur (total) | CE119 | mg/kg S | - | 5493 | 4088 | - | - |
| Sulphur (total) | CE119 | % w/w S | - | 0.55 | 0.41 | - | - |
| Total Organic Carbon (TOC) | CE197 | % w/w C | 2.3 | - | - | 16.2 | 5.6 |
| Estimate of OMC (calculated from TOC) | CE197 | % w/w | 4.0 | - | - | 27.9 | 9.6 |

# Chemtech Environmental Limited

# METHOD DETAILS

| METHOD | SOILS | METHOD SUMMARY | SAMPLE | STATUS | LOD | UNITS |
|---|---|---|---|---|---|---|
| CE004 | pH | Based on BS 1377, pH Meter | As received | U | - | units |
| CE061 | Magnesium (2:1 water soluble) | Aqueous extraction, ICP-OES | Dry | | 1 | mg/l Mg |
| CE049 | Chloride (2:1 water soluble) | Aqueous extraction, IC-COND | Dry | U | 1 | mg/l Cl |
| CE049 | Nitrate (2:1 water soluble) | Aqueous extraction, IC-COND | Dry | U | 1 | mg/l $NO_3$ |
| CE061 | Sulphate (2:1 water soluble) | Aqueous extraction, ICP-OES | Dry | U | 10 | mg/l $SO_4$ |
| CE062 | Sulphate (total) | Acid extraction, ICP-OES | Dry | U | 100 | mg/kg $SO_4$ |
| CE119 | Sulphur (total) | Acid extraction, ICP-OES | Dry | | 100 | mg/kg S |
| CE119 | Sulphur (total) | Acid extraction, ICP-OES | Dry | | 0.01 | % w/w S |
| CE197 | Total Organic Carbon (TOC) | Carbon Analyser | Dry | | 0.1 | % w/w C |
| CE197 | Estimate of OMC (calculated from TOC) | Calculation from Total Organic Carbon | Dry | | 0.1 | % w/w |

# Chemtech Environmental Limited

# DEVIATING SAMPLE INFORMATION

**Comments**
Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.
For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.
Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

**Key**

| | |
|---|---|
| N | No (not deviating sample) |
| Y | Yes (deviating sample) |
| NSD | Sampling date not provided |
| NST | Sampling time not provided (waters only) |
| EHT | Sample exceeded holding time(s) |
| IC | Sample not received in appropriate containers |
| HP | Headspace present in sample container |
| NCF | Sample not chemically fixed (where appropriate) |
| OR | Other (specify) |

| Lab ref | Sample id | Depth (m) | Deviating | Tests (Reason for deviation) |
|---|---|---|---|---|
| 103691-2 | GBTP04 | 2.50-3.00 | Y | All (NSD) |
| 103691-3 | GBBH04 | 1.20-1.70 | Y | All (NSD) |

# Chemtech Environmental Limited

# Additional Information

**Notes**

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.
For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.
Analytical results are inclusive of stones, where applicable.

# APPENDIX VII – **CHEMICAL LABORATORY TEST RESULTS**

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

# Final Report

| | |
|---|---|
| **Report No.:** | 21-23736-1 |
| **Initial Date of Issue:** | 19-Aug-2021 |
| **Client** | Quantum Geotechnic Ltd |
| **Client Address:** | Plas Newydd<br>Llanedi<br>Pontarddulais<br>Swansea<br>SA4 0FQ |
| **Contact(s):** | Arwel Jones<br>Phil Darby |
| **Project** | Q0560 Grandison Brook |
| **Quotation No.:** | Q21-25050 |
| **Order No.:** | |
| **No. of Samples:** | 7 |
| **Turnaround (Wkdays):** | 5 |
| **Date Approved:** | 19-Aug-2021 |
| **Approved By:** | |
| **Details:** | Glynn Harvey, Technical Manager |

| | |
|---|---|
| **Date Received:** | 12-Jul-2021 |
| **Date Instructed:** | 13-Aug-2021 |
| **Results Due:** | 19-Aug-2021 |

# Results - Leachate

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | | **Chemtest Job No.:** | | 21-23736 | 21-23736 | 21-23736 | 21-23736 |
|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | | **Chemtest Sample ID.:** | | 1238072 | 1238078 | 1238093 | 1238094 |
| Order No.: | | | | Client Sample Ref.: | | 3 | 5 | 3 | 6 |
| | | | | Sample Location: | | GBBH02 | GBTP05 | GBTP06 | GBBH05 |
| | | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL |
| | | | | Top Depth (m): | | 0.50 | 1.20 | 1.20 | 1.00 |
| | | | | Date Sampled: | | 05-Jul-2021 | 06-Jul-2021 | | 06-Jul-2021 |
| **Determinand** | **Accred.** | **SOP** | **Type** | **Units** | **LOD** | | | | |
| pH | U | 1010 | 2:1 | | N/A | 8.4 | 8.3 | 8.3 | 8.3 |
| Chemical Oxygen Demand | U | 1100 | 2:1 | mg O2/l | 10 | 10 | 11 | 14 | < 10 |
| Ammoniacal Nitrogen | U | 1220 | 2:1 | mg/l | 0.050 | 0.86 | 0.093 | 0.12 | 0.17 |
| Nitrite | U | 1220 | 2:1 | mg/l | 0.020 | 0.023 | < 0.020 | < 0.020 | < 0.020 |
| Nitrate | U | 1220 | 2:1 | mg/l | 0.50 | 2.3 | 2.7 | 1.4 | 5.3 |
| Sulphate | U | 1220 | 2:1 | mg/l | 1.0 | 23 | 22 | 33 | 13 |
| Cyanide (Total) | U | 1300 | 2:1 | mg/l | 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Cyanide (Free) | U | 1300 | 2:1 | mg/l | 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Cyanide (Complex) | U | 1300 | 2:1 | mg/l | 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Sulphide | U | 1325 | 2:1 | mg/l | 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Magnesium | U | 1455 | 2:1 | mg/l | 0.20 | 0.56 | 2.9 | 2.1 | 1.4 |
| Aluminium (Dissolved) | N | 1455 | 2:1 | µg/l | 5.0 | 230 | 38 | 40 | 44 |
| Arsenic (Dissolved) | U | 1455 | 2:1 | µg/l | 0.20 | 1.2 | 1.6 | 3.8 | 3.1 |
| Boron (Dissolved) | U | 1455 | 2:1 | µg/l | 10.0 | 26 | 38 | 39 | 23 |
| Barium (Dissolved) | U | 1455 | 2:1 | µg/l | 5.00 | 7.4 | 76 | 99 | 37 |
| Beryllium (Dissolved) | U | 1455 | 2:1 | µg/l | 1.00 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Cadmium (Dissolved) | U | 1455 | 2:1 | µg/l | 0.11 | < 0.11 | < 0.11 | < 0.11 | < 0.11 |
| Copper (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 1.8 | 3.4 | 3.9 | 7.8 |
| Mercury (Dissolved) | U | 1455 | 2:1 | µg/l | 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Manganese (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 310 | 3.6 | 7.1 | 2.2 |
| Molybdenum (Dissolved) | U | 1455 | 2:1 | µg/l | 0.20 | 0.81 | 27 | 50 | 7.8 |
| Nickel (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 0.68 | 0.90 | 0.58 | 2.1 |
| Lead (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 1.0 | 0.82 | 1.1 | 7.8 |
| Antimony (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | < 0.50 | 5.9 | 13 | 13 |
| Selenium (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 0.73 | 2.8 | 4.7 | 0.68 |
| Vanadium (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 0.91 | < 0.50 | 3.1 | 1.1 |
| Zinc (Dissolved) | U | 1455 | 2:1 | µg/l | 2.5 | < 2.5 | 11 | 11 | 12 |
| Chromium (Total) | N | 1455 | 2:1 | µg/l | 0.50 | 0.51 | 1.8 | < 0.50 | < 0.50 |
| Iron (Dissolved) | N | 1455 | 2:1 | µg/l | 5.0 | 1600 | 20 | 23 | 74 |
| Chromium (Hexavalent) | U | 1490 | 2:1 | µg/l | 20 | [B] < 20 | [B] < 20 | [A] < 20 | [B] < 20 |
| C2 Aliphatic TPH >C5-C6 | N | 1675 | 2:1 | µg/l | 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| C2 Aliphatic TPH >C6-C8 | N | 1675 | 2:1 | µg/l | 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| C2 Aliphatic TPH >C8-C10 | N | 1675 | 2:1 | µg/l | 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| C2 Aliphatic TPH >C10-C12 | N | 1675 | 2:1 | µg/l | 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| C2 Aliphatic TPH >C12-C16 | N | 1675 | 2:1 | µg/l | 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| C2 Aliphatic TPH >C16-C21 | N | 1675 | 2:1 | µg/l | 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| C2 Aliphatic TPH >C21-C35 | N | 1675 | 2:1 | µg/l | 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| C2 Aliphatic TPH >C35-C44 | N | 1675 | 2:1 | µg/l | 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| Total Aliphatic Hydrocarbons | N | 1675 | 2:1 | µg/l | 5.0 | [B] < 5.0 | [B] < 5.0 | [A] < 5.0 | [B] < 5.0 |

# Results - Leachate

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | | **Chemtest Job No.:** | | 21-23736 | 21-23736 | 21-23736 | 21-23736 |
|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | | **Chemtest Sample ID.:** | | 1238072 | 1238078 | 1238093 | 1238094 |
| Order No.: | | | | Client Sample Ref.: | | 3 | 5 | 3 | 6 |
| | | | | Sample Location: | | GBBH02 | GBTP05 | GBTP06 | GBBH05 |
| | | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL |
| | | | | Top Depth (m): | | 0.50 | 1.20 | 1.20 | 1.00 |
| | | | | Date Sampled: | | 05-Jul-2021 | 06-Jul-2021 | | 06-Jul-2021 |
| **Determinand** | **Accred.** | **SOP** | **Type** | **Units** | **LOD** | | | | |
| C2 Aromatic TPH >C5-C7 | N | 1675 | 2:1 | µg/l | 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| C2 Aromatic TPH >C7-C8 | N | 1675 | 2:1 | µg/l | 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| C2 Aromatic TPH >C8-C10 | N | 1675 | 2:1 | µg/l | 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| C2 Aromatic TPH >C10-C12 | N | 1675 | 2:1 | µg/l | 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| C2 Aromatic TPH >C12-C16 | N | 1675 | 2:1 | µg/l | 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| C2 Aromatic TPH >C16-C21 | N | 1675 | 2:1 | µg/l | 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| C2 Aromatic TPH >C21-C35 | N | 1675 | 2:1 | µg/l | 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| C2 Aromatic TPH >C35-C44 | N | 1675 | 2:1 | µg/l | 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| C2 Total Aromatic Hydrocarbons | N | 1675 | 2:1 | µg/l | 5.0 | [B] < 5.0 | [B] < 5.0 | [A] < 5.0 | [B] < 5.0 |
| Total Petroleum Hydrocarbons | N | 1675 | 2:1 | µg/l | 10 | [B] < 10 | [B] < 10 | [A] < 10 | [B] < 10 |
| Total Of 16 PAH's | N | 1700 | 2:1 | µg/l | 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 |
| Benzene | U | 1760 | 2:1 | µg/l | 1.0 | [B] < 1.0 | [B] < 1.0 | [A] < 1.0 | [B] < 1.0 |
| Toluene | U | 1760 | 2:1 | µg/l | 1.0 | [B] < 1.0 | [B] < 1.0 | [A] < 1.0 | [B] < 1.0 |
| Ethylbenzene | U | 1760 | 2:1 | µg/l | 1.0 | [B] < 1.0 | [B] < 1.0 | [A] < 1.0 | [B] < 1.0 |
| m & p-Xylene | U | 1760 | 2:1 | µg/l | 1.0 | [B] < 1.0 | [B] < 1.0 | [A] < 1.0 | [B] < 1.0 |
| o-Xylene | U | 1760 | 2:1 | µg/l | 1.0 | [B] < 1.0 | [B] < 1.0 | [A] < 1.0 | [B] < 1.0 |
| Methyl Tert-Butyl Ether | N | 1760 | 2:1 | µg/l | 1.0 | [B] < 1.0 | [B] < 1.0 | [A] < 1.0 | [B] < 1.0 |
| Naphthalene | N | 1800 | 2:1 | µg/l | 0.010 | 1.3 | 0.98 | 1.1 | 0.77 |
| Acenaphthylene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Acenaphthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Fluorene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Phenanthrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Anthracene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Fluoranthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Pyrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Benzo[a]anthracene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Chrysene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Benzo[b]fluoranthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Benzo[k]fluoranthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Benzo[a]pyrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Indeno(1,2,3-c,d)Pyrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Dibenz(a,h)Anthracene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Benzo[g,h,i]perylene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Coronene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Total Of 17 PAH's | N | 1800 | 2:1 | µg/l | 0.20 | 1.3 | 0.98 | 1.1 | 0.77 |
| Total Phenols | U | 1920 | 2:1 | mg/l | 0.030 | < 0.030 | < 0.030 | < 0.030 | < 0.030 |

# Results - Soil

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | | | **Chemtest Job No.:** | 21-23736 | 21-23736 | 21-23736 | 21-23736 | 21-23736 | 21-23736 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | | | **Chemtest Sample ID.:** | 1238072 | 1238078 | 1238083 | 1238087 | 1238090 | 1238093 | 1238094 |
| Order No.: | | | | | Client Sample Ref.: | 3 | 5 | 2 | 3 | 4 | 3 | 6 |
| | | | | | Sample Location: | GBBH02 | GBTP05 | GBTP01 | GBTP02 | GBTP03 | GBTP06 | GBBH05 |
| | | | | | Sample Type: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | | | Top Depth (m): | 0.50 | 1.20 | 0.30 | 0.60 | 0.60 | 1.20 | 1.00 |
| | | | | | Date Sampled: | 05-Jul-2021 | 06-Jul-2021 | 07-Jul-2021 | 05-Jul-2021 | 05-Jul-2021 | | 06-Jul-2021 |
| | | | | | Asbestos Lab: | DURHAM | DURHAM | DURHAM | DURHAM | DURHAM | DURHAM | DURHAM |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | |
| ACM Type | U | 2192 | | N/A | | - | - | - | - | - | - | - |
| Asbestos Identification | U | 2192 | | N/A | | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | | 17 | 22 | 14 | 15 | 21 | 22 | 30 |
| Soil Colour | N | 2040 | | N/A | | Brown | Grey | Brown | Brown | Brown | Black | Black |
| Other Material | N | 2040 | | N/A | | Stones and Glass | Stones | Stones | Stones and Roots | Stones and Roots | Stones | Stones |
| Soil Texture | N | 2040 | | N/A | | Sand | Sand | Sand | Sand | Sand | Sand | Sand |
| pH | M | 2010 | | 4.0 | | [B] 7.1 | [B] 8.0 | [B] 8.2 | [B] 6.8 | [B] 6.2 | [A] 7.5 | [B] 7.7 |
| Boron (Hot Water Soluble) | M | 2120 | mg/kg | 0.40 | | [B] < 0.40 | [B] 0.45 | [B] 0.60 | [B] < 0.40 | [B] < 0.40 | [A] 1.1 | [B] 0.63 |
| Magnesium (Water Soluble) | M | 2120 | mg/kg | 20 | | [B] < 20 | [B] < 20 | [B] < 20 | [B] < 20 | [B] < 20 | [A] < 20 | [B] < 20 |
| Sulphate (2:1 Water Soluble) as SO4 | M | 2120 | g/l | 0.010 | | [B] < 0.010 | [B] < 0.010 | [B] 0.063 | [B] < 0.010 | [B] < 0.010 | [A] 0.047 | [B] 0.025 |
| Nitrite (Extractable) | N | 2220 | mg/kg | 0.10 | | 0.12 | 0.24 | 0.11 | 3.6 | < 0.10 | 0.22 | 0.22 |
| Nitrate (Water Soluble) | N | 2220 | g/l | 0.010 | | < 0.010 | < 0.010 | 0.013 | < 0.010 | < 0.010 | < 0.010 | 0.013 |
| Cyanide (Complex) | M | 2300 | mg/kg | 0.50 | | [B] < 0.50 | [B] < 0.50 | [B] < 0.50 | [B] < 0.50 | [B] < 0.50 | [A] < 0.50 | [B] < 0.50 |
| Cyanide (Free) | M | 2300 | mg/kg | 0.50 | | [B] < 0.50 | [B] < 0.50 | [B] < 0.50 | [B] < 0.50 | [B] < 0.50 | [A] < 0.50 | [B] < 0.50 |
| Cyanide (Total) | M | 2300 | mg/kg | 0.50 | | [B] < 0.50 | [B] < 0.50 | [B] < 0.50 | [B] < 0.50 | [B] < 0.50 | [A] < 0.50 | [B] < 0.50 |
| Sulphide (Easily Liberatable) | N | 2325 | mg/kg | 0.50 | | [B] 0.79 | [B] 1.6 | [B] 1.2 | [B] 3.0 | [B] < 0.50 | [A] 23 | [B] 2.1 |
| Ammoniacal Nitrogen | M | 2425 | mg/kg | 0.50 | | [B] 12 | [B] 1.4 | [B] 2.2 | [B] 1.1 | [B] 1.7 | [A] 1.4 | [B] 7.1 |
| Aluminium (Total) | N | 2430 | mg/kg | 100 | | [B] 5000 | [B] 4400 | [B] 8700 | [B] 5600 | [B] 3700 | [A] 7800 | [B] 6900 |
| Iron (Total) | N | 2430 | mg/kg | 100 | | [B] 16000 | [B] 23000 | [B] 20000 | [B] 16000 | [B] 18000 | [A] 26000 | [B] 26000 |
| Sulphate (Total) | M | 2430 | mg/kg | 100 | | [B] 270 | [B] 1600 | [B] 490 | [B] 350 | [B] 300 | [A] 2400 | [B] 2500 |
| Arsenic | M | 2450 | mg/kg | 1.0 | | 2.5 | 23 | 16 | 7.2 | 3.9 | 38 | 44 |
| Barium | M | 2450 | mg/kg | 10 | | 21 | 310 | 59 | 27 | 27 | 720 | 550 |
| Beryllium | U | 2450 | mg/kg | 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 1.6 | 1.4 |
| Cadmium | M | 2450 | mg/kg | 0.10 | | < 0.10 | 0.27 | 0.36 | 0.23 | < 0.10 | 0.74 | 0.58 |
| Chromium | M | 2450 | mg/kg | 1.0 | | 5.3 | 7.9 | 9.7 | 5.8 | 5.4 | 11 | 9.4 |
| Manganese | M | 2450 | mg/kg | 5.0 | | 540 | 350 | 620 | 410 | 490 | 520 | 410 |
| Molybdenum | M | 2450 | mg/kg | 2.0 | | < 2.0 | 6.2 | < 2.0 | < 2.0 | < 2.0 | 10 | 8.1 |
| Antimony | N | 2450 | mg/kg | 2.0 | | 2.4 | 3.3 | < 2.0 | < 2.0 | < 2.0 | 7.8 | 14 |
| Copper | M | 2450 | mg/kg | 0.50 | | 16 | 77 | 43 | 20 | 10 | 220 | 1900 |
| Mercury | M | 2450 | mg/kg | 0.10 | | < 0.10 | 0.41 | < 0.10 | < 0.10 | < 0.10 | 0.38 | 0.89 |
| Nickel | M | 2450 | mg/kg | 0.50 | | 9.6 | 37 | 17 | 11 | 12 | 47 | 39 |
| Lead | M | 2450 | mg/kg | 0.50 | | 8.1 | 220 | 31 | 14 | 8.6 | 470 | 1200 |
| Selenium | M | 2450 | mg/kg | 0.20 | | 0.29 | 0.46 | 0.32 | 0.24 | 0.26 | 0.77 | 0.54 |
| Vanadium | U | 2450 | mg/kg | 5.0 | | < 5.0 | 6.8 | 6.7 | < 5.0 | < 5.0 | 18 | 13 |
| Zinc | M | 2450 | mg/kg | 0.50 | | 26 | 230 | 75 | 46 | 64 | 450 | 390 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |

# Results - Soil

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 21-23736 | 21-23736 | 21-23736 | 21-23736 | 21-23736 | 21-23736 | 21-23736 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | **Chemtest Sample ID.:** | | 1238072 | 1238078 | 1238083 | 1238087 | 1238090 | 1238093 | 1238094 |
| Order No.: | | | Client Sample Ref.: | | 3 | 5 | 2 | 3 | 4 | 3 | 6 |
| | | | Sample Location: | | GBBH02 | GBTP05 | GBTP01 | GBTP02 | GBTP03 | GBTP06 | GBBH05 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.50 | 1.20 | 0.30 | 0.60 | 0.60 | 1.20 | 1.00 |
| | | | Date Sampled: | | 05-Jul-2021 | 06-Jul-2021 | 07-Jul-2021 | 05-Jul-2021 | 05-Jul-2021 | | 06-Jul-2021 |
| | | | Asbestos Lab: | | DURHAM | DURHAM | DURHAM | DURHAM | DURHAM | DURHAM | DURHAM |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | |
| Organic Matter | M | 2625 | % | 0.40 | [B] 3.8 | [B] 55 | [B] 3.0 | [B] 3.1 | [B] 6.2 | [A] 60 | [B] 3.0 |
| Aliphatic TPH >C5-C6 | N | 2680 | mg/kg | 0.010 | [B] < 0.010 | [B] < 0.010 | [B] < 0.010 | [B] < 0.010 | [B] < 0.010 | [A] < 0.010 | [B] < 0.010 |
| Aliphatic TPH >C6-C8 | N | 2680 | mg/kg | 0.010 | [B] < 0.010 | [B] < 0.010 | [B] < 0.010 | [B] < 0.010 | [B] < 0.010 | [A] < 0.010 | [B] < 0.010 |
| Aliphatic TPH >C8-C10 | N | 2680 | mg/kg | 0.10 | [B] < 0.10 | [B] < 0.10 | [B] < 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| Aliphatic TPH >C10-C12 | N | 2680 | mg/kg | 0.10 | [B] < 0.10 | [B] 10 | [B] < 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| Aliphatic TPH >C12-C16 | N | 2680 | mg/kg | 0.10 | [B] < 0.10 | [B] 17 | [B] < 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| Aliphatic TPH >C16-C21 | N | 2680 | mg/kg | 0.10 | [B] < 0.10 | [B] 9.3 | [B] < 0.10 | [B] < 0.10 | [B] 7.7 | [A] < 0.10 | [B] < 0.10 |
| Aliphatic TPH >C21-C35 | N | 2680 | mg/kg | 0.10 | [B] < 0.10 | [B] 97 | [B] < 0.10 | [B] < 0.10 | [B] 58 | [A] 58 | [B] < 0.10 |
| Aliphatic TPH >C35-C44 | N | 2680 | mg/kg | 0.10 | [B] < 0.10 | [B] < 0.10 | [B] < 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| Total Aliphatic Hydrocarbons | N | 2680 | mg/kg | 1.0 | [B] < 1.0 | [B] 130 | [B] < 1.0 | [B] < 1.0 | [B] 66 | [A] 58 | [B] < 1.0 |
| Aromatic TPH >C5-C7 | N | 2680 | mg/kg | 0.010 | [B] < 0.010 | [B] < 0.010 | [B] < 0.010 | [B] < 0.010 | [B] < 0.010 | [A] < 0.010 | [B] < 0.010 |
| Aromatic TPH >C7-C8 | N | 2680 | mg/kg | 0.010 | [B] < 0.010 | [B] < 0.010 | [B] < 0.010 | [B] < 0.010 | [B] < 0.010 | [A] < 0.010 | [B] < 0.010 |
| Aromatic TPH >C8-C10 | N | 2680 | mg/kg | 0.10 | [B] < 0.10 | [B] < 0.10 | [B] < 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| Aromatic TPH >C10-C12 | N | 2680 | mg/kg | 0.10 | [B] < 0.10 | [B] < 0.10 | [B] < 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| Aromatic TPH >C12-C16 | N | 2680 | mg/kg | 0.10 | [B] < 0.10 | [B] 6.5 | [B] < 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| Aromatic TPH >C16-C21 | N | 2680 | mg/kg | 0.10 | [B] < 0.10 | [B] 47 | [B] < 0.10 | [B] < 0.10 | [B] < 0.10 | [A] 39 | [B] 11 |
| Aromatic TPH >C21-C35 | N | 2680 | mg/kg | 0.10 | [B] < 0.10 | [B] 280 | [B] < 0.10 | [B] < 0.10 | [B] 81 | [A] 260 | [B] 120 |
| Aromatic TPH >C35-C44 | N | 2680 | mg/kg | 0.10 | [B] < 0.10 | [B] < 0.10 | [B] < 0.10 | [B] < 0.10 | [B] < 0.10 | [A] < 0.10 | [B] < 0.10 |
| Total Aromatic Hydrocarbons | N | 2680 | mg/kg | 1.0 | [B] < 1.0 | [B] 340 | [B] < 1.0 | [B] < 1.0 | [B] 81 | [A] 300 | [B] 130 |
| Total Petroleum Hydrocarbons | N | 2680 | mg/kg | 2.0 | [B] < 2.0 | [B] 470 | [B] < 2.0 | [B] < 2.0 | [B] 150 | [A] 360 | [B] 130 |
| Benzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | [B] < 1.0 | [B] < 1.0 | [B] < 1.0 | [B] < 1.0 | [A] < 1.0 | [B] < 1.0 |
| Toluene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | [B] < 1.0 | [B] < 1.0 | [B] < 1.0 | [B] < 1.0 | [A] < 1.0 | [B] < 1.0 |
| Ethylbenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | [B] < 1.0 | [B] < 1.0 | [B] < 1.0 | [B] < 1.0 | [A] < 1.0 | [B] < 1.0 |
| m & p-Xylene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | [B] < 1.0 | [B] < 1.0 | [B] < 1.0 | [B] < 1.0 | [A] < 1.0 | [B] < 1.0 |
| o-Xylene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | [B] < 1.0 | [B] < 1.0 | [B] < 1.0 | [B] < 1.0 | [A] < 1.0 | [B] < 1.0 |
| Methyl Tert-Butyl Ether | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | [B] < 1.0 | [B] < 1.0 | [B] < 1.0 | [B] < 1.0 | [A] < 1.0 | [B] < 1.0 |
| Naphthalene | N | 2800 | mg/kg | 0.010 | [B] 0.11 | [B] 0.88 | [B] < 0.010 | [B] < 0.010 | [B] < 0.010 | [A] 1.0 | [B] 1.5 |
| Acenaphthylene | N | 2800 | mg/kg | 0.010 | [B] 0.025 | [B] 0.16 | [B] < 0.010 | [B] < 0.010 | [B] < 0.010 | [A] 0.42 | [B] 0.25 |
| Acenaphthene | N | 2800 | mg/kg | 0.010 | [B] 0.024 | [B] 0.17 | [B] < 0.010 | [B] < 0.010 | [B] < 0.010 | [A] 0.55 | [B] 0.23 |
| Fluorene | N | 2800 | mg/kg | 0.010 | [B] 0.065 | [B] 0.26 | [B] < 0.010 | [B] < 0.010 | [B] < 0.010 | [A] 0.57 | [B] 0.31 |
| Phenanthrene | N | 2800 | mg/kg | 0.010 | [B] 0.18 | [B] 2.0 | [B] 0.26 | [B] 0.19 | [B] 0.16 | [A] 5.7 | [B] 3.7 |
| Anthracene | N | 2800 | mg/kg | 0.010 | [B] 0.073 | [B] 0.27 | [B] 0.055 | [B] 0.022 | [B] 0.052 | [A] 1.2 | [B] 0.69 |
| Fluoranthene | N | 2800 | mg/kg | 0.010 | [B] 0.076 | [B] 2.0 | [B] 0.26 | [B] 0.12 | [B] 0.082 | [A] 13 | [B] 5.9 |
| Pyrene | N | 2800 | mg/kg | 0.010 | [B] 0.053 | [B] 1.7 | [B] 0.22 | [B] 0.081 | [B] 0.074 | [A] 10 | [B] 5.0 |
| Benzo[a]anthracene | N | 2800 | mg/kg | 0.010 | [B] 0.070 | [B] 1.5 | [B] 0.14 | [B] 0.065 | [B] 0.068 | [A] 8.0 | [B] 3.9 |
| Chrysene | N | 2800 | mg/kg | 0.010 | [B] 0.082 | [B] 2.1 | [B] 0.17 | [B] 0.087 | [B] 0.078 | [A] 9.2 | [B] 4.1 |
| Benzo[b]fluoranthene | N | 2800 | mg/kg | 0.010 | [B] 0.048 | [B] 2.1 | [B] 0.23 | [B] 0.090 | [B] 0.056 | [A] 12 | [B] 6.0 |
| Benzo[k]fluoranthene | N | 2800 | mg/kg | 0.010 | [B] 0.060 | [B] 0.87 | [B] 0.079 | [B] 0.024 | [B] 0.030 | [A] 4.4 | [B] 2.4 |

# Results - Soil

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 21-23736 | 21-23736 | 21-23736 | 21-23736 | 21-23736 | 21-23736 | 21-23736 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | **Chemtest Sample ID.:** | | 1238072 | 1238078 | 1238083 | 1238087 | 1238090 | 1238093 | 1238094 |
| Order No.: | | | Client Sample Ref.: | | 3 | 5 | 2 | 3 | 4 | 3 | 6 |
| | | | Sample Location: | | GBBH02 | GBTP05 | GBTP01 | GBTP02 | GBTP03 | GBTP06 | GBBH05 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.50 | 1.20 | 0.30 | 0.60 | 0.60 | 1.20 | 1.00 |
| | | | Date Sampled: | | 05-Jul-2021 | 06-Jul-2021 | 07-Jul-2021 | 05-Jul-2021 | 05-Jul-2021 | | 06-Jul-2021 |
| | | | Asbestos Lab: | | DURHAM | DURHAM | DURHAM | DURHAM | DURHAM | DURHAM | DURHAM |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | |
| Benzo[a]pyrene | N | 2800 | mg/kg | 0.010 | [B] 0.064 | [B] 1.6 | [B] 0.12 | [B] 0.033 | [B] 0.018 | [A] 8.4 | [B] 4.3 |
| Indeno(1,2,3-c,d)Pyrene | N | 2800 | mg/kg | 0.010 | [B] 0.049 | [B] 1.2 | [B] 0.15 | [B] 0.014 | [B] < 0.010 | [A] 7.3 | [B] 3.7 |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.010 | [B] 0.11 | [B] 0.35 | [B] 0.084 | [B] 0.038 | [B] < 0.010 | [A] 1.6 | [B] 0.92 |
| Benzo[g,h,i]perylene | N | 2800 | mg/kg | 0.010 | [B] 0.11 | [B] 1.1 | [B] 0.20 | [B] 0.075 | [B] < 0.010 | [A] 5.9 | [B] 3.7 |
| Coronene | N | 2800 | mg/kg | 0.010 | [B] < 0.010 | [B] < 0.010 | [B] < 0.010 | [B] < 0.010 | [B] < 0.010 | [A] < 0.010 | [B] < 0.010 |
| Total Of 17 PAH's | N | 2800 | mg/kg | 0.20 | [B] 1.2 | [B] 18 | [B] 2.0 | [B] 0.84 | [B] 0.62 | [A] 89 | [B] 47 |
| Total Phenols | M | 2920 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |

# Results - 2 Stage WAC

**Project: Q0560 Grandison Brook**

| | | | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 21-23736 | | | | | | | | |
| **Chemtest Sample ID:** | 1238094 | | | | | | | | |
| **Sample Ref:** | 6 | | | | | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| **Sample ID:** | | | | | | | | | |
| **Sample Location:** | GBBH05 | | | | | | | | |
| **Top Depth(m):** | 1.00 | | | | | | | | |
| **Bottom Depth(m):** | | | | | | | | | |
| **Sampling Date:** | 06-Jul-2021 | | | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | | | | | |
| Total Organic Carbon | 2625 | M | % | | | [B] 1.7 | 3 | 5 | 6 |
| Loss on Ignition | | | | | | | -- | -- | 10 |
| Total BTEX | 2760 | M | mg/kg | | | [B] < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | M | mg/kg | | | < 0.10 | 1 | -- | -- |
| TPH Total WAC | 2670 | M | mg/kg | | | [B] 13 | 500 | -- | -- |
| Total (Of 17) PAH's | 2700 | N | mg/kg | | | 59 | 100 | -- | -- |
| pH | | | | | | | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | | | 0.0030 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **2:1 mg/l** | **8:1 mg/l** | **2:1 mg/kg** | **Cumulative mg/kg 10:1** | **Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg** | | |
| Arsenic | 1455 | U | 0.0031 | 0.0039 | 0.0058 | 0.038 | 0.5 | 2 | 25 |
| Barium | 1455 | U | 0.037 | 0.013 | 0.069 | 0.14 | 20 | 100 | 300 |
| Cadmium | 1455 | U | < 0.00011 | < 0.00011 | < 0.00011 | < 0.00011 | 0.04 | 1 | 5 |
| Chromium | 1455 | U | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | 0.5 | 10 | 70 |
| Copper | 1455 | U | 0.0078 | 0.012 | 0.015 | 0.0019 | 2 | 50 | 100 |
| Mercury | 1455 | U | < 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | 0.01 | 0.2 | 2 |
| Molybdenum | 1455 | U | 0.0078 | 0.0018 | 0.015 | 0.019 | 0.5 | 10 | 30 |
| Nickel | 1455 | U | 0.0021 | 0.0023 | 0.0039 | 0.023 | 0.4 | 10 | 40 |
| Lead | 1455 | U | 0.0078 | 0.023 | 0.015 | 0.22 | 0.5 | 10 | 50 |
| Antimony | 1455 | U | 0.013 | 0.0041 | 0.025 | 0.043 | 0.06 | 0.7 | 5 |
| Selenium | 1455 | U | 0.0007 | < 0.0005 | 0.0013 | < 0.0005 | 0.1 | 0.5 | 7 |
| Zinc | 1455 | U | 0.012 | 0.009 | 0.023 | 0.088 | 4 | 50 | 200 |
| Chloride | 1220 | U | 1.3 | < 1.0 | < 10 | < 10 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.22 | 0.19 | < 1.0 | 1.9 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 13 | 1.1 | 24 | 14 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 5.4 | 28 | 10 | 270 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.030 | < 0.30 | < 0.50 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 8.3 | < 2.5 | < 50 | < 50 | 500 | 800 | 1000 |

| **Solid Information** | |
|---|---|
| Dry mass of test portion/kg | 0.175 |
| Moisture (%) | 30 |

| **Leachate Test Information** | |
|---|---|
| Leachant volume 1st extract/l | 0.276 |
| Leachant volume 2nd extract/l | 1.400 |
| Eluant recovered from 1st extract/l | 0.043 |

**Waste Acceptance Criteria**

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

# Deviations

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

| Sample: | Sample Ref: | Sample ID: | Sample Location: | Sampled Date: | Deviation Code(s): | Containers Received: |
|---|---|---|---|---|---|---|
| 1238072 | 3 | | GBBH02 | 05-Jul-2021 | B | Amber Glass 250ml |
| 1238072 | 3 | | GBBH02 | 05-Jul-2021 | B | Amber Glass 60ml |
| 1238072 | 3 | | GBBH02 | 05-Jul-2021 | B | Plastic Tub 500g |
| 1238078 | 5 | | GBTP05 | 06-Jul-2021 | B | Amber Glass 250ml |
| 1238078 | 5 | | GBTP05 | 06-Jul-2021 | B | Amber Glass 60ml |
| 1238078 | 5 | | GBTP05 | 06-Jul-2021 | B | Plastic Tub 500g |
| 1238083 | 2 | | GBTP01 | 07-Jul-2021 | B | Amber Glass 250ml |
| 1238083 | 2 | | GBTP01 | 07-Jul-2021 | B | Plastic Tub 500g |
| 1238087 | 3 | | GBTP02 | 05-Jul-2021 | B | Amber Glass 250ml |
| 1238087 | 3 | | GBTP02 | 05-Jul-2021 | B | Amber Glass 60ml |
| 1238087 | 3 | | GBTP02 | 05-Jul-2021 | B | Plastic Tub 500g |
| 1238090 | 4 | | GBTP03 | 05-Jul-2021 | B | Amber Glass 250ml |
| 1238090 | 4 | | GBTP03 | 05-Jul-2021 | B | Amber Glass 60ml |
| 1238090 | 4 | | GBTP03 | 05-Jul-2021 | B | Plastic Tub 500g |
| 1238093 | 3 | | GBTP06 | | A | Amber Glass 250ml |
| 1238093 | 3 | | GBTP06 | | A | Plastic Tub 500g |
| 1238094 | 6 | | GBBH05 | 06-Jul-2021 | B | Amber Glass 250ml |
| 1238094 | 6 | | GBBH05 | 06-Jul-2021 | B | Amber Glass 60ml |
| 1238094 | 6 | | GBBH05 | 06-Jul-2021 | B | Plastic Tub 500g |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 1010 | pH Value of Waters | pH | pH Meter |
| 1020 | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters | Conductivity Meter |
| 1100 | Chemical Oxygen Demand | Chemical Oxygen demand (COD) | Dichromate oxidation of organic matter in sample followed by colorimetric determination of residual Cr[VI]. |
| 1220 | Anions, Alkalinity & Ammonium in Waters | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser. |
| 1300 | Cyanides & Thiocyanate in Waters | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Continuous Flow Analysis. |
| 1325 | Sulphide in Waters | Sulphides | Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N–dimethyl-pphenylenediamine. |
| 1455 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1490 | Hexavalent Chromium in Waters | Chromium [VI] | Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 1610 | Total/Dissolved Organic Carbon in Waters | Organic Carbon | TOC Analyser using Catalytic Oxidation |
| 1675 | TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG) | Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44 | Pentane extraction / GCxGC FID detection |
| 1700 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds) |
| 1760 | Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260) | Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds. |
| 1800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Pentane extraction / GCMS detection |
| 1920 | Phenols in Waters by HPLC | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded. | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection. |
| 2010 | pH Value of Soils | pH | pH Meter |
| 2015 | Acid Neutralisation Capacity | Acid Reserve | Titration |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2040 | Soil Description(Requirement of MCERTS) | Soil description | As received soil is described based upon BS5930 |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2220 | Water soluble Chloride in Soils | Chloride | Aqueous extraction and measuremernt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate. |
| 2300 | Cyanides & Thiocyanate in Soils | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser. |
| 2325 | Sulphide in Soils | Sulphide | Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine. |
| 2425 | Extractable Ammonium in soils | Ammonium | Extraction with potassium chloride solution / analysis by 'Aquakem 600' Discrete Analyser using sodium salicylate and sodium dichloroisocyanurate. |
| 2430 | Total Sulphate in soils | Total Sulphate | Acid digestion followed by determination of sulphate in extract by ICP-OES. |
| 2450 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |
| 2490 | Hexavalent Chromium in Soils | Chromium [VI] | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2670 | Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40 | Dichloromethane extraction / GC-FID |
| 2680 | TPH A/A Split | Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44 | Dichloromethane extraction / GCxGC FID detection |
| 2700 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds) |
| 2760 | Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule | Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds. |
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene* | Dichloromethane extraction / GC-MS |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 2815 | Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS | ICES7 PCB congeners | Acetone/Hexane extraction / GC-MS |
| 2920 | Phenols in Soils by HPLC | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded. | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection. |
| 640 | Characterisation of Waste (Leaching C10) | Waste material including soil, sludges and granular waste | ComplianceTest for Leaching of Granular Waste Material and Sludge |
| 650 | Characterisation of Waste (Leaching WAC) | Waste material including soil, sludges and granular waste | ComplianceTest for Leaching of Granular Waste Material and Sludge |

## Report Information

**Key**

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

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

**Sample Deviation Codes**

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

**Sample Retention and Disposal**

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

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

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

# Final Report

| | | | |
|---|---|---|---|
| **Report No.:** | 21-27605-1 | | |
| **Initial Date of Issue:** | 19-Aug-2021 | | |
| **Client** | Quantum Geotechnic Ltd | | |
| **Client Address:** | 13A Bishops Court Gardens<br>Clyst St Mary<br>Exeter<br>EX5 1DH | | |
| **Contact(s):** | Ross McDermott | | |
| **Project** | Q0560 Grandison Brook | | |
| **Quotation No.:** | Q21-25050 | **Date Received:** | 11-Aug-2021 |
| **Order No.:** | | **Date Instructed:** | 13-Aug-2021 |
| **No. of Samples:** | 2 | | |
| **Turnaround (Wkdays):** | 5 | **Results Due:** | 19-Aug-2021 |
| **Date Approved:** | 19-Aug-2021 | | |
| **Approved By:** | | | |
| **Details:** | Glynn Harvey, Technical Manager | | |

# Results - Leachate

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | | **Chemtest Job No.:** | | 21-27605 | 21-27605 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | | **Chemtest Sample ID.:** | | 1257574 | 1257577 |
| | | | | Client Sample ID.: | | ES3 | ES3 |
| | | | | Sample Location: | | GBH01 | GBH03 |
| | | | | Sample Type: | | SOIL | SOIL |
| | | | | Top Depth (m): | | 0.5 | 0.5 |
| **Determinand** | **Accred.** | **SOP** | **Type** | **Units** | **LOD** | | |
| pH | U | 1010 | 2:1 | | N/A | 8.7 | 8.5 |
| Chemical Oxygen Demand | U | 1100 | 2:1 | mg O2/l | 10 | 11 | 13 |
| Ammoniacal Nitrogen | U | 1220 | 2:1 | mg/l | 0.050 | 0.093 | 0.093 |
| Nitrite | U | 1220 | 2:1 | mg/l | 0.020 | 0.038 | 0.020 |
| Nitrate | U | 1220 | 2:1 | mg/l | 0.50 | 1.2 | < 0.50 |
| Sulphate | U | 1220 | 2:1 | mg/l | 1.0 | 7.0 | 32 |
| Cyanide (Total) | U | 1300 | 2:1 | mg/l | 0.050 | < 0.050 | < 0.050 |
| Cyanide (Free) | U | 1300 | 2:1 | mg/l | 0.050 | < 0.050 | < 0.050 |
| Cyanide (Complex) | U | 1300 | 2:1 | mg/l | 0.050 | < 0.050 | < 0.050 |
| Sulphide | U | 1325 | 2:1 | mg/l | 0.050 | < 0.050 | < 0.050 |
| Magnesium | U | 1455 | 2:1 | mg/l | 0.20 | 0.75 | 1.4 |
| Aluminium (Dissolved) | N | 1455 | 2:1 | µg/l | 5.0 | 210 | 18 |
| Arsenic (Dissolved) | U | 1455 | 2:1 | µg/l | 0.20 | 1.0 | 16 |
| Boron (Dissolved) | U | 1455 | 2:1 | µg/l | 10.0 | 16 | 66 |
| Barium (Dissolved) | U | 1455 | 2:1 | µg/l | 5.00 | < 5.0 | 14 |
| Beryllium (Dissolved) | U | 1455 | 2:1 | µg/l | 1.00 | < 1.0 | < 1.0 |
| Cadmium (Dissolved) | U | 1455 | 2:1 | µg/l | 0.11 | < 0.11 | < 0.11 |
| Copper (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 1.8 | 2.4 |
| Mercury (Dissolved) | U | 1455 | 2:1 | µg/l | 0.05 | < 0.05 | 0.08 |
| Manganese (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 20 | 1.9 |
| Molybdenum (Dissolved) | U | 1455 | 2:1 | µg/l | 0.20 | 1.1 | 46 |
| Nickel (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 0.76 | < 0.50 |
| Lead (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 0.52 | < 0.50 |
| Antimony (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | < 0.50 | 1.3 |
| Selenium (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 2.4 | 6.6 |
| Vanadium (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 0.93 | 19 |
| Zinc (Dissolved) | U | 1455 | 2:1 | µg/l | 2.5 | 6.5 | < 2.5 |
| Chromium (Total) | N | 1455 | 2:1 | µg/l | 0.50 | 0.76 | 4.8 |
| Iron (Dissolved) | N | 1455 | 2:1 | µg/l | 5.0 | 1700 | 7.9 |
| Chromium (Hexavalent) | U | 1490 | 2:1 | µg/l | 20 | [A] < 20 | [A] < 20 |
| C2 Aliphatic TPH >C5-C6 | N | 1675 | 2:1 | µg/l | 0.10 | [A] < 0.10 | [A] < 0.10 |
| C2 Aliphatic TPH >C6-C8 | N | 1675 | 2:1 | µg/l | 0.10 | [A] < 0.10 | [A] < 0.10 |
| C2 Aliphatic TPH >C8-C10 | N | 1675 | 2:1 | µg/l | 0.10 | [A] < 0.10 | [A] < 0.10 |
| C2 Aliphatic TPH >C10-C12 | N | 1675 | 2:1 | µg/l | 0.10 | [A] < 0.10 | [A] < 0.10 |
| C2 Aliphatic TPH >C12-C16 | N | 1675 | 2:1 | µg/l | 0.10 | [A] < 0.10 | [A] < 0.10 |
| C2 Aliphatic TPH >C16-C21 | N | 1675 | 2:1 | µg/l | 0.10 | [A] < 0.10 | [A] < 0.10 |
| C2 Aliphatic TPH >C21-C35 | N | 1675 | 2:1 | µg/l | 0.10 | [A] < 0.10 | [A] < 0.10 |
| C2 Aliphatic TPH >C35-C44 | N | 1675 | 2:1 | µg/l | 0.10 | [A] < 0.10 | [A] < 0.10 |
| Total Aliphatic Hydrocarbons | N | 1675 | 2:1 | µg/l | 5.0 | [A] < 5.0 | [A] < 5.0 |
| C2 Aromatic TPH >C5-C7 | N | 1675 | 2:1 | µg/l | 0.10 | [A] < 0.10 | [A] < 0.10 |

# Results - Leachate

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | | **Chemtest Job No.:** | | 21-27605 | 21-27605 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | | **Chemtest Sample ID.:** | | 1257574 | 1257577 |
| | | | | Client Sample ID.: | | ES3 | ES3 |
| | | | | Sample Location: | | GBH01 | GBH03 |
| | | | | Sample Type: | | SOIL | SOIL |
| | | | | Top Depth (m): | | 0.5 | 0.5 |
| **Determinand** | **Accred.** | **SOP** | **Type** | **Units** | **LOD** | | |
| C2 Aromatic TPH >C7-C8 | N | 1675 | 2:1 | µg/l | 0.10 | [A] < 0.10 | [A] < 0.10 |
| C2 Aromatic TPH >C8-C10 | N | 1675 | 2:1 | µg/l | 0.10 | [A] < 0.10 | [A] < 0.10 |
| C2 Aromatic TPH >C10-C12 | N | 1675 | 2:1 | µg/l | 0.10 | [A] < 0.10 | [A] < 0.10 |
| C2 Aromatic TPH >C12-C16 | N | 1675 | 2:1 | µg/l | 0.10 | [A] < 0.10 | [A] < 0.10 |
| C2 Aromatic TPH >C16-C21 | N | 1675 | 2:1 | µg/l | 0.10 | [A] < 0.10 | [A] < 0.10 |
| C2 Aromatic TPH >C21-C35 | N | 1675 | 2:1 | µg/l | 0.10 | [A] < 0.10 | [A] < 0.10 |
| C2 Aromatic TPH >C35-C44 | N | 1675 | 2:1 | µg/l | 0.10 | [A] < 0.10 | [A] < 0.10 |
| C2 Total Aromatic Hydrocarbons | N | 1675 | 2:1 | µg/l | 5.0 | [A] < 5.0 | [A] < 5.0 |
| Total Petroleum Hydrocarbons | N | 1675 | 2:1 | µg/l | 10 | [A] < 10 | [A] < 10 |
| Total Of 16 PAH's | N | 1700 | 2:1 | µg/l | 0.20 | 38 | < 0.20 |
| Benzene | U | 1760 | 2:1 | µg/l | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Toluene | U | 1760 | 2:1 | µg/l | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Ethylbenzene | U | 1760 | 2:1 | µg/l | 1.0 | [A] < 1.0 | [A] < 1.0 |
| m & p-Xylene | U | 1760 | 2:1 | µg/l | 1.0 | [A] < 1.0 | [A] < 1.0 |
| o-Xylene | U | 1760 | 2:1 | µg/l | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Methyl Tert-Butyl Ether | N | 1760 | 2:1 | µg/l | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Naphthalene | N | 1800 | 2:1 | µg/l | 0.010 | 1.3 | 1.3 |
| Acenaphthylene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Acenaphthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Fluorene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Phenanthrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Anthracene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Fluoranthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Pyrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Benzo[a]anthracene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Chrysene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Benzo[b]fluoranthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Benzo[k]fluoranthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Benzo[a]pyrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Indeno(1,2,3-c,d)Pyrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Dibenz(a,h)Anthracene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Benzo[g,h,i]perylene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Coronene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Total Of 17 PAH's | N | 1800 | 2:1 | µg/l | 0.20 | 1.3 | 1.3 |
| Total Phenols | U | 1920 | 2:1 | mg/l | 0.030 | < 0.030 | < 0.030 |

# Results - Soil

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 21-27605 | 21-27605 |
|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | **Chemtest Sample ID.:** | | 1257574 | 1257577 |
| | | | Client Sample ID.: | | ES3 | ES3 |
| | | | Sample Location: | | GBH01 | GBH03 |
| | | | Sample Type: | | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 0.5 |
| | | | Asbestos Lab: | | DURHAM | DURHAM |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | |
| ACM Type | U | 2192 | | N/A | - | - |
| Asbestos Identification | U | 2192 | | N/A | No Asbestos Detected | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | 13 | 9.4 |
| Soil Colour | N | 2040 | | N/A | Brown | Brown |
| Other Material | N | 2040 | | N/A | Stones | Stones |
| Soil Texture | N | 2040 | | N/A | Sand | Sand |
| pH | M | 2010 | | 4.0 | [A] 7.2 | [A] 8.3 |
| Boron (Hot Water Soluble) | M | 2120 | mg/kg | 0.40 | [A] < 0.40 | [A] 0.53 |
| Magnesium (Water Soluble) | M | 2120 | mg/kg | 20 | [A] < 20 | [A] < 20 |
| Sulphate (2:1 Water Soluble) as SO4 | M | 2120 | g/l | 0.010 | [A] < 0.010 | [A] 0.021 |
| Nitrite (Extractable) | N | 2220 | mg/kg | 0.10 | < 0.10 | 0.12 |
| Nitrate (Water Soluble) | N | 2220 | g/l | 0.010 | < 0.010 | < 0.010 |
| Cyanide (Complex) | M | 2300 | mg/kg | 0.50 | [A] < 0.50 | [A] < 0.50 |
| Cyanide (Free) | M | 2300 | mg/kg | 0.50 | [A] < 0.50 | [A] < 0.50 |
| Cyanide (Total) | M | 2300 | mg/kg | 0.50 | [A] < 0.50 | [A] < 0.50 |
| Sulphide (Easily Liberatable) | N | 2325 | mg/kg | 0.50 | [A] 13 | [A] 1.5 |
| Ammoniacal Nitrogen | M | 2425 | mg/kg | 0.50 | [A] 3.3 | [A] 3.3 |
| Aluminium (Total) | N | 2430 | mg/kg | 100 | [A] 12000 | [A] 11000 |
| Iron (Total) | N | 2430 | mg/kg | 100 | [A] 21000 | [A] 20000 |
| Sulphate (Total) | M | 2430 | mg/kg | 100 | [A] 150 | [A] 170 |
| Arsenic | M | 2450 | mg/kg | 1.0 | 14 | 13 |
| Barium | M | 2450 | mg/kg | 10 | 55 | 48 |
| Beryllium | U | 2450 | mg/kg | 1.0 | < 1.0 | < 1.0 |
| Cadmium | M | 2450 | mg/kg | 0.10 | 0.16 | 0.16 |
| Chromium | M | 2450 | mg/kg | 1.0 | 12 | 12 |
| Manganese | M | 2450 | mg/kg | 5.0 | 710 | 640 |
| Molybdenum | M | 2450 | mg/kg | 2.0 | < 2.0 | < 2.0 |
| Antimony | N | 2450 | mg/kg | 2.0 | 2.0 | < 2.0 |
| Copper | M | 2450 | mg/kg | 0.50 | 22 | 20 |
| Mercury | M | 2450 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Nickel | M | 2450 | mg/kg | 0.50 | 38 | 36 |
| Lead | M | 2450 | mg/kg | 0.50 | 56 | 52 |
| Selenium | M | 2450 | mg/kg | 0.20 | < 0.20 | < 0.20 |
| Vanadium | U | 2450 | mg/kg | 5.0 | 8.8 | 7.9 |
| Zinc | M | 2450 | mg/kg | 0.50 | 77 | 63 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 | < 0.50 |
| Organic Matter | M | 2625 | % | 0.40 | [A] 1.7 | [A] 13 |
| Aliphatic TPH >C5-C6 | N | 2680 | mg/kg | 0.010 | [A] < 0.010 | [A] < 0.010 |

# Results - Soil

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 21-27605 | 21-27605 |
|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | **Chemtest Sample ID.:** | | 1257574 | 1257577 |
| | | | Client Sample ID.: | | ES3 | ES3 |
| | | | Sample Location: | | GBH01 | GBH03 |
| | | | Sample Type: | | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 0.5 |
| | | | Asbestos Lab: | | DURHAM | DURHAM |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | |
| Aliphatic TPH >C6-C8 | N | 2680 | mg/kg | 0.010 | [A] < 0.010 | [A] < 0.010 |
| Aliphatic TPH >C8-C10 | N | 2680 | mg/kg | 0.10 | [A] < 0.10 | [A] < 0.10 |
| Aliphatic TPH >C10-C12 | N | 2680 | mg/kg | 0.10 | [A] < 0.10 | [A] < 0.10 |
| Aliphatic TPH >C12-C16 | N | 2680 | mg/kg | 0.10 | [A] < 0.10 | [A] 14 |
| Aliphatic TPH >C16-C21 | N | 2680 | mg/kg | 0.10 | [A] < 0.10 | [A] 34 |
| Aliphatic TPH >C21-C35 | N | 2680 | mg/kg | 0.10 | [A] 36 | [A] 110 |
| Aliphatic TPH >C35-C44 | N | 2680 | mg/kg | 0.10 | [A] < 0.10 | [A] 160 |
| Total Aliphatic Hydrocarbons | N | 2680 | mg/kg | 1.0 | [A] 36 | [A] 310 |
| Aromatic TPH >C5-C7 | N | 2680 | mg/kg | 0.010 | [A] < 0.010 | [A] < 0.010 |
| Aromatic TPH >C7-C8 | N | 2680 | mg/kg | 0.010 | [A] < 0.010 | [A] < 0.010 |
| Aromatic TPH >C8-C10 | N | 2680 | mg/kg | 0.10 | [A] < 0.10 | [A] < 0.10 |
| Aromatic TPH >C10-C12 | N | 2680 | mg/kg | 0.10 | [A] < 0.10 | [A] 4.5 |
| Aromatic TPH >C12-C16 | N | 2680 | mg/kg | 0.10 | [A] < 0.10 | [A] 250 |
| Aromatic TPH >C16-C21 | N | 2680 | mg/kg | 0.10 | [A] 17 | [A] 1500 |
| Aromatic TPH >C21-C35 | N | 2680 | mg/kg | 0.10 | [A] 160 | [A] 4900 |
| Aromatic TPH >C35-C44 | N | 2680 | mg/kg | 0.10 | [A] < 0.10 | [A] 350 |
| Total Aromatic Hydrocarbons | N | 2680 | mg/kg | 1.0 | [A] 180 | [A] 7000 |
| Total Petroleum Hydrocarbons | N | 2680 | mg/kg | 2.0 | [A] 210 | [A] 7300 |
| Benzene | M | 2760 | µg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Toluene | M | 2760 | µg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Ethylbenzene | M | 2760 | µg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| m & p-Xylene | M | 2760 | µg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| o-Xylene | M | 2760 | µg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Methyl Tert-Butyl Ether | M | 2760 | µg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Naphthalene | N | 2800 | mg/kg | 0.010 | [A] < 0.010 | [A] 0.81 |
| Acenaphthylene | N | 2800 | mg/kg | 0.010 | [A] < 0.010 | [A] 2.1 |
| Acenaphthene | N | 2800 | mg/kg | 0.010 | [A] < 0.010 | [A] 1.0 |
| Fluorene | N | 2800 | mg/kg | 0.010 | [A] < 0.010 | [A] 1.5 |
| Phenanthrene | N | 2800 | mg/kg | 0.010 | [A] 0.063 | [A] 16 |
| Anthracene | N | 2800 | mg/kg | 0.010 | [A] 0.017 | [A] 6.6 |
| Fluoranthene | N | 2800 | mg/kg | 0.010 | [A] 0.11 | [A] 61 |
| Pyrene | N | 2800 | mg/kg | 0.010 | [A] 0.089 | [A] 47 |
| Benzo[a]anthracene | N | 2800 | mg/kg | 0.010 | [A] 0.091 | [A] 37 |
| Chrysene | N | 2800 | mg/kg | 0.010 | [A] 0.060 | [A] 36 |
| Benzo[b]fluoranthene | N | 2800 | mg/kg | 0.010 | [A] 0.12 | [A] 50 |
| Benzo[k]fluoranthene | N | 2800 | mg/kg | 0.010 | [A] 0.056 | [A] 20 |
| Benzo[a]pyrene | N | 2800 | mg/kg | 0.010 | [A] 0.063 | [A] 37 |
| Indeno(1,2,3-c,d)Pyrene | N | 2800 | mg/kg | 0.010 | [A] 0.045 | [A] 30 |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.010 | [A] 0.025 | [A] 6.2 |

# Results - Soil

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 21-27605 | 21-27605 |
|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | **Chemtest Sample ID.:** | | 1257574 | 1257577 |
| | | | Client Sample ID.: | | ES3 | ES3 |
| | | | Sample Location: | | GBH01 | GBH03 |
| | | | Sample Type: | | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 0.5 |
| | | | Asbestos Lab: | | DURHAM | DURHAM |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | |
| Benzo[g,h,i]perylene | N | 2800 | mg/kg | 0.010 | [A] 0.041 | [A] 25 |
| Coronene | N | 2800 | mg/kg | 0.010 | [A] < 0.010 | [A] < 0.010 |
| Total Of 17 PAH's | N | 2800 | mg/kg | 0.20 | [A] 0.78 | [A] 380 |
| Total Phenols | M | 2920 | mg/kg | 0.10 | < 0.10 | < 0.10 |

# Deviations

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

| Sample: | Sample Ref: | Sample ID: | Sample Location: | Sampled Date: | Deviation Code(s): | Containers Received: |
|---|---|---|---|---|---|---|
| 1257574 | | ES3 | GBH01 | | A | Amber Glass 250ml |
| 1257574 | | ES3 | GBH01 | | A | Amber Glass 60ml |
| 1257574 | | ES3 | GBH01 | | A | Plastic Tub 500g |
| 1257577 | | ES3 | GBH03 | | A | Amber Glass 250ml |
| 1257577 | | ES3 | GBH03 | | A | Amber Glass 60ml |
| 1257577 | | ES3 | GBH03 | | A | Plastic Tub 500g |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 1010 | pH Value of Waters | pH | pH Meter |
| 1100 | Chemical Oxygen Demand | Chemical Oxygen demand (COD) | Dichromate oxidation of organic matter in sample followed by colorimetric determination of residual Cr[VI]. |
| 1220 | Anions, Alkalinity & Ammonium in Waters | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser. |
| 1300 | Cyanides & Thiocyanate in Waters | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Continuous Flow Analysis. |
| 1325 | Sulphide in Waters | Sulphides | Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N–dimethyl-pphenylenediamine. |
| 1455 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1490 | Hexavalent Chromium in Waters | Chromium [VI] | Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 1675 | TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG) | Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44 | Pentane extraction / GCxGC FID detection |
| 1700 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds) |
| 1760 | Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260) | Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds. |
| 1800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Pentane extraction / GCMS detection |
| 1920 | Phenols in Waters by HPLC | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded. | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection. |
| 2010 | pH Value of Soils | pH | pH Meter |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2040 | Soil Description(Requirement of MCERTS) | Soil description | As received soil is described based upon BS5930 |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2220 | Water soluble Chloride in Soils | Chloride | Aqueous extraction and measuremernt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate. |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 2300 | Cyanides & Thiocyanate in Soils | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser. |
| 2325 | Sulphide in Soils | Sulphide | Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine. |
| 2425 | Extractable Ammonium in soils | Ammonium | Extraction with potassium chloride solution / analysis by 'Aquakem 600' Discrete Analyser using sodium salicylate and sodium dichloroisocyanurate. |
| 2430 | Total Sulphate in soils | Total Sulphate | Acid digestion followed by determination of sulphate in extract by ICP-OES. |
| 2450 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |
| 2490 | Hexavalent Chromium in Soils | Chromium [VI] | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2680 | TPH A/A Split | Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44 | Dichloromethane extraction / GCxGC FID detection |
| 2760 | Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule | Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds. |
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene* | Dichloromethane extraction / GC-MS |
| 2920 | Phenols in Soils by HPLC | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded. | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection. |
| 640 | Characterisation of Waste (Leaching C10) | Waste material including soil, sludges and granular waste | ComplianceTest for Leaching of Granular Waste Material and Sludge |
| 650 | Characterisation of Waste (Leaching WAC) | Waste material including soil, sludges and granular waste | ComplianceTest for Leaching of Granular Waste Material and Sludge |

## Report Information

**Key**

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

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

**Sample Deviation Codes**

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

**Sample Retention and Disposal**

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

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

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

# Final Report

| | |
|---|---|
| **Report No.:** | 21-29503-1 |
| **Initial Date of Issue:** | 31-Aug-2021 |
| **Client** | Quantum Geotechnic Ltd |
| **Client Address:** | Plas Newydd<br>Llanedi<br>Pontarddulais<br>Swansea<br>SA4 0FQ |
| **Contact(s):** | Arwel Jones<br>Phil Darby |
| **Project** | Q0560 Grandison Brook |
| **Quotation No.:** | Q21-25050 |
| **Order No.:** | |
| **No. of Samples:** | 3 |
| **Turnaround (Wkdays):** | 5 |
| **Date Approved:** | 31-Aug-2021 |
| **Approved By:** | |
| **Details:** | Glynn Harvey, Technical Manager |

| | |
|---|---|
| **Date Received:** | 24-Aug-2021 |
| **Date Instructed:** | 24-Aug-2021 |
| **Results Due:** | 31-Aug-2021 |

# Results - Leachate

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | | **Chemtest Job No.:** | | 21-29503 | 21-29503 | 21-29503 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | | **Chemtest Sample ID.:** | | 1266784 | 1266785 | 1266786 |
| | | | | Sample Location: | | HP02 | HP02 | HP03 |
| | | | | Sample Type: | | SOIL | SOIL | SOIL |
| | | | | Top Depth (m): | | 0.50 | 1.00 | 0.40 |
| | | | | Date Sampled: | | 18-Aug-2021 | 18-Aug-2021 | 19-Aug-2021 |
| **Determinand** | **Accred.** | **SOP** | **Type** | **Units** | **LOD** | | | |
| pH | U | 1010 | 2:1 | | N/A | 8.3 | 8.0 | 8.1 |
| Chemical Oxygen Demand | U | 1100 | 2:1 | mg O2/l | 10 | 31 | 25 | < 10 |
| Ammoniacal Nitrogen | U | 1220 | 2:1 | mg/l | 0.050 | 0.068 | 0.061 | 0.078 |
| Nitrite | U | 1220 | 2:1 | mg/l | 0.020 | < 0.020 | < 0.020 | < 0.020 |
| Nitrate | U | 1220 | 2:1 | mg/l | 0.50 | < 0.50 | 1.2 | 1.3 |
| Sulphate | U | 1220 | 2:1 | mg/l | 1.0 | 35 | 12 | 11 |
| Cyanide (Total) | U | 1300 | 2:1 | mg/l | 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Cyanide (Free) | U | 1300 | 2:1 | mg/l | 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Cyanide (Complex) | U | 1300 | 2:1 | mg/l | 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Sulphide | U | 1325 | 2:1 | mg/l | 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Magnesium | U | 1455 | 2:1 | mg/l | 0.20 | 2.8 | 3.4 | 2.5 |
| Aluminium (Dissolved) | N | 1455 | 2:1 | µg/l | 5.0 | 37 | 8.7 | 39 |
| Arsenic (Dissolved) | U | 1455 | 2:1 | µg/l | 0.20 | 11 | 1.0 | 2.6 |
| Boron (Dissolved) | U | 1455 | 2:1 | µg/l | 10.0 | 61 | 26 | 20 |
| Barium (Dissolved) | U | 1455 | 2:1 | µg/l | 5.00 | 37 | 10 | 44 |
| Beryllium (Dissolved) | U | 1455 | 2:1 | µg/l | 1.00 | < 1.0 | < 1.0 | < 1.0 |
| Cadmium (Dissolved) | U | 1455 | 2:1 | µg/l | 0.11 | < 0.11 | < 0.11 | < 0.11 |
| Copper (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 3.8 | 2.0 | 1.6 |
| Mercury (Dissolved) | U | 1455 | 2:1 | µg/l | 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Manganese (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 16 | 1.7 | 0.96 |
| Molybdenum (Dissolved) | U | 1455 | 2:1 | µg/l | 0.20 | 20 | 6.6 | 10 |
| Nickel (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 0.67 | < 0.50 | < 0.50 |
| Lead (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Antimony (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 1.4 | < 0.50 | 4.4 |
| Selenium (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 5.3 | 1.2 | 0.59 |
| Vanadium (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 9.3 | < 0.50 | 0.79 |
| Zinc (Dissolved) | U | 1455 | 2:1 | µg/l | 2.5 | < 2.5 | < 2.5 | < 2.5 |
| Chromium (Total) | N | 1455 | 2:1 | µg/l | 0.50 | 0.58 | < 0.50 | 1.5 |
| Iron (Dissolved) | N | 1455 | 2:1 | µg/l | 5.0 | 18 | 6.7 | < 5.0 |
| Chromium (Hexavalent) | U | 1490 | 2:1 | µg/l | 20 | < 20 | < 20 | < 20 |
| C2 Aliphatic TPH >C5-C6 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| C2 Aliphatic TPH >C6-C8 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| C2 Aliphatic TPH >C8-C10 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| C2 Aliphatic TPH >C10-C12 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| C2 Aliphatic TPH >C12-C16 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| C2 Aliphatic TPH >C16-C21 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| C2 Aliphatic TPH >C21-C35 | N | 1675 | 2:1 | µg/l | 0.10 | 87 | 100 | 120 |
| C2 Aliphatic TPH >C35-C44 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Aliphatic Hydrocarbons | N | 1675 | 2:1 | µg/l | 5.0 | 87 | 100 | 120 |
| C2 Aromatic TPH >C5-C7 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |

# Results - Leachate

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | | **Chemtest Job No.:** | | 21-29503 | 21-29503 | 21-29503 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | | **Chemtest Sample ID.:** | | 1266784 | 1266785 | 1266786 |
| | | | | Sample Location: | | HP02 | HP02 | HP03 |
| | | | | Sample Type: | | SOIL | SOIL | SOIL |
| | | | | Top Depth (m): | | 0.50 | 1.00 | 0.40 |
| | | | | Date Sampled: | | 18-Aug-2021 | 18-Aug-2021 | 19-Aug-2021 |
| **Determinand** | **Accred.** | **SOP** | **Type** | **Units** | **LOD** | | | |
| C2 Aromatic TPH >C7-C8 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| C2 Aromatic TPH >C8-C10 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| C2 Aromatic TPH >C10-C12 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| C2 Aromatic TPH >C12-C16 | N | 1675 | 2:1 | µg/l | 0.10 | 410 | 420 | 320 |
| C2 Aromatic TPH >C16-C21 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| C2 Aromatic TPH >C21-C35 | N | 1675 | 2:1 | µg/l | 0.10 | 230 | 170 | 1500 |
| C2 Aromatic TPH >C35-C44 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| C2 Total Aromatic Hydrocarbons | N | 1675 | 2:1 | µg/l | 5.0 | 640 | 590 | 1800 |
| Total Petroleum Hydrocarbons | N | 1675 | 2:1 | µg/l | 10 | 720 | 700 | 1900 |
| Total Of 16 PAH's | N | 1700 | 2:1 | µg/l | 0.20 | < 0.20 | < 0.20 | < 0.20 |
| Benzene | U | 1760 | 2:1 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | U | 1760 | 2:1 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | U | 1760 | 2:1 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| m & p-Xylene | U | 1760 | 2:1 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-Xylene | U | 1760 | 2:1 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Methyl Tert-Butyl Ether | N | 1760 | 2:1 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Naphthalene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Acenaphthylene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Acenaphthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Fluorene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Phenanthrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Anthracene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Fluoranthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Pyrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Benzo[a]anthracene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Chrysene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Benzo[b]fluoranthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Benzo[k]fluoranthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Benzo[a]pyrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Indeno(1,2,3-c,d)Pyrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Dibenz(a,h)Anthracene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Benzo[g,h,i]perylene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Coronene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Total Of 17 PAH's | N | 1800 | 2:1 | µg/l | 0.20 | < 0.20 | < 0.20 | < 0.20 |
| Total Phenols | U | 1920 | 2:1 | mg/l | 0.030 | < 0.030 | < 0.030 | < 0.030 |

# Results - Soil

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 21-29503 | 21-29503 | 21-29503 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | **Chemtest Sample ID.:** | | 1266784 | 1266785 | 1266786 |
| | | | Sample Location: | | HP02 | HP02 | HP03 |
| | | | Sample Type: | | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.50 | 1.00 | 0.40 |
| | | | Date Sampled: | | 18-Aug-2021 | 18-Aug-2021 | 19-Aug-2021 |
| | | | Asbestos Lab: | | DURHAM | DURHAM | DURHAM |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | |
| ACM Type | U | 2192 | | N/A | - | - | - |
| Asbestos Identification | U | 2192 | | N/A | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | 9.2 | 15 | 7.4 |
| Soil Colour | N | 2040 | | N/A | Brown | Brown | Brown |
| Other Material | N | 2040 | | N/A | Stones | None | Stones |
| Soil Texture | N | 2040 | | N/A | Sand | Sand | Sand |
| pH | M | 2010 | | 4.0 | 9.0 | 8.7 | 8.9 |
| Boron (Hot Water Soluble) | M | 2120 | mg/kg | 0.40 | 0.66 | < 0.40 | < 0.40 |
| Magnesium (Water Soluble) | M | 2120 | mg/kg | 20 | 400 | 340 | 360 |
| Sulphate (2:1 Water Soluble) as SO4 | M | 2120 | g/l | 0.010 | 0.091 | < 0.010 | < 0.010 |
| Nitrite (Extractable) | N | 2220 | mg/kg | 0.10 | 0.40 | < 0.10 | 0.16 |
| Nitrate (Water Soluble) | N | 2220 | g/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Cyanide (Complex) | M | 2300 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Cyanide (Free) | M | 2300 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Cyanide (Total) | M | 2300 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Sulphide (Easily Liberatable) | N | 2325 | mg/kg | 0.50 | 0.56 | 0.56 | 0.56 |
| Ammoniacal Nitrogen | M | 2425 | mg/kg | 0.50 | 1.8 | < 0.50 | < 0.50 |
| Aluminium (Total) | N | 2430 | mg/kg | 100 | 11000 | 4200 | 3200 |
| Iron (Total) | N | 2430 | mg/kg | 100 | 19000 | 14000 | 13000 |
| Sulphate (Total) | M | 2430 | mg/kg | 100 | 1800 | 190 | 650 |
| Arsenic | M | 2450 | mg/kg | 1.0 | 18 | 9.7 | 18 |
| Barium | M | 2450 | mg/kg | 10 | 190 | 23 | 130 |
| Beryllium | U | 2450 | mg/kg | 1.0 | 1.2 | < 1.0 | < 1.0 |
| Cadmium | M | 2450 | mg/kg | 0.10 | 0.33 | < 0.10 | 0.38 |
| Chromium | M | 2450 | mg/kg | 1.0 | 31 | 7.1 | 12 |
| Manganese | M | 2450 | mg/kg | 5.0 | 1900 | 400 | 550 |
| Molybdenum | M | 2450 | mg/kg | 2.0 | < 2.0 | < 2.0 | 2.1 |
| Antimony | N | 2450 | mg/kg | 2.0 | < 2.0 | < 2.0 | 2.0 |
| Copper | M | 2450 | mg/kg | 0.50 | 190 | 26 | 75 |
| Mercury | M | 2450 | mg/kg | 0.10 | < 0.10 | < 0.10 | 0.14 |
| Nickel | M | 2450 | mg/kg | 0.50 | 30 | 11 | 22 |
| Lead | M | 2450 | mg/kg | 0.50 | 53 | 12 | 110 |
| Selenium | M | 2450 | mg/kg | 0.20 | 0.76 | 0.20 | < 0.20 |
| Vanadium | U | 2450 | mg/kg | 5.0 | 33 | 8.7 | 11 |
| Zinc | M | 2450 | mg/kg | 0.50 | 110 | 35 | 150 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Organic Matter | M | 2625 | % | 0.40 | 12 | 10 | 13 |
| Aliphatic TPH >C5-C6 | N | 2680 | mg/kg | 0.010 | < 0.010 | < 0.010 | < 0.010 |

