terra firma

Geotechnical & Geoenvironmental Specialists

Geotechnical and Geoenvironmental Report

Site: Penywaun

Prepared For: Newydd Housing Association

Issue Date: February 2023

Job No: 17264

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V2

REPORT TITLE : **Geotechnical and Geoenvironmental Report: Proposed Residential Development of land adjacent to Hirwaun road (A4059), Penywaun, CF44 9HW.**

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Executive Summary

<table>
<tr><td>Site Location and Proposed Development</td><td>Newydd Housing Association (The Client) is proposing the residential development of a land adjacent to Hirwaun road (A4059), Penywaun, CF44 9HW. The development comprises 19 units with access road, parking areas and associated gardens.</td></tr>
<tr><td>Site History</td><td>In 1868-1890, the central and eastern area of the site is located in an area of colliery spoil associated with the Pwll Bryngwyn mine. A footpath is crossing the western end of the site. In 1900, the western end of the site was separated by a field boundary. The footpath is also no longer present in this edition. In 1964, the western end of the site is bound by a road. In 1971, a parking area was developed in the south west of the site and a row or garages was present. The 1996 edition shows the garages to the west of the site to have been removed. The site then remains without significant changes to the present day.</td></tr>
<tr><td>Geology</td><td>The site is shown to be underlain by the South Wales Lower Coal Measures formation rocks which are Carboniferous in age. Superficial deposits are recorded as Till. Made ground is anticipated at the site. Based on the historic maps this is likely to comprise colliery spoil.</td></tr>
<tr><td>Radon</td><td>No radon protective measures are required for new developments on the investigation site.</td></tr>
<tr><td>Coal Mining Risk Assessment</td><td>The risk from shallow mining across the site is generally considered to be low as workings, the areas where coal was removed, are not anticipated.
There is however a risk posed to the site from the Horseway adit which may be present at shallow depth (less than 30m) below the eastern end of the site.
The risk from this feature will need to be quantified by investigation using rotary drilling methods.</td></tr>
<tr><td>Ground Conditions</td><td>Due to the variable ground conditions encountered It is convenient to divide the site into two Zones – Zone A and Zone B and treat these areas separately. The location of the Zones are shown on Drawing 01.
The ground conditions encountered by the exploratory holes in Zone A can in general be summarised as shown in Table 5.1.
Table 1.1 Summary of Typical Ground Conditions – Zone A
<table>
<tr><th colspan="3">Depth (m)</th><th>Thickness (m)</th><th>Stratum</th></tr>
<tr><td>0.00</td><td>-</td><td>1.20/2.00</td><td>0.50/2.00</td><td>COLLIERY SPOIL: Soft to firm dark grey silty gravelly CLAY with low cobble content.</td></tr>
<tr><td>1.20/2.00</td><td>-</td><td>3.00/3.80</td><td>2.80/4.00</td><td>COLLIERY SPOIL: Soft to firm dark grey silty gravelly CLAY with low cobble content or COLLIERY SPOIL: Loose to medium dense dark grey clayey angular to subangular fine to coarse GRAVEL of mudstone.</td></tr>
<tr><td>3.80</td><td>-</td><td>4.00</td><td>0.20</td><td>Soft to firm dark brown sandy SILT.</td></tr>
</table>
The ground conditions encountered by the exploratory holes in Zone B can in general be summarised as shown in Table 5.1.
Table 1.2 Summary of Typical Ground Conditions – Zone B
<table>
<tr><th colspan="3">Depth (m)</th><th>Thickness (m)</th><th>Stratum</th></tr>
<tr><td>0.00</td><td>-</td><td>0.10</td><td>0.10</td><td>TARMAC.</td></tr>
<tr><td>0.10</td><td>-</td><td>0.70</td><td>0.60</td><td>MADE GROUND: Loose black mottled brown clayey very gravelly fine to coarse SAND with high cobble content.</td></tr>
<tr><td>0.70</td><td>-</td><td>3.00</td><td>2.30</td><td>Soft to firm greenish brown mottled grey silty sandy gravelly CLAY.</td></tr>
</table>
</td></tr>
<tr><td>Contamination of Concern</td><td>All substances tested for were found to be present at concentrations below their respective human health threshold level, with the exception of Dibenzo(ah)anthracene which was found to exceed in one sample taken from WS04 at 0.30m depth.</td></tr>
<tr><td>Mitigation Measures</td><td>To protect future site users from the identified contamination the site will need to be capped at the block(s) where WS04 is located, covering Plots 16/17 and 18/19. The capping should consist of the proposed buildings and hard standings. In garden and soft landscaped areas the capping should consist of</td></tr>
</table>

	600mm of suitable inert topsoil, and subsoil if desired. The soils should also be physically suitable and contain no 'sharps' as defined in BS8332:2015 Specification for Topsoil and BS8601:2013 Specification for Subsoil and Requirements for Use.
Ground Gas Risk Assessment	*The first three rounds of gas monitoring have found that the site falls in Gas Characteristic Situation 1 and based on these no special protection measures are required.* *Upon completion of the full six rounds of monitoring the recommendations will be reviewed in a letter report and if necessary amended.*
Foundation Solution	*The foundation recommendations given in this Section are based upon any necessary stabilisation works to the Horse adit having been successfully completed.* *The ground conditions mainly comprise colliery spoil of variable strength. Consequently, the use of traditional shallow foundations in these strata are not recommended. Such foundations are likely to lead to high and unacceptable total and differential settlements.* *It is recommended that a reinforced concrete raft type foundation floor slab solution founded upon 2.00m of recompacted ground is used.* *The ground beneath the rafts should be excavated to a depth of 2.00m below the underside of the foundation and extend to at least 1.0m outside the perimeter of the raft. All unsuitable and deleterious materials should be removed.* *The ground should then be compacted in layers to Series 600 of the Specification for Highway Works. The materials should be placed within 2% of its optimum moisture content. Should the moisture content of the in-situ materials be greater than this then the materials should be dried either by air drying or incorporation lime into the made ground to reduce the moisture content in order to achieve Optimum Moisture content. The re-compaction works should be supervised by a qualified Geotechnical Engineer with in-situ plate tests carried out to confirm the correct level of compaction as directed by the supervising engineer.* *If after the removal of deleterious and unsuitable materials, there is a shortfall then suitable inert granular materials should be sourced from off site.* *Following successful completion of the re-compaction works an allowable bearing pressure of 50kN/m2 may be used for design purposes. Total settlements should not exceed 25mm with angular distortions >1:750.* *It should be noted that there are steeply sloping batters along some of the site boundaries. In order to maintain the batters stability the houses should be located in such a way that a 45° line struck from the outermost edge of the building formation does not impinge on the batter face.* *It should also be noted that such a foundation approach should be confirmed as acceptable with the warranty provider. If this is not acceptable with the warranty provider the full thickness of made ground can be excavated and re-engineered or, if this proves uneconomic, consideration should be given to the use of piled foundations.* *If this is the case then additional works will be required in the form of boreholes to determine pile lengths and capacity.*
Recommended Further Works	*Due to the presence of the Horsway Adit it is recommended that a series of stitch drilled rotary boreholes is undertaken across the presumed route.* *During the rotary drilling it would also be possible to undertake sampling and testing to allow the design of deep foundations should they be required.* *To inform the compaction of 2.00m below the foundations an Earthworks Specification will be required. Samples should be collected for geotechnical testing to determine the required compaction methodology. The specification should also detail the requirements for performance testing during the earthworks. Geotechnical testing as listed in the main text will also be required.*

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SECTION 1 Introduction and Proposed Development

1.1 Introduction

Newydd Housing Association (The Client) is proposing the residential development of a land adjacent to Hirwaun road (A4059), Penywaun, CF44 9HW. The development comprises 19 units with access road, parking areas and associated gardens and soft landscaping. The proposed site layout can be seen in **Figure 1.1**.

Figure 1.1 Proposed Layout

Terra Firma (Wales) Limited have been commissioned by the Client to undertake a geoenvironmental assessment and geotechnical investigation of the site.

The main objectives of the geoenvironmental assessment programme are:

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

The main objectives of the geotechnical site investigation are:

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

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

1.2 Limitations and Exceptions of Investigation

The Client has requested that a Geoenvironmental Site Assessment (GSA) and Geotechnical Investigation (GI) be performed to enable the outlined main objectives.

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

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

The investigation was limited by the existing dense scrub vegetation and underground services.

1.3 Quality Assurance

The quality and environmental aspects of the assessment comply with Terra Firma Wales Ltd business management system which is UKAS Accredited to ISO 9001:2015 and ISO 14001:2015 standards.

SECTION 2 Review of Existing Data

2.1 Physical Setting and Current Site Use

The development site is irregular in shape and locates on land adjacent to Hirwaun road (A4059), Penywaun, CF44 9HW. The site centres on an approximate National Grid Reference of 297490, 204570, occupying a plan area of approximately 0.6 Hectares.

Most of the site is currently undeveloped and covered with grass and scrub vegetation. The west end area is about 3 m below the rest of the site and is covered by asphalt to the south and scrub vegetation to the north.

Site boundaries are defined by residential housing to the west, storage warehouse to the east, field land and recreation ground to the north and the Hirwaun road (A4059) to the south.

A notable offsite feature is the Afon Cynon / River Cynon located approximately at 430m to the north of the site.

The site elevation is approximately 208m AOD steeply sloping down to the west to 205m AOD.

The site location can be seen on **Figure 2.1**.

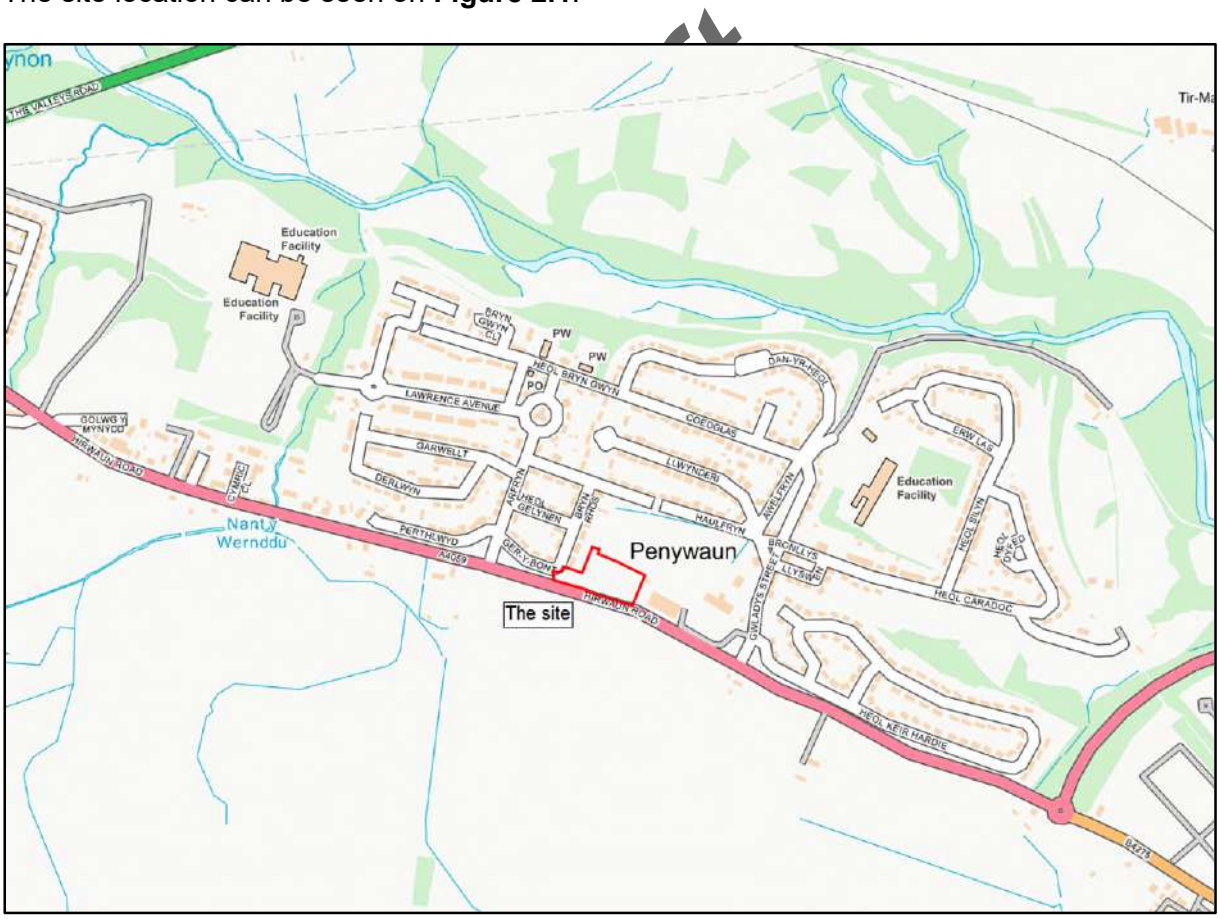

Figure 2.1 Site Location

2.2 Site History

Historical maps of the site have been obtained in an Envirocheck Report, provided by Landmark Information Group. The history plans are supplied in **Annex A** of this report, and the most relevant editions are summarised in **Table 2.1**. Distances are approximate, and any changes in-between map editions may not be recorded.

Table 2.1 Historical Development from Map Information

Map Date & Scale	Key Features on Site	Key Features off Site
1868-1890 1:2,500 **1885** 1:10,560	The central and eastern area of the site is located in an area of colliery spoil from the Pwll Bryngwyn Mine. A footpath is crossing the western end of the site.	Located 40m to the south east of the site is a small square feature associated with the Pwll Bryngwyn mine and is thought to be a shaft. The Hirwaun Common Railway is located to the north of the site. An unnamed road is located immediately to the south of the site. An old pond is present at 80m to the south of the site. Rhyd y Waen bricks works located at approximately 100m to the west of the site. Residential housing is located approximately at 200m to the east, a tramway is located at 200m to the west of the site. An old level is also present 240m to the south west of the site. The area from 250m south of the site is an area of open cast workings identified as Bryn Gwyn Patches and Slades Patch.
1900 1:2,500	The western end of the site is now separated from the rest of the site by a field boundary. The footpath is no longer present.	A school was developed at 180m to the east of the site. The brickworks is now shown to be disused.
1919 1:2,500	No significant changes.	No significant changes.
1921 1:10,560	No significant changes.	The map shows the Aberdare & Hirwaun Tramway located approximately at 350m to the north of the site. The Afon Cynon / River Cynon is located approximately 430m to the north of the site with the direction of the flow to the east.
1938-1945 1:10,560	No significant changes.	No significant changes.
1964 1:2,500	The western end of the site is bounded by the corner of Ger-Y-Bont and Bryn Rhos, new residential roads.	The unnamed road located immediately to the south of the site is now called Hirwaun Road. The northern area has seen significant residential development with houses immediately to the west of the site on Bryn Rhos, at 100m to the north of the site and 200m to the east of the site. A football ground is developed 53m to the north east of the site. The map shows a small stream / drain located at 67m to the north of the site.
1971 1:2,500	A parking area with a row of residential garages has been developed in the south west of the site.	A playground area is located at 43m to the north of the site.
1986 1:2,500	No significant changes.	There is a Warehouse development at 20m to the east of the site.
1996 1:2,500	The row of garages in the western end of the site have been demolished.	No significant changes.
1999 1:10,000	No significant changes.	The small stream / drain located 67m north of the site is shown to flow in an easterly direction.
2006 1:10,000	No significant changes.	No significant changes.
2022 1:10,000	No significant changes.	No significant changes.

2.3 Geological Setting

2.3.1 Geology

The 1:10,000 scale British Geological Map of the area (SN90SE) was consulted for geology underlying the site. The site is shown to be underlain by the South Wales Lower Coal Measures formation rocks which are Carboniferous in age.

Superficial deposits are recorded as Till.

Made ground is anticipated at the site. Based on the historic maps this is likely to comprise colliery spoil.

Detailed stratigraphical information is provided in **Table 2.2**.

Table 2.2 Detailed Stratigraphical Information

Period	Formation
Modern	**Made Ground (Colliery Spoil):** Likely to comprise clayey GRAVEL or gravelly CLAY with a high mudstone component.
Quaternary	**Till, Devensian:** Diamicton. Variable deposits comprising a mixture of clay, silt sand and gravel.
Carboniferous	**South Wales Lower Coal Measures Formation:** Coal Bearing Mudstone/Siltstone with Seatearth and minor Sandstone.

Strata are typically dipping 10º to the south in the local area.

On the abandoned mine plan (SWR2466) a fault (NW-SE) is shown at approximately 120m to the west of the site. This however is not recorded on the geological maps.

2.3.2 Radon

The Envirocheck Report (**Annex A**) details that **no** radon protective measures are required for new developments on the investigation site.

2.3.3 Mining

Relevant BGS mineral sites within 500m from the site as recorded in the Envirocheck Report datasheets (**Annex A**) are summaries in **Table 2.3**.

Table 2.3 BGS Recorded Mineral Sites

Site Name	Distance / Direction	Type	Commodity
Pwll Bryngwyn	77 S	Underground	Coal - Deep
Rhydywaun	287 SW	Underground	Coal - Deep
Rhydywaun	312 W	Underground	Coal - Deep

Coal Authority Report information is presented in **SECTION 3** of this report. The Coal Authority Consultants Coal Mining Report is appended in (**Annex B**).

2.3.4 Natural Hazards

There is no potential for ground dissolution on site.

There is no potential for compressive ground stability on site.

The potential for collapsible ground stability on site is very low.

The potential for landslides on site is very low to low.

The potential for shrinking/swelling clays on site is very low.

The potential for running sands on site is very low.

2.4 Environmental Setting

The following sections have been compiled using the Landmark Information Group Envirocheck datasheet and maps which can be found in **Annex A**.

2.4.1 Hydrogeology

Superficial deposits beneath the site have an aquifer designation of secondary aquifer – Undifferentiated.

The bedrock deposits beneath the site have an aquifer designation of secondary aquifer – A.

Deeper groundwater flow within the underlying bedrock will be controlled by the strata dip and any fractures or bedding planes within the rock units.

The hydraulic gradient will be at its steepest during periods of heavy rainfall and aquifer recharge.

The site does not locate within a groundwater source protection zone.

2.4.2 Hydrology

The nearest surface water feature locates off site at 67m to the north and comprises an in-land river with the direction of the flow to the east.

The Afon Cynon / River Cynon is located approximately at 430m to the north of the site with the direction of the flow to the east.

The topography of the site and surrounding area slopes down towards to the north. Surface water is likely to drain in this direction.

2.4.3 Flooding

The site is not at risk from extreme flooding from rivers or sea.

The site has potential for groundwater flooding of property situated below ground level.

The southwest area of the site is at high risk of flooding from surface waters with a 1 in 30 years return.

2.4.4 Waste

There is no recorded landfill, historical landfill, licensed waste management facilities or waste transfer sites within 250m of the site.

There is one discharge consent within 250m from the site located 31m to the west, the operator is Dwr Cymru Cyfyngedig, operation dates are 20th October 1989 – 30th June 1998.

2.4.5 Pollution

No pollution incidents are recorded to have occurred within 250m radius of the site.

2.4.6 Sensitive Land Use

The site is not located within a sensitive land use area.

There are seven areas of ancient woodland, one national park and one site of special scientific interest within 1km of the site, the closest, an ancient woodland which locates 330m north.

2.4.7 Estimated Urban Soil Chemistry

The BGS have published estimated urban soil chemistry concentrations locally to the site for a number of common contaminants, i.e. arsenic, cadmium, chromium, lead and nickel. All of the given determinants have anticipated concentrations that are below the recognised trigger levels for a residential with plant uptake scenario.

2.4.8 Industrial Land Use

There are no contemporary trade directory entries recorded within proximity of the site.

Relevant points of interest recorded within proximity of the site are summarised in **Table 2.4**.

Table 2.4 Relevant Points of Interest Summary

Name	Category	Distance / Direction
Playground	Recreational and Environmental	43 N
Playground	Recreational and Environmental	53 NE
Playground	Recreational and Environmental	250 NE

2.4.9 Infilled Land

Potentially infilled land features within 250m of the site are summarised in **Table 2.5**.

Table 2.5 Potentially Infilled Land

Feature	Distance/Direction from site
Unknown Filled Ground (Pit, quarry etc) – Non water	0 NE
Unknown Filled Ground (Pond, marsh, river, stream, dock etc) – Water	0 NW
Unknown Filled Ground (Pond, marsh, river, stream, dock etc) – Water	28 NE
Unknown Filled Ground (Pond, marsh, river, stream, dock etc) – Water	106 NW
Unknown Filled Ground (Pit, quarry etc) – Non water	112 SW
Unknown Filled Ground (Pond, marsh, river, stream, dock etc) – Water	132 E

Unknown Filled Ground (Pond, marsh, river, stream, dock etc) – Water	153 E
Unknown Filled Ground (Pit, quarry etc) – Non water	184 W
Unknown Filled Ground (Pond, marsh, river, stream, dock etc) – Water	202 E

2.5 Ecology

During the site walk over no Japanese Knotweed was identified on site. However the site was visited outside of the active growing season.

Information on managing Japanese Knotweed can be found in the PCA Code of Practice for the Management of Japanese Knotweed 2018 and INNSA Code of Practice, Managing Japanese Knotweed 2017.

Please note that Terra Firma (Wales) Ltd are not specialists in this field and the advice of an expert should be sought.

2.6 Archaeology

Please note that Terra Firma (Wales) Ltd are not specialists in this field and the advice of an expert should be sought.

SECTION 3 Coal Mining Risk Assessment

3.1 Geotechnical Risk

3.1.1 Underground Mining

Based upon geological map data, the stratigraphical sequence within 30m of the ground surface of the site is illustrated in **Figure 3.1**.

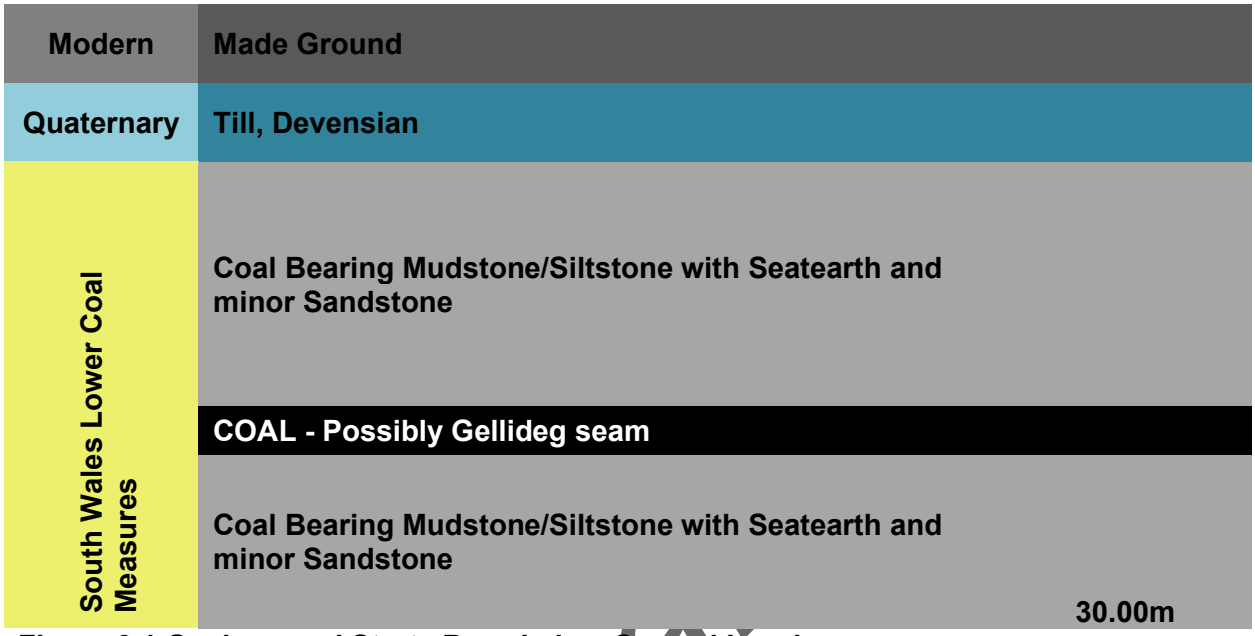

Figure 3.1 Geology and Strata Base below Ground Level

The Coal Authority Report states:

Past underground mining: No past mining recorded.
Probable unrecorded shallow workings: There are none.
Spine roadways: No spine roadway recorded at shallow depth.
Mine entries: There are 2 mine entries recorded within 100 meters of the enquiry boundary.

- ***Shaft*** (Bryngwyn Pit) 297204-012 located at a grid reference of 297555, 204495 at 42m to the south west of the site. This shaft has been filled at some time in the past by the Opencast Executive. There are no details of the fill material or date of filling.
- ***Adit*** 297204-054 (Horseway Level) located at a grid reference of 297508, 204679 at 72m to the north of the site. It is orientated towards the site and may underly the site.

Opencast mines. An area of historic opencast mining is located 20m to the south of the site and extends greatly occupying a large portion of the hill side.
Coal Authority managed tips. None recorded within 500 metres of the enquiry boundary.
Mine gas. None recorded within 500 metres of the enquiry boundary.
Mine water treatment schemes: None recorded within 500m of the enquiry boundary

Outcrops: Outcrops details are summarised in **Table 2.5**.

Table 3.1 Outcrops details

Seam Name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing
Gellideg	Coal	Yes	Within	N/A	115

Using the 1:10,000 geological map (Sheet SN90SE) there is a possibility of the coal outcrop, as listed on the Coal Authority Report being the Gellideg coal seam.

Abandoned mine plans: SWR2466
The abandoned mining plans for the shallow seams (less than 30m) have been obtained. The approximate site boundary has been positioned on the mining plan using the Coal Authority map and the position of the river, the mine adit 297204-054 (Horseway Level) to the north of the site and the mine shaft 297204-012 (Bryngwyn Pit) to the south of the site. An extract can be seen below in **Figure 3.2** and shows the workings in the area. This shows that the Horseway adit (297204-054) is connected with the Bryngwyn Pit mine shaft (297204-012) to the south of the site. The line of the adit will therefore pass under the site.

The full mining plan can be seen in **Annex B**.

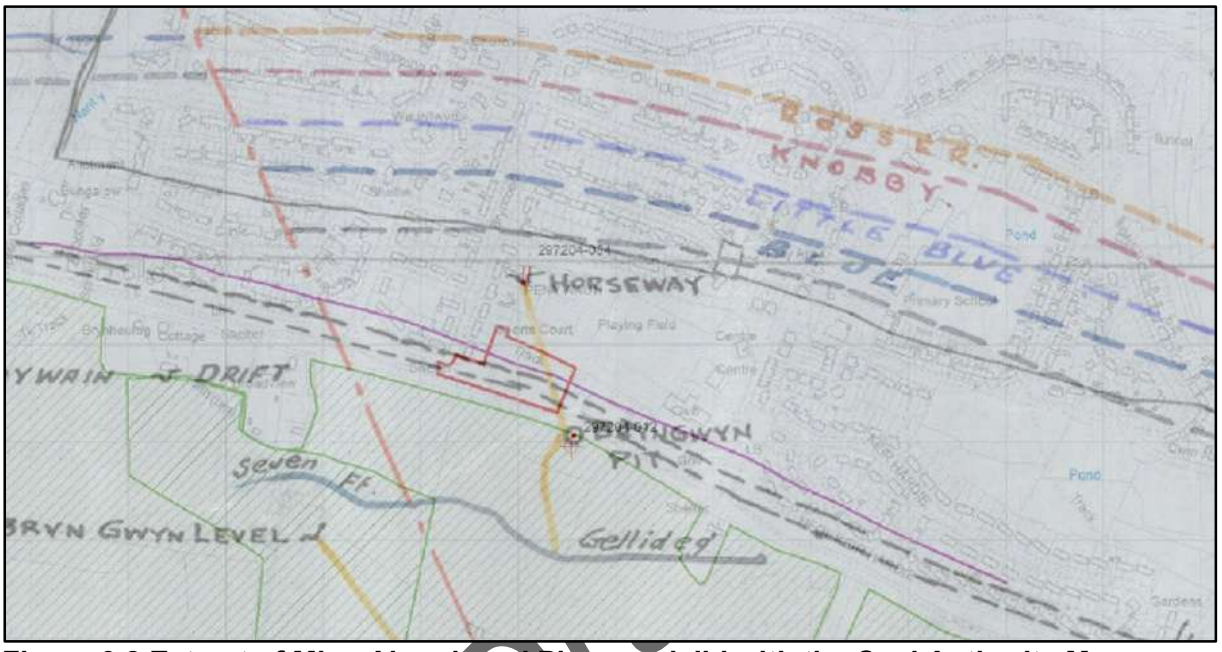

Figure 3.2 Extract of Mine Abandoned Plan overlalid with the Coal Authority Map

The dip of the adit is unknown however these are usually shallow to horizontal features. The site is seen to be at an elevation of 208m and the location of the adit is at 195m. Assuming a worst-case scenario, that the adit is horizontal, this would place the feature at a depth of 13m below the site. It is also possible that the adit would follow the dip of the geology which is 10° in a southerly direction. Using trigonometry and accounting for the change in topography this would place the feature at approximately 25.00m on the northern boundary and 37.00m on the southern boundary.

3.1.2 Conclusion

The risk from shallow mining across the site is generally considered to be low given the Coal Authority data and historical records.

There is however a risk posed to the site from the Horseway adit which may be present at shallow depth (less than 30m) below the eastern end of the site.

The risk from this feature will need to be quantified by investigation using rotary drilling methods.

SECTION 4 Preliminary Human Health and Environmental Risk Assessment

4.1 General

The preliminary human health and environmental risk assessment is a qualitative evaluation of unacceptable risks to human health or the environment from potential 'contaminated land', based on reviewed information in preceding sections of this report.

For 'contaminated land' to exist as defined in Part 2A of the Environmental Protection Act (EPA) 1990, a Pollutant Linkage needs to be identified. Pollutant linkages are defined by having a valid 'source – pathway – receptor' as established in the preliminary conceptual site model.

For our definitions of pollution linkage and how we define risk please refer to **Annex C** which includes our classifications of consequence and probability, and risk assessment matrix.

4.2 Potential Sources of Contamination

Potential or known sources of contamination associated the sites current and historical land use are summarised in **Table 4.1**.

Table 4.1 Contamination Sources

ID	Source	Contaminant
S1	Made Ground, Colliery Spoil	Metals, metalloids, PAHs, TPH, Asbestos
S2	Infilled land	Ground Gas
S3	Historic mining	Mine gas

No other significant potential on-site or off-site sources of contamination have been identified during the desk study.

4.3 Potential Pollution Pathways

Potential contaminant pathways associated with a residential with home grown produce land use are as follows.