# Results - Soil

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 21-29503 | 21-29503 | 21-29503 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | **Chemtest Sample ID.:** | | 1266784 | 1266785 | 1266786 |
| | | | Sample Location: | | HP02 | HP02 | HP03 |
| | | | Sample Type: | | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.50 | 1.00 | 0.40 |
| | | | Date Sampled: | | 18-Aug-2021 | 18-Aug-2021 | 19-Aug-2021 |
| | | | Asbestos Lab: | | DURHAM | DURHAM | DURHAM |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | |
| Aliphatic TPH >C6-C8 | N | 2680 | mg/kg | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Aliphatic TPH >C8-C10 | N | 2680 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C10-C12 | N | 2680 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C12-C16 | N | 2680 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C16-C21 | N | 2680 | mg/kg | 0.10 | 27 | < 0.10 | < 0.10 |
| Aliphatic TPH >C21-C35 | N | 2680 | mg/kg | 0.10 | 70 | < 0.10 | < 0.10 |
| Aliphatic TPH >C35-C44 | N | 2680 | mg/kg | 0.10 | 260 | < 0.10 | < 0.10 |
| Total Aliphatic Hydrocarbons | N | 2680 | mg/kg | 1.0 | 350 | < 1.0 | < 1.0 |
| Aromatic TPH >C5-C7 | N | 2680 | mg/kg | 0.010 | 94 | < 0.010 | < 0.010 |
| Aromatic TPH >C7-C8 | N | 2680 | mg/kg | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Aromatic TPH >C8-C10 | N | 2680 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C10-C12 | N | 2680 | mg/kg | 0.10 | 18 | < 0.10 | < 0.10 |
| Aromatic TPH >C12-C16 | N | 2680 | mg/kg | 0.10 | 280 | < 0.10 | < 0.10 |
| Aromatic TPH >C16-C21 | N | 2680 | mg/kg | 0.10 | 1300 | < 0.10 | 3.9 |
| Aromatic TPH >C21-C35 | N | 2680 | mg/kg | 0.10 | 3500 | < 0.10 | 19 |
| Aromatic TPH >C35-C44 | N | 2680 | mg/kg | 0.10 | 280 | < 0.10 | < 0.10 |
| Total Aromatic Hydrocarbons | N | 2680 | mg/kg | 1.0 | 5400 | < 1.0 | 23 |
| Total Petroleum Hydrocarbons | N | 2680 | mg/kg | 2.0 | 5800 | < 2.0 | 23 |
| Benzene | M | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | M | 2760 | µg/kg | 1.0 | 11 | 11 | 2.2 |
| Ethylbenzene | M | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| m & p-Xylene | M | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-Xylene | M | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Methyl Tert-Butyl Ether | M | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Naphthalene | N | 2800 | mg/kg | 0.010 | 2.7 | 0.68 | 0.52 |
| Acenaphthylene | N | 2800 | mg/kg | 0.010 | 5.1 | 0.22 | 0.24 |
| Acenaphthene | N | 2800 | mg/kg | 0.010 | 5.0 | 0.28 | 0.21 |
| Fluorene | N | 2800 | mg/kg | 0.010 | 10 | 0.54 | 0.30 |
| Phenanthrene | N | 2800 | mg/kg | 0.010 | 56 | 2.8 | 2.1 |
| Anthracene | N | 2800 | mg/kg | 0.010 | 19 | 0.69 | 0.44 |
| Fluoranthene | N | 2800 | mg/kg | 0.010 | 83 | 2.1 | 3.2 |
| Pyrene | N | 2800 | mg/kg | 0.010 | 64 | 1.6 | 2.6 |
| Benzo[a]anthracene | N | 2800 | mg/kg | 0.010 | 43 | 0.97 | 1.6 |
| Chrysene | N | 2800 | mg/kg | 0.010 | 38 | 0.97 | 1.5 |
| Benzo[b]fluoranthene | N | 2800 | mg/kg | 0.010 | 63 | 1.4 | 2.4 |
| Benzo[k]fluoranthene | N | 2800 | mg/kg | 0.010 | 25 | 0.47 | 0.71 |
| Benzo[a]pyrene | N | 2800 | mg/kg | 0.010 | 56 | 1.2 | 2.1 |
| Indeno(1,2,3-c,d)Pyrene | N | 2800 | mg/kg | 0.010 | 44 | 0.91 | 1.6 |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.010 | 8.3 | 0.30 | 0.44 |

# Results - Soil

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 21-29503 | 21-29503 | 21-29503 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | **Chemtest Sample ID.:** | | 1266784 | 1266785 | 1266786 |
| | | | Sample Location: | | HP02 | HP02 | HP03 |
| | | | Sample Type: | | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.50 | 1.00 | 0.40 |
| | | | Date Sampled: | | 18-Aug-2021 | 18-Aug-2021 | 19-Aug-2021 |
| | | | Asbestos Lab: | | DURHAM | DURHAM | DURHAM |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | |
| Benzo[g,h,i]perylene | N | 2800 | mg/kg | 0.010 | 34 | 0.76 | 1.4 |
| Coronene | N | 2800 | mg/kg | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Total Of 17 PAH's | N | 2800 | mg/kg | 0.20 | 560 | 16 | 21 |
| Total Phenols | M | 2920 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 1010 | pH Value of Waters | pH | pH Meter |
| 1100 | Chemical Oxygen Demand | Chemical Oxygen demand (COD) | Dichromate oxidation of organic matter in sample followed by colorimetric determination of residual Cr[VI]. |
| 1220 | Anions, Alkalinity & Ammonium in Waters | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser. |
| 1300 | Cyanides & Thiocyanate in Waters | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Continuous Flow Analysis. |
| 1325 | Sulphide in Waters | Sulphides | Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N–dimethyl-pphenylenediamine. |
| 1455 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1490 | Hexavalent Chromium in Waters | Chromium [VI] | Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 1675 | TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG) | Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44 | Pentane extraction / GCxGC FID detection |
| 1700 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds) |
| 1760 | Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260) | Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds. |
| 1800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Pentane extraction / GCMS detection |
| 1920 | Phenols in Waters by HPLC | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded. | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection. |
| 2010 | pH Value of Soils | pH | pH Meter |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2040 | Soil Description(Requirement of MCERTS) | Soil description | As received soil is described based upon BS5930 |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2220 | Water soluble Chloride in Soils | Chloride | Aqueous extraction and measuremernt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate. |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 2300 | Cyanides & Thiocyanate in Soils | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser. |
| 2325 | Sulphide in Soils | Sulphide | Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine. |
| 2425 | Extractable Ammonium in soils | Ammonium | Extraction with potassium chloride solution / analysis by 'Aquakem 600' Discrete Analyser using sodium salicylate and sodium dichloroisocyanurate. |
| 2430 | Total Sulphate in soils | Total Sulphate | Acid digestion followed by determination of sulphate in extract by ICP-OES. |
| 2450 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |
| 2490 | Hexavalent Chromium in Soils | Chromium [VI] | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2680 | TPH A/A Split | Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44 | Dichloromethane extraction / GCxGC FID detection |
| 2760 | Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule | Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds. |
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene* | Dichloromethane extraction / GC-MS |
| 2920 | Phenols in Soils by HPLC | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded. | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection. |
| 640 | Characterisation of Waste (Leaching C10) | Waste material including soil, sludges and granular waste | ComplianceTest for Leaching of Granular Waste Material and Sludge |
| 650 | Characterisation of Waste (Leaching WAC) | Waste material including soil, sludges and granular waste | ComplianceTest for Leaching of Granular Waste Material and Sludge |

## Report Information

**Key**

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

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

**Sample Deviation Codes**

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

**Sample Retention and Disposal**

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

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

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

# Final Report

| | | | |
|---|---|---|---|
| **Report No.:** | 21-29846-1 | | |
| **Initial Date of Issue:** | 02-Sep-2021 | | |
| **Client** | Quantum Geotechnic Ltd | | |
| **Client Address:** | Plas Newydd<br>Llanedi<br>Pontarddulais<br>Swansea<br>SA4 0FQ | | |
| **Contact(s):** | Arwel Jones<br>Phil Darby | | |
| **Project** | Q0560 Grandison Brook | | |
| **Quotation No.:** | Q21-25050 | **Date Received:** | 26-Aug-2021 |
| **Order No.:** | | **Date Instructed:** | 26-Aug-2021 |
| **No. of Samples:** | 3 | | |
| **Turnaround (Wkdays):** | 5 | **Results Due:** | 02-Sep-2021 |
| **Date Approved:** | 02-Sep-2021 | | |
| **Approved By:** | | | |

**Details:** Glynn Harvey, Technical Manager

# Results - Water

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 21-29846 | 21-29846 | 21-29846 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | **Chemtest Sample ID.:** | | 1268234 | 1268235 | 1268236 |
| | | | Client Sample ID.: | | 1 | 2 | |
| | | | Sample Location: | | Upstream | Downstream | GBBH05 |
| | | | Sample Type: | | WATER | WATER | WATER |
| | | | Date Sampled: | | 25-Aug-2021 | 25-Aug-2021 | 25-Aug-2021 |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | |
| pH | U | 1010 | | N/A | 8.5 | 8.5 | 8.3 |
| Biochemical Oxygen Demand Low Level | N | 1090 | mg O2/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Alkalinity (Total) | U | 1220 | mg/l | 10 | 150 | 61 | 61 |
| Chloride | U | 1220 | mg/l | 1.0 | 32 | 20 | 19 |
| Ammonia (Free) | N | 1220 | mg/l | 0.050 | 0.19 | < 0.050 | < 0.050 |
| Ammonium | U | 1220 | mg/l | 0.050 | 1.4 | 0.33 | 0.30 |
| Ammoniacal Nitrogen | U | 1220 | mg/l | 0.050 | 1.2 | 0.30 | 0.26 |
| Nitrate | U | 1220 | mg/l | 0.50 | 11 | 4.4 | 7.8 |
| Phosphorus (Dissolved) | U | 1220 | mg/l | 0.020 | 0.065 | 0.024 | 0.023 |
| Sulphate | U | 1220 | mg/l | 1.0 | 35 | 19 | 20 |
| Cyanide (Total) | U | 1300 | mg/l | 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Cyanide (Free) | U | 1300 | mg/l | 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Sulphide | U | 1325 | mg/l | 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Calcium | U | 1455 | mg/l | 2.00 | 46 | 21 | 21 |
| Total Hardness as CaCO3 | U | 1270 | mg/l | 15 | 160 | 69 | 67 |
| Aluminium (Dissolved) | N | 1455 | µg/l | 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Arsenic (Dissolved) | U | 1455 | µg/l | 0.20 | 1.2 | 0.81 | 0.95 |
| Boron (Dissolved) | U | 1455 | µg/l | 10.0 | 51 | 24 | 23 |
| Barium (Dissolved) | U | 1455 | µg/l | 5.00 | 41 | 20 | 20 |
| Beryllium (Dissolved) | U | 1455 | µg/l | 1.00 | < 1.0 | < 1.0 | < 1.0 |
| Cadmium (Dissolved) | U | 1455 | µg/l | 0.11 | < 0.11 | < 0.11 | < 0.11 |
| Copper (Dissolved) | U | 1455 | µg/l | 0.50 | 2.6 | 2.8 | 2.5 |
| Iron (Dissolved) | N | 1455 | µg/l | 5.0 | < 5.0 | 110 | 150 |
| Mercury (Dissolved) | U | 1455 | µg/l | 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Molybdenum (Dissolved) | U | 1455 | µg/l | 0.20 | 1.3 | 0.83 | 0.64 |
| Nickel (Dissolved) | U | 1455 | µg/l | 0.50 | 0.66 | 1.1 | 1.1 |
| Lead (Dissolved) | U | 1455 | µg/l | 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Antimony (Dissolved) | U | 1455 | µg/l | 0.50 | 0.56 | < 0.50 | < 0.50 |
| Selenium (Dissolved) | U | 1455 | µg/l | 0.50 | 2.0 | < 0.50 | 0.56 |
| Vanadium (Dissolved) | U | 1455 | µg/l | 0.50 | 0.58 | 0.51 | 0.52 |
| Zinc (Dissolved) | U | 1455 | µg/l | 2.5 | 8.8 | 3.6 | 3.9 |
| Chromium (Total) | N | 1455 | µg/l | 0.50 | 6.6 | 5.8 | 5.7 |
| Low-Level Chromium (Hexavalent) | U | 1495 | µg/l | 0.10 | 3.7 | 3.3 | 3.0 |
| Dissolved Organic Carbon | U | 1610 | mg/l | 2.0 | 2.2 | 3.5 | 3.4 |
| Total Organic Carbon | U | 1610 | mg/l | 2.0 | 2.0 | 3.2 | 3.3 |
| Aliphatic TPH >C5-C6 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C6-C8 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C8-C10 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C10-C12 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C12-C16 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |

# Results - Water

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 21-29846 | 21-29846 | 21-29846 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | **Chemtest Sample ID.:** | | 1268234 | 1268235 | 1268236 |
| | | | Client Sample ID.: | | 1 | 2 | |
| | | | Sample Location: | | Upstream | Downstream | GBBH05 |
| | | | Sample Type: | | WATER | WATER | WATER |
| | | | Date Sampled: | | 25-Aug-2021 | 25-Aug-2021 | 25-Aug-2021 |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | |
| Aliphatic TPH >C16-C21 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C21-C35 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C35-C44 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Aliphatic Hydrocarbons | N | 1675 | µg/l | 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Aromatic TPH >C5-C7 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C7-C8 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C8-C10 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C10-C12 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C12-C16 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C16-C21 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C21-C35 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C35-C44 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Aromatic Hydrocarbons | N | 1675 | µg/l | 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Total Petroleum Hydrocarbons | N | 1675 | µg/l | 10 | < 10 | < 10 | < 10 |
| Benzene | U | 1760 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | U | 1760 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | U | 1760 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| m & p-Xylene | U | 1760 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-Xylene | U | 1760 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Naphthalene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthylene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluorene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Phenanthrene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Anthracene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluoranthene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Pyrene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[a]anthracene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Chrysene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[a]pyrene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Coronene | N | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Of 17 PAH's | N | 1800 | µg/l | 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Total Phenols | U | 1920 | mg/l | 0.030 | < 0.030 | < 0.030 | < 0.030 |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 1010 | pH Value of Waters | pH | pH Meter |
| 1090 | Biochemical Oxygen Demand | Biochemical Oxygen demand (BOD) | Colorimetric determination of dissolved oxygen in seeded sample after 5 days incubation at 20°C. |
| 1220 | Anions, Alkalinity & Ammonium in Waters | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser. |
| 1270 | Total Hardness of Waters | Total hardness | Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO3 equivalent. |
| 1300 | Cyanides & Thiocyanate in Waters | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Continuous Flow Analysis. |
| 1325 | Sulphide in Waters | Sulphides | Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N–dimethyl-pphenylenediamine. |
| 1455 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1495 | Low Level Hexavalent Chromium in Waters | Chromium [VI] | Colorimetric determination of hexavalent chromium expressed as Cr (VI) µg/l in water, using Ion Chromatography and UV-visible spectrophotometry. |
| 1610 | Total/Dissolved Organic Carbon in Waters | Organic Carbon | TOC Analyser using Catalytic Oxidation |
| 1675 | TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG) | Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44 | Pentane extraction / GCxGC FID detection |
| 1760 | Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260) | Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds. |
| 1800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Pentane extraction / GCMS detection |
| 1920 | Phenols in Waters by HPLC | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded. | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection. |

## Report Information

**Key**

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

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

**Sample Deviation Codes**

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

**Sample Retention and Disposal**

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

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

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

# Final Report

| | | | |
|---|---|---|---|
| **Report No.:** | 21-29847-1 | | |
| **Initial Date of Issue:** | 02-Sep-2021 | | |
| **Client** | Quantum Geotechnic Ltd | | |
| **Client Address:** | Plas Newydd<br>Llanedi<br>Pontarddulais<br>Swansea<br>SA4 0FQ | | |
| **Contact(s):** | Arwel Jones<br>Phil Darby | | |
| **Project** | Q0560 Grandison Brook | | |
| **Quotation No.:** | Q21-25050 | **Date Received:** | 26-Aug-2021 |
| **Order No.:** | | **Date Instructed:** | 26-Aug-2021 |
| **No. of Samples:** | 1 | | |
| **Turnaround (Wkdays):** | 5 | **Results Due:** | 02-Sep-2021 |
| **Date Approved:** | 02-Sep-2021 | | |
| **Approved By:** | | | |
| **Details:** | Glynn Harvey, Technical Manager | | |

# Results - Leachate

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | | **Chemtest Job No.:** | | 21-29847 |
|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | | **Chemtest Sample ID.:** | | 1268237 |
| | | | | Client Sample ID.: | | 1 |
| | | | | Sample Location: | | HP05 |
| | | | | Sample Type: | | SOIL |
| | | | | Top Depth (m): | | 0.3 |
| | | | | Date Sampled: | | 19-Aug-2021 |
| **Determinand** | **Accred.** | **SOP** | **Type** | **Units** | **LOD** | |
| pH | U | 1010 | 2:1 | | N/A | 8.6 |
| Chemical Oxygen Demand | U | 1100 | 2:1 | mg O2/l | 10 | 31 |
| Ammoniacal Nitrogen | U | 1220 | 2:1 | mg/l | 0.050 | 0.093 |
| Nitrite | U | 1220 | 2:1 | mg/l | 0.020 | < 0.020 |
| Nitrate | U | 1220 | 2:1 | mg/l | 0.50 | 15 |
| Sulphate | U | 1220 | 2:1 | mg/l | 1.0 | 8.8 |
| Cyanide (Total) | U | 1300 | 2:1 | mg/l | 0.050 | < 0.050 |
| Cyanide (Free) | U | 1300 | 2:1 | mg/l | 0.050 | < 0.050 |
| Cyanide (Complex) | U | 1300 | 2:1 | mg/l | 0.050 | < 0.050 |
| Sulphide | U | 1325 | 2:1 | mg/l | 0.050 | < 0.050 |
| Magnesium | U | 1455 | 2:1 | mg/l | 0.20 | 2.8 |
| Aluminium (Dissolved) | N | 1455 | 2:1 | µg/l | 5.0 | 19 |
| Arsenic (Dissolved) | U | 1455 | 2:1 | µg/l | 0.20 | 1.1 |
| Boron (Dissolved) | U | 1455 | 2:1 | µg/l | 10.0 | 20 |
| Barium (Dissolved) | U | 1455 | 2:1 | µg/l | 5.00 | 34 |
| Beryllium (Dissolved) | U | 1455 | 2:1 | µg/l | 1.00 | < 1.0 |
| Cadmium (Dissolved) | U | 1455 | 2:1 | µg/l | 0.11 | < 0.11 |
| Copper (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 5.0 |
| Mercury (Dissolved) | U | 1455 | 2:1 | µg/l | 0.05 | < 0.05 |
| Manganese (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 1.6 |
| Molybdenum (Dissolved) | U | 1455 | 2:1 | µg/l | 0.20 | 1.3 |
| Nickel (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 0.75 |
| Lead (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | < 0.50 |
| Antimony (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 1.4 |
| Selenium (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | < 0.50 |
| Vanadium (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | < 0.50 |
| Zinc (Dissolved) | U | 1455 | 2:1 | µg/l | 2.5 | < 2.5 |
| Chromium (Total) | N | 1455 | 2:1 | µg/l | 0.50 | < 0.50 |
| Iron (Dissolved) | N | 1455 | 2:1 | µg/l | 5.0 | 53 |
| Chromium (Hexavalent) | U | 1490 | 2:1 | µg/l | 20 | < 20 |
| C2 Aliphatic TPH >C5-C6 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 |
| C2 Aliphatic TPH >C6-C8 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 |
| C2 Aliphatic TPH >C8-C10 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 |
| C2 Aliphatic TPH >C10-C12 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 |
| C2 Aliphatic TPH >C12-C16 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 |
| C2 Aliphatic TPH >C16-C21 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 |
| C2 Aliphatic TPH >C21-C35 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 |
| C2 Aliphatic TPH >C35-C44 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 |
| Total Aliphatic Hydrocarbons | N | 1675 | 2:1 | µg/l | 5.0 | < 5.0 |

# Results - Leachate

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | | **Chemtest Job No.:** | | 21-29847 |
|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | | **Chemtest Sample ID.:** | | 1268237 |
| | | | | Client Sample ID.: | | 1 |
| | | | | Sample Location: | | HP05 |
| | | | | Sample Type: | | SOIL |
| | | | | Top Depth (m): | | 0.3 |
| | | | | Date Sampled: | | 19-Aug-2021 |
| **Determinand** | **Accred.** | **SOP** | **Type** | **Units** | **LOD** | |
| C2 Aromatic TPH >C5-C7 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 |
| C2 Aromatic TPH >C7-C8 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 |
| C2 Aromatic TPH >C8-C10 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 |
| C2 Aromatic TPH >C10-C12 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 |
| C2 Aromatic TPH >C12-C16 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 |
| C2 Aromatic TPH >C16-C21 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 |
| C2 Aromatic TPH >C21-C35 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 |
| C2 Aromatic TPH >C35-C44 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 |
| C2 Total Aromatic Hydrocarbons | N | 1675 | 2:1 | µg/l | 5.0 | < 5.0 |
| Total Petroleum Hydrocarbons | N | 1675 | 2:1 | µg/l | 10 | < 10 |
| Total Of 16 PAH's | N | 1700 | 2:1 | µg/l | 0.20 | < 0.20 |
| Benzene | U | 1760 | 2:1 | µg/l | 1.0 | < 1.0 |
| Toluene | U | 1760 | 2:1 | µg/l | 1.0 | < 1.0 |
| Ethylbenzene | U | 1760 | 2:1 | µg/l | 1.0 | < 1.0 |
| m & p-Xylene | U | 1760 | 2:1 | µg/l | 1.0 | < 1.0 |
| o-Xylene | U | 1760 | 2:1 | µg/l | 1.0 | < 1.0 |
| Methyl Tert-Butyl Ether | N | 1760 | 2:1 | µg/l | 1.0 | < 1.0 |
| Naphthalene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 |
| Acenaphthylene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 |
| Acenaphthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 |
| Fluorene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 |
| Phenanthrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 |
| Anthracene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 |
| Fluoranthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 |
| Pyrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 |
| Benzo[a]anthracene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 |
| Chrysene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 |
| Benzo[b]fluoranthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 |
| Benzo[k]fluoranthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 |
| Benzo[a]pyrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 |
| Indeno(1,2,3-c,d)Pyrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 |
| Dibenz(a,h)Anthracene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 |
| Benzo[g,h,i]perylene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 |
| Coronene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 |
| Total Of 17 PAH's | N | 1800 | 2:1 | µg/l | 0.20 | < 0.20 |
| Total Phenols | U | 1920 | 2:1 | mg/l | 0.030 | < 0.030 |

# Results - Soil

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 21-29847 |
|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | **Chemtest Sample ID.:** | | 1268237 |
| | | | Client Sample ID.: | | 1 |
| | | | Sample Location: | | HP05 |
| | | | Sample Type: | | SOIL |
| | | | Top Depth (m): | | 0.3 |
| | | | Date Sampled: | | 19-Aug-2021 |
| | | | Asbestos Lab: | | DURHAM |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | |
| ACM Type | U | 2192 | | N/A | - |
| Asbestos Identification | U | 2192 | | N/A | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | 9.8 |
| Soil Colour | N | 2040 | | N/A | Brown |
| Other Material | N | 2040 | | N/A | Stones and Roots |
| Soil Texture | N | 2040 | | N/A | Sand |
| pH | M | 2010 | | 4.0 | 8.2 |
| Boron (Hot Water Soluble) | M | 2120 | mg/kg | 0.40 | 6.2 |
| Magnesium (Water Soluble) | M | 2120 | mg/kg | 20 | 740 |
| Sulphate (2:1 Water Soluble) as SO4 | M | 2120 | g/l | 0.010 | 0.015 |
| Nitrite (Extractable) | N | 2220 | mg/kg | 0.10 | 4.2 |
| Nitrate (Water Soluble) | N | 2220 | g/l | 0.010 | < 0.010 |
| Cyanide (Complex) | M | 2300 | mg/kg | 0.50 | < 0.50 |
| Cyanide (Free) | M | 2300 | mg/kg | 0.50 | < 0.50 |
| Cyanide (Total) | M | 2300 | mg/kg | 0.50 | < 0.50 |
| Sulphide (Easily Liberatable) | N | 2325 | mg/kg | 0.50 | 1.2 |
| Ammoniacal Nitrogen | M | 2425 | mg/kg | 0.50 | 1.4 |
| Aluminium (Total) | N | 2430 | mg/kg | 100 | 6200 |
| Iron (Total) | N | 2430 | mg/kg | 100 | 18000 |
| Sulphate (Total) | M | 2430 | mg/kg | 100 | 1200 |
| Arsenic | M | 2450 | mg/kg | 1.0 | 19 |
| Barium | M | 2450 | mg/kg | 10 | 220 |
| Beryllium | U | 2450 | mg/kg | 1.0 | < 1.0 |
| Cadmium | M | 2450 | mg/kg | 0.10 | 0.44 |
| Chromium | M | 2450 | mg/kg | 1.0 | 14 |
| Manganese | M | 2450 | mg/kg | 5.0 | 530 |
| Molybdenum | M | 2450 | mg/kg | 2.0 | < 2.0 |
| Antimony | N | 2450 | mg/kg | 2.0 | < 2.0 |
| Copper | M | 2450 | mg/kg | 0.50 | 35 |
| Mercury | M | 2450 | mg/kg | 0.10 | < 0.10 |
| Nickel | M | 2450 | mg/kg | 0.50 | 19 |
| Lead | M | 2450 | mg/kg | 0.50 | 46 |
| Selenium | M | 2450 | mg/kg | 0.20 | < 0.20 |
| Vanadium | U | 2450 | mg/kg | 5.0 | 21 |
| Zinc | M | 2450 | mg/kg | 0.50 | 100 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 |

# Results - Soil

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 21-29847 |
|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | **Chemtest Sample ID.:** | | 1268237 |
| | | | Client Sample ID.: | | 1 |
| | | | Sample Location: | | HP05 |
| | | | Sample Type: | | SOIL |
| | | | Top Depth (m): | | 0.3 |
| | | | Date Sampled: | | 19-Aug-2021 |
| | | | Asbestos Lab: | | DURHAM |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | |
| Organic Matter | M | 2625 | % | 0.40 | 10 |
| Aliphatic TPH >C5-C6 | N | 2680 | mg/kg | 0.010 | < 0.010 |
| Aliphatic TPH >C6-C8 | N | 2680 | mg/kg | 0.010 | < 0.010 |
| Aliphatic TPH >C8-C10 | N | 2680 | mg/kg | 0.10 | 9.0 |
| Aliphatic TPH >C10-C12 | N | 2680 | mg/kg | 0.10 | 3.1 |
| Aliphatic TPH >C12-C16 | N | 2680 | mg/kg | 0.10 | 6.9 |
| Aliphatic TPH >C16-C21 | N | 2680 | mg/kg | 0.10 | < 0.10 |
| Aliphatic TPH >C21-C35 | N | 2680 | mg/kg | 0.10 | 22 |
| Aliphatic TPH >C35-C44 | N | 2680 | mg/kg | 0.10 | < 0.10 |
| Total Aliphatic Hydrocarbons | N | 2680 | mg/kg | 1.0 | 41 |
| Aromatic TPH >C5-C7 | N | 2680 | mg/kg | 0.010 | < 0.010 |
| Aromatic TPH >C7-C8 | N | 2680 | mg/kg | 0.010 | < 0.010 |
| Aromatic TPH >C8-C10 | N | 2680 | mg/kg | 0.10 | < 0.10 |
| Aromatic TPH >C10-C12 | N | 2680 | mg/kg | 0.10 | < 0.10 |
| Aromatic TPH >C12-C16 | N | 2680 | mg/kg | 0.10 | < 0.10 |
| Aromatic TPH >C16-C21 | N | 2680 | mg/kg | 0.10 | < 0.10 |
| Aromatic TPH >C21-C35 | N | 2680 | mg/kg | 0.10 | 93 |
| Aromatic TPH >C35-C44 | N | 2680 | mg/kg | 0.10 | < 0.10 |
| Total Aromatic Hydrocarbons | N | 2680 | mg/kg | 1.0 | 93 |
| Total Petroleum Hydrocarbons | N | 2680 | mg/kg | 2.0 | 130 |
| Benzene | M | 2760 | µg/kg | 1.0 | < 1.0 |
| Toluene | M | 2760 | µg/kg | 1.0 | < 1.0 |
| Ethylbenzene | M | 2760 | µg/kg | 1.0 | < 1.0 |
| m & p-Xylene | M | 2760 | µg/kg | 1.0 | < 1.0 |
| o-Xylene | M | 2760 | µg/kg | 1.0 | < 1.0 |
| Methyl Tert-Butyl Ether | M | 2760 | µg/kg | 1.0 | < 1.0 |
| Naphthalene | N | 2800 | mg/kg | 0.010 | 0.12 |
| Acenaphthylene | N | 2800 | mg/kg | 0.010 | 0.14 |
| Acenaphthene | N | 2800 | mg/kg | 0.010 | 0.18 |
| Fluorene | N | 2800 | mg/kg | 0.010 | 0.13 |
| Phenanthrene | N | 2800 | mg/kg | 0.010 | 0.50 |
| Anthracene | N | 2800 | mg/kg | 0.010 | 0.19 |
| Fluoranthene | N | 2800 | mg/kg | 0.010 | 1.1 |
| Pyrene | N | 2800 | mg/kg | 0.010 | 0.85 |
| Benzo[a]anthracene | N | 2800 | mg/kg | 0.010 | 0.75 |
| Chrysene | N | 2800 | mg/kg | 0.010 | 0.64 |
| Benzo[b]fluoranthene | N | 2800 | mg/kg | 0.010 | 0.88 |
| Benzo[k]fluoranthene | N | 2800 | mg/kg | 0.010 | 0.38 |

# Results - Soil

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 21-29847 |
|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | **Chemtest Sample ID.:** | | 1268237 |
| | | | Client Sample ID.: | | 1 |
| | | | Sample Location: | | HP05 |
| | | | Sample Type: | | SOIL |
| | | | Top Depth (m): | | 0.3 |
| | | | Date Sampled: | | 19-Aug-2021 |
| | | | Asbestos Lab: | | DURHAM |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | |
| Benzo[a]pyrene | N | 2800 | mg/kg | 0.010 | 0.55 |
| Indeno(1,2,3-c,d)Pyrene | N | 2800 | mg/kg | 0.010 | 0.32 |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.010 | 0.13 |
| Benzo[g,h,i]perylene | N | 2800 | mg/kg | 0.010 | 0.31 |
| Coronene | N | 2800 | mg/kg | 0.010 | < 0.010 |
| Total Of 17 PAH's | N | 2800 | mg/kg | 0.20 | 7.2 |
| Total Phenols | M | 2920 | mg/kg | 0.10 | < 0.10 |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 1010 | pH Value of Waters | pH | pH Meter |
| 1100 | Chemical Oxygen Demand | Chemical Oxygen demand (COD) | Dichromate oxidation of organic matter in sample followed by colorimetric determination of residual Cr[VI]. |
| 1220 | Anions, Alkalinity & Ammonium in Waters | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser. |
| 1300 | Cyanides & Thiocyanate in Waters | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Continuous Flow Analysis. |
| 1325 | Sulphide in Waters | Sulphides | Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N–dimethyl-pphenylenediamine. |
| 1455 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1490 | Hexavalent Chromium in Waters | Chromium [VI] | Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 1675 | TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG) | Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44 | Pentane extraction / GCxGC FID detection |
| 1700 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds) |
| 1760 | Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260) | Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds. |
| 1800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Pentane extraction / GCMS detection |
| 1920 | Phenols in Waters by HPLC | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded. | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection. |
| 2010 | pH Value of Soils | pH | pH Meter |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2040 | Soil Description(Requirement of MCERTS) | Soil description | As received soil is described based upon BS5930 |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2220 | Water soluble Chloride in Soils | Chloride | Aqueous extraction and measuremernt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate. |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 2300 | Cyanides & Thiocyanate in Soils | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser. |
| 2325 | Sulphide in Soils | Sulphide | Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine. |
| 2425 | Extractable Ammonium in soils | Ammonium | Extraction with potassium chloride solution / analysis by 'Aquakem 600' Discrete Analyser using sodium salicylate and sodium dichloroisocyanurate. |
| 2430 | Total Sulphate in soils | Total Sulphate | Acid digestion followed by determination of sulphate in extract by ICP-OES. |
| 2450 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |
| 2490 | Hexavalent Chromium in Soils | Chromium [VI] | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2680 | TPH A/A Split | Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44 | Dichloromethane extraction / GCxGC FID detection |
| 2760 | Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule | Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds. |
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene* | Dichloromethane extraction / GC-MS |
| 2920 | Phenols in Soils by HPLC | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded. | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection. |
| 640 | Characterisation of Waste (Leaching C10) | Waste material including soil, sludges and granular waste | ComplianceTest for Leaching of Granular Waste Material and Sludge |
| 650 | Characterisation of Waste (Leaching WAC) | Waste material including soil, sludges and granular waste | ComplianceTest for Leaching of Granular Waste Material and Sludge |

## Report Information

**Key**

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

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

**Sample Deviation Codes**

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

**Sample Retention and Disposal**

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

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

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

# Final Report

| | | | |
|---|---|---|---|
| **Report No.:** | 21-40292-1 | | |
| **Initial Date of Issue:** | 03-Dec-2021 | | |
| **Client** | Quantum Geotechnic Ltd | | |
| **Client Address:** | Plas Newydd<br>Llanedi<br>Pontarddulais<br>Swansea<br>SA4 0FQ | | |
| **Contact(s):** | Arwel Jones | | |
| **Project** | Q0560 Grandison Brook | | |
| **Quotation No.:** | Q21-25050 | **Date Received:** | 17-Nov-2021 |
| **Order No.:** | | **Date Instructed:** | 25-Nov-2021 |
| **No. of Samples:** | 3 | | |
| **Turnaround (Wkdays):** | 5 | **Results Due:** | 01-Dec-2021 |
| **Date Approved:** | 03-Dec-2021 | | |

**Approved By:**

**Details:** Glynn Harvey, Technical Manager

# Results - Leachate

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | | **Chemtest Job No.:** | | 21-40292 | 21-40292 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | | **Chemtest Sample ID.:** | | 1321253 | 1321255 |
| Order No.: | | | | Client Sample Ref.: | | 7 | 1 |
| | | | | Sample Location: | | GBTP04 | GBBH04 |
| | | | | Sample Type: | | SOIL | SOIL |
| | | | | Top Depth (m): | | 0.5 | 0.5 |
| | | | | Date Sampled: | | 15-Nov-2021 | 15-Nov-2021 |
| **Determinand** | **Accred.** | **SOP** | **Type** | **Units** | **LOD** | | |
| pH | U | 1010 | 2:1 | | N/A | 8.8 | 8.5 |
| Chemical Oxygen Demand | U | 1100 | 2:1 | mg O2/l | 10 | < 10 | 15 |
| Ammoniacal Nitrogen | U | 1220 | 2:1 | mg/l | 0.050 | < 0.050 | 0.051 |
| Nitrite | U | 1220 | 2:1 | mg/l | 0.020 | < 0.020 | < 0.020 |
| Nitrate | U | 1220 | 2:1 | mg/l | 0.50 | 2.0 | 1.5 |
| Sulphate | U | 1220 | 2:1 | mg/l | 1.0 | 15 | 14 |
| Cyanide (Total) | U | 1300 | 2:1 | mg/l | 0.050 | 0.25 | < 0.050 |
| Cyanide (Free) | U | 1300 | 2:1 | mg/l | 0.050 | < 0.050 | < 0.050 |
| Cyanide (Complex) | U | 1300 | 2:1 | mg/l | 0.050 | 0.25 | < 0.050 |
| Sulphide | U | 1325 | 2:1 | mg/l | 0.050 | 0.074 | 0.054 |
| Magnesium | U | 1455 | 2:1 | mg/l | 0.20 | 1.5 | 1.4 |
| Aluminium (Dissolved) | N | 1455 | 2:1 | µg/l | 5.0 | 7500 | 7900 |
| Arsenic (Dissolved) | U | 1455 | 2:1 | µg/l | 0.20 | 36 | 8.6 |
| Boron (Dissolved) | U | 1455 | 2:1 | µg/l | 10.0 | 25 | 23 |
| Barium (Dissolved) | U | 1455 | 2:1 | µg/l | 5.00 | 55 | 25 |
| Beryllium (Dissolved) | U | 1455 | 2:1 | µg/l | 1.00 | < 1.0 | < 1.0 |
| Cadmium (Dissolved) | U | 1455 | 2:1 | µg/l | 0.11 | 0.13 | < 0.11 |
| Copper (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 110 | 20 |
| Mercury (Dissolved) | U | 1455 | 2:1 | µg/l | 0.05 | 0.42 | < 0.05 |
| Manganese (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 96 | 18 |
| Molybdenum (Dissolved) | U | 1455 | 2:1 | µg/l | 0.20 | 7.3 | 2.5 |
| Nickel (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 13 | 4.5 |
| Lead (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 93 | 11 |
| Antimony (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 8.3 | 1.5 |
| Selenium (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 1.8 | < 0.50 |
| Vanadium (Dissolved) | U | 1455 | 2:1 | µg/l | 0.50 | 24 | 20 |
| Zinc (Dissolved) | U | 1455 | 2:1 | µg/l | 2.5 | 82 | 29 |
| Chromium (Total) | N | 1455 | 2:1 | µg/l | 0.50 | 25 | 13 |
| Iron (Dissolved) | N | 1455 | 2:1 | µg/l | 5.0 | 12000 | 6300 |
| Chromium (Hexavalent) | U | 1490 | 2:1 | µg/l | 20 | 22 | < 20 |
| C2 Aliphatic TPH >C5-C6 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| C2 Aliphatic TPH >C6-C8 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| C2 Aliphatic TPH >C8-C10 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| C2 Aliphatic TPH >C10-C12 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| C2 Aliphatic TPH >C12-C16 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| C2 Aliphatic TPH >C16-C21 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| C2 Aliphatic TPH >C21-C35 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| C2 Aliphatic TPH >C35-C44 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Total Aliphatic Hydrocarbons | N | 1675 | 2:1 | µg/l | 5.0 | < 5.0 | < 5.0 |

# Results - Leachate

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | | **Chemtest Job No.:** | | 21-40292 | 21-40292 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | | **Chemtest Sample ID.:** | | 1321253 | 1321255 |
| Order No.: | | | | Client Sample Ref.: | | 7 | 1 |
| | | | | Sample Location: | | GBTP04 | GBBH04 |
| | | | | Sample Type: | | SOIL | SOIL |
| | | | | Top Depth (m): | | 0.5 | 0.5 |
| | | | | Date Sampled: | | 15-Nov-2021 | 15-Nov-2021 |
| **Determinand** | **Accred.** | **SOP** | **Type** | **Units** | **LOD** | | |
| C2 Aromatic TPH >C5-C7 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| C2 Aromatic TPH >C7-C8 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| C2 Aromatic TPH >C8-C10 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| C2 Aromatic TPH >C10-C12 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| C2 Aromatic TPH >C12-C16 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| C2 Aromatic TPH >C16-C21 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| C2 Aromatic TPH >C21-C35 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| C2 Aromatic TPH >C35-C44 | N | 1675 | 2:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| C2 Total Aromatic Hydrocarbons | N | 1675 | 2:1 | µg/l | 5.0 | < 5.0 | < 5.0 |
| Total Petroleum Hydrocarbons | N | 1675 | 2:1 | µg/l | 10 | < 10 | < 10 |
| Total Of 16 PAH's | N | 1700 | 2:1 | µg/l | 0.20 | < 0.20 | < 0.20 |
| Benzene | U | 1760 | 2:1 | µg/l | 1.0 | < 1.0 | < 1.0 |
| Toluene | U | 1760 | 2:1 | µg/l | 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | U | 1760 | 2:1 | µg/l | 1.0 | < 1.0 | < 1.0 |
| m & p-Xylene | U | 1760 | 2:1 | µg/l | 1.0 | < 1.0 | < 1.0 |
| o-Xylene | U | 1760 | 2:1 | µg/l | 1.0 | < 1.0 | < 1.0 |
| Methyl Tert-Butyl Ether | N | 1760 | 2:1 | µg/l | 1.0 | < 1.0 | < 1.0 |
| Naphthalene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Acenaphthylene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Acenaphthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Fluorene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Phenanthrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Anthracene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Fluoranthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Pyrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Benzo[a]anthracene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Chrysene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Benzo[b]fluoranthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Benzo[k]fluoranthene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Benzo[a]pyrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Indeno(1,2,3-c,d)Pyrene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Dibenz(a,h)Anthracene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Benzo[g,h,i]perylene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Coronene | N | 1800 | 2:1 | µg/l | 0.010 | < 0.010 | < 0.010 |
| Total Of 17 PAH's | N | 1800 | 2:1 | µg/l | 0.20 | < 0.20 | < 0.20 |
| Total Phenols | U | 1920 | 2:1 | mg/l | 0.030 | < 0.030 | < 0.030 |

# Results - Soil

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 21-40292 | 21-40292 | 21-40292 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | **Chemtest Sample ID.:** | | 1321253 | 1321254 | 1321255 |
| Order No.: | | | Client Sample Ref.: | | 7 | 2 | 1 |
| | | | Sample Location: | | GBTP04 | GBTP04 | GBBH04 |
| | | | Sample Type: | | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 1.0 | 0.5 |
| | | | Date Sampled: | | 15-Nov-2021 | 15-Nov-2021 | 15-Nov-2021 |
| | | | Asbestos Lab: | | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | |
| ACM Type | U | 2192 | | N/A | - | - | - |
| Asbestos Identification | U | 2192 | | N/A | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | 24 | 38 | 25 |
| Soil Colour | N | 2040 | | N/A | Brown | Brown | Grey |
| Other Material | N | 2040 | | N/A | Stones and Roots | Stones | Stones, Roots and Wood |
| Soil Texture | N | 2040 | | N/A | Sand | Clay | Clay |
| pH | M | 2010 | | 4.0 | 7.1 | 7.0 | 7.0 |
| Boron (Hot Water Soluble) | M | 2120 | mg/kg | 0.40 | 0.68 | 3.2 | 0.51 |
| Magnesium (Water Soluble) | M | 2120 | mg/kg | 20 | < 20 | < 20 | < 20 |
| Sulphate (2:1 Water Soluble) as SO4 | M | 2120 | g/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Nitrite (Extractable) | N | 2220 | mg/kg | 0.10 | 0.19 | 0.20 | 0.28 |
| Nitrate (Water Soluble) | N | 2220 | g/l | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Cyanide (Complex) | M | 2300 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Cyanide (Free) | M | 2300 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Cyanide (Total) | M | 2300 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Sulphide (Easily Liberatable) | N | 2325 | mg/kg | 0.50 | 2.1 | 34 | 1.9 |
| Ammoniacal Nitrogen | M | 2425 | mg/kg | 0.50 | 4.4 | 22 | 6.5 |
| Aluminium (Total) | N | 2430 | mg/kg | 100 | 12000 | 10000 | 12000 |
| Iron (Total) | N | 2430 | mg/kg | 100 | 22000 | 18000 | 19000 |
| Sulphate (Total) | U | 2430 | mg/kg | 100 | 1300 | 1500 | 990 |
| Arsenic | M | 2450 | mg/kg | 1.0 | 51 | 9.8 | 17 |
| Barium | M | 2450 | mg/kg | 10 | 150 | 23 | 40 |
| Beryllium | U | 2450 | mg/kg | 1.0 | 1.3 | < 1.0 | < 1.0 |
| Cadmium | M | 2450 | mg/kg | 0.10 | 0.46 | < 0.10 | < 0.10 |
| Chromium | M | 2450 | mg/kg | 1.0 | 26 | 28 | 31 |
| Manganese | M | 2450 | mg/kg | 5.0 | 390 | 150 | 160 |
| Molybdenum | M | 2450 | mg/kg | 2.0 | 4.3 | < 2.0 | 2.1 |
| Antimony | N | 2450 | mg/kg | 2.0 | 9.6 | < 2.0 | < 2.0 |
| Copper | M | 2450 | mg/kg | 0.50 | 250 | 110 | 54 |
| Mercury | M | 2450 | mg/kg | 0.10 | 0.57 | < 0.10 | < 0.10 |
| Nickel | M | 2450 | mg/kg | 0.50 | 35 | 21 | 19 |
| Lead | M | 2450 | mg/kg | 0.50 | 200 | 29 | 40 |
| Selenium | M | 2450 | mg/kg | 0.20 | 1.4 | < 0.20 | 0.33 |
| Vanadium | U | 2450 | mg/kg | 5.0 | 41 | 39 | 43 |
| Zinc | M | 2450 | mg/kg | 0.50 | 170 | 68 | 66 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 |

# Results - Soil

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 21-40292 | 21-40292 | 21-40292 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | **Chemtest Sample ID.:** | | 1321253 | 1321254 | 1321255 |
| Order No.: | | | Client Sample Ref.: | | 7 | 2 | 1 |
| | | | Sample Location: | | GBTP04 | GBTP04 | GBBH04 |
| | | | Sample Type: | | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 1.0 | 0.5 |
| | | | Date Sampled: | | 15-Nov-2021 | 15-Nov-2021 | 15-Nov-2021 |
| | | | Asbestos Lab: | | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | |
| Organic Matter | M | 2625 | % | 0.40 | 17 | 4.8 | 3.8 |
| Aliphatic TPH >C5-C6 | N | 2680 | mg/kg | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Aliphatic TPH >C6-C8 | N | 2680 | mg/kg | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Aliphatic TPH >C8-C10 | N | 2680 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C10-C12 | N | 2680 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C12-C16 | N | 2680 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C16-C21 | N | 2680 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C21-C35 | N | 2680 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C35-C44 | N | 2680 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Aliphatic Hydrocarbons | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic TPH >C5-C7 | N | 2680 | mg/kg | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Aromatic TPH >C7-C8 | N | 2680 | mg/kg | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Aromatic TPH >C8-C10 | N | 2680 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C10-C12 | N | 2680 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C12-C16 | N | 2680 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C16-C21 | N | 2680 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C21-C35 | N | 2680 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C35-C44 | N | 2680 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Aromatic Hydrocarbons | N | 2680 | mg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Total Petroleum Hydrocarbons | N | 2680 | mg/kg | 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Benzene | M | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | M | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | M | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| m & p-Xylene | M | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-Xylene | M | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Methyl Tert-Butyl Ether | M | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Naphthalene | N | 2800 | mg/kg | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Acenaphthylene | N | 2800 | mg/kg | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Acenaphthene | N | 2800 | mg/kg | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Fluorene | N | 2800 | mg/kg | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Phenanthrene | N | 2800 | mg/kg | 0.010 | < 0.010 | 1.1 | < 0.010 |
| Anthracene | N | 2800 | mg/kg | 0.010 | < 0.010 | 0.33 | < 0.010 |
| Fluoranthene | N | 2800 | mg/kg | 0.010 | < 0.010 | 3.1 | 0.16 |
| Pyrene | N | 2800 | mg/kg | 0.010 | < 0.010 | 2.5 | 0.15 |
| Benzo[a]anthracene | N | 2800 | mg/kg | 0.010 | < 0.010 | 1.7 | 0.087 |
| Chrysene | N | 2800 | mg/kg | 0.010 | < 0.010 | 1.9 | 0.044 |
| Benzo[b]fluoranthene | N | 2800 | mg/kg | 0.010 | < 0.010 | 2.5 | < 0.010 |
| Benzo[k]fluoranthene | N | 2800 | mg/kg | 0.010 | < 0.010 | 0.94 | < 0.010 |

# Results - Soil

**Project: Q0560 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 21-40292 | 21-40292 | 21-40292 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q21-25050 | | | **Chemtest Sample ID.:** | | 1321253 | 1321254 | 1321255 |
| Order No.: | | | Client Sample Ref.: | | 7 | 2 | 1 |
| | | | Sample Location: | | GBTP04 | GBTP04 | GBBH04 |
| | | | Sample Type: | | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 1.0 | 0.5 |
| | | | Date Sampled: | | 15-Nov-2021 | 15-Nov-2021 | 15-Nov-2021 |
| | | | Asbestos Lab: | | COVENTRY | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | |
| Benzo[a]pyrene | N | 2800 | mg/kg | 0.010 | < 0.010 | 1.5 | < 0.010 |
| Indeno(1,2,3-c,d)Pyrene | N | 2800 | mg/kg | 0.010 | < 0.010 | 1.4 | < 0.010 |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.010 | < 0.010 | 0.33 | < 0.010 |
| Benzo[g,h,i]perylene | N | 2800 | mg/kg | 0.010 | < 0.010 | 1.2 | < 0.010 |
| Coronene | N | 2800 | mg/kg | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Total Of 17 PAH's | N | 2800 | mg/kg | 0.20 | < 0.20 | 19 | 0.44 |
| Total Phenols | M | 2920 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 1010 | pH Value of Waters | pH | pH Meter |
| 1100 | Chemical Oxygen Demand | Chemical Oxygen demand (COD) | Dichromate oxidation of organic matter in sample followed by colorimetric determination of residual Cr[VI]. |
| 1220 | Anions, Alkalinity & Ammonium in Waters | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser. |
| 1300 | Cyanides & Thiocyanate in Waters | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Continuous Flow Analysis. |
| 1325 | Sulphide in Waters | Sulphides | Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N–dimethyl-pphenylenediamine. |
| 1455 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1490 | Hexavalent Chromium in Waters | Chromium [VI] | Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 1675 | TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG) | Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44 | Pentane extraction / GCxGC FID detection |
| 1700 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds) |
| 1760 | Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260) | Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds. |
| 1800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Pentane extraction / GCMS detection |
| 1920 | Phenols in Waters by HPLC | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded. | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection. |
| 2010 | pH Value of Soils | pH | pH Meter |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2040 | Soil Description(Requirement of MCERTS) | Soil description | As received soil is described based upon BS5930 |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2220 | Water soluble Chloride in Soils | Chloride | Aqueous extraction and measuremernt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate. |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 2300 | Cyanides & Thiocyanate in Soils | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser. |
| 2325 | Sulphide in Soils | Sulphide | Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine. |
| 2425 | Extractable Ammonium in soils | Ammonium | Extraction with potassium chloride solution / analysis by 'Aquakem 600' Discrete Analyser using sodium salicylate and sodium dichloroisocyanurate. |
| 2430 | Total Sulphate in soils | Total Sulphate | Acid digestion followed by determination of sulphate in extract by ICP-OES. |
| 2450 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |
| 2490 | Hexavalent Chromium in Soils | Chromium [VI] | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2680 | TPH A/A Split | Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44 | Dichloromethane extraction / GCxGC FID detection |
| 2760 | Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule | Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds. |
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene* | Dichloromethane extraction / GC-MS |
| 2920 | Phenols in Soils by HPLC | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded. | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection. |
| 640 | Characterisation of Waste (Leaching C10) | Waste material including soil, sludges and granular waste | ComplianceTest for Leaching of Granular Waste Material and Sludge |
| 650 | Characterisation of Waste (Leaching WAC) | Waste material including soil, sludges and granular waste | ComplianceTest for Leaching of Granular Waste Material and Sludge |

## Report Information

**Key**

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

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

**Sample Deviation Codes**

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

**Sample Retention and Disposal**

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

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

# APPENDIX VIII – **GAS AND GROUNDWATER MONITORING RECORDS**

## LANDGAS & GROUNDWATER MONITORING RECORD SHEET



| | |
|---|---|
| Project Name: | Grandison Brfook |
| Project No.: | Q0560 |
| BH/TP No.: | GB-BH05 |
| Instruments Used: | Water Dip Meter Probe, GA2000 Gas Anaylser |

| Installation Date: | | | | |
|---|---|---|---|---|
| GL (mAOD) | Pipe | Type | Installation Depth (mbgl) | Response Zone (mbgl) |
| 5.79 | A | 50mm | 4.00 | 3.0-4.0 |
| | | | | |

| Pipe | Date | Time (24hrs) | Atmos Pressure mBar | Differential Well Pressure mBar | Flow L/hr | $CH_4$ % | $CO_2$ % | $O_2$ % | CO ppm | $H_2S$ ppm | Water Level | | HoleDepth | | Local Weather | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | mbgl | mAOD | mbgl | mAOD | Recent | Current | |
| A | 25/08/2022 | 11:50 | 1012 | -0.16 | 0.0 | 0.0 | 0.1 | 19.2 | 1 | 0 | 3.62 | 2.17 | 4.00 | 1.79 | | | |
| A | 21/12/2022 | 11:10 | 996 | -0.26 | -0.1 | 0.1 | 0.2 | 18.6 | 0 | 0 | 3.21 | 2.58 | 4.00 | 1.79 | | | |
| A | 24/01/2022 | 16:15 | 952 | -0.43 | -0.2 | 0.0 | 0.1 | 19.5 | 0 | 0 | 3.19 | 2.60 | 4.00 | 1.79 | | | |
| A | 24/02/2022 | 08:15 | 943 | -0.35 | -0.1 | 0.0 | 0.1 | 20.1 | 0 | 0 | 3.06 | 2.73 | 4.00 | 1.79 | | | |
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## LANDGAS & GROUNDWATER MONITORING RECORD SHEET



| | |
|---|---|
| Project Name: | Grandison Brfook |
| Project No.: | Q0560 |
| BH/TP No.: | GB-BH04 |
| Instruments Used: | Water Dip Meter Probe, GA2000 Gas Anaylser |

| Installation Date: | | | | |
|---|---|---|---|---|
| GL (mAOD) | Pipe | Type | Installation Depth (mbgl) | Response Zone (mbgl) |
| 4.99 | A | 50mm | 8.00 | 1.0-8.0 |
| | | | | |

| Pipe | Date | Time (24hrs) | Atmos Pressure mBar | Differential Well Pressure mBar | Flow L/hr | $CH_4$ % | $CO_2$ % | $O_2$ % | CO ppm | $H_2S$ ppm | Water Level | | HoleDepth | | Local Weather | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | mbgl | mAOD | mbgl | mAOD | Recent | Current | |
| A | 21/12/2022 | 10:15 | 996 | -0.26 | 0.1 | 0.0 | 0.2 | 18.6 | 0 | 0 | 2.53 | 2.46 | 8.00 | -3.01 | | | |
| A | 24/01/2022 | 15:25 | 952 | -0.43 | -0.1 | 0.1 | 0.2 | 19.5 | 1 | 0 | 2.46 | 2.53 | 8.00 | -3.01 | | | |
| A | 24/02/2022 | 07:30 | 943 | -0.35 | 0.0 | 0.1 | 0.1 | 19.3 | 0 | 0 | 2.39 | 2.60 | 8.00 | -3.01 | | | |
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E: enquiries@quantumgeotech.co.uk
W: http://www.quantumgeotech.co.uk

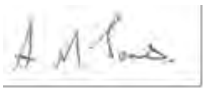
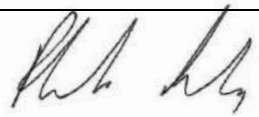
# GRANDISON BROOK FLOOD ALEVIATION SCHEME – PHASE III GROUND INVESTIGATION

# GROUND INVESTIGATION FACTUAL REPORT

# Report No. Q1114/FR.01 September 2023

## DOCUMENT CONTROL

| | |
|---|---|
| **Contract Name:** | **Grandison Brook Flood Alleviation Scheme – Phase III Ground Investigation** |
| **Contract Reference:** | **Q1114** |
| **Report Type:** | **Ground Investigation Factual Report** |
| **Report Reference:** | **Q1114/FR.01** |
| **Date of Report Production:** | **September 2023** |
| **Client:** | **Atkins** |

| Version: | Date: | Prepared by: | Checked by: | Approved by: |
|---|---|---|---|---|
| 1 | 08/09/23 | A Jones | P. Darby | J. Stark |
| | |  |  | |
| | | Project Manager | Senior Engineering Geologist *B.Sc.(Hons).,M.Sc., C.Geol., F.G.S.* | *Technical Manager B.Sc.(Hons.),M.Sc., C.Geol., F.G.S.* |

*Disclaimer: Quantum Geotechnic Limited has prepared this report in accordance with the instructions of the above named Client for their sole and specific use. Any third parties who may use the information contained herein do so at their own risk.*

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## 0.0 FOREWORD

The following Conditions and Notes on Site Investigation Procedures should be read in conjunction with this report.

### 0.1 General

Recommendations made and opinions expressed in the report are based on the strata observed in the excavations, together with the results of site and laboratory tests. No responsibility can be held for conditions which have not been revealed by the Exploratory Holes or which occur between Exploratory Holes. Whilst the report may suggest the likely configuration of strata, both between Exploratory Holes and below the maximum depth of investigation, this is only indicative and liability cannot be accepted for its accuracy.

Unless specifically stated, no account has been taken of possible subsidence due to mineral extraction below or close to the site.

### 0.2 Investigation Procedures

Windowless Sample Boreholes, Hand and Machine excavated pitting techniques for ground investigation have been employed within the project. All Exploratory Hole operations, sampling and logging of soils, rocks and in-situ testing complies with the recommendations of the British Code of Practice BS 5930: 2015 'Site Investigations', British Code of Practice BS 10175: A2:2017 'Investigation of Potentially Contaminated Sites' and BS 1377: 1990, 'Methods of Test for Soils for Engineering Purposes'.

### 0.3 Routine Sampling

Representative bulk disturbed and environmental samples of the different strata are taken following completion of logging. These samples are sealed and labelled in clear plastic bags and 2kg plastic tubs. Soil samples obtained for environmental testing are sampled and sealed in borosilicate amber jars or in specialist vessels where required. Ground Water samples were sampled and sealed in borosilicate amber bottles or in specialist vessels where required All samples are returned from site to QGL's laboratory for controlled storage within 24 hours of sampling to await test scheduling/requirements.

### 0.4 In-Situ Testing, Surveying & Instrumentation

In-situ testing comprised:

- Standard Penetration Testing within Boreholes (SPT)
- All exploratory hole locations to be surveyed for location and elevation.
- PID testing

### 0.5 Groundwater

Where possible, the depth of entry of any influx of groundwater is recorded during the course of excavation or boring operations. The rate of inflow into the excavation or borehole is monitored during the course of the excavation or during boring procedures. Upon encountering any water strikes, work is temporarily halted and the water levels monitored for a standard twenty-minute period recording the change in water level at the end of the twenty minutes.

Groundwater conditions observed in the excavations are those appertaining to the period of investigation. It should be noted, however, that groundwater levels are subject to diurnal, seasonal and climatic variations and can also be affected by drainage conditions or other causes.

### 0.6 Retention of Samples

After satisfactory completion of all the scheduled laboratory tests on any sample, the remaining material is discarded. Further to notifying the Engineer/ Client with one week's notice all soil and/or rock samples not tested will be discarded 28 days after submission of the approved final report.

## 1.0 INTRODUCTION

### 1.1 General

Upon the instructions of Atkins, the scheme Engineer / Investigation Supervisor / Client, Quantum Geotechnic Limited (QGL) was commissioned to undertake a third phase of ground investigation works for the proposed flood alleviation scheme for Grandison Brook, Briton Ferry.

The siteworks were carried out between 15th and 17th May 2023.

This report presents a factual account of the fieldwork carried out, includes descriptions of the strata encountered, available groundwater observations, details of in-situ testing undertaken, location of services encountered and provides results of subsequent laboratory testing of samples obtained from the investigation.

General notes on the techniques employed by QGL are described in the Foreword together with the limitations inherent in carrying out site investigation work.

### 1.2 Purpose of Ground Investigation

The purpose of the ground investigation is to determine the existing ground conditions on the site, together with details and location of services along the proposed culvert route to allow the design of the proposed Grandison Brook Flood Alleviation Schem culvert improvement works.

The proposed culvert improvement works will involve the installation of a new culvert in the highway and through green spaces, also enclosing the current open channel within a culvert in some sections. The new culvert will rejoin the existing watercourse further downstream before it discharges into the River Neath. The Grandison Brook Flood Alleviation Scheme is required to mitigate flooding to properties within the vicinity of the Brook.

### 1.3 Initial Scope of Work

The aim of the ground investigation is to:

- Determine the nature and thickness of any Made Ground;
- Determine the nature and thickness of the Superficial Deposits;
- Determine the depth to Bedrock and thickness of any weathered horizon;
- Recover suitable samples for geotechnical and geo-environmental laboratory testing;
- Locate presence, size and depth of services on site.

The initial scope of works entails the following:

- 3 no. Windowless Sample / Dynamic Sampled Boreholes
- 4 no. Hand Excavated Pits
- 1 no. Hand Excavated Trench to locate 2 x 300mm water main buried services
- 4 no. Machine Excavated Trial Pits
- In-Situ Testing
- 2 No. Surface water samples from nearby watercourse
- Post fieldwork groundwater and ground gas monitoring

General

- Geotechnical and Geo-environmental Laboratory Testing.
- Factual reporting detailing the investigation.

General notes on the techniques employed by QGL are described in the Foreword together with the limitations inherent in carrying out ground investigation work.

## 2.0 SITE DETAIL

### 2.1 Site Description

The site is located in the Pantyrheol area of Briton Ferry, Neath and passes through residential areas, sports fields, Ysgol Carreg Hir, along Ynysymaerdy Road, through Jersey Park, across the A474 and through railway land towards the River Neath. This Phase III investigation was focused within the Railway Land, Jersey Park, land adjacent to the Briton Ferry Football Ground and rough ground behind the properties at Collins Street.

The site is located at Ordnance Survey National Grid reference 274680E and 195180N.

QGL were the appointed Contractor for the works, under order number 5192793-002 issued on 18th April 2023.

The general extent of the site is shown in Figure 1 in Appendix I.

### 2.2 Statutory Service Information

All service information was held by the Client with the relevant plans and information made available to QGL prior to commencement of the intrusive works.

A permit to excavate was issued by QGL for all exploratory holes. Standard QGL procedures for breaking ground were followed and all areas were scanned using a cable avoidance tool. A hand dug trial pit was excavated to 1.2m prior to commencement of drilling where services may be at risk. All hand excavation was undertaken using insulated digging tools.

### 2.3 Published Geology

Details of the published and inferred geology of the site are summarised as followed:

The British Geological Survey (BGS) sheet 1:50,000 247 (Swansea) indicates

*Superficial Deposits*

The site is predominantly underlain by Glacial Till deposits. Tidal Flat deposits are mapped along the northern boundary of the site.

*Bedrock Geology*

The site is mapped to be underlain by interbedded sandstone, siltstone and mudstone with coal seams of

the Hughes Member and Brithdir Member.

*Client Supplied Information*

“Ground Investigation information for Cwrt Sart Comprehensive School, located approximately 200m north west of the site has been made available by Neath Port Talbot County Borough Council. The ground investigation found Made Ground between 0.7m and 1.45m thick comprising sandy gravel with low to medium cobble content, soft clay and peat between 0.3m and 2.15m thick overlying firm to stiff sandy gravelly clay and medium dense sandy gravel with low to medium cobble content with thin lenses of sand…… Groundwater was recorded in two boreholes at 1.5m and 2.3m”.

## 3.0 FIELDWORK

### 3.1 General

A summary of the works completed and covered by this report are given below:

- 2 No. Windowless Sample / Dynamic Sampled boreholes. (GB-BH07 & GB-BH09)
- 1 No. Hand Excavated Trial Trench (GB-HP06)
- 1 No. Machine Excavated Trial Pit (GB-TP11)
- Surface water sampling at 2 No. locations
- In-situ testing and sampling.
- Post fieldwork groundwater and ground gas monitoring.

Full time site supervision and attendance from QGL was undertaken on all aspects of the site works and subsequent reinstatement works of all exploratory hole locations. All service plans were held onsite, with all site personnel inducted by QGL and briefed of the pertinent Risk Assessments and Method Statements relating to the tasks to be undertaken.

The borehole locations were subject to a 1.2m deep service / utility inspection pit prior to any drilling. Also, each area of investigation was fully eCAT4+ ('Cable Avoidance Tool') scanned prior to breaking ground.

Access to GB-BH07 is via Network Rail owned land and assets which required Network rail supervision. Due to the presence of dense vegetation within the Railway Land, access was not available to GB-HP07, GB-HP08, GB-HP09 and GB-HP10.

Exploratory holes GB-TP12, GB-TP13, GB-TP14 and GB-BH08 were postponed due to the for CADW permission to work within the area of an old railway line (scheduled monument) within Jersy Park.

### 3.2 Exploratory Hole Locations

The exploratory hole locations were specified by Atkins and set out on site by QGL using the co-ordinates provided.

Exploratory Hole Location Plans are presented as Figure 2 in Appendix I and the Exploratory Hole co-ordinates and levels are detailed within Table 1.

***Table 1:*** *Exploratory Hole Co-Ordinates & Levels*

| Exploratory Hole | Easting | Northing | Height (mAOD) |
|---|---|---|---|
| GB-BH07 | 274053.91 | 195634.53 | 4.9 |
| GB-BH09 | 274578.133 | 194913.036 | 14.818 |
| GB-HP06 | 274528.147 | 195242.791 | 12.683 |
| GB-TP11 | 274201.821 | 195620.017 | 4.92 |

## 3.3 Boreholes

***Windowless Sample Boreholes***

Windowless Sample Boreholes were undertaken during the site works. Windowless Sampling techniques involve a sampler dynamically driven down to depth using sampling tubes, nominally 116mm in diameter and reducing as depth increases. This technique allows a relatively undisturbed sample of soil to be taken in a plastic liner, or alternatively sub sampled as a disturbed jar sample. Within competent granular-cohesive soils the portable equipment used for Windowless Sampling is limited by the nature of the ground and robustness of the driving tool. The recovered sample liners were subsequently split and logged on site in accordance with BS5930: 2015; BS EN ISO 14688-1:2017 and BS EN ISO 14688-2:2017, by a Quantum Engineering Geologist. Each Windowless Sample location was reinstated with Bentonite and surface replaced as per pre-existing construction.

In-situ testing was carried out in specified boreholes.

A summary of the boreholes are provided in Table 2.

***Table 2:*** *Borehole details*

| Exploratory Hole ID | Drilling method | SPT Hammer Reference | Termination Depth (mbgl) | Notes/Reason for Termination |
|---|---|---|---|---|
| GB-BH07 | Windowless Sampling / Dynamic Sampling | TERRIER | 8.2 | Approximately Scheduled Depth |
| GB-BH09 | Windowless Sampling / Dynamic Sampling | TERRIER | 4.65 | Refusal on Dense Gravel and / or Cobbles |

The Engineering Geologist's borehole logs are presented within Appendix II.

A 50mm dual gas and groundwater monitoring standpipe was installed in boreholes GB-BH04 & GB-BH05, records of the post fieldwork monitoring are presented in Appendix VIII.

## 3.4 Hand Excavated Service Trial Trench

1 No. Hand Excavated Trial Trench was formed using insulated Hand Digging Tools and the assistance of a two tonne excavator to determine the locations of the underground services present together with shallow ground conditions. The position is shown on the exploratory hole location plan in Appendix I.

This method of investigation allows a safe method of excavation around services together with direct sampling of the near surface deposits for identification purposes, as well as assessment of any salient features and Made Ground or disturbed ground. The trial trench was logged in accordance with BS5930:2015; BS EN ISO 14688-1:2017 and BS EN ISO 14688-2:2017 and supervised at all times by an

Engineering Geologist from QGL. The trial trench was backfilled with compacted layers of arisings upon completion with suitable surface reinstatement where required.

Details of the Trial Trench, including final depth in metres below ground level (mbgl) are provided below in Table 3.

***Table 3:*** *Hand Pit details*

| Exploratory Hole ID | Exploratory Hole Type | Termination Depth (mbgl) | Notes/Reason for Termination |
|---|---|---|---|
| GB-HP06 | Hand Excavated Trial Trench | 1.4 | Terminated upon identifying targeted buried services |

A complete set of Engineering Geologist Trial Trench log is presented within Appendix III.

### 3.5 Machine Excavated Trial Pits

1 No. Trial Pit was excavated using an 8 tonne excavator owned and operated by Spencer ECA as an approved plant supplier to QGL. The exploratory hole positions are shown on the exploratory hole location plan in Figure 2 in Appendix I.

This method of investigation allows direct sampling of the near surface deposits for identification purposes, locating of buried services, as well as assessment of any salient features and Made Ground or disturbed ground. The trial pits were logged in accordance with BS5930:2015; BS EN ISO 14688-1:2017 and BS EN ISO 14688-2:2017,and supervised at all times by an Engineering Geologist from QGL.

The trial pit was backfilled with compacted layers of arisings upon completion.

Geotechnical and Environmental samples were taken within the superficial deposits for laboratory testing purposes.

Details of the Trial Pit including final depths in metres below ground level (mbgl) are provided in Table 4.

***Table 4:*** *Trial Pit Detail*

| Exploratory Hole ID | Exploratory Hole Type | Final Length (mbgl) | Reason for termination |
|---|---|---|---|
| GB-TP11 | Machine Excavated Trial Pit | 3.5 | Maximum reach of excavator |

A complete set of Engineering Geologist's Machine Excavated Trial Pit logs are presented within Appendix IV.

## 3.6 Land gas and Groundwater Standpipe Installations

50mm internal diameter standpipes were installed in selected boreholes for the purposes of land gas and groundwater monitoring and sampling.

Monitoring standpipes consist of plastic pipework set in filter aggregate (pea gravel) forming a well. The filter is sealed at one or both ends by use of bentonite pellets which 'go off' and become watertight. Parts of the pipe itself are slotted, allowing the infiltration of groundwater which can then be accessed through the pipe from ground level. Slotted sections are covered by 'geo-sock' to reduce the intrusion of silt into the standpipes and the range of depths at which the groundwater is intercepted is known as the 'response zone'.

Standpipes were installed using a combination of 1m and 3m lengths of pipework (threaded at either end) fitted together and lowered into the borehole. The boreholes were then filled with either pea gravel or bentonite pellets (depending on which zone or level) and cemented in place at ground level with a steel flush cover.

Each standpipe installation was designed by the Investigation Supervisor and instructed on site, after the completion of each borehole. All standpipe installations were sealed above the response zone by a minimum of 0.50m of bentonite pellets.

A summary of the pipe installation details is presented in Table 5

***Table 5:*** *Borehole Installation Details*

| Exploratory Hole ID | Installation Pipe ID | Standpipe Diameter (Internal mm) | Response Zone (mbgl) | | Total Standpipe Length (m) |
|---|---|---|---|---|---|
| | | | Top | Bottom | |
| GB-BH07 | A | 50 | 1.00 | 2.50 | 2.50 |
| GB-BH09 | A | 50 | 1.00 | 4.65 | 4.65 |

## 3.7 In-Situ Testing

### *3.7.1 Standard Penetration Testing*

Standard penetration tests (SPTs) were undertaken within all boreholes, at intervals specified by Redstart.

This is a dynamic test as described in BS EN ISO 22476-3:2005 + A1:2011. Within fine grained or cohesive soils, the test incorporates a small diameter tube (650mm length, 50mm external diameter and 35mm internal diameter) with a cutting shoe known as the 'split barrel sampler'. The sampler is forced into the soil dynamically using blows from a 63.5kg hammer dropped through 760mm. The sampler is initially advanced 150mm into the soil with seating blows, then the number of blows required to advance the sampler each 75mm increment up to a depth of 300mm is recorded. This cumulative total number of blows over the

300mm test is referred to as the "N" value. For coarse gravels and bedrock the split barrel is replaced by a 60° cone (SPT(C) - Standard Penetration Test (Cone)). SPT/SPT(C) results are detailed within the relevant borehole Logs. The SPT calibration certificate for the SPT hammer used during this investigation is presented in Appendix II.

### *3.7.2 Headspace Testing*

All environmental soil samples collected were screened using a calibrated Photoionisation Detector onsite to measure isobutylene, prior to being sent to the laboratory.

Soil is placed in a sealed plastic bag, half-filled to allow airspace above the soil and left a period of no less than one hour prior to screening.

Measurements are detailed within the exploratory hole logs included within Appendix II and Appendix III.

## 3.8 Soil, Groundwater and Surface Water Sampling

Disturbed samples of soil were taken in clear sealed plastic bags and white plastic tubs. Environmental samples were taken at various depths as noted on the relevant logs.

Environmental soil samples were taken in amber glass jars, vials and plastic tubs provided by the laboratory to suit the anticipated testing.

Groundwater samples were collected during post fieldwork monitoring rounds. Surface water samples were collected from Grandison Brook at specified locations, detailed within Figure 2, Appendix I. All water samples were collected in the required vials, plastic and gas bottles.

The environmental samples were dispatched to Chemtest, Coventry using a daily courier service for storage awaiting testing instructions from the Engineer.

Geotechnical samples were returned from site to QGL's laboratory for controlled storage to await test scheduling/requirements. For specific details of laboratory testing see Section 4.0.

## 3.9 Post-Fieldwork Monitoring

Following completion of the siteworks, QGL shall undertake 3 No. monitoring visits to record land gas and groundwater within the installed borehole standpipes..

Monitoring comprised groundwater and ground gas monitoring. Gas monitoring was undertaken using a GA2000 gas analyser to measure the following:

- Atmospheric pressure

- Flow rates (L/hr)
- Methane
- Carbon Dioxide
- Oxygen
- Carbon Monoxide
- Hydrogen Sulphide

Results are presented within Appendix VIII.

## 4.0 LABORATORY TESTING

### 4.1 General

The laboratory testing was scheduled by Atkins and comprised a number of geotechnical classification and performance tests as well as chemical testing on selected soil samples and ground water samples recovered from the investigation.

### 4.2 Geotechnical Testing

Geotechnical classification and performance testing was undertaken at QGL's approved UKAS accredited laboratory at GSTL, Llanelli.

Geotechnical tests undertaken on selected soil samples are listed below. All the geotechnical soil testing work was carried out in accordance with the procedures stipulated in the various sections of BS 1377:1990 "Methods of test for soils for civil engineering purposes" and to UKAS accreditation where applicable and chemical testing carried out in accordance with BRE Special Digest 1:2005 "Concrete in aggressive ground".

Geotechnical soil testing undertaken:

- 10 No. Moisture content
- 8 No. Liquid limit, plastic limit and plasticity index
- 10 No. Particle size distribution by wet sieving
- 6 No. Sedimentation by Pipette
- 4 No. Organic Matter

Geotechnical Laboratory Test results are presented in Appendix VI.

### 4.3 Geo-Environmental Testing

Geo-Environmental chemical testing was undertaken at Eurofins Chemtest ltd, Coventry. All testing was scheduled by Atkins. The following suites of testing were scheduled:

- 6 No Suite E (Soil)
- 4 No. Suite F (Leachate)
- 1 No. Suite G – Goundwater Sample
- 2 No. Sute G – Surface Water Sample

Chemical Laboratory Test results are presented in Appendix VII.

## 5.0 REFERENCES

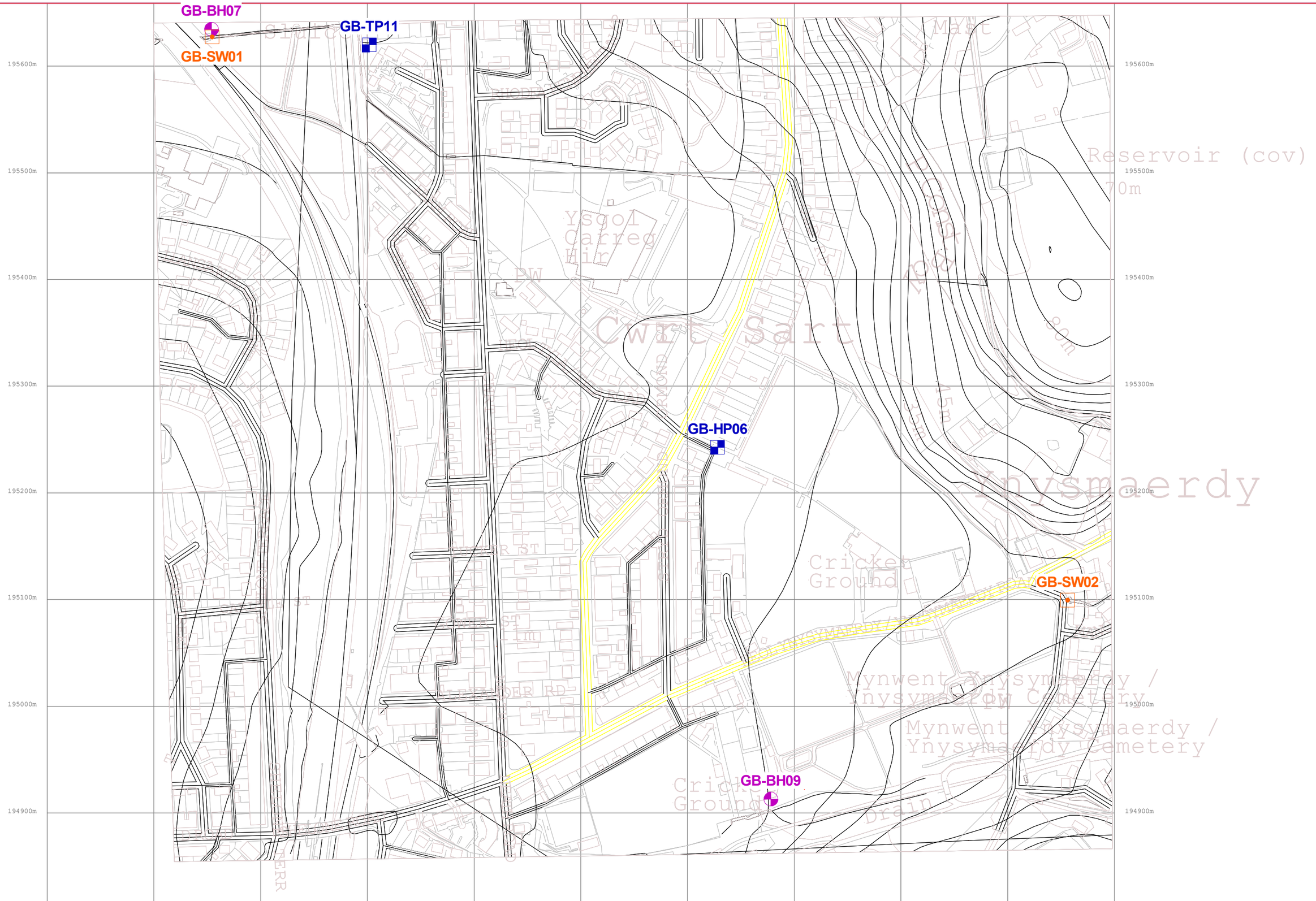
British Geological Survey:

- The British Geological Survey (BGS) sheet 1:50,000 247 (Swansea)
- BGS Geology of Britain Viewer (www.bgs.ac.uk)

Specialist Publications:-

- British Code of Practice BS 5930:2015 *'Code of Practice for Site Investigations'*
- British Code of Practice BS 1377:1990 *'Methods of test for soils for civil engineering purposes'.*
- British Code of Practice BS EN ISO 14688-1:2002+A2:2013 investigation and testing. Identification and classification of soil. Identification and description
- British Code of Practice BS EN ISO 14688-2:2004+A2:2013 Geotechnical investigation and testing. Identification and classification of soil. Principles for a classification.
- British Code of Practice BS EN ISO 14689-1:2003 Ground Investigation and Testing – Identification and classification of rock
- Health and Safety Executive Guidance Note EH40/90
- *CIRIA Report 143* 'The Standard Penetration Test (SPT): Methods and Use', 1995.
- BRE (2005) Special Digest 1:2005, 3rd Edition, Concrete in aggressive ground. BRE, Garston.
- BS 6031: 2009 Code of Practice for Earthworks.
- Workmanship for excavation shall comply with BS 8000: 1989 Part 1, Sections 3.1, 3.2 and 3.3.
- Specification for Highway Works (MCHW 1), Volume 1, Series 600 & Series 800, 2006 with Amendment 2016
- ICE UK Specification for Ground Investigation Second Edition.
- Design Manual for Roads and Bridges: Volume 7 Pavement Design and Maintenance
- Specification for Highways Works Series 600 Earthworks
- Highways Agency Interim Advice Note 73/06, Rev 1 2009, Clause 7.7

# APPENDIX I – **SITE PLANS AND FIGURES**

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KEY
Borehole | Trial Pit | Dynamic Probe | In-situ Test
Window Sample | Sampling Point | Historical Borehole

**PROJECT**
**GRANDISON BROOK**

**DRAWING TITLE:**
**EXPLORATORY HOLE LOCATION PLAN**

| JOB NO. | FIGURE NO. |
|---|---|
| Q1114 | 2 |
| DATE | SCALE |
| 08/09/23 | 1:3250 |

# APPENDIX II – **BOREHOLE LOGS**

**Contract : Grandison Brook**

**Client : Atkins**

**Window Sample No.**

**GB-BH07**

Dates : 17/5/23 - 17/5/23

Location : Railway Land

Job Number : Q1114

Engineer : Atkins

Ground Level : 4.90 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274053.91 E 195634.53 N *Co-ordinates to National Grid*

| Samples Depth | Samples Type No. | Sample Run Diam. (mm) | Sample Run Recovery (%) | Tests Depth | Tests SPT & Hand Vane Results | STRATA Depth (Thick-ness) | STRATA DESCRIPTION | Legend | Red. Level . A.O.D. | Water | Install/ Backfill |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.10) | Turf over TOPSOIL: Brown sandy slightly gravelly CLAY. | | 4.80 | | |
| 0.30 - 0.80 | B 1 | | | | | 0.10 | MADE GROUND: Black silty slightly sandy GRAVEL. Gravel is angular to sub angular fine to coarse siltstone, ash, brick, concrete, glass and tile. Sand is fine to coarse. | | | | |
| 0.30 | ES 1 | | | | | | PID = 0.0ppm | | | | |
| 0.80 | ES 2 | | | | | | PID = 0.0ppm | | | | |
| 1 | | | | | | | | | | | |
| 1.20 | SPTLS 1 | | | 1.20 | SPT (S) 14 (1-1-**6-5-2-1**) | (2.60) | PID = 0.0ppm | | | | |
| 1.20 - 2.00 | B 2 | 101 | 60 | | | | | | | | |
| 1.20 | ES 3 | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 2.20 | SPTLS 2 | | | 2.20 | SPT (S) 4 (1-1-**1-1-1-1**) | | PID = 0.0ppm | | | | |
| 2.20 - 2.60 | B 3 | 101 | 80 | | | | | | | | |
| 2.20 | ES 4 | | | | | 2.70 | Firm Mottled brown grey slightly silty slightly sandy CLAY. | | 2.20 | | |
| 3 | | | | | | | | | | | |
| 3.20 | SPTLS 3 | | | 3.20 | SPT (S) 4 (1-1-**1-1-1-1**) | (1.20) | PID = 0.0ppm | | | | |
| 3.20 - 3.80 | B 4 | 101 | 100 | | | | | | | | |
| 3.20 | ES 5 | | | | | | | | | | |
| 4 | | | | | | 3.90 | Soft blue grey silty slightly sandy organic CLAY with lenses of fibrous material. | | 1.00 | | |
| 4.00 - 4.20 | B 5 | | | | | | | | | | |
| 4.20 | SPTLS 4 | | | 4.20 | SPT (S) 0 (1-0-**0-0-0-0**) | | | | | | |
| 4.20 - 5.00 | B 6 | 101 | 100 | | | | | | | | |
| 5 | | | | | | | | | | | |
| 5.20 | SPTLS 5 | | | 5.20 | SPT (S) 0 (1-0-**0-0-0-0**) | (3.10) | | | | | |
| 5.20 - 6.00 | B 7 | 87 | 100 | | | | | | | | |
| 6 | | | | | | | | | | | |
| 6.20 | SPTLS 6 | | | 6.20 | SPT (S) 0 (1-0-**0-0-0-0**) | | | | | | |
| 6.20 - 6.80 | B 8 | 67 | 80 | | | | | | | | |
| 7 | | | | | | | | | | | |
| 7.20 | SPTLS 7 | | | | | 7.00 | Brown clayey pseudo-fibrous PEAT. | | -2.10 | | |
| 7.20 - 8.00 | B 9 | 57 | 100 | | | (1.20) | | | | | |
| 8 | | | | | | | | | | | |
| 8.20 | SPTLS 8 | | | | | 8.20 | Hole terminated at 8.2mbgl. Approxiamte scheduled depth | | -3.30 | | |

**Equipment used:** Dando Terrier

**Remarks:**

Seepage at 5.2mbgl

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| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated |
|---|---|---|---|---|
| PK | A Jones | 1 Of 1 | 10 | |

**Contract : Grandison Brook**

**Client : Atkins**

**Borehole No.**
**GB-BH07**

Dates : 17/5/23 - 17/5/23

Location : Railway Land

Job Number : Q1114

Engineer : Atkins

Ground Level : 4.90 m A.O.D.
*Level to Ordnance Datum*

Coordinates: 274053.91 E
195634.53 N
*Co-ordinates to National Grid*

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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| PK | A Jones | 1 Of 1 | 2 | All measurements in metres unless otherwise stated |

AGS

**Contract : Grandison Brook**

**Client : Atkins**

**Window Sample No.**

**GB-BH09**

Dates : 17/5/23 - 17/5/23

Location : Adj to Jersey Park

Job Number : Q1114

Engineer : Atkins

Ground Level : 14.82 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274578.13 E 194913.04 N *Co-ordinates to National Grid*

| Samples Depth | Samples Type No. | Sample Run Diam. (mm) | Sample Run Recovery (%) | Tests Depth | Tests SPT & Hand Vane Results | STRATA Depth (Thick-ness) | STRATA DESCRIPTION | Legend | Red. Level . A.O.D. | Water | Install/ Backfill |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.10) | Turf over TOPSOIL: Brown sandy slightly gravelly CLAY. Gravel is sub angular to sub rounded fine to coarse sandstone. | | 14.72 | | |
| 0.20 - 0.30 | B 1 | | | | | 0.10 | | | | | |
| 0.30 | ES 1 | | | | | (0.25) | | | 14.47 | | |
| 0.50 - 0.70 | B 2 | | | | | 0.35 | | | | | |
| 0.70 | ES 2 | | | | | (0.45) | | | | | |
| 1 1.00 - 1.30 | B 3 | | | | | 0.80 | MADE GROUND: Brown clayey slightly sandy GRAVEL with low cobble content of sandstone. Gravel is sub angular to sub rounded fine to coarse sandstone and siltstone, angular brick and concrete with plastic. Sand is fine to coarse. PID = 0.0ppm | | 14.02 | | |
| 1.20 | SPTLS 1 | | | 1.20 | SPT (S) 0 (1-0-**0-0-0-0**) | (0.60) | | | | | |
| 1.20 | ES 3 | | | | | | | | | | |
| 1.50 - 1.80 | B 4 | 101 | 80 | | | 1.40 | | | 13.42 | | |
| 2 | | | | | | (0.80) | | | | | |
| 2.20 | SPTLS 2 | | | 2.20 | SPT (S) 2 (1-0-**0-0-0-2**) | 2.20 | MADE GROUND: Black silty sandy GRAVEL. Gravel is angular to sub angular fine to coarse siltstone and ash. Sand is fine to coarse. PID = 0.0ppm | | 12.62 | | |
| 2.30 - 2.50 | B 5 | | | | | (0.50) | | | | | |
| 2.80 - 3.00 | B 6 | 101 | 100 | | | 2.70 | Grey slightly silty gravelly SAND. Sand is fine to coarse. Gravel is sub rounded fine to coarse sandstone. PID = 0.0ppm | | 12.12 | | |
| 3 | | | | | | (0.40) | | | | | |
| 3.20 | SPTLS 3 | | | 3.20 | SPT (S) 18 (2-2-**4-4-4-6**) | 3.10 | Brown sandy slightly gravelly organic CLAY. Gravel is sub rounded fine to coarse sandstone. Sand is fine to coarse. | | 11.72 | | |
| 3.20 - 4.00 | B 7 | 101 | 80 | | | (1.55) | Mottled pale brown grey sandy slightly organic CLAY. Sand is fine to coarse. | | | | |
| 4 4.00 - 4.60 | B 8 | | | | | | Grey slightly silty gravelly SAND. Gravel is sub angular to sub rounded fine to coarse sandstone. | | | | |
| 4.20 | SPTLS 4 | 101 | 80 | 4.20 | SPT (S) 22 (2-2-**4-4-6-8**) | | | | | | |
| | | | | 4.65 | SPT (C) 50/80mm (25-50/5mm----) | 4.65 | Grey slightly silty sandy GRAVEL. Gravel is sub angular to sub rounded fine to coarse sandstone and siltstone. Sand is fine to coarse. | | 10.17 | | |
| | | | | | | | Hole terminated at 4.65mbgl upon refusal. (Possible cobble / dense gravel) | | | | |

**Equipment used:** Dando Terrier

**Remarks:**

Fast groundwater ingress at 1.2mbgl

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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| PK | A Jones | 1 Of 1 | 10 | All measurements in metres unless otherwise stated |

AGS

**Contract : Grandison Brook**

**Client : Atkins**

**Borehole No.**
**GB-BH09**

Dates : 17/5/23 - 17/5/23

Location : Adj to Jersey Park

Job Number : Q1114

Engineer : Atkins

Ground Level : 14.82 m A.O.D.
*Level to Ordnance Datum*

Coordinates: 274578.13 E
194913.04 N
*Co-ordinates to National Grid*

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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| PK | A Jones | 1 Of 1 | 2 | All measurements in metres unless otherwise stated |

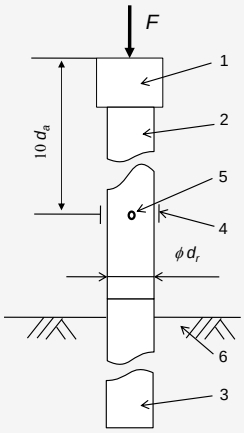
AGS

# SPT Calibration Report

## Hammer Energy Measurement Report

| | | |
|---|---|---|
| **Type of Hammer** | | TERRIER |
| **Test No** | | EQU2023_108 |
| **Client** | | QUANTUM GEOTECH |
| **Test Depth (m)** | | 11.70 |
| **Mass of hammer** | $m$ = | 63.5kg |
| **Falling height** | $h$ = | 0.76m |
| $E_{theor}$ = | $m \times g \times h$ = | 473J |

## Characteristics of the instrumented rod




**Key**

1 Anvil
2 Part of instrumented rod
3 Drive Rod
4 Strain Gauge
5 Accelerometer
6 Ground

$F$ Force
$d_r$ Diameter of rod

Fig. B.1 and B.2
BS EN ISO 22476-3 : 2005 + A1 : 2011

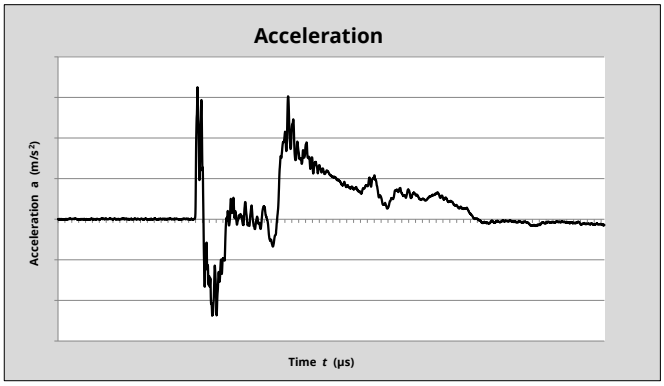
| | | |
|---|---|---|
| **Diameter** | $d_r$ = | 0.052 m |
| **Length of instrumented rod** | | 0.558 m |
| **Area** | A = | 11.61 cm² |
| **Modulus** | $E_a$ = | 206843 MPa |

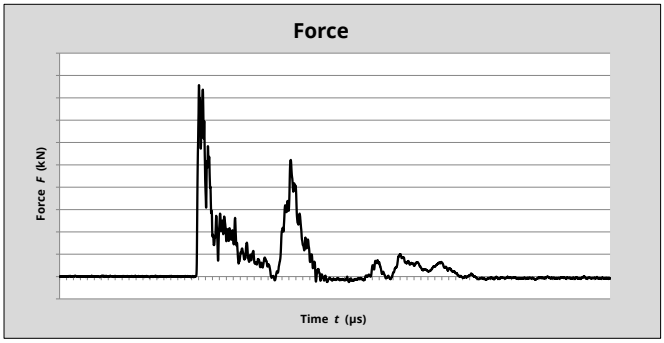
| DATE OF TEST | VALID UNTIL | HAMMER ID |
|---|---|---|
| 16/06/2023 | 15/06/2024 | DT13137 |

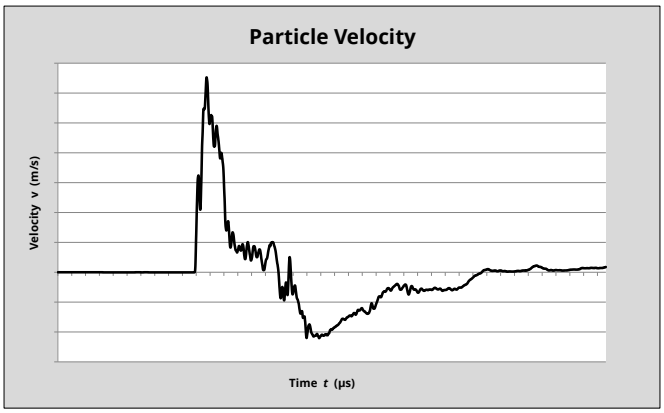
$E_{meas}$ = **0.352** kN-m

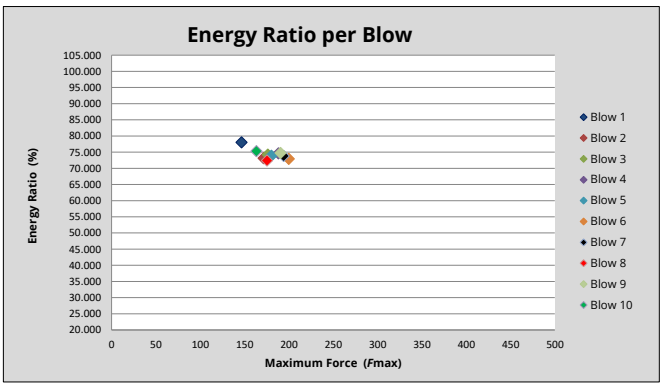
$E_{theor}$ = **0.473** kN-m

Comments




**Energy Ratio (Er) =** $\frac{E_{meas}}{E_{theor}}$ **74.36%**

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| Equipe SPT Analyzer Operator | Certificate prepared by | Certificate checked by | Certificate date |
|---|---|---|---|
| JL | | | 19/06/2023 |

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# KEY TO BOREHOLE AND TRIAL PIT LOGS

## MATERIAL LEGENDS

| | | |
|---|---|---|
| Made Ground | Topsoil | Clay |
| Gravel | Sand | Silt |
| Peat | Boulders | Cobbles |
| Chalk | Conglomerate | Volcaniclastic |
| Asphalt | Void | Mudstone |
| Siltstone | Sandstone | Limestone |
| Ironstone | Mudstone / Siltstone | Breccia |
| Coal | Coral | Bedrock |
| Shale | Gypsum | Igneous (Coarse Grained) |
| Igneous (Fine Grained) | Igneous (Medium Grained) | Metamorphic (Coarse Grained) |
| Metamorphic (Fine Grained) | Metamorphic (Medium Grained) | |

## INSTALLATION / BACKFILL DETAILS

| | | |
|---|---|---|
| Arisings | Concrete | Bentonite cement grout |
| Bentonite seal | Filter | Pea Gravel |
| Plain pipe | Slotted pipe | Piezometer / Standpipe tip |

NOTE:
Legend symbols in accordance with BS 5930 (2015)

Quantum Geotech

# KEY TO BOREHOLE AND TRIAL PIT LOGS

**m.A.O.D.** metres Above Ordnance Datum.

## SAMPLE AND TEST TYPES

| | |
|---|---|
| **U** | Undisturbed driven tube sample - 102mm diameter, 450mm long. |
| **P** | Undisturbed pushed piston sample - 102mm diameter, 1000mm long. |
| **TW** | Undisturbed thin walled push in sample - 100mm diameter, 750mm long. |
| **B** | Bulk disturbed sample. |
| **BLK** | Block Sample |
| **CBR** | Heavy duty undisturbed sample - 154 mm diameter (CBR mould). |
| **D** | Small disturbed sample. |
| **LB** | Large Bulk disturbed sample (for earthworks testing) |
| **C** | Core sample |
| **W** | Water sample |
| **G** | Gas sample |
| **ES** | Environmental sample (soil) |
| **j** | Jar sample |
| **t** | Tub sample |
| **p** | Pot sample |
| **s** | Small sample |
| **v** | Vial sample |
| **S** | Standard Penetration Test using split spoon sampler. (See Note). |
| **C** | Standard Penetration Test using a solid 60 degree cone. (See Note). |

NOTE: Where a single value is quoted this is the N value for 300 mm penetration following a seating drive of 150 mm. Where this full penetration is not achieved the number of blows is quoted for the penetration below the seating drive eg. 63/160 mm.
Where total penetration is less than the seating drive this is indicated by a + and the number of blows for total penetration is quoted eg. +50/75 mm.

| | |
|---|---|
| **HV** | Hand Vane Test. Vane undrained shear strength, $c_u$, quoted in kPa. |
| **V** | Borehole Vane Test. Vane undrained shear strength, $c_u$, quoted in kPa. |
| **FHT/RHT** | Falling / Rising Head Permeability Test. |

## CORE RUN DETAILS

| | |
|---|---|
| **TCR** | Total Core Recovery, % |
| **SCR** | Solid Core Recovery, % |
| **RQD** | Rock Quality Designation, % |
| **FI** | Fracture Index. NI - Non intact where > 25 No. per metre length. |

## WATER COLUMN SYMBOLS

| | |
|---|---|
| | First water strike, second water strike etc. |
| | Standing water level after first strike, second strike etc. |
| | Seepage. |

NOTE:
Legend symbols in accordance with BS 5930 (2015)

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# APPENDIX III – **HAND EXCAVATED SERVICE TRIAL PIT LOGS**

**Contract : Grandison Brook**

**Client : Atkins**

**Trial Pit No.**
**GB-HP06**

Dates : 15/5/23 - 15/5/23

Location : Adj to Football Ground

Job Number : Q1114

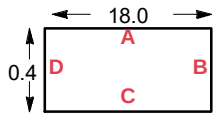
Engineer : Atkins

Ground Level : 12.68 m A.O.D.
*Level to Ordnance Datum*

Coordinates: 274528.15 E
195242.79 N
*Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | 0.20 - 0.40 | B1 | | | 0.45 | MADE GROUND: Dark brown clayey sandy GRAVEL with low cobble content of sandstone, concrete and tarmac. Gravel is angular to sub angular fine to coarse sandstone, siltstone, slate, concrete, brick, tarmac, tile and rare glass with plastic and many roots.<br>PID = 0.0ppm | | | |
| | 0.30 - | ES1 | | | | | | | |
| | 0.50 - 1.00 | B2 | | | 0.45 | Orange brown slightly silty sandy GRAVEL. Gravel is sub angular to sub rounded fine to coarse sandstone and siltstone, with many roots.<br>PID = 0.0ppm | | 12.23 | |
| | 0.60 - | ES2 | | | | | | | |
| 1 | 1.00 - | ES3 | | | 0.95 | PID = 0.0ppm | | | |
| | | | | | 1.40 | Trial pit terminated upon locating water mains. | | 11.28 | |

**PLAN**




Groundwater: No groundwater encountered

Stability: Stable

Shoring: None

Remarks: 12inch water main located at 1.3mbgl, 4.8m from back Football ground stand wall;
8inch cast water main located at 1.3mbgl, 2.85m from back of Football ground stand wall.
Pit excavated from 274528.147(E) 195242.791(N) to 274546. 547(E) 195236.171(N) and 274528.147(E) 195242.791(N) to 274531.448(E) 195244.744(N)

Equipment Used: 1.6tonne tracked excavator and Insulated hand tools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| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated |
|---|---|---|---|---|
| JW, RM & PK | A Jones | 1 Of 3 | 4 | |

AGS

| | | |
|---|---|---|
| **Contract : Grandison Brook**<br>**Client : Atkins** | | **Trial Pit No.**<br>**GB-HP06** |
| Dates : 15/5/23 - 15/5/23<br>Location : Adj to Football Ground | Job Number : Q1114<br>Engineer : Atkins | Ground Level : 12.68 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274528.15 E 195242.79 N *Co-ordinates to National Grid* |

| Contract : Grandison Brook<br>Client : Atkins | | Trial Pit No.<br>GB-HP06 |
|---|---|---|
| Dates : 15/5/23 - 15/5/23<br>Location : Adj to Football Ground | Job Number : Q1114<br>Engineer : Atkins | Ground Level : 12.68 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274528.15 E 195242.79 N *Co-ordinates to National Grid* |

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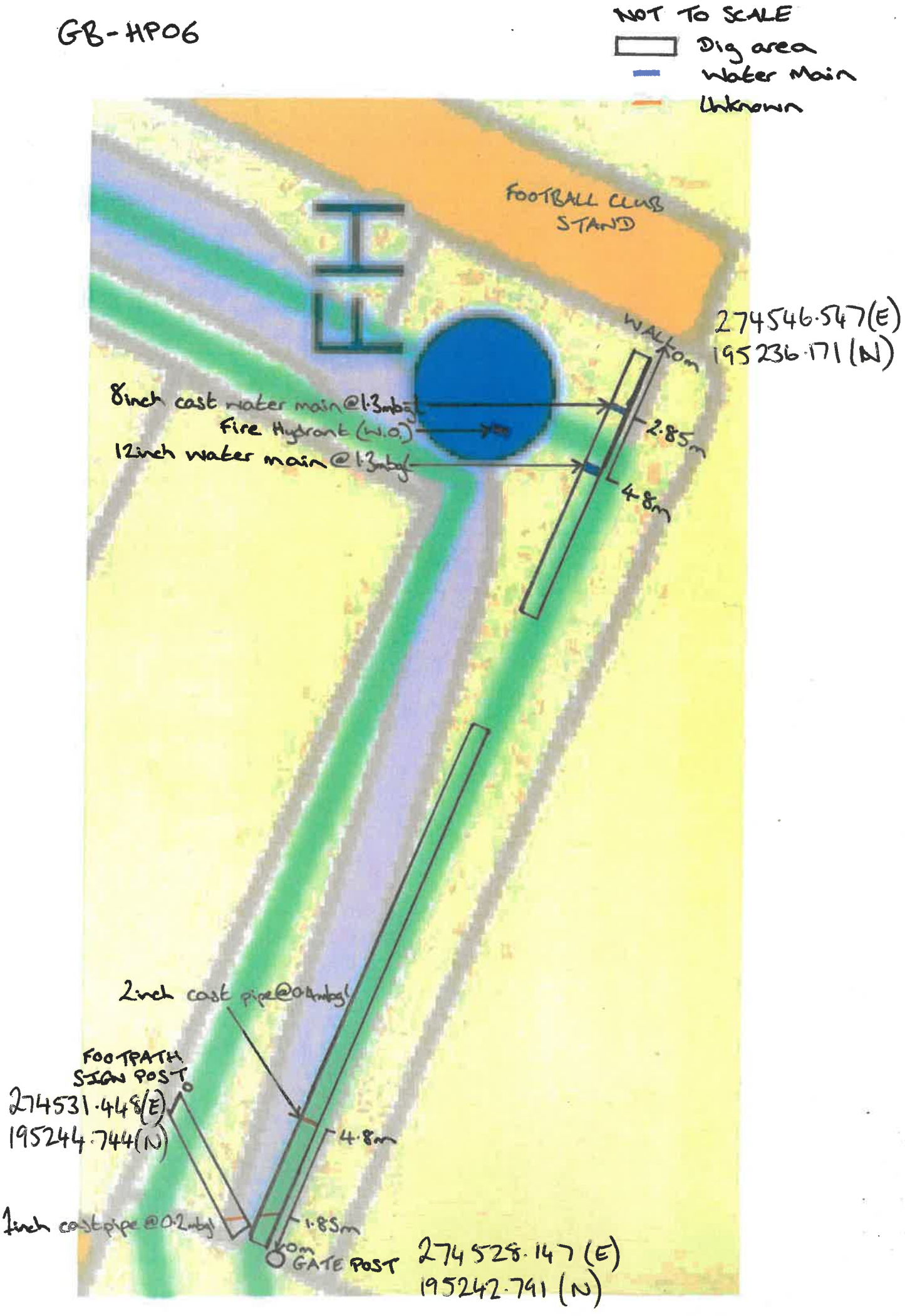
|---|---|---|---|---|
| JW, RM & PK | A Jones | 3 Of 3 | | |

GB-HP06


NOT TO SCALE
Dig area
Water Main
Unknown
FOOTBALL CLUB STAND
WALL
0m
274546.547(E)
195236.171(N)
8inch cast water main@1.3mbgl
Fire Hydrant (W.O.)
12inch water main@1.3mbgl
2.85m
4.8m
2inch cast pipe@0.4mbgl
FOOTPATH SIGN POST
0m
274531.448(E)
195244.744(N)
4.8m
1inch cast pipe @0.2mbgl
1.85m
0m
GATE POST
274528.147(E)
195242.791(N)

# KEY TO BOREHOLE AND TRIAL PIT LOGS

## MATERIAL LEGENDS

| | | |
|---|---|---|
| Made Ground | Topsoil | Clay |
| Gravel | Sand | Silt |
| Peat | Boulders | Cobbles |
| Chalk | Conglomerate | Volcaniclastic |
| Asphalt | Void | Mudstone |
| Siltstone | Sandstone | Limestone |
| Ironstone | Mudstone / Siltstone | Breccia |
| Coal | Coral | Bedrock |
| Shale | Gypsum | Igneous (Coarse Grained) |
| Igneous (Fine Grained) | Igneous (Medium Grained) | Metamorphic (Coarse Grained) |
| Metamorphic (Fine Grained) | Metamorphic (Medium Grained) | |

## INSTALLATION / BACKFILL DETAILS

| | | |
|---|---|---|
| Arisings | Concrete | Bentonite cement grout |
| Bentonite seal | Filter | Pea Gravel |
| Plain pipe | Slotted pipe | Piezometer / Standpipe tip |

NOTE:
Legend symbols in accordance with BS 5930 (2015)

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# KEY TO BOREHOLE AND TRIAL PIT LOGS

**m.A.O.D.** metres Above Ordnance Datum.

## SAMPLE AND TEST TYPES

| | |
|---|---|
| **U** | Undisturbed driven tube sample - 102mm diameter, 450mm long. |
| **P** | Undisturbed pushed piston sample - 102mm diameter, 1000mm long. |
| **TW** | Undisturbed thin walled push in sample - 100mm diameter, 750mm long. |
| **B** | Bulk disturbed sample. |
| **BLK** | Block Sample |
| **CBR** | Heavy duty undisturbed sample - 154 mm diameter (CBR mould). |
| **D** | Small disturbed sample. |
| **LB** | Large Bulk disturbed sample (for earthworks testing) |
| **C** | Core sample |
| **W** | Water sample |
| **G** | Gas sample |
| **ES** | Environmental sample (soil) |
| **j** | Jar sample |
| **t** | Tub sample |
| **p** | Pot sample |
| **s** | Small sample |
| **v** | Vial sample |
| **S** | Standard Penetration Test using split spoon sampler. (See Note). |
| **C** | Standard Penetration Test using a solid 60 degree cone. (See Note). |

NOTE: Where a single value is quoted this is the N value for 300 mm penetration following a seating drive of 150 mm. Where this full penetration is not achieved the number of blows is quoted for the penetration below the seating drive eg. 63/160 mm.
Where total penetration is less than the seating drive this is indicated by a + and the number of blows for total penetration is quoted eg. +50/75 mm.

| | |
|---|---|
| **HV** | Hand Vane Test. Vane undrained shear strength, $c_u$, quoted in kPa. |
| **V** | Borehole Vane Test. Vane undrained shear strength, $c_u$, quoted in kPa. |
| **FHT/RHT** | Falling / Rising Head Permeability Test. |

## CORE RUN DETAILS

| | |
|---|---|
| **TCR** | Total Core Recovery, % |
| **SCR** | Solid Core Recovery, % |
| **RQD** | Rock Quality Designation, % |
| **FI** | Fracture Index. NI - Non intact where > 25 No. per metre length. |

## WATER COLUMN SYMBOLS

| | |
|---|---|
| | First water strike, second water strike etc. |
| | Standing water level after first strike, second strike etc. |
| | Seepage. |

NOTE:
Legend symbols in accordance with BS 5930 (2015)

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# APPENDIX IV – **MACHINE EXCAVATED TRIAL PIT LOGS**

**Contract : Grandison Brook**

**Client : Atkins**

**Trial Pit No. GB-TP11**

Dates : 16/5/23 - 16/5/23

Location : Rear of Collins Street

Job Number : Q1114

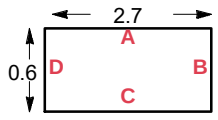
Engineer : Atkins

Ground Level : 4.92 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274201.82 E 195620.02 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | 0.10 - 0.20 | B1 | | | | Grass over MADE GROUND: Dark brown slightly silty sandy GRAVEL. Gravel is angular to sub angular fine to coarse sandstone with plastic. PID = 0.0ppm | | | |
| | 0.20 - | ES1 | | | 0.35 | | | | |
| | 0.40 - 0.50 | B2 | | | 0.35 | MADE GROUND: Black silty slightly sandy GRAVEL. Gravel is angular to sub angular fine to coarse siltstone, sandstone, ash, glass, tile, and clay pipe fragments. PID = 0.0ppm | | 4.57 | |
| | 0.50 - | ES2 | | | 0.25 | | | | |
| | 0.70 - 0.80 | B3 | | | 0.60 | Firm to stiff, mottled brown grey slightly silty slightly sandy slightly gravelly CLAY. | | 4.32 | |
| | 0.80 - | D1 | | | 0.30 | PID = 0.0ppm | | | |
| | | ES3 | | | | | | | |
| 1 | | | | | 0.90 | Soft blue grey slightly silty slightly sandy slightly organic CLAY. | | 4.02 | |
| | 1.60 - | D2 | | | | with fine fibrous organic material from 1.6mbgl | | | |
| 2 | 2.00 - 2.20 | B4 | | | 2.60 | | | | |
| 3 | 3.00 - 3.50 | B5 | | | | | | | |
| | | | | | 3.50 | Trial Pit terminated at 3.5mbgl | | 1.42 | |

**PLAN**




Groundwater: Seepage at 0.9mbgl, Many seepages from 1.6 - 3.5mbgl

Stability: Stable

Shoring: None

Remarks:

Equipment Used: 6.5tonne tracked 360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|---|---|---|---|---|
| JW | A Jones | 1 Of 2 | 4 | |

AGS

| Contract : Grandison Brook<br>Client : Atkins | | Trial Pit No.<br>GB-TP11 |
|---|---|---|
| Dates : 16/5/23 - 16/5/23<br>Location : Rear of Collins Street | Job Number : Q1114<br>Engineer : Atkins | Ground Level : 4.92 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274201.82 E 195620.02 N *Co-ordinates to National Grid* |

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|---|---|---|---|---|---|
| JW | A Jones | 2 Of 2 | | | |

# KEY TO BOREHOLE AND TRIAL PIT LOGS

## MATERIAL LEGENDS

| | | |
|---|---|---|
| Made Ground | Topsoil | Clay |
| Gravel | Sand | Silt |
| Peat | Boulders | Cobbles |
| Chalk | Conglomerate | Volcaniclastic |
| Asphalt | Void | Mudstone |
| Siltstone | Sandstone | Limestone |
| Ironstone | Mudstone / Siltstone | Breccia |
| Coal | Coral | Bedrock |
| Shale | Gypsum | Igneous (Coarse Grained) |
| Igneous (Fine Grained) | Igneous (Medium Grained) | Metamorphic (Coarse Grained) |
| Metamorphic (Fine Grained) | Metamorphic (Medium Grained) | |

## INSTALLATION / BACKFILL DETAILS

| | | |
|---|---|---|
| Arisings | Concrete | Bentonite cement grout |
| Bentonite seal | Filter | Pea Gravel |
| Plain pipe | Slotted pipe | Piezometer / Standpipe tip |

NOTE:
Legend symbols in accordance with BS 5930 (2015)

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# KEY TO BOREHOLE AND TRIAL PIT LOGS

**m.A.O.D.** metres Above Ordnance Datum.

## SAMPLE AND TEST TYPES

| | |
|---|---|
| **U** | Undisturbed driven tube sample - 102mm diameter, 450mm long. |
| **P** | Undisturbed pushed piston sample - 102mm diameter, 1000mm long. |
| **TW** | Undisturbed thin walled push in sample - 100mm diameter, 750mm long. |
| **B** | Bulk disturbed sample. |
| **BLK** | Block Sample |
| **CBR** | Heavy duty undisturbed sample - 154 mm diameter (CBR mould). |
| **D** | Small disturbed sample. |
| **LB** | Large Bulk disturbed sample (for earthworks testing) |
| **C** | Core sample |
| **W** | Water sample |
| **G** | Gas sample |
| **ES** | Environmental sample (soil) |
| **j** | Jar sample |
| **t** | Tub sample |
| **p** | Pot sample |
| **s** | Small sample |
| **v** | Vial sample |
| **S** | Standard Penetration Test using split spoon sampler. (See Note). |
| **C** | Standard Penetration Test using a solid 60 degree cone. (See Note). |

NOTE: Where a single value is quoted this is the N value for 300 mm penetration following a seating drive of 150 mm. Where this full penetration is not achieved the number of blows is quoted for the penetration below the seating drive eg. 63/160 mm.
Where total penetration is less than the seating drive this is indicated by a + and the number of blows for total penetration is quoted eg. +50/75 mm.

| | |
|---|---|
| **HV** | Hand Vane Test. Vane undrained shear strength, $c_u$, quoted in kPa. |
| **V** | Borehole Vane Test. Vane undrained shear strength, $c_u$, quoted in kPa. |
| **FHT/RHT** | Falling / Rising Head Permeability Test. |

## CORE RUN DETAILS

| | |
|---|---|
| **TCR** | Total Core Recovery, % |
| **SCR** | Solid Core Recovery, % |
| **RQD** | Rock Quality Designation, % |
| **FI** | Fracture Index. NI - Non intact where > 25 No. per metre length. |

## WATER COLUMN SYMBOLS

| | |
|---|---|
| | First water strike, second water strike etc. |
| | Standing water level after first strike, second strike etc. |
| | Seepage. |

NOTE:
Legend symbols in accordance with BS 5930 (2015)

Quantum Geotech

# APPENDIX VI – **GEOTECHNICAL LABORATORY TEST RESULTS**

# Laboratory Report

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES A PHENNA GROUP COMPANY

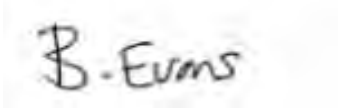
## Contract Number: 67452

Client Ref: **Q1114**
Client PO: **Q1114**

Date Received: **03-07-2023**
Date Completed: **12-07-2023**
Report Date: **12-07-2023**

Client: **Quantum Geotechnic Ltd**
**Plas Newydd**
**Llanedi**
**Pontarddulais**
**Swansea**
**SA4 0FQ**

This report has been checked and approved by:



**Brendan Evans**
Office Administrator

Contract Title: **Grandison Brook**
For the attention of: **Arwel Jones**

| Test Description | Qty |
|---|---|
| **Moisture Content of Soil**<br>BS1377 : Part 2 : Clause 3.2 : 1990 - * UKAS | 10 |
| **4 Point Liquid & Plastic Limit**<br>BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS | 8 |
| **PSD Wet & Dry Sieve method**<br>BS 1377:1990 - Part 2 : 9.2 - * UKAS | 10 |
| **PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected)**<br>BS 1377:1990 - Part 2 : 9.4 - * UKAS | 6 |
| **Organic Matter Content**<br>Sub-contracted Test | 4 |
| **Disposal of samples for job** | 1 |

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

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

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



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

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

# Summary of Soil Descriptions

| | |
|---|---|
| Contract Number | 67452 |
| Project Name | Grandison Brook |
| Client Reference | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Descriptions |
|---|---|---|---|---|---|---|
| GB-HP06 | 2 | B | 0.50 | - | 1.00 | Brown/ grey slightly silty clayey fine to coarse sandy fine to coarse GRAVEL |
| GB-TP11 | 3 | B | 0.70 | - | 0.80 | Brown/ grey silty CLAY |
| GB-TP11 | 4 | B | 2.00 | - | 2.20 | Grey slightly gravelly slightly sandy clayey SILT |
| GB-BH07 | 2 | B | 1.20 | - | 2.00 | Brown/ grey slightly silty/ clayey fine to coarse sandy fine to coarse GRAVEL |
| GB-BH07 | 3 | B | 2.20 | - | 2.60 | Brown clayey silty fine to coarse sandy fine to coarse GRAVEL |
| GB-BH07 | 5 | B | 4.00 | - | 4.20 | Grey slightly sandy SILT/ CLAY |
| GB-BH07 | 6 | B | 4.20 | - | 5.00 | Grey slightly sandy SILT/ CLAY |
| GB-BH07 | 9 | B | 7.20 | - | 8.00 | Grey slightly sandy clayey SILT |
| GB-BH09 | 4 | B | 1.50 | - | 1.80 | Grey slightly gravelly fine to coarse sandy SILT/ CLAY |
| GB-BH09 | 5 | B | 2.30 | - | 2.50 | Brown/ grey fine to coarse sandy silty CLAY |
| GB-BH09 | 7 | B | 3.20 | - | 4.00 | Brown/ grey slightly gravelly fine to coarse sandy SILT/ CLAY |

| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **Natural Moisture Content ( BS 1377:1990 - Part 2 : 3.2 )** | |
|---|---|---|
| Contract Number | 67452 | |
| Project Name | Grandison Brook | |
| Date Tested | 07/07/2023 | |
| | | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Moisture Content % | Remarks |
|---|---|---|---|---|---|---|---|
| GB-BH07 | 5 | B | 4.00 | - | 4.20 | 18 | |
| GB-BH09 | 7 | B | 3.20 | - | 4.00 | 16 | |
| | | | | - | | | |
| | | | | - | | | |
| | | | | - | |

| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377:1990 - Part 2 : 4.3 & 5.3 ) | |
|---|---|---|
| Contract Number | 67452 | |
| Project Name | Grandison Brook | |
| Date Tested | 04/07/2023 | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Moisture Content % | Liquid Limit % | Plastic Limit % | Plasticity index % | Passing 0.425mm % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GB-HP06 | 2 | B | 0.50 | - | 1.00 | 16 | 34 | 18 | 16 | 40 | CL Low Plasticity |
| GB-TP11 | 3 | B | 0.70 | - | 0.80 | 26 | 54 | 24 | 30 | 100 | CH High Plasticity |
| GB-TP11 | 4 | B | 2.00 | - | 2.20 | 47 | 97 | 44 | 53 | 96 | ME Extremely High Plasticity |
| GB-BH07 | 2 | B | 1.20 | - | 2.00 | 32 | 65 | 30 | 35 | 18 | CH High Plasticity |
| GB-BH07 | 3 | B | 2.20 | - | 2.60 | 43 | 86 | 40 | 46 | 53 | MV Very High Plasticity |
| GB-BH07 | 6 | B | 4.20 | - | 5.00 | 33 | 67 | 31 | 36 | 100 | CH High Plasticity |
| GB-BH07 | 9 | B | 7.20 | - | 8.00 | 51 | 105 | 48 | 57 | 99 | ME Extremely High Plasticity |
| GB-BH09 | 5 | B | 2.30 | - | 2.50 | 33 | 68 | 31 | 37 | 99 | CH High Plasticity |
| | | | | - | | | | | | | |
| | | | | - | | | | | | | |
| | | | | - | | | | | | | |
| | | | | - | | | | | | | |
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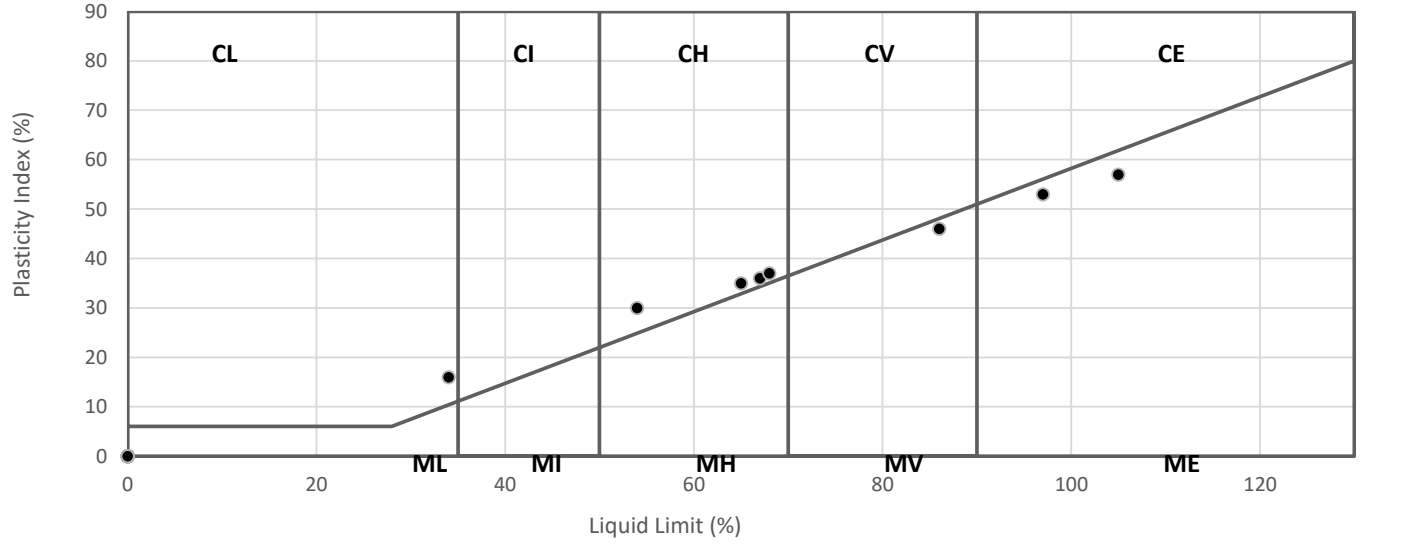
| | | | | - | | | | | | | |
| | | | | - | | | | | | | |
| | | | | - | | | | | | | |

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

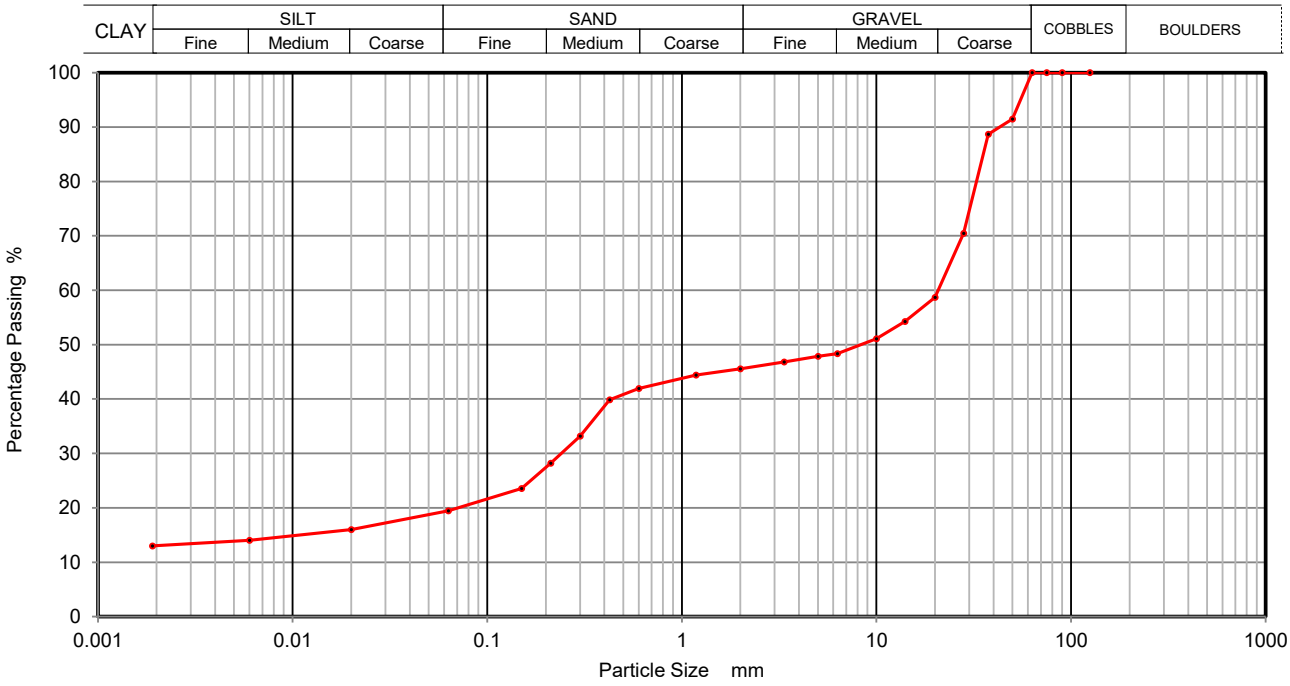
**PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION**
**BS 5930:2015+A1:2020**




| Operator |
|---|
| Ethan Harper |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL | **PARTICLE SIZE DISTRIBUTION**<br>**BS 1377 Part 2:1990**<br>**Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4** | Contract Number | 67452 |
| | | Borehole/Pit No. | GB-HP06 |
| Project Name | Grandison Brook | Sample No. | 2 |
| Soil Description | *See sample description sheet | Depth Top | 0.50 |
| | | Depth Base | 1.00 |
| Date Tested | 07/07/2023 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | 0.0200 | 16 |
| 90 | 100 | 0.0060 | 14 |
| 75 | 100 | 0.0020 | 13 |
| 63 | 100 | | |
| 50 | 92 | | |
| 37.5 | 89 | | |
| 28 | 70 | | |
| 20 | 59 | | |
| 14 | 54 | | |
| 10 | 51 | | |
| 6.3 | 48 | | |
| 5 | 48 | | |
| 3.35 | 47 | | |
| 2 | 46 | | |
| 1.18 | 44 | | |
| 0.6 | 42 | | |
| 0.425 | 40 | | |
| 0.3 | 33 | | |
| 0.212 | 28 | | |
| 0.15 | 24 | | |
| 0.063 | 19 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 54 |
| Sand | 27 |
| Silt | 6 |
| Clay | 13 |
| | |

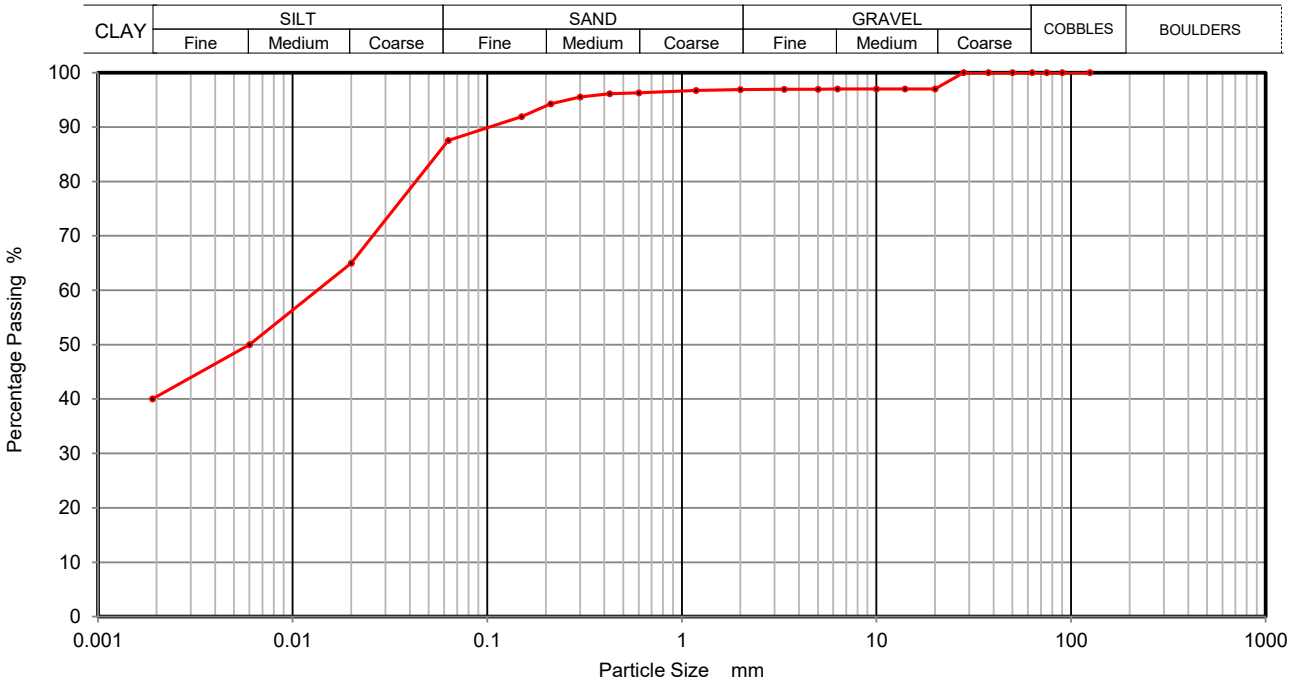
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| David Edwards |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **PARTICLE SIZE DISTRIBUTION**<br>**BS 1377 Part 2:1990**<br>**Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4** | Contract Number | 67452 |
| | | Borehole/Pit No. | GB-TP11 |
| Project Name | Grandison Brook | Sample No. | 4 |
| Soil Description | *See sample description sheet | Depth Top | 2.00 |
| | | Depth Base | 2.20 |
| Date Tested | 07/07/2023 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | 0.0200 | 65 |
| 90 | 100 | 0.0060 | 50 |
| 75 | 100 | 0.0020 | 40 |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 97 | | |
| 14 | 97 | | |
| 10 | 97 | | |
| 6.3 | 97 | | |
| 5 | 97 | | |
| 3.35 | 97 | | |
| 2 | 97 | | |
| 1.18 | 97 | | |
| 0.6 | 96 | | |
| 0.425 | 96 | | |
| 0.3 | 96 | | |
| 0.212 | 94 | | |
| 0.15 | 92 | | |
| 0.063 | 88 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 3 |
| Sand | 9 |
| Silt | 48 |
| Clay | 40 |
| | |

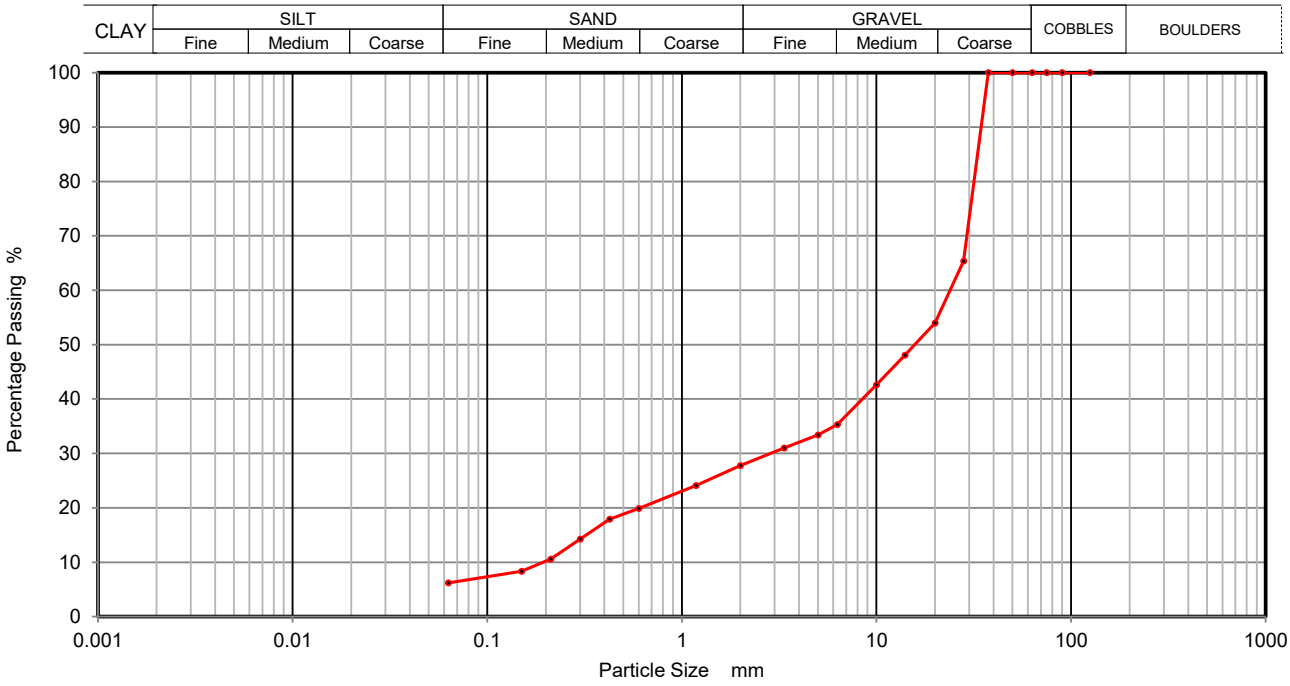
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| David Edwards |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **PARTICLE SIZE DISTRIBUTION**<br>**BS 1377 Part 2:1990**<br>**Wet Sieve, Clause 9.2** | Contract Number | 67452 |
| | | Borehole/Pit No. | GB-BH07 |
| Project Name | Grandison Brook | Sample No. | 2 |
| Soil Description | *See sample description sheet | Depth Top | 1.20 |
| | | Depth Base | 2.00 |
| Date Tested | 07/07/2023 | 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 | 65 | | |
| 20 | 54 | | |
| 14 | 48 | | |
| 10 | 43 | | |
| 6.3 | 35 | | |
| 5 | 33 | | |
| 3.35 | 31 | | |
| 2 | 28 | | |
| 1.18 | 24 | | |
| 0.6 | 20 | | |
| 0.425 | 18 | | |
| 0.3 | 14 | | |
| 0.212 | 11 | | |
| 0.15 | 8 | | |
| 0.063 | 6 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 72 |
| Sand | 22 |
| Silt and Clay | 6 |
| | |
| | |

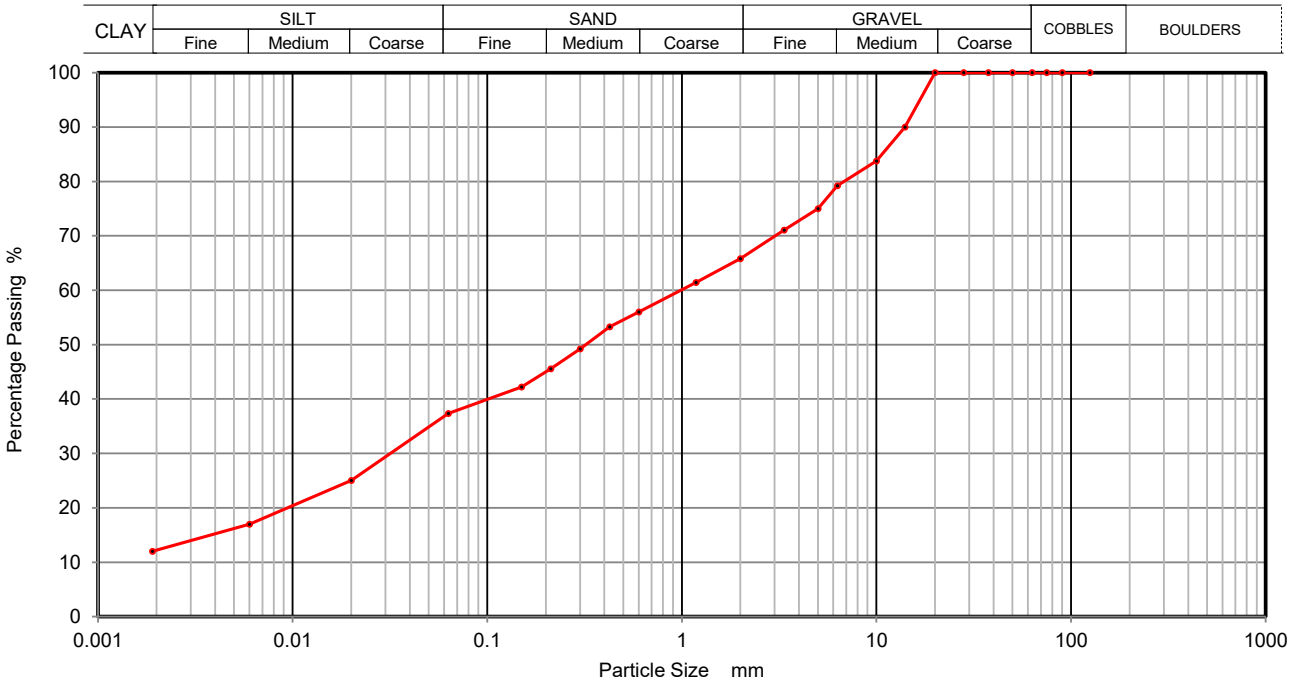
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| David Edwards |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL | **PARTICLE SIZE DISTRIBUTION**<br>**BS 1377 Part 2:1990**<br>**Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4** | Contract Number | 67452 |
| | | Borehole/Pit No. | GB-BH07 |
| Project Name | Grandison Brook | Sample No. | 3 |
| Soil Description | *See sample description sheet | Depth Top | 2.20 |
| | | Depth Base | 2.60 |
| Date Tested | 07/07/2023 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | 0.0200 | 25 |
| 90 | 100 | 0.0060 | 17 |
| 75 | 100 | 0.0020 | 12 |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 90 | | |
| 10 | 84 | | |
| 6.3 | 79 | | |
| 5 | 75 | | |
| 3.35 | 71 | | |
| 2 | 66 | | |
| 1.18 | 61 | | |
| 0.6 | 56 | | |
| 0.425 | 53 | | |
| 0.3 | 49 | | |
| 0.212 | 46 | | |
| 0.15 | 42 | | |
| 0.063 | 37 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 34 |
| Sand | 29 |
| Silt | 25 |
| Clay | 12 |
| | |

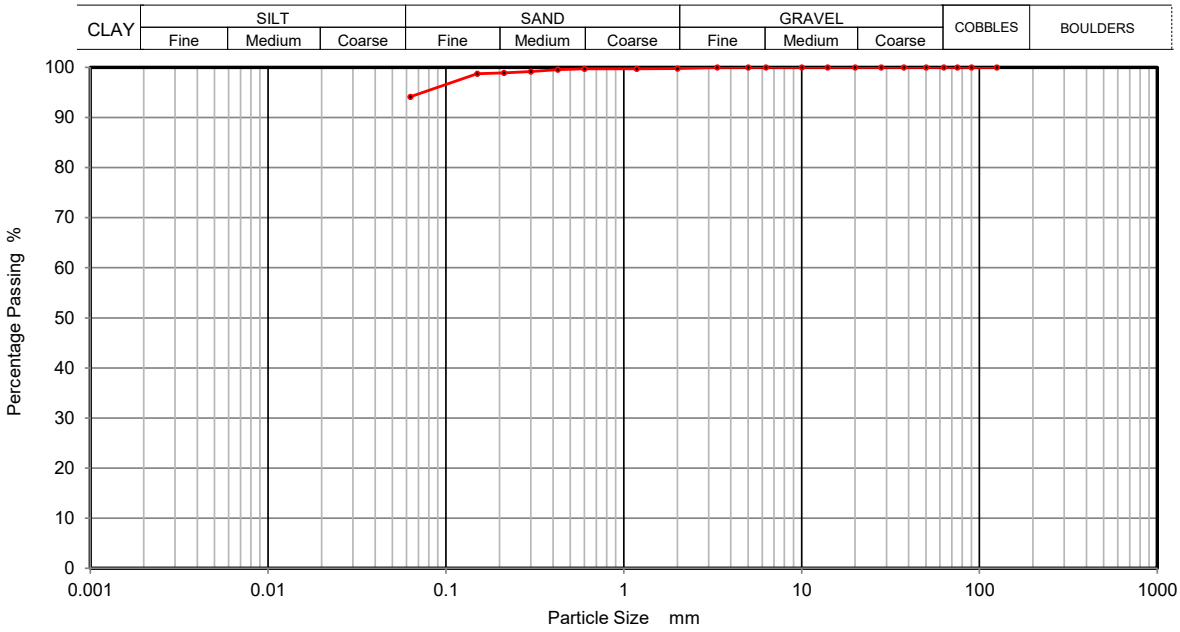
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| David Edwards |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **PARTICLE SIZE DISTRIBUTION**<br>**BS 1377 Part 2:1990**<br>**Wet Sieve, Clause 9.2** | Contract Number | 67452 |
| | | Borehole/Pit No. | GB-BH07 |
| Project Name | Grandison Brook | Sample No. | 5 |
| Soil Description | *See sample description sheet | Depth Top | 4.00 |
| | | Depth Base | 4.20 |
| Date Tested | 07/07/2023 | 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 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | | |
| 0.6 | 100 | | |
| 0.425 | 100 | | |
| 0.3 | 99 | | |
| 0.212 | 99 | | |
| 0.15 | 99 | | |
| 0.063 | 94 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 0 |
| Sand | 6 |
| Silt and Clay | 94 |
| | |
| | |

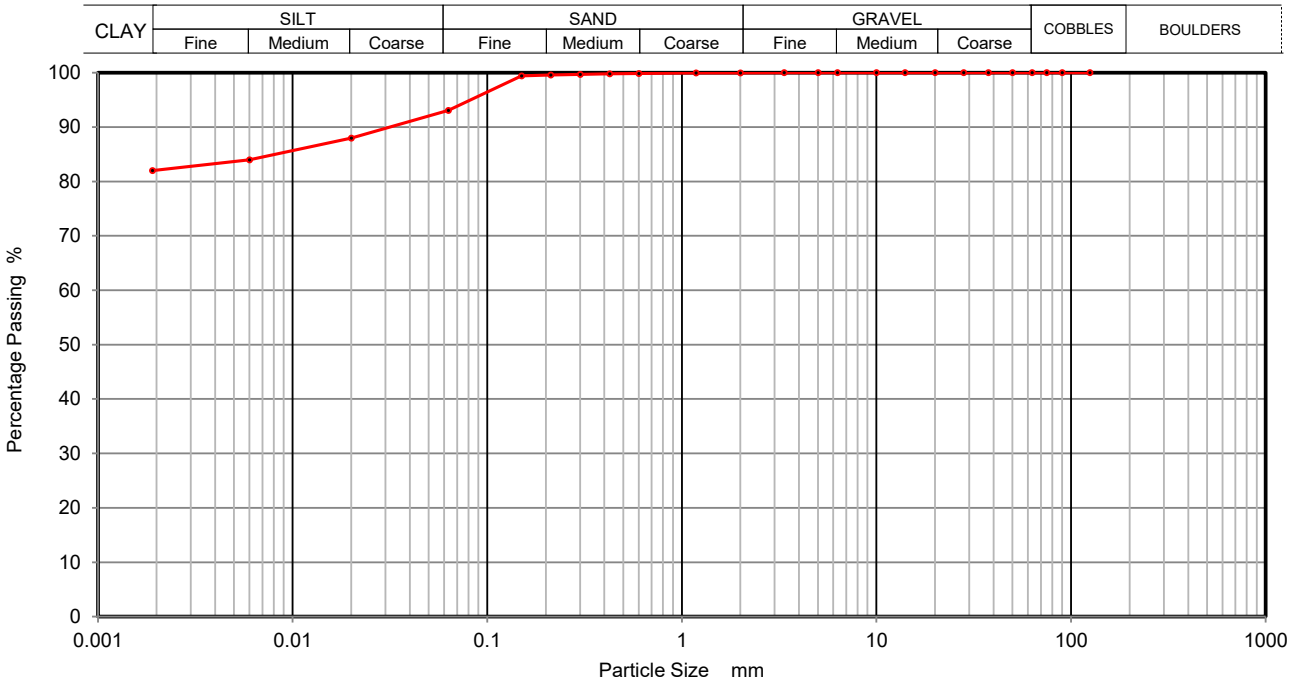
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| David Edwards |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL | **PARTICLE SIZE DISTRIBUTION**<br>**BS 1377 Part 2:1990**<br>**Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4** | Contract Number | 67452 |
| | | Borehole/Pit No. | GB-BH07 |
| Project Name | Grandison Brook | Sample No. | 6 |
| Soil Description | *See sample description sheet | Depth Top | 4.20 |
| | | Depth Base | 5.00 |
| Date Tested | 07/07/2023 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | 0.0200 | 88 |
| 90 | 100 | 0.0060 | 84 |
| 75 | 100 | 0.0020 | 82 |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | | |
| 0.6 | 100 | | |
| 0.425 | 100 | | |
| 0.3 | 100 | | |
| 0.212 | 100 | | |
| 0.15 | 99 | | |
| 0.063 | 93 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 0 |
| Sand | 7 |
| Silt | 11 |
| Clay | 82 |
| | |

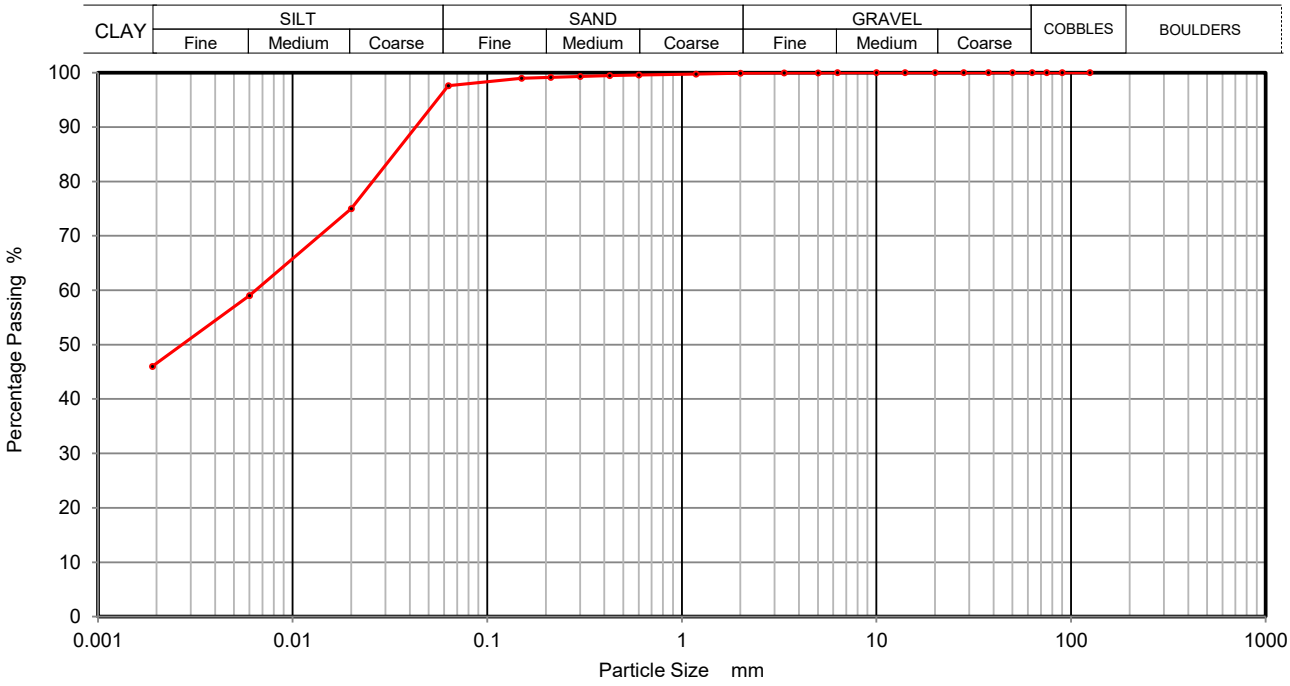
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| David Edwards |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **PARTICLE SIZE DISTRIBUTION**<br>**BS 1377 Part 2:1990**<br>**Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4** | Contract Number | 67452 |
| | | Borehole/Pit No. | GB-BH07 |
| Project Name | Grandison Brook | Sample No. | 9 |
| Soil Description | *See sample description sheet | Depth Top | 7.20 |
| | | Depth Base | 8.00 |
| Date Tested | 07/07/2023 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | 0.0200 | 75 |
| 90 | 100 | 0.0060 | 59 |
| 75 | 100 | 0.0020 | 46 |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | | |
| 0.6 | 100 | | |
| 0.425 | 99 | | |
| 0.3 | 99 | | |
| 0.212 | 99 | | |
| 0.15 | 99 | | |
| 0.063 | 98 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 0 |
| Sand | 2 |
| Silt | 52 |
| Clay | 46 |
| | |