P1 – Direct soil and dust ingestion
P2 – Consumption of home grown produce
P3 – Dermal contact
P4 – Inhalation of dust and vapours
P5 – Vertical migration of leachates (unsaturated zone)
P6 – Horizontal and vertical migration of contaminants (saturated zone)
P7 – Artificial contaminant pathway (borehole, pile, excavation etc)
P8 – Surface run-off
P9 – Plant uptake
P10 – Horizontal and vertical migration of ground gasses and vapours
P11 – Direct contact with construction materials
P12 – Inhalation of asbestos fibres

4.4 Potential Receptors

There are human and hydrological receptors to any contamination that may be present on site. Potential receptors include.

R1 – Construction and maintenance workers
R2 – Future site users (residents and visitors)
R3 – Passers-by or neighbouring site users
R4 – Groundwater (aquifer)

R5 – Surface waters (river/lake)
R6 – Area of public open space
R7 – Construction materials (concrete/potable water pipes)

4.5 Preliminary Conceptual Site Model

The preliminary conceptual site model establishes potential pollutant linkages between contaminants (source), pathways and receptors, realised during the preparation of the desk study report. Where a potential pollutant linkage is identified an assessment of risk is subsequently undertaken. The preliminary conceptual site model is tabulated in **Table 4.2**.

Outcomes of the preliminary conceptual site model are used as a basis for the design and implementation of the site investigation, whereby areas of potential contamination can be targeted as well as investigating the wider site.

Findings of the site investigation can in turn be used to develop and refine the conceptual site model.

Table 4.2 Preliminary Conceptual Site Model

Source	Pathway	Receptor	Preliminary Risk Assessment		
			Consequence	Probability	Risk
Human Health					
Contaminated Soils S1, S2	Direct soil and dust ingestion P1 Dermal contact P3 Inhalation of dust and vapours P4	Construction and maintenance workers R1	**Medium**	**Low Likelihood**	**Low Risk:** COSHH assessment and good level of PPE/ hygiene by site workers/ staff; dust suppression measures if required. Suitably designed site investigation recommended
		Passers-by or neighbouring site users R3	**Medium**	**Unlikely**	**Near Zero Risk:** Dust suppression measures if required.
		Future site users (residents and visitors) R2	**Medium**	**Likely**	**Medium Risk:** Suitably designed site investigation recommended
Ground Gas S1, S2	Horizontal and vertical migration of ground gasses and vapours P10	Future site users (residents and visitors) R2, Construction and maintenance workers R1	**Severe**	**Low Likelihood**	**Medium Risk:** Nine occurrences of infilled land locate within influencing distance of the site.
Mine Gas S3			**Severe**	**Low Likelihood**	**Medium Risk:** The Horseway adit passes under the site and is connected with the Bryngwyn Pit mine shaft. However, there is no record of mine gas from the Coal Authority.
Impacted Groundwaters S1, S2	Horizontal and vertical migration of contaminants (saturated zone) P6 Dermal contact P3	Construction and maintenance workers R1	**Medium**	**Low Likelihood**	**Low Risk:** The historic maps have shown the site to be located in the area of colliery spoil from the Pwll Bryngwyn mine, the risk of contamination being present in soils and impacting groundwaters is therefore possible but not considered to be significant. Chemical analysis of the soils should be undertaken to identify any contamination.
Contaminated Soils S1, S2	Plant uptake P9 Consumption of home grown produce P2	Future site users (residents) R2	**Medium**	**Low Likelihood**	**Low Risk:** The site has been located in the area of colliery spoil from the Pwll Bryngwyn mine, and possible contamination may be anticipated on site. Chemical analysis of the soils should be undertaken to identify any contamination.
Contaminated Soils S1	Direct Contact P11	Construction materials (water pipes) R7	**Mild**	**Low Likelihood**	**Low Risk:** An appropriate water supply pipe material should be chosen after the potable water supplier has completed an assessment in accordance with UK Water Industry Research guidance; Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites, UKWIR Report Ref: 10/WM/03/21.

Aggressive ground conditions – Sulphates S1		Construction materials (concrete) R7	**Mild**	**Low Likelihood**	**Low Risk:** Chemical analysis of the soils should be undertaken and the appropriate classification of concrete should be specified as per BRE Special Digest 1: Concrete in Aggressive Ground.
Aquatic Environment					
Contaminated Soils S1	Vertical migration of leachates (unsaturated zone) P5	Groundwater (aquifer) R4 Surface waters (river/lake) R5	**Mild**	**Low Likelihood**	**Low Risk:** The site has been in the area of colliery spoil from the Pwll Bryngwyn mine, and possible contamination may be anticipated on site. Chemical analysis of the soils should be undertaken to identify any contamination.
	Surface run-off P8	Surface waters (river/lake) R5			
	Horizontal and vertical migration of contaminants (saturated zone) P6				

SECTION 5 Field Investigation

5.1 Site Works

A geotechnical and geoenvironmental site investigation comprising four window samples and five trial pits including three soakaway tests were undertaken on the 7th of December 2022.

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

Trial pits referenced TP01 to TP05, were formed using a JCB with a 0.60m wide bucket.

Representative disturbed samples were taken and retained in airtight containers for environmental and geotechnical testing. The trial pit logs are presented in **Annex D**.

Soakaway tests were carried out in trial pits TP01 to TP03 in general accordance with BRE DG 365:2016. The excavation sides were squared using the excavator bucket and dimensions recorded within the test section. The trial pit was partially filled with clean water using a dedicated bowser with a 75mm diameter outlet and the fall in level recorded against time. The results are presented in **Annex E**.

The boreholes referenced WS01 to WS04, were formed using a Terrier 2000 rig. Dynamic sampling techniques were employed from surface to produce a continuous disturbed sample.

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

Boreholes were monitored for groundwater ingress as drilling proceeded.

Representative disturbed samples were taken and retained in airtight containers for environmental and geotechnical testing. The borehole logs are presented in **Annex F.**

Dynamic Cone Penetrometer tests, referenced TRL01 to TRL05, were carried out using a CNS Farnell A2465 dynamic cone penetrometer. Probe depths were measured with respect to ground level and the number of blows for the penetration of the probe was recorded. Equivalent CBR values have been calculated and presented with the results in **Annex G**.

Exploratory hole locations are shown on **Drawing 01**.

5.2 Ground Conditions

Due to the variable ground conditions encountered It is convenient to divide the site into two Zones – **Zone A** and **Zone B** and treat these areas separately. The location of the Zones are shown on **Drawing 01.**

The ground conditions encountered by the exploratory holes in **Zone A** can in general be summarised as shown in **Table 5.1**.

Table 5.1 Summary of Typical Ground Conditions – Zone A

Depth (m)			Thickness (m)	Stratum
0.00	-	1.20/2.00	0.50/2.00	**COLLIERY SPOIL:** Soft to firm dark grey silty gravelly **CLAY** with low cobble content.
1.20/2.00	-	3.00/3.80	2.80/4.00	**COLLIERY SPOIL:** Soft to firm dark grey

				silty gravelly **CLAY** with low cobble content or Loose to medium dense dark grey clayey angular to subangular fine to coarse **GRAVEL** of mudstone.
3.80	-	4.00	0.20	Soft to firm dark brown sandy **SILT**.

The ground conditions encountered by the exploratory holes in **Zone B** can in general be summarised as shown in **Table 5.1**.

Table 5.2 Summary of Typical Ground Conditions – Zone B

Depth (m)			Thickness (m)	Stratum
0.00	-	0.10	0.10	**TARMAC**.
0.10	-	0.70	0.60	**MADE GROUND:** Loose black mottled brown clayey very gravelly fine to coarse **SAND** with high cobble content.
0.70	-	3.00	2.30	Soft to firm greenish brown mottled grey silty sandy gravelly **CLAY**.

5.2.1 Miscellaneous Ground Conditions

WS02 from 3.80m to 4.00m: Soft to firm dark brown sandy **SILT**.

WS04 from 3.60m to 3.70m: Firm dark brown sandy **SILT**.

WS04 from 3.70m to 4.00m: Variable silty **CLAY**.

TP01 from 0.00m to 1.00m: **MADE GROUND:** Grass over loose to medium dense dark grey clayey silty sandy **GRAVEL** of mudstone, brick, concrete, ceramic fragments, glass fragments with medium cobble and boulder content.

5.3 Groundwater

There was no groundwater recorded during the site investigation.

5.4 Stability and Obstructions

Trial pits remained stable and vertical during excavation.

WS01 was cancelled at 3.00m depth due to collapse of the borehole walls at 2.00m depth.

5.5 Installation Well Construction

Gas well locations were selected on a targeted basis to investigate suspected sources of contamination or potential contamination migration pathways.

Gas installation well construction details are summarised in **Table 5.3**.

Table 5.3 Installation Well Summary

Location	Response Zone		Stratum
	From (m)	To (m)	
WS01	1	2	**COLLIERY SPOIL:** Loose to medium dense dark grey clayey **GRAVEL** of mudstone.
WS02	2	3	**COLLIERY SPOIL:** Loose to medium dense dark grey clayey **GRAVEL** of mudstone.

WS03	2	3	**COLLIERY SPOIL:** Soft to firm dark grey silty gravelly **CLAY** with low cobble content.

5.6 Laboratory Chemical Testing

5.6.1 Sampling Strategy

Soil sampling locations were selected on a targeted basis to investigate suspected sources of contamination or potential contamination migration pathways. Sample locations, depths and suspected/known contamination source targets are summarised in **Table 5.4**:

Table 5.4 Sample Locations, Depths and Targets

Location	Depth (m)	Contamination Targets
TP01	0.30	S1, S2. MADE GROUND. Silty sandy GRAVEL.
TP02	0.50	S1, S2. COLLIERY SPOIL. Silty gravelly CLAY.
TP03	0.30	S1, S2. MADE GROUND. Clayey gravelly SAND.
TP04	0.50	S1, S2. COLLIERY SPOIL. Silty gravelly CLAY.
TP05	0.40	S1, S2. COLLIERY SPOIL. Silty gravelly CLAY.
WS01	0.20	S1, S2. COLLIERY SPOIL. Silty gravelly CLAY.
WS02	0.20	S1, S2. COLLIERY SPOIL. Silty gravelly CLAY.
WS03	0.20	S1, S2. COLLIERY SPOIL. Silty gravelly CLAY.
WS04	0.30	S1, S2. COLLIERY SPOIL. Silty gravelly CLAY.

5.6.2 Soil Laboratory Analysis

During the site investigation works soil samples were taken and despatched to the accredited laboratories of Eurofins Chemtest for laboratory chemical testing. Soil samples were tested for the determinants listed in **Table 5.5**.

Table 5.5 Soil Laboratory Analysis

Metals & Metalloids	In-Organics	Organics	Others
Arsenic	Cyanide	Phenols	pH (acidity)
Boron	Sulphate	PAH	Asbestos
Cadmium		Petroleum Hydrocarbons	
Chromium III			
Chromium VI			
Copper			
Lead			
Mercury			
Nickel			
Selenium			
Zinc			

The results are discussed in detail in **SECTION 6** and the laboratory test results certificates may be found in **Annex I**.

5.7 Soil Property Testing

5.7.1 In-situ Permeability Testing

During the site investigation three trial pit soakaway tests were undertaken in TP1 to TP03 and carried out in general accordance with BRE DG 365:2016.

Soakaway test results are summarised in **Table 5.6**.

Table 5.6 Summary of Soakaway Results

Trial Pit	Depth Range of Test (m)	Infiltration Rate (ms^{-1})
TP01	1.20 – 1.70mbgl	First Fill: $5.08x10^{-03}$
	1.20 – 1.70mbgl	Second Fill: $5.08x10^{-03}$
	1.10 – 1.70mbgl	Third Fill: $4.34x10^{-03}$
TP02	0.70 – 1.20mbgl	First Fill: $3.98x10^{-03}$
	0.65 – 1.20mbgl	Second Fill: $4.01x10^{-03}$
	0.70 – 1.20mbgl	Third Fill: $3.98x10^{-03}$
TP03	1.35 – 2.00mbgl	No infiltration recorded. **Unable to calculate infiltration rate.**

The test results are discussed in **SECTION 10.6** and the calculation sheets may be found in **Annex E**.

5.7.2 Laboratory Geotechnical Testing

A schedule of laboratory tests was prepared by Terra Firma Wales Ltd and samples were despatched to the accredited laboratories of GSTL/Apex Testing Solutions. A summary of the testing carried out is presented in **Table 5.7**.

Table 5.7 Summary of Geotechnical Testing

Geotechnical Test	Standard (BS1377:1990)	No. Tested
4 Point Liquid and Plastic Limit	Part 2, Clause 4.3 & 5.3	4

The test results are presented in **Annex H** and discussed in **SECTION 7** of this report.

SECTION 6 Evaluation of Geoenvironmental Analytical Results

6.1 Assessment Methodology

Comparison of the analytical results has been made with the 2015 Suitable 4 Use Levels (S4UL) provided by Land Quality Management (LQM) Limited and the Chartered Institute of Environmental Health (CIEH) or provisional Category 4 Screening Levels (pC4SL).

Sulphate results have been compared to guidelines presented in British Research Establishment (BRE SD1:2015). Sulphate levels need only be considered for buried concrete risk assessment and are not human health related.

6.2 Soil Test Results

A summary of the chemical test results which include the regulatory soil guideline values used in a residential setting with plant uptake are given in the following tables. The complete results can be found in **Annex I**.

6.2.1 Inorganics & Miscellaneous

Nine samples were tested for a standard suite of inorganics, pH and organic matter. The summarised results are in **Table 6.1**.

Table 6.1 Summary of Soil Chemical Test Results – Inorganics & Miscellaneous

Substance	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Arsenic	37	LQM/CIEH	7.3	18	0
Cadmium	11	LQM/CIEH	0.20	0.43	0
Chromium III	910	LQM/CIEH	12	23	0
Chromium VI	6	LQM/CIEH	<0.50	<0.50	0
Copper	2400	LQM/CIEH	28	61	0
Lead	200	pC4SL	34	120	0
Mercury (inorganic)	40	LQM/CIEH	<0.05	1.6	0
Nickel	180	LQM/CIEH	20	55	0
Selenium	250	LQM/CIEH	0.47	1.3	0
Zinc	3700	LQM/CIEH	53	360	0
Cyanide	-	-	<0.5	1.2	-
Boron	290	LQM/CIEH	<0.40	0.52	0
Sulphate (%)	0.24	BRE	<0.010	0.027	0
Organic Matter (%)	-	-	1.1	2.9	-
pH	-	-	6.9	8.3	-

Notes:
- No available guideline

6.2.2 Organics

Nine samples were tested for speciated polycyclic aromatic hydrocarbons. The summarised results are in **Table 6.2**.

Table 6.2 Summary of Soil Chemical Test Results – Speciated PAH

Substance	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Naphthalene	2.3	LQM/CIEH	0.16	0.43	0
Acenaphthylene	170	LQM/CIEH	<0.10	0.11	0
Acenaphthene	210	LQM/CIEH	<0.10	1.2	0
Fluorene	170	LQM/CIEH	<0.10	1.4	0
Phenanthrene	95	LQM/CIEH	0.13	6.5	0
Anthracene	2400	LQM/CIEH	<0.10	1.7	0
Fluoranthene	280	LQM/CIEH	<0.10	9.4	0
Pyrene	620	LQM/CIEH	<0.10	6.0	0
Benzo(a)anthracene	7.2	LQM/CIEH	<0.10	5.3	0
Chrysene	15	LQM/CIEH	<0.10	5.8	0
Benzo(b)fluoranthene	2.6	LQM/CIEH	<0.10	6.2	0
Benzo(k)fluoranthene	77	LQM/CIEH	<0.10	2.2	0
Benzo(a)pyrene	2.2	LQM/CIEH	<0.10	5.3	0
Indeno(123cd)pyrene	27	LQM/CIEH	<0.10	2.8	0
Dibenzo(ah)anthracene	0.24	LQM/CIEH	<0.10	0.79	1
Benzo(ghi)perylene	320	LQM/CIEH	<0.10	2.1	0
Total PAH	-	-	<2.0	57	-

Notes:
Thresholds based on 1.0% soil organic matter
- No available guidelines

Nine samples were tested for petroleum hydrocarbon. The summarised results are shown in **Table 6.3**.

Table 6.3 Summary of Soil Chemical Test Results – Petroleum Hydrocarbons

Substance	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Aliphatic					
VPH C5 – C6 Ali	42	LQM/CIEH	<0.05	<0.05	0
VPH C6 – C7 Ali	100^	LQM/CIEH	<0.05	<0.05	0
VPH C7 – C8 Ali	100^	LQM/CIEH	<0.05	<0.05	0
VPH C8 – C10 Ali	27	LQM/CIEH	<0.05	0.14	0
EPH C10 – C12 Ali	130	LQM/CIEH	<2.0	<2.0	0
EPH C12 – C16 Ali	1100	LQM/CIEH	<1.0	<1.0	0
EPH C16 – C21 Ali	65000*	LQM/CIEH	<2.0	<2.0	0
EPH C21 – C35 Ali	65000*	LQM/CIEH	<3.0	3.2	0
EPH C35 – C40 Ali	65000	LQM/CIEH	<1.0	1.6	0
Aromatic					
VPH C5 – C7 Arom	70	LQM/CIEH	<0.05	<0.05	0
VPH C7 – C8 Arom	130	LQM/CIEH	<0.05	<0.05	0

VPH C8 – C10 Arom	34	LQM/CIEH	<0.05	<0.05	0
EPH C10 – C12 Arom	74	LQM/CIEH	<1.0	1.5	0
EPH C12 – C16 Arom	140	LQM/CIEH	1.3	2.5	0
EPH C16 – C21 Arom	260	LQM/CIEH	2.0	7.8	0
EPH C21 – C35 Arom	1100	LQM/CIEH	3.5	20	0
EPH C35 – C40 Arom	1100	LQM/CIEH	2.9	4.3	0

Notes:
VPH –Volatile Petroleum Hydrocarbon
EPH – Extractable Petroleum Hydrocarbon
Ali – Aliphatic
Arom – Aromatic
Thresholds based on 1.0% soil organic matter
^ – Ali C6-C7 and C7-C8 based on criteria for Ali EC >6-8
* – Ali C16-21 and C21-C35 based on criteria for Ali EC >16-35

6.2.3 Asbestos Testing

All samples were scheduled for asbestos screening. Asbestos was not detected.

SECTION 7 Geotechnical Testing Results

Geotechnical testing results are summarised in the following sections and presented in their entirety in **Annex H**.

7.1 Plasticity Testing

During the investigation four samples of the shallow clay material was taken and submitted for plasticity testing. The test results are summarised in **Table 7.1**.

Table 7.1 Plasticity & Moisture Content Test Results

Location	Depth (m)	Laboratory Principal Soil Type	Plasticity Index (%)	Passing 425µm Sieve (%)	Modified Plasticity Index (%)	Volume Change Potential
TP01	1.10	Clayey GRAVEL	22	30	6.6	Very Low
WS01	1.00	Clayey GRAVEL	24	28	6.72	Very Low
WS02	0.80	Silty GRAVEL	21	18	3.78	Very Low
WS03	1.00	Clayey GRAVEL	20	31	6.2	Very Low

In line with the NHBC (Chapter 4.2), the modified plasticity index for each sample was calculated. For design purposes the soils on site should be assumed to have a very low volume change potential.

SECTION 8 Ground Gas Risk Assessment

8.1 Gas Screening Value

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

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

Recorded gas concentrations are summarised in **Table 8.1**.

Table 8.1 Measured Gas Concentration Summary

Gas	Minimum (% V/V)	Maximum (% V/V)
Methane	0	0.1
Carbon Dioxide	0.2	0.8
Oxygen	20	21.8

Methane levels peaked at 0.1% V/V. Carbon dioxide levels varied between 0.2% and 0.8% V/V. Oxygen concentrations varied between 20% and 21.8% V/V.

The gas flow rate from the boreholes was also assessed, a maximum flow rate of 0.4 l/hr was recorded.

Based on a flow rate of 0.4 l/hr and the highest recorded carbon dioxide concentration of 0.8%, a gas screening value of 0.0032 l/hr is calculated, as follows:

(0.8/100) x 0.4 = 0.0032 l/hr

The results to date are presented in **Annex J**.

8.2 Conclusion

When this monitoring result is compared with Table 8.5 of CIRIA report C665, the site is classified as ‘Gas Characteristic Situation 1’ (CS1). No special protection measures are required for CS1 sites.

Upon completion of the full six rounds of monitoring the recommendation will be reviewed in a letter report and if necessary amended.

SECTION 9 Quantitative Risk Assessment

9.1 Contaminants of Concern

All substances tested for were found to be present at concentrations below their respective human health threshold level, with the exception of Dibenzo(ah)anthracene which was found to exceed in one sample taken from WS04 at 0.30m depth.

Contaminants identified as part of the investigation are summarised in **Table 9.1**, along with an interpretation of the likely contamination source. Where applicable, the contaminant, source relationship is based on the inferences made in the preliminary conceptual site model.

Table 9.1 Contaminants of Concern

Location	Depth	Contaminant	Source
WS04	0.30	Dibenzo(ah)anthracene	Colliery Spoil

9.2 Pollutant Linkages

Based on the findings of the intrusive site investigation and identified contaminants, the preliminary conceptual site model has been revised. Significant pollutant linkages are tabulated in the refined conceptual site model **Table 9.2**. Identified pollutant linkages will require detailed risk assessment, appropriate mitigation or remedial measures.

Table 9.2 Refined Conceptual Site Model

Source	Pathway	Receptor
Dibenzo(ah)anthracene Contaminated Soils S1	Direct soil and dust ingestion P1 Dermal contact P3 Inhalation of dust and vapours P4	Construction and Maintenance Workers R1
	Direct soil and dust ingestion P1 Dermal contact P3 Inhalation of dust and vapours P4	Future Site Users (Workers and Visitors) R2
	Direct soil and dust ingestion P1 Dermal contact P3 Inhalation of dust and vapours P4 Plant uptake P9	Passers-by and Neighbouring Site Users R3
	Surface run-off P8 Horizontal and vertical migration of contaminants (saturated zone) P6	Surface Waters (Rivers/Lakes) R5
	Vertical migration of leachates (unsaturated zone) P5	Groundwater (aquifer) R4 Surface waters (river/lake) R5

9.3 Mitigation and Remedial Measures

The following sections summarise the likely mitigation and remedial measures suitable for the identified contamination and proposed development. Detailed methodology to achieve the measures should be prescribed in a Remediation Strategy Report and the results presented in a Validation Report upon completion of the development.

9.3.1 Human Health

9.3.1.1 Contaminated Soils

To protect future site users from the identified contamination the site will need to be capped at the block(s) where WS04 is located, covering Plots 16/17 and 18/19. The capping should consist of the proposed buildings and hard standings. In garden and soft landscaped areas the capping should consist of 600mm of suitable inert topsoil, and subsoil if desired. The soils should also be physically suitable and contain no ‘sharps’ as defined in BS8332:2015

Specification for Topsoil and BS8601:2013 Specification for Subsoil and Requirements for Use.

As good practice, construction workers should adhere to good site management, COSHH, good standards of hygiene and appropriate health & safety on site, with personal protection equipment (PPE) and dust suppression where appropriate.

All imported soils should be validated as clean and suitable for use in accordance with 'Requirements for the Chemical Testing of Imported Soils for Various End Uses and Validation Cover Systems'.

For proposed new supply water pipes, the UK Water Industry Research publication 'Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites (Report 10/WM/03/21)' should be consulted.

In accordance with EC Regulation 1272/2008 and Environment Agency Guidance WM3 soils destined for off-site disposal should be classified on the basis of their hazard phrases prior to disposal. Soils are classified as a mirror entry waste and should be classified on the basis of their specific chemical properties.

If during earthworks ground conditions are encountered that are markedly different to those found during the investigation then the ground should be subject to additional sampling and testing and any necessary remedial measures designed and implemented before continuing with the works.

9.3.1.2 Ground Gas/Radon

No radon protective measures are required for new developments on the investigation site, due to the site being in a lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level).

The first three rounds of gas monitoring have found that the site falls in Gas Characteristic Situation 1 and based on these no special protection measures are required.

Upon completion of the full six rounds of monitoring the recommendations will be reviewed in a letter report and if necessary amended.

9.3.2 Aquatic Environment

Site specific mitigation and remedial measures are not required with respect to the aquatic environment.

During the construction period, there is a risk to the environment/adjacent sites from de-watering, digging foundations, moving contaminated soil, drainage misconnections, discharges to local surface waters or the ground, runoff from construction materials and/or exposed ground, wheel washings and oil or chemical spills.

The risk is considered to be negligible as any adverse effects will be easily preventable by due diligence to good construction practise and housekeeping in preventing surface runoff and the spillage of materials.

The basic measures that should be taken are as follows:

- Prepare a drainage plan and mark the manholes to prevent pollutants accidently reaching the surface water sewers;
- Carry out any activities that could cause pollution in a designated, bunded area, away from rivers or boreholes. Where possible it should drain to the foul sewer;
- Use settlement ponds to remove silty water;

- Store all oils and chemicals in a fully bunded area to prevent leaks or spills;
- Get advice on whether you need an environmental permit and apply in good time

SECTION 10 Engineering Recommendations

10.1 Preparation of Site

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

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

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

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

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

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

10.2 Foundation and Floor Slab Solution

The foundation recommendations given in this Section are based upon any necessary stabilisation works to the Horse adit having been successfully completed.

The ground conditions mainly comprise colliery spoil of variable strength. Consequently, the use of traditional shallow foundations in these strata are not recommended. Such foundations are likely to lead to high and unacceptable total and differential settlements.

It is recommended that a reinforced concrete raft type foundation floor slab solution founded upon 2.00m of recompacted ground is used.

The ground beneath the rafts should be excavated to a depth of 2.00m below the underside of the foundation and extend to at least 1.0m outside the perimeter of the raft. All unsuitable and deleterious materials should be removed.

The ground should then be compacted in layers to Series 600 of the Specification for Highway Works. The materials should be placed within 2% of its optimum moisture content. Should the moisture content of the in-situ materials be greater than this then the materials should be dried either by air drying or incorporation lime into the made ground to reduce the moisture content in order to achieve Optimum Moisture content. The re-compaction works should be supervised by a qualified Geotechnical Engineer with in-situ plate tests carried out to confirm the correct level of compaction as directed by the supervising engineer.

If after the removal of deleterious and unsuitable materials, there is a shortfall then suitable inert granular materials should be sourced from off site.

Following successful completion of the re-compaction works an allowable bearing pressure of 50kN/m^2 may be used for design purposes. Total settlements should not exceed 25mm with angular distortions >1:750.

It should be noted that there are steeply sloping batters along some of the site boundaries. In order to maintain the batters stability the houses should be located in such a way that a 45º line struck from the outermost edge of the building formation does not impinge on the batter face.

It should also be noted that such a foundation approach should be confirmed as acceptable with the warranty provider. If this is not acceptable with the warranty provider the full thickness of made ground can be excavated and re-engineered or, if this proves uneconomic, consideration should be given to the use of piled foundations.

If this is the case then additional works will be required in the form of boreholes to determine pile lengths and capacity.

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

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

10.3 Excavations and Formations

Most of the shallow excavations will be possible with normal soil excavating machinery.

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

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

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

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

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

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

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

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

10.4 Protection of Buried Concrete

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

10.5 Access Roads and Car Parking Areas

For car parking and road areas, formations within the in-situ natural soils a CBR value of 5% typically from depths of 400mm may be used for design purposes. CBR Profiles utilising a UK Transport Research Laboratory Dynamic Cone Penetrometer (TRL DCP) are reported in **Annex G**.

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

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

10.6 Storm Water Drainage

During the site investigation three soakaway test was undertaken in general accordance with BRE DG 365:2016. The soakaway test was carried out in trial pit TP01 to TP03.

The soakaway test TP01 at 1.70m depth recorded infiltration rates of **$5.08x10^{-03}$** (1st Fill), **$5.08x10^{-03}$** (2nd Fill) and **$4.34x10^{-03}$** (3rd Fill). The use of soakaway stormwater drainage is therefore considered viable in the location and depth test.

The soakaway test TP02 at 1.20m depth recorded infiltration rates of **$3.98x10^{-03}$** (1st Fill), **$4.01x10^{-03}$** (2nd Fill) and **$3.98x10^{-03}$** (3rd Fill). The use of soakaway stormwater drainage is therefore considered viable in the location and depth test.

The soakaway test in trial pit TP03 recorded no infiltration and was subsequently terminated early. It is considered the use of soakaway storm water draining in this location and depth is unsuitable.

Proposed soakaways should be positioned at least 5.0m away from any structure.

10.7 Retaining Walls

Due to the topography of the site, it is likely that a program of earthworks comprising cut and fill will be required to form level development areas. The site won soil may be reused but should be classified with testing and an Earthworks Specification produced detailing the requirement for compaction and testing to confirm performance. Due to the contamination the site won soils should however not be used in the final 600mm where gardens are proposed.

Due to the change in levels across the site, retaining walls be required. The existing steepness of any embankments should not be increased. Any cuts should be undertaken in small sections and in such a way so as not to induce any instability to the ground.

Effective shear parameters for retaining wall design are presented in Table 8.1.

Table 8.1 Effective Shear Stress Parameters

Stratum Description	Bulk Unit Weight (γ) kN/m^3	Effective Cohesion (c′) kN/m^2	Effective Angle of Shearing Resistance (ϕ') degrees
Soft to firm cohesive soils	18	0	20 – 25
Firm to stiff cohesive soils	18	0	30
Loose granular soils	18	0	22
Medium dense granular soils	18	0	28
Well compacted, granular materials,	19 – 20	0	30 - 35

compacted as per Specification for Highway Works and other relevant guidance such as British Standards (BS) 6031: 1981. Code of Practise for Earthworks.			
Fresh/slightly weathered mudstone/siltstone bedrock	19-24	5	35 - 40
Moderately / highly weathered Mudstone/siltstone bedrock	19-24	0	30 – 35

The parameters are based on experience in similar ground conditions.

The materials to be in-filled behind the retaining wall should be placed at or close to its optimum moisture content/maximum dry density and compacted in layers as per the requirements of the Specification for Highway Works. During the earthworks suitable in-situ testing should be carried out to ensure that the compaction process is achieving the required maximum dry density to achieve at least 95% compaction.

The acceptability of the filling works should be verified by appropriate on-site testing. A certification report should also be prepared on the earthworks by a suitably qualified Geotechnical Engineer.

Appropriate drainage should be incorporated in the design to prevent the build-up of hydrostatic pressure.

Appropriate cutting and benching of the existing slope should be conducted prior to the replacement of any imported fill to minimise the risk of any slip surfaces forming on the interface between the existing imported materials.

During construction, surcharge of the retaining walls, retained soil and the crest and slope faces of the cuttings/embankments by construction machinery should be kept to a minimum, particularly during wet periods when slope de-stabilisation may be maximised.