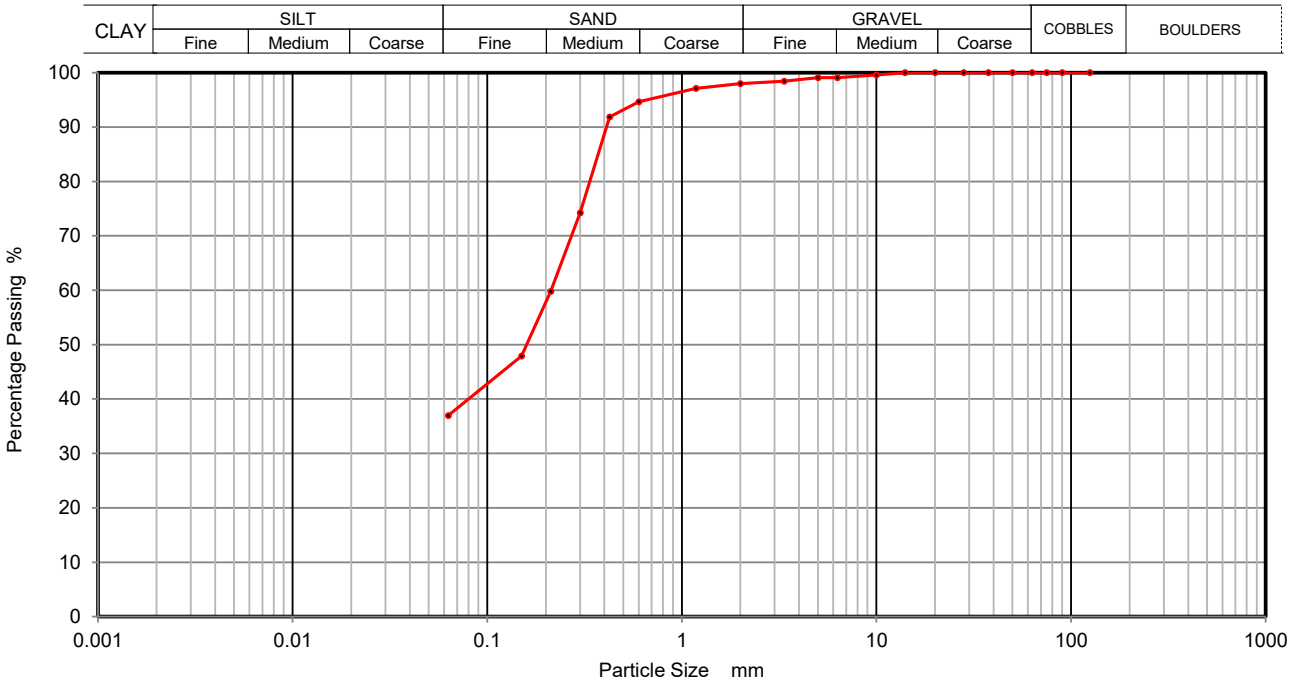
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| David Edwards |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL | **PARTICLE SIZE DISTRIBUTION**<br>**BS 1377 Part 2:1990**<br>**Wet Sieve, Clause 9.2** | Contract Number | 67452 |
| | | Borehole/Pit No. | GB-BH09 |
| Project Name | Grandison Brook | Sample No. | 4 |
| Soil Description | *See sample description sheet | Depth Top | 1.50 |
| | | Depth Base | 1.80 |
| Date Tested | 07/07/2023 | 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 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 99 | | |
| 5 | 99 | | |
| 3.35 | 98 | | |
| 2 | 98 | | |
| 1.18 | 97 | | |
| 0.6 | 95 | | |
| 0.425 | 92 | | |
| 0.3 | 74 | | |
| 0.212 | 60 | | |
| 0.15 | 48 | | |
| 0.063 | 37 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 2 |
| Sand | 61 |
| Silt and Clay | 37 |
| | |
| | |

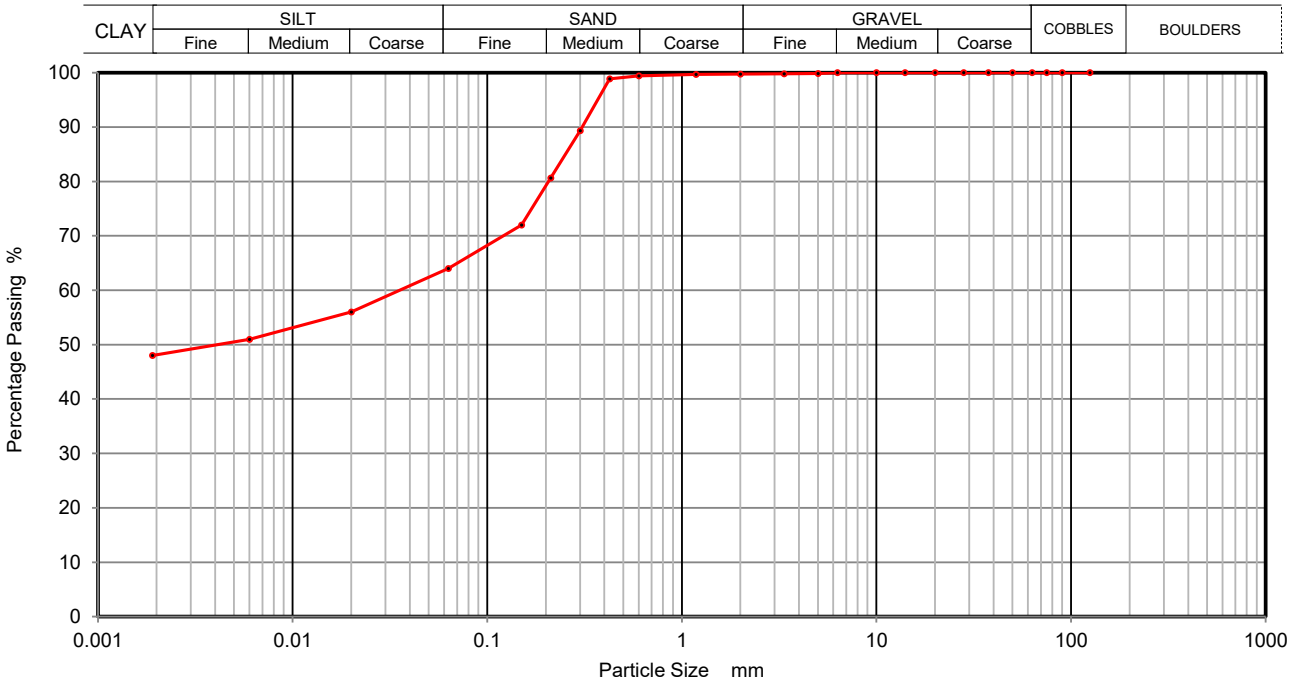
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| David Edwards |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **PARTICLE SIZE DISTRIBUTION**<br>**BS 1377 Part 2:1990**<br>**Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4** | Contract Number | 67452 |
| | | Borehole/Pit No. | GB-BH09 |
| Project Name | Grandison Brook | Sample No. | 5 |
| Soil Description | *See sample description sheet | Depth Top | 2.30 |
| | | Depth Base | 2.50 |
| Date Tested | 07/07/2023 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | 0.0200 | 56 |
| 90 | 100 | 0.0060 | 51 |
| 75 | 100 | 0.0020 | 48 |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | | |
| 0.6 | 99 | | |
| 0.425 | 99 | | |
| 0.3 | 89 | | |
| 0.212 | 81 | | |
| 0.15 | 72 | | |
| 0.063 | 64 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 0 |
| Sand | 36 |
| Silt | 16 |
| Clay | 48 |
| | |

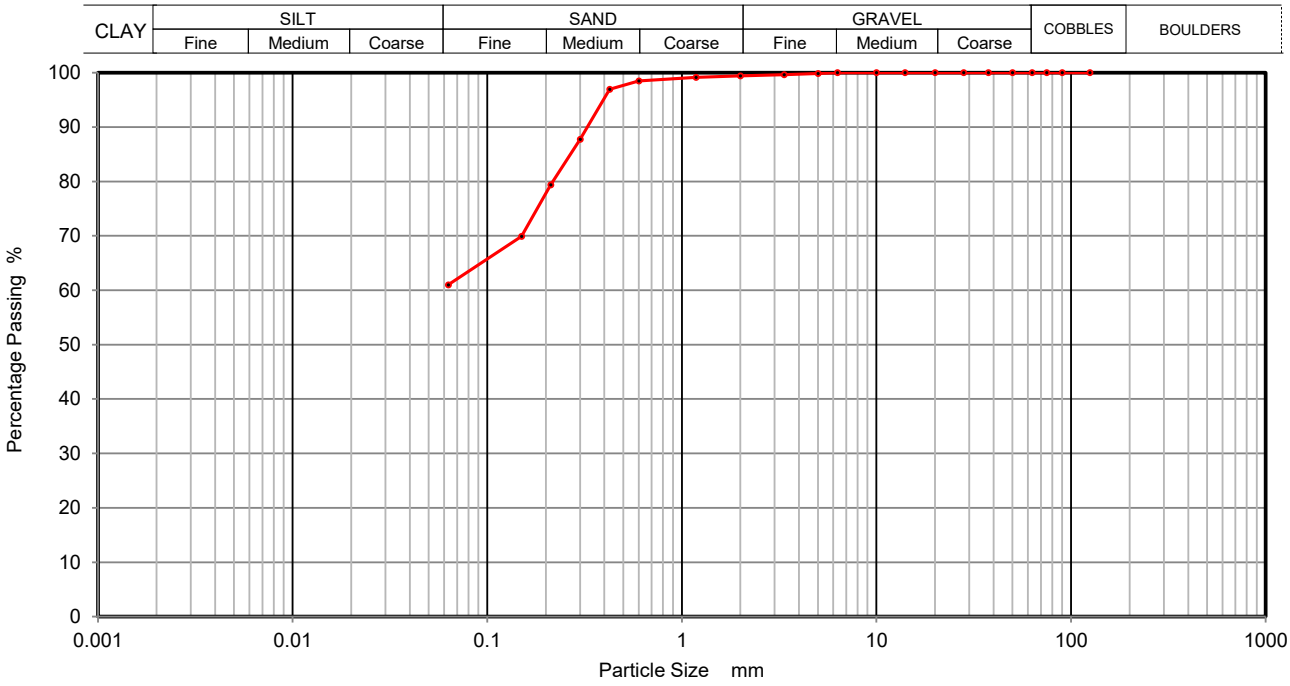
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| David Edwards |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL | **PARTICLE SIZE DISTRIBUTION**<br>**BS 1377 Part 2:1990**<br>**Wet Sieve, Clause 9.2** | Contract Number | 67452 |
| | | Borehole/Pit No. | GB-BH09 |
| Project Name | Grandison Brook | Sample No. | 7 |
| Soil Description | *See sample description sheet | Depth Top | 3.20 |
| | | Depth Base | 4.00 |
| Date Tested | 07/07/2023 | 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 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 100 | | |
| 2 | 99 | | |
| 1.18 | 99 | | |
| 0.6 | 98 | | |
| 0.425 | 97 | | |
| 0.3 | 88 | | |
| 0.212 | 79 | | |
| 0.15 | 70 | | |
| 0.063 | 61 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 1 |
| Sand | 38 |
| Silt and Clay | 61 |
| | |
| | |

Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| David Edwards |

UKAS TESTING 2788

2531

# ANALYTICAL TEST REPORT

| | |
|---|---|
| Contract no: | 124438 |
| Contract name: | Grandison Brook |
| Client reference: | 67452 |
| Clients name: | Geo Site and Testing Services |
| Clients address: | Unit 3 and 4 Heol Aur<br>Dafen Industrial Estate, Dafen<br>Llanelli, Carmarthenshire<br>SA14 8QN |
| Samples received: | 05 July 2023 |
| Analysis started: | 05 July 2023 |
| Analysis completed: | 11 July 2023 |
| Report issued: | 11 July 2023 |

| Key | | |
|---|---|---|
| | U | UKAS accredited test |
| | M | MCERTS & UKAS accredited test |
| | $ | Test carried out by an approved subcontractor |
| | I/S | Insufficient sample to carry out test |
| | N/S | Sample not suitable for testing |

Approved by: E. McCulloch

Ellis McCulloch

Senior Reporting Administrator

# Chemtech Environmental Limited

## SOILS

| Lab number | | | 124438-1 | 124438-2 | 124438-3 | 124438-4 |
|---|---|---|---|---|---|---|
| Sample id | | | GB-TP11 | GB-BH07 | GB-BH07 | GB-BH09 |
| Depth (m) | | | 2.00-2.20 | 4.20-5.00 | 7.20-8.00 | 2.30-2.50 |
| Sample Type | | | B4 | B6 | B9 | B5 |
| Date sampled | | | - | - | - | - |
| Test | Method | Units | | | | |
| Total Organic Carbon (TOC) | CE197 | % w/w C | 1.4 | 0.5 | 1.6 | 1.1 |
| Estimate of OMC (calculated from TOC) | CE197 | % w/w | 2.5 | 0.9 | 2.7 | 1.9 |

# Chemtech Environmental Limited

## METHOD DETAILS

| METHOD | SOILS | METHOD SUMMARY | SAMPLE | STATUS | LOD | UNITS |
|---|---|---|---|---|---|---|
| CE197 | Total Organic Carbon (TOC) | Carbon Analyser | Dry | | 0.1 | % w/w C |
| CE197 | Estimate of OMC (calculated from TOC) | Calculation from Total Organic Carbon | Dry | | 0.1 | % w/w |

# Chemtech Environmental Limited

# DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.
For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.
Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

| | |
|---|---|
| N | No (not deviating sample) |
| Y | Yes (deviating sample) |
| NSD | Sampling date not provided |
| NST | Sampling time not provided (waters only) |
| EHT | Sample exceeded holding time(s) |
| IC | Sample not received in appropriate containers |
| HP | Headspace present in sample container |
| NCF | Sample not chemically fixed (where appropriate) |
| OR | Other (specify) |

| Lab ref | Sample id | Depth (m) | Deviating | Tests (Reason for deviation) |
|---|---|---|---|---|
| 124438-1 | GB-TP11 | 2.00-2.20 | Y | All (NSD) |
| 124438-2 | GB-BH07 | 4.20-5.00 | Y | All (NSD) |
| 124438-3 | GB-BH07 | 7.20-8.00 | Y | All (NSD) |
| 124438-4 | GB-BH09 | 2.30-2.50 | Y | All (NSD) |

# Chemtech Environmental Limited

# ADDITIONAL INFORMATION

## Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.
For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.
Analytical results are inclusive of stones, where applicable.

# APPENDIX VII – **CHEMICAL LABORATORY TEST RESULTS**

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

# Final Report

| | |
|---|---|
| **Report No.:** | 23-16281-1 |
| **Initial Date of Issue:** | 24-May-2023 |
| **Re-Issue Details:** | |
| **Client** | Quantum Geotechnic Ltd |
| **Client Address:** | Plas Newydd<br>Llanedi<br>Pontarddulais<br>Swansea<br>SA4 0FQ |
| **Contact(s):** | Arwel Jones |
| **Project** | Q1114 Grandison Brook |
| **Quotation No.:** | Q23-30210 |
| **Order No.:** | |
| **No. of Samples:** | 1 |
| **Turnaround (Wkdays):** | 5 |
| **Date Approved:** | 24-May-2023 |
| **Approved By:** | |

| | |
|---|---|
| **Date Received:** | 17-May-2023 |
| **Date Instructed:** | 18-May-2023 |
| **Results Due:** | 24-May-2023 |

**Details:** Stuart Henderson, Technical Manager

# Results - Leachate

**Project: Q1114 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | | **Chemtest Job No.:** | | 23-16281 |
|---|---|---|---|---|---|---|
| Quotation No.: Q23-30210 | | | | **Chemtest Sample ID.:** | | 1640426 |
| Order No.: | | | | Client Sample Ref.: | | 1 |
| | | | | Sample Location: | | GBHP 06 |
| | | | | Sample Type: | | SOIL |
| | | | | Top Depth (m): | | 0.30 |
| | | | | Date Sampled: | | 15-May-2023 |
| **Determinand** | **Accred.** | **SOP** | **Type** | **Units** | **LOD** | |
| pH | U | 1010 | 10:1 | | N/A | 8.1 |
| Sulphate | U | 1220 | 10:1 | mg/l | 1.0 | 43 |
| Cyanide (Total) | U | 1300 | 10:1 | mg/l | 0.050 | < 0.050 |
| Arsenic (Dissolved) | U | 1455 | 10:1 | µg/l | 0.20 | 0.42 |
| Boron (Dissolved) | U | 1455 | 10:1 | µg/l | 10.0 | 18 |
| Cadmium (Dissolved) | U | 1455 | 10:1 | µg/l | 0.11 | < 0.11 |
| Copper (Dissolved) | U | 1455 | 10:1 | µg/l | 0.50 | 1.8 |
| Mercury (Dissolved) | U | 1455 | 10:1 | µg/l | 0.05 | < 0.05 |
| Nickel (Dissolved) | U | 1455 | 10:1 | µg/l | 0.50 | < 0.50 |
| Lead (Dissolved) | U | 1455 | 10:1 | µg/l | 0.50 | < 0.50 |
| Zinc (Dissolved) | U | 1455 | 10:1 | µg/l | 2.5 | < 2.5 |
| Chromium (Total) | N | 1455 | 10:1 | µg/l | 0.50 | 0.76 |
| Total TPH >C6-C40 | U | 1670 | 10:1 | µg/l | 10 | < 10 |
| Naphthalene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 |
| Acenaphthylene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 |
| Acenaphthene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 |
| Fluorene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 |
| Phenanthrene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 |
| Anthracene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 |
| Fluoranthene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 |
| Pyrene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 |
| Benzo[a]anthracene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 |
| Chrysene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 |
| Benzo[b]fluoranthene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 |
| Benzo[k]fluoranthene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 |
| Benzo[a]pyrene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 |
| Total Of 16 PAH's | U | 1800 | 10:1 | µg/l | 2.0 | < 2.0 |
| Total Phenols | U | 1920 | 10:1 | mg/l | 0.030 | < 0.030 |

# Results - Soil

**Project: Q1114 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 23-16281 |
|---|---|---|---|---|---|
| Quotation No.: Q23-30210 | | | **Chemtest Sample ID.:** | | 1640426 |
| Order No.: | | | Client Sample Ref.: | | 1 |
| | | | Sample Location: | | GBHP 06 |
| | | | Sample Type: | | SOIL |
| | | | Top Depth (m): | | 0.30 |
| | | | Date Sampled: | | 15-May-2023 |
| | | | Asbestos Lab: | | DURHAM |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | |
| ACM Type | U | 2192 | | N/A | - |
| Asbestos Identification | U | 2192 | | N/A | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | 15 |
| Soil Colour | N | 2040 | | N/A | Brown |
| Other Material | N | 2040 | | N/A | Stones |
| Soil Texture | N | 2040 | | N/A | Sand |
| pH | U | 2010 | | 4.0 | 7.4 |
| Boron (Hot Water Soluble) | U | 2120 | mg/kg | 0.40 | 0.93 |
| Sulphate (2:1 Water Soluble) as SO4 | U | 2120 | g/l | 0.010 | 0.035 |
| Cyanide (Total) | U | 2300 | mg/kg | 0.50 | < 0.50 |
| Arsenic | U | 2455 | mg/kg | 0.5 | 33 |
| Cadmium | U | 2455 | mg/kg | 0.10 | 0.68 |
| Chromium | U | 2455 | mg/kg | 0.5 | 16 |
| Copper | U | 2455 | mg/kg | 0.50 | 86 |
| Mercury | U | 2455 | mg/kg | 0.05 | 0.13 |
| Nickel | U | 2455 | mg/kg | 0.50 | 22 |
| Lead | U | 2455 | mg/kg | 0.50 | 120 |
| Zinc | U | 2455 | mg/kg | 0.50 | 200 |
| Organic Matter | U | 2625 | % | 0.40 | 6.6 |
| Total TPH >C6-C40 | U | 2670 | mg/kg | 10 | 37 |
| Naphthalene | U | 2800 | mg/kg | 0.10 | 0.27 |
| Acenaphthylene | N | 2800 | mg/kg | 0.10 | < 0.10 |
| Acenaphthene | U | 2800 | mg/kg | 0.10 | < 0.10 |
| Fluorene | U | 2800 | mg/kg | 0.10 | 0.12 |
| Phenanthrene | U | 2800 | mg/kg | 0.10 | 0.99 |
| Anthracene | U | 2800 | mg/kg | 0.10 | 0.25 |
| Fluoranthene | U | 2800 | mg/kg | 0.10 | 1.8 |
| Pyrene | U | 2800 | mg/kg | 0.10 | 1.3 |
| Benzo[a]anthracene | U | 2800 | mg/kg | 0.10 | 1.2 |
| Chrysene | U | 2800 | mg/kg | 0.10 | 1.5 |
| Benzo[b]fluoranthene | U | 2800 | mg/kg | 0.10 | 1.9 |
| Benzo[k]fluoranthene | U | 2800 | mg/kg | 0.10 | 0.59 |
| Benzo[a]pyrene | U | 2800 | mg/kg | 0.10 | 1.0 |
| Indeno(1,2,3-c,d)Pyrene | U | 2800 | mg/kg | 0.10 | 0.83 |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.10 | 0.25 |
| Benzo[g,h,i]perylene | U | 2800 | mg/kg | 0.10 | 0.61 |
| Total Of 16 PAH's | N | 2800 | mg/kg | 2.0 | 13 |

# Results - Soil

**Project: Q1114 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 23-16281 |
|---|---|---|---|---|---|
| Quotation No.: Q23-30210 | | | **Chemtest Sample ID.:** | | 1640426 |
| Order No.: | | | Client Sample Ref.: | | 1 |
| | | | Sample Location: | | GBHP 06 |
| | | | Sample Type: | | SOIL |
| | | | Top Depth (m): | | 0.30 |
| | | | Date Sampled: | | 15-May-2023 |
| | | | Asbestos Lab: | | DURHAM |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | |
| Total Phenols | U | 2920 | mg/kg | 0.10 | < 0.10 |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 1010 | pH Value of Waters | pH | pH Meter |
| 1220 | Anions, Alkalinity & Ammonium in Waters | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser. |
| 1300 | Cyanides & Thiocyanate in Waters | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Continuous Flow Analysis. |
| 1455 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1670 | Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO | Pentane extraction / GC FID detection |
| 1800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Pentane extraction / GCMS detection |
| 1920 | Phenols in Waters by HPLC | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded. | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection. |
| 2010 | pH Value of Soils | pH | pH Meter |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2040 | Soil Description(Requirement of MCERTS) | Soil description | As received soil is described based upon BS5930 |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2300 | Cyanides & Thiocyanate in Soils | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser. |
| 2455 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2670 | Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40 | Dichloromethane extraction / GC-FID |
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene* | Dichloromethane extraction / GC-MS |
| 2920 | Phenols in Soils by HPLC | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded. | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection. |
| 640 | Characterisation of Waste (Leaching C10) | Waste material including soil, sludges and granular waste | ComplianceTest for Leaching of Granular Waste Material and Sludge |

## Report Information

**Key**

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

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

**Sample Deviation Codes**

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

**Sample Retention and Disposal**

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

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

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

# Final Report

| | |
|---|---|
| **Report No.:** | 23-16559-1 |
| **Initial Date of Issue:** | 02-Jun-2023 |
| **Re-Issue Details:** | |
| **Client** | Quantum Geotechnic Ltd |
| **Client Address:** | Plas Newydd Farm<br>Llanedi<br>Pontarddulais<br>Swansea<br>SA4 0FQ |
| **Contact(s):** | Arwel Jones |
| **Project** | Q1114 Grandison Brook |
| **Quotation No.:** | Q23-30210 |
| **Order No.:** | |
| **No. of Samples:** | 3 |
| **Turnaround (Wkdays):** | 5 |
| **Date Approved:** | 02-Jun-2023 |
| **Approved By:** | |
| **Details:** | Stuart Henderson, Technical Manager |

| | |
|---|---|
| **Date Received:** | 19-May-2023 |
| **Date Instructed:** | 24-May-2023 |
| **Results Due:** | 31-May-2023 |

# Results - Leachate

**Project: Q1114 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | | **Chemtest Job No.:** | | 23-16559 | 23-16559 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q23-30210 | | | | **Chemtest Sample ID.:** | | 1641736 | 1641738 |
| Order No.: | | | | Client Sample Ref.: | | 2 | 1 |
| | | | | Client Sample ID.: | | GB-BH09 | GB-BH07 |
| | | | | Sample Type: | | SOIL | SOIL |
| | | | | Top Depth (m): | | 0.7 | 0.3 |
| **Determinand** | **Accred.** | **SOP** | **Type** | **Units** | **LOD** | | |
| pH | U | 1010 | 10:1 | | N/A | 7.3 | 6.8 |
| Sulphate | U | 1220 | 10:1 | mg/l | 1.0 | 10 | 13 |
| Cyanide (Total) | U | 1300 | 10:1 | mg/l | 0.050 | < 0.050 | < 0.050 |
| Arsenic (Dissolved) | U | 1455 | 10:1 | µg/l | 0.20 | 5.2 | 1.1 |
| Boron (Dissolved) | U | 1455 | 10:1 | µg/l | 10.0 | 48 | 46 |
| Cadmium (Dissolved) | U | 1455 | 10:1 | µg/l | 0.11 | < 0.11 | 0.36 |
| Copper (Dissolved) | U | 1455 | 10:1 | µg/l | 0.50 | 6.3 | 12 |
| Mercury (Dissolved) | U | 1455 | 10:1 | µg/l | 0.05 | < 0.05 | < 0.05 |
| Nickel (Dissolved) | U | 1455 | 10:1 | µg/l | 0.50 | 0.62 | 14 |
| Lead (Dissolved) | U | 1455 | 10:1 | µg/l | 0.50 | 12 | 27 |
| Zinc (Dissolved) | U | 1455 | 10:1 | µg/l | 2.5 | 38 | 300 |
| Chromium (Total) | N | 1455 | 10:1 | µg/l | 0.50 | < 0.50 | 0.78 |
| Total TPH >C6-C40 | U | 1670 | 10:1 | µg/l | 10 | < 10 | < 10 |
| Naphthalene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Acenaphthylene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Acenaphthene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Fluorene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Phenanthrene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Anthracene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Fluoranthene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Pyrene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Benzo[a]anthracene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Chrysene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Benzo[a]pyrene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Total Of 16 PAH's | U | 1800 | 10:1 | µg/l | 2.0 | < 2.0 | < 2.0 |
| Total Phenols | U | 1920 | 10:1 | mg/l | 0.030 | < 0.030 | < 0.030 |

# Results - Soil

**Project: Q1114 Grandison Brook**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 23-16559 | 23-16559 | 23-16559 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q23-30210 | | | **Chemtest Sample ID.:** | | 1641736 | 1641738 | 1641740 |
| Order No.: | | | Client Sample Ref.: | | 2 | 1 | 3 |
| | | | Client Sample ID.: | | GB-BH09 | GB-BH07 | GB-BH07 |
| | | | Sample Type: | | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.7 | 0.3 | 1.2 |
| | | | Asbestos Lab: | | DURHAM | DURHAM | DURHAM |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | |
| ACM Type | U | 2192 | | N/A | - | - | - |
| Asbestos Identification | U | 2192 | | N/A | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | 19 | 13 | 16 |
| Soil Colour | N | 2040 | | N/A | Brown | Brown | Black |
| Other Material | N | 2040 | | N/A | Stones | Stones | Stones |
| Soil Texture | N | 2040 | | N/A | Sand | Sand | Sand |
| pH | U | 2010 | | 4.0 | 6.8 | 6.8 | 8.1 |
| Boron (Hot Water Soluble) | U | 2120 | mg/kg | 0.40 | < 0.40 | < 0.40 | < 0.40 |
| Sulphate (2:1 Water Soluble) as SO4 | U | 2120 | g/l | 0.010 | < 0.010 | 0.047 | < 0.010 |
| Cyanide (Total) | U | 2300 | mg/kg | 0.50 | < 0.50 | < 0.50 | 1.7 |
| Arsenic | U | 2455 | mg/kg | 0.5 | 32 | 16 | 42 |
| Cadmium | U | 2455 | mg/kg | 0.10 | 0.65 | 1.4 | 3.6 |
| Chromium | U | 2455 | mg/kg | 0.5 | 11 | 14 | 40 |
| Copper | U | 2455 | mg/kg | 0.50 | 74 | 200 | 620 |
| Mercury | U | 2455 | mg/kg | 0.05 | 0.11 | 0.19 | 0.59 |
| Nickel | U | 2455 | mg/kg | 0.50 | 16 | 48 | 120 |
| Lead | U | 2455 | mg/kg | 0.50 | 190 | 430 | 1300 |
| Zinc | U | 2455 | mg/kg | 0.50 | 350 | 660 | 1400 |
| Organic Matter | U | 2625 | % | 0.40 | 40 | 48 | 48 |
| Total TPH >C6-C40 | U | 2670 | mg/kg | 10 | < 10 | 540 | 370 |
| Naphthalene | U | 2800 | mg/kg | 0.10 | 0.95 | 1.1 | 0.85 |
| Acenaphthylene | N | 2800 | mg/kg | 0.10 | < 0.10 | 0.23 | 0.16 |
| Acenaphthene | U | 2800 | mg/kg | 0.10 | < 0.10 | 0.54 | 0.24 |
| Fluorene | U | 2800 | mg/kg | 0.10 | 0.28 | 0.53 | 0.30 |
| Phenanthrene | U | 2800 | mg/kg | 0.10 | 1.4 | 6.7 | 3.7 |
| Anthracene | U | 2800 | mg/kg | 0.10 | 0.16 | 1.5 | 0.89 |
| Fluoranthene | U | 2800 | mg/kg | 0.10 | 0.48 | 11 | 6.3 |
| Pyrene | U | 2800 | mg/kg | 0.10 | 0.35 | 8.8 | 5.2 |
| Benzo[a]anthracene | U | 2800 | mg/kg | 0.10 | 0.28 | 5.5 | 3.3 |
| Chrysene | U | 2800 | mg/kg | 0.10 | 0.62 | 6.8 | 4.1 |
| Benzo[b]fluoranthene | U | 2800 | mg/kg | 0.10 | 0.59 | 8.2 | 4.6 |
| Benzo[k]fluoranthene | U | 2800 | mg/kg | 0.10 | 0.15 | 2.9 | 1.5 |
| Benzo[a]pyrene | U | 2800 | mg/kg | 0.10 | 0.19 | 5.4 | 3.2 |
| Indeno(1,2,3-c,d)Pyrene | U | 2800 | mg/kg | 0.10 | < 0.10 | 3.9 | 2.4 |
| Dibenz(a,h)Anthracene | N | 2800 | mg/kg | 0.10 | < 0.10 | 0.86 | 0.54 |
| Benzo[g,h,i]perylene | U | 2800 | mg/kg | 0.10 | < 0.10 | 3.5 | 2.1 |
| Total Of 16 PAH's | N | 2800 | mg/kg | 2.0 | 5.5 | 68 | 39 |
| Total Phenols | U | 2920 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 1010 | pH Value of Waters | pH | pH Meter |
| 1220 | Anions, Alkalinity & Ammonium in Waters | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser. |
| 1300 | Cyanides & Thiocyanate in Waters | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Continuous Flow Analysis. |
| 1455 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1670 | Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO | Pentane extraction / GC FID detection |
| 1800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Pentane extraction / GCMS detection |
| 1920 | Phenols in Waters by HPLC | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded. | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection. |
| 2010 | pH Value of Soils | pH | pH Meter |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2040 | Soil Description(Requirement of MCERTS) | Soil description | As received soil is described based upon BS5930 |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2300 | Cyanides & Thiocyanate in Soils | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser. |
| 2455 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2670 | Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40 | Dichloromethane extraction / GC-FID |
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene* | Dichloromethane extraction / GC-MS |
| 2920 | Phenols in Soils by HPLC | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded. | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection. |
| 640 | Characterisation of Waste (Leaching C10) | Waste material including soil, sludges and granular waste | ComplianceTest for Leaching of Granular Waste Material and Sludge |

## Report Information

**Key**

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

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

**Sample Deviation Codes**

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

**Sample Retention and Disposal**

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

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

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

UKAS TESTING
2183

# Final Report

| | |
|---|---|
| **Report No.:** | 23-18767-1 |
| **Initial Date of Issue:** | 09-Jun-2023 |
| **Re-Issue Details:** | |
| **Client** | Quantum Geotechnic Ltd |
| **Client Address:** | Plas Newydd Farm<br>Llanedi<br>Pontarddulais<br>Swansea<br>SA4 0FQ |
| **Contact(s):** | Arwel Jones |
| **Project** | Q1114 Grandson Brook, Briton Ferry |

| | | | |
|---|---|---|---|
| **Quotation No.:** | Q23-30210 | **Date Received:** | 02-Jun-2023 |
| **Order No.:** | | **Date Instructed:** | 05-Jun-2023 |
| **No. of Samples:** | 3 | | |
| **Turnaround (Wkdays):** | 5 | **Results Due:** | 09-Jun-2023 |
| **Date Approved:** | 09-Jun-2023 | | |

**Approved By:**

**Details:** Stuart Henderson, Technical Manager

# Results - Water

**Project: Q1114 Grandson Brook, Briton Ferry**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 23-18767 | 23-18767 | 23-18767 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q23-30210 | | | **Chemtest Sample ID.:** | | 1650675 | 1650676 | 1650677 |
| Order No.: | | | Client Sample Ref.: | | EW1 | EW1 | EW1 |
| | | | Sample Location: | | GB BH 07 | GB SW 01 | GB SW 02 |
| | | | Sample Type: | | WATER | WATER | WATER |
| | | | Top Depth (m): | | 1.93 | | |
| | | | Bottom Depth (m): | | 4.46 | | |
| | | | Date Sampled: | | 31-May-2023 | 31-May-2023 | 31-May-2023 |
| | | | Time Sampled: | | 9:30 | 9:50 | 10:20 |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | |
| pH | U | 1010 | | N/A | 6.8 | 7.5 | 7.8 |
| Biochemical Oxygen Demand | N | 1090 | mg O2/l | 4.0 | [B] < 4.0 | [B] < 4.0 | [B] < 4.0 |
| Chloride | U | 1220 | mg/l | 1.0 | 21 | 21 | 28 |
| Ammonia (Free) | N | 1220 | mg/l | 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Ammonium | U | 1220 | mg/l | 0.050 | 2.0 | 0.080 | < 0.050 |
| Ammoniacal Nitrogen | U | 1220 | mg/l | 0.050 | 1.6 | 0.063 | < 0.050 |
| Nitrate as NO3 | U | 1220 | mg/l | 0.50 | < 0.50 | 4.6 | 6.7 |
| Sulphate | U | 1220 | mg/l | 1.0 | 2.9 | 22 | 42 |
| Cyanide (Total) Low-Level | N | 1300 | mg/l | 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Cyanide (Free) Low-Level | N | 1300 | mg/l | 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Sulphide | U | 1325 | mg/l | 0.050 | [B] < 0.050 | [B] < 0.050 | [B] < 0.050 |
| Calcium (Dissolved) | U | 1455 | mg/l | 2.00 | | 24 | 47 |
| Total Hardness as CaCO3 | U | 1270 | mg/l | 15 | | 76 | 160 |
| Aluminium (Dissolved) | N | 1455 | µg/l | 5.0 | 17 | 7.8 | < 5.0 |
| Arsenic (Dissolved) | U | 1455 | µg/l | 0.20 | 0.58 | 1.0 | 1.4 |
| Boron (Dissolved) | U | 1455 | µg/l | 10.0 | 36 | 24 | 40 |
| Barium (Dissolved) | U | 1455 | µg/l | 5.00 | 58 | 21 | 39 |
| Beryllium (Dissolved) | U | 1455 | µg/l | 1.00 | < 1.0 | < 1.0 | < 1.0 |
| Cadmium (Dissolved) | U | 1455 | µg/l | 0.11 | < 0.11 | < 0.11 | < 0.11 |
| Copper (Dissolved) | U | 1455 | µg/l | 0.50 | 1.3 | 1.9 | 1.7 |
| Iron (Dissolved) | N | 1455 | µg/l | 5.0 | 100 | 120 | < 5.0 |
| Mercury (Dissolved) | U | 1455 | µg/l | 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Molybdenum (Dissolved) | U | 1455 | µg/l | 0.20 | 3.4 | 0.94 | 1.2 |
| Nickel (Dissolved) | U | 1455 | µg/l | 0.50 | 0.70 | 0.94 | 0.59 |
| Lead (Dissolved) | U | 1455 | µg/l | 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Antimony (Dissolved) | U | 1455 | µg/l | 0.50 | < 0.50 | 0.55 | 0.90 |
| Selenium (Dissolved) | U | 1455 | µg/l | 0.50 | < 0.50 | 0.68 | 1.7 |
| Vanadium (Dissolved) | U | 1455 | µg/l | 0.50 | < 0.50 | 0.62 | 0.66 |
| Zinc (Dissolved) | U | 1455 | µg/l | 2.5 | 23 | 13 | 17 |
| Chromium (Total) | N | 1455 | µg/l | 0.50 | 36 | 2.5 | 1.6 |
| Low-Level Chromium (Hexavalent) | U | 1495 | µg/l | 0.10 | [B] 0.35 | [B] 0.15 | [B] 0.28 |
| Dissolved Organic Carbon | U | 1610 | mg/l | 2.0 | | 2.9 | 2.4 |
| Total Organic Carbon | U | 1610 | mg/l | 2.0 | 15 | 2.7 | 2.2 |
| Aliphatic TPH >C5-C6 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C6-C8 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C8-C10 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C10-C12 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |

# Results - Water

**Project: Q1114 Grandson Brook, Briton Ferry**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 23-18767 | 23-18767 | 23-18767 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q23-30210 | | | **Chemtest Sample ID.:** | | 1650675 | 1650676 | 1650677 |
| Order No.: | | | Client Sample Ref.: | | EW1 | EW1 | EW1 |
| | | | Sample Location: | | GB BH 07 | GB SW 01 | GB SW 02 |
| | | | Sample Type: | | WATER | WATER | WATER |
| | | | Top Depth (m): | | 1.93 | | |
| | | | Bottom Depth (m): | | 4.46 | | |
| | | | Date Sampled: | | 31-May-2023 | 31-May-2023 | 31-May-2023 |
| | | | Time Sampled: | | 9:30 | 9:50 | 10:20 |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | |
| Aliphatic TPH >C12-C16 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C16-C21 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C21-C35 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C35-C44 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Aliphatic Hydrocarbons | N | 1675 | µg/l | 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Aromatic TPH >C5-C7 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C7-C8 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C8-C10 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C10-C12 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C12-C16 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C16-C21 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C21-C35 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C35-C44 | N | 1675 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Aromatic Hydrocarbons | N | 1675 | µg/l | 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Total Petroleum Hydrocarbons | N | 1675 | µg/l | 10 | < 10 | < 10 | < 10 |
| Benzene | U | 1760 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | U | 1760 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | U | 1760 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| m & p-Xylene | U | 1760 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-Xylene | U | 1760 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Naphthalene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthylene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluorene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Phenanthrene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Anthracene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluoranthene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Pyrene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[a]anthracene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Chrysene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[a]pyrene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 1800 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Of 16 PAH's | U | 1800 | µg/l | 2.0 | < 2.0 | < 2.0 | < 2.0 |

# Results - Water

**Project: Q1114 Grandson Brook, Briton Ferry**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 23-18767 | 23-18767 | 23-18767 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q23-30210 | | | **Chemtest Sample ID.:** | | 1650675 | 1650676 | 1650677 |
| Order No.: | | | Client Sample Ref.: | | EW1 | EW1 | EW1 |
| | | | Sample Location: | | GB BH 07 | GB SW 01 | GB SW 02 |
| | | | Sample Type: | | WATER | WATER | WATER |
| | | | Top Depth (m): | | 1.93 | | |
| | | | Bottom Depth (m): | | 4.46 | | |
| | | | Date Sampled: | | 31-May-2023 | 31-May-2023 | 31-May-2023 |
| | | | Time Sampled: | | 9:30 | 9:50 | 10:20 |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | |
| Total Phenols | U | 1920 | mg/l | 0.030 | < 0.030 | < 0.030 | < 0.030 |

# Deviations

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

| Sample: | Sample Ref: | Sample ID: | Sample Location: | Sampled Date: | Deviation Code(s): | Containers Received: |
|---|---|---|---|---|---|---|
| 1650675 | EW1 | | GB BH 07 | 31-May-2023 | B | Coloured Winchester 1000ml |
| 1650675 | EW1 | | GB BH 07 | 31-May-2023 | B | EPA Vial 40ml |
| 1650675 | EW1 | | GB BH 07 | 31-May-2023 | B | Plastic Bottle 1000ml |
| 1650676 | EW1 | | GB SW 01 | 31-May-2023 | B | Coloured Winchester 1000ml |
| 1650676 | EW1 | | GB SW 01 | 31-May-2023 | B | EPA Vial 40ml |
| 1650676 | EW1 | | GB SW 01 | 31-May-2023 | B | Plastic Bottle 1000ml |
| 1650677 | EW1 | | GB SW 02 | 31-May-2023 | B | Coloured Winchester 1000ml |
| 1650677 | EW1 | | GB SW 02 | 31-May-2023 | B | EPA Vial 40ml |
| 1650677 | EW1 | | GB SW 02 | 31-May-2023 | B | Plastic Bottle 1000ml |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 1010 | pH Value of Waters | pH | pH Meter |
| 1090 | Biochemical Oxygen Demand | Biochemical Oxygen demand (BOD) | Colorimetric determination of dissolved oxygen in seeded sample after 5 days incubation at 20°C. |
| 1220 | Anions, Alkalinity & Ammonium in Waters | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser. |
| 1270 | Total Hardness of Waters | Total hardness | Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO3 equivalent. |
| 1300 | Cyanides & Thiocyanate in Waters | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Continuous Flow Analysis. |
| 1325 | Sulphide in Waters | Sulphides | Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N–dimethyl-pphenylenediamine. |
| 1455 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1495 | Low Level Hexavalent Chromium in Waters | Chromium [VI] | Colorimetric determination of hexavalent chromium expressed as Cr (VI) µg/l in water, using Ion Chromatography and UV-visible spectrophotometry. |
| 1610 | Total/Dissolved Organic Carbon in Waters | Organic Carbon | TOC Analyser using Catalytic Oxidation |
| 1675 | TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG) | Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44 | Pentane extraction / GCxGC FID detection |
| 1760 | Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260) | Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds. |
| 1800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Pentane extraction / GCMS detection |
| 1920 | Phenols in Waters by HPLC | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded. | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection. |

## Report Information

**Key**

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

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

**Sample Deviation Codes**

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

**Sample Retention and Disposal**

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

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

# APPENDIX VIII – **GAS AND GROUNDWATER MONITORING RECORDS**

## LANDGAS & GROUNDWATER MONITORING RECORD SHEET



| | |
|---|---|
| Project Name: | Grandison Brook, Briton Ferry |
| Project No.: | Q1114 |
| BH/TP No.: | GBH07 |
| Instruments Used: | Water Dip Meter Probe, GA2000 Gas Anaylser |

| Installation Date: | | | | |
|---|---|---|---|---|
| GL (mAOD) | Pipe | Type | Installation Depth (mbgl) | Response Zone (mbgl) |
| 4.9 | A | 50mm | 2.50 | 1.0-2.5 |
| | | | | |

| Pipe | Date | Time (24hrs) | Atmos Pressure mBar | Differential Well Pressure mBar | Flow L/hr | $CH_4$ % | $CO_2$ % | $O_2$ % | CO ppm | $H_2S$ ppm | Water Level | | HoleDepth | | Local Weather | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | mbgl | mAOD | mbgl | mAOD | Recent | Current | |
| A | 31.5.23 | 08:45 | 1029 | -0.15 | 0.5 | 0.0 | 1.6 | 17.4 | 0 | 0 | 1.93 | | 4.46 | | Sunny | Sunny | |
| | | | | | | | | | | | | | | | | | |
| A | 19.06.23 | 12:30 | 1011 | -0.04 | 0.0 | 0.0 | 2.7 | 15.1 | 0 | 0 | 2.62 | | 4.36 | | Sunny | Sunny | |
| | | | | | | | | | | | | | | | | | |
| A | 6.07.23 | 08:45 | 1016 | -0.02 | 0.0 | 0.1 | 3.7 | 12.3 | 0 | 0 | 2.88 | | 4.35 | | Sunny | Sunny | |
| | | | | | | | | | | | | | | | | | |
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## LANDGAS & GROUNDWATER MONITORING RECORD SHEET



| | |
|---|---|
| Project Name: | Grandison Brook, Briton Ferry |
| Project No.: | Q1114 |
| BH/TP No.: | GBH09 |
| Instruments Used: | Water Dip Meter Probe, GA2000 Gas Anaylser |

| Installation Date: | | | | |
|---|---|---|---|---|
| GL (mAOD) | Pipe | Type | Installation Depth (mbgl) | Response Zone (mbgl) |
| 14.82 | A | 50mm | 4.65 | 1.0-4.65 |
| | | | | |

| Pipe | Date | Time (24hrs) | Atmos Pressure mBar | Differential Well Pressure mBar | Flow L/hr | $CH_4$ % | $CO_2$ % | $O_2$ % | CO ppm | $H_2S$ ppm | Water Level | | HoleDepth | | Local Weather | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | mbgl | mAOD | mbgl | mAOD | Recent | Current | |
| A | 31.5.23 | 10:00 | 1029 | -0.15 | 0.4 | 0.0 | 0.2 | 21.1 | 0 | 0 | Dry | | 2.80 | | Sunny | Sunny | |
| | | | | | | | | | | | | | | | | | |
| A | 19.06.23 | 13:00 | 1011 | -0.04 | 0.3 | 0.0 | 4.1 | 17.6 | 0 | 0 | 2.33 | | 2.80 | | Sunny | Sunny | |
| | | | | | | | | | | | | | | | | | |
| A | 6.07.23 | 09:15 | 1016 | -0.02 | -0.1 | 0.0 | 2.5 | 18.4 | 0 | 0 | 2.28 | | 2.81 | | Sunny | Sunny | |
| | | | | | | | | | | | | | | | | | |
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# GRANDISON BROOK
# PHASE 4
# GROUND INVESTIGATION
# FACTUAL LETTER REPORT

**Report No. Q1432GI/LR01**

| | | | |
|---|---|---|---|
| **PREPARED BY:** | Quantum Geotechnic Ltd | **DATE:** | 13/02/2024 |
| **CLIENT:** | Atkins | **AUTHOR:** | Arwel Jones |
| **PROJECT TITLE:** | Grandison Brook Phase 4 | **OUR REF:** | Q1432GI/LR01 |
| **RE:** | Ground Investigation Factual Letter Report | | |

## 1.0 Introduction

Upon the instructions of the Client, Atkins, Quantum Geotechnic Limited (QGL) was commissioned to undertake additional ground investigation work the proposed flood alleviation scheme for Grandison Brook, Briton Ferry.

QGL were requested to attend site and undertake investigative work to determine the ground conditions and locate an underground sewage pipe, together with establishing the thickness of concrete over the existing culvert.

The general location of the site is set out in Figure 1 below.

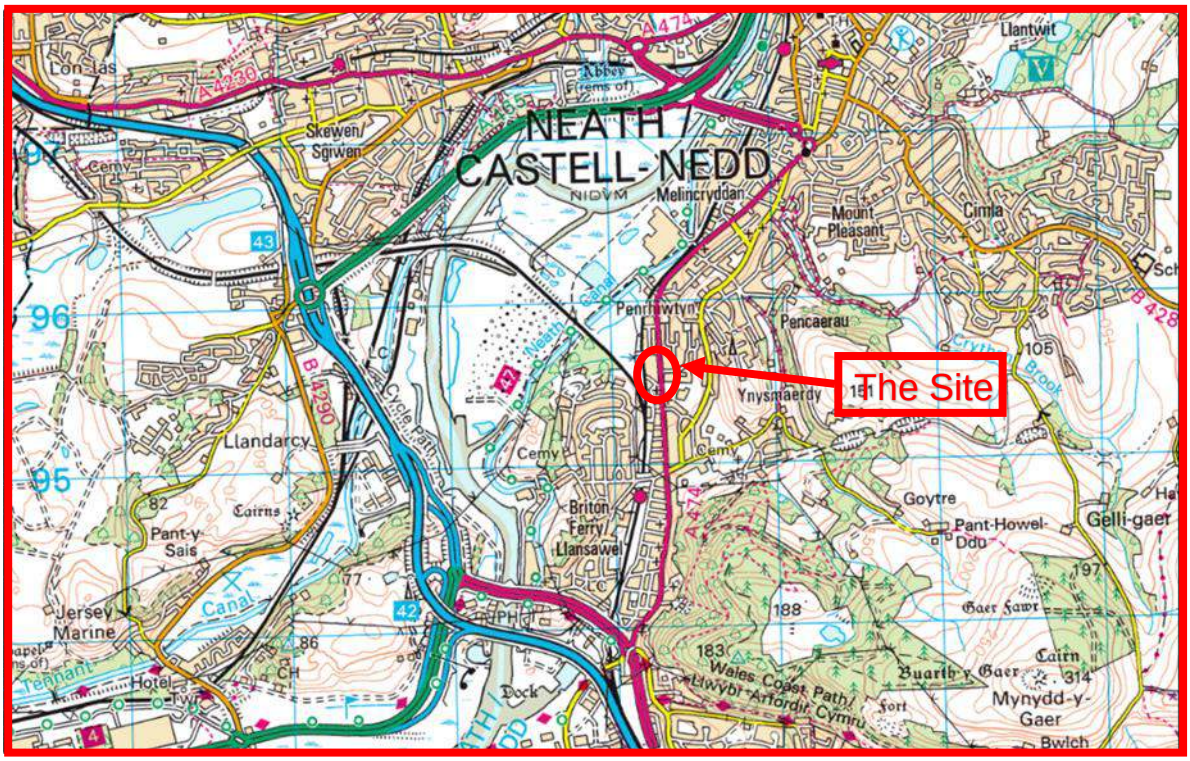



***Figure 1:*** Site location. Not to Scale *© Ordnance Survey*

This report sets out the existing conditions on site and the findings of the intrusive ground investigation.

## 1.1 Site Setting

The site is located in the Pant Yr Heol area of Briton Ferry, Neath and passes through residential areas, sports fields, Ysgol Carreg Hir, along Ynysymaerdy Road, through Jersey Park, across the A474

and through railway land towards the River Neath. This additional investigation was focused within the land to the rear of properties along Farm Road and adjacent culvert off A474 Pant Yr Heol.

The site is located at Ordnance Survey National Grid reference SS74264 95514.

## 1.2 Published Geology Review

Details of the published and inferred geology of the site are summarised as followed:

The British Geological Survey (BGS) sheet 1:50,000 247 (Swansea) indicates:-

*Superficial Deposits*

The site is predominantly underlain by Glacial Till deposits. Tidal Flat deposits are mapped along the northern boundary of the site.

*Bedrock Geology*

The site is mapped to be underlain by interbedded sandstone, siltstone and mudstone with coal seams of the Hughes Member and Brithdir Member.

## 1.3 Exploratory Hole Locations

The exploratory hole locations were specified by the Client and set out on site by QGL. All exploratory positions were surveyed accurately using a Leica GS08 GPS on completion. Table 1 below summarises the exploratory hole locations.

| Exploratory Hole ID | Easting | Northing | Ground Level (m.A.O.D) |
|---|---|---|---|
| GBTP05A | 274255.40 | 195514.55 | 5.10 |
| GBTP05B | 274225.08 | 195543.03 | 5.29 |
| GBCC01 | 274288.71 | 195516.06 | 5.65 |

***Table 1:*** *Exploratory Hole Locations*

An Exploratory Hole Location Plan is presented as Figure 1 in Appendix I.

## 2.0 Ground Investigation Works Undertaken

The fieldworks were undertaken on 23rd and 24th October 2023 and comprised the following:

- 2 No. Hand & Machine excavated shallow trial pits to locate sewage pipe;
- 1 No. Concrete Core;
- 2 No Stream Silt samples for Laboratory testing.

No incidents or near misses were recorded during the fieldworks. No deviations from Standards and Procedures adopted for the works were recorded. Each area of investigation was fully CAT ('Cable Avoidance Tool') scanned prior to breaking ground. Site supervision and attendance by an Engineering Geologist from QGL was provided on all aspects of the site works.

### *2.1 Intrusive Investigation Methods*

***Trial Pits***

Hand and Machine Excavated Trial Pitting techniques were used throughout the ground investigation using a 3tonne tracked excavator and insulated hand digging tools to expose services. Two trial pits (GBTP05A and GBTPB06A) were excavated. The purpose of these pits was to locate the existing sewage pipe and assess the shallow ground conditions around the services. This method of investigation allows direct sampling of the near surface deposits for identification purposes, as well as assessment of any salient features and Made Ground or disturbed ground. The Trial Pits were logged in accordance with BS5930:2015+A1:2020; BS EN ISO 14688-1:2018 and BS EN ISO 14688-2:2018, and supervised at all times by an Engineering Geologist from QGL. Each Trial Pit location was reinstated with compacted arisings.

Table 2 below details the depths achieved and location of services within each trial pit.

| Trial Pit I.D. | Sewage Pipe | | Termination Depth (mbgl) |
|---|---|---|---|
| | Depth to crown of pipe (mbgl) | Distance from Garden Wall | |
| GBTP05A | 1.1 | 1.6 | 1.3 |
| GBTP06A | 1.1 | 1.2 | 1.2 |

***Table 2:*** Termination depth of Trial Pits

A complete set of Engineer's Trial Pit logs are presented within Appendix II.

***Concrete Core***

One vertical Masonry core was undertaken to determine the thickness of concrete pad covering the existing Culvert at the Pant Yr Heol crossing.

The core was undertaken using a hydraulic Xcalibre Magnum diamond coring drill with a 100mm core barrel. On completion the core hole was backfilled with concrete.

A summary of the concrete core is presented in Table 3, with Engineer's Concrete Core log presented in Appendix III.

| Trial Pit I.D. | Angle | Length of Core (m) | Reinforcement |
|---|---|---|---|
| GBCC01 | Vertical | 0.57 | Yes - 10mm |

***Table 3:*** Concrete Core Summary

## *3.0 Laboratory Testing*

Environmental soil samples were taken in amber glass jars, vials and plastic tubs provided by the laboratory to suit the anticipated testing of two silt samples obtained from the stream passing through the adjacent land.

Geo-Environmental chemical testing was undertaken at Eurofins Chemtest ltd, Newmarket. All testing was scheduled by Atkins. The following suites of testing were scheduled:

- 2 No Suite E - Soil
- 2 No Suite H - WAC testing

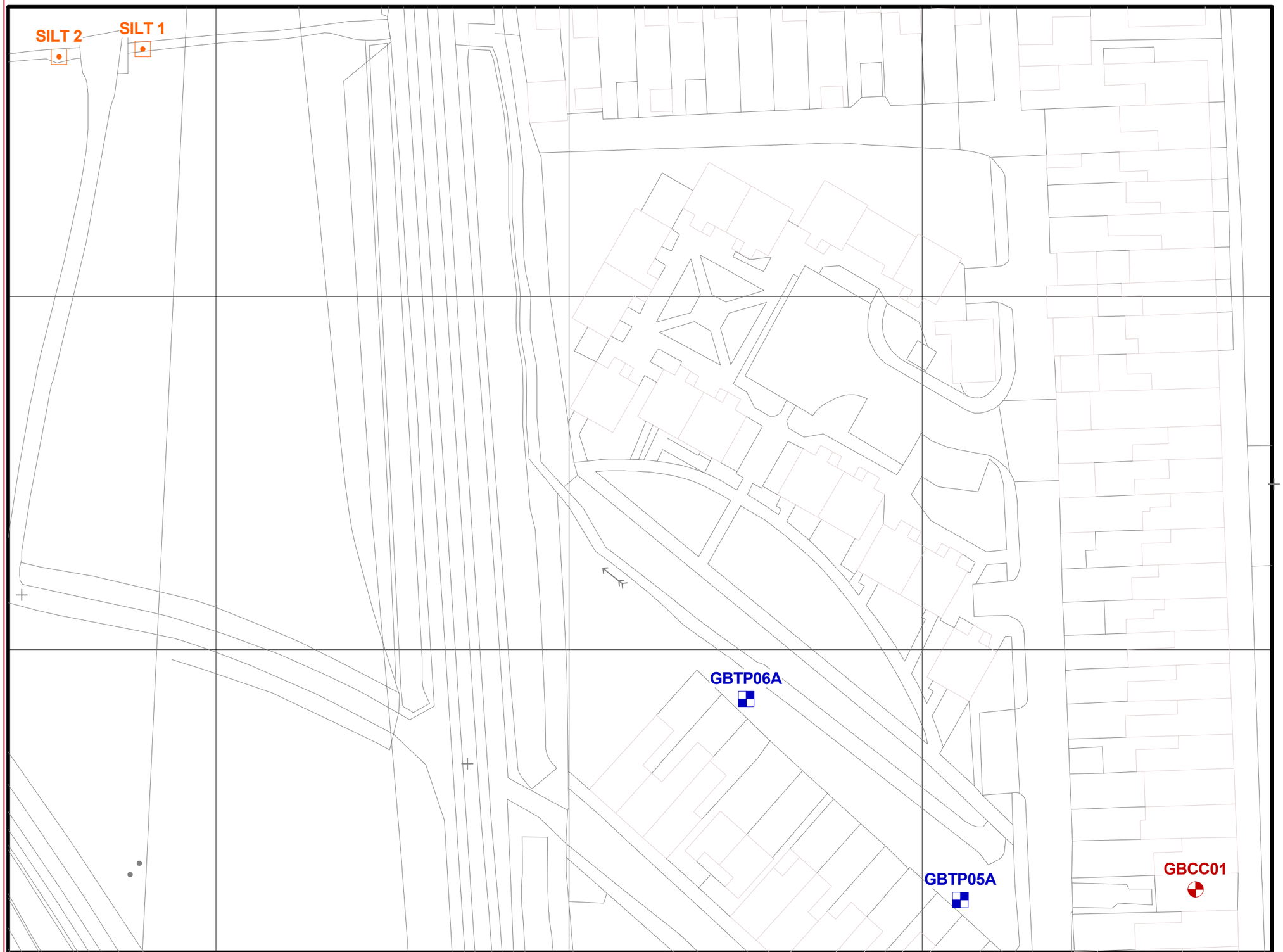
Laboratory test certificates are presented within Appendix IV.

We trust that the above is of assistance; however, if you need any further clarification or have any queries, please do not hesitate to contact us.

Best Regards

Arwel Jones
Project Manager
Quantum Geotech

## APPENDIX I – EXPLORATORY HOLE LOCATION PLAN

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KEY
Borehole
Trial Pit
Dynamic Probe
In-situ Test
Window Sample
Sampling Point
Historical Borehole

**PROJECT**
**GRANDISON BROOK PHASE 4**

**DRAWING TITLE:**
**EXPLORATORY HOLE LOCATION PLAN**

| JOB NO. | FIGURE NO. |
|---|---|
| Q1432 | 2 |
| DATE | SCALE |
| 14/02/24 | 1:550 |

## APPENDIX II – ENGINEERING GEOLOGIST TRIAL PIT LOGS

**Contract : Grandison Brook Phase 4**

**Client : Atkins**

**Trial Pit No. GBTP05A**

Dates : 23/11/23 - 23/11/23

Location : Brook Court

Job Number : Q1432

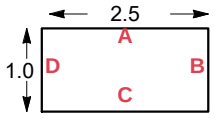
Engineer : Atkins

Ground Level : 5.10 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274255.40 E 195514.55 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.45 | Turf over TOPSOIL: Brown slightly gravelly clayey Sand with many rootletts. | | | |
| | | | | | 0.45 | MADE GROUND: Black silty slightly sandy Gravel with low cobble content of siltstone, brick and slag. Gravel is angular to sub angular fine to coarse siltstone, sandstone, ash, slag, brick and concrete, angular fine to medium coal with glass bottles and plastic. | | 4.65 | |
| | | | | | 0.85 | | | | |
| 1 | | | | | | 250mm Clay foul sewer pipe at 1.1mbgl, 1.6m from back of rear garden wall. | | | |
| | | | | | 1.30 | Trial Pit terminated at 1.3mbgl | | 3.80 | 1 |

**PLAN**




Groundwater: Slow water ingress at 1.3mbgl, Seepage at 1.1mbgl.

Stability: Sides collapsing

Shoring: None

Remarks: Trial Pit to establish depth and location of foul sewer.
Pit marked out using plan provided by client.
Area CAT and Genny scanned with permit to excavate issued by QGL.
Clay Foul sewer pipe located at 1.1mbgl, 1.6m from back of rear garden wall.
Trial Pit backfilled with arrisings, with Turf replaced at surface.

Equipment Used: 2.7tonne tracked excavator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email: enquiries@quantumgeotech.co.uk


| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| JJ | A Jones | 1 Of 2 | 3 | All measurements in metres unless otherwise stated |

AGS

| Contract : Grandison Brook Phase 4<br>Client : Atkins | | Trial Pit No.<br>GBTP05A |
|---|---|---|
| Dates : 23/11/23 - 23/11/23<br>Location : Brook Court | Job Number : Q1432<br>Engineer : Atkins | Ground Level : 5.10 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274255.40 E 195514.55 N *Co-ordinates to National Grid* |

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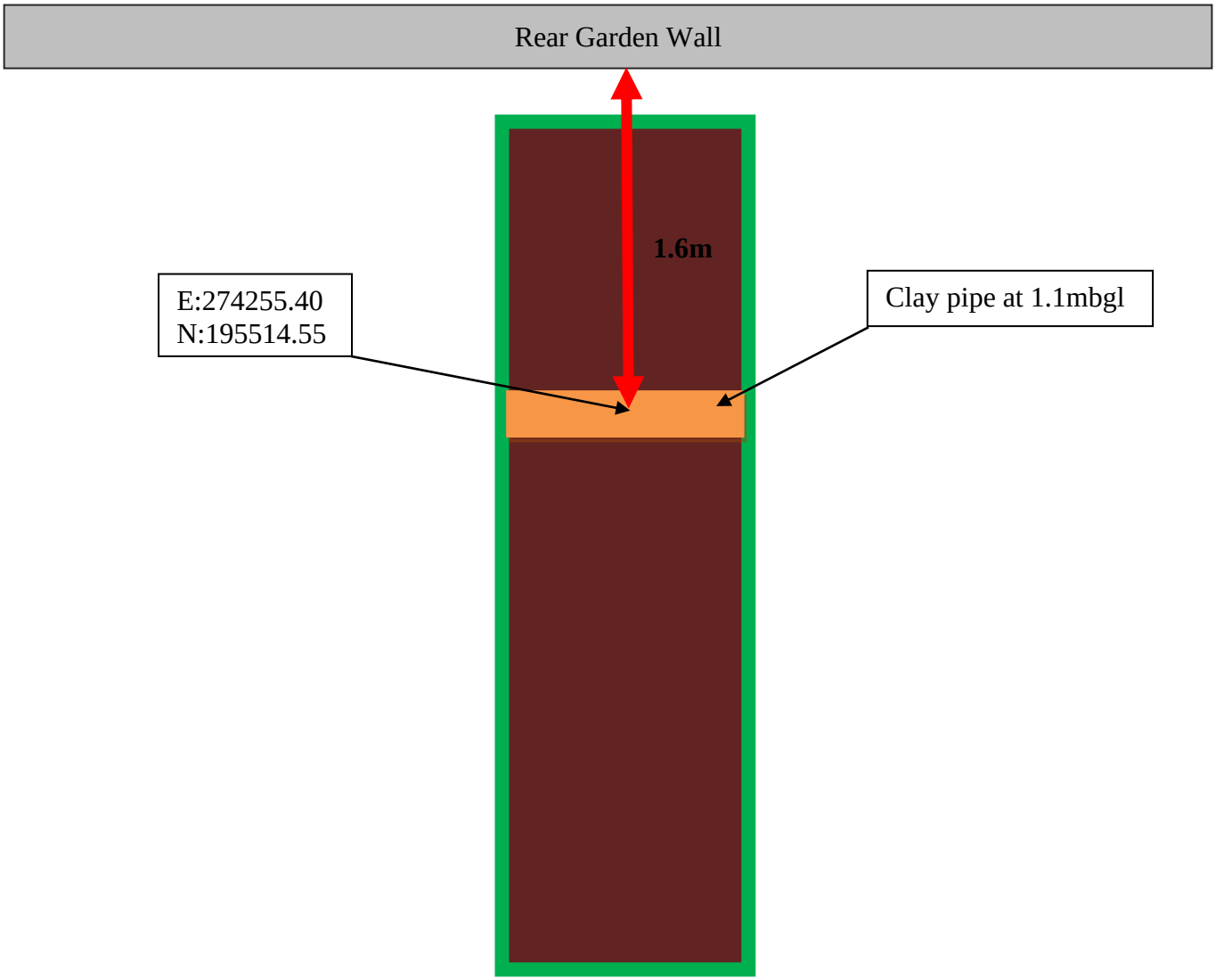
| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| JJ | A Jones | 2 Of 2 | | All measurements in metres unless otherwise stated |

AGS

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| | | |
|---|---|---|
| | **Grandison Brook Phase 4** | |
| | | **Scale: Not to Scale** |
| | **GBTP05A** | **Job No. Q1432** |

**Contract : Grandison Brook Phase 4**

**Client : Atkins**

**Trial Pit No. GBTP06A**

Dates : 23/11/23 - 23/11/23

Location : Brook Court

Job Number : Q1432

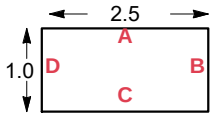
Engineer : Atkins

Ground Level : 5.29 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274225.08 E 195543.03 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.10 | Turf over TOPSOIL: Brown slightly gravelly clayey Sand with many rootletts. | | | |
| | | | | | 0.10 | MADE GROUND: Black silty slightly sandy Gravel with low cobble content of sandstone, brick and concrete. Gravel is angular to sub angular fine to coarse siltstone, sandstone, ash, brick and concrete, angular fine to medium coal with glass bottles and plastic. | | 5.19 | |
| | | | | | 0.50 | | | | |
| | | | | | 0.60 | MADE GROUND: Black sandy slightly gravelly SILT with low cobble content of brick. Gravel is angular to sub angular fine to coarse siltstone, sandstone and fine coal. | | 4.69 | |
| 1 | | | | | 0.60 | | | | |
| | | | | | 1.20 | Trial Pit terminated at 1.2mbgl | | 4.09 | |

**PLAN**




Groundwater: Seepage at 1.15mbgl, becoming very wet.

Stability: Sides collapsing

Shoring: None

Remarks: Trial Pit to establish depth and location of foul sewer.
Pit marked out using plan provided by client.
Area CAT and Genny scanned with permit to excavate issued by QGL.
Clay Foul sewer pipe located at 1.1mbgl, 1.2m from back of rear garden wall.
Trial Pit backfilled with arrisings, with Turf replaced at surface.