During the site development/construction phases stability surveys should be undertaken at regular intervals, including pictorial records. Any evidence of slope instability should be reported to a qualified engineer and appropriate remedial measure implemented.

Unless incorporated into the design and build of any retaining walls, post development, the retaining walls, the retained soil or the top of the cutting/embankment slopes and slope faces themselves should not be surcharged with buildings, car parking or access roads etc.

SECTION 11 Recommended Additional Investigation

11.1 Horseway Adit

Due to the presence of the Horsway Adit beneath the site an intrusive investigation will be required to try and quantify the risk posed to the proposed development.

To try and determine the depth and orientation It is recommended that two rows of rotary boreholes are undertaken. These should employ a 'stitch drill' methodology with boreholes spaced approximately 1.00m apart and in a line perpendicular to the assumed path of the adit. The two rows should be spaced across the site to determine the orientation and change in depth.

The boreholes should be sunk to confirm a minimum of 30.00m of rock. Where made ground and/or superficial deposits are thick the borehole will need to extend to the corresponding depth.

11.2 Deep Foundations

During the above investigation the drilling rig can also be used to determine pile type, depths and allowable safe working loads.

11.3 Re-compaction of Colliery Spoil

To allow the 2.00m of made ground to be properly recompacted across the site an Earthworks Specifications should be produced. This will entail the collection of samples for geotechnical testing allowing the soils to be classified and determine the required methodology for compaction. The specification should also detail the required testing regime to ensure it has achieved the required performance criteria.

This testing will include:

- Plasticity
- Grading including sedimentation by pipette
- Proctor Compaction using 2.5kg hammer

ANNEX A
Envirocheck Report

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Envirocheck® Report:

Datasheet

Order Details:

Order Number:
304681434_1_1

Customer Reference:
17264TM Penywaun

National Grid Reference:
297490, 204570

Slice:
A

Site Area (Ha):
0.6

Search Buffer (m):
1000

Site Details:

Penywaun
Aberdare
CF44 9EE

Client Details:

Ms R Liley
TFW Group Ltd
5 Deryn Court
Wharfdale Road
Pentwyn
Cardiff
CF23 7HB

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Contents

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.

Report Version v53.0

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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		1	6	16
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
Enforcement and Prohibition Notices					
Integrated Pollution Controls					
Integrated Pollution Prevention And Control					
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls	pg 7				1
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 7		Yes		
Pollution Incidents to Controlled Waters	pg 7			1	3
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances					
River Quality	pg 8			1	1
River Quality Biology Sampling Points	pg 9				1
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register	pg 9				1
Water Abstractions	pg 9				(*8)
Water Industry Act Referrals					
Groundwater Vulnerability Map	pg 11	Yes	n/a	n/a	n/a
Bedrock Aquifer Designations	pg 11	Yes	n/a	n/a	n/a
Superficial Aquifer Designations	pg 11	Yes	n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences				n/a	n/a
Flooding from Rivers or Sea without Defences				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 11		11	18	144

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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					
Historical Landfill Sites	pg 32				1
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)					
Licensed Waste Management Facilities (Locations)					
Local Authority Landfill Coverage	pg 32	1	n/a	n/a	n/a
Local Authority Recorded Landfill Sites					
Potentially Infilled Land (Non-Water)	pg 32	1	2	2	5
Potentially Infilled Land (Water)	pg 32	1	5	6	4
Registered Landfill Sites	pg 33				1
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites					
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 34	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry	pg 34	Yes	Yes	Yes	Yes
BGS Recorded Mineral Sites	pg 36		1	2	22
BGS Urban Soil Chemistry					
BGS Urban Soil Chemistry Averages					
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas	pg 41	Yes	n/a	n/a	n/a
Mining Instability	pg 41	Yes	n/a	n/a	n/a
Man-Made Mining Cavities					
Natural Cavities					
Non Coal Mining Areas of Great Britain	pg 41	Yes		n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 41	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards				n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 41	Yes	Yes	n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 41	Yes		n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 41	Yes		n/a	n/a
Radon Potential - Radon Affected Areas			n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a
Industrial Land Use					
Contemporary Trade Directory Entries	pg 42			2	10
Fuel Station Entries	pg 43				1
Points of Interest - Commercial Services	pg 43				1
Points of Interest - Education and Health					
Points of Interest - Manufacturing and Production	pg 43				7
Points of Interest - Public Infrastructure	pg 43				2
Points of Interest - Recreational and Environmental	pg 44		3	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 45			4	7
Areas of Adopted Green Belt					
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves					
Marine Nature Reserves					
National Nature Reserves					
National Parks	pg 45				1
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones					
Ramsar Sites					
Sites of Special Scientific Interest	pg 45				1
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 Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (E)	0	1	297500 204572
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (NE)	0	1	297491 204572
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A13NE (NE)	18	1	297550 204600
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A13NW (NW)	113	1	297400 204700
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NE (N)	195	1	297550 204800
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NW (W)	229	1	297200 204650
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (SE)	248	1	297750 204400
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NE (NE)	309	1	297700 204850
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A18SE (N)	331	1	297491 204950
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A18SE (N)	339	1	297550 204950
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A18SE (N)	381	1	297491 205000
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A18SW (N)	403	1	297350 205000
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14SW (E)	411	1	297950 204450
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A18SE (N)	431	1	297491 205050
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A18SE (N)	432	1	297500 205050
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SE (N)	437	1	297550 205050
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A18SE (NE)	439	1	297700 205000
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A18SE (N)	448	1	297600 205050
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14SW (SE)	471	1	297950 204300
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A18SW (NW)	472	1	297200 205000
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A19SW (NE)	475	1	297850 204950
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A18SW (N)	482	1	297450 205100

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12NE (W)	484	1	296950 204700
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A18SW (N)	488	1	297400 205100
1	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Rear Of St Winifreds Church Hirwa, Hirwaun Authority: Natural Resources Wales Catchment Area: River Taff Reference: AN0098801 Permit Version: 2 Effective Date: 20th October 1989 Issued Date: 20th October 1989 Revocation Date: 30th June 1998 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Trib Of River Cynon **Status:** **Authorisation revoked** Positional Accuracy: Located by supplier to within 100m	A13SW (W)	31	2	297400 204546
2	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Rear Of St Winifreds Church Hirwa, Hirwaun Authority: Natural Resources Wales Catchment Area: AFON CYNON - SOURCE TO CONF AMAN R Reference: An0098801 Permit Version: 3 Effective Date: 1st July 1998 Issued Date: 30th June 1998 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Trib Of River Cynon **Status:** **Effective** Positional Accuracy: Located by supplier to within 100m	A13NW (N)	292	2	297400 204900
2	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Rear Of St Winifreds Church Hirwa, Hirwaun Authority: Natural Resources Wales Catchment Area: AFON CYNON - SOURCE TO CONF AMAN R Reference: An0098801 Permit Version: 3 Effective Date: 1st July 1998 Issued Date: 30th June 1998 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Trib Of River Cynon **Status:** **Effective** Positional Accuracy: Located by supplier to within 100m	A13NW (N)	292	2	297400 204900
3	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Cso At Rear Of St Winifreds Church Hirwa, Heol Bryn Gwyn, Penywaun, Rct, Cf44 9et Authority: Natural Resources Wales Catchment Area: AFON CYNON - SOURCE TO CONF AMAN R Reference: An0098801 Permit Version: 4 Effective Date: 6th February 2020 Issued Date: 6th February 2020 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Tributary Of The River Cynon **Status:** **Effective** Positional Accuracy: Located by supplier to within 10m	A18SW (N)	376	2	297395 204985

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
4	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Rear Of St Winifreds Church Hirwa, Hirwaun Authority: Natural Resources Wales Catchment Area: River Taff Reference: An0098801 Permit Version: 1 Effective Date: 19th October 1989 Issued Date: 19th October 1989 Revocation Date: 19th October 1989 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Trib Of River Cynon **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 10m	A18SW (N)	439	2	297400 205050
5	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Penywaun - Rear Of 10 Cymric C Authority: Natural Resources Wales Catchment Area: River Taff Reference: An0099101 Permit Version: 1 Effective Date: 20th October 1989 Issued Date: 20th October 1989 Revocation Date: 6th May 1998 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Cynon **Status: Consent expired** Positional Accuracy: Located by supplier to within 100m	A12NE (W)	469	2	296990 204770
6	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Penywaun - Rear Of Gardens 17 Mango, 17 Mangoed Authority: Natural Resources Wales Catchment Area: River Taff Reference: An0099201 Permit Version: 1 Effective Date: 20th October 1989 Issued Date: 20th October 1989 Revocation Date: 4th March 1994 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: Cynon **Status: Consent expired** Positional Accuracy: Located by supplier to within 10m	A18SW (NW)	492	2	297160 205000
7	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Penywaun - Footpath Rear Of Ga Authority: Natural Resources Wales Catchment Area: AFON CYNON - SOURCE TO CONF AMAN R Reference: AE2001701 Permit Version: 1 Effective Date: 30th July 1963 Issued Date: 30th July 1963 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Gamlyn Stream **Status: Effective** Positional Accuracy: Located by supplier to within 100m	A19SW (NE)	513	2	297920 204940

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
7	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Penywaun - Footpath Rear Of Ga Authority: Natural Resources Wales Catchment Area: AFON CYNON - SOURCE TO CONF AMAN R Reference: Ae2001701 Permit Version: 1 Effective Date: 30th July 1963 Issued Date: 30th July 1963 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Gamlyn Stream **Status: Surrendered** Positional Accuracy: Located by supplier to within 10m	A19SW (NE)	513	2	297920 204940
8	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Penywaun - Rear Of 37/39 Erw Las, Cf44 9bg Authority: Natural Resources Wales Catchment Area: AFON CYNON - SOURCE TO CONF AMAN R Reference: An0112701 Permit Version: 2 Effective Date: 8th September 2010 Issued Date: 8th September 2010 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: River Cynon **Status: Effective** Positional Accuracy: Located by supplier to within 10m	A14NW (NE)	559	2	298020 204890
8	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Penywaun - Rear Of 37/39 Erw Las, Cf44 9bg Authority: Natural Resources Wales Catchment Area: AFON CYNON - SOURCE TO CONF AMAN R Reference: An0112701 Permit Version: 2 Effective Date: 8th September 2010 Issued Date: 8th September 2010 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: River Cynon **Status: Effective** Positional Accuracy: Located by supplier to within 10m	A14NW (NE)	559	2	298020 204890
8	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Penywaun - Rear Of 37/39 Erw Las, Cf44 9bg Authority: Natural Resources Wales Catchment Area: River Taff Reference: AN0112701 Permit Version: 1 Effective Date: 20th October 1989 Issued Date: 20th October 1989 Revocation Date: 7th September 2010 Discharge Type: Public Sewage: Storm Sewage Overflow Discharge Environment: Freshwater Stream/River Receiving Water: Cynon **Status: New Consent, by Application (Water Resources Act 1991, Section 88)** Positional Accuracy: Located by supplier to within 100m	A14NW (NE)	559	2	298020 204890

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
9	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Penywaun - Rear Of 37/39 Erw L, 37 Erw Las, Aberdare, Cf44 9bg Authority: Natural Resources Wales Catchment Area: AFON CYNON - SOURCE TO CONF AMAN R Reference: An0112701 Permit Version: 3 Effective Date: 21st October 2019 Issued Date: 21st October 2019 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Afon Cynon **Status: Effective** Positional Accuracy: Located by supplier to within 10m	A19SW (NE)	586	2	298010 204949
10	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Hirwaun - Rear Of Garden 70 Tr, Cf44 9lb Authority: Natural Resources Wales Catchment Area: AFON CYNON - SOURCE TO CONF AMAN R Reference: An0098701 Permit Version: 2 Effective Date: 8th September 2010 Issued Date: 8th September 2010 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: River Cynon **Status: Effective** Positional Accuracy: Located by supplier to within 10m	A17SW (NW)	925	2	296660 205110
10	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Hirwaun - Rear Of Garden 70 Tr, Cf44 9lb Authority: Natural Resources Wales Catchment Area: AFON CYNON - SOURCE TO CONF AMAN R Reference: An0098701 Permit Version: 2 Effective Date: 8th September 2010 Issued Date: 8th September 2010 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: River Cynon **Status: Effective** Positional Accuracy: Located by supplier to within 10m	A17SW (NW)	925	2	296660 205110
10	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Hirwaun - Rear Of Garden 70 Tr, Cf44 9lb Authority: Natural Resources Wales Catchment Area: River Taff Reference: AN0098701 Permit Version: 1 Effective Date: 20th October 1989 Issued Date: 20th October 1989 Revocation Date: 7th September 2010 Discharge Type: Public Sewage: Storm Sewage Overflow Discharge Environment: Freshwater Stream/River Receiving Water: Cynon **Status: New Consent, by Application (Water Resources Act 1991, Section 88)** Positional Accuracy: Located by supplier to within 100m	A17SW (NW)	925	2	296660 205110

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
10	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Cso At Hirwaun Trenant No 66 Rear Of Garden, Rear Garden 66 Trenant, Hirwaun, Aberdare, Cf44 9la Authority: Natural Resources Wales Catchment Area: AFON CYNON - SOURCE TO CONF AMAN R Reference: An0098601 Permit Version: 3 Effective Date: 21st August 2019 Issued Date: 21st August 2019 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Tributary Of The River Cynon **Status:** **Effective** Positional Accuracy: Located by supplier to within 10m	A17SW (NW)	928	2	296667 205125
10	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Cso At Hirwaun Trenant No70 Rear Of Garden, Rear Garden 70 Trenant, Hirwaun, Aberdare, Cf44 9la Authority: Natural Resources Wales Catchment Area: AFON CYNON - SOURCE TO CONF AMAN R Reference: An0098701 Permit Version: 3 Effective Date: 18th September 2019 Issued Date: 18th September 2019 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Tributary Of The River Cynon **Status:** **Effective** Positional Accuracy: Located by supplier to within 10m	A17SW (NW)	931	2	296671 205136
10	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Hirwaun - Rear Of Garden 66 Tr, Cf44 9lb Authority: Natural Resources Wales Catchment Area: AFON CYNON - SOURCE TO CONF AMAN R Reference: An0098601 Permit Version: 2 Effective Date: 8th September 2010 Issued Date: 8th September 2010 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: River Cynon **Status:** **Effective** Positional Accuracy: Located by supplier to within 10m	A17SW (NW)	961	2	296630 205130
10	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Hirwaun - Rear Of Garden 66 Tr, Cf44 9lb Authority: Natural Resources Wales Catchment Area: AFON CYNON - SOURCE TO CONF AMAN R Reference: An0098601 Permit Version: 2 Effective Date: 8th September 2010 Issued Date: 8th September 2010 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Freshwater Stream/River Receiving Water: River Cynon **Status:** **Effective** Positional Accuracy: Located by supplier to within 10m	A17SW (NW)	961	2	296630 205130

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
10	**Discharge Consents** Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Hirwaun - Rear Of Garden 66 Tr, Cf44 9lb Authority: Natural Resources Wales Catchment Area: River Taff Reference: AN0098601 Permit Version: 1 Effective Date: 20th October 1989 Issued Date: 20th October 1989 Revocation Date: 7th September 2010 Discharge Type: Public Sewage: Storm Sewage Overflow Discharge Environment: Freshwater Stream/River Receiving Water: Cynon **Status: New Consent, by Application (Water Resources Act 1991, Section 88)** Positional Accuracy: Located by supplier to within 100m	A17SW (NW)	961	2	296630 205130
11	**Discharge Consents** Operator: Gemini Aquaculture Ltd Property Type: Undefined Or Other Location: Neyland, Gemini Aquaculture, Burnel Quay Authority: Natural Resources Wales Catchment Area: Westfield Pill Reference: Bp0139401 Permit Version: 2 Effective Date: 18th April 1989 Issued Date: 18th April 1989 Revocation Date: 29th December 1993 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: To Land **Status: Consent expired** Positional Accuracy: Located by supplier to within 100m	A17SW (NW)	948	2	296700 205200
11	**Discharge Consents** Operator: Gemini Aquaculture Ltd Property Type: Undefined Or Other Location: Neyland, Gemini Aquaculture, Burnel Quay Authority: Natural Resources Wales Catchment Area: Westfield Pill Reference: Bp0139401 Permit Version: 1 Effective Date: 1st January 1901 Issued Date: 1st January 1901 Revocation Date: 17th April 1989 Discharge Type: Unspecified Discharge Environment: Not Supplied Receiving Water: To Land **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 100m	A17SW (NW)	948	2	296700 205200
12	**Local Authority Pollution Prevention and Controls** Name: Shell Hirwaun Location: Aberdare Road, Hirwaun, ABERDARE, Mid Glamorgan, CF44 9HR Authority: Rhondda Cynon Taff County Borough Council, Public Health and Protection Division Permit Reference: EPA PS7 Dated: 26th November 1998 Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station **Status: Authorised** Positional Accuracy: Automatically positioned to the address	A12NW (W)	878	3	296575 204824
	Nearest Surface Water Feature	A13NE (N)	67	-	297515 204677
13	**Pollution Incidents to Controlled Waters** Property Type: Coal Location: River Authority: Environment Agency, Welsh Region Pollutant: Unknown Note: Poor Operational Practise Incident Date: 6th May 1992 Incident Reference: 3983 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Overflow Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A18SE (NE)	440	4	297701 205001

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
14	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Pentwyn Cynon Farm, Near Petrol Station, Main Authority: Environment Agency, Welsh Region Pollutant: Unknown Note: Not Supplied Incident Date: 4th October 1991 Incident Reference: 809 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A17SE (NW)	770	4	296900 205150
15	**Pollution Incidents to Controlled Waters** Property Type: Warehouses Location: Shell Garage, Aberdare Road, HIRWAUN Authority: Environment Agency, Welsh Region Pollutant: Sewage - Treated Effluent Note: Accidental Spillage/Leakage Incident Date: 4th May 1995 Incident Reference: 24187 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Spillage Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A12NW (W)	828	4	296600 204700
16	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Entrance To Cosheston Pill Authority: Environment Agency, Welsh Region Pollutant: Oils - Diesel (Including Agricultural) Note: Cleddau/Cosheston Pill Incident Date: 21st July 1997 Incident Reference: 33108 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A9NE (E)	921	4	298400 204200
	River Quality Name: Cynon GQA Grade: River Quality B Reach: Conf.Nant Y Wennalt-Conf.Nant Grove Estimated Distance (km): 5.1 Flow Rate: Flow less than 2.5 cumecs Flow Type: River Year: 2000	A18SE (N)	390	4	297610 204986
	River Quality Name: Cynon GQA Grade: River Quality A Reach: Conf.Nant Grove-Conf.Nant Y Bwlch Estimated Distance (km): 1.5 Flow Rate: Flow less than 1.25 cumecs Flow Type: River Year: 2000	A17NW (NW)	934	4	296780 205264

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
17	**River Quality Biology Sampling Points** Name: Cynon Reach: Confluence Nant Y Wennalt To Confluence Nant Grove Estimated Distance: 5.10 Positional Accuracy: Located by supplier to within 100m Year: 1990 GQA Grade: River Quality Biology GQA Grade Not Supplied Year: 1995 GQA Grade: River Quality Biology GQA Grade B - Good Year: 2000 GQA Grade: River Quality Biology GQA Grade B - Good Year: 2002 GQA Grade: River Quality Biology GQA Grade B - Good Year: 2003 GQA Grade: River Quality Biology GQA Grade B - Good Year: 2004 GQA Grade: River Quality Biology GQA Grade B - Good Year: 2005 GQA Grade: River Quality Biology GQA Grade B - Good Year: 2006 GQA Grade: River Quality Biology GQA Grade B - Good Year: 2007 GQA Grade: River Quality Biology GQA Grade B - Good Year: 2008 GQA Grade: River Quality Biology GQA Grade C - Fairly Good Year: 2009 GQA Grade: River Quality Biology GQA Grade C - Fairly Good	A17NW (NW)	948	4	296800 205300
18	**Substantiated Pollution Incident Register** Authority: Natural Resources Wales Incident Date: 23rd April 2021 Incident Reference: 2103570 Water Impact: Category 4 - No Impact Air Impact: Category 4 - No Impact Land Impact: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 10m Pollutant: Specific Waste Materials: Household Waste	A14SE (E)	771	2	298318 204444
	Water Abstractions Operator: Dwr Cymru Cyfyngedig Licence Number: 21/57/23/0050 Permit Version: 100 Location: Top Lake - Dare Country Park To Storage Reservoir Authority: Natural Resources Wales Abstraction: Public Water Supply: Potable Water Supply - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Top Lake - Country Park To Storage Reservoir Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 7th March 1977 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	(S)	1741	2	297600 202790
	Water Abstractions Operator: Dwr Cymru Cyfyngedig Licence Number: 21/57/23/0050 Permit Version: Not Supplied Location: Not Supplied Authority: Natural Resources Wales Abstraction: Public Water Supply: Potable Water Supply - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(S)	1741	2	297600 202790

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Rhondda Cynon Taf County Borough Council Licence Number: Wa/057/0023/003 Permit Version: 1 Location: Inland Water (Lake):Un-Named (Upper) Lake On River Dare Authority: Natural Resources Wales Abstraction: Production Of Energy: Hydroelectric Power Generation Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 30th October 2014 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(S)	1754	2	297755 202790
	Water Abstractions Operator: Rhondda Cynon Taf County Borough Council Licence Number: Wa/057/0023/003 Permit Version: Not Supplied Location: Not Supplied Authority: Natural Resources Wales Abstraction: Production Of Energy: Hydroelectric Power Generation Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(S)	1754	2	297755 202790
	Water Abstractions Operator: Rhondda Cynon Taf County Borough Council Licence Number: Wa/057/0023/006 Permit Version: Not Supplied Location: Not Supplied Authority: Natural Resources Wales Abstraction: Electricity: Hydro-electric Power Generation - Very Low Abstraction Type: Not Supplied Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(S)	1754	2	297755 202790
	Water Abstractions Operator: Dwr Cymru Cyfyngedig Licence Number: 21/57/23/0049 Permit Version: 100 Location: Nant Melyn To Bwllfa Storage Reservoir Authority: Natural Resources Wales Abstraction: Public Water Supply: Potable Water Supply - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Nant Melyn Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 28th June 1976 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	(S)	1819	2	297220 202740

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Dwr Cymru Cyfyngedig Licence Number: 21/57/23/0049 Permit Version: Not Supplied Location: Not Supplied Authority: Natural Resources Wales Abstraction: Public Water Supply: Potable Water Supply - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(S)	1819	2	297220 202740
	Water Abstractions Operator: Mrs A Davies Licence Number: 21/57/23/0004 Permit Version: 100 Location: Well At Brickworks (Point B) Authority: Environment Agency, Welsh Region Abstraction: Dairies: Evaporative Cooling Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Well (B) Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 10th February 1966 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A21NW (NW)	1985	4	296040 206010
	Groundwater Vulnerability Map Combined Classification: Secondary Bedrock Aquifer - Medium Vulnerability Combined Vulnerability: Medium Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer Pollutant Speed: Low Bedrock Flow: Well Connected Fractures Dilution: >550 mm/year Baseflow Index: <40% Superficial Patchiness: <90% Superficial Thickness: 3-10m Superficial Recharge: High	A13SE (NE)	0	2	297491 204572
	Bedrock Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A13SE (NE)	0	2	297491 204572
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - Undifferentiated	A13SE (NE)	0	2	297491 204572
	Extreme Flooding from Rivers or Sea without Defences None				
	Flooding from Rivers or Sea without Defences None				
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
19	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 206.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NE (N)	67	5	297515 204677

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
20	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 37.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NE (E)	134	5	297691 204592
21	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.9 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NE (E)	162	5	297713 204622
22	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NE (E)	166	5	297716 204626
23	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 361.3 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NE (E)	169	5	297717 204633
24	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 52.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13SW (W)	176	5	297262 204494
25	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 57.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13NW (W)	191	5	297229 204601
26	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 516.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13SW (SW)	202	5	297258 204450
27	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 29.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13SW (W)	202	5	297221 204544
28	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 598.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13SW (W)	227	5	297198 204529

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
29	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 234.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A13SW (W)	227	5	297198 204529
30	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 240.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SE (N)	360	5	297541 204973
31	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 72.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SW (N)	392	5	297374 204996
32	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 333.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SE (N)	409	5	297565 205018
33	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 411.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A8NE (SE)	413	5	297795 204206
34	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 17.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12NE (W)	416	5	297007 204636
35	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 122.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Nant y Wernddu Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12NE (W)	429	5	297000 204674
36	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 99.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SW (N)	433	5	297391 205042
37	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 129.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Nant y Wernddu Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12NE (W)	433	5	296990 204641

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
38	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 125.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Nant y Wernddu Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12NE (NW)	435	5	297037 204791
39	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 8.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 2	A18SW (N)	446	5	297448 205064
40	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 23.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SW (N)	451	5	297354 205052
41	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 21.9 Watercourse Level: Underground Permanent: True Watercourse Name: Nant y Wernddu Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12NE (NW)	451	5	297064 204861
42	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 230.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 2	A18SW (N)	454	5	297444 205071
43	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 174.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SE (NE)	457	5	297765 204983
44	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 183.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Nant y Wernddu Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12NE (NW)	465	5	297065 204883
45	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 17.7 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SW (N)	468	5	297332 205063
46	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 147.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SW (N)	469	5	297335 205065

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
47	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 91.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SW (N)	472	5	297318 205062
48	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 26.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	510	5	297928 204927
49	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 85.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	530	5	297933 204950
50	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 77.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17SE (NW)	540	5	297126 205035
51	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 104.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Nant y Wernddu Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17SE (NW)	540	5	297126 205035
52	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17SE (NW)	540	5	297063 204988
53	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17SE (NW)	544	5	297063 204993
54	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 8.1 Watercourse Level: Underground Permanent: True Watercourse Name: Nant y Wernddu Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12NE (W)	559	5	296863 204637
55	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 163.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Nant y Wernddu Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12NE (W)	567	5	296855 204636

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
56	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SW (NW)	594	5	297243 205164
57	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 18.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SW (NW)	594	5	297243 205164
58	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 105.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SW (NW)	595	5	297241 205163
59	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 46.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SW (NW)	595	5	297241 205163
60	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 278.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Nant Hir Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	597	5	298016 204958
61	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 138.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	597	5	298016 204958
62	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 326.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SW (N)	609	5	297247 205181
63	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 121.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17SE (NW)	616	5	297140 205133
64	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 14.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17SE (NW)	616	5	297140 205133

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
65	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 193.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17SE (NW)	625	5	297126 205134
66	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 14.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SW (NW)	636	5	297205 205192
67	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 674.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9NW (SE)	646	5	297861 203970
68	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 141.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18NW (N)	660	5	297482 205278
69	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 114.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18NW (N)	665	5	297478 205284
70	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 271.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14SW (SE)	673	5	298152 204252
71	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 35.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9NW (SE)	674	5	298143 204231
72	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9NW (SE)	674	5	298143 204231
73	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 14.4 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14SW (SE)	674	5	298151 204246

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
74	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 3.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14SW (SE)	674	5	298152 204250
75	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 18.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9NW (SE)	678	5	298131 204199
76	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 17.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	682	5	298146 204921
77	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 115.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9NW (SE)	690	5	298134 204180
78	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	693	5	298150 204937
79	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 197.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14NE (E)	697	5	298216 204805
80	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 93.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18SE (NE)	699	5	297782 205249
81	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 256.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	699	5	298158 204936
82	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 33.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	699	5	298158 204936

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
83	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 103.5 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	707	5	298147 204967
84	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 79.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12SW (W)	709	5	296710 204568
85	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 189.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Nant y Wernddu Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12SW (W)	710	5	296709 204569
86	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 92.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17SE (NW)	722	5	297047 205200
87	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 57.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17SE (NW)	722	5	297047 205200
88	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 85.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12SW (W)	730	5	296695 204493
89	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 141.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12SW (W)	730	5	296695 204493
90	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 41.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14SE (E)	740	5	298290 204465
91	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 158.9 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14SE (E)	740	5	298290 204465

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
92	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 179.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Nant Hir Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	743	5	297952 205206
93	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 119.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12SW (W)	746	5	296692 204410
94	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 421.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12SW (W)	746	5	296692 204410
95	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 47.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Nant Hir Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	769	5	297859 205289
96	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 9.8 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	772	5	298003 205206
97	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 28.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17SE (NW)	774	5	296945 205193
98	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17SE (NW)	774	5	296945 205193
99	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 52.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17NE (NW)	775	5	297037 205256
100	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 57.0 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17NE (NW)	775	5	297037 205256

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
101	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 182.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17SE (NW)	781	5	296948 205204
102	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 60.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SW (NE)	781	5	298005 205216
103	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9NE (SE)	788	5	298191 204086
104	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9NE (SE)	790	5	298183 204072
105	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 6.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9NE (SE)	790	5	298190 204082
106	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 48.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17SE (NW)	791	5	296896 205175
107	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9NE (SE)	791	5	298185 204073
108	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 145.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17NE (NW)	792	5	297074 205299
109	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9NE (SE)	792	5	298187 204074

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
110	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 57.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17SE (NW)	802	5	296922 205211
111	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 50.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Nant Hir Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	809	5	297860 205334
112	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 143.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SE (NE)	810	5	298233 205024
113	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 74.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17NE (NW)	824	5	297029 205308
114	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 513.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18NE (N)	824	5	297646 205425
115	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 97.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12SW (W)	832	5	296596 204454
116	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 19.8 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	834	5	298047 205252
117	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 41.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14SE (E)	834	5	298384 204460
118	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 20.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17SW (NW)	844	5	296785 205139

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
119	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 105.6 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18NW (N)	847	5	297341 205454
120	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 214.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14NE (E)	852	5	298404 204676
121	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 50.7 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17SW (NW)	853	5	296783 205150
122	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 64.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	854	5	298059 205267
123	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 207.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17NE (NW)	859	5	296884 205254
124	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 82.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17NE (NW)	859	5	296884 205254
125	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 6.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Nant Hir Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	859	5	297875 205382
126	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 224.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12NW (W)	862	5	296600 204852
127	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 166.4 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12NW (W)	863	5	296599 204851

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
128	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 445.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Nant Hir Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	866	5	297878 205388
129	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 44.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (NE)	866	5	297878 205388
130	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 259.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19NW (N)	869	5	297837 205412
131	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 147.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14SE (E)	870	5	298428 204544
132	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 72.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 2	A14NE (E)	871	5	298426 204655
133	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 72.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14NE (E)	871	5	298426 204655
134	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14SE (E)	872	5	298424 204473
135	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 23.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14NE (E)	877	5	298390 204854
136	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 9.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14NE (E)	877	5	298390 204854

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
137	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 51.5 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14SE (E)	877	5	298429 204474
138	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 420.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 2	A14NE (E)	878	5	298406 204806
139	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 42.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14NE (E)	880	5	298385 204877
140	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 31.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17SW (NW)	882	5	296793 205203
141	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 69.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 2	A14NE (E)	886	5	298399 204855
142	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 225.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14NE (E)	886	5	298399 204855
143	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 328.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17SW (NW)	888	5	296808 205226
144	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 9.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 2	A19SE (E)	888	5	298377 204919
145	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 35.4 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17NE (NW)	890	5	297097 205422

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
146	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 42.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17NE (NW)	893	5	297014 205381
147	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 82.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Nant y Wernddu Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12SW (W)	893	5	296529 204511
148	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 238.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12NW (W)	898	5	296529 204701
149	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 106.4 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A12NW (W)	898	5	296529 204701
150	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 60.3 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SE (NE)	900	5	298255 205146
151	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 16.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A8SE (S)	910	5	297607 203623
152	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 153.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A8SE (S)	911	5	297623 203623
153	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 113.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18NW (N)	916	5	297180 205485
154	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 57.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9SW (SE)	919	5	297992 203730

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
155	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 49.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9NE (SE)	921	5	298300 204010
156	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 220.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A8SE (S)	922	5	297591 203609
157	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 74.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9SW (SE)	922	5	297965 203713
158	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 9.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17NE (NW)	925	5	297084 205455
159	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17NE (NW)	925	5	297085 205456
160	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17NE (NW)	925	5	297085 205456
161	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 122.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14SE (E)	927	5	298480 204482
162	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 36.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17NE (NW)	934	5	296999 205420
163	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 17.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14NE (E)	936	5	298490 204661

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
164	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A8SE (S)	941	5	297751 203613
165	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 106.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Cynon Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14NE (E)	942	5	298494 204678
166	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 58.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A8SE (S)	951	5	297760 203605
167	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 55.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A8SE (S)	951	5	297760 203605
168	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 428.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18NW (N)	952	5	297312 205556
169	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 103.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A18NW (N)	952	5	297312 205556
170	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 159.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A11NE (W)	952	5	296468 204616
171	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 37.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17NE (NW)	954	5	296836 205336
172	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 104.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A19SE (NE)	956	5	298282 205199

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
173	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 106.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9SW (SE)	959	5	298113 203762
174	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 93.1 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9SW (SE)	959	5	298113 203762
175	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 286.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9SE (SE)	964	5	298188 203818
176	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 6.0 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17NE (NW)	965	5	296999 205455
177	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 97.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A14SE (E)	967	5	298498 204346
178	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 8.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A8SE (S)	969	5	297806 203599
179	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 111.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9NE (SE)	970	5	298335 203975
180	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 90.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17NE (NW)	971	5	296996 205461
181	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 19.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A8SE (S)	972	5	297823 203600

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
182	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9SW (SE)	974	5	298035 203691
183	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 84.4 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A11SE (W)	975	5	296447 204504
184	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 124.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A11SE (W)	975	5	296447 204504
185	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A9SW (SE)	975	5	298033 203690
186	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 9.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A8SE (S)	978	5	297807 203590
187	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 91.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 2	A8SE (S)	987	5	297808 203580
188	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 58.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 2	A8SE (S)	987	5	297808 203580
189	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 34.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A17NW (NW)	990	5	296805 205358
190	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 64.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A15NW (E)	992	5	298544 204689

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
191	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 715.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Cynon, Ely and Rhondda Primacy: 1	A3NW (S)	992	5	297419 203546

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
192	**Historical Landfill Sites** Licence Holder: Mr and Mrs R Allen Location: Hirwaun, Aberdare Name: Pentwyn Cynon Farm Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD14945 First Input Date: 31st October 1988 Last Input Date: 31st December 1992 Specified Waste Type: Deposited Waste included Inert Waste EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 6940/0043 BGS Ref: Not Supplied Other Ref: 1/88	A12NE (NW)	625	2	296850 204840
	Local Authority Landfill Coverage Name: Rhondda Cynon Taff County Borough Council - Has supplied landfill data		0	6	297491 204572
193	**Potentially Infilled Land (Non-Water)** Bearing Ref: NE Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1990	A13SE (NE)	0	-	297491 204572
194	**Potentially Infilled Land (Non-Water)** Bearing Ref: SW Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1990	A13SW (SW)	112	-	297415 204452
195	**Potentially Infilled Land (Non-Water)** Bearing Ref: W Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1990	A13NW (W)	184	-	297237 204605
196	**Potentially Infilled Land (Non-Water)** Bearing Ref: E Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1990	A14SW (E)	319	-	297877 204564
197	**Potentially Infilled Land (Non-Water)** Bearing Ref: W Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1990	A12SE (W)	429	-	296990 204573
198	**Potentially Infilled Land (Non-Water)** Bearing Ref: SW Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1990	A7NE (SW)	709	-	296931 204056
199	**Potentially Infilled Land (Non-Water)** Bearing Ref: W Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1990	A7NW (W)	847	-	296646 204227
200	**Potentially Infilled Land (Non-Water)** Bearing Ref: W Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1990	A12NW (W)	862	-	296585 204799
201	**Potentially Infilled Land (Non-Water)** Bearing Ref: SE Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1990	A9NE (SE)	889	-	298294 204061
202	**Potentially Infilled Land (Non-Water)** Bearing Ref: SW Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1990	A7NW (SW)	911	-	296718 203989
203	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1945	A13NW (NW)	0	-	297450 204592
204	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1900	A13NE (NE)	28	-	297549 204611
205	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1921	A13NW (NW)	106	-	297401 204690

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
206	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1945	A13SE (E)	132	-	297685 204539
207	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1921	A13NE (E)	153	-	297690 204654
208	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1921	A13NE (E)	202	-	297742 204658
209	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1951	A13NW (N)	262	-	297452 204879
210	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1945	A14SW (E)	276	-	297834 204563
211	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1964	A14NW (NE)	348	-	297840 204780
212	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1951	A14NW (NE)	422	-	297886 204842
213	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1945	A14SW (SE)	425	-	297938 204383
214	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1964	A14NW (NE)	468	-	297905 204889
215	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1951	A14NW (E)	590	-	298100 204808
216	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1964	A17SE (NW)	615	-	296970 205001
217	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1945	A9NW (SE)	673	-	298110 204174
218	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1945	A9NE (SE)	907	-	298322 204071
219	**Registered Landfill Sites** Licence Holder: R R Allen (Mr & Mrs) Licence Reference: 1/88 Site Location: Pentwyn Cynon Farm, Hirwaun, Aberdare, Mid Glamorgan Licence Easting: 296800 Licence Northing: 205000 Operator Location: As Site Address Authority: Environment Agency Wales, South East Area Site Category: Landfill Max Input Rate: Undefined Waste Source Restrictions: No known restriction on source of waste Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st October 1988 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Inert,Non-Flam,Non-Tox.Builders Rubble Sub & Topsoil Prohibited Waste: Asbestos (Except That Assoc.With Veh.) Free Flammable Solvents Medical (Misuse Of Drugs Act) Medical, Surgical, Veterinary Wastes Pcb'S Percussive & Explosive Waste Special Wastes	A17SW (NW)	747	4	296800 205000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Pennine Lower Coal Measures Formation And South Wales Lower Coal Measures Formation (Undifferentiated)	A13SE (NE)	0	1	297491 204572
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13SE (NE)	0	1	297491 204572
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13SW (S)	59	1	297462 204492
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 30 - 45 mg/kg	A13SW (SW)	145	1	297415 204418
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18SE (N)	343	1	297569 204950
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 45 - 60 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18SE (N)	356	1	297507 204973
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A17SE (NW)	579	1	297109 205070

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 45 - 60 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A19SW (NE)	603	1	298035 204945
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 30 - 45 mg/kg	A8SE (S)	683	1	297492 203849
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A19SW (NE)	700	1	298090 205031
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 30 - 45 mg/kg	A9NW (SE)	702	1	298000 204000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14NE (E)	737	1	298258 204808
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A9SW (SE)	850	1	297890 203756

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 30 - 45 mg/kg	A8SW (S)	906	1	297163 203699
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A7SE (SW)	913	1	297109 203711
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A9NE (SE)	915	1	298297 204018
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 30 - 45 mg/kg	A8SW (S)	940	1	297185 203656
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 35 - 45 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A7SE (SW)	961	1	297075 203672
220	**BGS Recorded Mineral Sites** Site Name: Pwll Bryngwyn Location: Aberdare, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 125355 Type: Underground **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Lower Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A13SE (S)	77	1	297533 204454

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
221	**BGS Recorded Mineral Sites** Site Name: Rhydywaun Location: Aberdare, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 125350 Type: Underground **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Middle Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	287	1	297225 204359
222	**BGS Recorded Mineral Sites** Site Name: Rhydywaun Location: Aberdare, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 125345 Type: Underground **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Lower Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A12SE (W)	312	1	297110 204541
223	**BGS Recorded Mineral Sites** Site Name: Bryngwyn Occs Location: Hirwaun, Aberdare, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 235378 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Coal Measures Group Commodity: Coal - Opencast Positional Accuracy: Located by supplier to within 100m	A8NE (SE)	503	1	297800 204100
224	**BGS Recorded Mineral Sites** Site Name: Bryngwyn Level Location: Aberdare, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 125348 Type: Underground **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Middle Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A8NW (SW)	516	1	297203 204101
225	**BGS Recorded Mineral Sites** Site Name: Slade'S Patch Location: Aberdare, Merthyr Tydfil, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 153761 Type: Underground **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Middle Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A8NW (S)	583	1	297265 204006
226	**BGS Recorded Mineral Sites** Site Name: Slade'S Patch Location: Aberdare, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 125340 Type: Underground **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Middle Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	584	1	297041 204125

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
227	**BGS Recorded Mineral Sites** Site Name: Tir Rhos Location: Aberdare, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 125344 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Middle Coal Measures Formation Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	591	1	297097 204074
228	**BGS Recorded Mineral Sites** Site Name: Dawkin Place Location: Aberdare, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 125362 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Lower Coal Measures Formation Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A14SW (E)	600	1	298143 204441
229	**BGS Recorded Mineral Sites** Site Name: Slade'S Patch Location: Aberdare, Merthyr Tydfil, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 153760 Type: Underground **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Middle Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A8NW (SW)	611	1	297181 204007
230	**BGS Recorded Mineral Sites** Site Name: Slade'S Patch Location: Aberdare, Merthyr Tydfil, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 153762 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Middle Coal Measures Formation Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A8NW (S)	627	1	297310 203945
231	**BGS Recorded Mineral Sites** Site Name: Slade'S Patch Location: Aberdare, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 125339 Type: Underground **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Middle Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	636	1	297007 204086
232	**BGS Recorded Mineral Sites** Site Name: Pant-Yr-Ysgawen Location: Aberdare, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 125342 Type: Underground **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Lower Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A17SE (NW)	644	1	297068 205121

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
233	**BGS Recorded Mineral Sites** Site Name: Gamlyn Location: Aberdare, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 125364 Type: Underground **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Lower Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A14NE (E)	716	1	298266 204684
234	**BGS Recorded Mineral Sites** Site Name: Slade'S Patch Location: Aberdare, Merthyr Tydfil, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 153759 Type: Underground **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Middle Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	717	1	297113 203921
235	**BGS Recorded Mineral Sites** Site Name: Lluestai-Llwydwn Location: Aberdare, Merthyr Tydfil, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 153766 Type: Underground **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Middle Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A9SW (SE)	731	1	297831 203860
236	**BGS Recorded Mineral Sites** Site Name: Slade'S Patch Location: Aberdare, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 125337 Type: Underground **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Middle Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	742	1	296905 204036
237	**BGS Recorded Mineral Sites** Site Name: Slade'S Patch Location: Aberdare, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 125335 Type: Underground **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Middle Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	758	1	296844 204078
238	**BGS Recorded Mineral Sites** Site Name: Penwaun Occs Location: Hirwaun, Aberdare, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 235376 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Coal Measures Group Commodity: Coal - Opencast Positional Accuracy: Located by supplier to within 10m	A12SW (W)	760	1	296660 204550

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
239	**BGS Recorded Mineral Sites** Site Name: Penwaun Occs Location: Hirwaun, Aberdare, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 235377 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Coal Measures Group Commodity: Coal - Opencast Positional Accuracy: Located by supplier to within 10m	A12SW (W)	785	1	296695 204270
240	**BGS Recorded Mineral Sites** Site Name: Lluestai-Llwydwn Location: Aberdare, Merthyr Tydfil, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 153765 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Middle Coal Measures Formation Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A9SW (SE)	809	1	297857 203786
241	**BGS Recorded Mineral Sites** Site Name: Slade'S Patch Location: Aberdare, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 125331 Type: Underground **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Middle Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A7NW (SW)	836	1	296718 204117
242	**BGS Recorded Mineral Sites** Site Name: Slade'S Patch Location: Aberdare, Merthyr Tydfil, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 153758 Type: Underground **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Middle Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A7NW (SW)	934	1	296702 203972
243	**BGS Recorded Mineral Sites** Site Name: Dawkin Place Location: Aberdare, Merthyr Tydfil, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 153764 Type: Underground **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Middle Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A9NE (SE)	969	1	298293 203921
244	**BGS Recorded Mineral Sites** Site Name: Dawkin Place Location: Aberdare, Merthyr Tydfil, Mid Glamorgan Source: British Geological Survey, National Geoscience Information Service Reference: 153763 Type: Underground **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: South Wales Lower Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A9NE (SE)	971	1	298355 204003

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Measured Urban Soil Chemistry No data available				
	BGS Urban Soil Chemistry Averages No data available				
	Coal Mining Affected Areas 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 (NE)	0	7	297491 204572
	Mining Instability Mining Evidence: Inconclusive Coal Mining Source: Ove Arup & Partners Boundary Quality: As Supplied	A13SE (NE)	0	-	297491 204572
	Non Coal Mining Areas of Great Britain Risk: Highly Unlikely Source: British Geological Survey, National Geoscience Information Service	A13SE (NE)	0	1	297491 204572
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (NE)	0	1	297491 204572
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (NE)	0	1	297491 204572
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (NE)	0	1	297491 204572
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SE (NE)	0	1	297491 204572
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (S)	0	1	297490 204570
	Potential for Landslide Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	245	1	297419 204311
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (NE)	0	1	297491 204572
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	59	1	297462 204492
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (NE)	0	1	297491 204572
	Radon Potential - Radon Affected Areas 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). Source: British Geological Survey, National Geoscience Information Service	A13SE (NE)	0	1	297491 204572
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13SE (NE)	0	1	297491 204572

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
245	**Contemporary Trade Directory Entries** Name: Aberdare G C S Location: 37, Heol Keir Hardie, Aberdare, Mid Glamorgan, CF44 9AW Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (E)	272	-	297813 204481
246	**Contemporary Trade Directory Entries** Name: Picnaks Location: 2, Bryngwyn, Penywaun, Aberdare, Mid Glamorgan, CF44 9AH Classification: Printers - Glass, Metal, Plastics Etc. **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	366	-	297815 204288
247	**Contemporary Trade Directory Entries** Name: Burfords Professional Cleaning Services Location: Burford House,Braken View,Hirwaun Rd, Hirwaun, Aberdare, Mid Glamorgan, CF44 9LE Classification: Carpet, Curtain & Upholstery Cleaners **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A12NW (W)	686	-	296752 204744
248	**Contemporary Trade Directory Entries** Name: Hirwaun Engineering Location: Hirwaun Rd, Hirwaun, Aberdare, Mid Glamorgan, CF44 9HR Classification: Precision Engineers **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A12NW (W)	792	-	296659 204804
249	**Contemporary Trade Directory Entries** Name: A R J Tyres Location: Brooklyn, Hirwaun Road, Hirwaun, Aberdare, Mid Glamorgan, CF44 9HR Classification: Tyre Dealers **Status: Active** Positional Accuracy: Automatically positioned to the address	A12NW (W)	857	-	296579 204753
249	**Contemporary Trade Directory Entries** Name: Venturefoam Ltd Location: Brooklyn Yard, Hirwaun Road, Hirwaun, Aberdare, Mid Glamorgan, CF44 9HR Classification: Foam Products - Rubber & Plastics **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NW (W)	857	-	296579 204753
249	**Contemporary Trade Directory Entries** Name: Cuddys Commercial Vehicles Location: Brooklyn Yard, Hirwaun Road, Hirwaun, Aberdare, Mid Glamorgan, CF44 9HR Classification: Commercial Vehicle Servicing, Repairs, Parts & Accessories **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NW (W)	857	-	296579 204753
249	**Contemporary Trade Directory Entries** Name: Body Smart Location: Brooklyn Yard, Hirwaun Road, Hirwaun, Aberdare, Mid Glamorgan, CF44 9HR Classification: Car Body Repairs **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NW (W)	857	-	296579 204753
249	**Contemporary Trade Directory Entries** Name: Jessicas Auto Repairs Location: Brooklyn, Hirwaun Road, Hirwaun, Aberdare, Mid Glamorgan, CF44 9HR Classification: Car Body Repairs **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NW (W)	857	-	296579 204753
250	**Contemporary Trade Directory Entries** Name: Shell (Uk) Ltd Location: Hirwaun Rd, Hirwaun, Aberdare, Mid Glamorgan, CF44 9HR Classification: Petrol Filling Stations **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A12NW (W)	880	-	296582 204852
251	**Contemporary Trade Directory Entries** Name: Dudley Autos Location: Brooklyn Yard, Hirwaun Road, Hirwaun, Aberdare, CF44 9HR Classification: Garage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A12NW (W)	921	-	296512 204744

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
251	**Contemporary Trade Directory Entries** Name: Dudley'S Metal Fabs Ltd Location: Brooklyn Yard, Hirwaun Road, Hirwaun, Aberdare, CF44 9HR Classification: Gate Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A12NW (W)	921	-	296512 204744
252	**Fuel Station Entries** Name: Shell Hirwaun Location: Hirwaun Road , Hirwaun , Aberdare, Rhondda Cynon Taf, CF44 9HR Brand: Shell Premises Type: Not Applicable **Status: Obsolete** Positional Accuracy: Automatically positioned to the address	A12NW (W)	883	-	296570 204824
253	**Points of Interest - Commercial Services** Name: Dudley Autos Location: Brooklyn Yard, Hirwaun Road, Hirwaun, CF44 9HR Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A12NW (W)	921	8	296512 204744
254	**Points of Interest - Manufacturing and Production** Name: Quarry (Disused) Location: CF44 Category: Extractive Industries Class Code: Unspecified Quarries Or Mines Positional Accuracy: Positioned to an adjacent address or location	A8NW (S)	624	8	297329 203942
254	**Points of Interest - Manufacturing and Production** Name: Quarry (Disused) Location: CF44 Category: Extractive Industries Class Code: Unspecified Quarries Or Mines Positional Accuracy: Positioned to an adjacent address or location	A8NW (S)	626	8	297330 203940
255	**Points of Interest - Manufacturing and Production** Name: Quarry (Disused) Location: CF44 Category: Extractive Industries Class Code: Unspecified Quarries Or Mines Positional Accuracy: Positioned to an adjacent address or location	A9SW (SE)	786	8	297870 203817
255	**Points of Interest - Manufacturing and Production** Name: Quarry (Disused) Location: CF44 Category: Extractive Industries Class Code: Unspecified Quarries Or Mines Positional Accuracy: Positioned to address or location	A9SW (SE)	801	8	297859 203796
255	**Points of Interest - Manufacturing and Production** Name: Quarry (Disused) Location: CF44 Category: Extractive Industries Class Code: Unspecified Quarries Or Mines Positional Accuracy: Positioned to an adjacent address or location	A9SW (SE)	835	8	297867 203762
256	**Points of Interest - Manufacturing and Production** Name: W D Jones & Partners Location: Cwmdare, Aberdare, CF44 8TS Category: Farming Class Code: Livestock Farming Positional Accuracy: Positioned to address or location	A8SE (S)	834	8	297590 203698
257	**Points of Interest - Manufacturing and Production** Name: Air Shaft Location: CF44 Category: Extractive Industries Class Code: Unspecified Quarries Or Mines Positional Accuracy: Positioned to an adjacent address or location	A7NW (SW)	923	8	296780 203904
258	**Points of Interest - Public Infrastructure** Name: Weir Location: CF44 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A19SE (E)	867	8	298356 204915
258	**Points of Interest - Public Infrastructure** Name: Weir Location: CF44 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A19SE (E)	872	8	298362 204914

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
259	**Points of Interest - Recreational and Environmental** Name: Playground Location: (Haulfryn), CF44 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location	A13NE (NE)	43	8	297542 204632
259	**Points of Interest - Recreational and Environmental** Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A13NE (NE)	53	8	297531 204647
260	**Points of Interest - Recreational and Environmental** Name: Playground Location: (Awelfryn), CF44 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A13NE (NE)	250	8	297779 204693
260	**Points of Interest - Recreational and Environmental** Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A13NE (NE)	251	8	297780 204694
261	**Points of Interest - Recreational and Environmental** Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A14SW (E)	433	8	297988 204525
261	**Points of Interest - Recreational and Environmental** Name: Playground Location: (Heol Caradoc), CF44 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A14SW (E)	461	8	298015 204513
262	**Points of Interest - Recreational and Environmental** Name: Play Area Location: CF44 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A18SW (NW)	522	8	297173 205042
263	**Points of Interest - Recreational and Environmental** Name: Play Area Location: CF44 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A17SW (NW)	947	8	296578 205016

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
264	**Ancient Woodland** Name: Not Supplied Reference: 18498 Area(m²): 18009.07 Type: Ancient and Semi-Natural Woodland	A18SE (N)	330	2	297556 204939
265	**Ancient Woodland** Name: Not Supplied Reference: 13679 Area(m²): 18201.17 Type: Ancient and Semi-Natural Woodland	A18SE (N)	416	2	297544 205029
266	**Ancient Woodland** Name: Not Supplied Reference: 8799 Area(m²): 7833.99 Type: Ancient and Semi-Natural Woodland	A18SW (N)	450	2	297450 205067
267	**Ancient Woodland** Name: Not Supplied Reference: 18501 Area(m²): 7334.89 Type: Ancient and Semi-Natural Woodland	A18SW (N)	495	2	297375 205103
268	**Ancient Woodland** Name: Not Supplied Reference: 10151 Area(m²): 7765.83 Type: Ancient and Semi-Natural Woodland	A19SW (NE)	509	2	297840 205000
269	**Ancient Woodland** Name: Not Supplied Reference: 13680 Area(m²): 9129.01 Type: Ancient and Semi-Natural Woodland	A19SW (NE)	613	2	298022 204976
270	**Ancient Woodland** Name: Not Supplied Reference: 8798 Area(m²): 3153.48 Type: Ancient and Semi-Natural Woodland	A19SW (NE)	649	2	297993 205058
271	**Ancient Woodland** Name: Not Supplied Reference: 18499 Area(m²): 19793.82 Type: Ancient and Semi-Natural Woodland	A19SW (NE)	688	2	298071 205034
272	**Ancient Woodland** Name: Not Supplied Reference: 18503 Area(m²): 4837.64 Type: Ancient and Semi-Natural Woodland	A19SW (NE)	689	2	297920 205162
273	**Ancient Woodland** Name: Not Supplied Reference: 13681 Area(m²): 3808.35 Type: Ancient and Semi-Natural Woodland	A18NE (NE)	700	2	297784 205250
274	**Ancient Woodland** Name: Not Supplied Reference: 18502 Area(m²): 6922.86 Type: Ancient and Semi-Natural Woodland	A19SW (NE)	764	2	297970 205219
275	**National Parks** Name: Brecon Beacons Multiple Area: N Area (m2): 1349543930.88 Source: Natural Resources Wales **Status: Fully Designated - designated as a National Park** Designation Date: 31st December 1955	A18NE (N)	940	2	297490 205558
276	**Sites of Special Scientific Interest** Name: Tir Mawr A Dderi Hir, Llwydcoed Multiple Areas: Y Total Area (m2): 498451.79 Source: Natural Resources Wales Reference: 418432wuo Designation Details: Geological Designation Date: 12th September 2012 Date Type: Notified	A14NW (E)	609	2	298154 204703

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices		
Natural Resources Wales	June 2020	Annually
Neath Port Talbot County Borough Council - Environmental Health Department	October 2017	Annual Rolling Update
Rhondda Cynon Taff County Borough Council - Environmental Services	October 2017	Annual Rolling Update
Merthyr Tydfil County Borough Council - Environmental Health Department	September 2017	Annual Rolling Update
Discharge Consents		
Environment Agency - Welsh Region	August 2014	Quarterly
Natural Resources Wales	July 2022	Quarterly
Enforcement and Prohibition Notices		
Environment Agency - Welsh Region	March 2013	
Integrated Pollution Controls		
Environment Agency - Welsh Region	January 2009	
Integrated Pollution Prevention And Control		
Environment Agency - Welsh Region	January 2021	Quarterly
Natural Resources Wales	July 2022	Quarterly
Local Authority Integrated Pollution Prevention And Control		
Neath Port Talbot County Borough Council - Environmental Health Department	March 2014	Variable
Rhondda Cynon Taff County Borough Council - Public Health and Protection Division	September 2014	Variable
Merthyr Tydfil County Borough Council - Environmental Health Department	September 2016	Variable
Local Authority Pollution Prevention and Controls		
Neath Port Talbot County Borough Council - Environmental Health Department	March 2014	Annual Rolling Update
Rhondda Cynon Taff County Borough Council - Public Health and Protection Division	September 2014	Annual Rolling Update
Merthyr Tydfil County Borough Council - Environmental Health Department	September 2016	Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements		
Neath Port Talbot County Borough Council - Environmental Health Department	March 2015	Variable
Rhondda Cynon Taff County Borough Council - Public Health and Protection Division	September 2014	Variable
Merthyr Tydfil County Borough Council - Environmental Health Department	September 2016	Variable
Nearest Surface Water Feature		
Ordnance Survey	September 2022	
Pollution Incidents to Controlled Waters		
Environment Agency - Welsh Region	December 1998	
Prosecutions Relating to Authorised Processes		
Environment Agency - Welsh Region	July 2015	
Natural Resources Wales	July 2015	
Prosecutions Relating to Controlled Waters		
Environment Agency - Welsh Region	March 2013	
Natural Resources Wales	March 2013	
Registered Radioactive Substances		
Natural Resources Wales	January 2015	
Environment Agency - Welsh Region	June 2016	As notified
River Quality		
Environment Agency - Head Office	November 2001	Not Applicable
River Quality Biology Sampling Points		
Environment Agency - Head Office	April 2012	
Substantiated Pollution Incident Register		
Natural Resources Wales	August 2022	Quarterly
Environment Agency Wales - South East Area	January 2021	Quarterly
Environment Agency Wales - South West Area	January 2021	Quarterly
Water Abstractions		
Natural Resources Wales	July 2022	Quarterly
Environment Agency - Welsh Region	October 2022	Quarterly

Data Currency

Agency & Hydrological	Version	Update Cycle
Water Industry Act Referrals Natural Resources Wales Environment Agency - Welsh Region	 July 2022 October 2017	 Quarterly
Groundwater Vulnerability Map Natural Resources Wales	 June 2018	 As notified
Bedrock Aquifer Designations Natural Resources Wales	 January 2018	 Annually
Superficial Aquifer Designations Natural Resources Wales	 January 2018	 Annually
Source Protection Zones Natural Resources Wales	 July 2022	 Annual Rolling Update
Extreme Flooding from Rivers or Sea without Defences Natural Resources Wales	 September 2020	
Flooding from Rivers or Sea without Defences Natural Resources Wales	 September 2020	
Areas Benefiting from Flood Defences Natural Resources Wales	 November 2019	 Quarterly
Flood Water Storage Areas Natural Resources Wales	 August 2019	 Quarterly
Flood Defences Natural Resources Wales	 November 2019	 Quarterly
OS Water Network Lines Ordnance Survey	 October 2022	 Quarterly
Surface Water 1 in 30 year Flood Extent Natural Resources Wales	 May 2018	 Annually
Surface Water 1 in 100 year Flood Extent Natural Resources Wales	 May 2018	 Annually
Surface Water 1 in 1000 year Flood Extent Natural Resources Wales	 May 2018	 Annually
Surface Water Suitability Natural Resources Wales	 February 2016	 Annually
BGS Groundwater Flooding Susceptibility British Geological Survey - National Geoscience Information Service	 May 2013	 As notified

Data Currency

Waste	Version	Update Cycle
BGS Recorded Landfill Sites		
British Geological Survey - National Geoscience Information Service	November 2002	As notified
Historical Landfill Sites		
Natural Resources Wales	July 2019	Quarterly
Integrated Pollution Control Registered Waste Sites		
Environment Agency - Welsh Region	January 2009	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries)		
Natural Resources Wales	October 2021	Quarterly
Environment Agency Wales - South East Area	October 2022	Quarterly
Environment Agency Wales - South West Area	October 2022	Quarterly
Licensed Waste Management Facilities (Locations)		
Environment Agency Wales - South East Area	July 2021	Quarterly
Environment Agency Wales - South West Area	July 2021	Quarterly
Natural Resources Wales	July 2022	Quarterly
Local Authority Landfill Coverage		
Merthyr Tydfil County Borough Council - Environmental Health Department	February 2003	Not Applicable
Neath Port Talbot County Borough Council - Environmental Health Department	February 2003	Not Applicable
Rhondda Cynon Taff County Borough Council	February 2003	Not Applicable
Local Authority Recorded Landfill Sites		
Merthyr Tydfil County Borough Council - Environmental Health Department	October 2018	
Neath Port Talbot County Borough Council - Environmental Health Department	October 2018	
Rhondda Cynon Taff County Borough Council	October 2018	
Potentially Infilled Land (Non-Water)		
Landmark Information Group Limited	December 1999	Not Applicable
Potentially Infilled Land (Water)		
Landmark Information Group Limited	December 1999	
Registered Landfill Sites		
Environment Agency Wales - South East Area	March 2006	Not Applicable
Environment Agency Wales - South West Area	March 2006	Not Applicable
Registered Waste Transfer Sites		
Environment Agency Wales - South East Area	April 2018	
Environment Agency Wales - South West Area	April 2018	
Registered Waste Treatment or Disposal Sites		
Environment Agency Wales - South East Area	June 2015	
Environment Agency Wales - South West Area	June 2015	

Hazardous Substances	Version	Update Cycle
Control of Major Accident Hazards Sites (COMAH)		
Health and Safety Executive	January 2022	Bi-Annually
Explosive Sites		
Health and Safety Executive	March 2017	Annually
Notification of Installations Handling Hazardous Substances (NIHHS)		
Health and Safety Executive	August 2001	
Planning Hazardous Substance Enforcements		
Brecon Beacons National Park	August 2008	Annual Rolling Update
Rhondda Cynon Taff County Borough Council - Planning Department	February 2016	Variable
Neath Port Talbot County Borough Council - Planning Department	October 2015	Variable
Merthyr Tydfil County Borough Council - Planning Department	September 2007	Variable
Planning Hazardous Substance Consents		
Brecon Beacons National Park	August 2008	Annual Rolling Update
Rhondda Cynon Taff County Borough Council - Planning Department	February 2016	Variable
Neath Port Talbot County Borough Council - Planning Department	October 2015	Variable
Merthyr Tydfil County Borough Council - Planning Department	September 2007	Variable