Equipment Used: 2.7tonne tracked excavator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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| JJ | A Jones | 1 Of 2 | 3 | All measurements in metres unless otherwise stated |

AGS

| Contract : Grandison Brook Phase 4<br>Client : Atkins | | Trial Pit No.<br>GBTP06A |
|---|---|---|
| Dates : 23/11/23 - 23/11/23<br>Location : Brook Court | Job Number : Q1432<br>Engineer : Atkins | Ground Level : 5.29 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274225.08 E 195543.03 N *Co-ordinates to National Grid* |

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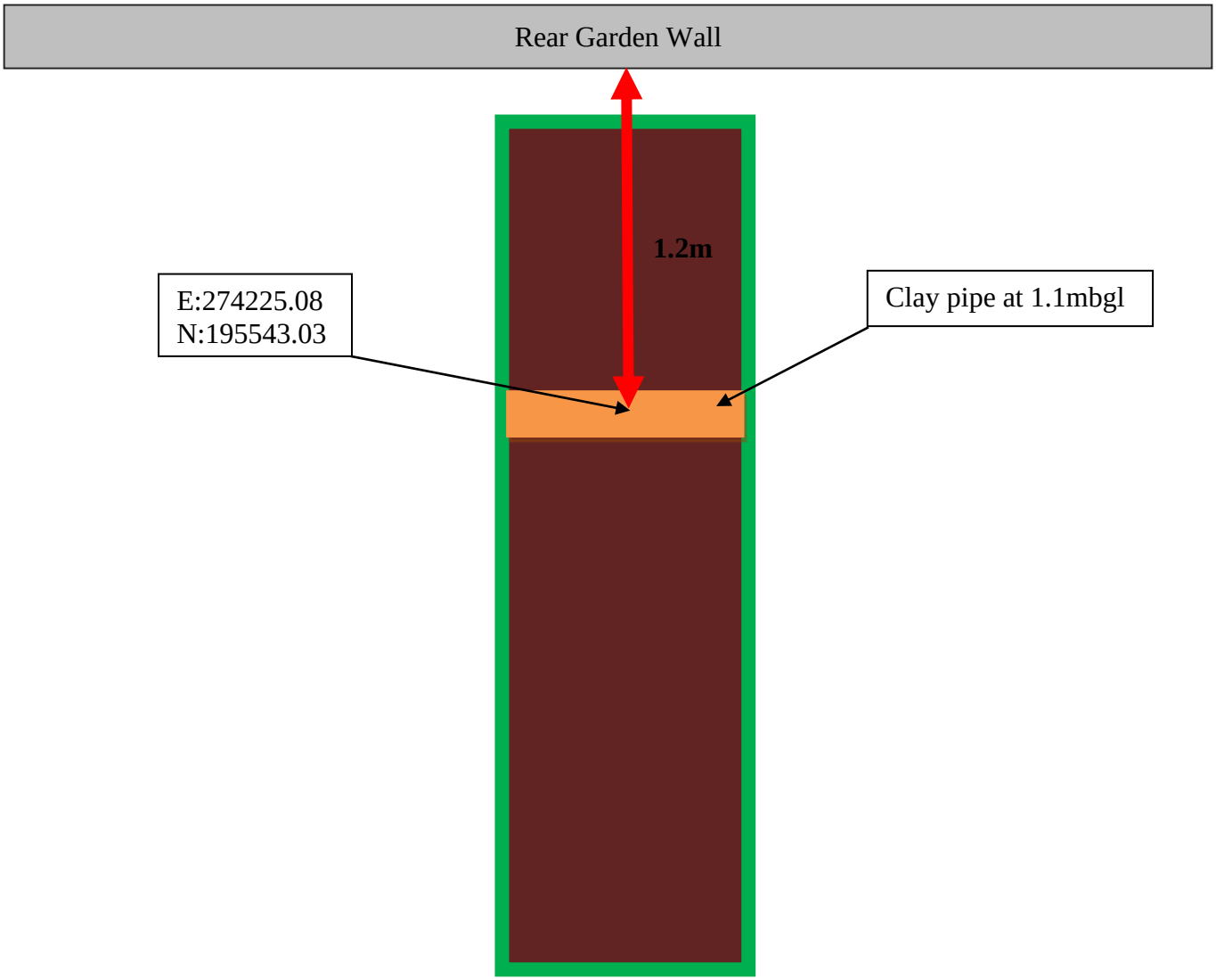
| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated | AGS |
|---|---|---|---|---|---|
| JJ | A Jones | 2 Of 2 | | | |

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**Grandison Brook Phase 4**

**Scale: Not to Scale**

**GBTP06A**

**Job No. Q1432**

## APPENDIX III – ENGINEERING GEOLOGIST CONCRETE CORE LOGS

**Contract : Grandison Brook Phase 4**

**Client : Atkins**

**Core No. GBCC01**

Dates : 24/11/23 - 24/11/23

Location : Pant yr Rheol Rd

Job Number : Q1432

Engineer : Atkins

Ground Level : 5.65 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274288.71 E 195516.06 N *Co-ordinates to National Grid*

**Core Diameter: 100mm Core Length: 0.57m**

| m Along Core Axis | Description | m Along Core Axis | Angle Of Fracture |
|---|---|---|---|
| | Strong, grey, CONCRETE (non-reinforced), 75-80% aggregate of fine to coarse, angular limestone and sandstone. | | |
| 0.1 | 10mm steel reinforcement at 0.08, 0.19 and 0.54mbgl. | 0.1 | |
| 0.2 | Drilling Induced fractures at 0.08, 0.12, 0.19, 0.25, 0.31, 0.39, 0.46 and 0.50mbgl | 0.2 | |
| 0.3 | | 0.3 | |
| 0.4 | | 0.4 | |
| 0.5 | | 0.5 | |
| | Core terminated at 0.57mbgl, on Base of core at 0.57m length | | |

**Equipment used:** Xcalibre Hydraulic Hand drill

**Remarks:** Core to establish the construction thickness over the culvert.

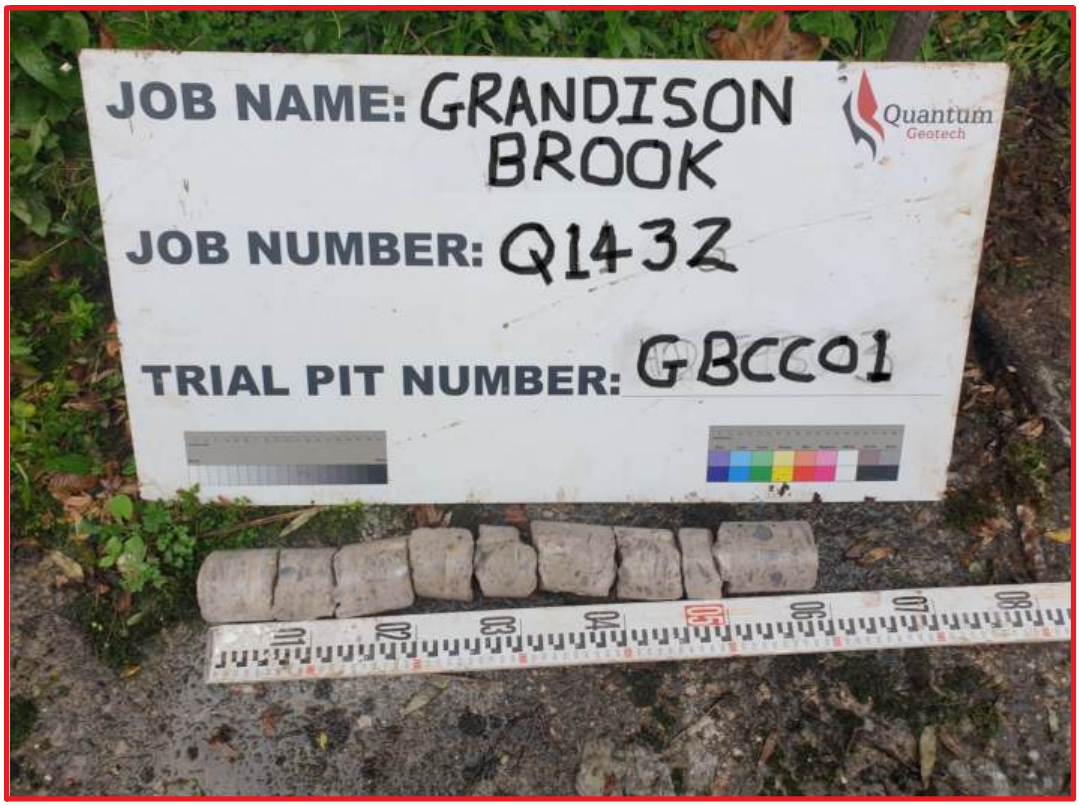
Quantum Geotech
Plas Newydd, Llanedi, Pontarddulais, Swansea
SA4 0FQ
Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| JJ | A Jones | 1 Of 2 | 1 | All measurements in metres unless otherwise stated |

AGS

| | | |
|---|---|---|
| **Contract : Grandison Brook Phase 4**<br>**Client : Atkins** | | **Core No. GBCC01** |
| Dates : 24/11/23 - 24/11/23<br>Location : Pant yr Rheol Rd | Job Number : Q1432<br>Engineer : Atkins | Ground Level : 5.65 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 274288.71 E 195516.06 N *Co-ordinates to National Grid* |

**Core Diameter: 100mm Core Length:0.57 m**




Quantum Geotech
Plas Newydd, Llanedi, Pontarddulais, Swansea
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Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| JJ | A Jones | 2 Of 2 | 1 | All measurements in metres unless otherwise stated |

AGS

## APPENDIX IV – LABORATORY TEST RESULTS

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

# Final Report

| | |
|---|---|
| **Report No.:** | 23-42377-1 |
| **Initial Date of Issue:** | 08-Jan-2024 |
| **Re-Issue Details:** | |
| **Client** | Spencer Quantum Ltd |
| **Client Address:** | Parcau Farm<br>Penrhiwllan<br>Llandysul<br>Ceredigion<br>SA44 5NW |
| **Contact(s):** | Arwel Jones |
| **Project** | Q1142 Grandison Brook Phase 4 |

| | | | |
|---|---|---|---|
| **Quotation No.:** | | **Date Received:** | 21-Dec-2023 |
| **Order No.:** | | **Date Instructed:** | 21-Dec-2023 |
| **No. of Samples:** | 2 | | |
| **Turnaround (Wkdays):** | 7 | **Results Due:** | 08-Jan-2024 |
| **Date Approved:** | 08-Jan-2024 | | |

**Approved By:**

**Details:** Stuart Henderson, Technical Manager

# Results - 2 Stage WAC

**Project: Q1142 Grandison Brook Phase 4**

| | | | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 23-42377 | | | | | | | | |
| **Chemtest Sample ID:** | 1749190 | | | | | | | | |
| **Sample Ref:** | | | | | | | | | |
| **Sample ID:** | | | | | | | | | |
| **Sample Location:** | Silt 1 | | | | | | | | |
| **Top Depth(m):** | | | | | | | | | |
| **Bottom Depth(m):** | | | | | | | | | |
| **Sampling Date:** | 24-Nov-2023 | | | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | M | % | | | 2.7 | 3 | 5 | 6 |
| Loss on Ignition | | | | | | | -- | -- | 10 |
| Total BTEX | 2760 | M | mg/kg | | | [B] < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | M | mg/kg | | | < 0.10 | 1 | -- | -- |
| TPH Total WAC | 2670 | M | mg/kg | | | [B] 160 | 500 | -- | -- |
| Total (Of 17) PAH's | 2700 | N | mg/kg | | | < 2.0 | 100 | -- | -- |
| pH at 20C | 2010 | M | | | | 8.3 | -- | >6 | -- |
| Acid Neutralisation Capacity | | | | | | | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **2:1 mg/l** | **8:1 mg/l** | **2:1 mg/kg** | **Cumulative mg/kg 10:1** | **Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg** | | |
| Arsenic | 1455 | U | < 0.0002 | 0.0010 | < 0.0002 | 0.0082 | 0.5 | 2 | 25 |
| Barium | 1455 | U | < 0.005 | < 0.005 | < 0.0005 | < 0.0005 | 20 | 100 | 300 |
| Cadmium | 1455 | U | < 0.00011 | < 0.00011 | < 0.00011 | < 0.00011 | 0.04 | 1 | 5 |
| Chromium | 1455 | U | < 0.0005 | 0.0016 | < 0.0005 | 0.014 | 0.5 | 10 | 70 |
| Copper | 1455 | U | < 0.0005 | 0.0014 | < 0.0005 | < 0.0005 | 2 | 50 | 100 |
| Mercury | 1455 | U | < 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | 0.01 | 0.2 | 2 |
| Molybdenum | 1455 | U | 0.0005 | 0.0004 | 0.0009 | 0.0043 | 0.5 | 10 | 30 |
| Nickel | 1455 | U | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | 0.4 | 10 | 40 |
| Lead | 1455 | U | < 0.0005 | 0.0010 | < 0.0005 | 0.0082 | 0.5 | 10 | 50 |
| Antimony | 1455 | U | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | 0.06 | 0.7 | 5 |
| Selenium | 1455 | U | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | 0.1 | 0.5 | 7 |
| Zinc | 1455 | U | 0.014 | 0.033 | 0.028 | 0.30 | 4 | 50 | 200 |
| Chloride | 1220 | U | < 1.0 | < 1.0 | < 10 | < 10 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.14 | 0.16 | < 1.0 | 1.6 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 1.3 | < 1.0 | < 10 | < 10 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 19 | 12 | 38 | 130 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.030 | < 0.30 | < 0.50 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 2.8 | 2.7 | < 50 | < 50 | 500 | 800 | 1000 |

| **Solid Information** | |
|---|---|
| Dry mass of test portion/kg | 0.175 |
| Moisture (%) | 18 |

| **Leachate Test Information** | |
|---|---|
| Leachant volume 1st extract/l | 0.312 |
| Leachant volume 2nd extract/l | 1.400 |
| Eluant recovered from 1st extract/l | 0.304 |

**Waste Acceptance Criteria**

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

# Results - 2 Stage WAC

**Project: Q1142 Grandison Brook Phase 4**

| | | | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 23-42377 | | | | | | | | |
| **Chemtest Sample ID:** | 1749191 | | | | | | | | |
| **Sample Ref:** | | | | | | | | | |
| **Sample ID:** | | | | | | | | | |
| **Sample Location:** | Silt 2 | | | | | | | | |
| **Top Depth(m):** | | | | | | | | | |
| **Bottom Depth(m):** | | | | | | | | | |
| **Sampling Date:** | 24-Nov-2023 | | | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | M | % | | | 3.2 | 3 | 5 | 6 |
| Loss on Ignition | | | | | | | -- | -- | 10 |
| Total BTEX | 2760 | M | mg/kg | | | [B] < 0.010 | 6 | -- | -- |
| Total PCBs (7 Congeners) | 2815 | M | mg/kg | | | < 0.10 | 1 | -- | -- |
| TPH Total WAC | 2670 | M | mg/kg | | | [B] 220 | 500 | -- | -- |
| Total (Of 17) PAH's | 2700 | N | mg/kg | | | < 2.0 | 100 | -- | -- |
| pH at 20C | 2010 | M | | | | 7.8 | -- | >6 | -- |
| Acid Neutralisation Capacity | | | | | | | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **2:1 mg/l** | **8:1 mg/l** | **2:1 mg/kg** | **Cumulative mg/kg 10:1** | **Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg** | | |
| Arsenic | 1455 | U | 0.0002 | 0.0005 | 0.0004 | 0.0047 | 0.5 | 2 | 25 |
| Barium | 1455 | U | < 0.005 | < 0.005 | < 0.0005 | < 0.0005 | 20 | 100 | 300 |
| Cadmium | 1455 | U | < 0.00011 | < 0.00011 | < 0.00011 | < 0.00011 | 0.04 | 1 | 5 |
| Chromium | 1455 | U | < 0.0005 | 0.0006 | < 0.0005 | 0.0050 | 0.5 | 10 | 70 |
| Copper | 1455 | U | 0.0006 | 0.0009 | 0.0011 | 0.0010 | 2 | 50 | 100 |
| Mercury | 1455 | U | < 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | 0.01 | 0.2 | 2 |
| Molybdenum | 1455 | U | 0.0006 | 0.0004 | 0.0012 | 0.0046 | 0.5 | 10 | 30 |
| Nickel | 1455 | U | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | 0.4 | 10 | 40 |
| Lead | 1455 | U | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | 0.5 | 10 | 50 |
| Antimony | 1455 | U | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | 0.06 | 0.7 | 5 |
| Selenium | 1455 | U | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | 0.1 | 0.5 | 7 |
| Zinc | 1455 | U | 0.013 | 0.027 | 0.025 | 0.24 | 4 | 50 | 200 |
| Chloride | 1220 | U | < 1.0 | < 1.0 | < 10 | < 10 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.14 | 0.13 | < 1.0 | 1.3 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 1.3 | < 1.0 | < 10 | < 10 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 18 | 11 | 36 | 120 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.030 | < 0.30 | < 0.50 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 2.8 | < 2.5 | < 50 | < 50 | 500 | 800 | 1000 |

| **Solid Information** | |
|---|---|
| Dry mass of test portion/kg | 0.175 |
| Moisture (%) | 16 |

| **Leachate Test Information** | |
|---|---|
| Leachant volume 1st extract/l | 0.316 |
| Leachant volume 2nd extract/l | 1.400 |
| Eluant recovered from 1st extract/l | 0.291 |

**Waste Acceptance Criteria**

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

# Deviations

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

| Sample: | Sample Ref: | Sample ID: | Sample Location: | Sampled Date: | Deviation Code(s): | Containers Received: |
|---|---|---|---|---|---|---|
| 1749190 | | | Silt 1 | 24-Nov-2023 | B | Amber Glass 250ml |
| 1749190 | | | Silt 1 | 24-Nov-2023 | B | Amber Glass 60ml |
| 1749190 | | | Silt 1 | 24-Nov-2023 | B | Plastic Tub 1000g |
| 1749191 | | | Silt 2 | 24-Nov-2023 | B | Amber Glass 250ml |
| 1749191 | | | Silt 2 | 24-Nov-2023 | B | Amber Glass 60ml |
| 1749191 | | | Silt 2 | 24-Nov-2023 | B | Plastic Tub 1000g |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 1020 | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters | Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters | Conductivity Meter |
| 1220 | Anions, Alkalinity & Ammonium in Waters | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser. |
| 1455 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1610 | Total/Dissolved Organic Carbon in Waters | Organic Carbon | TOC Analyser using Catalytic Oxidation |
| 1920 | Phenols in Waters by HPLC | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded. | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection. |
| 2010 | pH Value of Soils | pH at 20°C | pH Meter |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2040 | Soil Description(Requirement of MCERTS) | Soil description | As received soil is described based upon BS5930 |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2670 | Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40 | Dichloromethane extraction / GC-FID |
| 2700 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds) |
| 2760 | Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule | Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds. |
| 2815 | Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS | ICES7 PCB congeners | Acetone/Hexane extraction / GC-MS |
| 640 | Characterisation of Waste (Leaching C10) | Waste material including soil, sludges and granular waste | ComplianceTest for Leaching of Granular Waste Material and Sludge |
| 650 | Characterisation of Waste (Leaching WAC) | Waste material including soil, sludges and granular waste | ComplianceTest for Leaching of Granular Waste Material and Sludge |

## Report Information

**Key**

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

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

**Sample Deviation Codes**

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

**Sample Retention and Disposal**

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

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

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

# Final Report

| | |
|---|---|
| **Report No.:** | 23-42059-1 |
| **Initial Date of Issue:** | 05-Jan-2024 |
| **Re-Issue Details:** | |
| **Client** | Spencer Quantum Ltd |
| **Client Address:** | Parcau Farm<br>Penrhiwllan<br>Llandysul<br>Ceredigion<br>SA44 5NW |
| **Contact(s):** | Arwel Jones |
| **Project** | Q1142, GRANDISON BROOK PHASE 4 |

| | | | |
|---|---|---|---|
| **Quotation No.:** | Q23-33408 | **Date Received:** | 20-Dec-2023 |
| **Order No.:** | | **Date Instructed:** | 21-Dec-2023 |
| **No. of Samples:** | 2 | | |
| **Turnaround (Wkdays):** | 5 | **Results Due:** | 04-Jan-2024 |
| **Date Approved:** | 05-Jan-2024 | | |

**Approved By:**

**Details:** Stuart Henderson, Technical Manager

# Results - Soil

**Project: Q1142, GRANDISON BROOK PHASE 4**

| **Client: Spencer Quantum Ltd** | | | | **Chemtest Job No.:** | | 23-42059 | 23-42059 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q23-33408 | | | | **Chemtest Sample ID.:** | | 1748080 | 1748081 |
| Order No.: | | | | Client Sample Ref.: | | 1 | 2 |
| | | | | Sample Location: | | SILT 1 | SILT 2 |
| | | | | Sample Type: | | SOIL | SOIL |
| | | | | Date Sampled: | | 24-Nov-2023 | 24-Nov-2023 |
| | | | | Asbestos Lab: | | NEW-ASB | NEW-ASB |
| **Determinand** | **HWOL Code** | **Accred.** | **SOP** | **Units** | **LOD** | | |
| ACM Type | | U | 2192 | | N/A | - | - |
| Asbestos Identification | | U | 2192 | | N/A | No Asbestos Detected | No Asbestos Detected |
| Moisture | | N | 2030 | % | 0.020 | 18 | 16 |
| Soil Colour | | N | 2040 | | N/A | Brown | Brown |
| Other Material | | N | 2040 | | N/A | Stones and Roots | Stones and Roots |
| Soil Texture | | N | 2040 | | N/A | Clay | Clay |
| pH at 20C | | M | 2010 | | 4.0 | 8.3 | 7.8 |
| Boron (Hot Water Soluble) | | M | 2120 | mg/kg | 0.40 | 2.5 | < 0.40 |
| Sulphate (2:1 Water Soluble) as SO4 | | M | 2120 | g/l | 0.010 | 0.026 | < 0.010 |
| Cyanide (Total) | | M | 2300 | mg/kg | 0.50 | [B] < 0.50 | [B] < 0.50 |
| Arsenic | | M | 2455 | mg/kg | 0.5 | 23 | 24 |
| Cadmium | | M | 2455 | mg/kg | 0.10 | 0.13 | 0.18 |
| Chromium | | M | 2455 | mg/kg | 0.5 | 45 | 50 |
| Copper | | M | 2455 | mg/kg | 0.50 | 33 | 47 |
| Mercury | | M | 2455 | mg/kg | 0.05 | 0.08 | 0.10 |
| Nickel | | M | 2455 | mg/kg | 0.50 | 49 | 59 |
| Lead | | M | 2455 | mg/kg | 0.50 | 36 | 55 |
| Zinc | | M | 2455 | mg/kg | 0.50 | 130 | 150 |
| Organic Matter | | M | 2625 | % | 0.40 | 9.4 | 3.3 |
| Total TPH >C6-C40 | | M | 2670 | mg/kg | 10 | [B] < 10 | [B] 290 |
| Naphthalene | | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Acenaphthylene | | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Acenaphthene | | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Fluorene | | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Phenanthrene | | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Anthracene | | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Fluoranthene | | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Pyrene | | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Benzo[a]anthracene | | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Chrysene | | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene | | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Benzo[a]pyrene | | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | | M | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 |
| Total Of 16 PAH's | | N | 2800 | mg/kg | 2.0 | < 2.0 | < 2.0 |

# Results - Soil

**Project: Q1142, GRANDISON BROOK PHASE 4**

| **Client: Spencer Quantum Ltd** | | | | **Chemtest Job No.:** | | 23-42059 | 23-42059 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q23-33408 | | | | **Chemtest Sample ID.:** | | 1748080 | 1748081 |
| Order No.: | | | | Client Sample Ref.: | | 1 | 2 |
| | | | | Sample Location: | | SILT 1 | SILT 2 |
| | | | | Sample Type: | | SOIL | SOIL |
| | | | | Date Sampled: | | 24-Nov-2023 | 24-Nov-2023 |
| | | | | Asbestos Lab: | | NEW-ASB | NEW-ASB |
| **Determinand** | **HWOL Code** | **Accred.** | **SOP** | **Units** | **LOD** | | |
| Total Phenols | | M | 2920 | mg/kg | 0.10 | < 0.10 | < 0.10 |

# Deviations

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

| Sample: | Sample Ref: | Sample ID: | Sample Location: | Sampled Date: | Deviation Code(s): | Containers Received: |
|---|---|---|---|---|---|---|
| 1748080 | 1 | | SILT 1 | 24-Nov-2023 | B | Amber Glass 250ml |
| 1748080 | 1 | | SILT 1 | 24-Nov-2023 | B | Amber Glass 60ml |
| 1748080 | 1 | | SILT 1 | 24-Nov-2023 | B | Plastic Tub 1000g |
| 1748081 | 2 | | SILT 2 | 24-Nov-2023 | B | Amber Glass 250ml |
| 1748081 | 2 | | SILT 2 | 24-Nov-2023 | B | Amber Glass 60ml |
| 1748081 | 2 | | SILT 2 | 24-Nov-2023 | B | Plastic Tub 1000g |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 2010 | pH Value of Soils | pH at 20°C | pH Meter |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2040 | Soil Description(Requirement of MCERTS) | Soil description | As received soil is described based upon BS5930 |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2300 | Cyanides & Thiocyanate in Soils | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser. |
| 2455 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2670 | Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40 | Dichloromethane extraction / GC-FID |
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene* | Dichloromethane extraction / GC-MS |
| 2920 | Phenols in Soils by HPLC | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded. | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection. |

## Report Information

**Key**

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

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

**Sample Deviation Codes**

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

**Sample Retention and Disposal**

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

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

## DOCUMENT CONTROL

| | |
|---|---|
| **Contract Name:** | **Grandison Brook Phase 4** |
| **Contract Reference:** | **Q1432** |
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| **Report Reference:** | **Q1432GI/LR01** |
| **Date of Report Production:** | **February 2024** |
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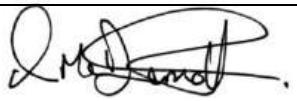
| 01 | 13/02/24 | A. Jones | P. Darby | R. McDermott |
| | | | |  |
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*Disclaimer: Quantum Geotechic Limited has prepared this report in accordance with the instructions of the above named Client for their sole and specific use. Any third parties who may use the information contained herein do so at their own risk.*

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# GRANDISON BROOK FLOOD ALEVIATION SCHEME – JERSEY PARK BOREHOLES GROUND INVESTIGATION FACTUAL REPORT

**Report No. Q1484/FR.01**

# GRANDISON BROOK FLOOD ALEVIATION SCHEME – JERSEY PARK BOREHOLES GROUND INVESTIGATION

# GROUND INVESTIGATION FACTUAL REPORT

# Report No. Q1484/FR.01 June 2024

## DOCUMENT CONTROL

| | |
|---|---|
| **Contract Name:** | **Grandison Brook Flood Alleviation Scheme – Jersey Park Boreholes Ground Investigation** |
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| **Date of Report Production:** | **June 2024** |
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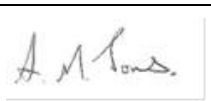
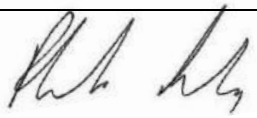
| 0.0 | 24/06/24 | A Jones | P. Darby | J. Stark |
| | |  |  | |
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## 0.0 FOREWORD

The following Conditions and Notes on Site Investigation Procedures should be read in conjunction with this report.

### 0.1 General

Recommendations made and opinions expressed in the report are based on the strata observed in the excavations, together with the results of site and laboratory tests. No responsibility can be held for conditions which have not been revealed by the Exploratory Holes or which occur between Exploratory Holes. Whilst the report may suggest the likely configuration of strata, both between Exploratory Holes and below the maximum depth of investigation, this is only indicative and liability cannot be accepted for its accuracy.

Unless specifically stated, no account has been taken of possible subsidence due to mineral extraction below or close to the site.

### 0.2 Investigation Procedures

Dynamic Sample Borehole techniques for ground investigation have been employed within the project. All Exploratory Hole operations, sampling and logging of soils, rocks and in-situ testing complies with the recommendations of the British Code of Practice BS 5930: 2015 'Site Investigations', British Code of Practice BS 10175: A2:2017 'Investigation of Potentially Contaminated Sites' and BS 1377: 1990, 'Methods of Test for Soils for Engineering Purposes'.

### 0.3 Routine Sampling

Representative bulk disturbed and environmental samples of the different strata are taken following completion of logging. These samples are sealed and labelled in clear plastic bags and 2kg plastic tubs. Soil samples obtained for environmental testing are sampled and sealed in borosilicate amber jars or in specialist vessels where required. Ground Water samples were sampled and sealed in borosilicate amber bottles or in specialist vessels where required All samples are returned from site to QGL's laboratory for controlled storage within 24 hours of sampling to await test scheduling/requirements.

### 0.4 In-Situ Testing, Surveying & Instrumentation

In-situ testing comprised:

- Standard Penetration Testing within Boreholes (SPT)
- All exploratory hole locations to be surveyed for location and elevation.
- PID testing

### 0.5 Groundwater

Where possible, the depth of entry of any influx of groundwater is recorded during the course of excavation or boring operations. The rate of inflow into the excavation or borehole is monitored during the course of the excavation or during boring procedures. Upon encountering any water strikes, work is temporarily halted and the water levels monitored for a standard twenty-minute period recording the change in water level at the end of the twenty minutes.

Groundwater conditions observed in the excavations are those appertaining to the period of investigation. It should be noted, however, that groundwater levels are subject to diurnal, seasonal and climatic variations and can also be affected by drainage conditions or other causes.

### 0.6 Retention of Samples

After satisfactory completion of all the scheduled laboratory tests on any sample, the remaining material is discarded. Further to notifying the Engineer/ Client with one week's notice all soil and/or rock samples not tested will be discarded 28 days after submission of the approved final report.

## 1.0 INTRODUCTION

### 1.1 General

Upon the instructions of Atkins, the scheme Engineer / Investigation Supervisor / Client, Quantum Geotechnic Limited (QGL) was commissioned to undertake a ground investigation works for the proposed flood alleviation scheme for Grandison Brook, Briton Ferry at Jersey Park.

The siteworks were carried out between 6th and 8th March 2024.

This report presents a factual account of the fieldwork carried out, includes descriptions of the strata encountered, available groundwater observations, details of in-situ testing undertaken, location of services encountered and provides results of subsequent laboratory testing of samples obtained from the investigation.

General notes on the techniques employed by QGL are described in the Foreword together with the limitations inherent in carrying out site investigation work.

### 1.2 Purpose of Ground Investigation

The purpose of the ground investigation is to determine the existing ground conditions on the site, to allow the design of the proposed attenuation tank as part of the Grandison Brook Flood Alleviation Schem culvert improvement works. This is the fifth phase of Ground Investigation carried out on the scheme by QGL.

The proposed culvert improvement works will involve the installation of a new culvert in the highway and through green spaces, also enclosing the current open channel within a culvert in some sections. The new culvert will rejoin the existing watercourse further downstream before it discharges into the River Neath. The Grandison Brook Flood Alleviation Scheme is required to mitigate flooding to properties within the vicinity of the Brook. This phase of investigation was undertaken in Jersey Park, Britton Ferry.

### 1.3 Initial Scope of Work

The aim of the ground investigation is to:

- Determine the nature and thickness of any Made Ground;
- Determine the nature and thickness of the Superficial Deposits;
- Recover suitable samples for geotechnical and geo-environmental laboratory testing;

The initial scope of works entails the following:

- 3 no. Dynamic Sampled Boreholes to maximum 8m depth

- In-Situ Testing
- Post fieldwork groundwater and ground gas monitoring

General

- Geotechnical and Geo-environmental Laboratory Testing.
- Factual reporting detailing the investigation.

General notes on the techniques employed by QGL are described in the Foreword together with the limitations inherent in carrying out ground investigation work.

## 2.0 SITE DETAIL

### 2.1 Site Description

The site is located within the recreational grounds of Jersey Park in the Ynysmaerdy area of Briton Ferry, Neath. The site is accessed through the park gates leading off Ynysmaerdy Road. The site is an asphalt surface comprising children's play area and open-air sport facilities.

The site is located at Ordnance Survey National Grid reference SS745949

QGL were the appointed Contractor for the works, under order number 5192793-003 issued on 13th February 2024.

The general extent of the site is shown in Figure 1 in Appendix I.

### 2.2 Statutory Service Information

All service information was held by the Client with the relevant plans and information made available to QGL prior to commencement of the intrusive works.

A permit to excavate was issued by QGL for all exploratory holes. Standard QGL procedures for breaking ground were followed and all areas were scanned using a cable avoidance tool. A hand dug trial pit was excavated to 1.2m prior to commencement of drilling where services may be at risk. All hand excavation was undertaken using insulated digging tools.

### 2.3 Published Geology

Details of the published and inferred geology of the site are summarised as followed:

The British Geological Survey (BGS) sheet 247(Swansea) 1:50,000 indicates,

*Superficial Deposits*

The site is predominantly underlain by Glacial Till deposits. Tidal Flat deposits are mapped along the northern boundary of the site.

*Bedrock Geology*

The site is mapped to be underlain by interbedded sandstone, siltstone and mudstone with coal seams of the Hughes Member and Brithdir Member.

## 3.0 FIELDWORK

### 3.1 General

A summary of the works completed and covered by this report are given below:

- 3 No. Dynamic Sampled boreholes. (GB-BH10 - GB-BH12)
- In-situ testing and sampling.
- Post fieldwork groundwater and ground gas monitoring.

Full time site supervision and attendance from QGL was undertaken on all aspects of the site works and subsequent reinstatement works of all exploratory hole locations. All service plans were held onsite, with all site personnel inducted by QGL and briefed of the pertinent Risk Assessments and Method Statements relating to the tasks to be undertaken.

The borehole locations were subject to a 1.2m deep service / utility inspection pit prior to any drilling. Also, each area of investigation was fully eCAT4+ ('Cable Avoidance Tool') scanned prior to breaking ground.

### 3.2 Exploratory Hole Locations

The exploratory hole locations were specified by Atkins and set out on site by QGL using the co-ordinates provided.

Exploratory Hole Location Plans are presented as Figure 2 in Appendix I and the Exploratory Hole co-ordinates and levels are detailed within Table 1 below.

***Table 1:*** *Exploratory Hole Co-Ordinates & Levels*

| Exploratory Hole | Easting | Northing | Height (mAOD) |
|---|---|---|---|
| GB-BH10 | 274578.96 | 194916.75 | 14.75 |
| GB-BH11 | 274569.43 | 194934.25 | 14.42 |
| GB-BH12 | 274565.07 | 194970.34 | 14.30 |

### 3.3 Boreholes

***Percussive Rotary (Dynamic Sampling) Boreholes***

A Commachio MC205 rubber track-mounted rotary drilling rig was used to progress the boreholes to depths of 8.0mbgl (below ground level)..

Each Borehole was drilled using dynamic sampling methods through the superficial deposits with an ODEX casing system. Dynamic Sampling is a technique whereby a hydraulically driven percussive hammer

attached to the head of the drill rig mast is used to drive a 1.00m length, 101mm diameter, steel sampling tube through the soils to obtain undisturbed samples within 87mm core liner.

On encountering an obstruction or refusal of the Dynamic sample barrel, all boreholes were continued and kept open using an ODEX casing system of 115mm diameter. A combined air/mist flush was used to clear the hole of returns and debris.

In-situ testing was carried out in all boreholes (see section 3.4.1.).

Details of the exploratory holes, including final depths in metres below ground level (mbgl) and SPT Hammer used are provided below in Table 2.

***Table 2:*** *Borehole details*

| Exploratory Hole ID | Drilling method | SPT Hammer Reference | Termination Depth (mbgl) | Notes/Reason for Termination |
|---|---|---|---|---|
| GB-BH10 | Dynamic Sampling | AR830 | 8.0 | Scheduled Depth |
| GB-BH11 | Dynamic Sampling | AR830 | 8.0 | Scheduled Depth |
| GB-BH12 | Dynamic Sampling | AR830 | 8.0 | Scheduled Depth |

The Engineering Geologist's borehole logs are presented within Appendix II.

A 50mm dual gas and groundwater monitoring standpipe was installed in all boreholes, records of the post fieldwork monitoring are presented in Appendix III.

### 3.4 Land gas and Groundwater Standpipe Installations

50mm internal diameter standpipes were installed in all boreholes for the purposes of land gas and groundwater monitoring and sampling.

Monitoring standpipes consist of plastic pipework set in filter aggregate (pea gravel) forming a well. The filter is sealed at one or both ends by use of bentonite pellets which 'go off' and become watertight. Parts of the pipe itself are slotted, allowing the infiltration of groundwater which can then be accessed through the pipe from ground level. Slotted sections are covered by 'geo-sock' to reduce the intrusion of silt into the standpipes and the range of depths at which the groundwater is intercepted is known as the 'response zone'.

Standpipes were installed using a combination of 1m and 3m lengths of pipework (threaded at either end) fitted together and lowered into the borehole. The boreholes were then filled with either pea gravel or bentonite pellets (depending on which zone or level) and cemented in place at ground level with a steel

flush cover.

Each standpipe installation was designed by the Investigation Supervisor and instructed on site, after the completion of each borehole. All standpipe installations were sealed above the response zone by a minimum of 0.50m of bentonite pellets.

A summary of the pipe installation details is presented in Table 3

***Table 3:*** *Borehole Installation Details*

| Exploratory Hole ID | Installation Pipe ID | Standpipe Diameter (Internal mm) | Response Zone (mbgl) | | Total Standpipe Length (m) |
|---|---|---|---|---|---|
| | | | Top | Bottom | |
| GB-BH10 | A | 50 | 2.00 | 8.00 | 8.00 |
| GB-BH11 | A | 50 | 2.00 | 8.00 | 8.00 |
| GB-BH12 | A | 50 | 1.00 | 8.00 | 8.00 |

## 3.5 In-Situ Testing

### *3.5.1 Standard Penetration Testing*

Standard penetration tests (SPTs) were undertaken within all boreholes, at intervals specified by Redstart.

This is a dynamic test as described in BS EN ISO 22476-3:2005 + A1:2011. Within fine grained or cohesive soils, the test incorporates a small diameter tube (650mm length, 50mm external diameter and 35mm internal diameter) with a cutting shoe known as the 'split barrel sampler'. The sampler is forced into the soil dynamically using blows from a 63.5kg hammer dropped through 760mm. The sampler is initially advanced 150mm into the soil with seating blows, then the number of blows required to advance the sampler each 75mm increment up to a depth of 300mm is recorded. This cumulative total number of blows over the 300mm test is referred to as the "N" value. For coarse gravels and bedrock the split barrel is replaced by a 60° cone (SPT(C) - Standard Penetration Test (Cone)). SPT/SPT(C) results are detailed within the relevant borehole Logs. The SPT calibration certificate for the SPT hammer used during this investigation is presented in Appendix II.

### *3.5.2 Headspace Testing*

All environmental soil samples collected were screened using a calibrated Photoionisation Detector onsite to measure isobutylene, prior to being sent to the laboratory.

Soil is placed in a sealed plastic bag, half-filled to allow airspace above the soil and left a period of no less than one hour prior to screening.

Measurements are detailed within the exploratory hole logs included within Appendix II.

### 3.6 Soil, Groundwater and Surface Water Sampling

Disturbed samples of soil were taken in clear sealed plastic bags and white plastic tubs. Environmental samples were taken at various depths as noted on the relevant logs.

Environmental soil samples were taken in amber glass jars, vials and plastic tubs provided by the laboratory to suit the anticipated testing.

Groundwater samples were collected during post fieldwork monitoring rounds.All water samples were collected in the required vials, plastic and glass bottles.

The environmental soil and water samples were dispatched to Chemtest, Newmarket using a daily courier service for storage awaiting testing instructions from the Engineer.

Geotechnical samples were returned from site to QGL's laboratory for controlled storage to await test scheduling/requirements. For specific details of laboratory testing see Section 4.0.

### 3.7 Post-Fieldwork Monitoring

Following completion of the siteworks, QGL have undertake 3 No. monitoring visits to record land gas and groundwater within the installed borehole standpipes.

Monitoring comprised groundwater and ground gas monitoring. Gas monitoring was undertaken using a GA2000 gas analyser to measure the following:

- Atmospheric pressure
- Flow rates (L/hr)
- Methane
- Carbon Dioxide
- Oxygen
- Carbon Monoxide
- Hydrogen Sulphide

Results are presented within Appendix III.

## 4.0 LABORATORY TESTING

### 4.1 General

The laboratory testing was scheduled by Atkins and comprised a number of geotechnical classification and performance tests as well as chemical testing on selected soil samples and ground water samples recovered from the investigation.

### 4.2 Geotechnical Testing

Geotechnical classification and performance testing was undertaken at QGL's approved UKAS accredited laboratory at GSTL, Llanelli.

Geotechnical tests undertaken on selected soil samples are listed below. All the geotechnical soil testing work was carried out in accordance with the procedures stipulated in the various sections of BS 1377:1990 "Methods of test for soils for civil engineering purposes" and to UKAS accreditation where applicable and chemical testing carried out in accordance with BRE Special Digest 1:2005 "Concrete in aggressive ground".

Geotechnical soil testing undertaken:

- 16 No. Moisture content
- 9 No. Liquid limit, plastic limit and plasticity index
- 9 No. Particle size distribution by wet sieving
- 8 No. Sedimentation by Pipette
- 2 No. Organic Matter
- 2 No. BRE Reduced Suite

Geotechnical Laboratory Test results are presented in Appendix IV.

### 4.3 Geo-Environmental Testing

Geo-Environmental chemical testing was undertaken at Eurofins Chemtest ltd, Newmarket. All testing was scheduled by Atkins. The following suites of testing were scheduled:

- 6 No Suite E (Soil)
- 2 No. Suite F (Leachate)

Chemical Laboratory Test results are presented in Appendix V.

## 5.0 REFERENCES

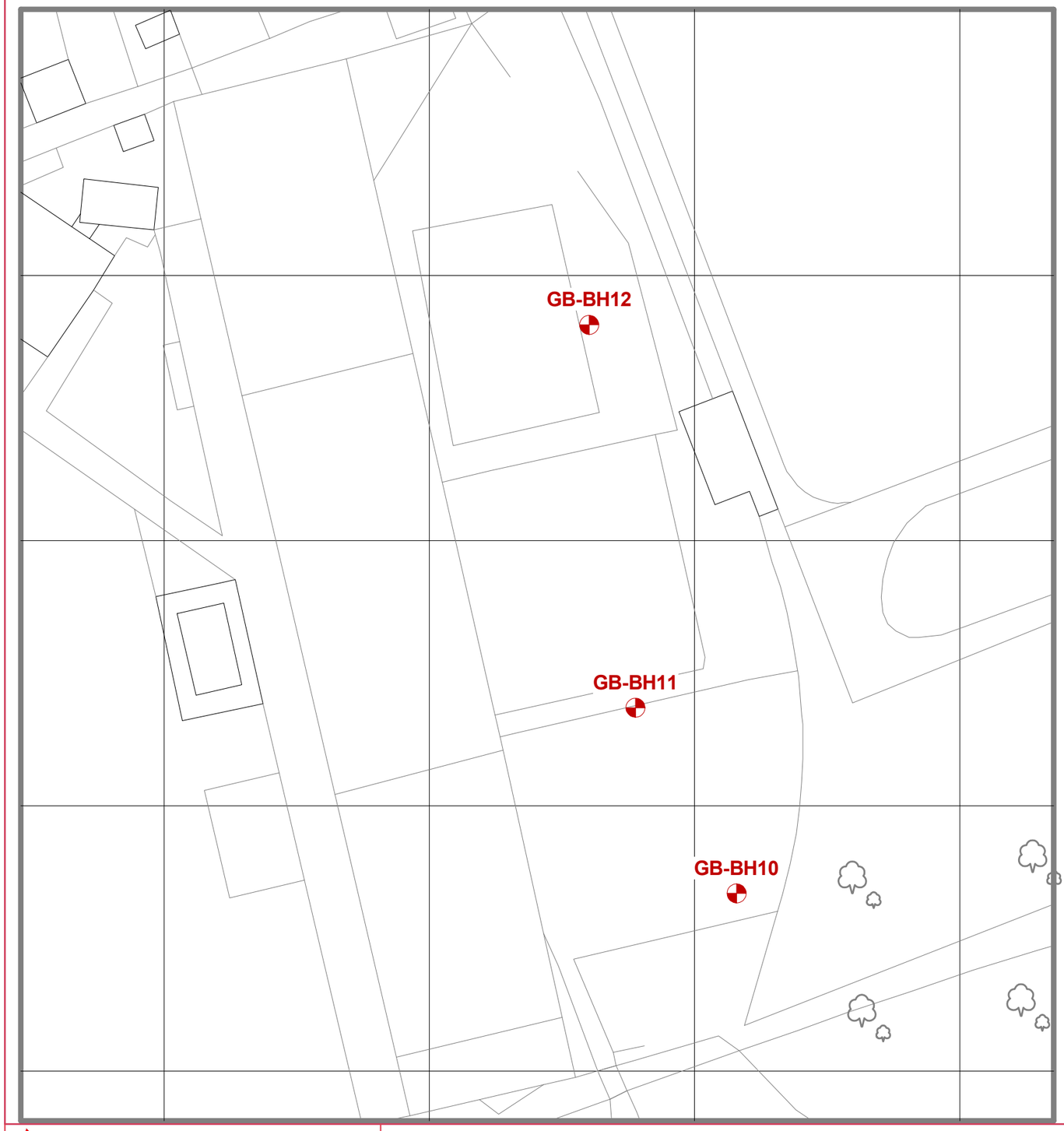
British Geological Survey:

- The British Geological Survey (BGS) sheet 1:50,000 247 (Swansea)
- BGS Geology of Britain Viewer (www.bgs.ac.uk)

Specialist Publications:-

- British Code of Practice BS 5930:2015 *'Code of Practice for Site Investigations'*
- British Code of Practice BS 1377:1990 *'Methods of test for soils for civil engineering purposes'.*
- British Code of Practice BS EN ISO 14688-1:2002+A2:2013 investigation and testing. Identification and classification of soil. Identification and description
- British Code of Practice BS EN ISO 14688-2:2004+A2:2013 Geotechnical investigation and testing. Identification and classification of soil. Principles for a classification.
- British Code of Practice BS EN ISO 14689-1:2003 Ground Investigation and Testing – Identification and classification of rock
- Health and Safety Executive Guidance Note EH40/90
- *CIRIA Report 143* 'The Standard Penetration Test (SPT): Methods and Use', 1995.
- BRE (2005) Special Digest 1:2005, 3rd Edition, Concrete in aggressive ground. BRE, Garston.
- BS 6031: 2009 Code of Practice for Earthworks.
- Workmanship for excavation shall comply with BS 8000: 1989 Part 1, Sections 3.1, 3.2 and 3.3.
- Specification for Highway Works (MCHW 1), Volume 1, Series 600 & Series 800, 2006 with Amendment 2016
- ICE UK Specification for Ground Investigation Second Edition.
- Design Manual for Roads and Bridges: Volume 7 Pavement Design and Maintenance
- Specification for Highways Works Series 600 Earthworks
- Highways Agency Interim Advice Note 73/06, Rev 1 2009, Clause 7.7

# APPENDIX I – **SITE PLANS AND FIGURES**

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KEY

Borehole | Trial Pit | Dynamic Probe | In-situ Test
Window Sample | Sampling Point | Historical Borehole

**PROJECT**
GRANDISON BROOK FAS - JERSEY PARK BOREHOLES

**DRAWING TITLE:**
EXPLORATORY HOLE LOCATION PLAN

| JOB NO. | FIGURE NO. |
|---|---|
| Q1484 | 2 |
| DATE | SCALE |
| 04/04/24 | 1:450 |

# APPENDIX II – **BOREHOLE LOGS**

**Contract :** Grandison Brook FAS - Jersey Park Boreholes

**Client :** Atkins

**Borehole No.** GB-BH10

Dates : 7/3/24 - 8/3/24

Location :

Job Number : Q1484

Engineer : Atkins

Ground Level : 14.75 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274578.96 E, 194916.75 N *Co-ordinates to National Grid*

| m B.G.L. | Run Details: Core Run | TCR % | SCR % | RQD % | Fractures: Min Avg Max | FI | Insitu Tests: Depth | Test Results | Samples: Depth | Type No. Blows | Strata: Depth (Thick-ness) | Description | Legend | Red. Level A.O.D. | Water | Install/ Backfill |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | 0.10 - 0.20 | B1 | (0.08) | TARMAC | | | | |
| | | | | | | | | | | | 0.08 | | | 14.67 | | |
| | | | | | | | | | 0.20 | ES1 | (0.22) | MADE GROUND: Dark grey slightly silty slightly sandy GRAVEL. Gravel is angular to sub angular fine to coarse sandstone with plastic. | | | | |
| | | | | | | | | | | | 0.30 | | | 14.45 | | |
| | | | | | | | | | | | (0.15) | Very strong CONCRETE | | | | |
| | | | | | | | | | 0.50 - 1.00 | B2 | 0.45 | | | 14.30 | | |
| | | | | | | | | | 0.50 | ES2 | | MADE GROUND: Dark grey slightly silty slightly sandy GRAVEL with high cobble content of sandstone. Gravel is angular to sub angular fine to coarse sandstone and siltstone with rare pottery. | | | | |
| 1 | | | | | | | | | 1.00 | ES3 | | | | | | |
| | 1.20 | 0 | | | | | 1.2 | SPT (S) 50/5mm (2-23/0mm-**50/5mm**---) | | | (1.65) | | | | | |
| | | | | | | | | | 1.50 - 2.00 | D1 | | | | | | |
| | | | | | | | | | 1.50 | ES4 | | | | | | |
| 2 | | | | | | | | | | | 2.10 | Brown slightly silty slightly gravelly clayey SAND. Sand is fine to coarse. | | 12.65 | | |
| | | | | | | | | | 2.20 - 2.70 | D2 | | | | | | |
| | 2.70 | | | | | | 2.7 | SPT (S) 22 (2-6-**6-6-5-5**) | | | | | | | | |
| | | | | | | | | | 2.80 | ES5 | | | | | | |
| | | | | | | | | | 2.90 | D3 | | | | | | |
| 3 | | | | | | | | | 3.00 - 4.00 | B3 | | | | | | |
| | | 100 | | | | | | | | | (2.20) | | | | | |
| 4 | | | | | | | | | | | | | | | | |

## Hole Progress / Water Obs

| Date / Time | H. Depth | C. Depth | Water |
|---|---|---|---|
| 07/03/2024 16:30 | 1.20 | | DRY |
| 08/03/2024 07:30 | 1.20 | | DRY |

## Casing

| Depth | Diam. |
|---|---|

## Groundwater

| Struck | Rose To | Behaviour | Sealed |
|---|---|---|---|
| 1.50 | 1.50 | Medium groundwater ingress at 1.5mbgl | 2.90 |

## Flush

| Depth | Type | Returns |
|---|---|---|
| 0.00 - 8.00 | Air | |

**Plant:** Comacchio 205

**Remarks:** Borehole marked out using co-ordinates supplied by Client and repositions to avoid park furniture in liaison with scheme engineer. STATS plans consulted, area CAT and Genny scanned, with permit issued by QGL.
On completion borehole installed following clients instructions with lockable steel flush cover at surface.

Quantum Geotech
Plas Newydd, Llanedi, Pontarddulais, Swansea
SA4 0FQ
Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

| Operator: | Logged By. | Sheet No. | m Per Page |
|---|---|---|---|
| GB & DF | A Jones | 1 Of 2 | 4.1 |

All measurements in metres unless otherwise stated

AGS

**Contract :** Grandison Brook FAS - Jersey Park Boreholes

**Client :** Atkins

**Borehole No.** GB-BH10

Dates : 7/3/24 - 8/3/24

Location :

Job Number : Q1484

Engineer : Atkins

Ground Level : 14.75 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274578.96 E, 194916.75 N *Co-ordinates to National Grid*

| m B.G.L. | Run Details: Core Run | TCR % | SCR % | RQD % | Fractures: Min Avg Max | FI | Insitu Tests: Depth | Test Results | Samples: Depth | Type No. Blows | Strata: Depth (Thick-ness) | Description | Legend | Red. Level A.O.D. | Water | Install/ Backfill |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4.20 | 100 | | | | | 4.2 | SPT (S) 41 (8-9-**10-10-10-11**) | 4.10 | D4 | | | | | | |
| | | 100 | | | | | | | 4.30 - 4.50 | B4 | 4.30 (0.20) | Dark brown clayey sandy GRAVEL. Gravel is sub angular to sub rounded fine to coarse sandstone and siltstone. Sand is fine to coarse. | | 10.45 | | |
| | | | | | | | | | 4.50 - 5.00 | D5 | 4.50 | *DRILLERS DESCRIPTION* Dark brown / grey sandy GRAVEL with cobbles. Arisings logged as Dark brownish grey silty slightly clayey slightly sandy GRAVEL. Gravel is angular to sub rounded fine to coarse sandstone and siltstone. | | 10.25 | | |
| 5 | | | | | | | | | | | | | | | | |
| | 5.70 | 0 | | | | | | | 5.50 - 6.00 | D6 | | | | | | |
| 6 | | | | | | | | | | | (3.50) | | | | | |
| | | | | | | | | | 6.50 - 7.00 | D7 | | | | | | |
| 7 | | | | | | | | | | | | | | | | |
| | 7.20 | 0 | | | | | 7.2 | SPT (S) 50 (6-6-**8-13-18-11**) | | | | | | | | |
| | 7.3 | | | | | | | | 7.50 - 8.00 | D8 | | | | | | |
| 8 | | | | | | | 8 | SPT (S) 50/95mm (15-10/50mm-**24-26/20mm**–) | | | 8.00 | Borehole terminated at scheduled depth of 8.0mbgl. | | 6.75 | | |

**Hole Progress / Water Obs**

| Date / Time | H. Depth | C. Depth | Water |
|---|---|---|---|
| 08/03/2024 13:00 | 8.00 | 8.00 | DRY |

**Casing**

| Depth | Diam. |
|---|---|
| 8.00 | 115.00 |

**Groundwater**

| Struck | Rose To | Behaviour | Sealed |
|---|---|---|---|
| | | | |

**Flush**

| Depth | Type | Returns |
|---|---|---|
| | | |

**Plant:** Comacchio 205

**Remarks:** Borehole marked out using co-ordinates supplied by Client and repositions to avoid park furniture in liaison with scheme engineer. STATS plans consulted, area CAT and Genny scanned, with permit issued by QGL.
On completion borehole installed following clients instructions with lockable steel flush cover at surface.

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Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

| Operator: | Logged By. | Sheet No. | m Per Page |
|---|---|---|---|
| GB & DF | A Jones | 2 Of 2 | 4.1 |

All measurements in metres unless otherwise stated

AGS

**Contract : Grandison Brook FAS - Jersey Park Boreholes**

**Client : Atkins**

**Borehole No.**
**GB-BH10**

| | | |
|---|---|---|
| Dates : 7/3/24 - 8/3/24 | Job Number : Q1484 | Ground Level : 14.75 m A.O.D. *Level to Ordnance Datum* |
| Location : | Engineer : Atkins | Coordinates: 274578.96 E 194916.75 N *Co-ordinates to National Grid* |

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|---|---|---|---|---|
| GB & DF | A Jones | 1 Of 1 | 2 | All measurements in metres unless otherwise stated |

AGS

**Contract :** Grandison Brook FAS - Jersey Park Boreholes

**Client :** Atkins

**Borehole No.** GB-BH11

Dates : 7/3/24 - 7/3/24

Location :

Job Number : Q1484

Engineer : Atkins

Ground Level : 14.42 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274569.43 E, 194934.25 N *Co-ordinates to National Grid*

| m B.G.L. | Run Details: Core Run | TCR % | SCR % | RQD % | Fractures: Min Avg Max | FI | Insitu Tests: Depth | Test Results | Samples: Depth | Type No. Blows | Strata: Depth (Thick-ness) | Description | Legend | Red. Level A.O.D. | Water | Install/ Backfill |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | (0.07) | CONCRETE paving slab. | | 14.35 | | |
| | | | | | | | | | | | 0.07 (0.08) | MADE GROUND: Orange brown slightly silty SAND. Sand is fine to coarse. | | 14.27 | | |
| | | | | | | | | | 0.30 - 0.40 | B1 | 0.15 (0.10) | Weak CONCRETE. | | 14.17 | | |
| | | | | | | | | | 0.50 | ES1 | 0.25 | MADE GROUND: Dark brownish grey silty sandy GRAVEL with low cobble content of sandstone. Gravel is angular to sub angular fine to coarse siltstone and sandstone, with plastic and steel wire. | | | | |
| | | | | | | | | | 0.80 - 1.20 | B2 | (1.05) | | | | | |
| 1 | | | | | | | | | 1.00 | ES2 | | | | | | |
| | 1.20 | | | | | | 1.2 | SPT (S) 9 (10-6-**3-2-2-2**) | | | | | | | | |
| | | | | | | | | | | | 1.30 | Soft brown sandy slightly gravelly CLAY with high cobble content of sandstone. | | 13.12 | | |
| | | | | | | | | | 1.50 - 2.50 | B3 | | | | | | |
| | | | | | | | | | 1.50 | ES3 | | | | | | |
| 2 | | 73 | | | | | | | 2.00 | D1 | | | | | | |
| | 2.70 | | | | | | 2.7 | SPT (S) 18 (2-3-**4-4-5-5**) | | | | | | | | |
| | | | | | | | | | | | (3.10) | | | | | |
| 3 | | | | | | | | | 3.00 - 4.00 | B4 | | | | | | |
| | | 80 | | | | | | | 3.50 | D2 | | | | | | |
| 4 | | | | | | | | | | | | | | | | |

**Hole Progress / Water Obs**

| Date / Time | H. Depth | C. Depth | Water |
|---|---|---|---|
| | | | |

**Casing**

| Depth | Diam. |
|---|---|
| | |

**Groundwater**

| Struck | Rose To | Behaviour | Sealed |
|---|---|---|---|
| | | No groundwater encountered | |

**Flush**

| Depth | Type | Returns |
|---|---|---|
| 0.00 - 8.00 | Air | |

**Plant:** Comacchio 205

**Remarks:** Borehole marked out using co-ordinates supplied by Client and repositions to avoid park furniture in liaison with scheme engineer. STATS plans consulted, area CAT and Genny scanned, with permit issued by QGL.
On completion borehole installed following clients instructions with lockable steel flush cover at surface.

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Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

| Operator: | Logged By. | Sheet No. | m Per Page |
|---|---|---|---|
| GB & DF | A Jones | 1 Of 2 | 4.1 |

All measurements in metres unless otherwise stated

AGS

**Contract :** Grandison Brook FAS - Jersey Park Boreholes

**Client :** Atkins

**Borehole No.** GB-BH11

Dates : 7/3/24 - 7/3/24

Location :

Job Number : Q1484

Engineer : Atkins

Ground Level : 14.42 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274569.43 E 194934.25 N *Co-ordinates to National Grid*

| m B.G.L. | Run Details: Core Run | TCR % | SCR % | RQD % | Fractures: Min Avg Max | FI | Insitu Tests: Depth | Test Results | Samples: Depth | Type No. Blows | Strata: Depth (Thick-ness) | Description | Legend | Red. Level A.O.D. | Water | Install/ Backfill |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4.20 | 80 | | | | | 4.2 | SPT (S) 15 (2-3-**3-3-6-3**) | | | | Soft brown sandy slightly gravelly CLAY with high cobble content of sandstone. | | | | |
| | | 100 | | | | | | | 4.50 - 4.80 | B5 | 4.40 (0.40) | Dark brown clayey sandy GRAVEL. Gravel is sub angular to sub rounded fine to coarse sandstone and siltstone. Sand is fine to coarse. | | 10.02 | | |
| | | | | | | | | | | | 4.80 | *DRILLERS DESCRIPTION* Dark brown / grey sandy GRAVEL with cobbles. Arisings logged as Dark brownish grey silty slightly clayey slightly sandy GRAVEL. Gravel is angular to sub rounded fine to coarse sandstone and siltstone. | | 9.62 | | |
| 5 | | | | | | | | | 5.00 - 5.50 | D3 | | | | | | |
| | 5.70 | 0 | | | | | 5.7 | SPT (S) 50/100mm (5-17-**16-34/25mm**-) | | | | | | | | |
| 6 | | | | | | | | | 6.00 - 6.50 | D4 | | | | | | |
| | | | | | | | | | | | (3.20) | | | | | |
| 7 | | | | | | | | | 7.00 - 7.50 | D5 | | | | | | |
| | 7.20 | 0 | | | | | 7.2 | SPT (S) 50/90mm (10-15/65mm-**27-23/15mm**-) | | | | | | | | |
| | 7.3 | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | 8.00 | Borehole terminated at scheduled depth of 8.0mbgl | | 6.42 | | |

## Hole Progress / Water Obs

| Date / Time | H. Depth | C. Depth | Water |
|---|---|---|---|
| 07/03/2024 14:30 | 8.00 | 8.00 | DRY |

## Casing

| Depth | Diam. |
|---|---|
| 8.00 | 115.00 |

## Groundwater

| Struck | Rose To | Behaviour | Sealed |
|---|---|---|---|

## Flush

| Depth | Type | Returns |
|---|---|---|

**Plant:** Comacchio 205

**Remarks:** Borehole marked out using co-ordinates supplied by Client and repositions to avoid park furniture in liaison with scheme engineer. STATS plans consulted, area CAT and Genny scanned, with permit issued by QGL.
On completion borehole installed following clients instructions with lockable steel flush cover at surface.

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SA4 0FQ
Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

| Operator: | Logged By. | Sheet No. | m Per Page |
|---|---|---|---|
| GB & DF | A Jones | 2 Of 2 | 4.1 |

All measurements in metres unless otherwise stated

AGS

**Contract : Grandison Brook FAS - Jersey Park Boreholes**

**Client : Atkins**

**Borehole No.**
**GB-BH11**

| | | |
|---|---|---|
| Dates : 7/3/24 - 7/3/24 | Job Number : Q1484 | Ground Level : 14.42 m A.O.D. *Level to Ordnance Datum* |
| Location : | Engineer : Atkins | Coordinates: 274569.43 E 194934.25 N *Co-ordinates to National Grid* |

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email: enquiries@quantumgeotech.co.uk

| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| GB & DF | A Jones | 1 Of 1 | 2 | All measurements in metres unless otherwise stated |

**Contract :** Grandison Brook FAS - Jersey Park Boreholes

**Client :** Atkins

**Borehole No.** GB-BH12

Dates : 6/3/14 - 6/3/24

Location :

Job Number : Q1484

Engineer : Atkins

Ground Level : 14.30 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274565.07 E 194970.34 N *Co-ordinates to National Grid*

| m B.G.L. | Run Details: Core Run | TCR % | SCR % | RQD % | Fractures: Min Avg Max | FI | Insitu Tests: Depth | Test Results | Samples: Depth | Type No. Blows | Strata: Depth (Thick-ness) | Description | Legend | Red. Level A.O.D. | Water | Install/ Backfill |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | (0.08) | TARMAC | | | | |
| | | | | | | | | | | | 0.08 | MADE GROUND: Grey slightly silty slightly sandy GRAVEL. Gravel is angular to sub angular fine to coarse limestone. (sub-base) | | 14.22 | | |
| | | | | | | | | | 0.30 | ES1 | (0.07) | | | 14.15 | | |
| | | | | | | | | | | | 0.15 | | | 14.00 | | |
| | | | | | | | | | 0.50 - 1.00 | B1 | (0.15) | | | | | |
| | | | | | | | | | | | 0.30 | MADE GROUND: Reddish grey slightly silty slightly sandy GRAVEL. Gravel is angular to sub angular fine to coarse siltstone and sandstone with rare pottery. | | | | |
| | | | | | | | | | 0.80 | ES2 | (0.70) | | | | | |
| 1 | | | | | | | | | | | 1.00 | Pale brown slightly clayey slightly silty sandy GRAVEL. Sand is fine to coarse. Gravel is sub angular to sub rounded fine to coarse siltstone and sandstone. | | 13.30 | | |
| | | | | | | | | | 1.10 | D1 | | | | | | |
| | 1.20 | | | | | | 1.2 | SPT (S) 0 (1-0-**0-0-0-0**) | 1.20 - 2.70 | B2 | | | | | | |
| | | | | | | | | | 1.50 | ES3 | | Pale brown slightly clayey silty slightly gravelly slightly organic SAND. Gravel is sub angular to sub rounded fine to medium sandstone. Sand is fine to coarse. | | | | |
| | | 67 | | | | | | | | | (1.80) | | | | | |
| 2 | | | | | | | | | 2.00 | D2 | | | | | | |
| | 2.70 | | | | | | 2.7 | SPT (S) 0 (0-0-**0-0-0-0**) | | | | | | | | |
| | | | | | | | | | | | 2.80 | Pale brown slightly clayey silty slightly sandy GRAVEL. Gravel is sub angular to sub rounded fine to coarse sandstone. Sand is fine to coarse. | | 11.50 | | |
| 3 | | | | | | | | | 3.00 - 3.70 | B3 | | | | | | |
| | | 100 | | | | | | | | | (1.10) | | | | | |
| | | | | | | | | | 3.50 | D3 | | | | | | |
| | | | | | | | | | 3.90 - 4.20 | B4 | 3.90 | Description on next page | | 10.40 | | |
| 4 | | | | | | | | | | | | | | | | |

## Hole Progress / Water Obs

| Date / Time | H. Depth | C. Depth | Water |
|---|---|---|---|

## Casing

| Depth | Diam. |
|---|---|

## Groundwater

| Struck | Rose To | Behaviour | Sealed |
|---|---|---|---|
| 1.20 | 1.00 | Slow groundwater ingress at 1.2mbgl | |

## Flush

| Depth | Type | Returns |
|---|---|---|
| 0.00 - 8.00 | Air | |

**Plant:** Comacchio 205

**Remarks:** Borehole marked out using co-ordinates supplied by Client and repositions to avoid park furniture in liaison with scheme engineer. STATS plans consulted, area CAT and Genny scanned, with permit issued by QGL.
On completion borehole installed following clients instructions with lockable steel flush cover at surface.

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SA4 0FQ
Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

| Operator: | Logged By. | Sheet No. | m Per Page |
|---|---|---|---|
| GB & RH | A Jones | 1 Of 3 | 4.1 |

All measurements in metres unless otherwise stated

AGS

**Contract :** Grandison Brook FAS - Jersey Park Boreholes

**Client :** Atkins

**Borehole No.** GB-BH12

Dates : 6/3/14 - 6/3/24

Location :

Job Number : Q1484

Engineer : Atkins

Ground Level : 14.30 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274565.07 E 194970.34 N *Co-ordinates to National Grid*

| m B.G.L. | Run Details: Core Run | TCR % | SCR % | RQD % | Fractures: Min Avg Max | FI | Insitu Tests: Depth | Test Results | Samples: Depth | Type No. Blows | Strata: Depth (Thick-ness) | Description | Legend | Red. Level A.O.D. | Water | Install/ Backfill |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4.20 | 100 | | | | | 4.2 | SPT (S) 50/230mm (12-10-**10-12-18-10/5mm**) | 4.20 - 4.55 | B5 | (0.30) | Dark grey slightly clayey slightly silty sandy GRAVEL. Sand is fine to coarse. Gravel is sub angular to sub rounded fine to coarse siltstone and sandstone. | | | | |
| | | 100 | | | | | | | | | 4.20 | | | 10.10 | | |
| | | | | | | | | | | | (0.35) | | | | | |
| | | | | | | | | | | | 4.55 | Brownish grey clayey slightly sandy GRAVEL with low cobble content of sandstone. Gravel is sub angular to sub rounded fine to coarse siltstone and sandstone. | | 9.75 | | |
| 5 | | | | | | | | | | | | *DRILLERS DESCRIPTION* Clayey sandy GRAVEL with cobbles. Arisings logged as Brownish grey silty slightly clayey sandy GRAVEL. Sand is fine to coarse. Gravel is sub angular to sub rounded fine to coarse sandstone and siltstone. | | | | |
| | 5.70 | 0 | | | | | 5.7 | SPT (S) 50/120mm (15-10/30mm-**27-23/45mm**--) | 5.70 - 6.50 | D4 | | | | | | |
| 6 | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | (3.25) | | | | | |
| | | | | | | | | | 6.50 - 7.20 | D5 | | | | | | |
| 7 | | | | | | | | | | | | | | | | |
| | 7.20 | 0 | | | | | 7.2 | SPT (S) 50/160mm (7-17/60mm-**17-23-10/10mm**-) | 7.20 - 7.80 | D6 | | | | | | |
| | 7.3 | | | | | | | | | | 7.80 | *DRILLERS DESCRIPTION* Grey SANDSTONE. Arisings logged as Grey angular Gravel of sandstone. | | 6.50 | | |
| | | | | | | | | | | | (0.20) | | | | | |
| 8 | | | | | | | 8 | SPT (C) 50/11mm (25/5mm-**50/11mm**---) | | | 8.00 | Borehole terminated at | | 6.30 | | |

## Hole Progress / Water Obs

| Date / Time | H. Depth | C. Depth | Water |
|---|---|---|---|
| 06/03/2024 15:00 | 8.00 | 8.00 | 6.30 |

## Casing

| Depth | Diam. |
|---|---|
| 8.00 | 115.00 |

## Groundwater

| Struck | Rose To | Behaviour | Sealed |
|---|---|---|---|

## Flush

| Depth | Type | Returns |
|---|---|---|

**Plant:** Comacchio 205

**Remarks:** Borehole marked out using co-ordinates supplied by Client and repositions to avoid park furniture in liaison with scheme engineer. STATS plans consulted, area CAT and Genny scanned, with permit issued by QGL.
On completion borehole installed following clients instructions with lockable steel flush cover at surface.

Quantum Geotech
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email: enquiries@quantumgeotech.co.uk

| Operator: | Logged By. | Sheet No. | m Per Page |
|---|---|---|---|
| GB & RH | A Jones | 2 Of 3 | 4.1 |

All measurements in metres unless otherwise stated

AGS

**Contract :** Grandison Brook FAS - Jersey Park Boreholes

**Client :** Atkins

**Borehole No.** GB-BH12

Dates : 6/3/14 - 6/3/24

Location :

Job Number : Q1484

Engineer : Atkins

Ground Level : 14.30 m A.O.D. *Level to Ordnance Datum*

Coordinates: 274565.07 E 194970.34 N *Co-ordinates to National Grid*

| m B.G.L. | Run Details: Core Run | TCR % | SCR % | RQD % | Fractures: Min Avg Max | FI | Insitu Tests: Depth | Test Results | Samples: Depth | Type No. Blows | Strata: Depth (Thick-ness) | Description | Legend | Red. Level A.O.D. | Water | Install/ Backfill |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | scheduled depth of 8.0mbgl | | | | |
| 9 | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | |

| Hole Progress / Water Obs: Date / Time | H. Depth | C. Depth | Water | Casing: Depth | Diam. | Groundwater: Struck | Rose To | Behaviour | Sealed | Flush: Depth | Type | Returns |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

**Plant:** Comacchio 205

**Remarks:** Borehole marked out using co-ordinates supplied by Client and repositions to avoid park furniture in liaison with scheme engineer. STATS plans consulted, area CAT and Genny scanned, with permit issued by QGL.
On completion borehole installed following clients instructions with lockable steel flush cover at surface.