Geological	Version	Update Cycle
BGS 1:625,000 Solid Geology		
British Geological Survey - National Geoscience Information Service	January 2009	As notified
BGS Estimated Soil Chemistry		
British Geological Survey - National Geoscience Information Service	December 2015	As notified
BGS Recorded Mineral Sites		
British Geological Survey - National Geoscience Information Service	November 2022	Bi-Annually
CBSCB Compensation District		
Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011	
Cheshire Brine Subsidence Compensation Board (CBSCB)	November 2020	As notified
Coal Mining Affected Areas		
The Coal Authority - Property Searches	March 2014	Annual Rolling Update
Mining Instability		
Ove Arup & Partners	June 1998	Not Applicable
Non Coal Mining Areas of Great Britain		
British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Potential for Collapsible Ground Stability Hazards		
British Geological Survey - National Geoscience Information Service	April 2020	As notified
Potential for Compressible Ground Stability Hazards		
British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Ground Dissolution Stability Hazards		
British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Landslide Ground Stability Hazards		
British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Running Sand Ground Stability Hazards		
British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Shrinking or Swelling Clay Ground Stability Hazards		
British Geological Survey - National Geoscience Information Service	January 2019	As notified
Radon Potential - Radon Affected Areas		
British Geological Survey - National Geoscience Information Service	September 2022	Annually
Radon Potential - Radon Protection Measures		
British Geological Survey - National Geoscience Information Service	September 2022	Annually

Data Currency

Industrial Land Use	Version	Update Cycle
Contemporary Trade Directory Entries Thomson Directories	October 2022	Quarterly
Fuel Station Entries Catalist Ltd - Experian	August 2022	Quarterly
Gas Pipelines National Grid	October 2021	Bi-Annually
Points of Interest - Commercial Services PointX	December 2022	Quarterly
Points of Interest - Education and Health PointX	December 2022	Quarterly
Points of Interest - Manufacturing and Production PointX	December 2022	Quarterly
Points of Interest - Public Infrastructure PointX	December 2022	Quarterly
Points of Interest - Recreational and Environmental PointX	December 2022	Quarterly
Underground Electrical Cables National Grid	May 2021	Bi-Annually

Data Currency

Sensitive Land Use	Version	Update Cycle
Ancient Woodland		
Natural Resources Wales	September 2018	Bi-Annually
Areas of Adopted Green Belt		
Brecon Beacons National Park	July 2022	Quarterly
Merthyr Tydfil County Borough Council	July 2022	Quarterly
Neath Port Talbot County Borough Council - Planning Services	July 2022	Quarterly
Rhondda Cynon Taff County Borough Council	July 2022	Quarterly
Areas of Unadopted Green Belt		
Brecon Beacons National Park	July 2022	Quarterly
Merthyr Tydfil County Borough Council	July 2022	Quarterly
Neath Port Talbot County Borough Council - Planning Services	July 2022	Quarterly
Rhondda Cynon Taff County Borough Council	July 2022	Quarterly
Areas of Outstanding Natural Beauty		
Natural Resources Wales	August 2022	Bi-Annually
Environmentally Sensitive Areas		
The National Assembly for Wales - GI Services (Department of Planning & Countryside)	January 2017	
Forest Parks		
Forestry Commission	April 1997	Not Applicable
Local Nature Reserves		
Merthyr Tydfil County Borough Council	August 2018	Bi-Annually
Neath Port Talbot County Borough Council	August 2018	Bi-Annually
Rhondda Cynon Taff County Borough Council	August 2018	Bi-Annually
Marine Nature Reserves		
Natural Resources Wales	August 2018	Bi-Annually
National Nature Reserves		
Natural Resources Wales	February 2022	Bi-Annually
National Parks		
Natural Resources Wales	February 2018	Annually
Nitrate Vulnerable Zones		
The National Assembly for Wales - GI Services (Department of Planning & Countryside)	April 2016	
Natural Resources Wales	July 2019	Bi-Annually
Ramsar Sites		
Natural Resources Wales	July 2019	Bi-Annually
Sites of Special Scientific Interest		
Natural Resources Wales	March 2020	Bi-Annually
Special Areas of Conservation		
Natural Resources Wales	August 2020	Bi-Annually
Special Protection Areas		
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	
Environment Agency	
Scottish Environment Protection Agency	
The Coal Authority	
British Geological Survey	
Centre for Ecology and Hydrology	
Natural Resources Wales	
Scottish Natural Heritage	
Natural England	
Public Health England	
Ove Arup	
Stantec UK Ltd	

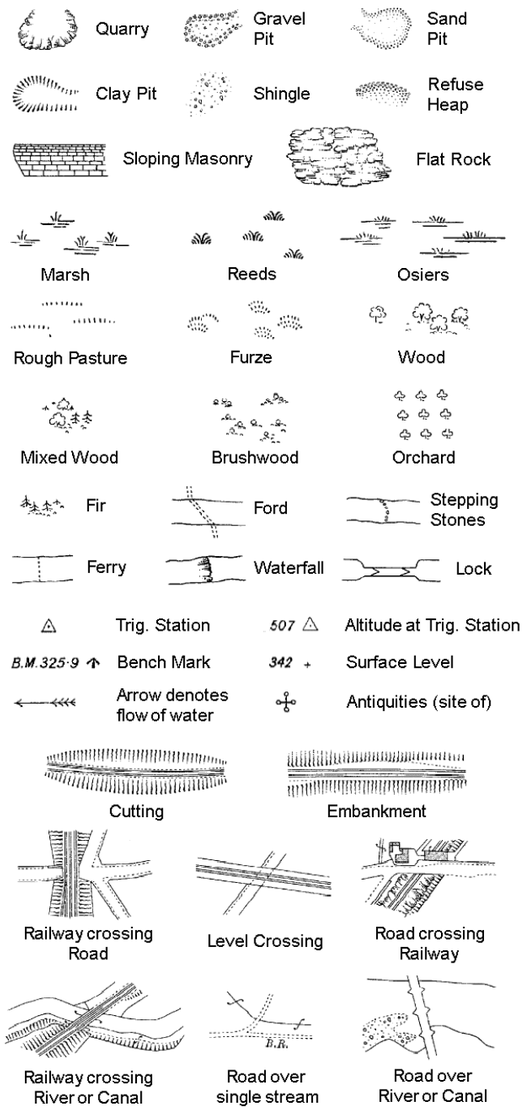
Useful Contacts

Contact	Name and Address	Contact Details
1	**British Geological Survey - Enquiry Service** British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
2	**Natural Resources Wales** Ty Cambria, 29 Newport Road, Cardiff, CF24 0TP	Telephone: 0300 065 3000 Email: enquiries@naturalresourceswales.gov.uk
3	**Rhondda Cynon Taff County Borough Council - Public Health and Protection Division** Community Services, RCT Borough Council, Dinas Esaf Estate, Williamstown, RCT, CF40 1NY	Telephone: 01443 442100 Website: www.rhondda-cynon-taff.gov.uk
4	**Environment Agency - National Customer Contact Centre (NCCC)** PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
5	**Ordnance Survey** Adanac Drive, Southampton, Hampshire, SO16 0AS	Telephone: 03456 05 05 05 Email: customerservices@ordnancesurvey.co.uk Website: www.ordnancesurvey.gov.uk
6	**Rhondda Cynon Taff County Borough Council** Headquarters - The Pavillions, Cambrian Park, Clydach Vale, Rhondda, CF40 2XX	Telephone: 01443 424000 Fax: 01443 424024 Website: www.rhondda-cynon-taff.gov.uk
7	**The Coal Authority - Property Searches** 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG	Telephone: 0345 762 6848 Fax: 01623 637 338 Email: groundstability@coal.gov.uk Website: www2.groundstability.com
8	**PointX** 7 Abbey Court, Eagle Way, Sowton, Exeter, Devon, EX2 7HY	Website: www.pointx.co.uk
-	**Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards** Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

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

Historical Mapping Legends

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



County Boundary (Geographical)

County & Civil Parish Boundary

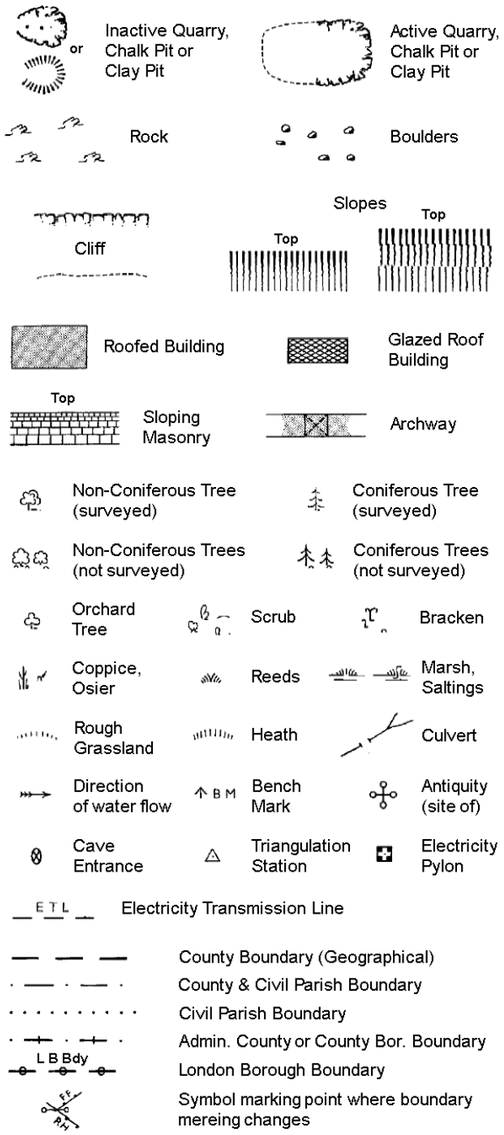
Administrative County & Civil Parish Boundary

Co. Boro. Bdy. County Borough Boundary (England)

Co. Burgh Bdy. County Burgh Boundary (Scotland)

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



County Boundary (Geographical)

County & Civil Parish Boundary

Civil Parish Boundary

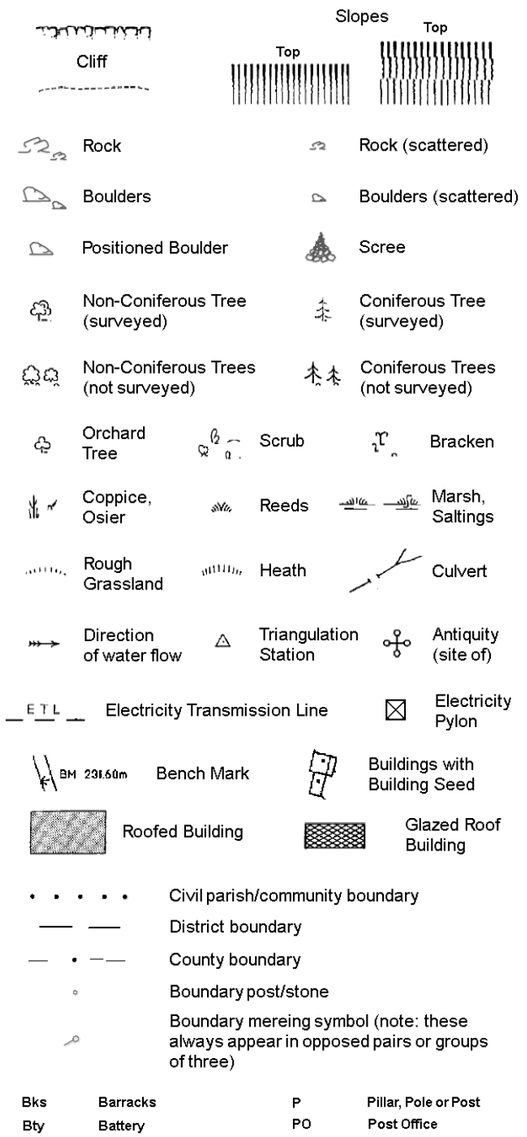
Admin. County or County Bor. Boundary

L B Bdy London Borough Boundary

Symbol marking point where boundary mereing changes

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



Civil parish/community boundary

District boundary

County boundary

Boundary post/stone

Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

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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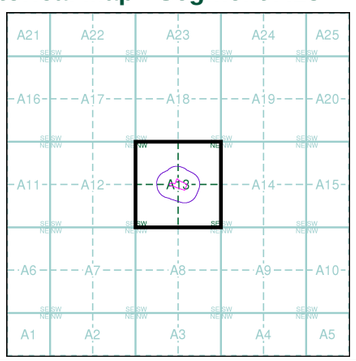
Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Glamorganshire	1:2,500	1868 - 1890	2
Brecknockshire	1:2,500	1886	3
Glamorganshire	1:2,500	1900	4
Brecknockshire	1:2,500	1919	5
Glamorganshire	1:2,500	1919	6
Ordnance Survey Plan	1:2,500	1964	7
Ordnance Survey Plan	1:2,500	1971	8
Additional SIMs	1:2,500	1986	9
Additional SIMs	1:2,500	1987	10
Large-Scale National Grid Data	1:2,500	1993	11
Large-Scale National Grid Data	1:2,500	1996	12
Historical Aerial Photography	1:2,500	2000	13

Historical Map - Segment A13



Order Details

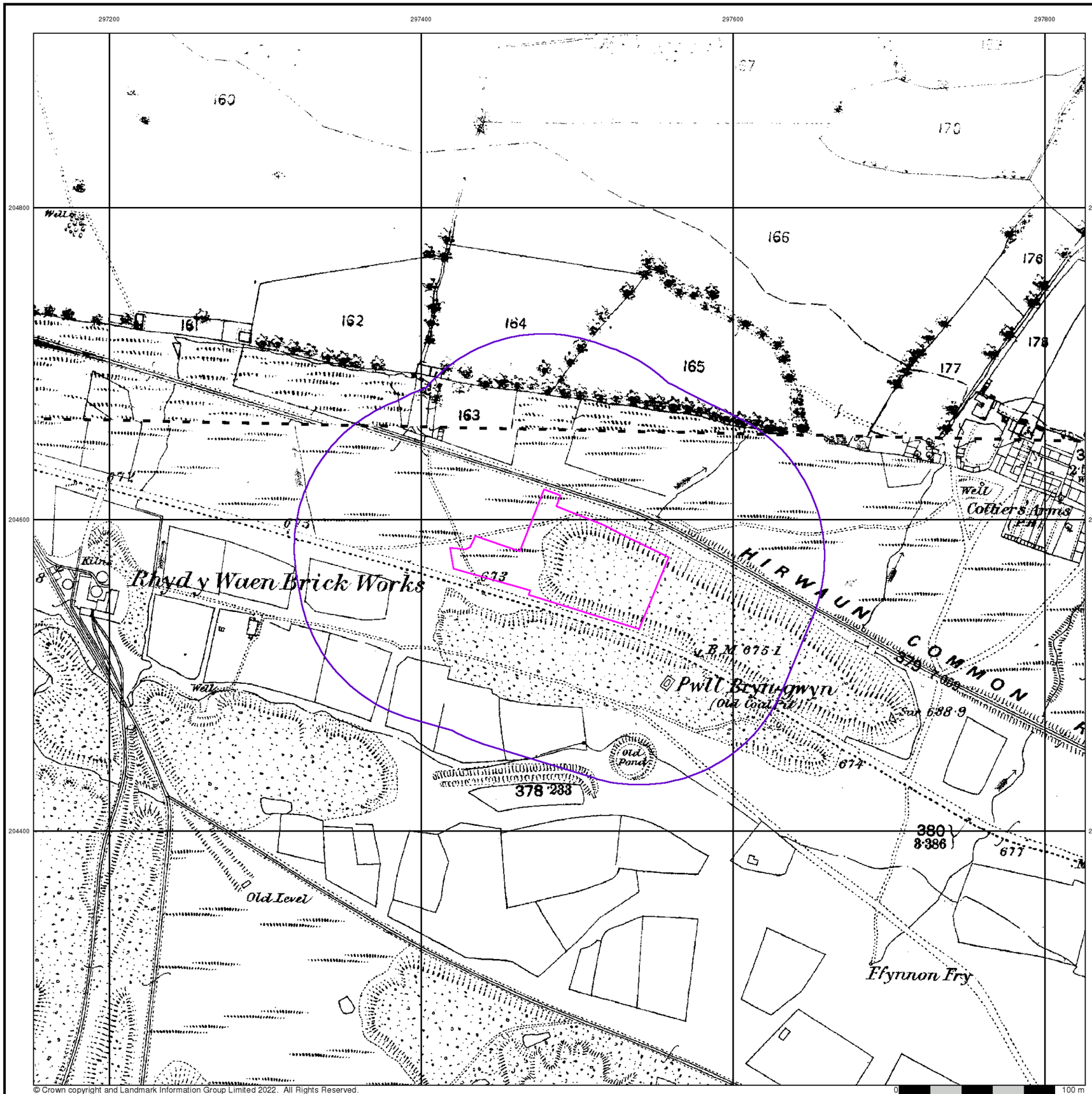
Order Number: 304681434_1_1
Customer Ref: 17264TM Penywaun
National Grid Reference: 297490, 204570
Slice: A
Site Area (Ha): 0.6
Search Buffer (m): 100

Site Details

Penywaun, Aberdare, CF44 9EE

Landmark INFORMATION GROUP

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



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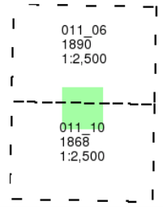
Glamorganshire

Published 1868 - 1890

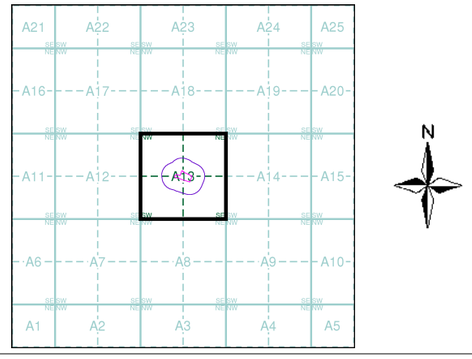
Source map scale - 1:2,500

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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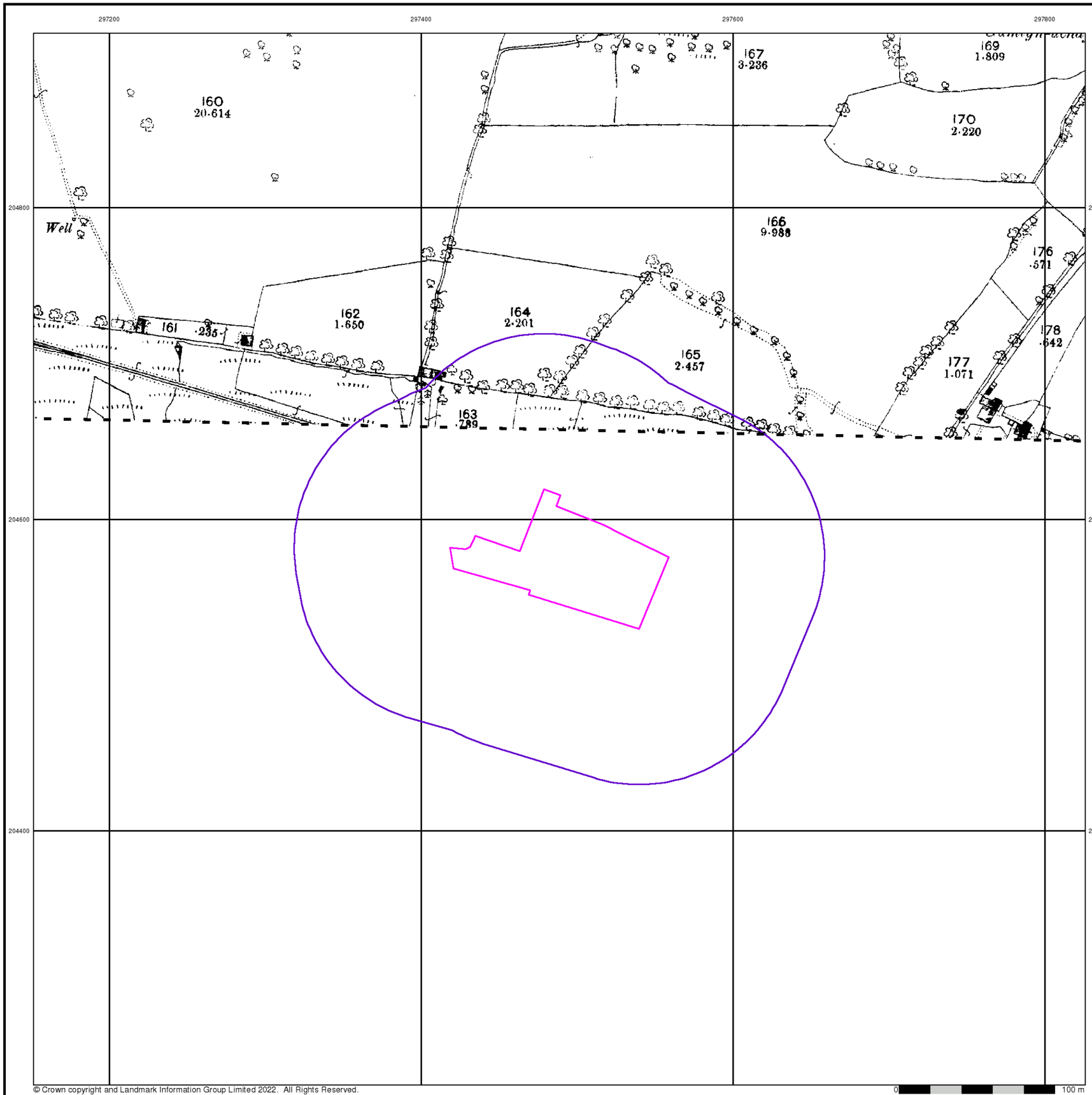

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Brecknockshire

Published 1886

Source map scale - 1:2,500

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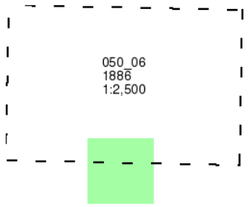
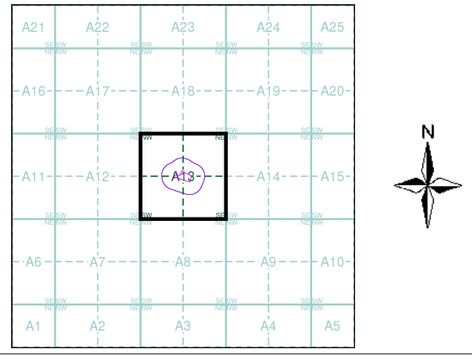


Historical Map - Segment A13



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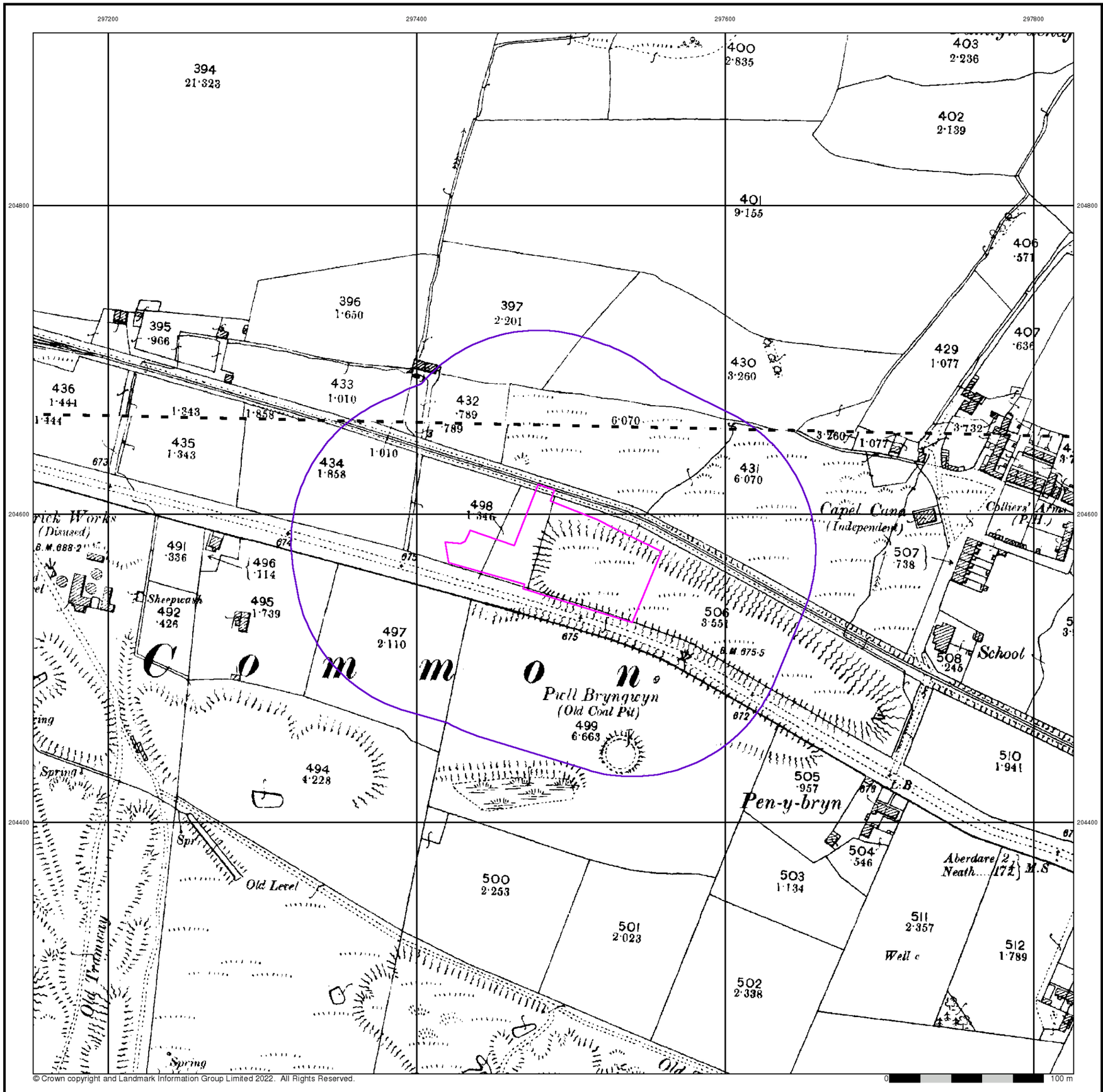

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Glamorganshire

Published 1900

Source map scale - 1:2,500

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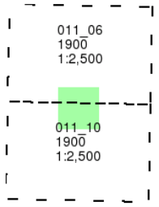
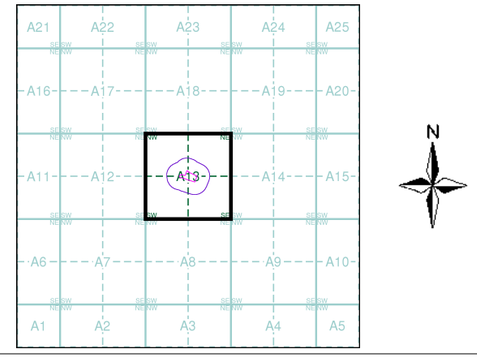


Historical Map - Segment A13



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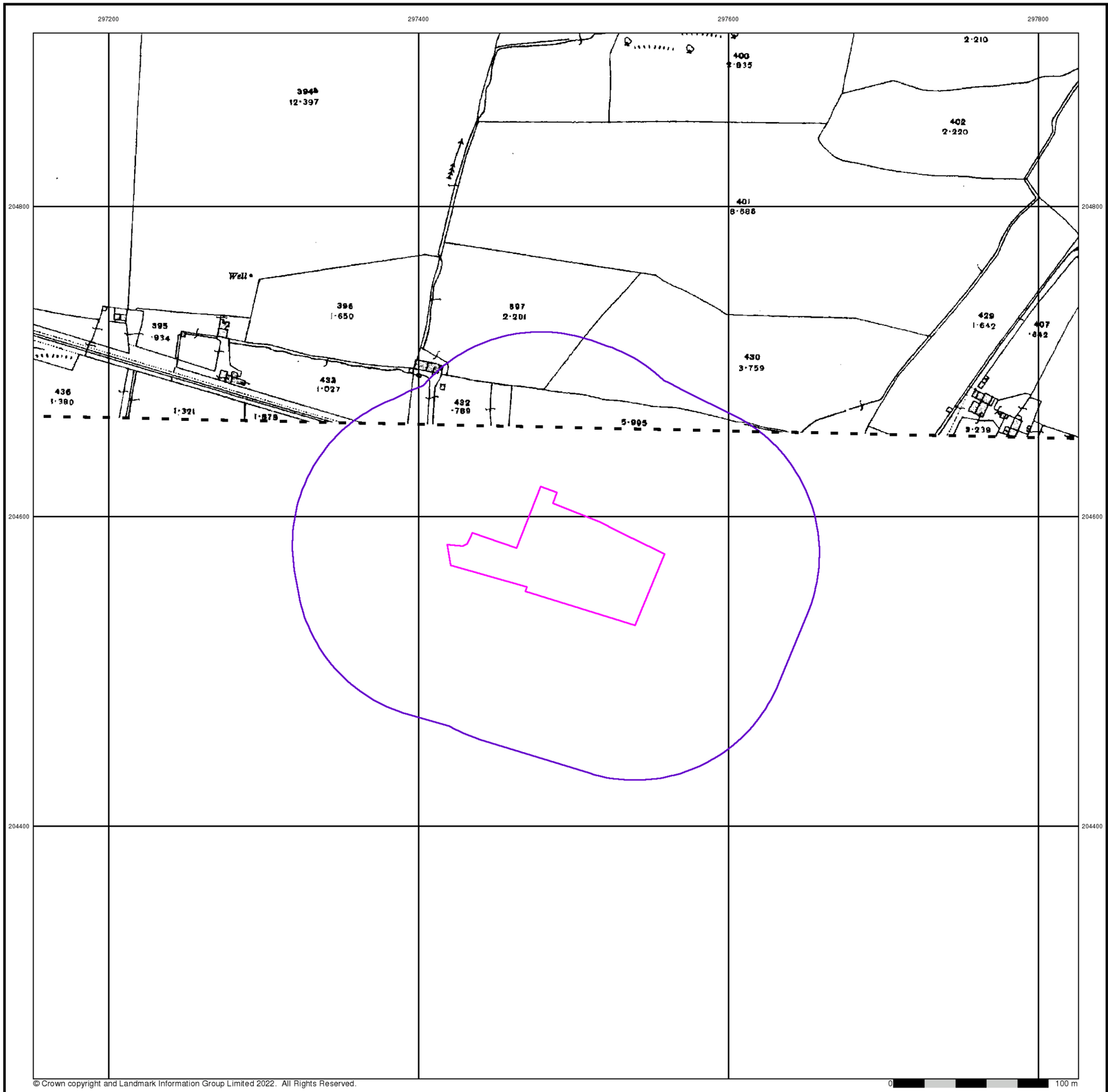