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| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated |
|---|---|---|---|---|
| GB & RH | A Jones | 3 Of 3 | 4.1 | |

**Contract : Grandison Brook FAS - Jersey Park Boreholes**

**Client : Atkins**

**Borehole No.**
**GB-BH12**

| | | |
|---|---|---|
| Dates : 6/3/14 - 6/3/24 | Job Number : Q1484 | Ground Level : 14.30 m A.O.D. *Level to Ordnance Datum* |
| Location : | Engineer : Atkins | Coordinates: 274565.07 E 194970.34 N *Co-ordinates to National Grid* |

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|---|---|---|---|---|
| GB & RH | A Jones | 1 Of 1 | 2 | All measurements in metres unless otherwise stated |

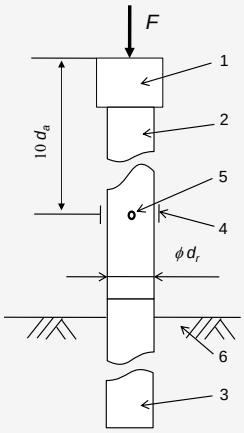
AGS

# SPT Calibration Report

## Hammer Energy Measurement Report

| | | |
|---|---|---|
| **Type of Hammer** | | SPT HAMMER |
| **Test No** | | EQU2023_110 |
| **Client** | | QUANTUM GEOTECH |
| **Test Depth (m)** | | 11.70 |
| **Mass of hammer** | $m$ = | 63.5kg |
| **Falling height** | $h$ = | 0.76m |
| $E_{theor}$ = | $m \times g \times h$ = | 473J |

## Characteristics of the instrumented rod




**Key**

1 Anvil
2 Part of instrumented rod
3 Drive Rod
4 Strain Gauge
5 Accelerometer
6 Ground

$F$ Force
$d_r$ Diameter of rod

Fig. B.1 and B.2
BS EN ISO 22476-3 : 2005 + A1 : 2011

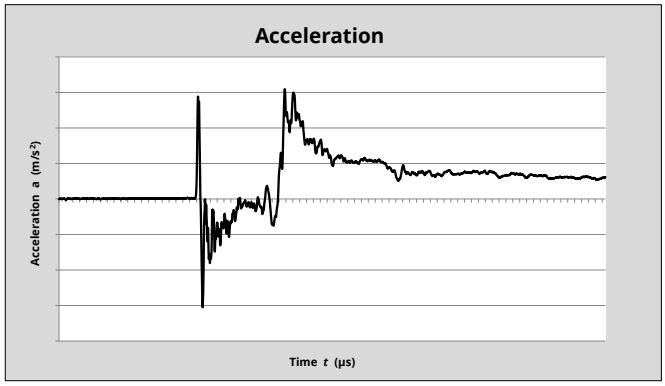
| | | |
|---|---|---|
| **Diameter** | $d_r$ = | 0.052 m |
| **Length of instrumented rod** | | 0.558 m |
| **Area** | A = | 11.61 cm² |
| **Modulus** | $E_a$ = | 206843 MPa |

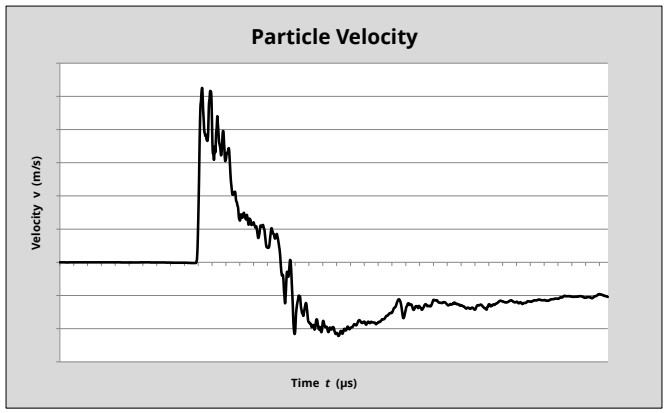
| DATE OF TEST | VALID UNTIL | HAMMER ID |
|---|---|---|
| 16/06/2023 | 15/06/2024 | AR830 |

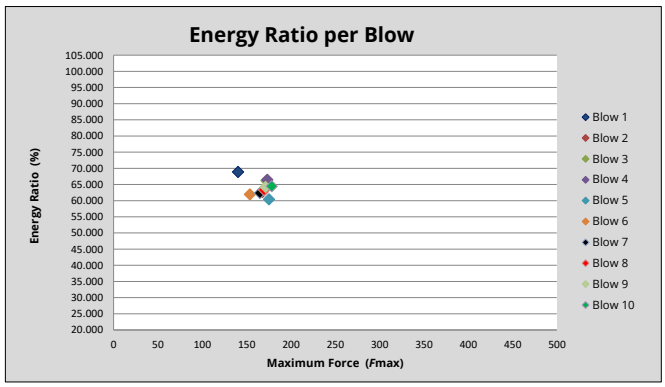
$E_{meas}$ = **0.303** kN-m

$E_{theor}$ = **0.473** kN-m

Comments






**Energy Ratio (Er) =** $\frac{E_{meas}}{E_{theor}}$ **64.13%**

© COPYRIGHT 2023

| Equipe SPT Analyzer Operator | Certificate prepared by | Certificate checked by | Certificate date |
|---|---|---|---|
| JL | | | 19/06/2023 |

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Tel: +44 (0)1295 670990 Fax: +44 (0)1295 678232 Email: info@equipegroup.com

# APPENDIX III – **GAS AND GROUNDWATER MONITORING RECORDS**

## LANDGAS & GROUNDWATER MONITORING RECORD SHEET



| | |
|---|---|
| Project Name: | Grandison Brook |
| Project No.: | Q1484 |
| BH/TP No.: | BH10 |
| Instruments Used: | Water Dip Meter Probe, GA2000 Gas Anaylser |

| Installation Date: | | | | |
|---|---|---|---|---|
| GL (mAOD) | Pipe | Type | Installation Depth (mbgl) | Response Zone (mbgl) |
| 14.75 | A | 50mm | 8.00 | 2.0 - 8.0 |
| | | | | |

| Pipe | Date | Time (24hrs) | Atmos Pressure mBar | Differential Well Pressure mBar | Flow L/hr | $CH_4$ % | $CO_2$ % | $O_2$ % | CO ppm | $H_2S$ ppm | Water Level | | HoleDepth | | Local Weather | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | mbgl | mAOD | mbgl | mAOD | Recent | Current | |
| A | 26.03.24 | | 987 | -0.09 | 0.0 | 10.1 | 2.5 | 2.5 | 0 | 0 | 4.52 | 10.23 | 7.23 | 7.52 | Overcast | Overcast/Dry | EW1 Taken |
| | | | | | | | | | | | | | | | | | |
| A | 8.4.24 | | 1003 | 0.28 | -0.1 | 0.3 | 1.0 | 10.6 | 0 | 0 | 4.24 | 10.51 | 7.14 | 7.61 | Rain | Overcast | |
| | | | | | | | | | | | | | | | | | |
| A | 22.4.24 | | 1027 | 0.22 | 0.0 | 0.0 | 0.4 | 17.2 | 0 | 0 | 4.70 | 10.05 | 7.09 | 7.66 | Sunny | Overcast | |
| | | | | | | | | | | | | | | | | | |
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## LANDGAS & GROUNDWATER MONITORING RECORD SHEET



| | |
|---|---|
| Project Name: | Grandison Brook |
| Project No.: | Q1484 |
| BH/TP No.: | BH11 |
| Instruments Used: | Water Dip Meter Probe, GA2000 Gas Anaylser |

| Installation Date: | | | | |
|---|---|---|---|---|
| GL (mAOD) | Pipe | Type | Installation Depth (mbgl) | Response Zone (mbgl) |
| 14.42 | A | 50mm | 8.00 | 2.0 - 8.0 |
| | | | | |

| Pipe | Date | Time (24hrs) | Atmos Pressure mBar | Differential Well Pressure mBar | Flow L/hr | $CH_4$ % | $CO_2$ % | $O_2$ % | CO ppm | $H_2S$ ppm | Water Level | | HoleDepth | | Local Weather | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | mbgl | mAOD | mbgl | mAOD | Recent | Current | |
| A | 26.03.24 | | 987 | -0.09 | 0.1 | 0.5 | 6.9 | 4.9 | 0 | 0 | 6.10 | 8.32 | 7.70 | 6.72 | Overcast | Overcast/Dry | Insufficient for sampling |
| | | | | | | | | | | | | | | | | | |
| A | 8.4.24 | | 1003 | 0.28 | 0.0 | 0.3 | 6.0 | 16.0 | 0 | 0 | 7.10 | 7.32 | 7.70 | 6.72 | Rain | Overcast | |
| | | | | | | | | | | | | | | | | | |
| A | 22.4.24 | | 1027 | 0.22 | 0.1 | 0.3 | 1.1 | 19.8 | 0 | 0 | 7.12 | 7.30 | 7.70 | 6.72 | Sunny | Overcast | |
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## LANDGAS & GROUNDWATER MONITORING RECORD SHEET



| | |
|---|---|
| Project Name: | Grandison Brook |
| Project No.: | Q1484 |
| BH/TP No.: | BH12 |
| Instruments Used: | Water Dip Meter Probe, GA2000 Gas Anaylser |

| Installation Date: | | | | |
|---|---|---|---|---|
| GL (mAOD) | Pipe | Type | Installation Depth (mbgl) | Response Zone (mbgl) |
| 14.3 | A | 50mm | 8.00 | 1.0 - 8.0 |
| | | | | |

| Pipe | Date | Time (24hrs) | Atmos Pressure | Differential Well Pressure | Flow | $CH_4$ | $CO_2$ | $O_2$ | CO | $H_2S$ | Water Level | | HoleDepth | | Local Weather | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mBar | mBar | L/hr | % | % | % | ppm | ppm | mbgl | mAOD | mbgl | mAOD | Recent | Current | |
| A | 26.03.24 | | 987 | -0.09 | 0.2 | 0.4 | 3.0 | 6.5 | 0 | 0 | 4.79 | 9.51 | 6.87 | 7.43 | Overcast | Overcast/Dry | EW1 Taken |
| | | | | | | | | | | | | | | | | | |
| A | 8.4.24 | | 1003 | 0.28 | 0.1 | 0.3 | 1.7 | 9.2 | 0 | 0 | 4.93 | 9.37 | 6.32 | 7.98 | Rain | Overcast | |
| | | | | | | | | | | | | | | | | | |
| A | 22.4.24 | | 1027 | 0.22 | 0.0 | 0.3 | 0.9 | 16.1 | 0 | 0 | 5.00 | 9.30 | 6.20 | 8.10 | Sunny | Overcast | |
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# APPENDIX IV – **GEOTECHNICAL LABORATORY TEST RESULTS**

# Laboratory Report

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES A PHENNA GROUP COMPANY

## Contract Number: 72058

Client Ref: **Q1484**
Client PO: **Q1484**

Date Received: **28-03-2024**
Date Completed: **18-04-2024**
Report Date: **18-04-2024**

Client: **Spencer Quantum Ltd**

Contract Title: **Grandison Brook - Jersey Park Boreholes**
For the attention of: **Arwel Jones**

This report has been checked and approved by:

B. Evans

**Brendan Evans**
Office Administrator

| Description | Qty |
|---|---|
| **Moisture Content**<br>BS 1377:1990 - Part 2 : 3.2 - * UKAS | 16 |
| **4 Point Liquid & Plastic Limit**<br>BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS | 9 |
| **PSD Wet Sieve method**<br>BS 1377:1990 - Part 2 : 9.2 - * UKAS | 9 |
| **PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected)**<br>BS 1377:1990 - Part 2 : 9.4 - * UKAS | 4 |
| **PSD: Sedimentation by pipette carried out separately**<br>BS 1377:1990 - Part 2 : 9.4 - * UKAS | 4 |
| **BRE Reduced Suite**<br>**includes pH, water & acid soluble sulphate and total sulphur**<br>Sub-contracted Test | 2 |
| **Organic Matter Content**<br>Sub-contracted Test | 2 |
| **Disposal of samples for job** | 1 |

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

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

**Approved Signatories:**
Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (HR & HSE Manager)

GEO Site & Testing Services Ltd
Unit 3-4 Heol Aur, Dafen Ind Est, Llanelli, Carmarthenshire SA14 8QN
Tel: 01554 784 040 Fax: 01554 784 040 info@gstl.co.uk https://gstl.co.uk

| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **Natural Moisture Content ( BS 1377:1990 - Part 2 : 3.2 ) DESCRIPTIONS** | |
|---|---|---|
| Contract Number | 72058 | |
| Site Name | Grandison Brook - Jersey Park Boreholes | |
| Date Tested | 12/04/2024 | |
| | | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Descriptions |
|---|---|---|---|---|---|---|
| GBBH10 | 2 | D | 2.20 | - | 2.70 | Brown fine to medium gravelly sandy silty CLAY |
| GBBH10 | 4 | D | 4.10 | - | | Brown fine to medium gravelly silty sandy CLAY |
| GBBH10 | 5 | D | 4.50 | - | 5.00 | Brown fine to coarse sandy silty/ clayey fine to coarse GRAVEL |
| GBBH11 | 2 | B | 0.80 | - | 1.20 | Brown fine to medium gravelly sandy CLAY |
| GBBH11 | 1 | D | 2.00 | - | | Brown fine to medium gravelly sandy silty CLAY |
| GBBH12 | 2 | B | 1.20 | - | 2.70 | Brown slightly gravelly silty/ clayey fine to coarse SAND |
| GBBH12 | 5 | D | 6.50 | - | 7.20 | Brown fine to medium gravelly sandy CLAY |
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| Operators |
|---|
| Clayton Jenkins |

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

# Natural Moisture Content
## ( BS 1377:1990 - Part 2 : 3.2 )

| | |
|---|---|
| Contract Number | 72058 |
| Project Name | Grandison Brook - Jersey Park Boreholes |
| Date Tested | 12/04/2024 |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Moisture Content % | Remarks |
|---|---|---|---|---|---|---|---|
| GBBH10 | 2 | D | 2.20 | - | 2.70 | 13 | |
| GBBH10 | 4 | D | 4.10 | - | | 10 | |
| GBBH10 | 5 | D | 4.50 | - | 5.00 | 33 | |
| GBBH11 | 2 | B | 0.80 | - | 1.20 | 29 | |
| GBBH11 | 1 | D | 2.00 | - | | 27 | |
| GBBH12 | 2 | B | 1.20 | - | 2.70 | 34 | |
| GBBH12 | 5 | D | 6.50 | - | 7.20 | 15 | |

| Operator |
|---|
| Clayton Jenkins |

UKAS TESTING
2788

| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377:1990 - Part 2 : 4.3 & 5.3 ) | |
|---|---|---|
| Contract Number | 72058 | |
| Project Name | Grandison Brook - Jersey Park Boreholes | |
| Date Tested | 12/04/2024 | |
| | **DESCRIPTIONS** | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Descriptions |
|---|---|---|---|---|---|---|
| GBBH10 | 3 | D | 2.90 | - | | Brown fine to medium gravelly SAND |
| GBBH10 | 6 | D | 5.50 | - | 6.00 | Brown fine to coarse sandy silty/ clayey fine to coarse GRAVEL |
| GBBH11 | 2 | D | 3.50 | - | | Brown fine to medium gravelly silty sandy CLAY |
| GBBH11 | 5 | B | 4.50 | - | 4.80 | Brown fine to coarse gravelly fine to coarse sandy silty CLAY |
| GBBH11 | 4 | D | 6.00 | - | 6.50 | Brown fine to medium gravelly silty CLAY |
| GBBH12 | 1 | D | 1.10 | - | | Brown fine to medium gravelly sandy silty CLAY |
| GBBH12 | 3 | D | 3.50 | - | | Brown fine to medium gravelly silty sandy CLAY |
| GBBH12 | 4 | B | 3.90 | - | 4.20 | Brown fine to medium gravelly silty sandy CLAY |
| GBBH12 | 5 | B | 4.20 | - | 4.55 | Brown fine to coarse sandy silty/clayey fine to coarse GRAVEL |
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| Operator |
|---|
| Clayton Jenkins |

| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377:1990 - Part 2 : 4.3 & 5.3 ) | |
|---|---|---|
| Contract Number | 72058 | |
| Project Name | Grandison Brook - Jersey Park Boreholes | |
| Date Tested | 12/04/2024 | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Moisture Content % | Liquid Limit % | Plastic Limit % | Plasticity index % | Passing 0.425mm % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GBBH10 | 3 | D | 2.90 | - | | 10 | | NP | | 20 | |
| GBBH10 | 6 | D | 5.50 | - | 6.00 | 9.6 | 32 | 13 | 19 | 36 | CL Low Plasticity |
| GBBH11 | 2 | D | 3.50 | - | | 17 | 41 | 15 | 26 | 89 | CI Intermediate Plasticity |
| GBBH11 | 5 | B | 4.50 | - | 4.80 | 16 | 36 | 13 | 23 | 76 | CI Intermediate Plasticity |
| GBBH11 | 4 | D | 6.00 | - | 6.50 | 10 | 32 | 14 | 18 | 82 | CL Low Plasticity |
| GBBH12 | 1 | D | 1.10 | - | | 27 | 56 | 23 | 33 | 87 | CH High Plasticity |
| GBBH12 | 3 | D | 3.50 | - | | 16 | 35 | 14 | 21 | 85 | CL/I Low/Inter. Plasticity |
| GBBH12 | 4 | B | 3.90 | - | 4.20 | 12 | 36 | 14 | 22 | 80 | CI Intermediate Plasticity |
| GBBH12 | 5 | B | 4.20 | - | 4.55 | 11 | 32 | 14 | 18 | 29 | CL Low Plasticity |
| | | | | - | | | | | | | |
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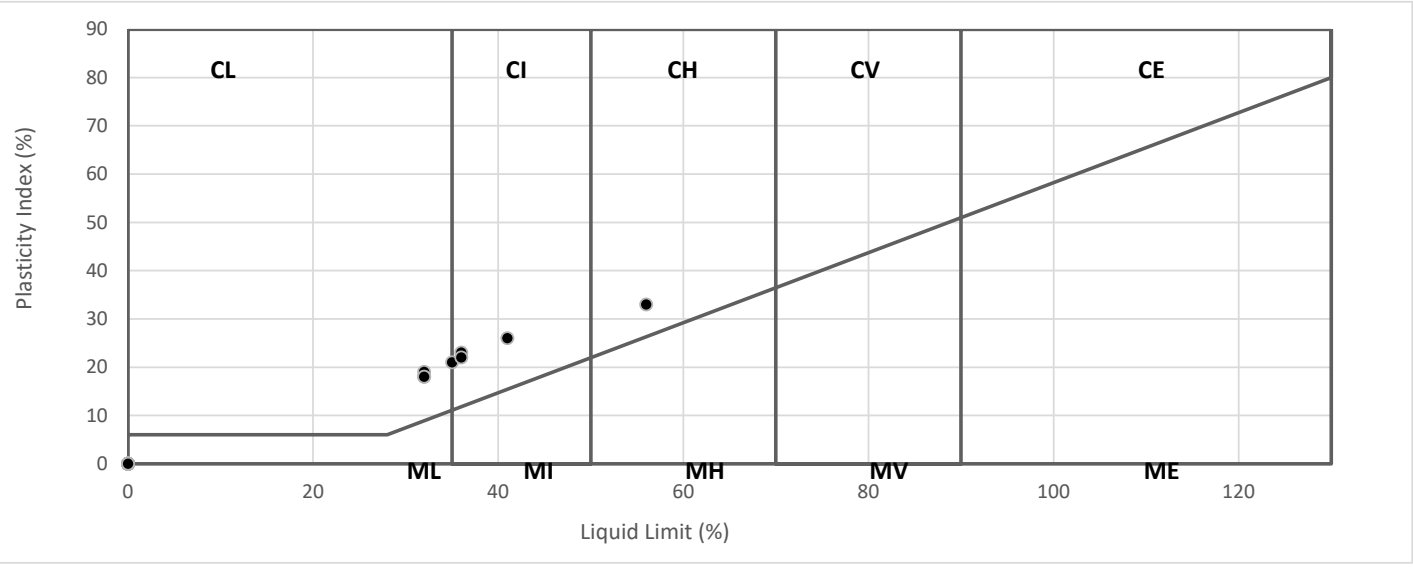
Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

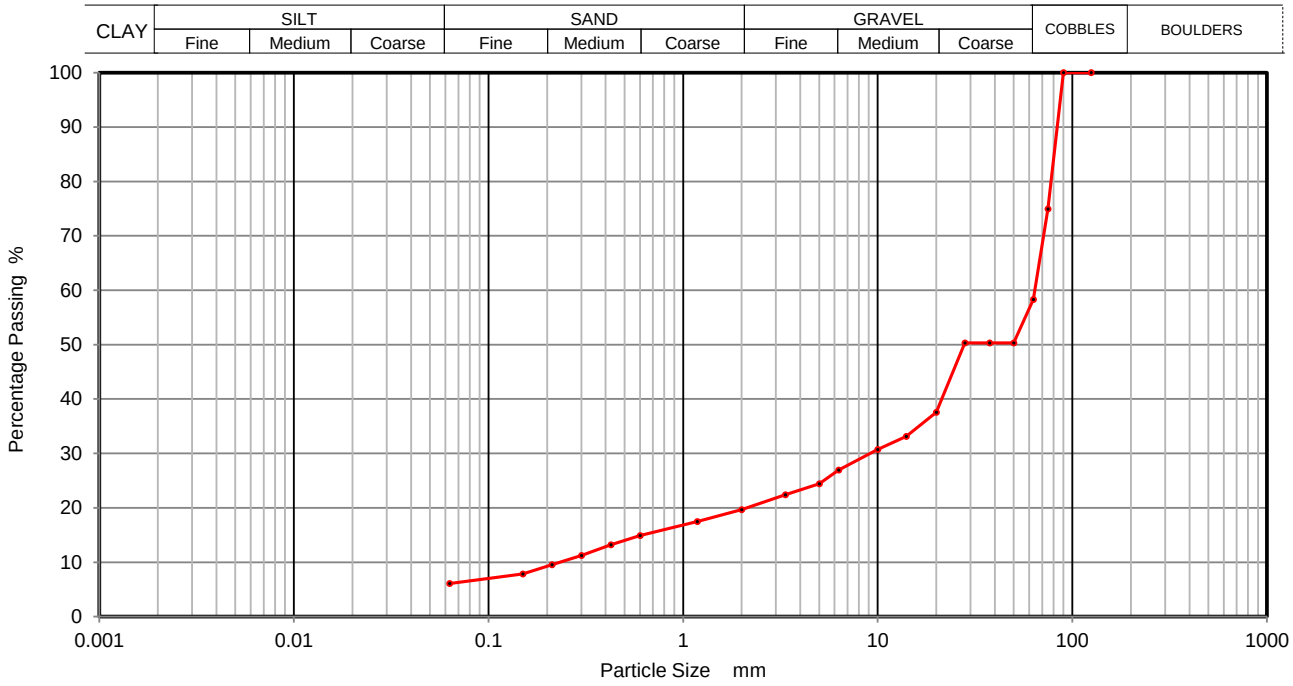
**PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION**
**BS 5930:2015+A1:2020**




| Operator |
|---|
| Clayton Jenkins |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **PARTICLE SIZE DISTRIBUTION**<br>**BS 1377 Part 2:1990**<br>**Wet Sieve, Clause 9.2** | Contract Number | 72058 |
| | | Borehole/Pit No. | GBBH10 |
| Project Name | Grandison Brook - Jersey Park Boreholes | Sample No. | 2 |
| Soil Description | Grey slightly silty/ clayey fine to coarse sandy fine to coarse GRAVEL with cobbles | Depth Top | 0.50 |
| | | Depth Base | 1.00 |
| Date Tested | 11/04/2024 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 75 | | |
| 63 | 58 | | |
| 50 | 50 | | |
| 37.5 | 50 | | |
| 28 | 50 | | |
| 20 | 38 | | |
| 14 | 33 | | |
| 10 | 31 | | |
| 6.3 | 27 | | |
| 5 | 24 | | |
| 3.35 | 22 | | |
| 2 | 20 | | |
| 1.18 | 17 | | |
| 0.6 | 15 | | |
| 0.425 | 13 | | |
| 0.3 | 11 | | |
| 0.212 | 10 | | |
| 0.15 | 8 | | |
| 0.063 | 6 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 42 |
| Gravel | 38 |
| Sand | 14 |
| Silt and Clay | 6 |
| | |
| | |

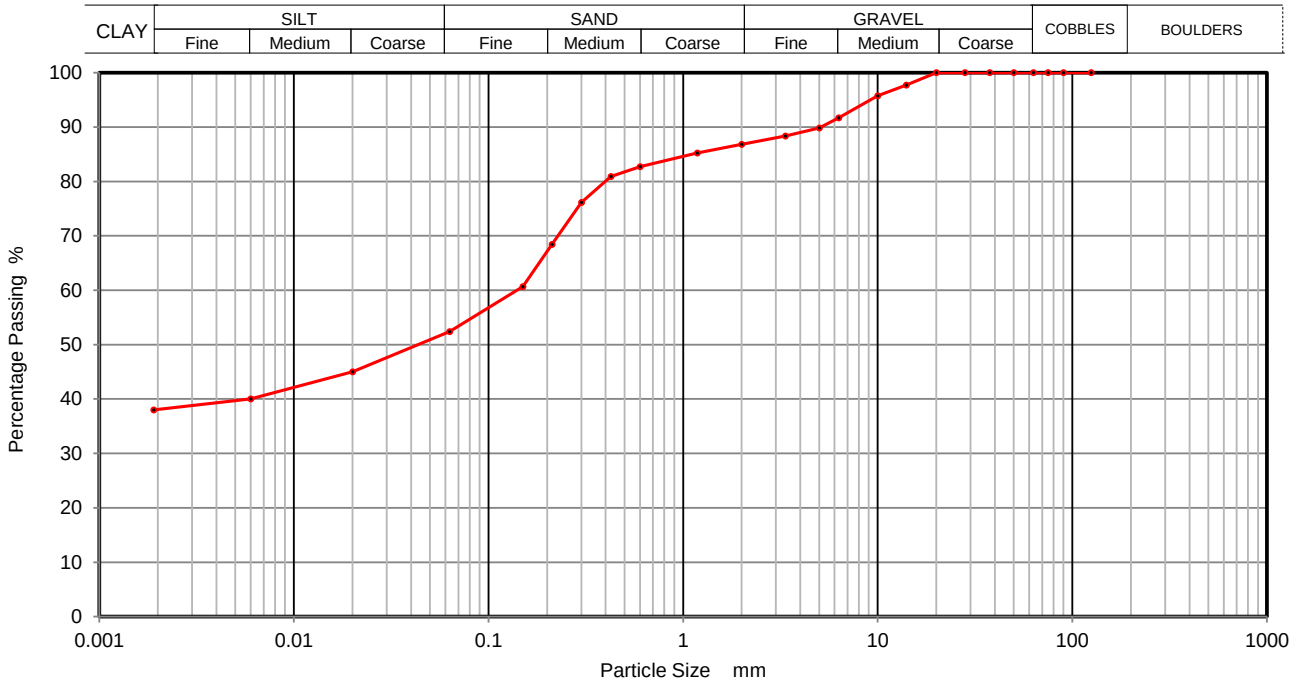
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| Cameron Thomas |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **PARTICLE SIZE DISTRIBUTION<br>BS 1377 Part 2:1990<br>Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4** | Contract Number | 72058 |
| | | Borehole/Pit No. | GBBH10 |
| Project Name | Grandison Brook - Jersey Park Boreholes | Sample No. | 3 |
| Soil Description | Brown fine to medium gravelly fine to coarse sandy silty CLAY | Depth Top | 3.00 |
| | | Depth Base | 4.00 |
| Date Tested | 11/04/2024 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | 0.0200 | 45 |
| 90 | 100 | 0.0060 | 40 |
| 75 | 100 | 0.0020 | 38 |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 98 | | |
| 10 | 96 | | |
| 6.3 | 92 | | |
| 5 | 90 | | |
| 3.35 | 88 | | |
| 2 | 87 | | |
| 1.18 | 85 | | |
| 0.6 | 83 | | |
| 0.425 | 81 | | |
| 0.3 | 76 | | |
| 0.212 | 68 | | |
| 0.15 | 61 | | |
| 0.063 | 52 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 13 |
| Sand | 35 |
| Silt | 14 |
| Clay | 38 |
| | |

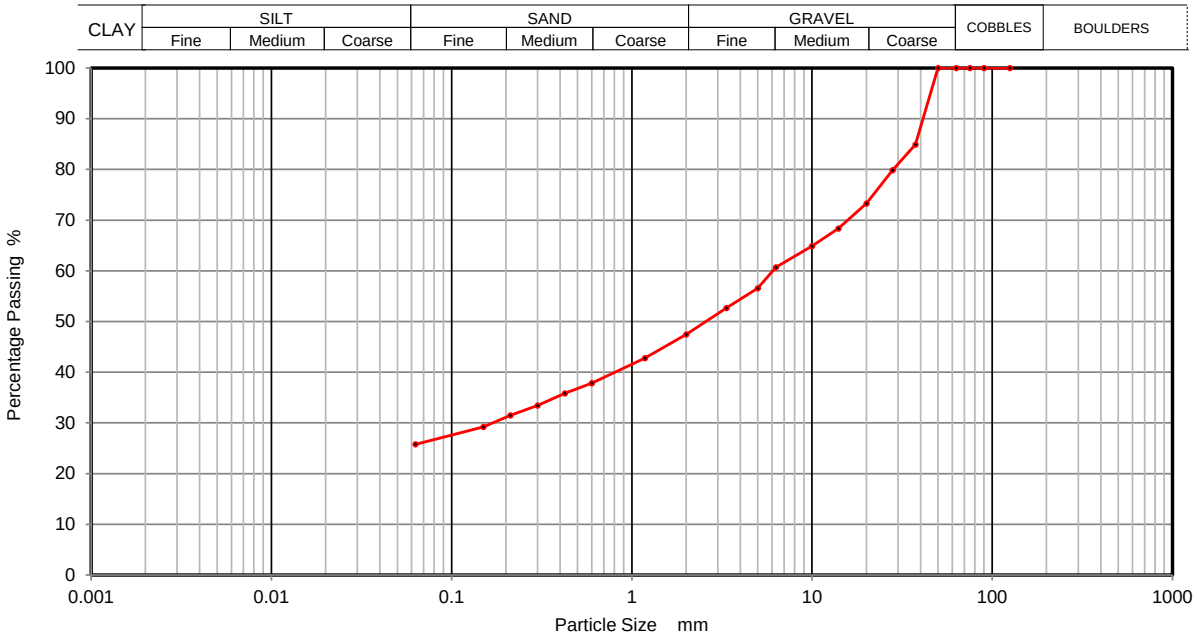
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| Cameron Thomas |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **PARTICLE SIZE DISTRIBUTION**<br>**BS 1377 Part 2:1990**<br>**Wet Sieve, Clause 9.2** | Contract Number | 72058 |
| | | Borehole/Pit No. | GBBH10 |
| Project Name | Grandison Brook - Jersey Park Boreholes | Sample No. | 5 |
| Soil Description | Brown fine to coarse sandy silty/ clayey fine to coarse GRAVEL | Depth Top | 4.50 |
| | | Depth Base | 8.00 |
| Date Tested | 11/04/2024 | Sample Type | D |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 85 | | |
| 28 | 80 | | |
| 20 | 73 | | |
| 14 | 68 | | |
| 10 | 65 | | |
| 6.3 | 61 | | |
| 5 | 57 | | |
| 3.35 | 53 | | |
| 2 | 47 | | |
| 1.18 | 43 | | |
| 0.6 | 38 | | |
| 0.425 | 36 | | |
| 0.3 | 33 | | |
| 0.212 | 31 | | |
| 0.15 | 29 | | |
| 0.063 | 26 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 53 |
| Sand | 21 |
| Silt and Clay | 26 |
| | |
| | |

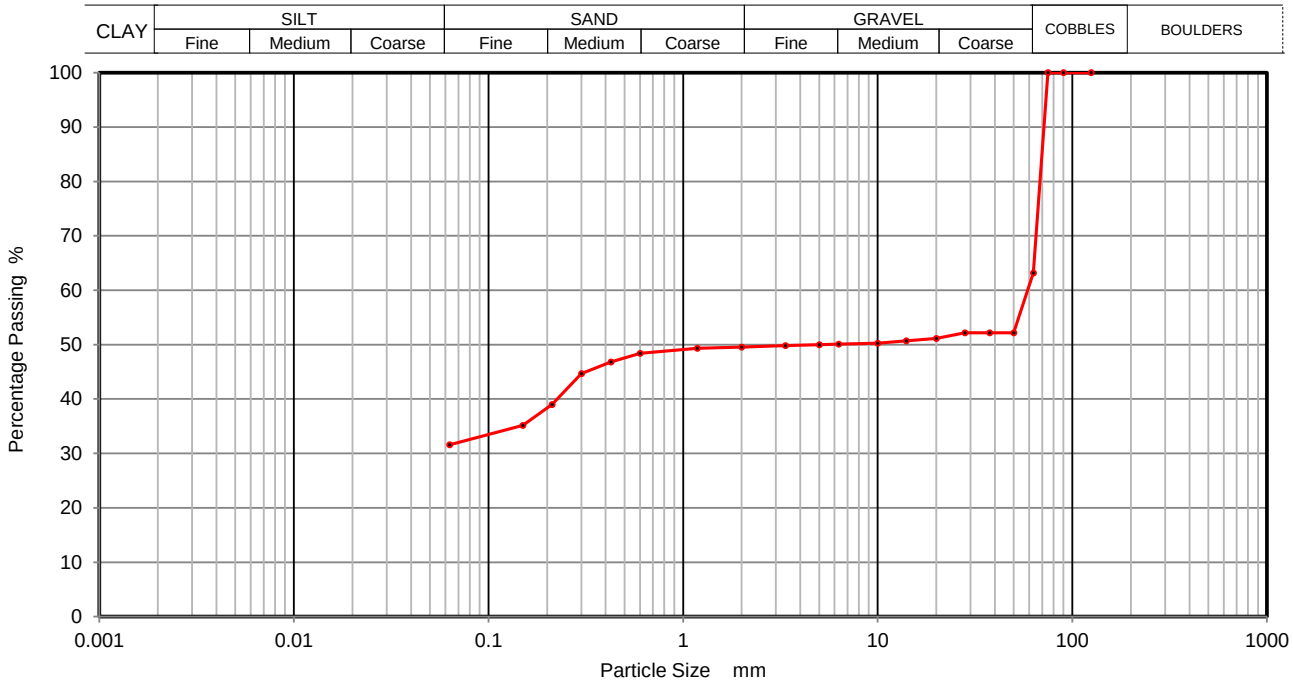
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| Cameron Thomas |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **PARTICLE SIZE DISTRIBUTION**<br>**BS 1377 Part 2:1990**<br>**Wet Sieve, Clause 9.2** | Contract Number | 72058 |
| | | Borehole/Pit No. | GBBH11 |
| Project Name | Grandison Brook - Jersey Park Boreholes | Sample No. | 3 |
| Soil Description | Brown fine to coarse gravelly fine to coarse sandy SILT/ CLAY with cobbles | Depth Top | 1.50 |
| | | Depth Base | 2.50 |
| Date Tested | 11/04/2024 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 63 | | |
| 50 | 52 | | |
| 37.5 | 52 | | |
| 28 | 52 | | |
| 20 | 51 | | |
| 14 | 51 | | |
| 10 | 50 | | |
| 6.3 | 50 | | |
| 5 | 50 | | |
| 3.35 | 50 | | |
| 2 | 50 | | |
| 1.18 | 49 | | |
| 0.6 | 48 | | |
| 0.425 | 47 | | |
| 0.3 | 45 | | |
| 0.212 | 39 | | |
| 0.15 | 35 | | |
| 0.063 | 32 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 37 |
| Gravel | 13 |
| Sand | 18 |
| Silt and Clay | 32 |
| | |
| | |

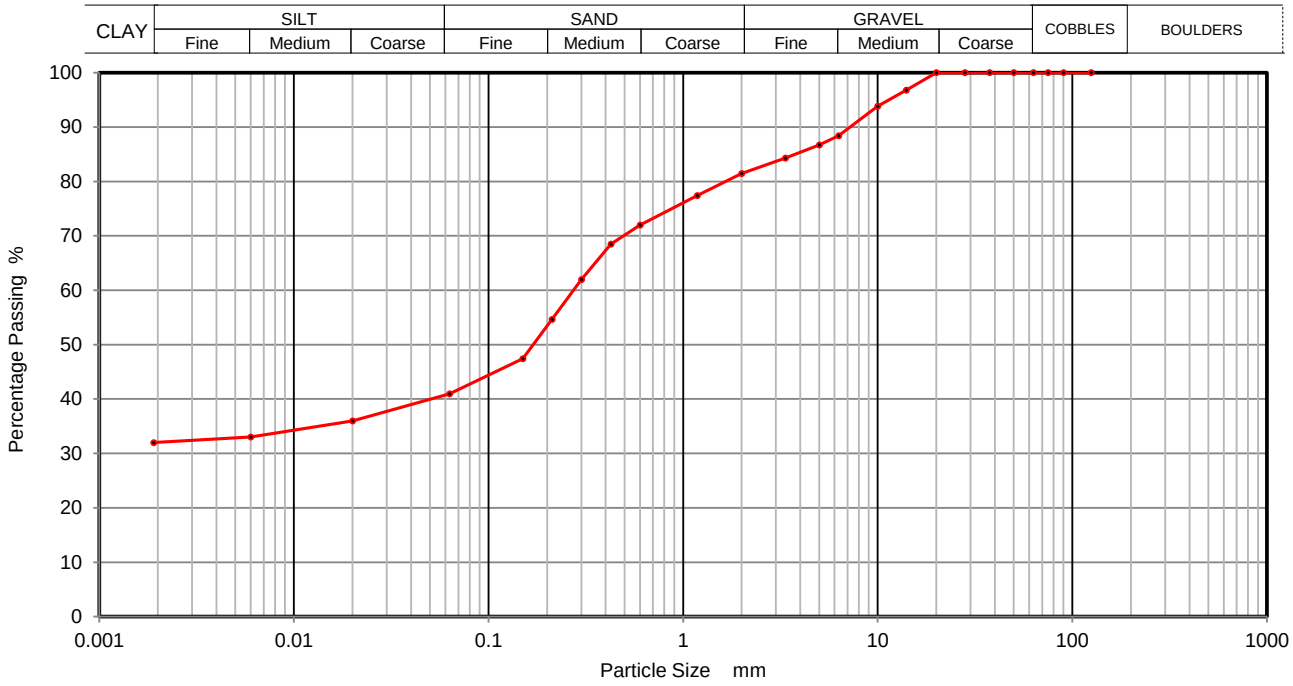
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| Cameron Thomas |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **PARTICLE SIZE DISTRIBUTION<br>BS 1377 Part 2:1990<br>Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4** | Contract Number | 72058 |
| | | Borehole/Pit No. | GBBH11 |
| Project Name | Grandison Brook - Jersey Park Boreholes | Sample No. | 4 |
| Soil Description | Brown fine to medium gravelly fine to coarse sandy silty CLAY | Depth Top | 3.00 |
| | | Depth Base | 4.00 |
| Date Tested | 11/04/2024 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | 0.0200 | 36 |
| 90 | 100 | 0.0060 | 33 |
| 75 | 100 | 0.0020 | 32 |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 97 | | |
| 10 | 94 | | |
| 6.3 | 88 | | |
| 5 | 87 | | |
| 3.35 | 84 | | |
| 2 | 81 | | |
| 1.18 | 77 | | |
| 0.6 | 72 | | |
| 0.425 | 69 | | |
| 0.3 | 62 | | |
| 0.212 | 55 | | |
| 0.15 | 47 | | |
| 0.063 | 41 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 19 |
| Sand | 40 |
| Silt | 9 |
| Clay | 32 |
| | |

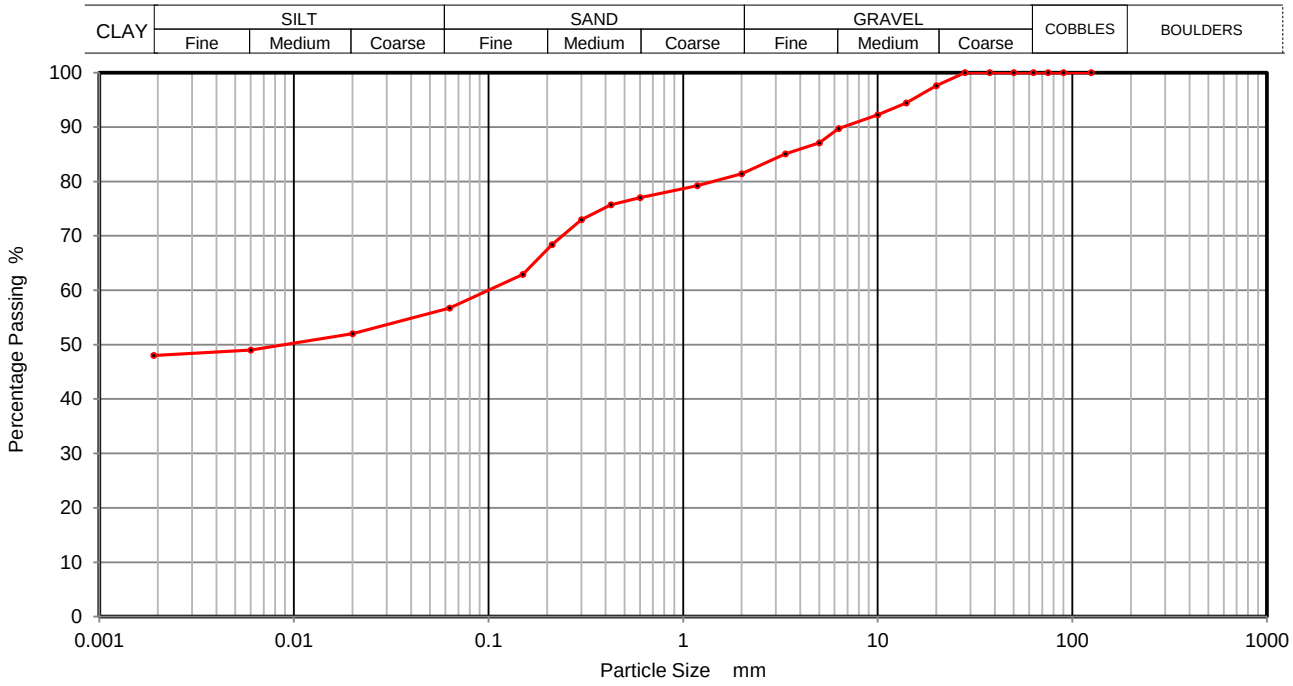
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| Cameron Thomas |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **PARTICLE SIZE DISTRIBUTION<br>BS 1377 Part 2:1990<br>Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4** | Contract Number | 72058 |
| | | Borehole/Pit No. | GBBH11 |
| Project Name | Grandison Brook - Jersey Park Boreholes | Sample No. | 5 |
| Soil Description | Brown fine to coarse gravelly fine to coarse sandy silty CLAY | Depth Top | 4.50 |
| | | Depth Base | 4.80 |
| Date Tested | 11/04/2024 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | 0.0200 | 52 |
| 90 | 100 | 0.0060 | 49 |
| 75 | 100 | 0.0020 | 48 |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 98 | | |
| 14 | 94 | | |
| 10 | 92 | | |
| 6.3 | 90 | | |
| 5 | 87 | | |
| 3.35 | 85 | | |
| 2 | 81 | | |
| 1.18 | 79 | | |
| 0.6 | 77 | | |
| 0.425 | 76 | | |
| 0.3 | 73 | | |
| 0.212 | 68 | | |
| 0.15 | 63 | | |
| 0.063 | 57 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 19 |
| Sand | 24 |
| Silt | 9 |
| Clay | 48 |
| | |

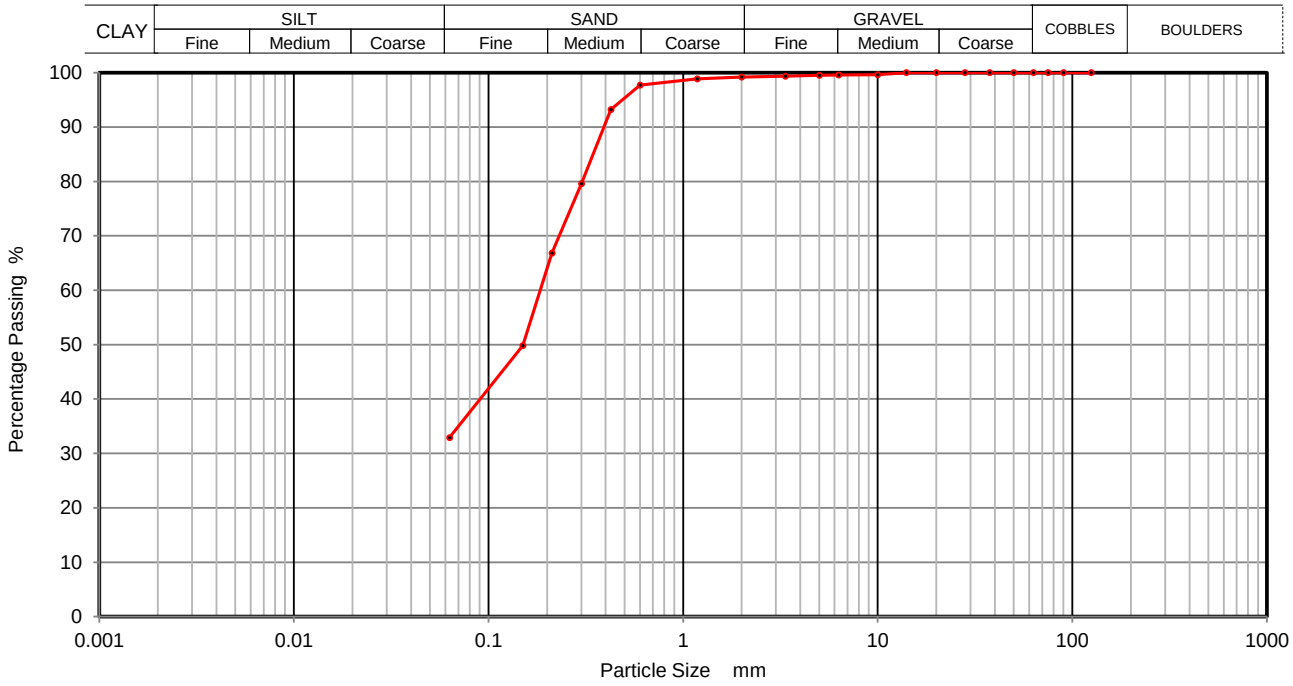
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| Cameron Thomas |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **PARTICLE SIZE DISTRIBUTION**<br>**BS 1377 Part 2:1990**<br>**Wet Sieve, Clause 9.2** | Contract Number | 72058 |
| | | Borehole/Pit No. | GBBH12 |
| Project Name | Grandison Brook - Jersey Park Boreholes | Sample No. | 2 |
| Soil Description | Brown slightly gravelly silty/ clayey fine to coarse SAND | Depth Top | 1.20 |
| | | Depth Base | 2.70 |
| Date Tested | 11/04/2024 | 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 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 99 | | |
| 2 | 99 | | |
| 1.18 | 99 | | |
| 0.6 | 98 | | |
| 0.425 | 93 | | |
| 0.3 | 80 | | |
| 0.212 | 67 | | |
| 0.15 | 50 | | |
| 0.063 | 33 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 1 |
| Sand | 66 |
| Silt and Clay | 33 |
| | |
| | |

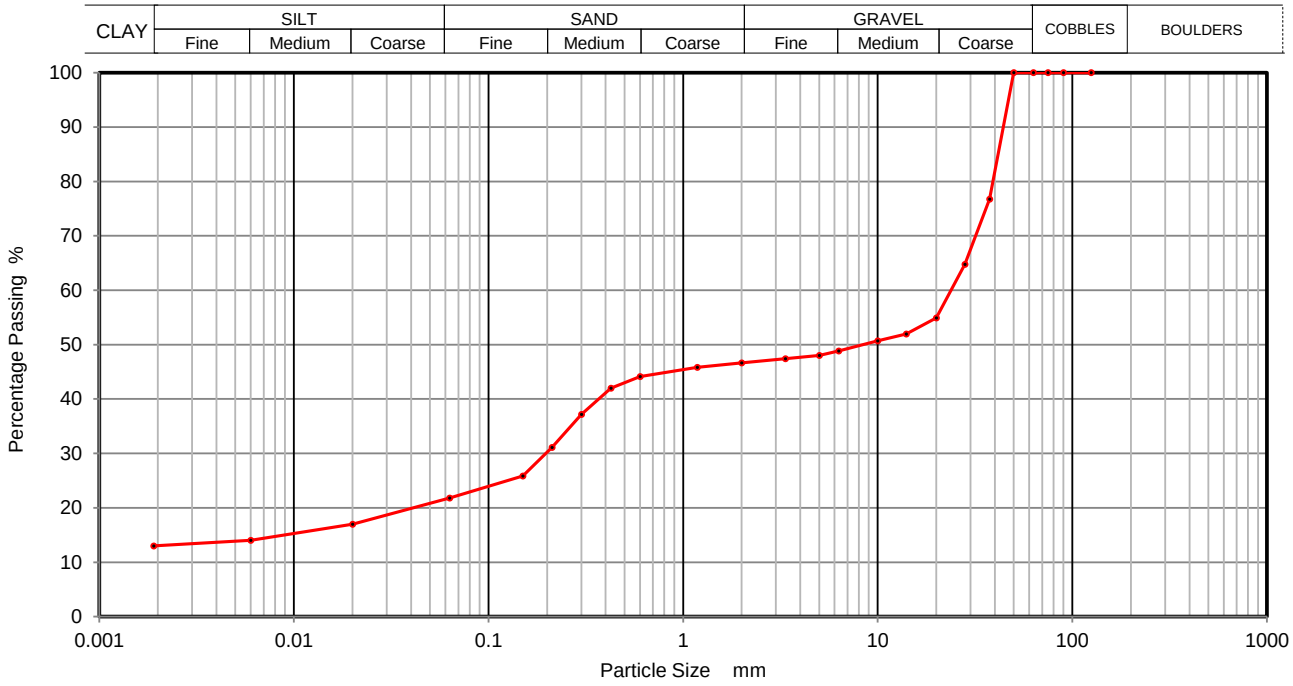
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| Cameron Thomas |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **PARTICLE SIZE DISTRIBUTION<br>BS 1377 Part 2:1990<br>Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4** | Contract Number | 72058 |
| | | Borehole/Pit No. | GBBH12 |
| Project Name | Grandison Brook - Jersey Park Boreholes | Sample No. | 3 |
| Soil Description | Brown slightly silty clayey fine to coarse sandy fine to coarse GRAVEL | Depth Top | 3.00 |
| | | Depth Base | 3.70 |
| Date Tested | 11/04/2024 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | 0.0200 | 17 |
| 90 | 100 | 0.0060 | 14 |
| 75 | 100 | 0.0020 | 13 |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 77 | | |
| 28 | 65 | | |
| 20 | 55 | | |
| 14 | 52 | | |
| 10 | 51 | | |
| 6.3 | 49 | | |
| 5 | 48 | | |
| 3.35 | 47 | | |
| 2 | 47 | | |
| 1.18 | 46 | | |
| 0.6 | 44 | | |
| 0.425 | 42 | | |
| 0.3 | 37 | | |
| 0.212 | 31 | | |
| 0.15 | 26 | | |
| 0.063 | 22 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 53 |
| Sand | 25 |
| Silt | 9 |
| Clay | 13 |
| | |

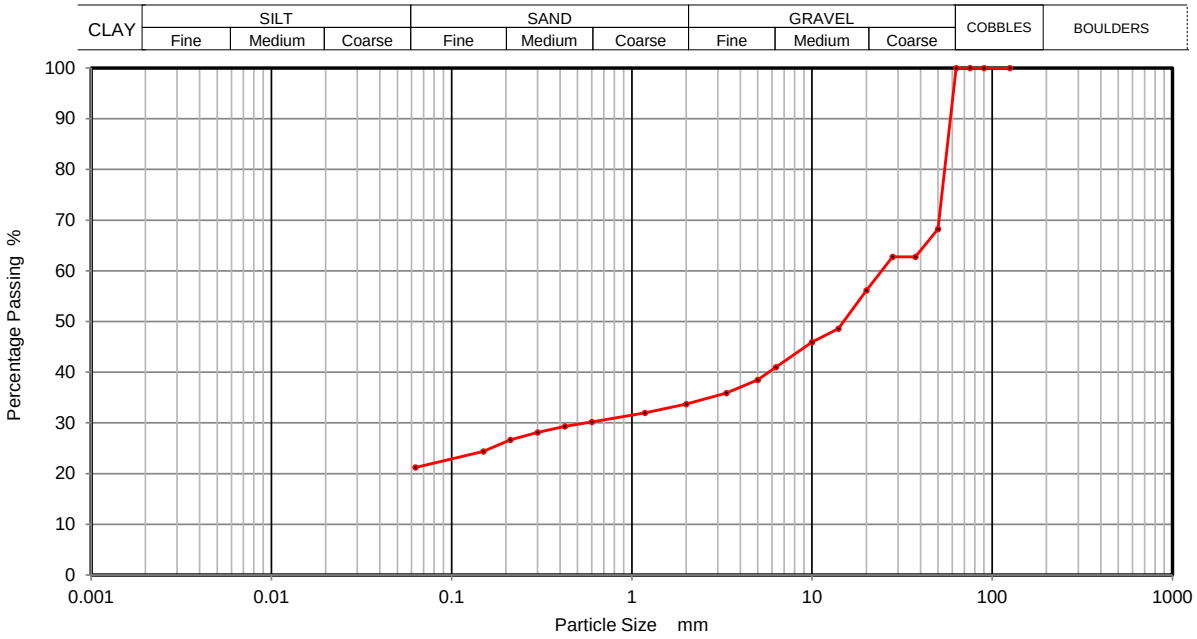
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| Cameron Thomas |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **PARTICLE SIZE DISTRIBUTION**<br>**BS 1377 Part 2:1990**<br>**Wet Sieve, Clause 9.2** | Contract Number | 72058 |
| | | Borehole/Pit No. | GBBH12 |
| Project Name | Grandison Brook - Jersey Park Boreholes | Sample No. | 5 |
| Soil Description | Brown fine to coarse sandy silty/clayey fine to coarse GRAVEL | Depth Top | 4.20 |
| | | Depth Base | 4.55 |
| Date Tested | 11/04/2024 | 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 | 63 | | |
| 28 | 63 | | |
| 20 | 56 | | |
| 14 | 49 | | |
| 10 | 46 | | |
| 6.3 | 41 | | |
| 5 | 38 | | |
| 3.35 | 36 | | |
| 2 | 34 | | |
| 1.18 | 32 | | |
| 0.6 | 30 | | |
| 0.425 | 29 | | |
| 0.3 | 28 | | |
| 0.212 | 27 | | |
| 0.15 | 24 | | |
| 0.063 | 21 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 66 |
| Sand | 13 |
| Silt and Clay | 21 |
| | |
| | |

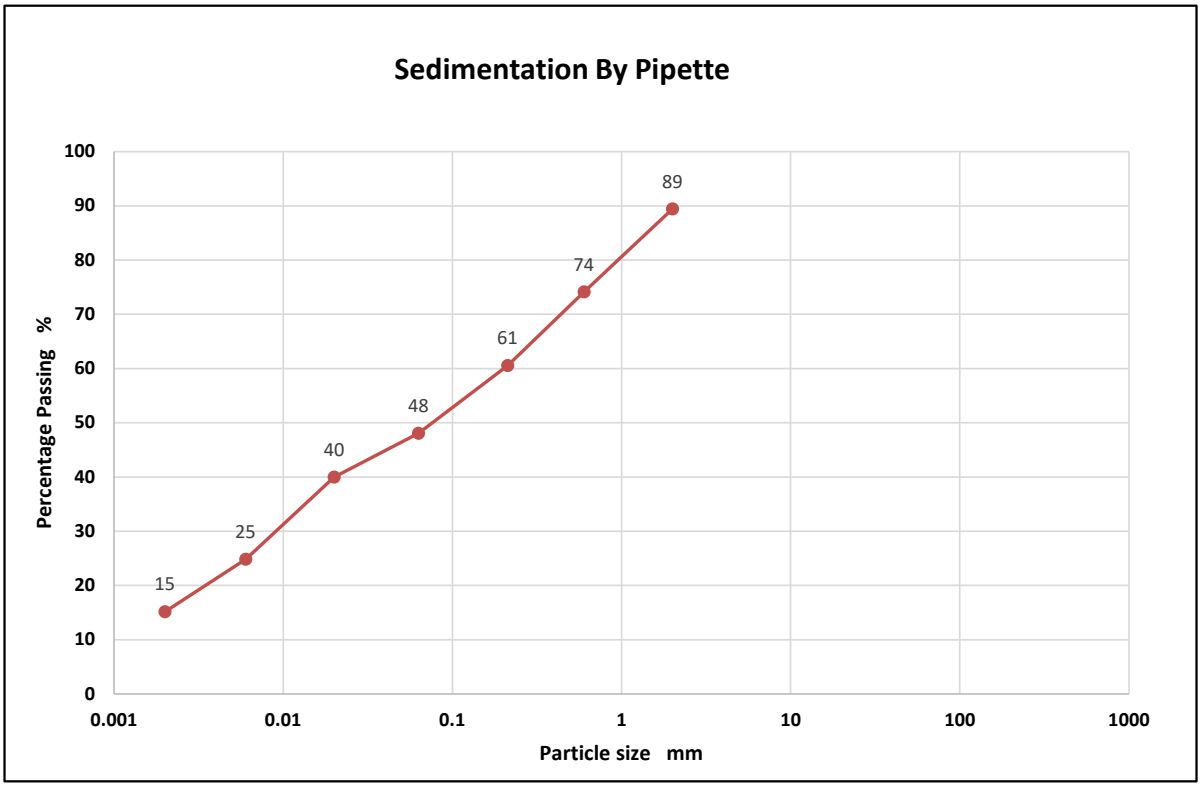
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operator |
|---|
| Cameron Thomas |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **Sedimentation By Pipette Analysis BS 1377 Part 2:1990 Clause 9.4** | Contract Number | 72058 |
| | | Borehole/Pit No. | GBBH10 |
| Project Name | Grandison Brook - Jersey Park Boreholes | Sample No. | 7 |
| Soil Description | Brown Gravelly Clayey Silty SAND | Depth Top | 6.50 |
| | | Depth Base | 7.00 |
| Date Tested | 11/04/2024 | Sample Type | D |




Top Sieve Analysis

| BS Test Sieve | Percentage Passing |
|---|---|
| 2.00 | 89 |
| 0.60 | 74 |
| 0.212 | 61 |
| 0.063 | 48 |

Sedimentation Analysis

| Particle Diameter | Percentage Passing |
|---|---|
| 0.02 | 40 |
| 0.006 | 25 |
| 0.002 | 15 |
| | |

| Soil Fraction | Total Percentage |
|---|---|
| Gravel | 11 |
| Sand | 41 |
| Silt | 33 |
| Clay | 15 |

| Operator |
|---|
| Rhydian Williams |

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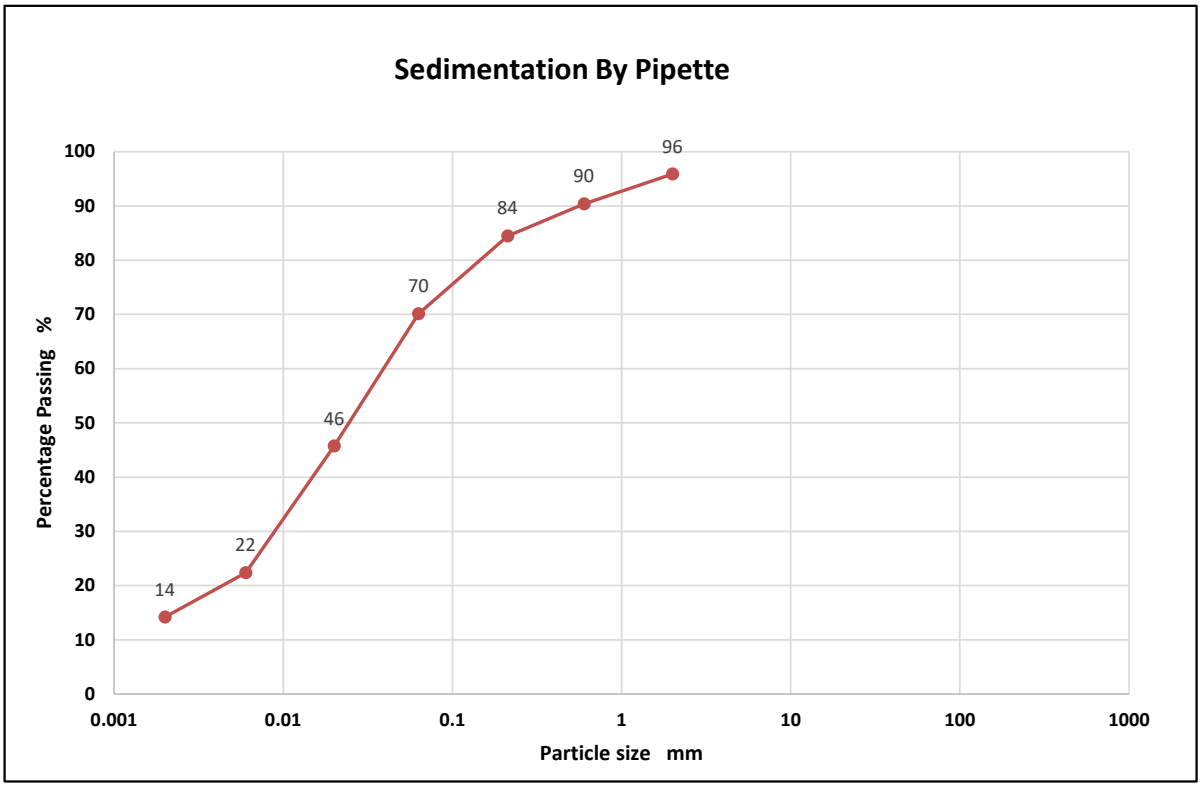
| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | Sedimentation By Pipette Analysis<br>BS 1377 Part 2:1990<br>Clause 9.4 | Contract Number | 72058 |
|---|---|---|---|
| | | Borehole/Pit No. | GBBH11 |
| Project Name | Grandison Brook - Jersey Park Boreholes | Sample No. | 3 |
| Soil Description | Brown Gravelly Clayey Sandy SILT | Depth Top | 5.00 |
| | | Depth Base | 5.50 |
| Date Tested | 11/04/2024 | Sample Type | D |




Top Sieve Analysis

| BS Test Sieve | Percentage Passing |
|---|---|
| 2.00 | 96 |
| 0.60 | 90 |
| 0.212 | 84 |
| 0.063 | 70 |

Sedimentation Analysis

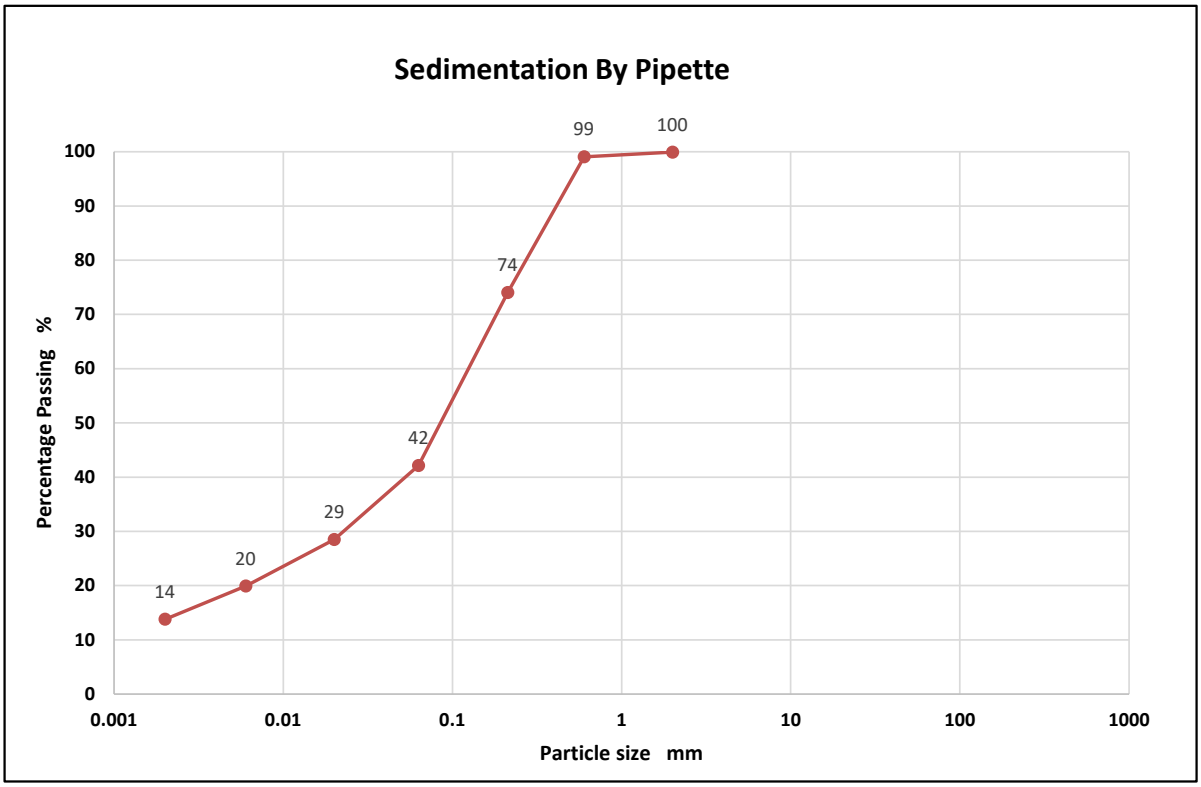
| Particle Diameter | Percentage Passing |
|---|---|
| 0.02 | 46 |
| 0.006 | 22 |
| 0.002 | 14 |
| | |

| Soil Fraction | Total Percentage |
|---|---|
| Gravel | 4 |
| Sand | 26 |
| Silt | 56 |
| Clay | 14 |

| Operator |
|---|
| Rhydian Williams |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | **Sedimentation By Pipette Analysis BS 1377 Part 2:1990 Clause 9.4** | Contract Number | 72058 |
| | | Borehole/Pit No. | GBBH12 |
| Project Name | Grandison Brook - Jersey Park Boreholes | Sample No. | 2 |
| Soil Description | Brown Clayey Silty SAND | Depth Top | 2.00 |
| | | Depth Base | |
| Date Tested | 11/04/2024 | Sample Type | D |




Top Sieve Analysis

| BS Test Sieve | Percentage Passing |
|---|---|
| 2.00 | 100 |
| 0.60 | 99 |
| 0.212 | 74 |
| 0.063 | 42 |

Sedimentation Analysis

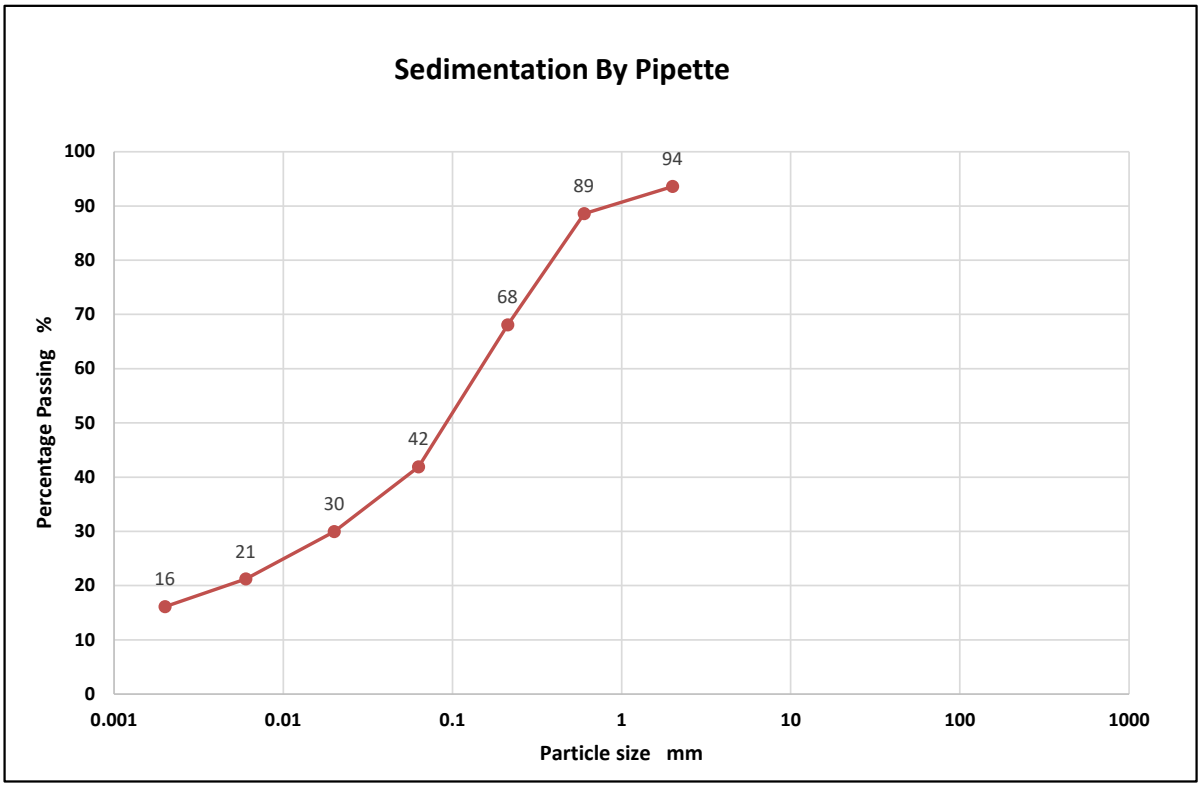
| Particle Diameter | Percentage Passing |
|---|---|
| 0.02 | 29 |
| 0.006 | 20 |
| 0.002 | 14 |
| | |

| Soil Fraction | Total Percentage |
|---|---|
| Gravel | 0 |
| Sand | 58 |
| Silt | 28 |
| Clay | 14 |

| Operator |
|---|
| Rhydian Williams |

UKAS TESTING 2788

| GSTL GEOTECHNICAL SITE & TESTING LABORATORIES | Sedimentation By Pipette Analysis<br>BS 1377 Part 2:1990<br>Clause 9.4 | Contract Number | 72058 |
|---|---|---|---|
| | | Borehole/Pit No. | GBBH12 |
| Project Name | Grandison Brook - Jersey Park Boreholes | Sample No. | 4 |
| Soil Description | Brown Gravelly Clayey Silty SAND | Depth Top | 5.70 |
| | | Depth Base | 6.50 |
| Date Tested | 11/04/2024 | Sample Type | D |




Top Sieve Analysis

| BS Test Sieve | Percentage Passing |
|---|---|
| 2.00 | 94 |
| 0.60 | 89 |
| 0.212 | 68 |
| 0.063 | 42 |

Sedimentation Analysis

| Particle Diameter | Percentage Passing |
|---|---|
| 0.02 | 30 |
| 0.006 | 21 |
| 0.002 | 16 |
| | |

| Soil Fraction | Total Percentage |
|---|---|
| Gravel | 6 |
| Sand | 52 |
| Silt | 26 |
| Clay | 16 |

| Operator |
|---|
| Rhydian Williams |

UKAS TESTING 2788

4161

CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

**GSTL**
Unit 3-4 Heol Aur
Dafen Ind Estate
Dafen
SA14 8QN

**Analytical Test Report: L24/03010/GSL - 24-43718**

| | | | |
|---|---|---|---|
| Your Project Reference: | **Q1484 Grandison Brook- Jersey Park Boreholes** | | |
| Your Order Number: | 72058 | Samples Received / Instructed: | 09/04/2024 / 09/04/2024 |
| Report Issue Number: | 1 | Sample Tested: | 09/04 to 16/04/2024 |
| Samples Analysed: | 4 soil samples | Report issued: | 16/04/2024 |

Signed

**James Gane**
Analytical Services Manager
CTS Group

Notes:

**General**

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with CTS method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

**Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.**

**Uncertainty of measurement values are available on request.**

Samples were supplied by customer, results apply to the samples as received.