0 100 m

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Brecknockshire

Published 1919

Source map scale - 1:2,500

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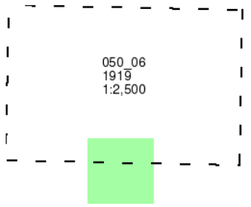
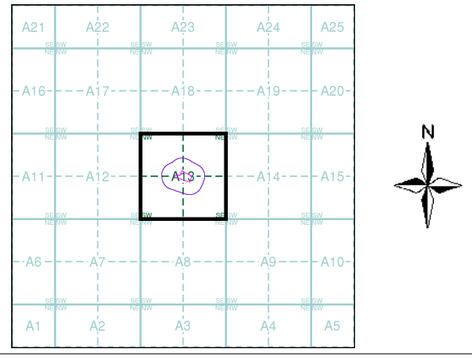


Historical Map - Segment A13



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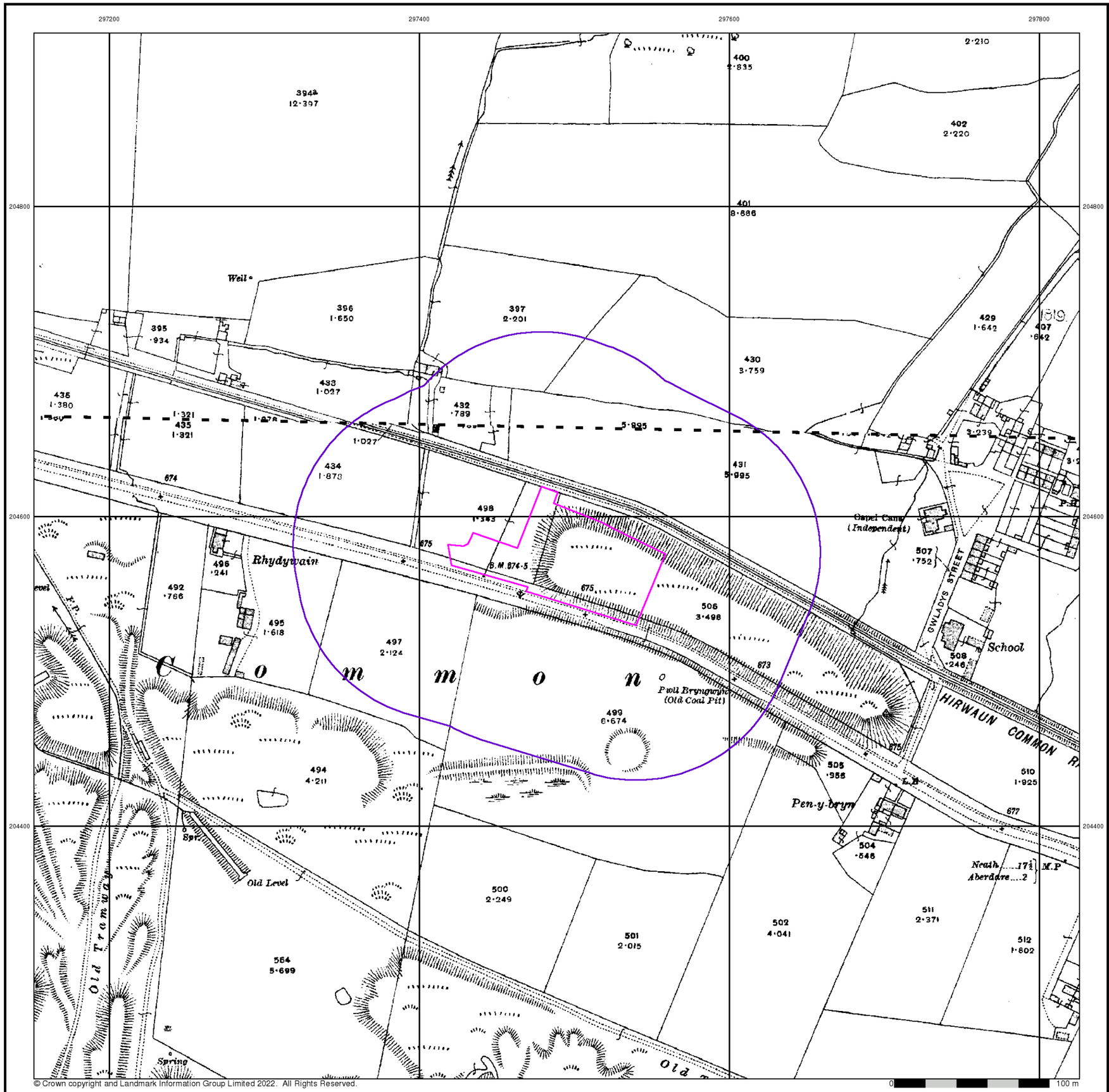

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Glamorganshire

Published 1919

Source map scale - 1:2,500

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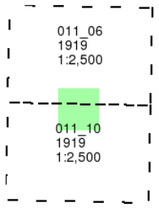
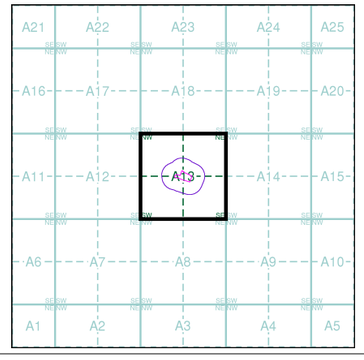


Historical Map - Segment A13



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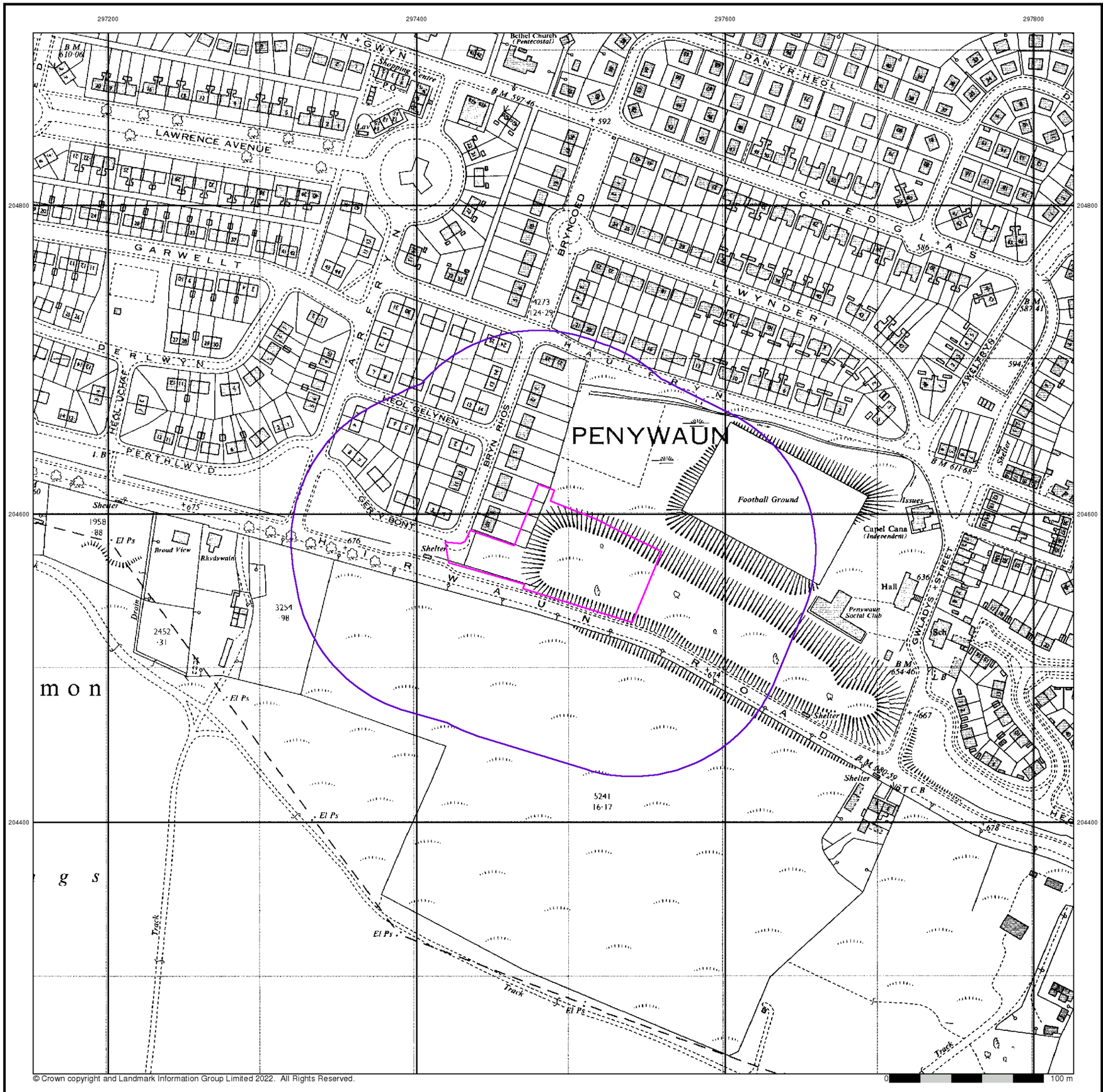

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Ordnance Survey Plan

Published 1964

Source map scale - 1:2,500

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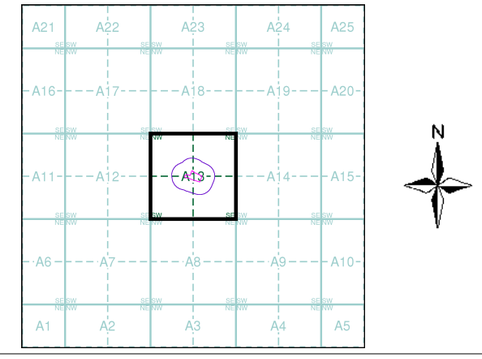
Map Name(s) and Date(s)

SN9704
1964
1:2,500

Historical Map - Segment A13



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Slice:	A
Site Area (Ha):	0.6
Search Buffer (m):	100

Site Details

Penywaun, Aberdare, CF44 9EE

Landmark INFORMATION GROUP

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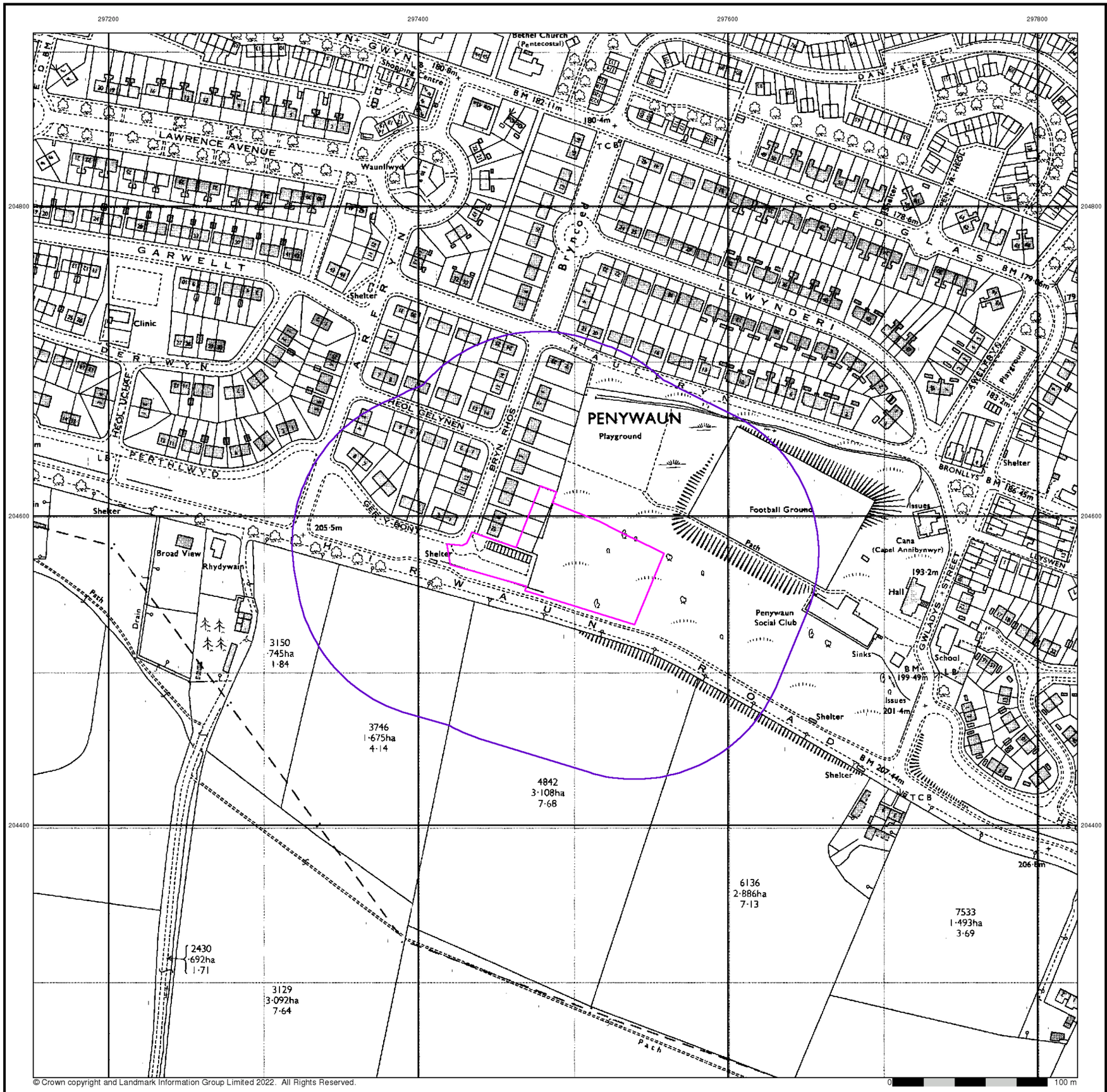
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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Geotechnical & Geoenvironmental Specialists

Ordnance Survey Plan

Published 1971

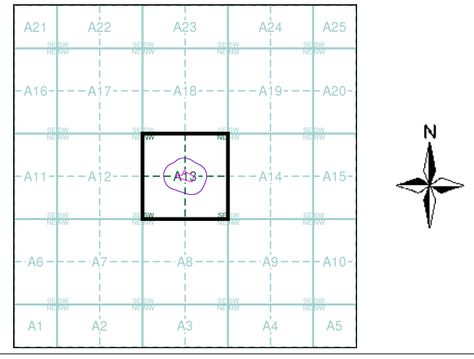
Source map scale - 1:2,500

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)

SN9704
1971
1:2,500

Historical Map - Segment A13



Order Details

Order Number:	304681434_1_1
Customer Ref:	17264TM Penywaun
National Grid Reference:	297490, 204570
Slice:	A
Site Area (Ha):	0.6
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Site Details

Penywaun, Aberdare, CF44 9EE

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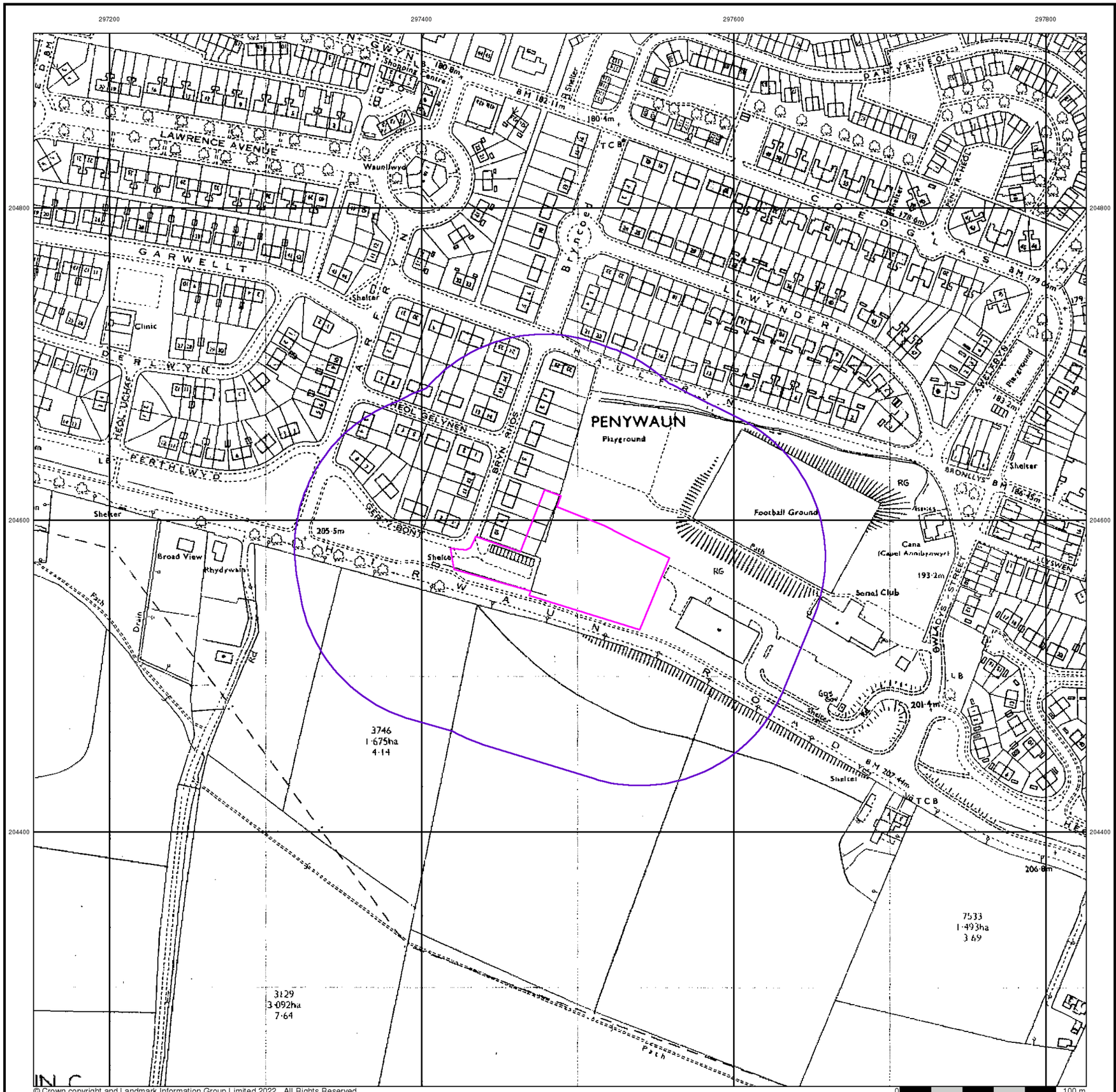

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Geotechnical & Geoenvironmental Specialists

Additional SIMs

Published 1986

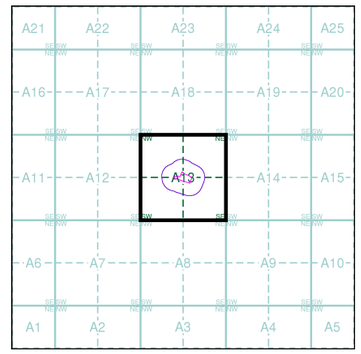
Source map scale - 1:2,500

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)

SN9704
1986
1:2,500

Historical Map - Segment A13



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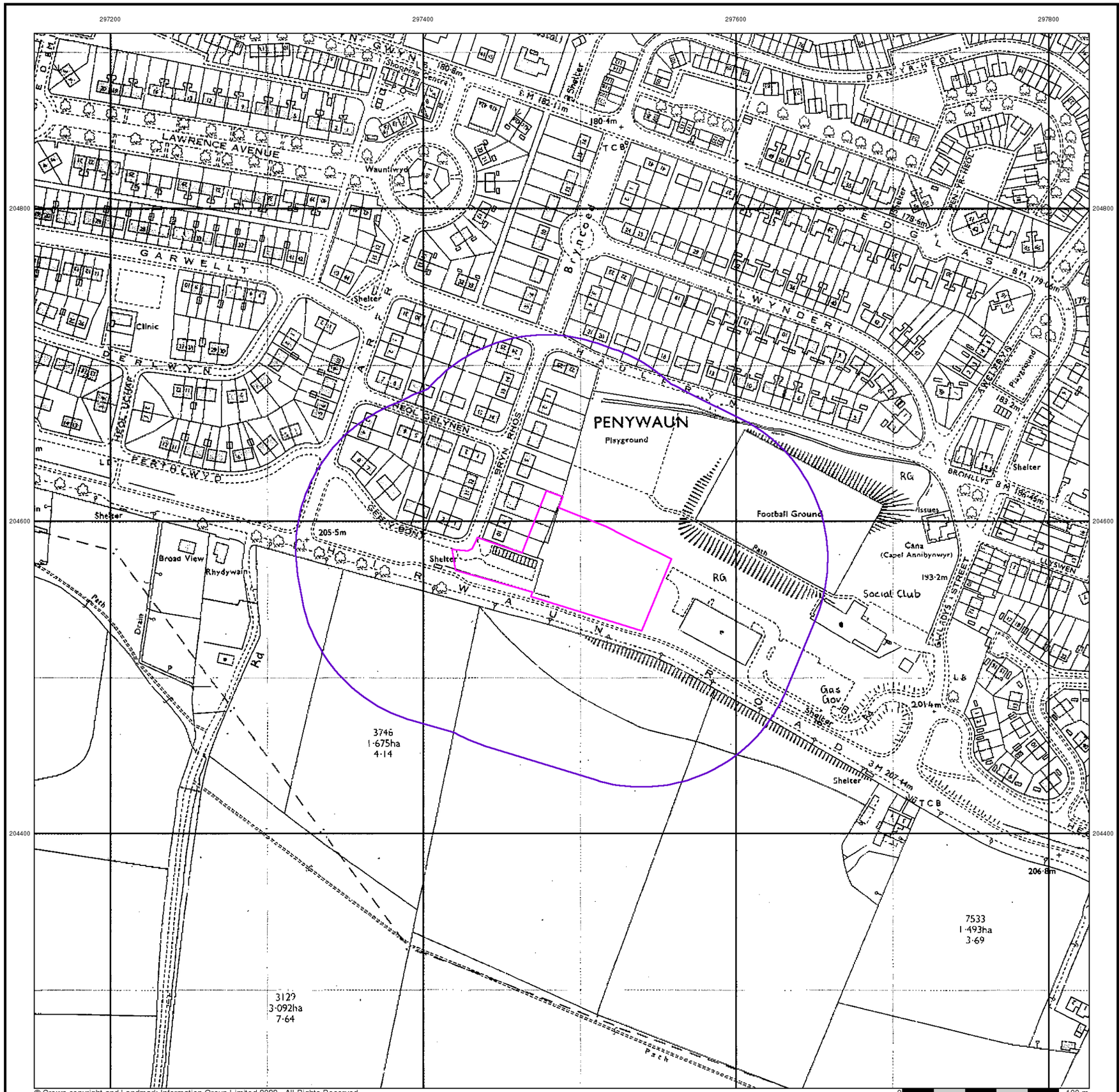

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Additional SIMs

Published 1987

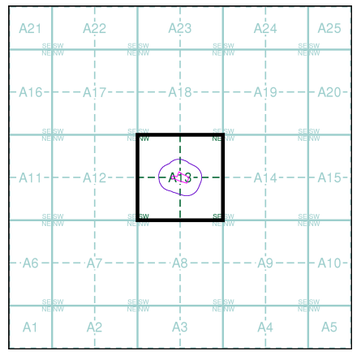
Source map scale - 1:2,500

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)

SN9704
1987
1:2,500

Historical Map - Segment A13



Order Details

Order Number:	304681434_1_1
Customer Ref:	17264TM Penywaun
National Grid Reference:	297490, 204570
Slice:	A
Site Area (Ha):	0.6
Search Buffer (m):	100

Site Details

Penywaun, Aberdare, CF44 9EE

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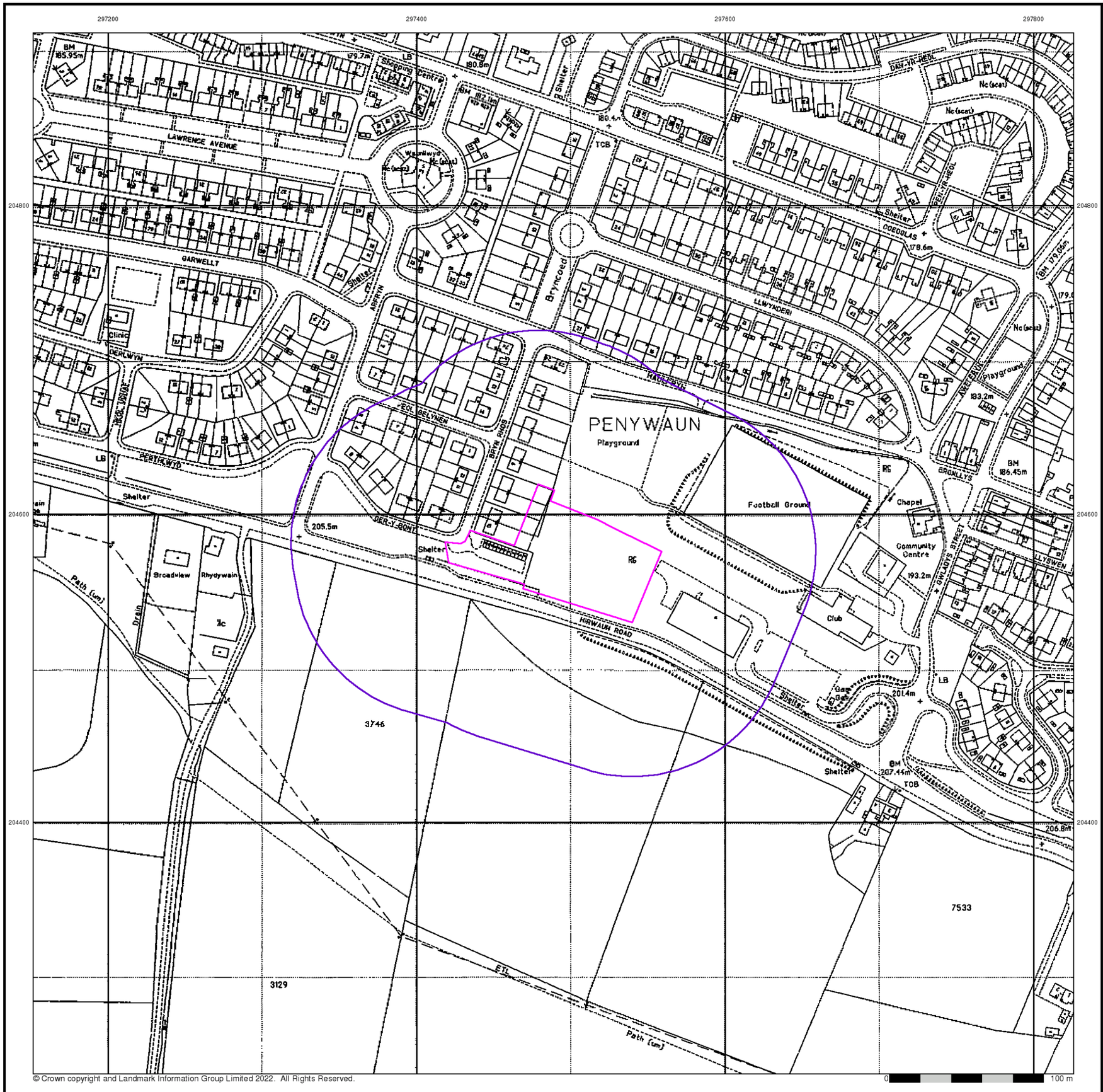

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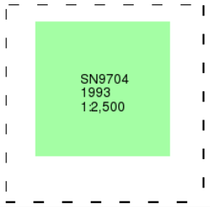
Large-Scale National Grid Data

Published 1993

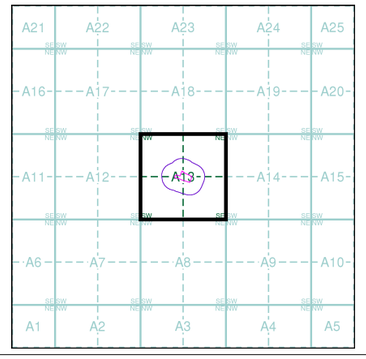
Source map scale - 1:2,500

'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



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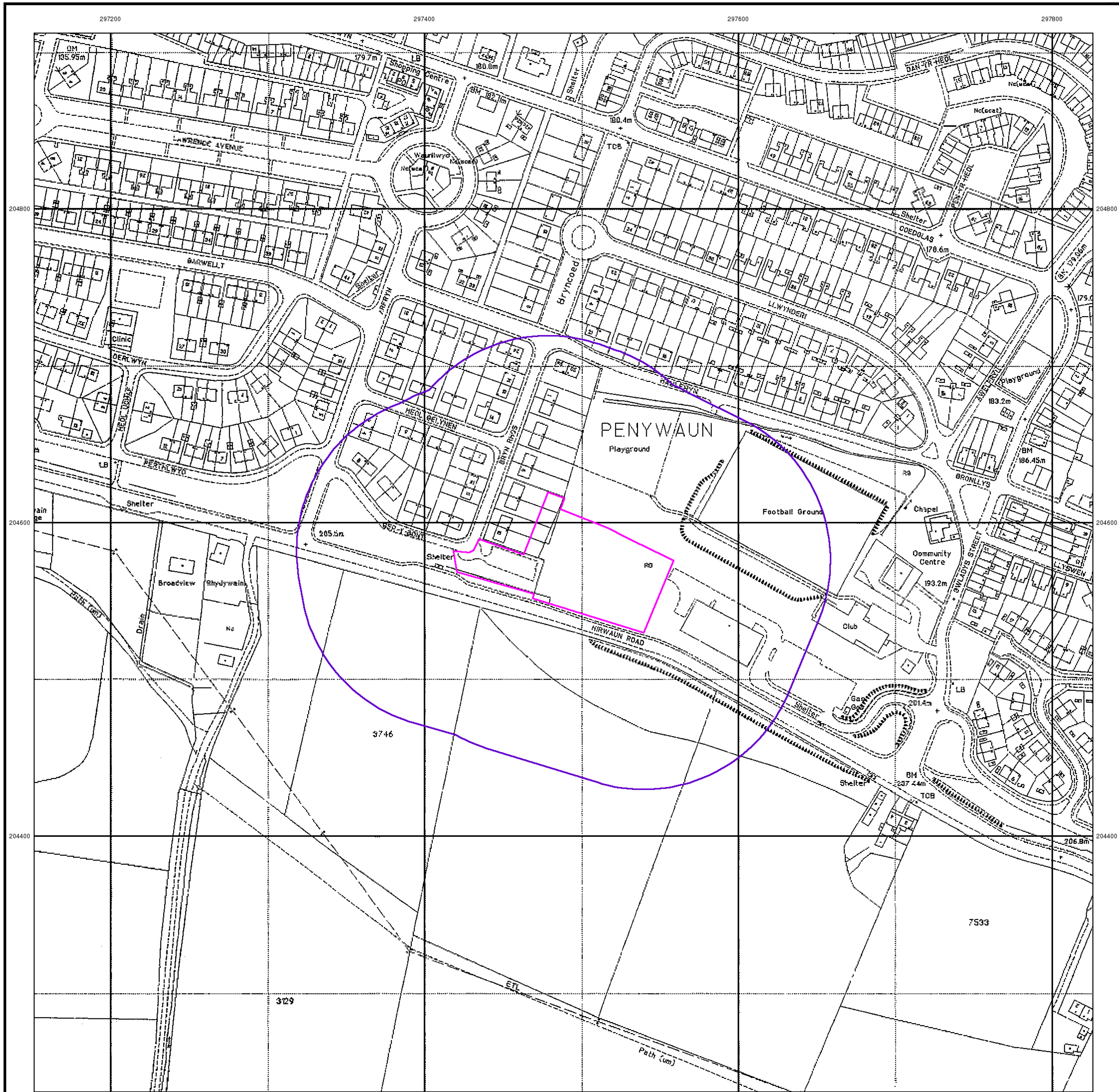