**Deviating Samples**

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

**Accreditation Key**

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited, subUKAS - Subcontracted to a laboratory UKAS accredited for this test, subMCERTS - Subcontracted to a laboratory MCERTS accredited for this test

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue: 08.04.2024

Issued by: J. Gane

Issue No: 4

Rev No: 6

7 - 11 Harding Street
Leicester
LE1 4DH

**L24/03010/GSL - 24-43718**

**Project Reference - Q1484 Grandison Brook- Jersey Park**

**Boreholes**

**Analytical Test Results - Solid**

| Lab Reference | | | 351972 | 351974 |
|---|---|---|---|---|
| Client Sample ID | | | 3 | 1 |
| Client Sample Location | | | GBBH11 | GBBH12 |
| Client Sample Type | | | B | D |
| Client Sample Number | | | - | - |
| Depth - Top (m) | | | 1.50 | 1.00 |
| Depth - Bottom (m) | | | 2.50 | 1.10 |
| Date of Sampling | | | - | - |
| Time of Sampling | | | - | - |
| Sample Matrix | | | Clay | Clay |
| **Determinant** | **Units** | **Accreditation** | | |
| SOM (via TOC) | (%) | UKAS | 2.3 | 3.3 |

7 - 11 Harding Street
Leicester
LE1 4DH

**L24/03010/GSL - 24-43718**

**Project Reference - Q1484 Grandison Brook- Jersey Park Boreholes**

**Analytical Test Results - Chemical Analysis**

| Lab Reference | | | 351973 | 351975 |
|---|---|---|---|---|
| Client Sample ID | | | 4 | 4 |
| Client Sample Location | | | GBBH11 | GBBH11 |
| Client Sample Type | | | B | B |
| Client Sample Number | | | - | - |
| Depth - Top (m) | | | 3.00 | 3.90 |
| Depth - Bottom (m) | | | 4.00 | 4.20 |
| Date of Sampling | | | - | - |
| Time of Sampling | | | - | - |
| Sample Matrix | | | Clay | Clay |
| **Determinant** | **Units** | **Accreditation** | | |
| Water soluble sulphate (as $SO_4$) | (mg/l) | u | 12 | < 10 |
| Acid Soluble Sulphate | (%) | u | < 0.01 | < 0.01 |
| Total Sulphur | (%) | UKAS | 0.01 | 0.06 |
| pH Value | pH Units | MCERTS | 7.1 | 6.2 |

CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

4161

**L24/03010/GSL - 24-43718**

**Project Reference - Q1484 Grandison Brook- Jersey Park Boreholes**

**Sample Descriptions**

| Lab Reference | Client Sample ID | Client Sample Location | Client Sample Type | Client Sample Number | Description | Moisture Content (%) | Stone Content (%) | Passing 2mm test sieve (%) |
|---|---|---|---|---|---|---|---|---|
| 351972 | 3 | GBBH11 | B | - | Brown silty clay | 26 | < 0.1 | - |
| 351973 | 4 | GBBH11 | B | - | Brown silty sandy clay | - | - | 100 |
| 351974 | 1 | GBBH12 | D | - | Dark brown silty sandy clay | 24 | < 0.1 | - |
| 351975 | 4 | GBBH11 | B | - | Dark grey very gravelly sandy silty clay | - | - | 85 |

**L24/03010/GSL - 24-43718**

**Project Reference - Q1484 Grandison Brook- Jersey Park Boreholes**

**Sample Comments**

| Lab Reference | Client Sample ID | Client Sample Location | Client Sample Type | Client Sample Number | Comments |
|---|---|---|---|---|---|
| 351972 | 3 | GBBH11 | B | - | |
| 351973 | 4 | GBBH11 | B | - | |
| 351974 | 1 | GBBH12 | D | - | |
| 351975 | 4 | GBBH11 | B | - | |

7 - 11 Harding Street
Leicester
LE1 4DH

**L24/03010/GSL - 24-43718**

**Project Reference - Q1484 Grandison Brook- Jersey Park Boreholes**

**Analysis Methodologies**

| Test Code | Test Name / Reference | Sample condition for analysis | Sample Preperation | Test Details |
|---|---|---|---|---|
| ANIONSS | MS - CL - Anions by Aquakem (2:1Extract) | Oven dried | Passing 2mm test sieve | Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio |
| TOCS | MS - CL - TOC Eltra | Air Dried | Passing 10mm test sieve | Determination of Total Organic Carbon in soils |
| PHS | MS - CL - pH in Soils | As received | Passing 10mm test sieve | Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction) |
| ASSO4S | MS - CL - Acid Soluble Sulphate | Oven Dried | Passing 2mm test sieve | Determination of total sulphate in soils by acid extraction followed by ICP analysis |
| SAMPLEPREP | MS - CL - Sample Preparation | - | - | Preparation of samples (including determination of moisture content) to allow for subsequent analysis |
| 1377TS-ELT | BS1377 Total Sulphur Content by HTC | Oven dried | BS1377 : Part 1 : 2016 | Total Sulphur Content testing of Soil in accordance with BS 1377 : Part 3 : 2018 + A1 : 2021 Clause 7.10 (using Eltra CS-800 Analyser) |

7 - 11 Harding Street
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LE1 4DH

**L24/03010/GSL - 24-43718**

**Project Reference - Q1484 Grandison Brook- Jersey Park Boreholes**

**Sample Deviations**

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

**Observations on receipt**

A - No date of sampling provided
C - Received in inappropriate container
H - Contains headspace
T - Temperature on receipt exceeds storage temperature
R - Sample(s) received with less than 96 hours for testing to commence/complete, any result formally classed as deviating will be marked with an X against the applicable test (i.e. RX)

**Observations whilst in laboratory**

X - Exceeds sampling to extraction or analysis timescales

| Lab Reference | Client Sample ID | Client Sample Location | Client Sample Type | Client Sample Number | Test | Deviations |
|---|---|---|---|---|---|---|
| 351972 | 3 | GBBH11 | B | - | | A |
| 351973 | 4 | GBBH11 | B | - | | A |
| 351974 | 1 | GBBH12 | D | - | | A |
| 351975 | 4 | GBBH11 | B | - | | A |

# APPENDIX V – **CHEMICAL LABORATORY TEST RESULTS**

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

# Amended Report

| | | | |
|---|---|---|---|
| **Report No.:** | 24-08078-2 | | |
| **Initial Date of Issue:** | 26-Mar-2024 | **Date of Re-Issue:** | 04-Apr-2024 |
| **Re-Issue Details:** | This report has been revised and directly supersedes 24-08078-1 in its entirety | | |
| **Client** | Spencer Quantum Ltd | | |
| **Client Address:** | 13A Bishops Court Gardens<br>Clyst St Mary<br>Exeter<br>EX5 1DH | | |
| **Contact(s):** | Arwel Jones | | |
| **Project** | Grandison Brook FAS - Jersey Park Boreholes | | |
| **Quotation No.:** | Q24-34208 | **Date Received:** | 15-Mar-2024 |
| **Order No.:** | Q1484 | **Date Instructed:** | 15-Mar-2024 |
| **No. of Samples:** | 6 | | |
| **Turnaround (Wkdays):** | 5 | **Results Due:** | 21-Mar-2024 |
| **Date Approved:** | 26-Mar-2024 | | |
| **Approved By:** | | | |
| **Details:** | Stuart Henderson, Technical Manager | | |

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

# Results - Leachate

**Project: Grandison Brook FAS - Jersey Park Boreholes**

| **Client: Spencer Quantum Ltd** | | | | **Chemtest Job No.:** | | 24-08078 | 24-08078 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q24-34208 | | | | **Chemtest Sample ID.:** | | 1780458 | 1780463 |
| Order No.: Q1484 | | | | Client Sample Ref.: | | 2 | 2 |
| | | | | Sample Location: | | GBBH10 | GBBH12 |
| | | | | Sample Type: | | SOIL | SOIL |
| | | | | Top Depth (m): | | 0.5 | 0.8 |
| | | | | Date Sampled: | | 07-Mar-2024 | 06-Mar-2024 |
| **Determinand** | **Accred.** | **SOP** | **Type** | **Units** | **LOD** | | |
| pH at 20C | U | 1010 | 10:1 | | 4.0 | 7.6 | 7.3 |
| Chemical Oxygen Demand | U | 1100 | 10:1 | mg O2/l | 10 | < 10 | 20 |
| Ammoniacal Nitrogen | U | 1220 | 10:1 | mg/l | 0.050 | < 0.050 | 1.3 |
| Nitrite | U | 1220 | 10:1 | mg/l | 0.020 | < 0.020 | < 0.020 |
| Nitrate | U | 1220 | 10:1 | mg/l | 0.50 | 6.7 | 1.7 |
| Sulphate | U | 1220 | 10:1 | mg/l | 1.0 | 54 | < 1.0 |
| Cyanide (Total) Low-Level | N | 1300 | 10:1 | mg/l | 0.0050 | < 0.0050 | < 0.0050 |
| Cyanide (Free) Low-Level | N | 1300 | 10:1 | mg/l | 0.0050 | < 0.0050 | < 0.0050 |
| Cyanide (Complex) Low-Level | N | 1300 | 10:1 | mg/l | 0.0050 | < 0.0050 | < 0.0050 |
| Sulphide | U | 1325 | 10:1 | mg/l | 0.050 | < 0.050 | < 0.050 |
| Magnesium | U | 1455 | 10:1 | mg/l | 0.20 | 2.0 | 0.50 |
| Aluminium (Dissolved) | N | 1455 | 10:1 | µg/l | 5.0 | 71 | 690 |
| Arsenic (Dissolved) | U | 1455 | 10:1 | µg/l | 0.20 | 15 | 17 |
| Boron (Dissolved) | U | 1455 | 10:1 | µg/l | 10.0 | 20 | 13 |
| Barium (Dissolved) | U | 1455 | 10:1 | µg/l | 5.00 | 72 | 7.2 |
| Beryllium (Dissolved) | U | 1455 | 10:1 | µg/l | 1.00 | < 1.0 | < 1.0 |
| Cadmium (Dissolved) | U | 1455 | 10:1 | µg/l | 0.11 | 0.21 | < 0.11 |
| Copper (Dissolved) | U | 1455 | 10:1 | µg/l | 0.50 | 3.2 | 12 |
| Mercury (Dissolved) | U | 1455 | 10:1 | µg/l | 0.05 | < 0.05 | < 0.05 |
| Manganese (Dissolved) | U | 1455 | 10:1 | µg/l | 0.50 | 36 | 90 |
| Molybdenum (Dissolved) | U | 1455 | 10:1 | µg/l | 0.20 | 5.8 | 2.9 |
| Nickel (Dissolved) | U | 1455 | 10:1 | µg/l | 0.50 | 0.84 | 1.6 |
| Lead (Dissolved) | U | 1455 | 10:1 | µg/l | 0.50 | 21 | 4.2 |
| Antimony (Dissolved) | U | 1455 | 10:1 | µg/l | 0.50 | 3.7 | 1.5 |
| Selenium (Dissolved) | U | 1455 | 10:1 | µg/l | 0.50 | 4.9 | 4.3 |
| Vanadium (Dissolved) | U | 1455 | 10:1 | µg/l | 0.50 | 1.4 | 2.8 |
| Zinc (Dissolved) | U | 1455 | 10:1 | µg/l | 2.5 | 22 | 11 |
| Chromium (Total) | N | 1455 | 10:1 | µg/l | 0.50 | 0.58 | 1.2 |
| Iron (Dissolved) | N | 1455 | 10:1 | µg/l | 5.0 | 48 | 1800 |
| Low-Level Chromium (Hexavalent) | N | 1495 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C5-C6 | N | 1675 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C6-C8 | N | 1675 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C8-C10 | N | 1675 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C10-C12 | N | 1675 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C12-C16 | N | 1675 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C16-C21 | N | 1675 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C21-C35 | N | 1675 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Aliphatic TPH >C35-C44 | N | 1675 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Total Aliphatic Hydrocarbons | N | 1675 | 10:1 | µg/l | 5.0 | < 5.0 | < 5.0 |

# Results - Leachate

**Project: Grandison Brook FAS - Jersey Park Boreholes**

| **Client: Spencer Quantum Ltd** | | | | **Chemtest Job No.:** | | 24-08078 | 24-08078 |
|---|---|---|---|---|---|---|---|
| Quotation No.: Q24-34208 | | | | **Chemtest Sample ID.:** | | 1780458 | 1780463 |
| Order No.: Q1484 | | | | Client Sample Ref.: | | 2 | 2 |
| | | | | Sample Location: | | GBBH10 | GBBH12 |
| | | | | Sample Type: | | SOIL | SOIL |
| | | | | Top Depth (m): | | 0.5 | 0.8 |
| | | | | Date Sampled: | | 07-Mar-2024 | 06-Mar-2024 |
| **Determinand** | **Accred.** | **SOP** | **Type** | **Units** | **LOD** | | |
| Aromatic TPH >C5-C7 | N | 1675 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C7-C8 | N | 1675 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C8-C10 | N | 1675 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C10-C12 | N | 1675 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C12-C16 | N | 1675 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C16-C21 | N | 1675 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C21-C35 | N | 1675 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Aromatic TPH >C35-C44 | N | 1675 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Total Aromatic Hydrocarbons | N | 1675 | 10:1 | µg/l | 5.0 | < 5.0 | < 5.0 |
| Total Petroleum Hydrocarbons | N | 1675 | 10:1 | µg/l | 10 | < 10 | < 10 |
| Benzene | U | 1760 | 10:1 | µg/l | 1.0 | < 1.0 | < 1.0 |
| Toluene | U | 1760 | 10:1 | µg/l | 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | U | 1760 | 10:1 | µg/l | 1.0 | < 1.0 | < 1.0 |
| m & p-Xylene | U | 1760 | 10:1 | µg/l | 1.0 | < 1.0 | < 1.0 |
| o-Xylene | U | 1760 | 10:1 | µg/l | 1.0 | < 1.0 | < 1.0 |
| Methyl Tert-Butyl Ether | N | 1760 | 10:1 | µg/l | 1.0 | < 1.0 | < 1.0 |
| Naphthalene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Acenaphthylene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Acenaphthene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Fluorene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Phenanthrene | U | 1800 | 10:1 | µg/l | 0.10 | 3.3 | < 0.10 |
| Anthracene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Fluoranthene | U | 1800 | 10:1 | µg/l | 0.10 | 6.4 | < 0.10 |
| Pyrene | U | 1800 | 10:1 | µg/l | 0.10 | 4.4 | < 0.10 |
| Benzo[a]anthracene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Chrysene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Benzo[a]pyrene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Coronene | N | 1800 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 |
| Total Of 17 PAH's | N | 1800 | 10:1 | µg/l | 2.0 | 14 | < 2.0 |
| Total Phenols | U | 1920 | 10:1 | mg/l | 0.030 | < 0.030 | < 0.030 |

# Results - Soil

**Project: Grandison Brook FAS - Jersey Park Boreholes**

| **Client: Spencer Quantum Ltd** | | | | **Chemtest Job No.:** | | 24-08078 | 24-08078 | 24-08078 | 24-08078 | 24-08078 | 24-08078 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q24-34208 | | | | **Chemtest Sample ID.:** | | 1780458 | 1780459 | 1780460 | 1780461 | 1780462 | 1780463 |
| Order No.: Q1484 | | | | Client Sample Ref.: | | 2 | 3 | 1 | 3 | 1 | 2 |
| | | | | Sample Location: | | GBBH10 | GBBH10 | GBBH11 | GBBH11 | GBBH12 | GBBH12 |
| | | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | | Top Depth (m): | | 0.5 | 1.0 | 0.5 | 1.5 | 0.25 | 0.8 |
| | | | | Date Sampled: | | 07-Mar-2024 | 07-Mar-2024 | 07-Mar-2024 | 07-Mar-2024 | 06-Mar-2024 | 06-Mar-2024 |
| | | | | Asbestos Lab: | | DURHAM | DURHAM | DURHAM | DURHAM | DURHAM | DURHAM |
| **Determinand** | **HWOL Code** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | |
| ACM Type | | U | 2192 | | N/A | - | - | - | - | - | - |
| Asbestos Identification | | U | 2192 | | N/A | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected |
| Moisture | | N | 2030 | % | 0.020 | 16 | 17 | 19 | 27 | 15 | 16 |
| Soil Colour | | N | 2040 | | N/A | Brown | Brown | Brown | Brown | Brown | Brown |
| Other Material | | N | 2040 | | N/A | Stones | Stones | Stones | Stones | Stones | Stones |
| Soil Texture | | N | 2040 | | N/A | Loam | Loam | Loam | Clay | Loam | Loam |
| pH at 20C | | M | 2010 | | 4.0 | 8.3 | 10.2 | 8.5 | 7.4 | 8.5 | 7.8 |
| Sulphate (2:1 Water Soluble) as SO4 | | M | 2120 | g/l | 0.010 | 0.12 | 0.076 | 0.15 | < 0.010 | < 0.010 | 0.015 |
| Total Sulphur | | U | 2175 | % | 0.010 | 0.27 | 0.17 | 0.16 | 0.098 | 0.22 | 0.047 |
| Nitrite (Extractable) | | N | 2220 | mg/kg | 0.10 | 0.12 | 0.52 | < 0.10 | < 0.10 | 0.30 | < 0.10 |
| Nitrate (Water Soluble) | | N | 2220 | g/l | 0.010 | < 0.010 | 0.019 | 0.015 | < 0.010 | < 0.010 | < 0.010 |
| Cyanide (Complex) | | M | 2300 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Cyanide (Free) | | M | 2300 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Cyanide (Total) | | M | 2300 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Thiocyanate | | M | 2300 | mg/kg | 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Sulphide (Easily Liberatable) | | N | 2325 | mg/kg | 0.50 | 13 | 29 | 11 | 5.1 | 7.7 | 3.7 |
| Ammoniacal Nitrogen | | M | 2425 | mg/kg | 0.50 | 6.1 | 0.77 | 19 | 37 | 3.5 | 54 |
| Aluminium (Total) | | N | 2430 | mg/kg | 100 | 4900 | 2500 | 3900 | 3500 | 3900 | 4100 |
| Iron (Total) | | N | 2430 | mg/kg | 100 | 9500 | 4400 | 7200 | 5400 | 10000 | 5900 |
| Sulphate (Total) | | U | 2430 | mg/kg | 100 | 2400 | 1000 | 1600 | 1400 | 1500 | 1400 |
| Sulphate (Acid Soluble) | | U | 2430 | % | 0.010 | 0.031 | 0.013 | 0.088 | 0.14 | 0.021 | 0.018 |
| Arsenic | | M | 2455 | mg/kg | 0.5 | 1400 | 67 | 810 | 28 | 810 | 180 |
| Barium | | M | 2455 | mg/kg | 0.5 | 550 | 1200 | 420 | 91 | 1600 | 400 |
| Beryllium | | U | 2455 | mg/kg | 0.5 | 1.3 | 0.8 | 1.7 | 0.5 | 1.8 | 1.2 |
| Cadmium | | M | 2455 | mg/kg | 0.10 | 27 | 1.4 | 11 | 0.45 | 22 | 5.3 |
| Chromium | | M | 2455 | mg/kg | 0.5 | 510 | 2900 | 45 | 22 | 73 | 40 |
| Manganese | | M | 2455 | mg/kg | 1.0 | 7600 | 31000 | 4200 | 260 | 4800 | 2800 |
| Molybdenum | | M | 2455 | mg/kg | 0.5 | 15 | 33 | 4.9 | 0.6 | 12 | 3.2 |
| Antimony | | N | 2455 | mg/kg | 2.0 | 55 | 3.3 | 28 | 2.5 | 100 | 22 |
| Copper | | M | 2455 | mg/kg | 0.50 | 1000 | 180 | 660 | 26 | 810 | 210 |
| Mercury | | M | 2455 | mg/kg | 0.05 | 0.20 | 0.34 | 0.14 | 0.09 | 0.27 | 0.13 |
| Nickel | | M | 2455 | mg/kg | 0.50 | 79 | 110 | 49 | 29 | 110 | 56 |
| Lead | | M | 2455 | mg/kg | 0.50 | 8300 | 210 | 3500 | 320 | 14000 | 2900 |
| Selenium | | M | 2455 | mg/kg | 0.25 | 5.2 | 1.4 | 1.8 | 0.73 | 3.1 | 1.6 |
| Vanadium | | U | 2455 | mg/kg | 0.5 | 190 | 680 | 57 | 38 | 120 | 51 |
| Zinc | | M | 2455 | mg/kg | 0.50 | 14000 | 450 | 6300 | 710 | 28000 | 6400 |
| Chromium (Hexavalent) | | N | 2490 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |

# Results - Soil

**Project: Grandison Brook FAS - Jersey Park Boreholes**

| **Client: Spencer Quantum Ltd** | | | **Chemtest Job No.:** | | | 24-08078 | 24-08078 | 24-08078 | 24-08078 | 24-08078 | 24-08078 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q24-34208 | | | **Chemtest Sample ID.:** | | | 1780458 | 1780459 | 1780460 | 1780461 | 1780462 | 1780463 |
| Order No.: Q1484 | | | Client Sample Ref.: | | | 2 | 3 | 1 | 3 | 1 | 2 |
| | | | Sample Location: | | | GBBH10 | GBBH10 | GBBH11 | GBBH11 | GBBH12 | GBBH12 |
| | | | Sample Type: | | | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | | 0.5 | 1.0 | 0.5 | 1.5 | 0.25 | 0.8 |
| | | | Date Sampled: | | | 07-Mar-2024 | 07-Mar-2024 | 07-Mar-2024 | 07-Mar-2024 | 06-Mar-2024 | 06-Mar-2024 |
| | | | Asbestos Lab: | | | DURHAM | DURHAM | DURHAM | DURHAM | DURHAM | DURHAM |
| **Determinand** | **HWOL Code** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | |
| Aliphatic VPH >C5-C6 | HS_2D_AL | U | 2780 | mg/kg | 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Aliphatic VPH >C6-C7 | HS_2D_AL | U | 2780 | mg/kg | 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Aliphatic VPH >C7-C8 | HS_2D_AL | U | 2780 | mg/kg | 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Aliphatic VPH >C6-C8 (Sum) | HS_2D_AL | N | 2780 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Aliphatic VPH >C8-C10 | HS_2D_AL | U | 2780 | mg/kg | 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Total Aliphatic VPH >C5-C10 | HS_2D_AL | U | 2780 | mg/kg | 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.25 |
| Aliphatic EPH >C10-C12 MC | EH_2D_AL_#1 | M | 2690 | mg/kg | 2.00 | 2.8 | 2.5 | 2.7 | 3.2 | 2.7 | 3.0 |
| Aliphatic EPH >C12-C16 MC | EH_2D_AL_#1 | M | 2690 | mg/kg | 1.00 | 1.7 | 1.7 | 1.3 | 1.7 | 1.4 | 1.7 |
| Aliphatic EPH >C16-C21 MC | EH_2D_AL_#1 | M | 2690 | mg/kg | 2.00 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Aliphatic EPH >C21-C35 MC | EH_2D_AL_#1 | M | 2690 | mg/kg | 3.00 | 3.8 | < 3.0 | 5.5 | < 3.0 | < 3.0 | < 3.0 |
| Aliphatic EPH >C35-C40 MC | EH_2D_AL_#1 | N | 2690 | mg/kg | 10.00 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Total Aliphatic EPH >C10-C35 MC | EH_2D_AL_#1 | M | 2690 | mg/kg | 5.00 | 8.4 | 5.6 | 11 | 6.0 | < 5.0 | 7.4 |
| Total Aliphatic EPH >C10-C40 MC | EH_2D_AL_#1 | N | 2690 | mg/kg | 10.00 | < 10 | < 10 | 11 | < 10 | < 10 | < 10 |
| Aromatic VPH >C5-C7 | HS_2D_AR | U | 2780 | mg/kg | 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Aromatic VPH >C7-C8 | HS_2D_AR | U | 2780 | mg/kg | 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Aromatic VPH >C8-C10 | HS_2D_AR | U | 2780 | mg/kg | 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Total Aromatic VPH >C5-C10 | HS_2D_AR | U | 2780 | mg/kg | 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.25 |
| Aromatic EPH >C10-C12 MC | EH_2D_AR_#1 | U | 2690 | mg/kg | 1.00 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic EPH >C12-C16 MC | EH_2D_AR_#1 | U | 2690 | mg/kg | 1.00 | < 1.0 | < 1.0 | 1.5 | < 1.0 | < 1.0 | < 1.0 |
| Aromatic EPH >C16-C21 MC | EH_2D_AR_#1 | U | 2690 | mg/kg | 2.00 | 8.6 | < 2.0 | 20 | < 2.0 | < 2.0 | < 2.0 |
| Aromatic EPH >C21-C35 MC | EH_2D_AR_#1 | U | 2690 | mg/kg | 2.00 | 17 | 2.2 | 56 | < 2.0 | < 2.0 | 3.9 |
| Aromatic EPH >C35-C40 MC | EH_2D_AR_#1 | N | 2690 | mg/kg | 1.00 | 44 | 1.5 | 3.3 | < 1.0 | < 1.0 | 1.1 |
| Total Aromatic EPH >C10-C35 MC | EH_2D_AR_#1 | U | 2690 | mg/kg | 5.00 | 26 | < 5.0 | 78 | < 5.0 | < 5.0 | 5.0 |
| Total Aromatic EPH >C10-C40 MC | EH_2D_AR_#1 | N | 2690 | mg/kg | 10.00 | 70 | < 10 | 81 | < 10 | < 10 | < 10 |
| Total VPH >C5-C10 | HS_2D_Total | U | 2780 | mg/kg | 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Total EPH >C10-C35 MC | EH_2D_Total_#1 | U | 2690 | mg/kg | 10.00 | 34 | < 10 | 88 | < 10 | < 10 | 12 |
| Total EPH >C10-C40 MC | EH_2D_Total_#1 | N | 2690 | mg/kg | 10.00 | 78 | < 10 | 92 | < 10 | < 10 | 14 |
| Organic Matter | | M | 2625 | % | 0.40 | 30 | 3.3 | 7.6 | 2.1 | 8.8 | 1.8 |
| Total TPH >C6-C40 | EH_1D_Total | M | 2670 | mg/kg | 10 | 160 | < 10 | 300 | < 10 | 130 | < 10 |
| Naphthalene | | M | 2700 | mg/kg | 0.10 | 0.52 | < 0.10 | 0.77 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthylene | | M | 2700 | mg/kg | 0.10 | 0.51 | < 0.10 | 0.43 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthene | | M | 2700 | mg/kg | 0.10 | 0.64 | < 0.10 | 0.59 | < 0.10 | < 0.10 | < 0.10 |
| Fluorene | | M | 2700 | mg/kg | 0.10 | 0.71 | < 0.10 | 0.65 | < 0.10 | < 0.10 | < 0.10 |
| Phenanthrene | | M | 2700 | mg/kg | 0.10 | 2.5 | < 0.10 | 2.1 | < 0.10 | < 0.10 | < 0.10 |
| Anthracene | | M | 2700 | mg/kg | 0.10 | 1.4 | < 0.10 | 1.1 | < 0.10 | < 0.10 | < 0.10 |
| Fluoranthene | | M | 2700 | mg/kg | 0.10 | 7.0 | 0.50 | 6.1 | < 0.10 | 0.24 | < 0.10 |
| Pyrene | | M | 2700 | mg/kg | 0.10 | 6.3 | 0.59 | 5.4 | < 0.10 | 0.35 | < 0.10 |
| Benzo[a]anthracene | | M | 2700 | mg/kg | 0.10 | 4.2 | 0.21 | 3.8 | < 0.10 | 0.63 | < 0.10 |

# Results - Soil

**Project: Grandison Brook FAS - Jersey Park Boreholes**

| **Client: Spencer Quantum Ltd** | | | | **Chemtest Job No.:** | | 24-08078 | 24-08078 | 24-08078 | 24-08078 | 24-08078 | 24-08078 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q24-34208 | | | | **Chemtest Sample ID.:** | | 1780458 | 1780459 | 1780460 | 1780461 | 1780462 | 1780463 |
| Order No.: Q1484 | | | | Client Sample Ref.: | | 2 | 3 | 1 | 3 | 1 | 2 |
| | | | | Sample Location: | | GBBH10 | GBBH10 | GBBH11 | GBBH11 | GBBH12 | GBBH12 |
| | | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | | Top Depth (m): | | 0.5 | 1.0 | 0.5 | 1.5 | 0.25 | 0.8 |
| | | | | Date Sampled: | | 07-Mar-2024 | 07-Mar-2024 | 07-Mar-2024 | 07-Mar-2024 | 06-Mar-2024 | 06-Mar-2024 |
| | | | | Asbestos Lab: | | DURHAM | DURHAM | DURHAM | DURHAM | DURHAM | DURHAM |
| **Determinand** | **HWOL Code** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | |
| Chrysene | | M | 2700 | mg/kg | 0.10 | 5.7 | 0.40 | 5.0 | < 0.10 | 0.44 | < 0.10 |
| Benzo[b]fluoranthene | | M | 2700 | mg/kg | 0.10 | 7.4 | < 0.10 | 5.5 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | | M | 2700 | mg/kg | 0.10 | 2.7 | < 0.10 | 1.9 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[a]pyrene | | M | 2700 | mg/kg | 0.10 | 5.0 | < 0.10 | 3.5 | < 0.10 | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | | M | 2700 | mg/kg | 0.10 | 4.0 | < 0.10 | 2.6 | < 0.10 | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | | M | 2700 | mg/kg | 0.10 | 1.4 | < 0.10 | 0.96 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | | M | 2700 | mg/kg | 0.10 | 3.7 | < 0.10 | 2.6 | < 0.10 | < 0.10 | < 0.10 |
| Total Of 16 PAH's | | M | 2700 | mg/kg | 2.0 | 54 | < 2.0 | 43 | < 2.0 | < 2.0 | < 2.0 |
| Benzene | | M | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | | M | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | | M | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| m & p-Xylene | | M | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-Xylene | | M | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Methyl Tert-Butyl Ether | | M | 2760 | µg/kg | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Naphthalene | | M | 2800 | mg/kg | 0.10 | 0.17 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthylene | | N | 2800 | mg/kg | 0.10 | 0.82 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthene | | M | 2800 | mg/kg | 0.10 | 0.19 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluorene | | M | 2800 | mg/kg | 0.10 | 0.52 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Phenanthrene | | M | 2800 | mg/kg | 0.10 | 3.9 | < 0.10 | 0.81 | < 0.10 | < 0.10 | < 0.10 |
| Anthracene | | M | 2800 | mg/kg | 0.10 | 2.1 | < 0.10 | 0.36 | < 0.10 | < 0.10 | < 0.10 |
| Fluoranthene | | M | 2800 | mg/kg | 0.10 | 12 | < 0.10 | 2.3 | < 0.10 | < 0.10 | < 0.10 |
| Pyrene | | M | 2800 | mg/kg | 0.10 | 7.9 | < 0.10 | 1.9 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[a]anthracene | | M | 2800 | mg/kg | 0.10 | 8.8 | < 0.10 | 1.3 | < 0.10 | < 0.10 | < 0.10 |
| Chrysene | | M | 2800 | mg/kg | 0.10 | 9.6 | < 0.10 | 1.2 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene | | M | 2800 | mg/kg | 0.10 | 12 | < 0.10 | 2.0 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | | M | 2800 | mg/kg | 0.10 | 4.5 | < 0.10 | 0.61 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[a]pyrene | | M | 2800 | mg/kg | 0.10 | 7.4 | < 0.10 | 1.4 | < 0.10 | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | | M | 2800 | mg/kg | 0.10 | 5.2 | < 0.10 | 0.94 | < 0.10 | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | | N | 2800 | mg/kg | 0.10 | 1.7 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | | M | 2800 | mg/kg | 0.10 | 4.0 | < 0.10 | 1.0 | < 0.10 | < 0.10 | < 0.10 |
| Coronene | | N | 2800 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Of 17 PAH's | | N | 2800 | mg/kg | 2.0 | 81 | < 2.0 | 14 | < 2.0 | < 2.0 | < 2.0 |
| Total Phenols | | M | 2920 | mg/kg | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |

# Test Methods

| SOP | Title | Parameters included | Method summary | Water Accred. |
|---|---|---|---|---|
| 1010 | pH Value of Waters | pH at 20°C | pH Meter | |
| 1100 | Chemical Oxygen Demand | Chemical Oxygen demand (COD) | Dichromate oxidation of organic matter in sample followed by colorimetric determination of residual Cr[VI]. | |
| 1220 | Anions, Alkalinity & Ammonium in Waters | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser. | |
| 1300 | Cyanides & Thiocyanate in Waters | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Continuous Flow Analysis. | |
| 1325 | Sulphide in Waters | Sulphides | Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N–dimethyl-pphenylenediamine. | |
| 1455 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). | |
| 1495 | Low Level Hexavalent Chromium in Waters | Chromium [VI] | Colorimetric determination of hexavalent chromium expressed as Cr (VI) µg/l in water, using Ion Chromatography and UV-visible spectrophotometry. | |
| 1675 | TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG) | Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44 | Pentane extraction / GCxGC FID detection | |
| 1760 | Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260) | Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds. | |
| 1800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Pentane extraction / GCMS detection | |
| 1920 | Phenols in Waters by HPLC | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded. | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection. | |
| 2010 | pH Value of Soils | pH at 20°C | pH Meter | |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. | |
| 2040 | Soil Description(Requirement of MCERTS) | Soil description | As received soil is described based upon BS5930 | |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES | |
| 2175 | Total Sulphur in Soils | Total Sulphur | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. | |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry | |
| 2220 | Water soluble Chloride in Soils | Chloride | Aqueous extraction and measuremernt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate. | |
| 2300 | Cyanides & Thiocyanate in Soils | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser. | |
| 2325 | Sulphide in Soils | Sulphide | Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine. | |

# Test Methods

| SOP | Title | Parameters included | Method summary | Water Accred. |
|---|---|---|---|---|
| 2425 | Extractable Ammonium in soils | Ammonium | Extraction with potassium chloride solution / analysis by 'Aquakem 600' Discrete Analyser using sodium salicylate and sodium dichloroisocyanurate. | |
| 2430 | Total Sulphate in soils | Total Sulphate | Acid digestion followed by determination of sulphate in extract by ICP-OES. | |
| 2455 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. | |
| 2490 | Hexavalent Chromium in Soils | Chromium [VI] | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. | |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. | |
| 2670 | Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40 | Dichloromethane extraction / GC-FID | |
| 2690 | EPH A/A Split | Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 | Acetone/Heptane extraction / GCxGC FID detection | |
| 2700 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds) | |
| 2760 | Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule | Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds. | |
| 2780 | VPH A/A Split | Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10 | Water extraction / Headspace GCxGC FID detection | |
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene* | Dichloromethane extraction / GC-MS | |
| 2920 | Phenols in Soils by HPLC | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded. | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection. | |
| 640 | Characterisation of Waste (Leaching C10) | Waste material including soil, sludges and granular waste | ComplianceTest for Leaching of Granular Waste Material and Sludge | |

## Report Information

**Key**

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

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

**Sample Deviation Codes**

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

**Sample Retention and Disposal**

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

**Water Sample Category Key for Accreditation**

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water

## Report Information

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

### Clean Up Codes

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

### HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

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

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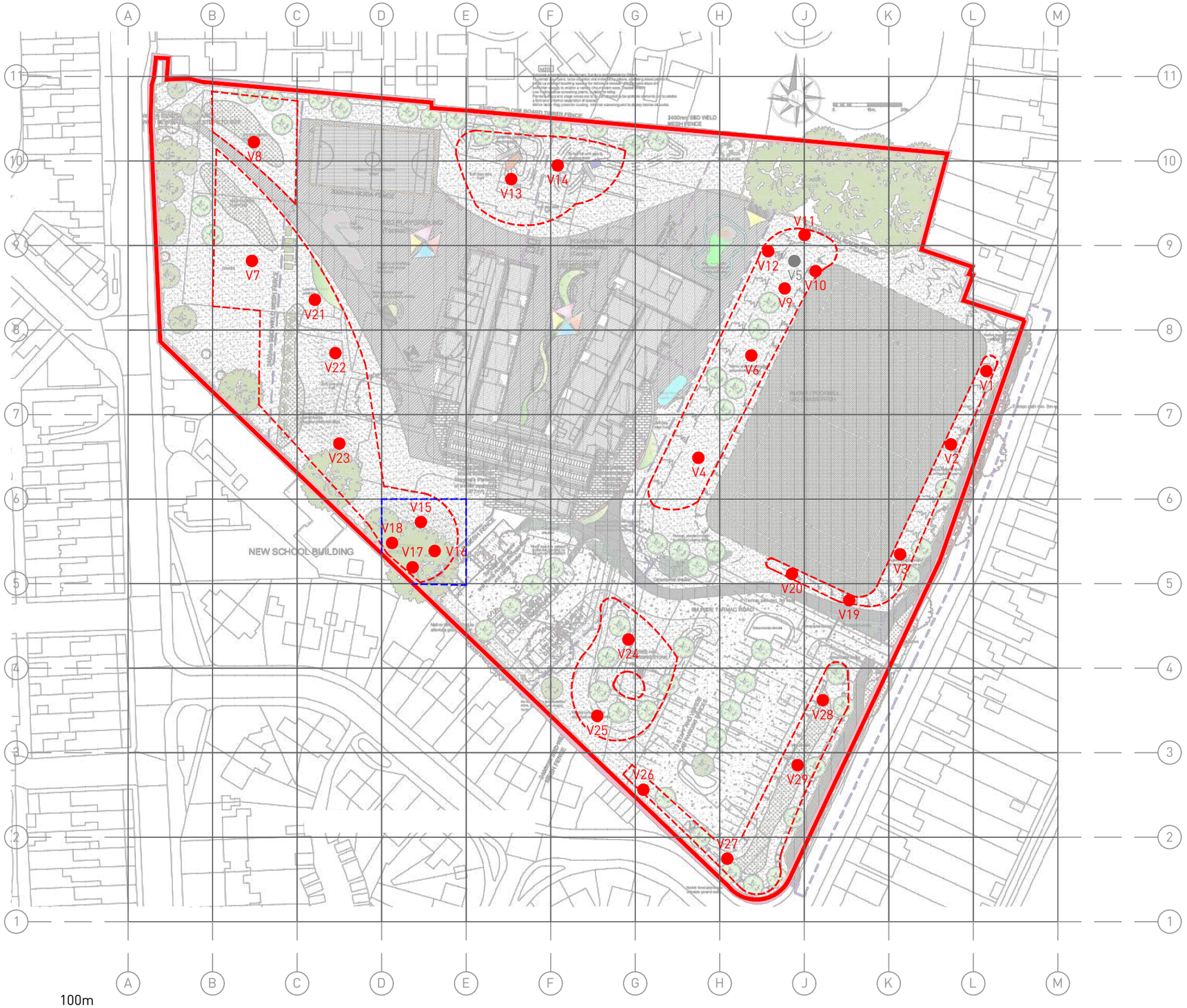
W: http://www.quantumgeotech.co.uk

# Appendix H. Ysgol Carreg Hir remediation drawings

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**Legend:**

- Site Boundary
- Soil Validation Sample Location (Passed Bund & Landscape Criteria)
- Soil Validation Sample Location (Failed Bund & Landscape Criteria)
- Area of Validated Capping
- Area of Arsenic Investigation

Drawing Notes:
Based on Powell Dobsons DWG - Proposed Site Layout.

All locations are approximate.

Site Address:
Ysgol Newydd Briton Ferry
Old Rd
Briton Ferry
Neath
SA11 2ET

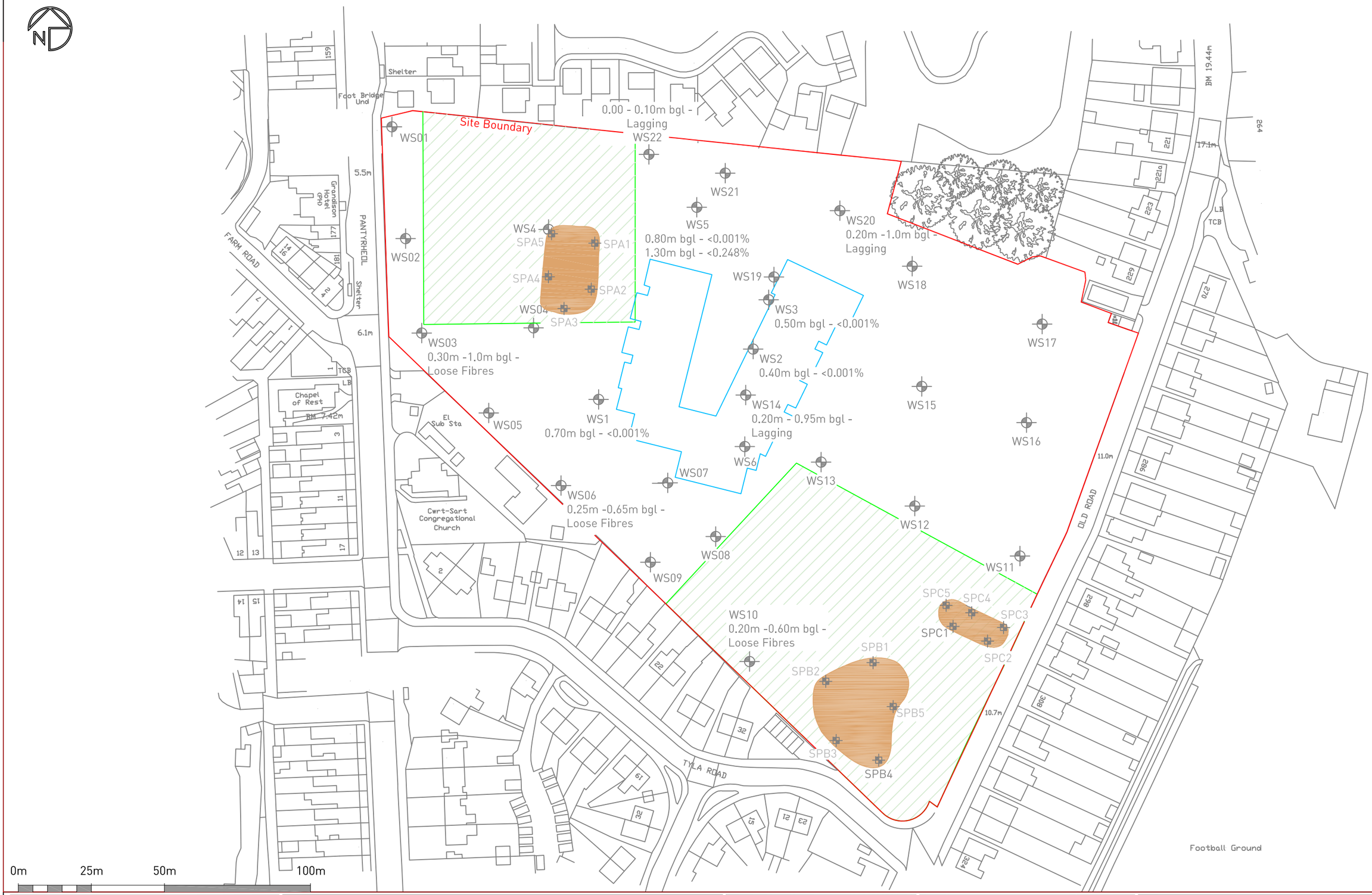
| Rev. | Description | Date |
|---|---|---|
| A | First Issue | 13/08/2018 |
| B | Locations Added | 03/09/2018 |
| C | Locations Updated | 09/10/2018 |

Project Name:
Ysgol Newydd, Briton Ferry

Client:
Kier Construction

Drawing Title:
Validation Soil Sample Location Plan

| Contract No: | Drawing No: | Scale @ A3: |
|---|---|---|
| S2333 | D2333/021 | 1:1250 |
| Drawn By: | QC Check By: | Approved By: |
| JH | AKS | LH |





sanctus

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Legend:

- Proposed Site Investigation Locations
- Previous Site Investigation Locations
- Stockpile Sample Location (No Asbestos Detected)
- Site Boundary
- Proposed Building Footprint
- Stockpile Location

Drawing Notes:
Based on Powell Dobsons DWG - Proposed Site Layout.

All locations are approximate.

Site Address:
Ysgol Newydd Briton Ferry
Old Rd
Briton Ferry
Neath
SA11 2ET

| Rev. | Description | Date |
|---|---|---|
| A | First Issue | 21/07/2017 |

| | | |
|---|---|---|
| Project Name: Ysgol Newydd, Briton Ferry | | |
| Client: Kier Construction | | |
| Drawing Title: Previous and Proposed Site Investigation Location Plan | | |
| Contract No: S2333 | Drawing No: D2333/005 | Scale @ A3: 1:1250 |
| Drawn By: JH | QC Check By: LH | Approved By: JR |

# Appendix I. Geoenvironmental screening sheets

| Assessment Criteria : | Drinking Water Standard England and Wales/WHO | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CaCO (mg/l): | 0.00 | | | pH | 0.00 | | | | | | | |
| Calcium (mg/l): | 0.00 | | | DOC (mg/l) | 0.00 | | Catchment area: | Drinking Water Standard | | | | |
| | | | | | | | | | Location | | GBBH05 | GBBH07 |
| | | | | | | | | | Sample ID | | GBBH05 | GBBH07 |
| | | | | | | | | | Depth | | -m | -m |
| | | | | | | | | | Date | | 25/07/2021 | 31/05/2023 |
| | | | | | | | | | Strata | | - | - |
| Constituents | Unit | Limit of Detection | Generic Assessment Criteria | Number of Samples | Minimum Value | Maximum Value | Number of Exceedences | Locations of Exceedences | | Zone | - | - |
| pH | - | N/A | 6.5-9.5 | 2 | 6.8 | 8.3 | 0 | | | | 8.3 | 6.8 |
| Biochemical Oxygen Demand Low Level | mg O2/l | 1.0 | No WSV | 2 | <1 | <4 | 0 | | | | <1 | <4 |
| Alkalinity (Total) | mg/l | 10 | No WSV | 1 | 61 | 61 | 0 | | | | 61 | |
| Chloride | mg/l | 1.0 | 250 | 2 | 19 | 21 | 0 | | | | 19 | 21 |
| Ammonia (Free) | mg/l | 0.050 | No WSV | 2 | <0.05 | <0.05 | 0 | | | | <0.05 | <0.05 |
| Ammonium | mg/l | 0.050 | 0.5 | 2 | 0.3 | 2 | 1 | GBBH07 | | | 0.3 | 2 |
| Ammoniacal Nitrogen | mg/l | 0.050 | 0.39 | 2 | 0.26 | 1.6 | 1 | GBBH07 | | | 0.26 | 1.6 |
| Nitrate | mg/l | 0.50 | 50 | 2 | <0.5 | 7.8 | 0 | | | | 7.8 | <0.5 |
| Phosphorus (Dissolved) | mg/l | 0.020 | No WSV | 1 | 0.023 | 0.023 | 0 | | | | 0.023 | |
| Sulphate | mg/l | 1.0 | 250 | 2 | 2.9 | 20 | 0 | | | | 20 | 2.9 |
| Cyanide (Total) | mg/l | 0.050 | 0.05 | 1 | <0.05 | <0.05 | 0 | | | | <0.05 | |
| Cyanide (Free) | mg/l | 0.050 | See Cyanide (total) | 1 | <0.05 | <0.05 | 0 | | | | <0.05 | |
| Cyanide (Total) Low-Level | mg/l | 0.0050 | No WSV | 1 | <0.005 | <0.005 | 0 | | | | | <0.005 |
| Cyanide (Free) Low-Level | mg/l | 0.0050 | No WSV | 1 | <0.005 | <0.005 | 0 | | | | | <0.005 |
| Sulphide | mg/l | 0.050 | No WSV | 2 | <0.05 | <0.05 | 0 | | | | <0.05 | <0.05 |
| Calcium | mg/l | 2.00 | N/A | 1 | 21 | 21 | 0 | | | | 21 | |
| Total Hardness as CaCO3 | mg/l | 15 | No WSV | 1 | 67 | 67 | 0 | | | | 67 | |
| Aluminium | mg/l | 0.005 | 0.2 | 2 | <0.005 | 0.017 | 0 | | | | <0.005 | 0.017 |
| Arsenic | mg/l | 0.0002 | 0.01 | 2 | 0.00058 | 0.00095 | 0 | | | | 0.00095 | 0.00058 |
| Boron | mg/l | 0.01 | 1 | 2 | 0.023 | 0.036 | 0 | | | | 0.023 | 0.036 |
| Barium | mg/l | 0.005 | 1.3 | 2 | 0.02 | 0.058 | 0 | | | | 0.02 | 0.058 |
| Beryllium | mg/l | 0.001 | 0.012 | 2 | <0.001 | <0.001 | 0 | | | | <0.001 | <0.001 |
| Cadmium | mg/l | 0.00011 | 0.005 | 2 | <0.00011 | <0.00011 | 0 | | | | <0.00011 | <0.00011 |
| Copper | mg/l | 0.0005 | 2 | 2 | 0.0013 | 0.0025 | 0 | | | | 0.0025 | 0.0013 |
| Iron | mg/l | 0.005 | 0.2 | 2 | 0.1 | 0.15 | 0 | | | | 0.15 | 0.1 |
| Mercury | mg/l | 0.00005 | 0.001 | 2 | <0.00005 | <0.00005 | 0 | | | | <0.00005 | <0.00005 |
| Molybdenum | mg/l | 0.0002 | 0.07 | 2 | 0.00064 | 0.0034 | 0 | | | | 0.00064 | 0.0034 |
| Nickel | mg/l | 0.0005 | 0.02 | 2 | 0.0007 | 0.0011 | 0 | | | | 0.0011 | 0.0007 |
| Lead | mg/l | 0.0005 | 0.01 | 2 | <0.0005 | <0.0005 | 0 | | | | <0.0005 | <0.0005 |
| Antimony | mg/l | 0.0005 | 0.005 | 2 | <0.0005 | <0.0005 | 0 | | | | <0.0005 | <0.0005 |
| Selenium | mg/l | 0.0005 | 0.01 | 2 | <0.0005 | 0.00056 | 0 | | | | 0.00056 | <0.0005 |
| Vanadium | mg/l | 0.0005 | N/A | 2 | <0.0005 | 0.00052 | 0 | | | | 0.00052 | <0.0005 |
| Zinc | mg/l | 0.0025 | 3 | 2 | 0.0039 | 0.023 | 0 | | | | 0.0039 | 0.023 |
| Chromium (Total) | mg/l | 0.0005 | 0.05 | 2 | 0.0057 | 0.036 | 0 | | | | 0.0057 | 0.036 |
| Low-Level Chromium (Hexavalent) | mg/l | 0.0001 | No WSV | 2 | 0.00035 | 0.003 | 0 | | | | 0.003 | 0.00035 |
| Dissolved Organic Carbon | mg/l | 2.0 | No WSV | 1 | 3.4 | 3.4 | 0 | | | | 3.4 | |
| Total Organic Carbon | mg/l | 2.0 | No WSV | 2 | 3.3 | 15 | 0 | | | | 3.3 | 15 |
| Aliphatic TPH >C5-C6 | mg/l | 0.0001 | 15 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C6-C8 | mg/l | 0.0001 | 15 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C8-C10 | mg/l | 0.0001 | 0.3 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C10-C12 | mg/l | 0.0001 | 0.3 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C12-C16 | mg/l | 0.0001 | 0.3 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C16-C21 | mg/l | 0.0001 | N/A | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C21-C35 | mg/l | 0.0001 | N/A | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C35-C44 | mg/l | 0.0001 | N/A | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Total Aliphatic Hydrocarbons | mg/l | 0.005 | No WSV | 2 | <0.005 | <0.005 | 0 | | | | <0.005 | <0.005 |
| Aromatic TPH >C5-C7 | mg/l | 0.0001 | 0.01 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C7-C8 | mg/l | 0.0001 | 0.7 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C8-C10 | mg/l | 0.0001 | 0.3 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C10-C12 | mg/l | 0.0001 | 0.09 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C12-C16 | mg/l | 0.0001 | 0.09 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C16-C21 | mg/l | 0.0001 | 0.09 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C21-C35 | mg/l | 0.0001 | 0.09 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C35-C44 | mg/l | 0.0001 | N/A | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Total Aromatic Hydrocarbons | mg/l | 0.005 | No WSV | 2 | <0.005 | <0.005 | 0 | | | | <0.005 | <0.005 |
| Total Petroleum Hydrocarbons | mg/l | 0.01 | No WSV | 2 | <0.01 | <0.01 | 0 | | | | <0.01 | <0.01 |
| Benzene | mg/l | 0.001 | 0.001 | 2 | <0.001 | <0.001 | 0 | | | | <0.001 | <0.001 |
| Toluene | mg/l | 0.001 | 0.7 | 2 | <0.001 | <0.001 | 0 | | | | <0.001 | <0.001 |
| Ethylbenzene | mg/l | 0.001 | 0.3 | 2 | <0.001 | <0.001 | 0 | | | | <0.001 | <0.001 |
| m & p-Xylene | mg/l | 0.001 | See Xylenes (total) | 2 | <0.001 | <0.001 | 0 | | | | <0.001 | <0.001 |
| o-Xylene | mg/l | 0.001 | See Xylenes (total) | 2 | <0.001 | <0.001 | 0 | | | | <0.001 | <0.001 |
| Naphthalene | mg/l | 0.0001 | See BaP | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Acenaphthylene | mg/l | 0.0001 | See BaP | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Acenaphthene | mg/l | 0.0001 | See BaP | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Fluorene | mg/l | 0.0001 | See BaP | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Phenanthrene | mg/l | 0.0001 | See BaP | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Anthracene | mg/l | 0.0001 | See BaP | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Fluoranthene | mg/l | 0.0001 | See BaP | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Pyrene | mg/l | 0.0001 | See BaP | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Benzo[a]anthracene | mg/l | 0.0001 | See BaP | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Chrysene | mg/l | 0.0001 | See BaP | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Benzo[b]fluoranthene | mg/l | 0.0001 | See PAH Sum of 4 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Benzo[k]fluoranthene | mg/l | 0.0001 | See PAH Sum of 4 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Benzo[a]pyrene | mg/l | 0.0001 | 0.00001 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Indeno(1,2,3-c,d)Pyrene | mg/l | 0.0001 | See PAH Sum of 4 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Dibenz(a,h)Anthracene | mg/l | 0.0001 | See BaP | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Benzo[g,h,i]perylene | mg/l | 0.0001 | See PAH Sum of 4 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Coronene | mg/l | 0.0001 | No WSV | 1 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | |
| Total Of 17 PAH's | mg/l | 0.002 | No WSV | 2 | <0.002 | <0.002 | 0 | | | | <0.002 | <0.002 |
| Total Phenols | mg/l | 0.030 | No WSV | 2 | <0.03 | <0.03 | 0 | | | | <0.03 | <0.03 |

| Assessment Criteria : | Manual SSAC | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CaCO (mg/l): | 116.00 | | | pH | 8.07 | | | | | | | |
| Calcium (mg/l): | 34.50 | | | DOC (mg/l) | 2.75 | | Catchment area: | Freshwater not listed | | | | |

| Constituents | Unit | Limit of Detection | Generic Assessment Criteria | Number of Samples | Minimum Value | Maximum Value | Number of Exceedences | Locations of Exceedences | Location | | GBBH05 | GBBH07 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Sample ID | | GBBH05 | GBBH07 |
| | | | | | | | | | Depth | | -m | -m |
| | | | | | | | | | Date | | 25/07/2021 | 31/05/2023 |
| | | | | | | | | | Strata | | - | - |
| | | | | | | | | | | Zone | - | - |
| pH | - | N/A | 6-9 | 2 | 6.8 | 8.3 | 0 | | | | 8.3 | 6.8 |
| Biochemical Oxygen Demand Low Level | mg O2/l | 1.0 | No WSV | 2 | <1 | <4 | 0 | | | | <1 | <4 |
| Alkalinity (Total) | mg/l | 10 | No WSV | 1 | 61 | 61 | 0 | | | | 61 | |
| Chloride | mg/l | 1.0 | 250 | 2 | 19 | 21 | 0 | | | | 19 | 21 |
| Ammonia (Free) | mg/l | 0.050 | No WSV | 2 | <0.05 | <0.05 | 0 | | | | <0.05 | <0.05 |
| Ammonium | mg/l | 0.050 | 0.26 | 2 | 0.3 | 2 | 2 | GBBH05; GBBH07 | | | 0.3 | 2 |
| Ammoniacal Nitrogen | mg/l | 0.050 | 0.2 | 2 | 0.26 | 1.6 | 2 | GBBH05; GBBH07 | | | 0.26 | 1.6 |
| Nitrate | mg/l | 0.50 | N/A | 2 | <0.5 | 7.8 | 0 | | | | 7.8 | <0.5 |
| Phosphorus (Dissolved) | mg/l | 0.020 | No WSV | 1 | 0.023 | 0.023 | 0 | | | | 0.023 | |
| Sulphate | mg/l | 1.0 | 400 | 2 | 2.9 | 20 | 0 | | | | 20 | 2.9 |
| Cyanide (Total) | mg/l | 0.050 | N/A | 1 | <0.05 | <0.05 | 0 | | | | <0.05 | |
| Cyanide (Free) | mg/l | 0.050 | 0.001 | 1 | <0.05 | <0.05 | 0 | | | | <0.05 | |
| Cyanide (Total) Low-Level | mg/l | 0.0050 | No WSV | 1 | <0.005 | <0.005 | 0 | | | | | <0.005 |
| Cyanide (Free) Low-Level | mg/l | 0.0050 | No WSV | 1 | <0.005 | <0.005 | 0 | | | | | <0.005 |
| Sulphide | mg/l | 0.050 | No WSV | 2 | <0.05 | <0.05 | 0 | | | | <0.05 | <0.05 |
| Calcium | mg/l | 2.00 | N/A | 1 | 21 | 21 | 0 | | | | 21 | |
| Total Hardness as CaCO3 | mg/l | 15 | No WSV | 1 | 67 | 67 | 0 | | | | 67 | |
| Aluminium | mg/l | 0.005 | N/A | 2 | <0.005 | 0.017 | 0 | | | | <0.005 | 0.017 |
| Arsenic | mg/l | 0.0002 | 0.05 | 2 | 0.00058 | 0.00095 | 0 | | | | 0.00095 | 0.00058 |
| Boron | mg/l | 0.01 | 2 | 2 | 0.023 | 0.036 | 0 | | | | 0.023 | 0.036 |
| Barium | mg/l | 0.005 | N/A | 2 | 0.02 | 0.058 | 0 | | | | 0.02 | 0.058 |
| Beryllium | mg/l | 0.001 | N/A | 2 | <0.001 | <0.001 | 0 | | | | <0.001 | <0.001 |
| Cadmium | mg/l | 0.00011 | 0.00008 -> CaCO3 0-50mg/l 0.00009 -> CaCO3 50-100mg/l 0.00015 -> CaCO3 100-200mg/l 0.00025 -> CaCO3 200+mg/l | 2 | <0.00011 | <0.00011 | 0 | | | | <0.00011 | <0.00011 |
| Copper | mg/l | 0.0005 | 0.007 | 2 | 0.0013 | 0.0025 | 0 | | | | 0.0025 | 0.0013 |
| Iron | mg/l | 0.005 | 1 | 2 | 0.1 | 0.15 | 0 | | | | 0.15 | 0.1 |
| Mercury | mg/l | 0.00005 | 0.00007 | 2 | <0.00005 | <0.00005 | 0 | | | | <0.00005 | <0.00005 |
| Molybdenum | mg/l | 0.0002 | N/A | 2 | 0.00064 | 0.0034 | 0 | | | | 0.00064 | 0.0034 |
| Nickel | mg/l | 0.0005 | 0.006 | 2 | 0.0007 | 0.0011 | 0 | | | | 0.0011 | 0.0007 |
| Lead | mg/l | 0.0005 | 0.003 | 2 | <0.0005 | <0.0005 | 0 | | | | <0.0005 | <0.0005 |
| Antimony | mg/l | 0.0005 | N/A | 2 | <0.0005 | <0.0005 | 0 | | | | <0.0005 | <0.0005 |
| Selenium | mg/l | 0.0005 | N/A | 2 | <0.0005 | 0.00056 | 0 | | | | 0.00056 | <0.0005 |
| Vanadium | mg/l | 0.0005 | 0.02 -> CaCO3 0-200mg/l 0.06 -> CaCO3 200+mg/l | 2 | <0.0005 | 0.00052 | 0 | | | | 0.00052 | <0.0005 |
| Zinc | mg/l | 0.0025 | 0.019 | 2 | 0.0039 | 0.023 | 1 | GBBH07 | | | 0.0039 | 0.023 |
| Chromium (Total) | mg/l | 0.0005 | See Cr VI as first pass | 2 | 0.0057 | 0.036 | 0 | | | | 0.0057 | 0.036 |
| Low-Level Chromium (Hexavalent) | mg/l | 0.0001 | No WSV | 2 | 0.00035 | 0.003 | 0 | | | | 0.003 | 0.00035 |
| Dissolved Organic Carbon | mg/l | 2.0 | No WSV | 1 | 3.4 | 3.4 | 0 | | | | 3.4 | |
| Total Organic Carbon | mg/l | 2.0 | No WSV | 2 | 3.3 | 15 | 0 | | | | 3.3 | 15 |
| Aliphatic TPH >C5-C6 | mg/l | 0.0001 | 0.01 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C6-C8 | mg/l | 0.0001 | 0.01 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C8-C10 | mg/l | 0.0001 | 0.01 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C10-C12 | mg/l | 0.0001 | 0.01 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C12-C16 | mg/l | 0.0001 | 0.01 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C16-C21 | mg/l | 0.0001 | 0.01 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C21-C35 | mg/l | 0.0001 | 0.01 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C35-C44 | mg/l | 0.0001 | 0.01 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Total Aliphatic Hydrocarbons | mg/l | 0.005 | No WSV | 2 | <0.005 | <0.005 | 0 | | | | <0.005 | <0.005 |
| Aromatic TPH >C5-C7 | mg/l | 0.0001 | 0.01 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C7-C8 | mg/l | 0.0001 | 0.01 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C8-C10 | mg/l | 0.0001 | 0.01 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C10-C12 | mg/l | 0.0001 | 0.01 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C12-C16 | mg/l | 0.0001 | 0.01 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C16-C21 | mg/l | 0.0001 | 0.01 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C21-C35 | mg/l | 0.0001 | 0.01 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C35-C44 | mg/l | 0.0001 | 0.01 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Total Aromatic Hydrocarbons | mg/l | 0.005 | No WSV | 2 | <0.005 | <0.005 | 0 | | | | <0.005 | <0.005 |
| Total Petroleum Hydrocarbons | mg/l | 0.01 | No WSV | 2 | <0.01 | <0.01 | 0 | | | | <0.01 | <0.01 |
| Benzene | mg/l | 0.001 | 0.01 | 2 | <0.001 | <0.001 | 0 | | | | <0.001 | <0.001 |
| Toluene | mg/l | 0.001 | 0.074 | 2 | <0.001 | <0.001 | 0 | | | | <0.001 | <0.001 |
| Ethylbenzene | mg/l | 0.001 | 0.02 | 2 | <0.001 | <0.001 | 0 | | | | <0.001 | <0.001 |
| m & p-Xylene | mg/l | 0.001 | See Xylenes (total) | 2 | <0.001 | <0.001 | 0 | | | | <0.001 | <0.001 |
| o-Xylene | mg/l | 0.001 | See Xylenes (total) | 2 | <0.001 | <0.001 | 0 | | | | <0.001 | <0.001 |
| Naphthalene | mg/l | 0.0001 | 0.002 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Acenaphthylene | mg/l | 0.0001 | Screen BaP only | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Acenaphthene | mg/l | 0.0001 | Screen BaP only | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Fluorene | mg/l | 0.0001 | N/A | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Phenanthrene | mg/l | 0.0001 | Screen BaP only | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Anthracene | mg/l | 0.0001 | 0.0001 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |

| Assessment Criteria : | Manual SSAC | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CaCO (mg/l): | 116.00 | | | pH | 8.07 | | | | | | | |
| Calcium (mg/l): | 34.50 | | | DOC (mg/l) | 2.75 | | Catchment area: | Freshwater not listed | | | | |
| | | | | | | | | | Location | | GBBH05 | GBBH07 |
| | | | | | | | | | Sample ID | | GBBH05 | GBBH07 |
| | | | | | | | | | Depth | | -m | -m |
| | | | | | | | | | Date | | 25/07/2021 | 31/05/2023 |
| | | | | | | | | | Strata | | - | - |
| Constituents | Unit | Limit of Detection | Generic Assessment Criteria | Number of Samples | Minimum Value | Maximum Value | Number of Exceedences | Locations of Exceedences | | Zone | - | - |
| Fluoranthene | mg/l | 0.0001 | 0.0000063 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Pyrene | mg/l | 0.0001 | N/A | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Benzo[a]anthracene | mg/l | 0.0001 | Screen BaP only | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Chrysene | mg/l | 0.0001 | Screen BaP only | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Benzo[b]fluoranthene | mg/l | 0.0001 | Screen BaP only | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Benzo[k]fluoranthene | mg/l | 0.0001 | Screen BaP only | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Benzo[a]pyrene | mg/l | 0.0001 | 0.00000017 | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Indeno(1,2,3-c,d)Pyrene | mg/l | 0.0001 | Screen BaP only | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Dibenz(a,h)Anthracene | mg/l | 0.0001 | N/A | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Benzo[g,h,i]perylene | mg/l | 0.0001 | Screen BaP only | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 |
| Coronene | mg/l | 0.0001 | No WSV | 1 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | |
| Total Of 17 PAH's | mg/l | 0.002 | No WSV | 2 | <0.002 | <0.002 | 0 | | | | <0.002 | <0.002 |
| Total Phenols | mg/l | 0.030 | No WSV | 2 | <0.03 | <0.03 | 0 | | | | <0.03 | <0.03 |

| Assessment Criteria : | Drinking Water Standard England and Wales/WHO |
|---|---|
| CaCO (mg/l): | 0.00 |
| Calcium (mg/l): | 0.00 |
| pH | 0.00 |
| DOC (mg/l) | 0.00 |
| Catchment area: | Drinking Water Standard |

| Constituents | Unit | Limit of Detection | Generic Assessment Criteria | Number of Samples | Minimum Value | Maximum Value | Number of Exceedences | Locations of Exceedences | Location | Sample ID | Depth | Date | Strata | Zone | GBH01 | GBH02 | GBH03 | GBH04 | GBH05 | GBTP04 | GBTP05 | GBTP06 | HP02 | HP02 | HP03 | HP05 | GBHP 06 | GB-BH09 | GB-BH07 | GBBH10 | GBBH12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | GBH01 | GBH02 | GBH03 | GBH04 | GBH05 | GBTP04 | GBTP05 | GBTP06 | HP02 | HP02 | HP03 | HP05 | GBHP 06 | GB-BH09 | GB-BH07 | GBBH10 | GBBH12 |
| | | | | | | | | | | | | | | | 0.5m | 0.50m | 0.5m | 0.5m | 1.00m | 0.5m | 1.20m | 1.20m | 0.50m | 1.00m | 0.40m | 0.3m | 0.30m | 0.7m | 0.3m | 0.5m | 0.8m |
| | | | | | | | | | | | | | | | | 05/07/2021 | | 15/11/2021 | 06/07/2021 | 15/11/2021 | 06/07/2021 | | 18/08/2021 | 18/08/2021 | 19/08/2021 | 19/08/2021 | 15/05/2023 | | | 07/03/2024 | 06/03/2024 |
| pH | - | N/A | 6.5-9.5 | 17 | 6.8 | 8.8 | 0 | | | | | | | | 8.7 | 8.4 | 8.5 | 8.5 | 8.3 | 8.8 | 8.3 | 8.3 | 8.3 | 8 | 8.1 | 8.6 | 8.1 | 7.3 | 6.8 | 7.6 | 7.3 |
| Chemical Oxygen Demand | mg O2/l | 10 | No WSV | 14 | 10 | 31 | 0 | | | | | | | | 11 | 10 | 13 | 15 | <10 | <10 | 11 | 14 | 31 | 25 | <10 | 31 | | | | <10 | 20 |
| Ammoniacal Nitrogen | mg/l | 0.050 | 0.39 | 14 | <0.05 | 1.3 | 2 | GBBH02, 0.50m; GBBH12, 0.8m | | | | | | | 0.093 | 0.86 | 0.093 | 0.051 | 0.17 | <0.05 | 0.093 | 0.12 | 0.068 | 0.061 | 0.078 | 0.093 | | | | <0.05 | 1.3 |
| Nitrite | mg/l | 0.020 | 0.5 | 14 | 0.02 | 0.038 | 0 | | | | | | | | 0.038 | 0.023 | 0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | | | | <0.02 | <0.02 |
| Nitrate | mg/l | 0.50 | 50 | 14 | <0.5 | 15 | 0 | | | | | | | | 1.2 | 2.3 | <0.5 | 1.5 | 5.3 | 2 | 2.7 | 1.4 | <0.5 | 1.2 | 1.3 | 15 | | | | 6.7 | 1.7 |
| Sulphate | mg/l | 1.0 | 250 | 17 | <1 | 54 | 0 | | | | | | | | 7 | 23 | 32 | 14 | 13 | 15 | 22 | 33 | 35 | 12 | 11 | 8.8 | 43 | 10 | 13 | 54 | <1 |
| Cyanide (Total) | mg/l | 0.050 | 0.05 | 15 | <0.05 | 0.25 | 1 | GBTP04, 0.5m | | | | | | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 0.25 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | | |
| Cyanide (Free) | mg/l | 0.050 | See Cyanide (total) | 12 | <0.05 | <0.05 | 0 | | | | | | | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | | | | | |
| Cyanide (Complex) | mg/l | 0.050 | 0.05 | 12 | <0.05 | 0.25 | 1 | GBTP04, 0.5m | | | | | | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 0.25 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | | | | | |
| Cyanide (Total) Low-Level | mg/l | 0.0050 | No WSV | 2 | <0.005 | <0.005 | 0 | | | | | | | | | | | | | | | | | | | | | | | <0.005 | <0.005 |
| Cyanide (Free) Low-Level | mg/l | 0.0050 | No WSV | 2 | <0.005 | <0.005 | 0 | | | | | | | | | | | | | | | | | | | | | | | <0.005 | <0.005 |
| Cyanide (Complex) Low-Level | mg/l | 0.0050 | No WSV | 2 | <0.005 | <0.005 | 0 | | | | | | | | | | | | | | | | | | | | | | | <0.005 | <0.005 |
| Sulphide | mg/l | 0.050 | No WSV | 14 | <0.05 | 0.074 | 0 | | | | | | | | <0.05 | <0.05 | <0.05 | 0.054 | <0.05 | 0.074 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | | | | <0.05 | <0.05 |
| Magnesium | mg/l | 0.20 | N/A | 14 | 0.5 | 3.4 | 0 | | | | | | | | 0.75 | 0.56 | 1.4 | 1.4 | 1.4 | 1.5 | 2.9 | 2.1 | 2.8 | 3.4 | 2.5 | 2.8 | | | | 2 | 0.5 |
| Aluminium | mg/l | 0.005 | 0.2 | 14 | 0.0087 | 7.9 | 5 | GBH01, 0.5m; GBBH02, 0.50m; GBBH04, 0.5m; GBTP04, 0.5m; GBBH12, 0.8m | | | | | | | 0.21 | 0.23 | 0.018 | 7.9 | 0.044 | 7.5 | 0.038 | 0.04 | 0.037 | 0.0087 | 0.039 | 0.019 | | | | 0.071 | 0.69 |
| Arsenic | mg/l | 0.0002 | 0.01 | 17 | 0.00042 | 0.036 | 5 | GBH03, 0.5m; GBTP04, 0.5m; HP02, 0.50m; GBBH10, 0.5m; GBBH12, 0.8m | | | | | | | 0.001 | 0.0012 | 0.016 | 0.0086 | 0.0031 | 0.036 | 0.0016 | 0.0038 | 0.011 | 0.001 | 0.0026 | 0.0011 | 0.00042 | 0.0052 | 0.0011 | 0.015 | 0.017 |
| Boron | mg/l | 0.01 | 1 | 17 | 0.013 | 0.066 | 0 | | | | | | | | 0.016 | 0.026 | 0.066 | 0.023 | 0.023 | 0.025 | 0.038 | 0.039 | 0.061 | 0.026 | 0.02 | 0.02 | 0.018 | 0.048 | 0.046 | 0.02 | 0.013 |
| Barium | mg/l | 0.005 | 1.3 | 14 | <0.005 | 0.099 | 0 | | | | | | | | <0.005 | 0.0074 | 0.014 | 0.025 | 0.037 | 0.055 | 0.076 | 0.099 | 0.037 | 0.01 | 0.044 | 0.034 | | | | 0.072 | 0.0072 |
| Beryllium | mg/l | 0.001 | 0.012 | 14 | <0.001 | <0.001 | 0 | | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | <0.001 | <0.001 |
| Cadmium | mg/l | 0.00011 | 0.005 | 17 | <0.00011 | 0.00036 | 0 | | | | | | | | <0.00011 | <0.00011 | <0.00011 | <0.00011 | <0.00011 | 0.00013 | <0.00011 | <0.00011 | <0.00011 | <0.00011 | <0.00011 | <0.00011 | <0.00011 | <0.00011 | 0.00036 | 0.00021 | <0.00011 |
| Copper | mg/l | 0.0005 | 2 | 17 | 0.0016 | 0.11 | 0 | | | | | | | | 0.0018 | 0.0018 | 0.0024 | 0.02 | 0.0078 | 0.11 | 0.0034 | 0.0039 | 0.0038 | 0.002 | 0.0016 | 0.005 | 0.0018 | 0.0063 | 0.012 | 0.0032 | 0.012 |
| Mercury | mg/l | 0.00005 | 0.001 | 17 | <0.00005 | 0.00042 | 0 | | | | | | | | <0.00005 | <0.00005 | 0.00008 | <0.00005 | <0.00005 | 0.00042 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 |
| Manganese | mg/l | 0.0005 | 0.05 | 14 | 0.00096 | 0.31 | 3 | GBBH02, 0.50m; GBTP04, 0.5m; GBBH12, 0.8m | | | | | | | 0.02 | 0.31 | 0.0019 | 0.018 | 0.0022 | 0.096 | 0.0036 | 0.0071 | 0.016 | 0.0017 | 0.00096 | 0.0016 | | | | 0.036 | 0.09 |
| Molybdenum | mg/l | 0.0002 | 0.07 | 14 | 0.00081 | 0.05 | 0 | | | | | | | | 0.0011 | 0.00081 | 0.046 | 0.0025 | 0.0078 | 0.0073 | 0.027 | 0.05 | 0.02 | 0.0066 | 0.01 | 0.0013 | | | | 0.0058 | 0.0029 |
| Nickel | mg/l | 0.0005 | 0.02 | 17 | <0.0005 | 0.014 | 0 | | | | | | | | 0.00076 | 0.00068 | <0.0005 | 0.0045 | 0.0021 | 0.013 | 0.0009 | 0.00058 | 0.00067 | <0.0005 | <0.0005 | 0.00075 | <0.0005 | 0.00062 | 0.014 | 0.00084 | 0.0016 |
| Lead | mg/l | 0.0005 | 0.01 | 17 | <0.0005 | 0.093 | 5 | GBBH04, 0.5m; GBTP04, 0.5m; GB-BH09, 0.7m; GB-BH07, 0.3m; GBBH10, 0.5m | | | | | | | 0.00052 | 0.001 | <0.0005 | 0.011 | 0.0078 | 0.093 | 0.00082 | 0.0011 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.012 | 0.027 | 0.021 | 0.0042 |
| Antimony | mg/l | 0.0005 | 0.005 | 14 | <0.0005 | 0.013 | 4 | GBBH05, 1.00m; GBTP04, 0.5m; GBTP05, 1.20m; GBTP06, 1.20m | | | | | | | <0.0005 | <0.0005 | 0.0013 | 0.0015 | 0.013 | 0.0083 | 0.0059 | 0.013 | 0.0014 | <0.0005 | 0.0044 | 0.0014 | | | | 0.0037 | 0.0015 |
| Selenium | mg/l | 0.0005 | 0.01 | 14 | <0.0005 | 0.0066 | 0 | | | | | | | | 0.0024 | 0.00073 | 0.0066 | <0.0005 | 0.00068 | 0.0018 | 0.0028 | 0.0047 | 0.0053 | 0.0012 | 0.00059 | <0.0005 | | | | 0.0049 | 0.0043 |
| Vanadium | mg/l | 0.0005 | N/A | 14 | <0.0005 | 0.024 | 0 | | | | | | | | 0.00093 | 0.00091 | 0.019 | 0.02 | 0.0011 | 0.024 | <0.0005 | 0.0031 | 0.0093 | <0.0005 | 0.00079 | <0.0005 | | | | 0.0014 | 0.0028 |
| Zinc | mg/l | 0.0025 | 3 | 17 | <0.0025 | 0.3 | 0 | | | | | | | | 0.0065 | <0.0025 | <0.0025 | 0.029 | 0.012 | 0.082 | 0.011 | 0.011 | <0.0025 | <0.0025 | <0.0025 | <0.0025 | <0.0025 | 0.038 | 0.3 | 0.022 | 0.011 |
| Chromium (Total) | mg/l | 0.0005 | 0.05 | 17 | <0.0005 | 0.025 | 0 | | | | | | | | 0.00076 | 0.00051 | 0.0048 | 0.013 | <0.0005 | 0.025 | 0.0018 | <0.0005 | 0.00058 | <0.0005 | 0.0015 | <0.0005 | 0.00076 | <0.0005 | 0.00078 | 0.00058 | 0.0012 |
| Iron (Dissolved) | mg/l | 0.005 | 0.2 | 14 | <0.005 | 12 | 5 | GBH01, 0.5m; GBBH02, 0.50m; GBBH04, 0.5m; GBTP04, 0.5m; GBBH12, 0.8m | | | | | | | 1.7 | 1.6 | 0.0079 | 6.3 | 0.074 | 12 | 0.02 | 0.023 | 0.018 | 0.0067 | <0.005 | 0.053 | | | | 0.048 | 1.8 |
| Chromium (Hexavalent) | mg/l | 0.02 | See Total Chromium | 12 | <0.02 | 0.022 | 0 | | | | | | | | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 0.022 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | | | | | |
| Low-Level Chromium (Hexavalent) | mg/l | 0.0001 | No WSV | 2 | <0.0001 | <0.0001 | 0 | | | | | | | | | | | | | | | | | | | | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C5-C6 | mg/l | 0.0001 | 15 | 14 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C6-C8 | mg/l | 0.0001 | 15 | 14 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C8-C10 | mg/l | 0.0001 | 0.3 | 14 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C10-C12 | mg/l | 0.0001 | 0.3 | 14 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C12-C16 | mg/l | 0.0001 | 0.3 | 14 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C16-C21 | mg/l | 0.0001 | N/A | 14 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C21-C35 | mg/l | 0.0001 | N/A | 14 | <0.0001 | 0.12 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 0.087 | 0.1 | 0.12 | <0.0001 | | | | <0.0001 | <0.0001 |
| Aliphatic TPH >C35-C44 | mg/l | 0.0001 | N/A | 14 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 |
| Total Aliphatic Hydrocarbons | mg/l | 0.005 | No WSV | 14 | <0.005 | 0.12 | 0 | | | | | | | | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | 0.087 | 0.1 | 0.12 | <0.005 | | | | <0.005 | <0.005 |
| Aromatic TPH >C5-C7 | mg/l | 0.0001 | 0.01 | 14 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C7-C8 | mg/l | 0.0001 | 0.7 | 14 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C8-C10 | mg/l | 0.0001 | 0.3 | 14 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C10-C12 | mg/l | 0.0001 | 0.09 | 14 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C12-C16 | mg/l | 0.0001 | 0.09 | 14 | <0.0001 | 0.42 | 3 | HP02, 0.50m; HP02, 1.00m; HP03, 0.40m | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 0.41 | 0.42 | 0.32 | <0.0001 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C16-C21 | mg/l | 0.0001 | 0.09 | 14 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C21-C35 | mg/l | 0.0001 | 0.09 | 14 | <0.0001 | 1.5 | 3 | HP02, 0.50m; HP02, 1.00m; HP03, 0.40m | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 0.23 | 0.17 | 1.5 | <0.0001 | | | | <0.0001 | <0.0001 |
| Aromatic TPH >C35-C44 | mg/l | 0.0001 | N/A | 14 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 |
| Total Aromatic Hydrocarbons | mg/l | 0.005 | No WSV | 14 | <0.005 | 1.8 | 0 | | | | | | | | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | 0.64 | 0.59 | 1.8 | <0.005 | | | | <0.005 | <0.005 |
| Total Petroleum Hydrocarbons | mg/l | 0.01 | No WSV | 17 | <0.01 | 1.9 | 0 | | | | | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.72 | 0.7 | 1.9 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Total Of 16 PAH's | mg/l | 0.0002 | No WSV | 12 | <0.0002 | 0.038 | 0 | | | | | | | | 0.038 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | | | | | |
| Benzene | mg/l | 0.001 | 0.001 | 14 | <0.001 | <0.001 | 0 | | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | <0.001 | <0.001 |
| Toluene | mg/l | 0.001 | 0.7 | 14 | <0.001 | <0.001 | 0 | | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | <0.001 | <0.001 |
| Ethylbenzene | mg/l | 0.001 | 0.3 | 14 | <0.001 | <0.001 | 0 | | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | <0.001 | <0.001 |
| m & p-Xylene | mg/l | 0.001 | See Xylenes (total) | 14 | <0.001 | <0.001 | 0 | | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | <0.001 | <0.001 |
| o-Xylene | mg/l | 0.001 | See Xylenes (total) | 14 | <0.001 | <0.001 | 0 | | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | <0.001 | <0.001 |
| Methyl Tert-Butyl Ether | mg/l | 0.001 | No WSV | 14 | <0.001 | <0.001 | 0 | | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | <0.001 | <0.001 |
| Naphthalene | mg/l | 0.00001 | See BaP | 17 | <0.00001 | 0.0013 | 0 | | | | | | | | 0.0013 | 0.0013 | 0.0013 | <0.00001 | 0.00077 | <0.00001 | 0.00098 | 0.0011 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Acenaphthylene | mg/l | 0.00001 | See BaP | 17 | <0.00001 | <0.0001 | 0 | | | | | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Acenaphthene | mg/l | 0.00001 | See BaP | 17 | <0.00001 | <0.0001 | 0 | | | | | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Fluorene | mg/l | 0.00001 | See BaP | 17 | <0.00001 | <0.0001 | 0 | | | | | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Phenanthrene | mg/l | 0.00001 | See BaP | 17 | <0.00001 | 0.0033 | 0 | | | | | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | 0.0033 | <0.0001 |
| Anthracene | mg/l | 0.00001 | See BaP | 17 | <0.00001 | <0.0001 | 0 | | | | | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Fluoranthene | mg/l | 0.00001 | See BaP | 17 | <0.00001 | 0.0064 | 0 | | | | | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | 0.0064 | <0.0001 |
| Pyrene | mg/l | 0.00001 | See BaP | 17 | <0.00001 | 0.0044 | 0 | | | | | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | 0.0044 | <0.0001 |
| Benzo[a]anthracene | mg/l | 0.00001 | See BaP | 17 | <0.00001 | <0.0001 | 0 | | | | | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Chrysene | mg/l | 0.00001 | See BaP | 17 | <0.00001 | <0.0001 | 0 | | | | | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Benzo[b]fluoranthene | mg/l | 0.00001 | See PAH Sum of 4 | 17 | <0.00001 | <0.0001 | 0 | | | | | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Benzo[k]fluoranthene | mg/l | 0.00001 | See PAH Sum of 4 | 17 | <0.00001 | <0.0001 | 0 | | | | | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Benzo[a]pyrene | mg/l | 0.00001 | 0.00001 | 17 | <0.00001 | <0.0001 | 0 | | | | | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Indeno(1,2,3-c,d)Pyrene | mg/l | 0.00001 | See PAH Sum of 4 | 17 | <0.00001 | <0.0001 | 0 | | | | | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Dibenz(a,h)Anthracene | mg/l | 0.00001 | See BaP | 17 | <0.00001 | <0.0001 | 0 | | | | | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Benzo[g,h,i]perylene | mg/l | 0.00001 | See PAH Sum of 4 | 17 | <0.00001 | <0.0001 | 0 | | | | | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Coronene | mg/l | 0.00001 | No WSV | 14 | <0.00001 | <0.0001 | 0 | | | | | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | | | | <0.00001 | <0.00001 |
| Total Of 17 PAH's | mg/l | 0.0002 | No WSV | 17 | <0.0002 | 0.014 | 0 | | | | | | | | 0.0013 | 0.0013 | 0.0013 | <0.0002 | 0.00077 | <0.0002 | 0.00098 | 0.0011 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.002 | <0.002 | <0.002 | 0.014 | <0.002 |
| Total Phenols | mg/l | 0.030 | No WSV | 17 | <0.03 | <0.03 | 0 | | | | | | | | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |

| Assessment Criteria : | Manual SSAC | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| CaCO (mg/l): | 116.00 | | pH | 8.07 | | | | | |
| Calcium (mg/l): | 34.50 | | DOC (mg/l) | 2.75 | Catchment area: | Freshwater not listed | | | |

| Constituents | Unit | Limit of Detection | Generic Assessment Criteria | Number of Samples | Minimum Value | Maximum Value | Number of Exceedences | Locations of Exceedences | Location | Sample ID | Depth | Date | Strata | Zone | GBH01 | GBBH02 | GBH03 | GBBH04 | GBBH05 | GBTP04 | GBTP05 | GBTP06 | HP02 | HP02 | HP03 | HP05 | GBHP 06 | GB-BH09 | GB-BH07 | GBBH10 | GBBH12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | GBH01 | GBBH02 | GBH03 | GBBH04 | GBBH05 | GBTP04 | GBTP05 | GBTP06 | HP02 | HP02 | HP03 | HP05 | GBHP 06 | GB-BH09 | GB-BH07 | GBBH10 | GBBH12 | | | | | | |
| | | | | | | | | | | | 0.5m | 0.50m | 0.5m | 0.5m | 1.00m | 0.5m | 1.20m | 1.20m | 0.50m | 1.00m | 0.40m | 0.3m | 0.30m | 0.7m | 0.3m | 0.5m | 0.8m | | | | | | |
| | | | | | | | | | | | | 05/07/2021 | | 15/11/2021 | 06/07/2021 | 15/11/2021 | 06/07/2021 | | 18/08/2021 | 18/08/2021 | 19/08/2021 | 19/08/2021 | 15/05/2023 | | | 07/03/2024 | 06/03/2024 | | | | | | |
| pH | - | N/A | 6-9 | 17 | 6.8 | 8.8 | 0 | | | | 8.7 | 8.4 | 8.5 | 8.5 | 8.3 | 8.8 | 8.3 | 8.3 | 8.3 | 8 | 8.1 | 8.6 | 8.1 | 7.3 | 6.8 | 7.6 | 7.3 | | | | | | |
| Chemical Oxygen Demand | mg O2/l | 10 | No WSV | 14 | 10 | 31 | 0 | | | | 11 | 10 | 13 | 15 | <10 | <10 | 11 | 14 | 31 | 25 | <10 | 31 | | | | <10 | 20 | | | | | | |
| Ammoniacal Nitrogen | mg/l | 0.050 | 0.2 | 14 | <0.05 | 1.3 | 2 | GBBH02, 0.50m; GBBH12, 0.8m | | | 0.093 | 0.86 | 0.093 | 0.051 | 0.17 | <0.05 | 0.093 | 0.12 | 0.068 | 0.061 | 0.078 | 0.093 | | | | <0.05 | 1.3 | | | | | | |
| Nitrite | mg/l | 0.020 | 0.01 | 14 | 0.02 | 0.038 | 3 | GBH01, 0.5m; GBBH02, 0.50m; GBH03, 0.5m | | | 0.038 | 0.023 | 0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | | | | <0.02 | <0.02 | | | | | | |
| Nitrate | mg/l | 0.50 | N/A | 14 | <0.5 | 15 | 0 | | | | 1.2 | 2.3 | <0.5 | 1.5 | 5.3 | 2 | 2.7 | 1.4 | <0.5 | 1.2 | 1.3 | 15 | | | | 6.7 | 1.7 | | | | | | |
| Sulphate | mg/l | 1.0 | 400 | 17 | <1 | 54 | 0 | | | | 7 | 23 | 32 | 14 | 13 | 15 | 22 | 33 | 35 | 12 | 11 | 8.8 | 43 | 10 | 13 | 54 | <1 | | | | | | |
| Cyanide (Total) | mg/l | 0.050 | N/A | 15 | <0.05 | 0.25 | 0 | | | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 0.25 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | | | | | | | |
| Cyanide (Free) | mg/l | 0.050 | 0.001 | 12 | <0.05 | <0.05 | 0 | | | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | | | | | | | | | | | |
| Cyanide (Complex) | mg/l | 0.050 | N/A | 12 | <0.05 | 0.25 | 0 | | | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 0.25 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | | | | | | | | | | | |
| Cyanide (Total) Low-Level | mg/l | 0.0050 | No WSV | 2 | <0.005 | <0.005 | 0 | | | | | | | | | | | | | | | | | | | <0.005 | <0.005 | | | | | | |
| Cyanide (Free) Low-Level | mg/l | 0.0050 | No WSV | 2 | <0.005 | <0.005 | 0 | | | | | | | | | | | | | | | | | | | <0.005 | <0.005 | | | | | | |
| Cyanide (Complex) Low-Level | mg/l | 0.0050 | No WSV | 2 | <0.005 | <0.005 | 0 | | | | | | | | | | | | | | | | | | | <0.005 | <0.005 | | | | | | |
| Sulphide | mg/l | 0.050 | No WSV | 14 | <0.05 | 0.074 | 0 | | | | <0.05 | <0.05 | <0.05 | 0.054 | <0.05 | 0.074 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | | | | <0.05 | <0.05 | | | | | | |
| Magnesium | mg/l | 0.20 | N/A | 14 | 0.5 | 3.4 | 0 | | | | 0.75 | 0.56 | 1.4 | 1.4 | 1.4 | 1.5 | 2.9 | 2.1 | 2.8 | 3.4 | 2.5 | 2.8 | | | | 2 | 0.5 | | | | | | |
| Aluminium | mg/l | 0.005 | N/A | 14 | 0.0087 | 7.9 | 0 | | | | 0.21 | 0.23 | 0.018 | 7.9 | 0.044 | 7.5 | 0.038 | 0.04 | 0.037 | 0.0087 | 0.039 | 0.019 | | | | 0.071 | 0.69 | | | | | | |
| Arsenic | mg/l | 0.0002 | 0.05 | 17 | 0.00042 | 0.036 | 0 | | | | 0.001 | 0.0012 | 0.016 | 0.0086 | 0.0031 | 0.036 | 0.0016 | 0.0038 | 0.011 | 0.001 | 0.0026 | 0.0011 | 0.00042 | 0.0052 | 0.0011 | 0.015 | 0.017 | | | | | | |
| Boron | mg/l | 0.01 | 2 | 17 | 0.013 | 0.066 | 0 | | | | 0.016 | 0.026 | 0.066 | 0.023 | 0.023 | 0.025 | 0.038 | 0.039 | 0.061 | 0.026 | 0.02 | 0.02 | 0.018 | 0.048 | 0.046 | 0.02 | 0.013 | | | | | | |
| Barium | mg/l | 0.005 | N/A | 14 | <0.005 | 0.099 | 0 | | | | <0.005 | 0.0074 | 0.014 | 0.025 | 0.037 | 0.055 | 0.076 | 0.099 | 0.037 | 0.01 | 0.044 | 0.034 | | | | 0.072 | 0.0072 | | | | | | |
| Beryllium | mg/l | 0.001 | N/A | 14 | <0.001 | <0.001 | 0 | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | <0.001 | <0.001 | | | | | | |
| Cadmium | mg/l | 0.00011 | 0.00008 -> CaCO3 0-50mg/l 0.00009 -> CaCO3 50-100mg/l 0.00015 -> CaCO3 100-200mg/l 0.00025 -> CaCO3 200+mg/l | 17 | <0.00011 | 0.00036 | 0 | | | | <0.00011 | <0.00011 | <0.00011 | <0.00011 | <0.00011 | 0.00013 | <0.00011 | <0.00011 | <0.00011 | <0.00011 | <0.00011 | <0.00011 | <0.00011 | <0.00011 | <0.00011 | 0.00036 | 0.00021 | <0.00011 | | | | | | |
| Copper | mg/l | 0.0005 | 0.007 | 17 | 0.0016 | 0.11 | 5 | GBBH04, 0.5m; GBBH05, 1.00m; GBTP04, 0.5m; GB-BH07, 0.3m; GBBH12, 0.8m | | | 0.0018 | 0.0018 | 0.0024 | 0.02 | 0.0078 | 0.11 | 0.0034 | 0.0039 | 0.0038 | 0.002 | 0.0016 | 0.005 | 0.0018 | 0.0063 | 0.012 | 0.0032 | 0.012 | | | | | | |
| Mercury | mg/l | 0.00005 | 0.00007 | 17 | <0.00005 | 0.00042 | 2 | GBH03, 0.5m; GBTP04, 0.5m | | | <0.00005 | <0.00005 | 0.00008 | <0.00005 | <0.00005 | 0.00042 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | <0.00005 | | | | | | |
| Manganese | mg/l | 0.0005 | 0.18 | 14 | 0.00096 | 0.31 | 1 | GBBH02, 0.50m | | | 0.02 | 0.31 | 0.0019 | 0.018 | 0.0022 | 0.096 | 0.0036 | 0.0071 | 0.016 | 0.0017 | 0.00096 | 0.0016 | | | | 0.036 | 0.09 | | | | | | |
| Molybdenum | mg/l | 0.0002 | N/A | 14 | 0.00081 | 0.05 | 0 | | | | 0.0011 | 0.00081 | 0.046 | 0.0025 | 0.0078 | 0.0073 | 0.027 | 0.05 | 0.02 | 0.0066 | 0.01 | 0.0013 | | | | 0.0058 | 0.0029 | | | | | | |
| Nickel | mg/l | 0.0005 | 0.006 | 17 | <0.0005 | 0.014 | 2 | GBTP04, 0.5m; GB-BH07, 0.3m | | | 0.00076 | 0.00068 | <0.0005 | 0.0045 | 0.0021 | 0.013 | 0.0009 | 0.00058 | 0.00067 | <0.0005 | <0.0005 | 0.00075 | <0.0005 | 0.00062 | 0.014 | 0.00084 | 0.0016 | | | | | | |
| Lead | mg/l | 0.0005 | 0.003 | 17 | <0.0005 | 0.093 | 7 | GBBH04, 0.5m; GBBH05, 1.00m; GBTP04, 0.5m; GB-BH09, 0.7m; GB-BH07, 0.3m; GBBH10, 0.5m; GBBH12, 0.8m | | | 0.00052 | 0.001 | <0.0005 | 0.011 | 0.0078 | 0.093 | 0.00082 | 0.0011 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.012 | 0.027 | 0.021 | 0.0042 | | | | | | |
| Antimony | mg/l | 0.0005 | N/A | 14 | <0.0005 | 0.013 | 0 | | | | <0.0005 | <0.0005 | 0.0013 | 0.0015 | 0.013 | 0.0083 | 0.0059 | 0.013 | 0.0014 | <0.0005 | 0.0044 | 0.0014 | | | | 0.0037 | 0.0015 | | | | | | |
| Selenium | mg/l | 0.0005 | N/A | 14 | <0.0005 | 0.0066 | 0 | | | | 0.0024 | 0.00073 | 0.0066 | <0.0005 | 0.00068 | 0.0018 | 0.0028 | 0.0047 | 0.0053 | 0.0012 | 0.00059 | <0.0005 | | | | 0.0049 | 0.0043 | | | | | | |
| Vanadium | mg/l | 0.0005 | 0.02 -> CaCO3 0-200mg/l 0.06 -> CaCO3 200+mg/l | 14 | <0.0005 | 0.024 | 0 | | | | 0.00093 | 0.00091 | 0.019 | 0.02 | 0.0011 | 0.024 | <0.0005 | 0.0031 | 0.0093 | <0.0005 | 0.00079 | <0.0005 | | | | 0.0014 | 0.0028 | | | | | | |
| Zinc | mg/l | 0.0025 | 0.019 | 17 | <0.0025 | 0.3 | 5 | GBBH04, 0.5m; GBTP04, 0.5m; GB-BH09, 0.7m; GB-BH07, 0.3m; GBBH10, 0.5m | | | 0.0065 | <0.0025 | <0.0025 | 0.029 | 0.012 | 0.082 | 0.011 | 0.011 | <0.0025 | <0.0025 | <0.0025 | <0.0025 | <0.0025 | 0.038 | 0.3 | 0.022 | 0.011 | | | | | | |
| Chromium (Total) | mg/l | 0.0005 | See Cr VI as first pass | 17 | <0.0005 | 0.025 | 0 | | | | 0.00076 | 0.00051 | 0.0048 | 0.013 | <0.0005 | 0.025 | 0.0018 | <0.0005 | 0.00058 | <0.0005 | 0.0015 | <0.0005 | 0.00076 | <0.0005 | 0.00078 | 0.00058 | 0.0012 | | | | | | |
| Iron (Dissolved) | mg/l | 0.005 | 1 | 14 | <0.005 | 12 | 5 | GBH01, 0.5m; GBBH02, 0.50m; GBBH04, 0.5m; GBTP04, 0.5m; GBBH12, 0.8m | | | 1.7 | 1.6 | 0.0079 | 6.3 | 0.074 | 12 | 0.02 | 0.023 | 0.018 | 0.0067 | <0.005 | 0.053 | | | | 0.048 | 1.8 | | | | | | |
| Chromium (Hexavalent) | mg/l | 0.02 | 0.0034 | 12 | <0.02 | 0.022 | 1 | GBTP04, 0.5m | | | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 0.022 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | | | | | | | | | | | |
| Low-Level Chromium (Hexavalent) | mg/l | 0.0001 | No WSV | 2 | <0.0001 | <0.0001 | 0 | | | | | | | | | | | | | | | | | | | <0.0001 | <0.0001 | | | | | | |
| Aliphatic TPH >C5-C6 | mg/l | 0.0001 | 0.01 | 14 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 | | | | | | |
| Aliphatic TPH >C6-C8 | mg/l | 0.0001 | 0.01 | 14 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 | | | | | | |
| Aliphatic TPH >C8-C10 | mg/l | 0.0001 | 0.01 | 14 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 | | | | | | |
| Aliphatic TPH >C10-C12 | mg/l | 0.0001 | 0.01 | 14 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 | | | | | | |
| Aliphatic TPH >C12-C16 | mg/l | 0.0001 | 0.01 | 14 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 | | | | | | |
| Aliphatic TPH >C16-C21 | mg/l | 0.0001 | 0.01 | 14 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 | | | | | | |
| Aliphatic TPH >C21-C35 | mg/l | 0.0001 | 0.01 | 14 | <0.0001 | 0.12 | 3 | HP02, 0.50m; HP02, 1.00m; HP03, 0.40m | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 0.087 | 0.1 | 0.12 | <0.0001 | | | | <0.0001 | <0.0001 | | | | | | |
| Aliphatic TPH >C35-C44 | mg/l | 0.0001 | 0.01 | 14 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 | | | | | | |
| Total Aliphatic Hydrocarbons | mg/l | 0.005 | No WSV | 14 | <0.005 | 0.12 | 0 | | | | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | 0.087 | 0.1 | 0.12 | <0.005 | | | | <0.005 | <0.005 | | | | | | |
| Aromatic TPH >C5-C7 | mg/l | 0.0001 | 0.01 | 14 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 | | | | | | |
| Aromatic TPH >C7-C8 | mg/l | 0.0001 | 0.01 | 14 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 | | | | | | |
| Aromatic TPH >C8-C10 | mg/l | 0.0001 | 0.01 | 14 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 | | | | | | |
| Aromatic TPH >C10-C12 | mg/l | 0.0001 | 0.01 | 14 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 | | | | | | |
| Aromatic TPH >C12-C16 | mg/l | 0.0001 | 0.01 | 14 | <0.0001 | 0.42 | 3 | HP02, 0.50m; HP02, 1.00m; HP03, 0.40m | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 0.41 | 0.42 | 0.32 | <0.0001 | | | | <0.0001 | <0.0001 | | | | | | |
| Aromatic TPH >C16-C21 | mg/l | 0.0001 | 0.01 | 14 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 | | | | | | |
| Aromatic TPH >C21-C35 | mg/l | 0.0001 | 0.01 | 14 | <0.0001 | 1.5 | 3 | HP02, 0.50m; HP02, 1.00m; HP03, 0.40m | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 0.23 | 0.17 | 1.5 | <0.0001 | | | | <0.0001 | <0.0001 | | | | | | |
| Aromatic TPH >C35-C44 | mg/l | 0.0001 | 0.01 | 14 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | <0.0001 | <0.0001 | | | | | | |
| Total Aromatic Hydrocarbons | mg/l | 0.005 | No WSV | 14 | <0.005 | 1.8 | 0 | | | | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | 0.64 | 0.59 | 1.8 | <0.005 | | | | <0.005 | <0.005 | | | | | | |
| Total Petroleum Hydrocarbons | mg/l | 0.01 | No WSV | 17 | <0.01 | 1.9 | 0 | | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.72 | 0.7 | 1.9 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | | | | |
| Total Of 16 PAH's | mg/l | 0.0002 | No WSV | 12 | <0.0002 | 0.038 | 0 | | | | 0.038 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | | | | | | | | | | | |
| Benzene | mg/l | 0.001 | 0.01 | 14 | <0.001 | <0.001 | 0 | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | <0.001 | <0.001 | | | | | | |
| Toluene | mg/l | 0.001 | 0.074 | 14 | <0.001 | <0.001 | 0 | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | <0.001 | <0.001 | | | | | | |
| Ethylbenzene | mg/l | 0.001 | 0.02 | 14 | <0.001 | <0.001 | 0 | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | <0.001 | <0.001 | | | | | | |
| m & p-Xylene | mg/l | 0.001 | See Xylenes (total) | 14 | <0.001 | <0.001 | 0 | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | <0.001 | <0.001 | | | | | | |
| o-Xylene | mg/l | 0.001 | See Xylenes (total) | 14 | <0.001 | <0.001 | 0 | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | <0.001 | <0.001 | | | | | | |
| Methyl Tert-Butyl Ether | mg/l | 0.001 | No WSV | 14 | <0.001 | <0.001 | 0 | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | <0.001 | <0.001 | | | | | | |
| Naphthalene | mg/l | 0.00001 | 0.002 | 17 | <0.00001 | 0.0013 | 0 | | | | 0.0013 | 0.0013 | 0.0013 | <0.00001 | 0.00077 | <0.00001 | 0.00098 | 0.0011 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | | | |
| Acenaphthylene | mg/l | 0.00001 | Screen BaP only | 17 | <0.00001 | <0.0001 | 0 | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | | | |
| Acenaphthene | mg/l | 0.00001 | Screen BaP only | 17 | <0.00001 | <0.0001 | 0 | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | | | |
| Fluorene | mg/l | 0.00001 | N/A | 17 | <0.00001 | <0.0001 | 0 | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | | | |
| Phenanthrene | mg/l | 0.00001 | Screen BaP only | 17 | <0.00001 | 0.0033 | 0 | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | 0.0033 | <0.0001 | | | | | | |
| Anthracene | mg/l | 0.00001 | 0.0001 | 17 | <0.00001 | <0.0001 | 0 | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | | | |
| Fluoranthene | mg/l | 0.00001 | 0.0000063 | 17 | <0.00001 | 0.0064 | 1 | GBBH10, 0.5m | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | 0.0064 | <0.0001 | | | | | | |
| Pyrene | mg/l | 0.00001 | N/A | 17 | <0.00001 | 0.0044 | 0 | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | 0.0044 | <0.0001 | | | | | | |
| Benzo[a]anthracene | mg/l | 0.00001 | Screen BaP only | 17 | <0.00001 | <0.0001 | 0 | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | | | |
| Chrysene | mg/l | 0.00001 | Screen BaP only | 17 | <0.00001 | <0.0001 | 0 | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | | | |
| Benzo[b]fluoranthene | mg/l | 0.00001 | Screen BaP only | 17 | <0.00001 | <0.0001 | 0 | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | | | |
| Benzo[k]fluoranthene | mg/l | 0.00001 | Screen BaP only | 17 | <0.00001 | <0.0001 | 0 | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | | | |
| Benzo[a]pyrene | mg/l | 0.00001 | 0.00000017 | 17 | <0.00001 | <0.0001 | 0 | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | | | |
| Indeno(1,2,3-c,d)Pyrene | mg/l | 0.00001 | Screen BaP only | 17 | <0.00001 | <0.0001 | 0 | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | | | |
| Dibenz(a,h)Anthracene | mg/l | 0.00001 | N/A | 17 | <0.00001 | <0.0001 | 0 | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | | | |
| Benzo[g,h,i]perylene | mg/l | 0.00001 | Screen BaP only | 17 | <0.00001 | <0.0001 | 0 | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | | | | | |
| Coronene | mg/l | 0.00001 | No WSV | 14 | <0.00001 | <0.0001 | 0 | | | | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | | | | <0.0001 | <0.0001 | | | | | | |
| Total Of 17 PAH's | mg/l | 0.0002 | No WSV | 17 | <0.0002 | 0.014 | 0 | | | | 0.0013 | 0.0013 | 0.0013 | <0.0002 | 0.00077 | <0.0002 | 0.00098 | 0.0011 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.002 | <0.002 | <0.002 | 0.014 | <0.002 | | | | | | |
| Total Phenols | mg/l | 0.030 | No WSV | 17 | <0.03 | <0.03 | 0 | | | | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | | | | | | |

| Assessment Criteria : | Manual SSAC |
|---|---|
| CaCO (mg/l): | 116.00 |
| pH | 8.07 |
| Calcium (mg/l): | 34.50 |
| DOC (mg/l) | 2.75 |
| Catchment area: | Freshwater not listed |

| Constituents | Unit | Limit of Detection | Generic Assessment Criteria | Number of Samples | Minimum Value | Maximum Value | Number of Exceedences | Locations of Exceedences | Location | Sample ID | Depth | Date | Strata | Zone | Upstream | Downstream | GB SW 02 (Upstream) | GB SW 01 (Downstream) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Upstream | Downstream | GB SW 02 (Upstream) | GB SW 01 (Downstream) |
| | | | | | | | | | | | | | | | -m | -m | -m | -m |
| | | | | | | | | | | | | | | | 25-Aug-201 | 25-Aug-201 | 31-May-23 | 31-May-23 |
| | | | | | | | | | | | | | | | - | - | - | - |
| | | | | | | | | | | | | | | | - | - | - | - |
| pH | | N/A | 6-9 | 4 | 7.5 | 8.5 | 0 | | | | | | | | 8.5 | 8.5 | 7.8 | 7.5 |
| Biochemical Oxygen Demand Low Level | mg O2/l | 1.0 | No WSV | 4 | <1 | <4 | 0 | | | | | | | | <1 | <1 | <4 | <4 |
| Alkalinity (Total) | mg/l | 10 | No WSV | 2 | 61 | 150 | 0 | | | | | | | | 150 | 61 | | |
| Chloride | mg/l | 1.0 | 250 | 4 | 20 | 32 | 0 | | | | | | | | 32 | 20 | 28 | 21 |
| Ammonia (Free) | mg/l | 0.050 | No WSV | 4 | <0.05 | 0.19 | 0 | | | | | | | | 0.19 | <0.05 | <0.05 | <0.05 |
| Ammonium | mg/l | 0.050 | 0.26 | 4 | <0.05 | 1.4 | 2 | Upstream, 25-Aug-201; Downstream, 25-Aug-201 | | | | | | | 1.4 | 0.33 | <0.05 | 0.08 |
| Ammoniacal Nitrogen | mg/l | 0.050 | 0.2 | 4 | <0.05 | 1.2 | 2 | Upstream, 25-Aug-201; Downstream, 25-Aug-201 | | | | | | | 1.2 | 0.3 | <0.05 | 0.063 |
| Nitrate | mg/l | 0.50 | N/A | 4 | 4.4 | 11 | 0 | | | | | | | | 11 | 4.4 | 6.7 | 4.6 |
| Phosphorus (Dissolved) | mg/l | 0.020 | No WSV | 2 | 0.024 | 0.065 | 0 | | | | | | | | 0.065 | 0.024 | | |
| Sulphate | mg/l | 1.0 | 400 | 4 | 19 | 42 | 0 | | | | | | | | 35 | 19 | 42 | 22 |
| Cyanide (Total) | mg/l | 0.050 | N/A | 2 | <0.05 | <0.05 | 0 | | | | | | | | <0.05 | <0.05 | | |
| Cyanide (Free) | mg/l | 0.050 | 0.001 | 2 | <0.05 | <0.05 | 0 | | | | | | | | <0.05 | <0.05 | | |
| Cyanide (Total) Low-Level | mg/l | 0.0050 | No WSV | 2 | <0.005 | <0.005 | 0 | | | | | | | | | | <0.005 | <0.005 |
| Cyanide (Free) Low-Level | mg/l | 0.0050 | No WSV | 2 | <0.005 | <0.005 | 0 | | | | | | | | | | <0.005 | <0.005 |
| Sulphide | mg/l | 0.050 | No WSV | 4 | <0.05 | <0.05 | 0 | | | | | | | | <0.05 | <0.05 | <0.05 | <0.05 |
| Calcium | mg/l | 2.00 | N/A | 4 | 21 | 47 | 0 | | | | | | | | 46 | 21 | 47 | 24 |
| Total Hardness as CaCO3 | mg/l | 15 | No WSV | 4 | 69 | 160 | 0 | | | | | | | | 160 | 69 | 160 | 76 |
| Aluminium | mg/l | 0.005 | N/A | 4 | <0.005 | 0.0078 | 0 | | | | | | | | <0.005 | <0.005 | <0.005 | 0.0078 |
| Arsenic | mg/l | 0.0002 | 0.05 | 4 | 0.00081 | 0.0014 | 0 | | | | | | | | 0.0012 | 0.00081 | 0.0014 | 0.001 |
| Boron | mg/l | 0.01 | 2 | 4 | 0.024 | 0.051 | 0 | | | | | | | | 0.051 | 0.024 | 0.04 | 0.024 |
| Barium | mg/l | 0.005 | N/A | 4 | 0.02 | 0.041 | 0 | | | | | | | | 0.041 | 0.02 | 0.039 | 0.021 |
| Beryllium | mg/l | 0.001 | N/A | 4 | <0.001 | <0.001 | 0 | | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 |
| Cadmium | mg/l | 0.00011 | 0.00008 -> CaCO3 0-50mg/l 0.00009 -> CaCO3 50-100mg/l 0.00015 -> CaCO3 100-200mg/l 0.00025 -> CaCO3 200+mg/l | 4 | <0.00011 | <0.00011 | 0 | | | | | | | | <0.00011 | <0.00011 | <0.00011 | <0.00011 |
| Copper | mg/l | 0.0005 | 0.007 | 4 | 0.0017 | 0.0028 | 0 | | | | | | | | 0.0026 | 0.0028 | 0.0017 | 0.0019 |
| Iron | mg/l | 0.005 | 1 | 4 | <0.005 | 0.12 | 0 | | | | | | | | <0.005 | 0.11 | <0.005 | 0.12 |
| Mercury | mg/l | 0.00005 | 0.00007 | 4 | <0.00005 | <0.00005 | 0 | | | | | | | | <0.00005 | <0.00005 | <0.00005 | <0.00005 |
| Molybdenum | mg/l | 0.0002 | N/A | 4 | 0.00083 | 0.0013 | 0 | | | | | | | | 0.0013 | 0.00083 | 0.0012 | 0.00094 |
| Nickel | mg/l | 0.0005 | 0.006 | 4 | 0.00059 | 0.0011 | 0 | | | | | | | | 0.00066 | 0.0011 | 0.00059 | 0.00094 |
| Lead | mg/l | 0.0005 | 0.003 | 4 | <0.0005 | <0.0005 | 0 | | | | | | | | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Antimony | mg/l | 0.0005 | N/A | 4 | <0.0005 | 0.0009 | 0 | | | | | | | | 0.00056 | <0.0005 | 0.0009 | 0.00055 |
| Selenium | mg/l | 0.0005 | N/A | 4 | <0.0005 | 0.002 | 0 | | | | | | | | 0.002 | <0.0005 | 0.0017 | 0.00068 |
| Vanadium | mg/l | 0.0005 | 0.02 -> CaCO3 0-200mg/l 0.06 -> CaCO3 200+mg/l | 4 | 0.00051 | 0.00066 | 0 | | | | | | | | 0.00058 | 0.00051 | 0.00066 | 0.00062 |
| Zinc | mg/l | 0.0025 | 0.019 | 4 | 0.0036 | 0.017 | 0 | | | | | | | | 0.0088 | 0.0036 | 0.017 | 0.013 |
| Chromium (Total) | mg/l | 0.0005 | See Cr VI as first pass | 4 | 0.0016 | 0.0066 | 0 | | | | | | | | 0.0066 | 0.0058 | 0.0016 | 0.0025 |
| Low-Level Chromium (Hexavalent) | mg/l | 0.0001 | No WSV | 4 | 0.00015 | 0.0037 | 0 | | | | | | | | 0.0037 | 0.0033 | 0.00028 | 0.00015 |
| Dissolved Organic Carbon | mg/l | 2.0 | No WSV | 4 | 2.2 | 3.5 | 0 | | | | | | | | 2.2 | 3.5 | 2.4 | 2.9 |
| Total Organic Carbon | mg/l | 2.0 | No WSV | 4 | 2 | 3.2 | 0 | | | | | | | | 2 | 3.2 | 2.2 | 2.7 |
| Aliphatic TPH >C5-C6 | mg/l | 0.0001 | 0.01 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aliphatic TPH >C6-C8 | mg/l | 0.0001 | 0.01 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aliphatic TPH >C8-C10 | mg/l | 0.0001 | 0.01 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aliphatic TPH >C10-C12 | mg/l | 0.0001 | 0.01 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aliphatic TPH >C12-C16 | mg/l | 0.0001 | 0.01 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aliphatic TPH >C16-C21 | mg/l | 0.0001 | 0.01 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aliphatic TPH >C21-C35 | mg/l | 0.0001 | 0.01 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aliphatic TPH >C35-C44 | mg/l | 0.0001 | 0.01 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Total Aliphatic Hydrocarbons | mg/l | 0.005 | No WSV | 4 | <0.005 | <0.005 | 0 | | | | | | | | <0.005 | <0.005 | <0.005 | <0.005 |
| Aromatic TPH >C5-C7 | mg/l | 0.0001 | 0.01 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aromatic TPH >C7-C8 | mg/l | 0.0001 | 0.01 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aromatic TPH >C8-C10 | mg/l | 0.0001 | 0.01 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aromatic TPH >C10-C12 | mg/l | 0.0001 | 0.01 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aromatic TPH >C12-C16 | mg/l | 0.0001 | 0.01 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aromatic TPH >C16-C21 | mg/l | 0.0001 | 0.01 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aromatic TPH >C21-C35 | mg/l | 0.0001 | 0.01 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Aromatic TPH >C35-C44 | mg/l | 0.0001 | 0.01 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Total Aromatic Hydrocarbons | mg/l | 0.005 | No WSV | 4 | <0.005 | <0.005 | 0 | | | | | | | | <0.005 | <0.005 | <0.005 | <0.005 |
| Total Petroleum Hydrocarbons | mg/l | 0.01 | No WSV | 4 | <0.01 | <0.01 | 0 | | | | | | | | <0.01 | <0.01 | <0.01 | <0.01 |
| Benzene | mg/l | 0.001 | 0.01 | 4 | <0.001 | <0.001 | 0 | | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 |
| Toluene | mg/l | 0.001 | 0.074 | 4 | <0.001 | <0.001 | 0 | | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 |
| Ethylbenzene | mg/l | 0.001 | 0.02 | 4 | <0.001 | <0.001 | 0 | | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 |
| m & p-Xylene | mg/l | 0.001 | See Xylenes (total) | 4 | <0.001 | <0.001 | 0 | | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 |
| o-Xylene | mg/l | 0.001 | See Xylenes (total) | 4 | <0.001 | <0.001 | 0 | | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 |
| Naphthalene | mg/l | 0.0001 | 0.002 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Acenaphthylene | mg/l | 0.0001 | Screen BaP only | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Acenaphthene | mg/l | 0.0001 | Screen BaP only | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Fluorene | mg/l | 0.0001 | N/A | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Phenanthrene | mg/l | 0.0001 | Screen BaP only | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Anthracene | mg/l | 0.0001 | 0.0001 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Fluoranthene | mg/l | 0.0001 | 0.0000063 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Pyrene | mg/l | 0.0001 | N/A | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Benzo[a]anthracene | mg/l | 0.0001 | Screen BaP only | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Chrysene | mg/l | 0.0001 | Screen BaP only | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Benzo[b]fluoranthene | mg/l | 0.0001 | Screen BaP only | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Benzo[k]fluoranthene | mg/l | 0.0001 | Screen BaP only | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Benzo[a]pyrene | mg/l | 0.0001 | 0.00000017 | 4 | <0.0001 | <0.0001 | 0 | | | | | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |

| Assessment Criteria : | Manual SSAC | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CaCO (mg/l): | 116.00 | | pH | 8.07 | | | | | | | | | | |
| Calcium (mg/l): | 34.50 | | DOC (mg/l) | 2.75 | | Catchment area: | Freshwater not listed | | | | | | | |
| | | | | | | | | | Location | | Upstream | Downstream | GB SW 02 (Upstream) | GB SW 01 (Downstream) |
| | | | | | | | | | Sample ID | | Upstream | Downstream | GB SW 02 (Upstream) | GB SW 01 (Downstream) |
| | | | | | | | | | Depth | | -m | -m | -m | -m |
| | | | | | | | | | Date | | 25-Aug-201 | 25-Aug-201 | 31-May-23 | 31-May-23 |
| | | | | | | | | | Strata | | - | - | - | - |
| Constituents | Unit | Limit of Detection | Generic Assessment Criteria | Number of Samples | Minimum Value | Maximum Value | Number of Exceedences | Locations of Exceedences | | Zone | - | - | - | - |
| Indeno(1,2,3-c,d)Pyrene | mg/l | 0.0001 | Screen BaP only | 4 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Dibenz(a,h)Anthracene | mg/l | 0.0001 | N/A | 4 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Benzo[g,h,i]perylene | mg/l | 0.0001 | Screen BaP only | 4 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Coronene | mg/l | 0.0001 | No WSV | 2 | <0.0001 | <0.0001 | 0 | | | | <0.0001 | <0.0001 | | |
| Total Of 17 PAH's | mg/l | 0.002 | No WSV | 4 | <0.002 | <0.002 | 0 | | | | <0.002 | <0.002 | <0.002 | <0.002 |
| Total Phenols | mg/l | 0.030 | No WSV | 4 | <0.03 | <0.03 | 0 | | | | <0.03 | <0.03 | <0.03 | <0.03 |

**Assessment Criteria :** *Public Open Space (Residential) - 6% SOM Sandy Loam*

Use MRL Values?

| Constituent | Unit | Limit of Detection | Generic Assessment Criteria | Number of Samples | Minimum Value | Maximum Value | Number of Exceedances | Locations of Exceedances | Location | GBH01 | GBBH02 | GBH03 | GBBH04 | GBBH05 | GBTP01 | GBTP02 | GBTP03 | GBTP04 | GBTP04 | GBTP05 | GBTP06 | HP02 | HP02 | HP03 | HP05 | GBHP 06 | GB-BH09 | GB-BH07 | GB-BH07 | SLIT 1 | SLIT 2 | GBBH10 | GBBH10 | GBBH11 | GBBH11 | GBBH12 | GBBH12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Sample ID | GBH01 | GBBH02 | GBH03 | GBBH04 | GBBH05 | GBTP01 | GBTP02 | GBTP03 | GBTP04 | GBTP04 | GBTP05 | GBTP06 | HP02 | HP03 | HP05 | GBHP 06 | GB-BH09 | GB-BH07 | GB-BH07 | SLIT 1 | SLIT 2 | GBBH10 | GBBH10 | GBBH11 | GBBH11 | GBBH12 | GBBH12 |
| | | | | | | | | | Depth | 0.5m | 0.50m | 0.5m | 0.5m | 1.00m | 0.30m | 0.60m | 0.60m | 0.5m | 1m | 1.20m | 1.20m | 0.50m | 1.00m | 0.40m | 0.3m | 0.30m | 0.7m | 0.3m | 1.2m | | | 0.5m | 1.0m | 0.5m | 1.5m | 0.25m | 0.8m |
| | | | | | | | | | Date | | 05-Jul-2021 | | 15-Nov-2021 | 06-Jul-2021 | 07-Jul-2021 | 05-Jul-2021 | 05-Jul-2021 | 15-Nov-2021 | 15-Nov-2021 | 06-Jul-2021 | 18-Aug-2021 | 18-Aug-2021 | 19-Aug-2021 | 19-Aug-2021 | 15-May-2023 | | | | 24/11/2023 | 24/11/2023 | 07-Mar-2024 | 07-Mar-2024 | 07-Mar-2024 | 07-Mar-2024 | 06-Mar-2024 | 06-Mar-2024 |
| | | | | | | | | | Strata | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | | | | | | | Zone | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ACM Type | - | N/A | No SSV | 0 | - | - | 3 | GBBH04, GBBH04, 0.5m; GBTP04, GBTP04, 0.5m; GBTP04, GBTP04, 1m | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Asbestos Identification | - | N/A | No SSV | 28 | - | - | 5 | GBH01, GBH01, 0.5m; GBH03, GBH03, 0.5m; GBBH04, GBBH04, 0.5m; GBTP04, GBTP04, 0.5m; GBTP04, GBTP04, 1m | | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected |
| Moisture | % | 0.020 | No SSV | 28 | 7.4 | 38 | 0 | | | 13 | 17 | 9.4 | 25 | 30 | 14 | 15 | 21 | 24 | 38 | 22 | 22 | 9.2 | 15 | 7.4 | 9.8 | 15 | 19 | 13 | 16 | 18 | 16 | 9.8 | 16 | 17 | 19 | 27 | 15 | 16 |
| Soil Colour | - | N/A | No SSV | 28 | - | - | 0 | | | Brown | Brown | Brown | Grey | Black | Brown | Brown | Brown | Brown | Brown | Grey | Black | Brown | Brown | Brown | Brown | Brown | Brown | Brown | Brown | Brown | Brown | Brown | Brown | Brown | Brown | Brown | Brown |
| Other Material | - | N/A | No SSV | 28 | - | - | 0 | | | Stones | Stones and Glass | Stones | Stones, Roots and Wood | Stones | Stones | Stones and Roots | Stones and Roots | Stones and Roots | Stones | Stones | Stones | None | Stones | Stones | Stones and Roots | Stones | Stones | Stones | Stones | Stones and Root | Stones and Root | Stones | Stones | Stones | Stones | Stones | Stones |
| Soil Texture | - | N/A | No SSV | 28 | - | - | 0 | | | Sand | Sand | Sand | Clay | Sand | Sand | Sand | Sand | Sand | Clay | Sand | Sand | Sand | Sand | Sand | Sand | Sand | Sand | Sand | Clay | Clay | Loam | Loam | Loam | Clay | Loam | Loam |
| pH | - | 4.0 | No SSV | 28 | 6.2 | 10.2 | 0 | | | 7.2 | 7.1 | 8.3 | 7 | 7.7 | 8.2 | 6.8 | 6.2 | 7.1 | 7 | 8 | 7.5 | 9 | 8.7 | 8.9 | 8.2 | 7.4 | 6.8 | [A] 6.8 | 8.1 | 8.3 | 7.8 | 8.3 | 10.2 | 8.5 | 7.4 | 8.5 | 7.8 |
| Boron (Hot Water Soluble) | mg/kg | 0.40 | No SSV | 22 | <0.4 | 6.2 | 0 | | | <0.4 | <0.4 | 0.53 | 0.51 | 0.63 | 0.6 | <0.4 | <0.4 | 0.68 | 3.2 | 0.45 | 1.1 | 0.66 | <0.4 | <0.4 | <0.4 | 6.2 | 0.93 | <0.4 | <0.4 | 2.5 | <0.4 | | | | | | |
| Magnesium (Water Soluble) | mg/kg | 20 | No SSV | 16 | <20 | 740 | 0 | | | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | 400 | 340 | 360 | 740 | | | | | | | | | | | |
| Sulphate (2:1 Water Soluble) as SO4 | g/l | 0.010 | No SSV | 28 | <0.01 | 0.15 | 0 | | | <0.01 | <0.01 | 0.021 | <0.01 | 0.035 | 0.063 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.047 | 0.081 | <0.01 | <0.01 | 0.015 | 0.035 | <0.01 | 0.047 | <0.01 | 0.026 | <0.01 | 0.12 | 0.076 | 0.15 | <0.01 | <0.01 | 0.015 |
| Nitrite (Extractable) | mg/kg | 0.10 | No SSV | 22 | <0.1 | 4.2 | 0 | | | <0.1 | 0.12 | 0.12 | 0.28 | 0.22 | 0.11 | 3.6 | <0.1 | 0.19 | 0.2 | 0.24 | 0.22 | 0.4 | <0.1 | 0.16 | 4.2 | | | | | | | 0.12 | 0.52 | <0.1 | <0.1 | 0.3 | <0.1 |
| Nitrate (Water Soluble) | g/l | 0.010 | No SSV | 22 | <0.01 | 0.019 | 0 | | | <0.01 | <0.01 | <0.01 | <0.01 | 0.013 | 0.013 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | | | | | <0.01 | 0.019 | 0.015 | <0.01 | <0.01 | <0.01 |
| Cyanide (Complex) | mg/kg | 0.50 | No SSV | 22 | <0.5 | <0.5 | 0 | | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | | | | | | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Cyanide (Free) | mg/kg | 0.50 | 34 | 22 | <0.5 | <0.5 | 0 | | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | | | | | | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Cyanide (Total) | mg/kg | 0.50 | No SSV | 28 | <0.5 | 1.7 | 0 | | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | 1.7 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Sulphide (Easily Liberatable) | mg/kg | 0.50 | No SSV | 22 | <0.5 | 34 | 0 | | | 13 | 0.79 | 1.5 | 1.9 | 2.1 | 1.2 | 3 | <0.5 | 2.1 | 34 | 1.6 | 23 | 0.56 | 0.56 | 0.56 | 1.2 | | | | | | | 13 | 29 | 11 | 5.1 | 7.7 | 3.7 |
| Ammoniacal Nitrogen | mg/kg | 0.50 | No SSV | 22 | <0.5 | 54 | 0 | | | 3.3 | 12 | 3.3 | 6.5 | 7.1 | 2.2 | 1.1 | 1.7 | 4.4 | 22 | 1.4 | 1.4 | 1.8 | <0.5 | <0.5 | <0.5 | | | | | | | 6.1 | 0.77 | 19 | 37 | 3.5 | 54 |
| Aluminium (Total) | mg/kg | 100 | No SSV | 22 | 2500 | 12000 | 0 | | | 12000 | 5000 | 11000 | 12000 | 6900 | 8700 | 5600 | 3700 | 12000 | 10000 | 4400 | 7800 | 11000 | 4200 | 3200 | 6200 | | | | | | | 4900 | 2500 | 3900 | 3500 | 3900 | 4100 |
| Iron (Total) | mg/kg | 100 | No SSV | 22 | 4400 | 26000 | 0 | | | 21000 | 16000 | 20000 | 19000 | 26000 | 20000 | 16000 | 16000 | 22000 | 18000 | 23000 | 26000 | 19000 | 14000 | 13000 | 18000 | | | | | | | 9500 | 4400 | 7200 | 6400 | 10000 | 5900 |
| Sulphate (Total) | mg/kg | 100 | No SSV | 22 | 150 | 2500 | 0 | | | 150 | 270 | 170 | 990 | 2500 | 490 | 350 | 300 | 1300 | 1500 | 1600 | 2400 | 1800 | 190 | 650 | 1200 | | | | | | | 2400 | 1000 | 1600 | 1400 | 1500 | 1400 |
| Arsenic | mg/kg | 1.0 | 79.1 | 28 | 2.5 | 1400 | 4 | GBBH10, GBBH10, 0.5m; GBBH11, GBBH11, 0.5m; GBBH12, GBBH12, 0.25m; GBBH12, GBBH12, 0.8m | | 14 | 2.5 | 13 | 17 | 44 | 16 | 7.2 | 3.9 | 51 | 9.8 | 23 | 38 | 18 | 9.7 | 18 | 19 | 33 | 32 | 16 | 42 | 23 | 24 | 1400 | 67 | 810 | 28 | 810 | 180 |
| Barium | mg/kg | 10 | 2680 | 22 | 21 | 1600 | 0 | | | 55 | 21 | 48 | 40 | 550 | 59 | 27 | 27 | 150 | 23 | 310 | 720 | 190 | 23 | 130 | 220 | | | | | | | 550 | 1200 | 420 | 91 | 1600 | 400 |
| Beryllium | mg/kg | 1.0 | 61 | 22 | <0.5 | 1.8 | 0 | | | <1 | <1 | <1 | <1 | 1.4 | <1 | <1 | <1 | 1.3 | <1 | <1 | 1.6 | 1.2 | <1 | <1 | <1 | | | | | | | 1.3 | 0.8 | 1.7 | 0.5 | 1.8 | 1.2 |
| Cadmium | mg/kg | 0.10 | 219 | 28 | <0.1 | 27 | 0 | | | 0.16 | <0.1 | 0.16 | <0.1 | 0.58 | 0.36 | 0.23 | <0.1 | 0.46 | <0.1 | 0.27 | 0.74 | 0.33 | <0.1 | 0.38 | 0.44 | 0.68 | 0.65 | 1.4 | 3.6 | 0.13 | 0.18 | 27 | 1.4 | 11 | 0.45 | 22 | 5.3 |
| Chromium | mg/kg | 1.0 | 33600 | 28 | 5.3 | 2900 | 0 | | | 12 | 5.3 | 12 | 31 | 9.4 | 9.7 | 5.8 | 5.4 | 26 | 28 | 7.9 | 11 | 31 | 7.1 | 12 | 14 | 16 | 11 | 14 | 40 | 45 | 50 | 510 | 2900 | 45 | 22 | 73 | 40 |
| Manganese | mg/kg | 5.0 | No SSV | 22 | 150 | 31000 | 0 | | | 710 | 540 | 640 | 160 | 410 | 620 | 410 | 490 | 390 | 150 | 350 | 520 | 1900 | 400 | 550 | 530 | | | | | | | 7600 | 31000 | 4200 | 260 | 4800 | 2800 |
| Molybdenum | mg/kg | 2.0 | 1360 | 22 | <0.6 | 33 | 0 | | | <2 | <2 | <2 | 2.1 | 8.1 | <2 | <2 | <2 | 4.3 | <2 | 6.2 | 10 | <2 | <2 | 2.1 | <2 | | | | | | | 15 | 33 | 4.9 | 0.6 | 12 | 3.2 |
| Antimony | mg/kg | 2.0 | 749 | 22 | <2 | 100 | 0 | | | 2 | 2.4 | <2 | 14 | <2 | <2 | <2 | <2 | 6.6 | <2 | 3.3 | 7.8 | <2 | <2 | <2 | <2 | | | | | | | 55 | 3.3 | 28 | 2.5 | 100 | 22 |
| Copper | mg/kg | 0.50 | 16400 | 28 | 10 | 1900 | 0 | | | 22 | 16 | 20 | 54 | 1900 | 43 | 20 | 10 | 250 | 110 | 77 | 220 | 190 | 26 | 75 | 35 | 86 | 74 | 200 | 620 | 33 | 47 | 1000 | 180 | 660 | 26 | 810 | 210 |
| Mercury | mg/kg | 0.10 | <0.08 | 28 | <0.1 | 0.89 | 0 | | | <0.1 | <0.1 | <0.1 | <0.1 | 0.89 | <0.1 | <0.1 | <0.1 | 0.57 | <0.1 | 0.41 | 0.38 | <0.1 | <0.1 | 0.14 | <0.1 | 0.13 | 0.15 | 0.19 | 0.59 | 0.08 | 0.1 | 2.2 | 0.34 | 0.14 | 0.09 | 0.27 | 0.13 |
| Nickel | mg/kg | 0.50 | 347 | 28 | 9.6 | 120 | 0 | | | 38 | 9.6 | 36 | 19 | 39 | 17 | 11 | 12 | 35 | 21 | 37 | 47 | 30 | 11 | 22 | 19 | 22 | 16 | 48 | 120 | 49 | 59 | 79 | 110 | 49 | 29 | 110 | 56 |
| Lead | mg/kg | 0.50 | 625 | 28 | 8.1 | 14000 | 6 | GBBH05, GBBH05, 1.00m; GB-BH07, GB-BH07, 1.2m; GBBH10, GBBH10, 0.5m; GBBH11, GBBH11, 0.5m; GBBH12, GBBH12, 0.25m; GBBH12, GBBH12, 0.8m | | 56 | 8.1 | 52 | 40 | 1200 | 31 | 14 | 8.6 | 200 | 29 | 220 | 470 | 53 | 12 | 110 | 46 | 120 | 190 | 430 | 1300 | 36 | 55 | 8300 | 210 | 3500 | 320 | 14000 | 2900 |
| Selenium | mg/kg | 0.20 | 1370 | 22 | <0.2 | 5.2 | 0 | | | <0.2 | 0.29 | <0.2 | 0.33 | 0.54 | 0.32 | 0.24 | 0.26 | 1.4 | <0.2 | 0.46 | 0.77 | 0.76 | 0.2 | <0.2 | <0.2 | | | | | | | 5.2 | 1.4 | 1.8 | 0.73 | 3.1 | 1.6 |
| Vanadium | mg/kg | 5.0 | 818 | 22 | <5 | 680 | 0 | | | 8.8 | <5 | 7.9 | 43 | 13 | 6.7 | <5 | <5 | 41 | 39 | 6.8 | 18 | 33 | 8.7 | 11 | 21 | | | | | | | 190 | 680 | 57 | 38 | 120 | 51 |
| Zinc | mg/kg | 0.50 | 93700 | 28 | 26 | 28000 | 0 | | | 77 | 26 | 83 | 66 | 390 | 75 | 49 | 64 | 170 | 68 | 230 | 450 | 110 | 35 | 150 | 100 | 200 | 350 | 660 | 1400 | 130 | 150 | 14000 | 400 | 6300 | 710 | 28000 | 6400 |
| Chromium (Hexavalent) | mg/kg | 0.50 | 26.1 | 22 | <0.5 | <0.5 | 0 | | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | | | | | | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Organic Matter | % | 0.40 | No SSV | 28 | 1.7 | 60 | 0 | | | 1.7 | 3.8 | 1.3 | 3.8 | 3 | 3 | 3.1 | 6.2 | 17 | 4.8 | 55 | 60 | 12 | 10 | 13 | 10 | 6.6 | 40 | 48 | 48 | 9.4 | 3.3 | 30 | 3.3 | 7.6 | 2.1 | 8.8 | 1.8 |
| Aliphatic TPH >C5-C6 | mg/kg | 0.010 | 847000 | 16 | <0.01 | <0.01 | 0 | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | | | | | | | | | | |
| Aliphatic TPH >C6-C8 | mg/kg | 0.010 | 886000 | 16 | <0.01 | <0.01 | 0 | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | | | | | | | | | | |
| Aliphatic TPH >C8-C10 | mg/kg | 0.10 | 18600 | 22 | <0.1 | 300 | 0 | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 9 | | | | | | | 160 | <10 | 300 | <10 | 130 | <10 |
| Aliphatic TPH >C10-C12 | mg/kg | 0.10 | 18700 | 16 | <0.1 | 10 | 0 | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 3.1 | | | | | | | | | | | | |
| Aliphatic TPH >C12-C16 | mg/kg | 0.10 | 18700 | 16 | <0.1 | 17 | 0 | | | <0.1 | <0.1 | <0.1 | 14 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 6.9 | | | | | | | | | | | | |
| Aliphatic TPH >C16-C21 | mg/kg | 0.10 | 445000 | 16 | <0.1 | 34 | 0 | | | <0.1 | <0.1 | 34 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 7.7 | <0.1 | <0.1 | 9.3 | <0.1 | <0.1 | 27 | <0.1 | | | | | | | | | | | | |
| Aliphatic TPH >C21-C35 | mg/kg | 0.10 | 445000 | 16 | <0.1 | 110 | 0 | | | 36 | <0.1 | 110 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 58 | <0.1 | <0.1 | 97 | 58 | 70 | <0.1 | <0.1 | | | | | | | 22 | | | | | |
| Aliphatic TPH >C35-C44 | mg/kg | 0.10 | No SSV | 16 | <0.1 | 260 | 0 | | | <0.1 | <0.1 | 160 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 260 | <0.1 | <0.1 | <0.1 | | | | | | | | | | | | |
| Total Aliphatic Hydrocarbons | mg/kg | 1.0 | No SSV | 16 | <1 | 350 | 0 | | | 36 | <1 | 310 | <1 | <1 | <1 | <1 | <1 | 66 | <1 | <1 | 130 | 58 | 350 | <1 | 41 | | | | | | | | | | | | |
| Aromatic TPH >C5-C7 | mg/kg | 0.010 | 142 | 16 | <0.01 | 94 | 0 | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | | | | | | | | | | |
| Aromatic TPH >C7-C8 | mg/kg | 0.010 | 55900 | 16 | <0.01 | <0.01 | 0 | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | | | | | | | | | | |
| Aromatic TPH >C8-C10 | mg/kg | 0.10 | 7460 | 16 | <0.1 | <0.1 | 0 | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | | | | | | |
| Aromatic TPH >C10-C12 | mg/kg | 0.10 | 7490 | 16 | <0.1 | 18 | 0 | | | <0.1 | <0.1 | 4.5 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 18 | <0.1 | <0.1 | <0.1 | | | | | | | | | | | | |
| Aromatic TPH >C12-C16 | mg/kg | 0.10 | 7500 | 16 | <0.1 | 280 | 0 | | | <0.1 | <0.1 | 250 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 6.8 | <0.1 | 280 | <0.1 | <0.1 | <0.1 | | | | | | | | | | | | |
| TPH aromatic C16-C21 | mg/kg | 0.10 | 3770 | 16 | <0.1 | 1500 | 0 | | | 17 | <0.1 | 1500 | <0.1 | 11 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 47 | 39 | 1300 | <0.1 | 3.9 | <0.1 | | | | | | | | | | | | |
| Aromatic TPH >C21-C35 | mg/kg | 0.10 | 3770 | 16 | <0.1 | 4900 | 1 | GBH03, GBH03, 0.5m | | 160 | <0.1 | 4900 | <0.1 | 120 | <0.1 | <0.1 | 81 | <0.1 | <0.1 | 280 | 260 | 3500 | <0.1 | 19 | 93 | | | | | | | | | | | | |
| Aromatic TPH >C35-C44 | mg/kg | 0.10 | No SSV | 16 | <0.1 | 350 | 0 | | | <0.1 | <0.1 | 350 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 280 | <0.1 | <0.1 | <0.1 | | | | | | | | | | | | |
| Total Aromatic Hydrocarbons | mg/kg | 1.0 | No SSV | 16 | <1 | 7000 | 0 | | | 180 | <1 | 7000 | <1 | 130 | <1 | <1 | 81 | <1 | <1 | 340 | 300 | 5400 | <1 | 23 | 93 | | | | | | | | | | | | |
| Total Petroleum Hydrocarbons | mg/kg | 2.0 | No SSV | 16 | <2 | 7300 | 0 | | | 210 | <2 | 7300 | <2 | 130 | <2 | <2 | 150 | <2 | <2 | 470 | 360 | 5800 | <2 | 23 | 130 | | | | | | | | | | | | |
| Total TPH >C6-C40 | mg/kg | 10 | No SSV | 6 | <10 | 540 | 0 | | | | | | | | | | | | | | | | | | | 37 | <10 | 540 | 370 | <10 | 290 | | | | | | |
| Benzene | mg/kg | 0.001 | 142 | 22 | <0.001 | <0.001 | 0 | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Toluene | mg/kg | 0.001 | 55900 | 22 | <0.001 | 0.011 | 0 | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.011 | 0.0022 | <0.001 | | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Ethylbenzene | mg/kg | 0.001 | 24900 | 22 | <0.001 | <0.001 | 0 | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| m & p-Xylene | mg/kg | 0.001 | No SSV | 22 | <0.001 | <0.001 | 0 | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| o-Xylene | mg/kg | 0.001 | 43100 | 22 | <0.001 | <0.001 | 0 | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Methyl Tert-Butyl Ether | mg/kg | 0.001 | 75000 | 22 | <0.001 | <0.001 | 0 | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Naphthalene | mg/kg | 0.010 | 4230 | 28 | <0.01 | <10 | 0 | | | <0.01 | 0.11 | 0.81 | <0.01 | 1.5 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.88 | 1 | 2.7 | 0.68 | 0.52 | 0.12 | 0.27 | 0.95 | 1.1 | 0.85 | <10 | <10 | 0.17 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Acenaphthylene | mg/kg | 0.010 | No SSV | 28 | <0.01 | <10 | 0 | | | <0.01 | 0.025 | 2.1 | <0.01 | 0.25 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.16 | 0.42 | 5.1 | 0.22 | 0.24 | 0.14 | <0.1 | <0.1 | 0.24 | 0.16 | <10 | <10 | 0.82 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Acenaphthene | mg/kg | 0.010 | 54800 | 28 | <0.01 | <10 | 0 | | | <0.01 | 0.024 | 1 | <0.01 | 0.23 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.17 | 0.55 | 5 | 0.28 | 0.21 | 0.18 | <0.1 | <0.1 | 0.54 | 0.24 | <10 | <10 | 0.19 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Fluorene | mg/kg | 0.010 | 9870 | 28 | <0.01 | 10 | 0 | | | <0.01 | 0.065 | 1.5 | <0.01 | 0.31 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.26 | 0.57 | 10 | 0.54 | 0.3 | 0.13 | 0.12 | 0.28 | 0.53 | 0.3 | <10 | <10 | 0.52 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Phenanthrene | mg/kg | 0.010 | No SSV | 28 | <0.01 | 56 | 0 | | | 0.063 | 0.18 | 16 | <0.01 | 3.7 | 0.26 | 0.19 | 0.16 | <0.01 | 1.1 | 2 | 5.7 | 56 | 2.8 | 2.1 | 0.5 | 0.99 | 1.4 | 6.7 | 3.7 | <10 | <10 | 3.9 | <0.1 | 0.81 | <0.1 | <0.1 | <0.1 |
| Anthracene | mg/kg | 0.010 | 74100 | 28 | <0.01 | 19 | 0 | | | 0.017 | 0.073 | 6.6 | <0.01 | 0.69 | 0.055 | 0.022 | 0.052 | <0.01 | 0.33 | 0.27 | 1.2 | 19 | 0.69 | 0.44 | 0.19 | 0.25 | 0.16 | 1.5 | 0.89 | <10 | <10 | 2.1 | <0.1 | 0.36 | <0.1 | <0.1 | <0.1 |
| Fluoranthene | mg/kg | 0.010 | 9870 | 28 | <0.01 | 83 | 0 | | | 0.11 | 0.076 | 61 | 0.16 | 5.9 | 0.26 | 0.12 | 0.082 | <0.01 | 3.1 | 2 | 13 | 83 | 2.1 | 3.2 | 1.1 | 1.8 | 0.48 | 11 | 6.3 | <10 | <10 | 12 | <0.1 | 2.3 | <0.1 | <0.1 | <0.1 |
| Pyrene | mg/kg | 0.010 | 7400 | 28 | <0.01 | 64 | 0 | | | 0.089 | 0.053 | 47 | 0.15 | 5 | 0.22 | 0.081 | 0.074 | <0.01 | 2.5 | 1.7 | 10 | 64 | 1.6 | 2.6 | 0.85 | 1.3 | 0.35 | 6.8 | 5.2 | <10 | <10 | 7.9 | <0.1 | 1.9 | <0.1 | <0.1 | <0.1 |
| Benzo(a)anthracene | mg/kg | 0.010 | BaP Surrogate | 28 | <0.01 | 43 | 0 | | | 0.091 | 0.07 | 37 | 0.087 | 3.9 | 0.14 | 0.065 | 0.068 | <0.01 | 1.7 | 1.5 | 8 | 43 | 0.97 | 1.6 | 0.75 | 1.2 | 0.28 | 5.5 | 3.3 | <10 | <10 | 8.8 | <0.1 | 1.3 | <0.1 | <0.1 | <0.1 |
| Chrysene | mg/kg | 0.010 | BaP Surrogate | 28 | <0.01 | 38 | 0 | | | 0.06 | 0.082 | 36 | 0.044 | 4.1 | 0.17 | 0.087 | 0.078 | <0.01 | 1.9 | 2.1 | 9.2 | 38 | 0.97 | 1.5 | 0.64 | 1.5 | 0.62 | 6.8 | 4.1 | <10 | <10 | 9.6 | <0.1 | 1.2 | <0.1 | <0.1 | <0.1 |
| Benzo(b)fluoranthene | mg/kg | 0.010 | BaP Surrogate | 28 | <0.01 | 63 | 0 | | | 0.12 | 0.048 | 50 | <0.01 | 6 | 0.23 | 0.09 | 0.056 | <0.01 | 2.5 | 2.1 | 12 | 63 | 1.4 | 2.4 | 0.88 | 1.9 | 0.59 | 8.2 | 4.6 | <10 | <10 | 12 | <0.1 | 2 | <0.1 | <0.1 | <0.1 |
| Benzo[k]fluoranthene | mg/kg | 0.010 | BaP Surrogate | 28 | <0.01 | 25 | 0 | | | 0.056 | 0.06 | 20 | <0.01 | 2.4 | 0.079 | 0.024 | 0.03 | <0.01 | 0.94 | 0.87 | 4.4 | 25 | 0.47 | 0.71 | 0.38 | 0.59 | 0.15 | 2.9 | 1.5 | <10 | <10 | 4.5 | <0.1 | 0.61 | <0.1 | <0.1 | <0.1 |
| Benzo pyrene | mg/kg | 0.010 | No SSV | 28 | <0.01 | 56 | 0 | | | 0.063 | 0.064 | 37 | <0.01 | 4.3 | 0.12 | 0.033 | 0.018 | <0.01 | 1.5 | 1.6 | 8.4 | 56 | 1.2 | 2.1 | 0.55 | 1 | 0.19 | 5.4 | 3.2 | <10 | <10 | 7.4 | <0.1 | 1.4 | <0.1 | <0.1 | <0.1 |
| Indeno(1,2,3-c,d)Pyrene | mg/kg | 0.010 | BaP Surrogate | 28 | <0.01 | 44 | 0 | | | 0.045 | 0.049 | 30 | <0.01 | 3.7 | 0.15 | 0.014 | <0.01 | <0.01 | 1.4 | 1.2 | 7.3 | 44 | 0.91 | 1.6 | 0.32 | 0.83 | <0.1 | 3.9 | 2.4 | <10 | <10 | 5.2 | <0.1 | 0.94 | <0.1 | <0.1 | <0.1 |
| Dibenz(a,h)Anthracene | mg/kg | 0.010 | BaP Surrogate | 28 | <0.01 | <10 | 0 | | | 0.025 | 0.11 | 6.2 | <0.01 | 0.92 | 0.064 | 0.038 | <0.01 | <0.01 | 0.33 | 0.35 | 1.6 | 8.3 | 0.3 | 0.44 | 0.13 | 0.25 | <0.1 | 0.86 | 0.54 | <10 | <10 | 1.7 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Benzo[g,h,i]perylene | mg/kg | 0.010 | BaP Surrogate | 28 | <0.01 | 34 | 0 | | | 0.041 | 0.11 | 25 | <0.01 | 3.7 | 0.2 | 0.075 | <0.01 | <0.01 | 1.2 | 1.1 | 5.9 | 34 | 0.76 | 1.4 | 0.31 | 0.61 | <0.1 | 3.5 | 2.1 | <10 | <10 | 4 | <0.1 | 1 | <0.1 | <0.1 | <0.1 |
| Coronene | mg/kg | 0.010 | No SSV | 22 | <0.01 | <0.1 | 0 | | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | | | | | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Total Of 17 PAH's | mg/kg | 0.20 | No SSV | 28 | <0.2 | 560 | 0 | | | 0.78 | 1.2 | 380 | 0.44 | 47 | 2 | 0.84 | 0.62 | <0.2 | 19 | 18 | 89 | 560 | 16 | 21 | 7.2 | 13 | 5.5 | 68 | 39 | <0.2 | <0.2 | 81 | <2 | 14 | <2 | <2 | <2 |
| Total Phenols | mg/kg | 0.10 | No SSV | 28 | <0.1 | <0.1 | 0 | | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |

# Appendix J. The Coal Authority report

The Coal Authority

# CON29M
## coal mining report

SITE AT 274590, 195200, NEATH PORT TALBOT

### Known or potential coal mining risks


| | |
|---|---|
| Past underground coal mining | Page 4 |
| Future underground coal mining | Page 4 |


### Further action

No further reports from the Coal Authority are required. Further information on any next steps can be found in our Professional opinion.

For more information on our reports please visit www.groundstability.com

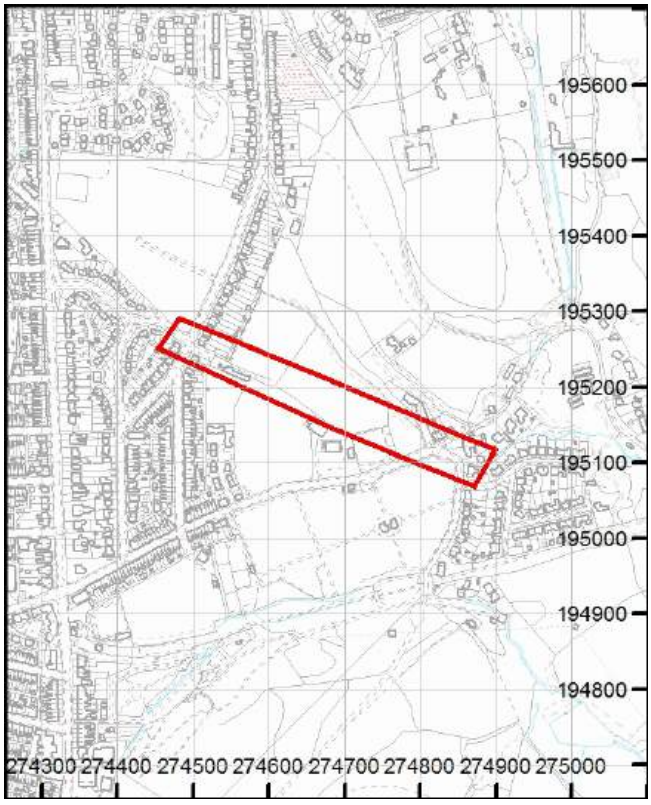
### Professional opinion

According to the official mining information records held by the Coal Authority at the time of this search, evidence of, or the potential for, coal mining related features have been identified. In view of the coal mining circumstances we would recommend that any planned or future development should follow detailed technical advice before beginning work on site. Please see page 3 for further details on Future development.

# Enquiry boundary

## Key

Approximate position of enquiry boundary shown




We can confirm that the location is **on the coalfield**

Map data

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This report is prepared in accordance with the latest Law Society's Guidance Notes 2018, the User Guide 2018 and the Coal Authority's Terms and Conditions applicable at the time the report was produced.

## Accessibility

If you would like this information in an alternative format, please contact our communications team on 0345 762 6848 or email communications@coal.gov.uk.

# Professional opinion

## Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed.

If you are looking to develop, or undertake works, within a coal mining development high risk area your Local Authority planning department may require a Coal Mining Risk Assessment to be undertaken by a qualified mining geologist or engineer. Should you require any additional information then please contact the Coal Authority on 0345 762 6848 or email cmra@coal.gov.uk.

# Detailed findings

Information provided by the Coal Authority in this report is compiled in response to the Law Society's CON29M Coal Mining enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL.

The Coal Authority owns the copyright in this report and the information used to produce this report is protected by our database rights. All rights are reserved and unauthorised use is prohibited. If we provide a report for you, this does not mean that copyright and any other rights will pass to you. However, you can use the report for your own purposes.

## 1 Past underground coal mining

The property is not within a surface area that could be affected by any past recorded underground coal mining.

However the property is in an area where the Coal Authority believes there is coal at or close to the surface. This coal may have been worked at some time in the past. The potential presence of coal workings at or close to the surface should be considered, particularly prior to any site works or future development activity, as ground movement could still be a risk. Your attention is drawn to the Professional opinion sections of the report.

## 2 Present underground coal mining

The property is not within a surface area that could be affected by present underground mining.

## 3 Future underground coal mining

The property is not in an area where the Coal Authority has received an application for, and is currently considering whether to grant a licence to remove or work coal by underground methods.

The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.

The property is not in an area likely to be affected from any planned future underground coal mining.

However, reserves of coal exist in the local area which could be worked at some time in the future.

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

## 4 Mine entries

There are no recorded coal mine entries known to the Coal Authority within, or within 20 metres, of the boundary of the property.

## 5 Coal mining geology

The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

## 6 Past opencast coal mining

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

## 7 Present opencast coal mining

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

## 8 Future opencast coal mining

There are no licence requests outstanding to remove coal by opencast methods within 800 metres of the boundary.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

## 9 Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

## 10 Mine gas

The Coal Authority has no record of a mine gas emission requiring action.

## 11 Hazards related to coal mining

The property has not been subject to remedial works, by or on behalf of the Coal Authority, under its Emergency Surface Hazard Call Out procedures.

## 12 Withdrawal of support

The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

## 13 Working facilities order

The property is not in an area where an order has been made, under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

## 14 Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

# Statutory cover

## Coal mining subsidence

In the unlikely event of any coal mining related subsidence damage, the Coal Authority or the mine operator has a duty to take remedial action in respect of subsidence caused by the withdrawal of support from land or property in connection with lawful coal mining operations.

When the works are the responsibility of the Coal Authority, our dedicated public safety and subsidence team will manage the claim. The house or land owner ("the owner") is covered for these works under the terms of the Coal Mining Subsidence Act 1991 (as amended by the Coal Industry Act 1994). Please note, this Act does not apply where coal was worked or gotten by virtue of the grant of a gale in the Forest of Dean, or any other part of the Hundred of St. Briavels in the county of Gloucester.

If you believe your land or property is suffering from coal mining subsidence damage and you need more information on what to do next, please use the following link to our website which sets out what your rights are and what you need to consider before making a claim.
www.gov.uk/government/publications/coal-mining-subsidence-damage-notice-form

## Coal mining hazards

Our public safety and subsidence team provide a 24 hour a day, 7 days a week hazard reporting service, to help protect the public from hazards caused by past coal workings, such as a mine shaft or shallow working collapse. To report any hazards please call 01623 646 333. Further information can be found on our website: www.gov.uk/coalauthority.

# Glossary

## Key terms

**adit** - horizontal or sloped entrance to a mine

**coal mining subsidence** - ground movement caused by the removal of coal by underground mining

**Coal Mining Subsidence Act 1991** - the Act setting out the duties of the Coal Authority to repair damage caused by coal mining subsidence

**coal mining subsidence damage** - damage to land, buildings or structures caused by the removal of coal by underground mining

**coal seams** - bed of coal of varying thickness

**future opencast coal mining** - a licence granted, or licence application received, by the Coal Authority to excavate coal from the surface

**future underground coal mining** - a licence granted, or licence application received, by the Coal Authority to excavate coal underground. Although it is unlikely, remaining coal reserves could create a possibility for future mining, which would be licensed by the Coal Authority

**mine entries** - collective name for shafts and adits

**payments to owners of former copyhold land** - historically, copyhold land gave rights to coal to the copyholder. Legislation was set up to allow others to work this coal, but they had to issue a notice and pay compensation if a copyholder came forward

**shaft** - vertical entry into a mine

**site investigation** - investigations of coal mining risks carried out with the Coal Authority's permission

**stop notice** - a delay to repairs because further coal mining subsidence damage may occur and it would be unwise to carry out permanent repairs

**subsidence claim** - a formal notice of subsidence damage to the Coal Authority since it was established on 31 October 1994

**withdrawal of support** - a historic notice informing landowners that the coal beneath their property was going to be worked

**working facilities orders** - a court order which gave permission, restricted or prevented coal mine workings

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