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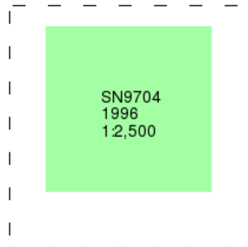
Large-Scale National Grid Data

Published 1996

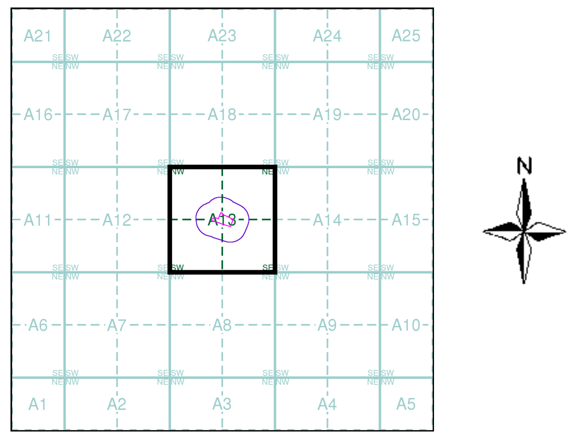
Source map scale - 1:2,500

'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



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297200 297400 297600 297800

204800 204600 204400

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0 100 m

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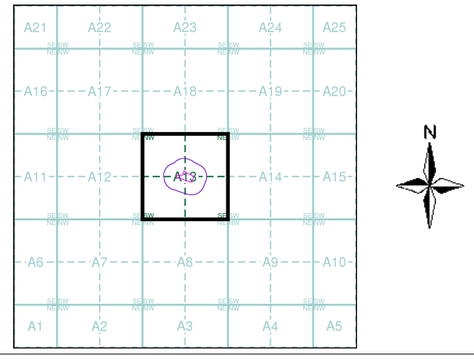
Historical Aerial Photography

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



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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
Pylon
Electricity Transmission Line
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
Mud
Sand
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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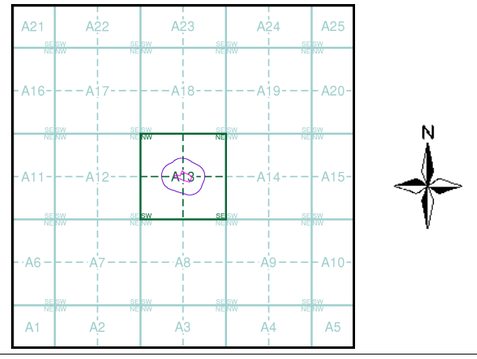
Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Brecknockshire	1:10,560	1884	2
Glamorganshire	1:10,560	1885	3
Glamorganshire	1:10,560	1900 - 1901	4
Brecknockshire	1:10,560	1905	5
Brecknockshire	1:10,560	1921	6
Glamorganshire	1:10,560	1921	7
Brecknockshire	1:10,560	1921	8
Glamorganshire	1:10,560	1938 - 1945	9
Historical Aerial Photography	1:10,560	1945	10
Brecknockshire	1:10,560	1951	11
Glamorganshire	1:10,560	1951 - 1953	12
Ordnance Survey Plan	1:10,000	1964	13
Ordnance Survey Plan	1:10,000	1968	14
Ordnance Survey Plan	1:10,000	1978	15
Ordnance Survey Plan	1:10,000	1990	16
10K Raster Mapping	1:10,000	1999	17
10K Raster Mapping	1:10,000	2006	18
VectorMap Local	1:10,000	2022	19

Historical Map - Slice A



Order Details

Order Number: 304681434_1_1
Customer Ref: 17264TM Penywaun
National Grid Reference: 297490, 204570
Slice: A
Site Area (Ha): 0.6
Search Buffer (m): 1000

Site Details

Penywaun, Aberdare, CF44 9EE

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Fax: 0844 844 9951
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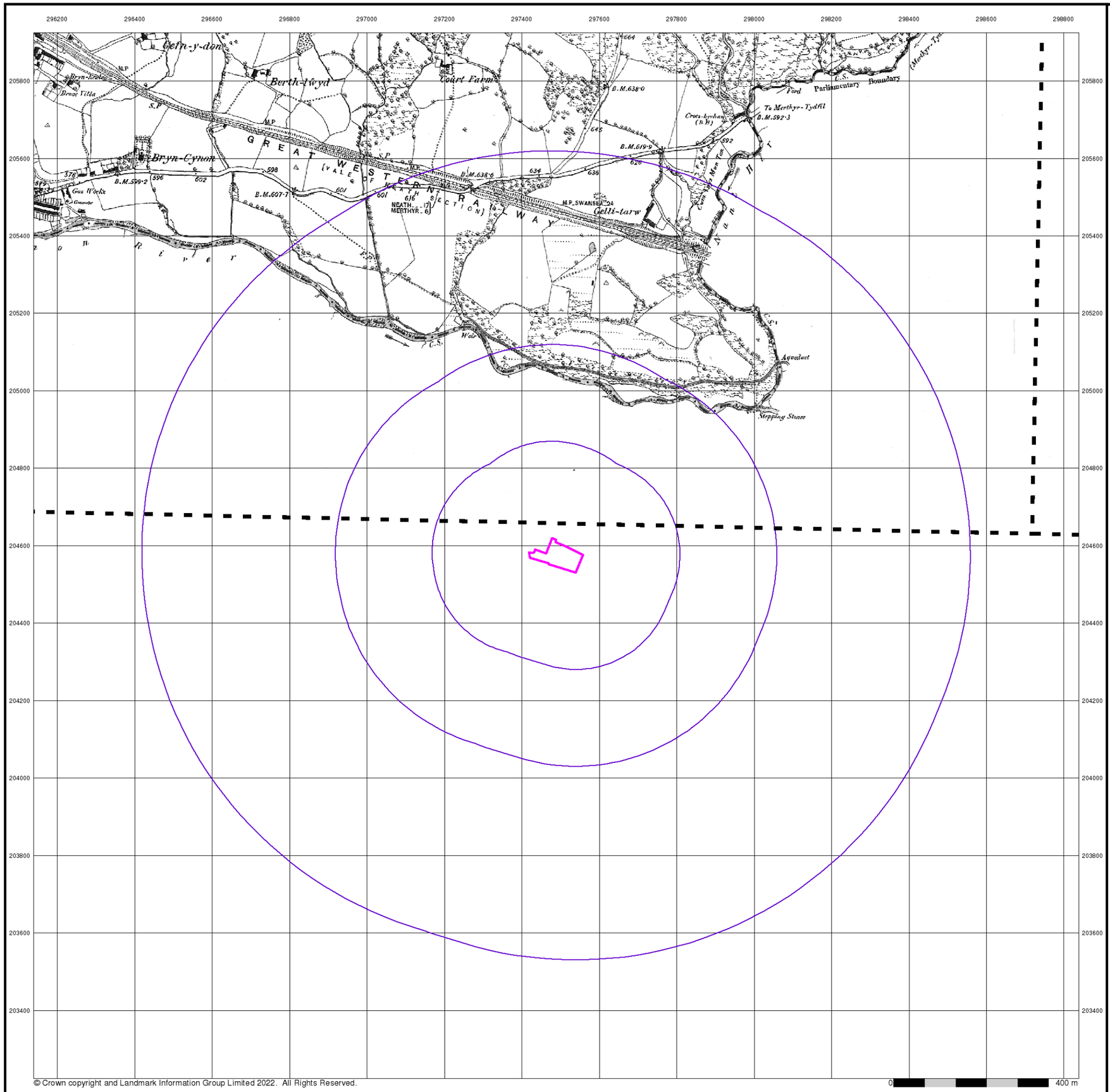

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Brecknockshire

Published 1884

Source map scale - 1:10,560

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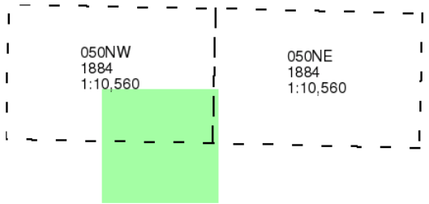
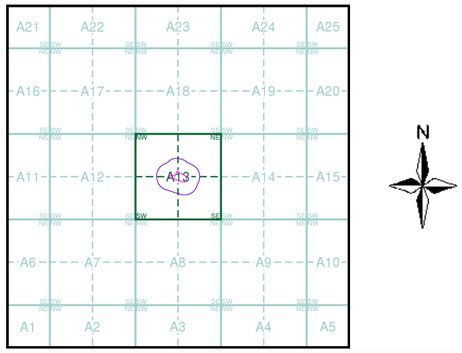
Map Name(s) and Date(s)



Historical Map - Slice A



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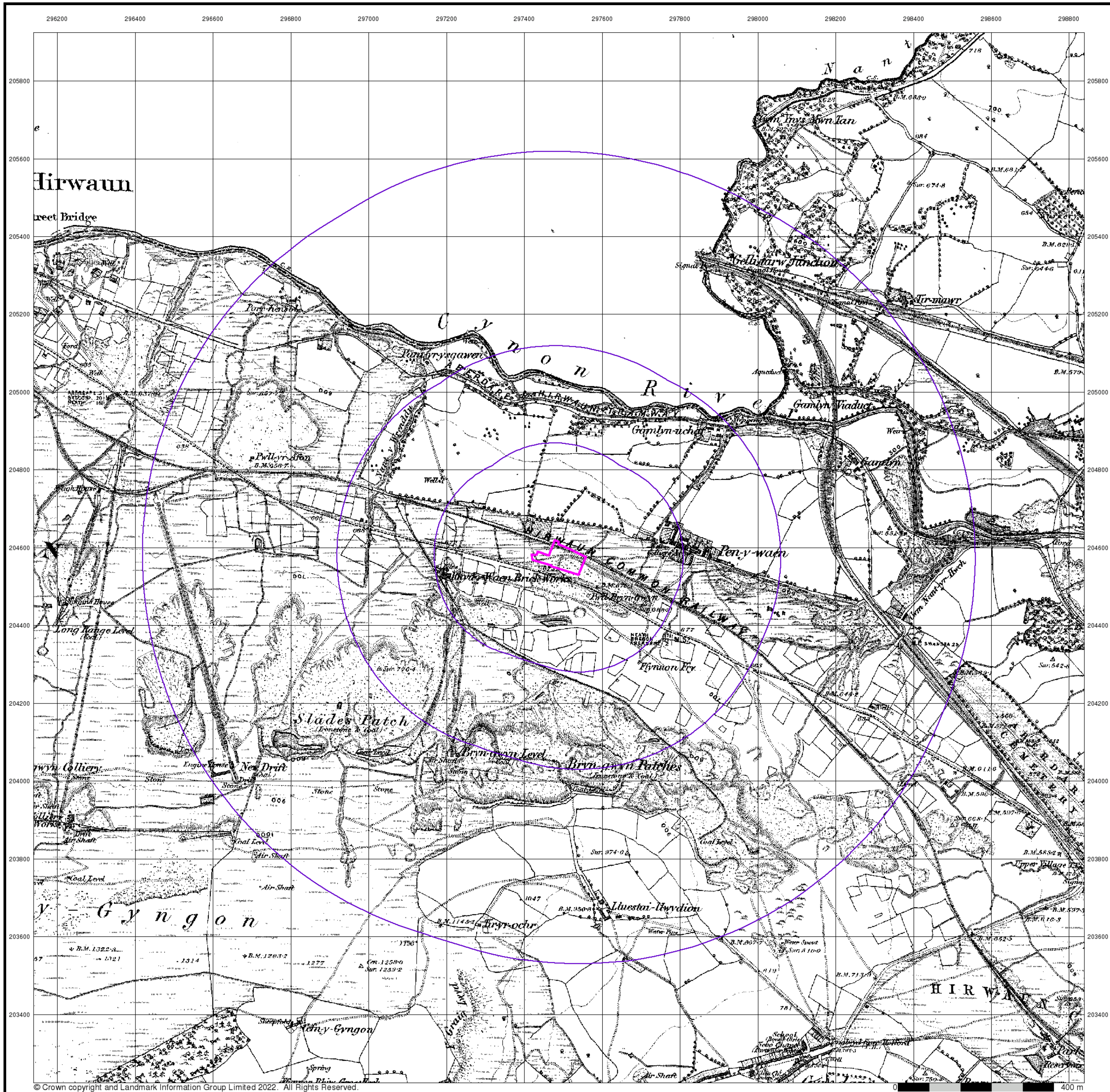

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Glamorganshire

Published 1885

Source map scale - 1:10,560

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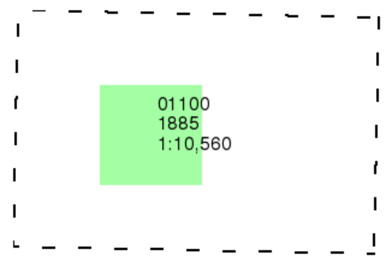
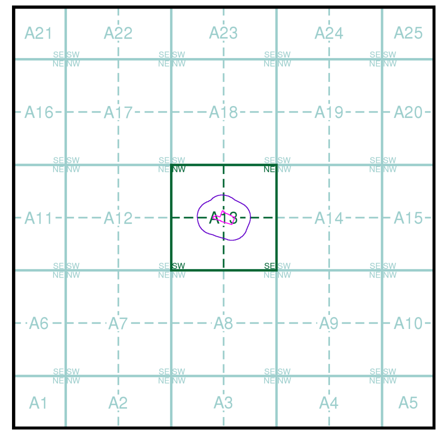


Historical Map - Slice A



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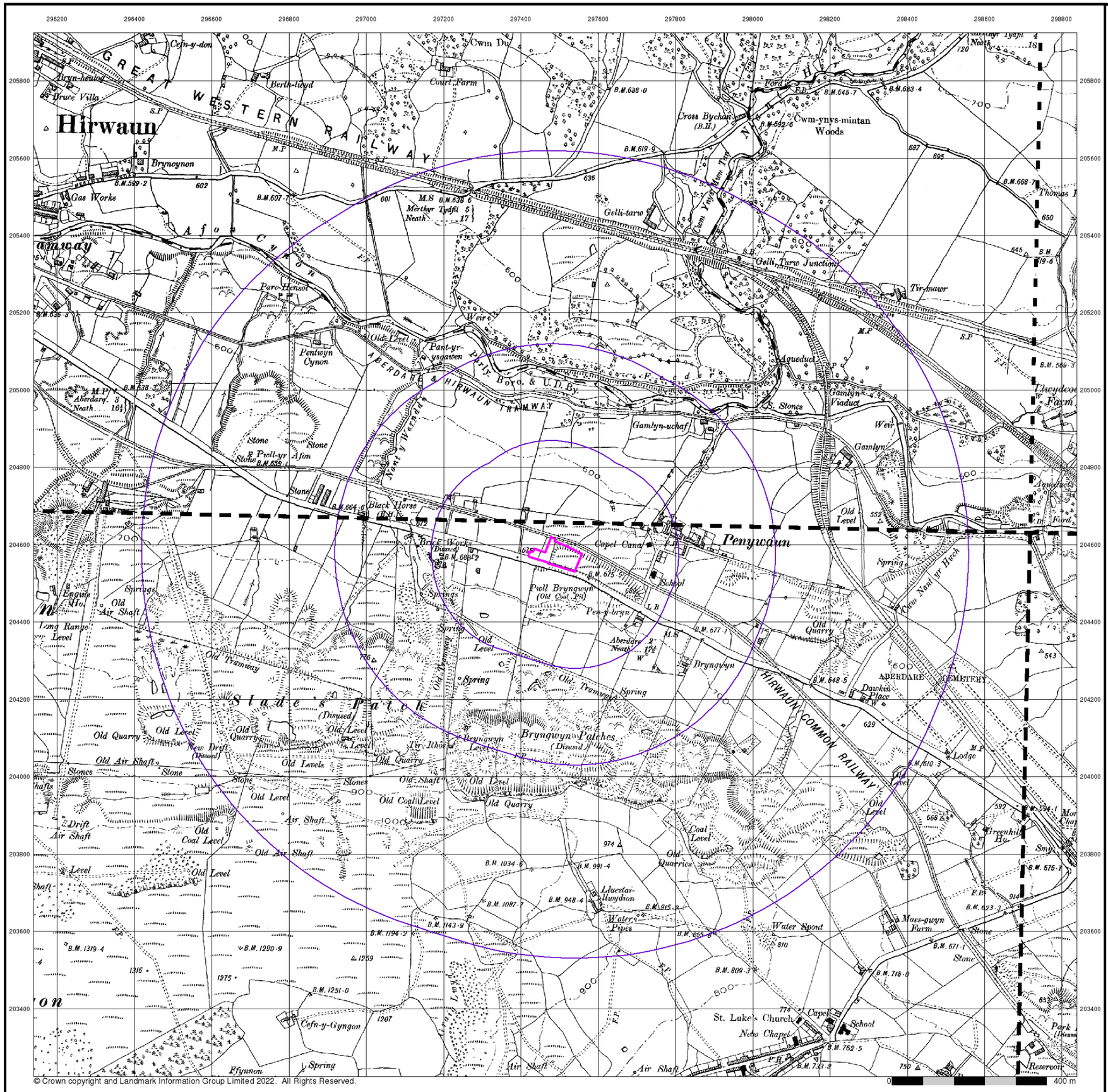

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Glamorganshire

Published 1900 - 1901

Source map scale - 1:10,560

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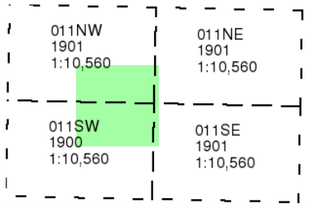
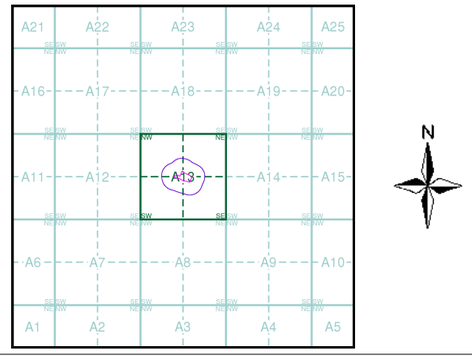
Map Name(s) and Date(s)



Historical Map - Slice A



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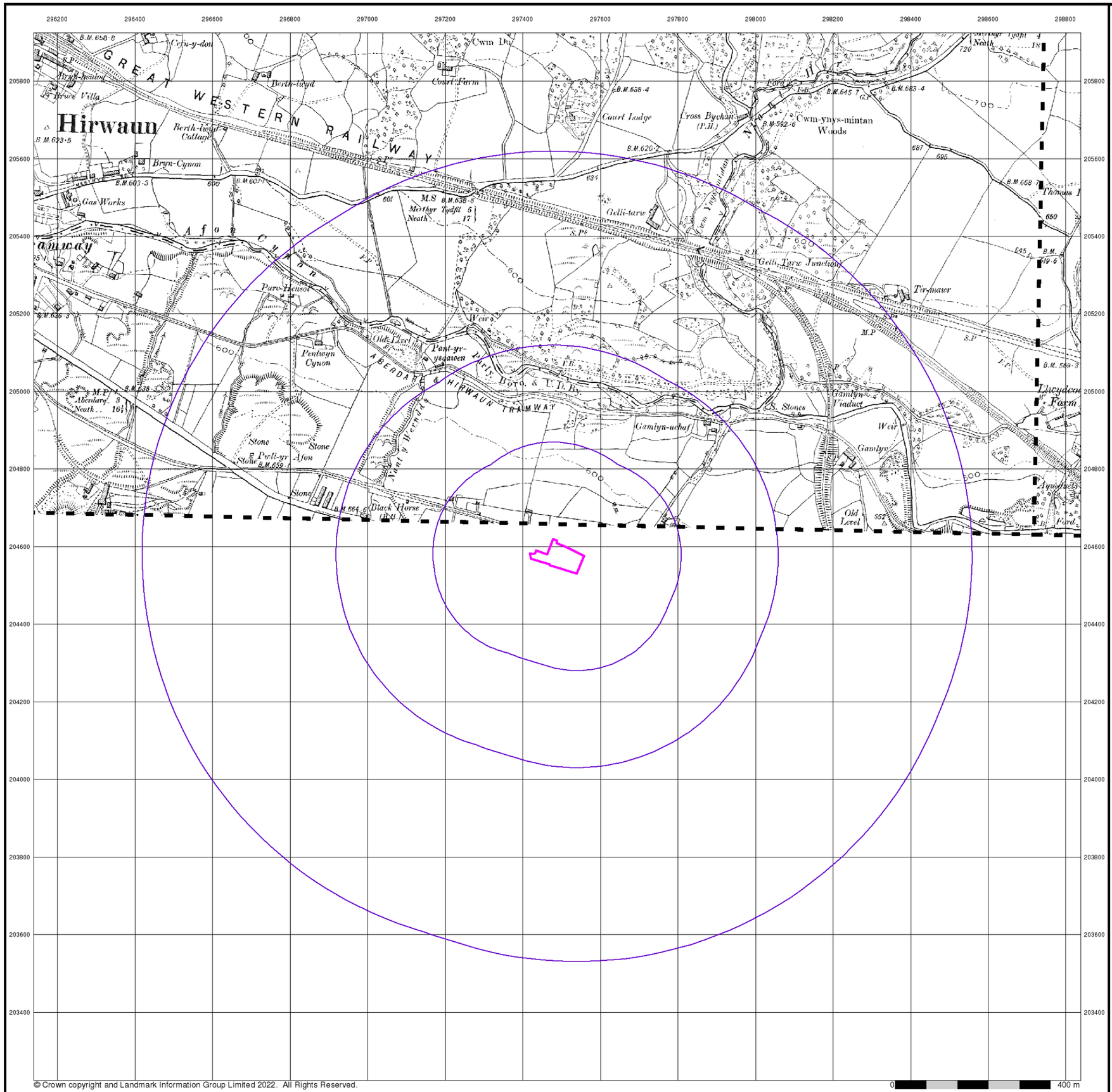

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Brecknockshire

Published 1905

Source map scale - 1:10,560

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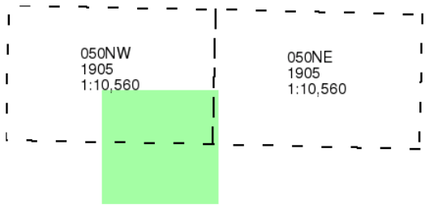
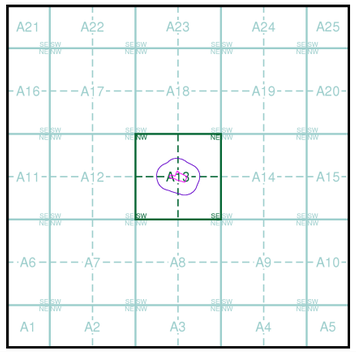


Historical Map - Slice A



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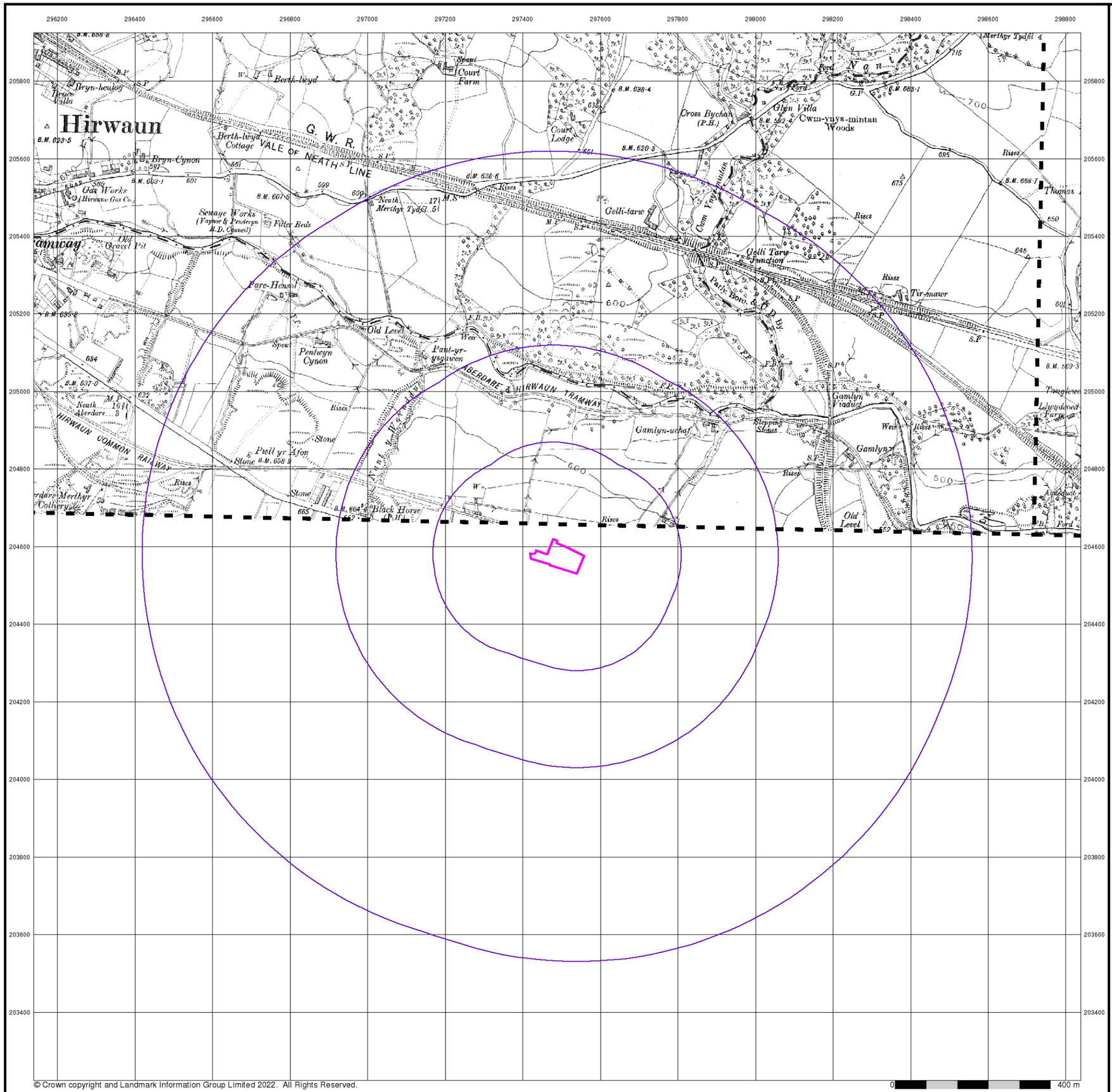

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Brecknockshire

Published 1921

Source map scale - 1:10,560

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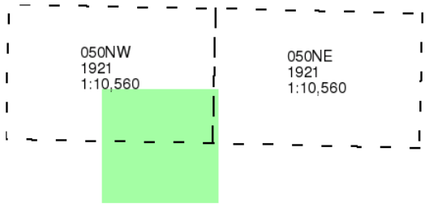
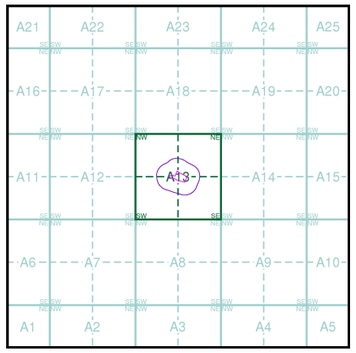
Map Name(s) and Date(s)



Historical Map - Slice A



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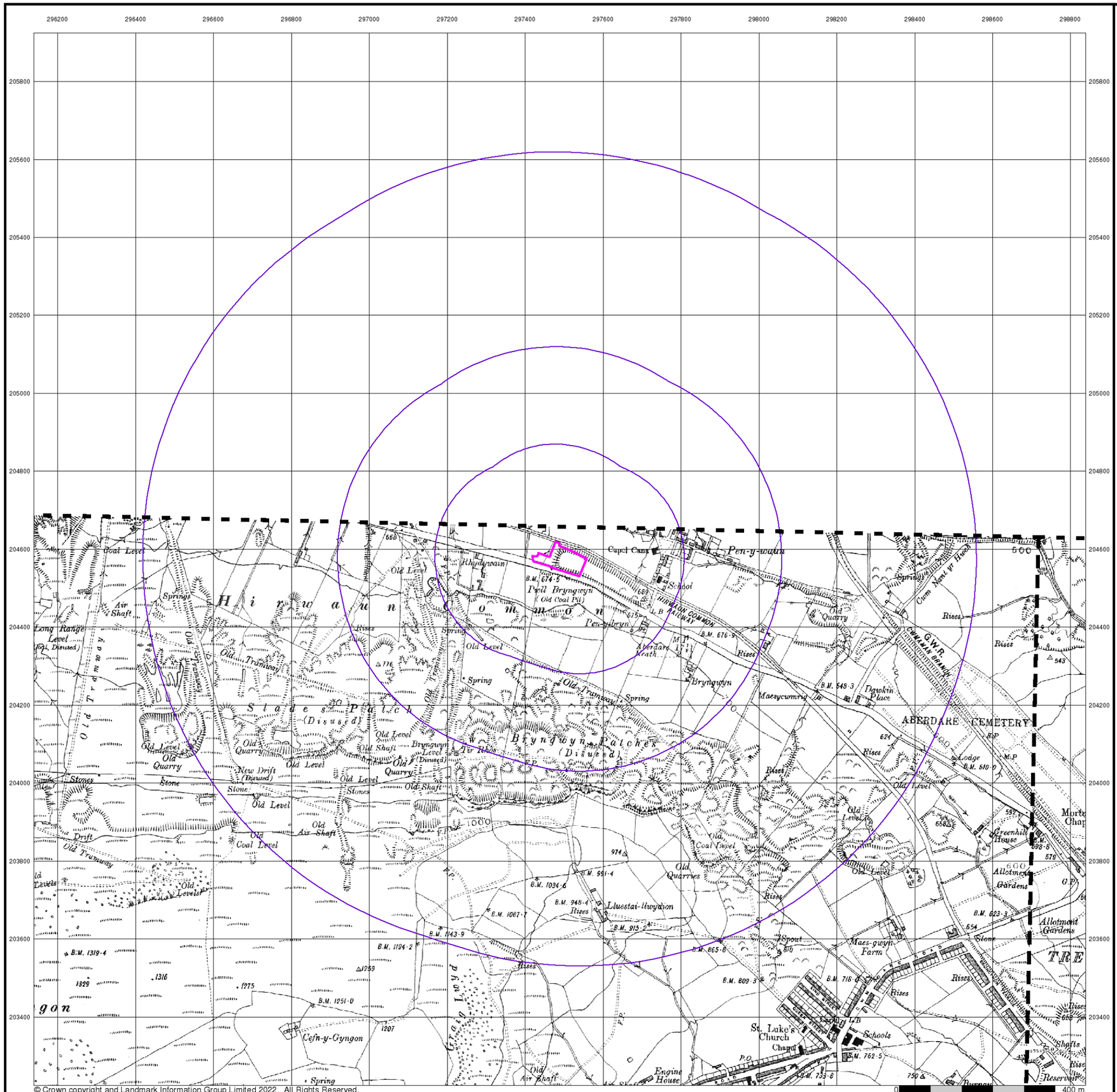

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Glamorganshire

Published 1921

Source map scale - 1:10,560

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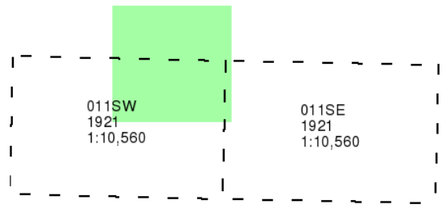
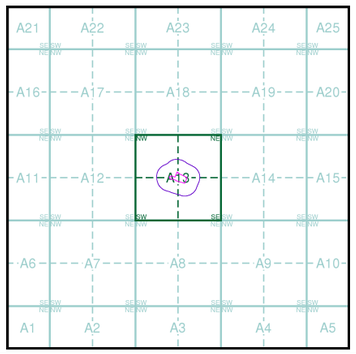
Map Name(s) and Date(s)



Historical Map - Slice A



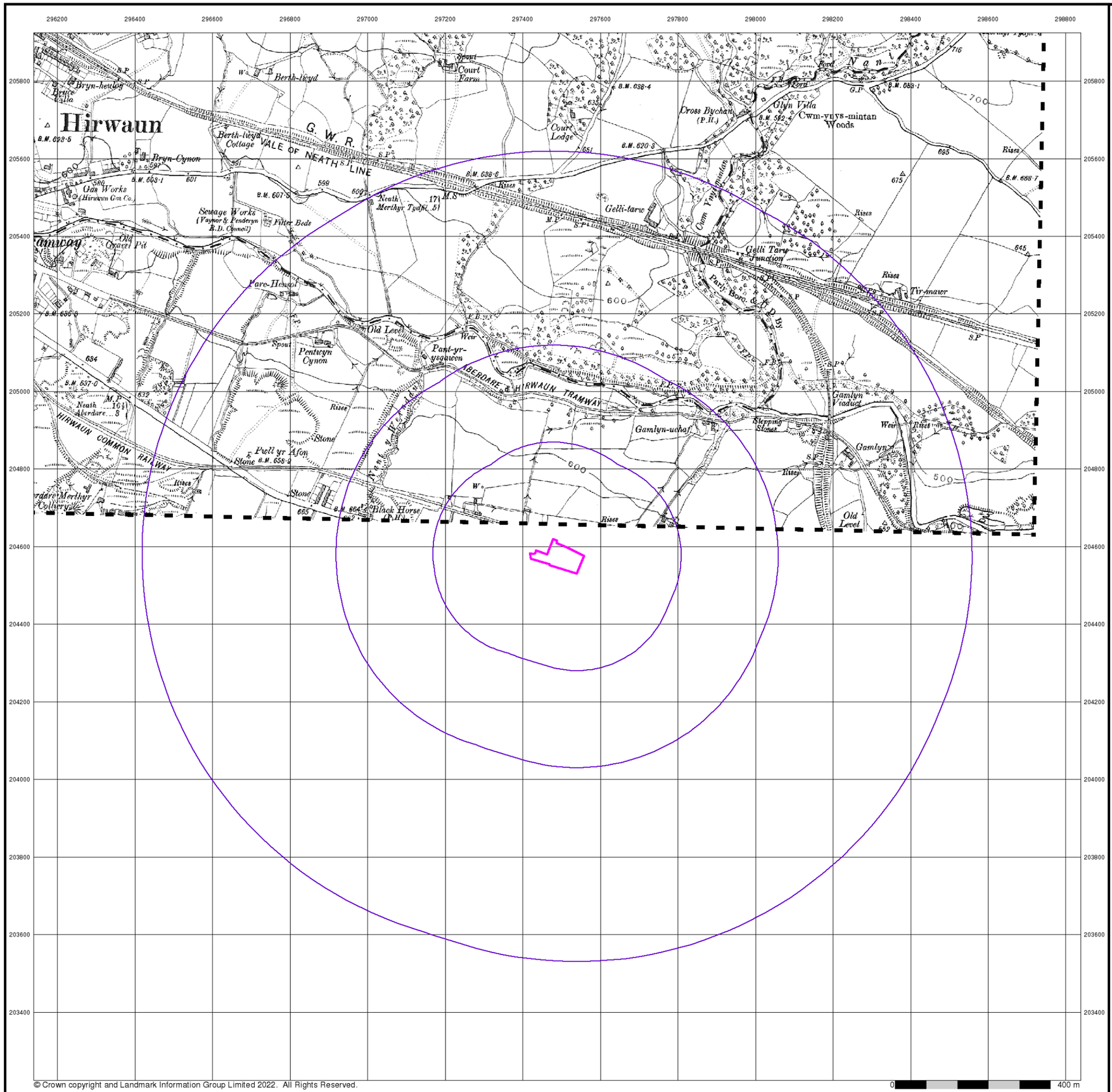
Order Details

Order Number:	304681434_1_1
Customer Ref:	17264TM Penywaun
National Grid Reference:	297490, 204570
Slice:	A
Site Area (Ha):	0.6
Search Buffer (m):	1000

Site Details

Penywaun, Aberdare, CF44 9EE

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



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Geotechnical & Geoenvironmental Specialists

Brecknockshire

Published 1921

Source map scale - 1:10,560

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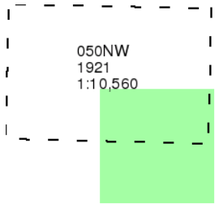
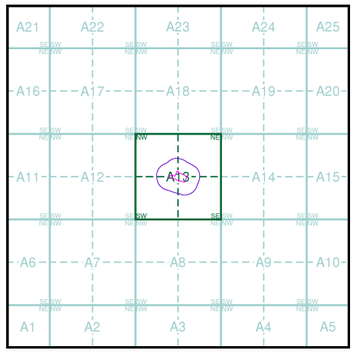
Map Name(s) and Date(s)



Historical Map - Slice A



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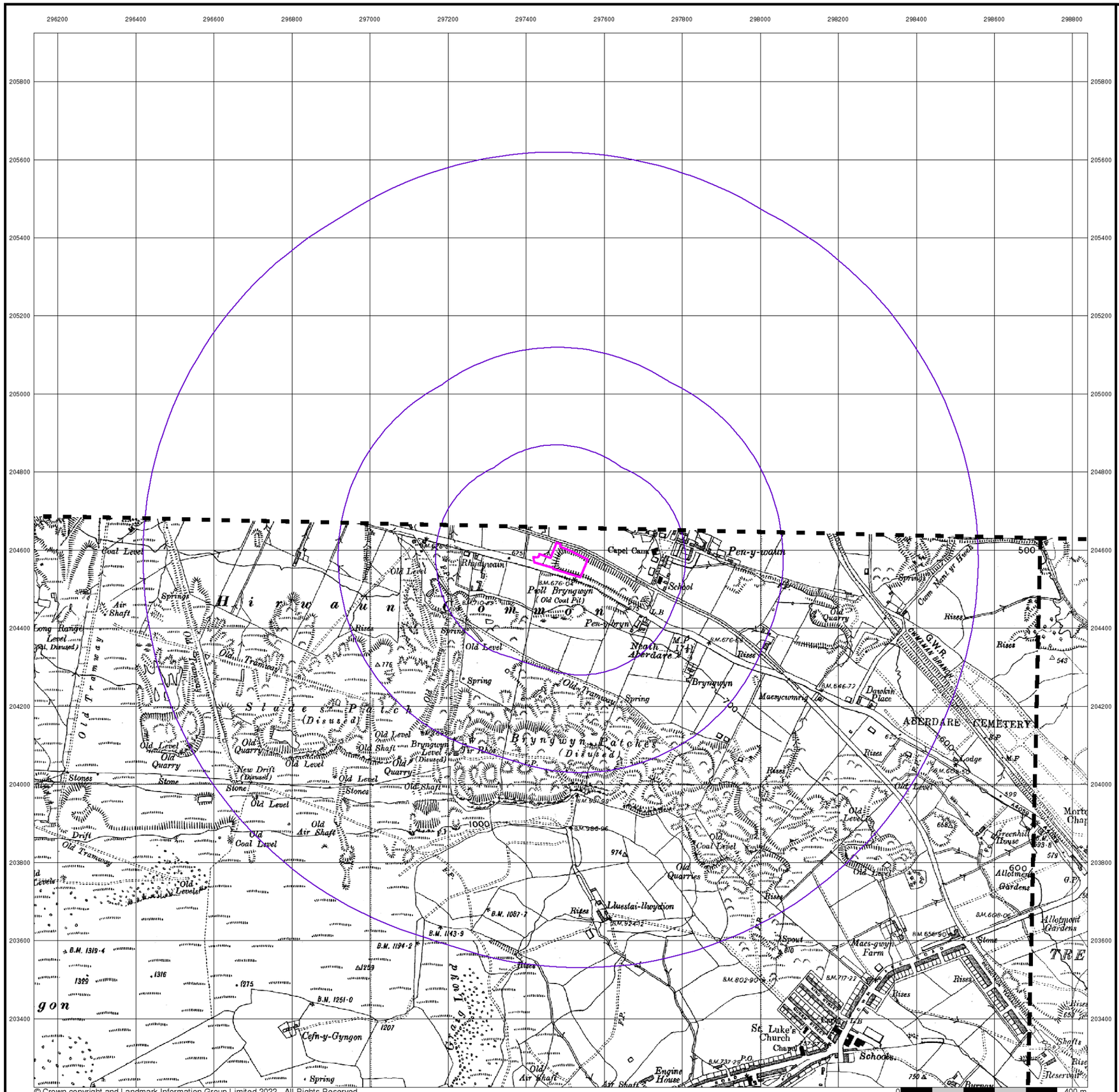

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Geotechnical & Geoenvironmental Specialists

Glamorganshire

Published 1938 - 1945

Source map scale - 1:10,560

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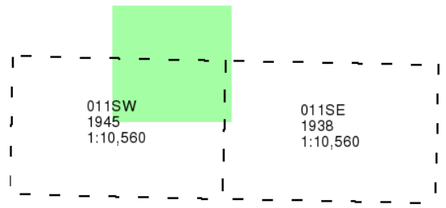
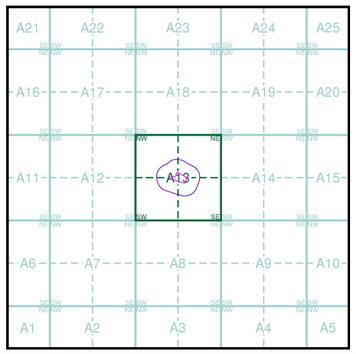
Map Name(s) and Date(s)



Historical Map - Slice A



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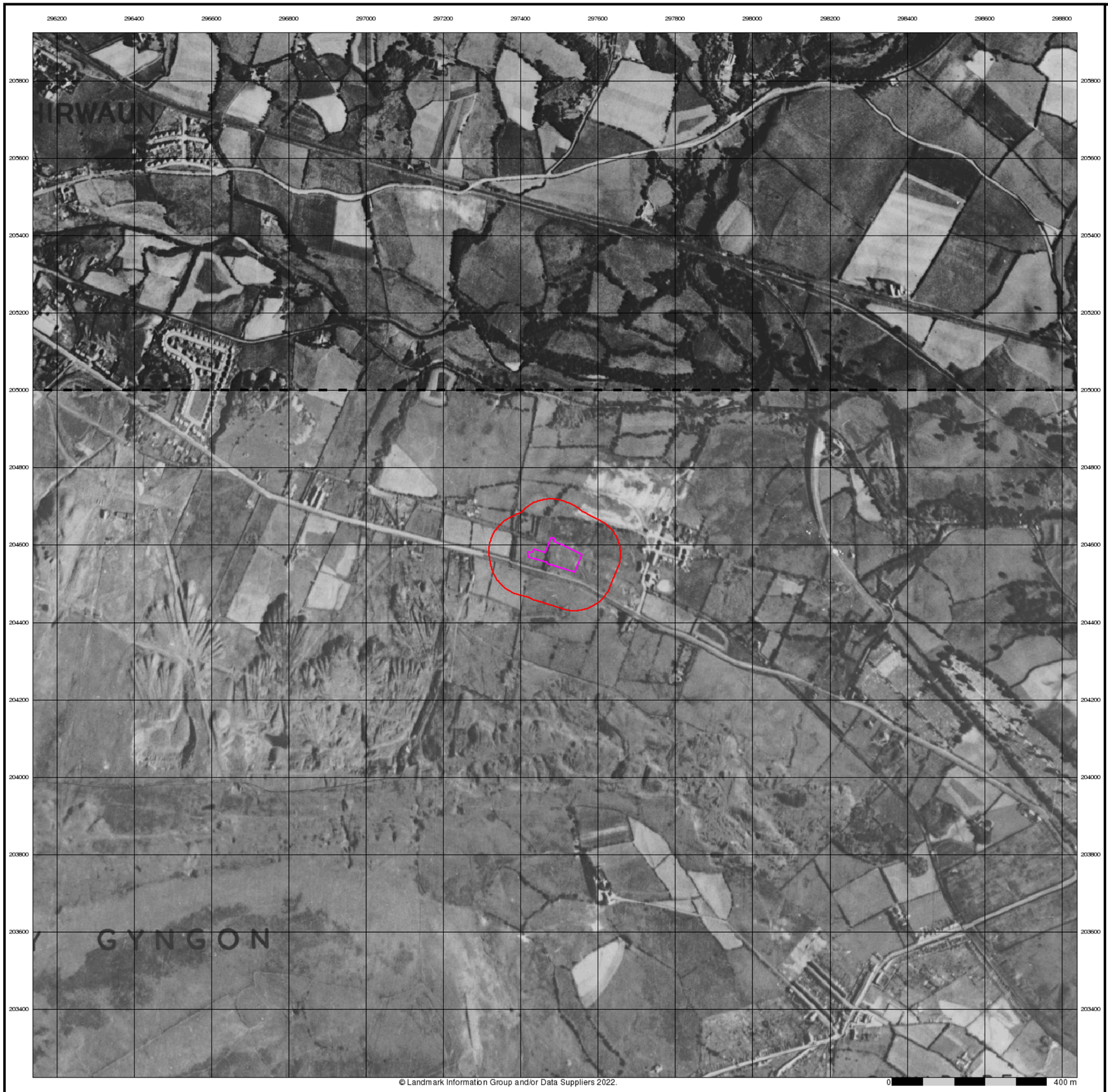

0 400 m

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Historical Aerial Photography

Published 1945

Source map scale - 1:10,560

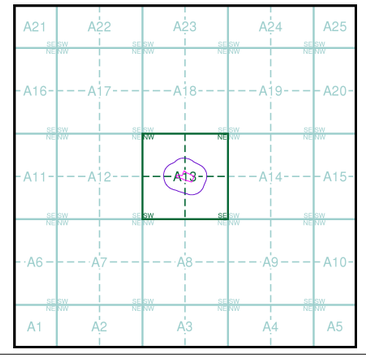
The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending preparation of conventional mapping, due to post war resource shortages. New security measures in the 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.

Map Name(s) and Date(s)

SN90NE
1945
1:10,560

SN90SE
1945
1:10,560

Historical Aerial Photography - Slice A



BRITISH LIBRARY

Order Details

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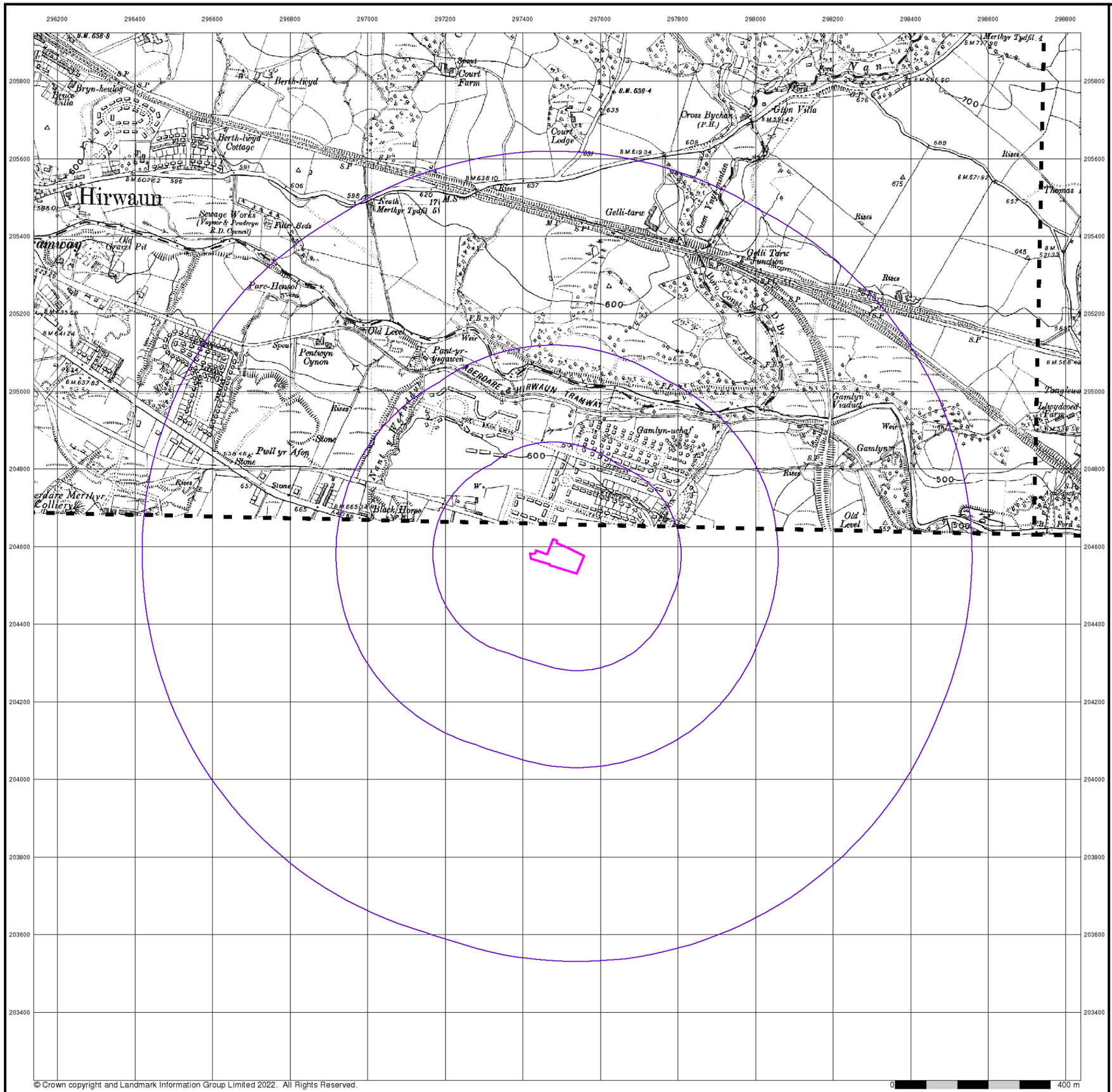

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Geotechnical & Geoenvironmental Specialists

Brecknockshire

Published 1951

Source map scale - 1:10,560

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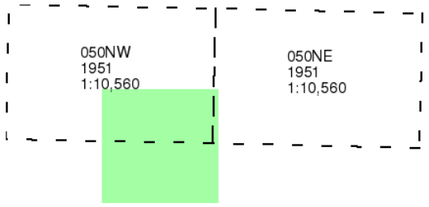
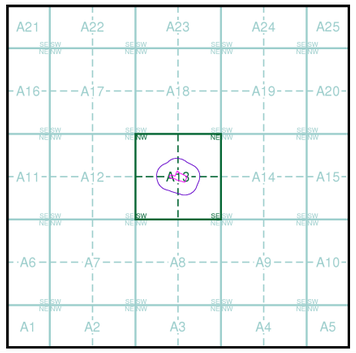
Map Name(s) and Date(s)



Historical Map - Slice A



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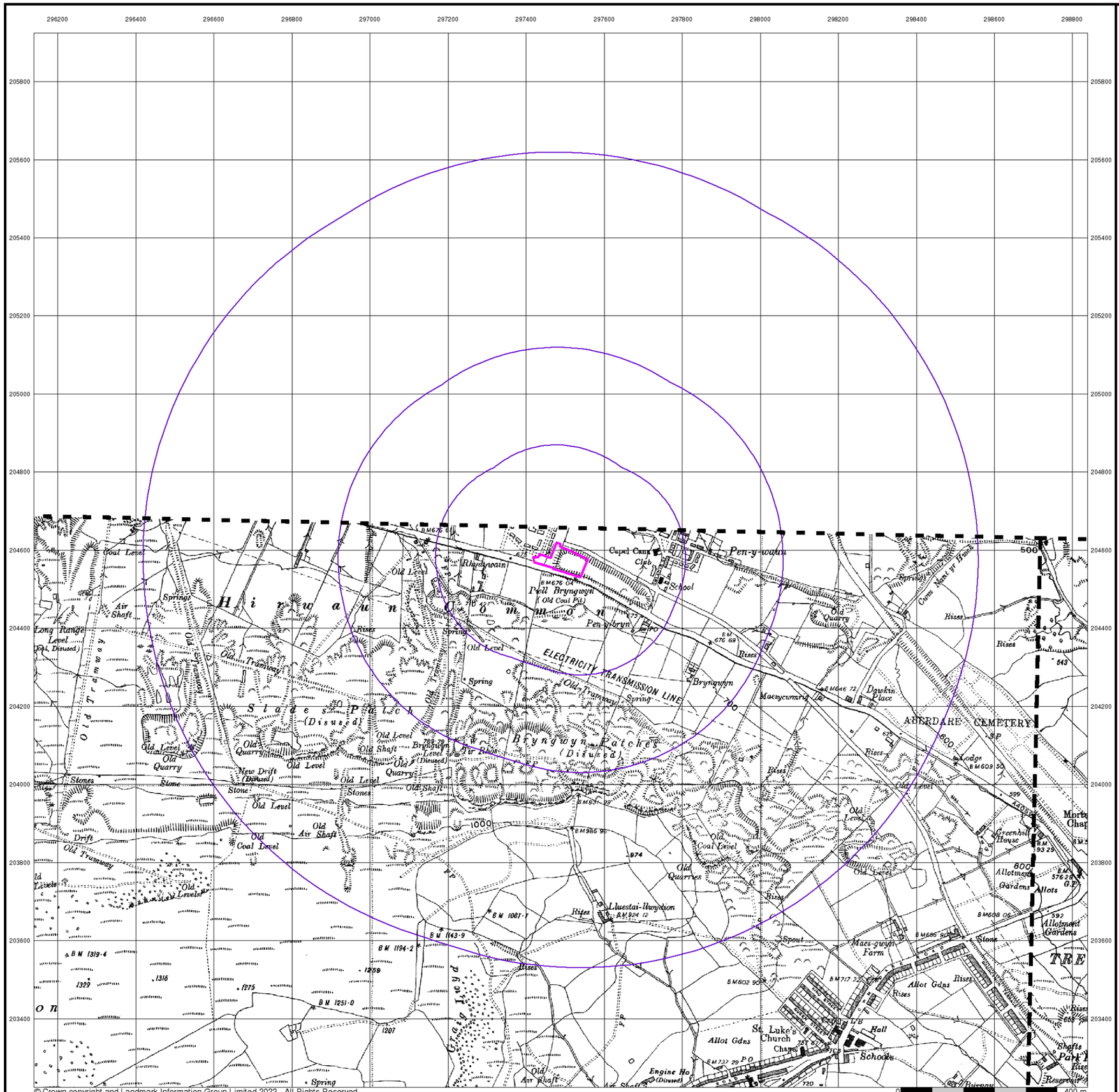

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Glamorganshire

Published 1951 - 1953

Source map scale - 1:10,560

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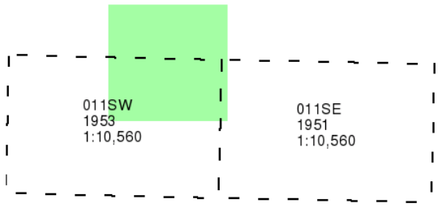
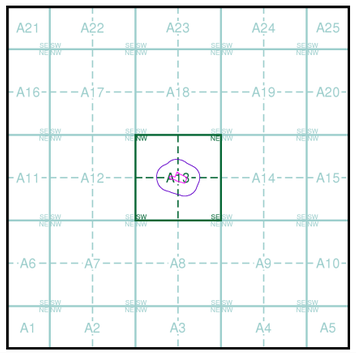


Historical Map - Slice A



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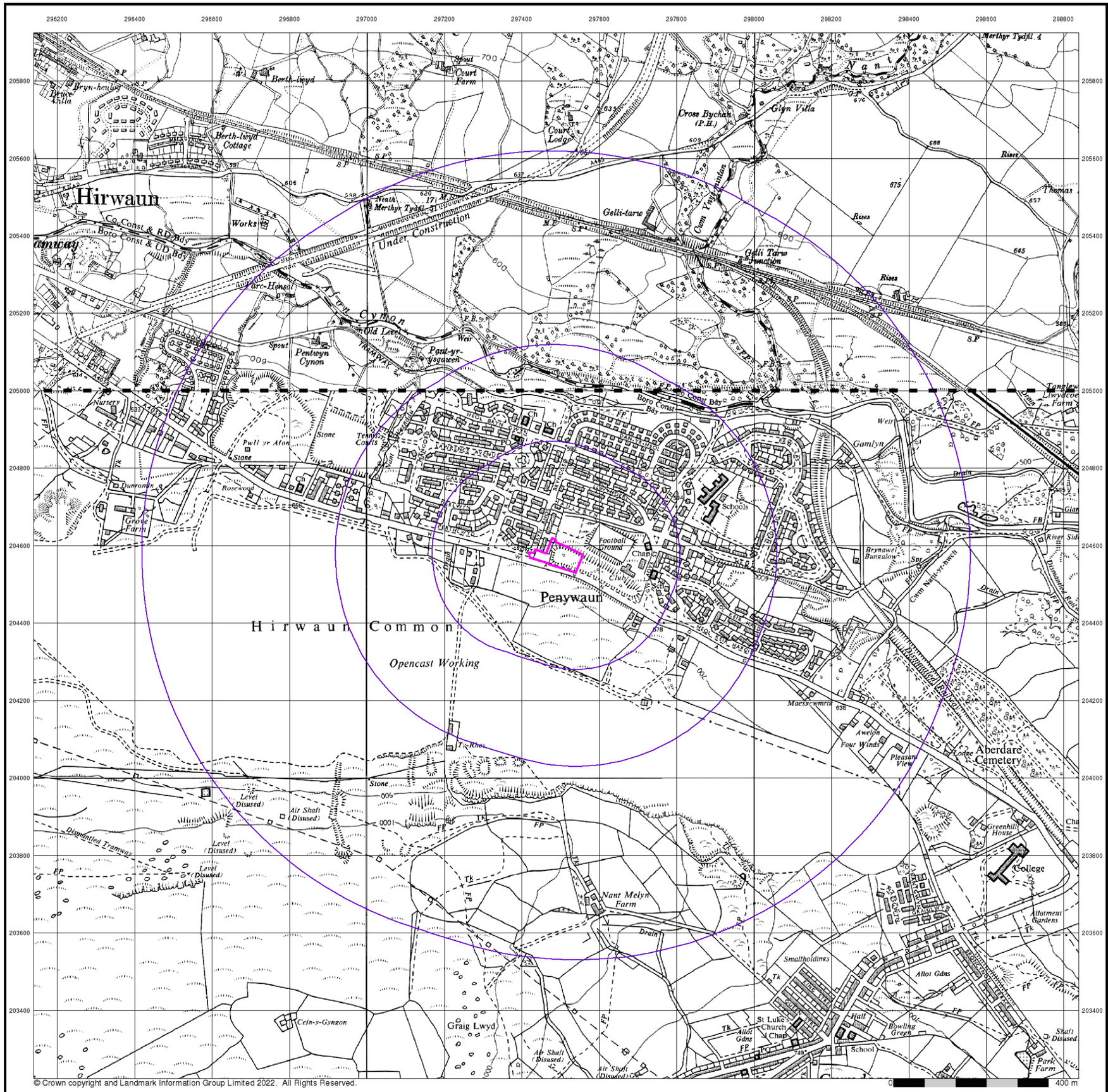

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Ordnance Survey Plan

Published 1964

Source map scale - 1:10,000

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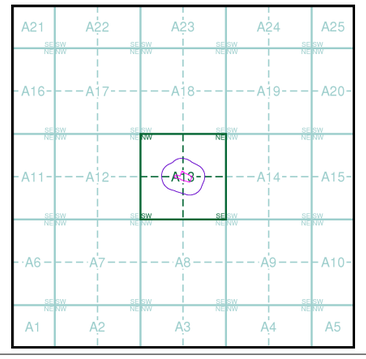
Map Name(s) and Date(s)

SN90NE
1964
1:10,560

SN90SE
1964
1:10,560

Historical Map - Slice A



Order Details

Order Number:	304681434_1_1
Customer Ref:	17264TM Penywaun
National Grid Reference:	297490, 204570
Slice:	A
Site Area (Ha):	0.6
Search Buffer (m):	1000

Site Details

Penywaun, Aberdare, CF44 9EE

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Tel: 0844 844 9952
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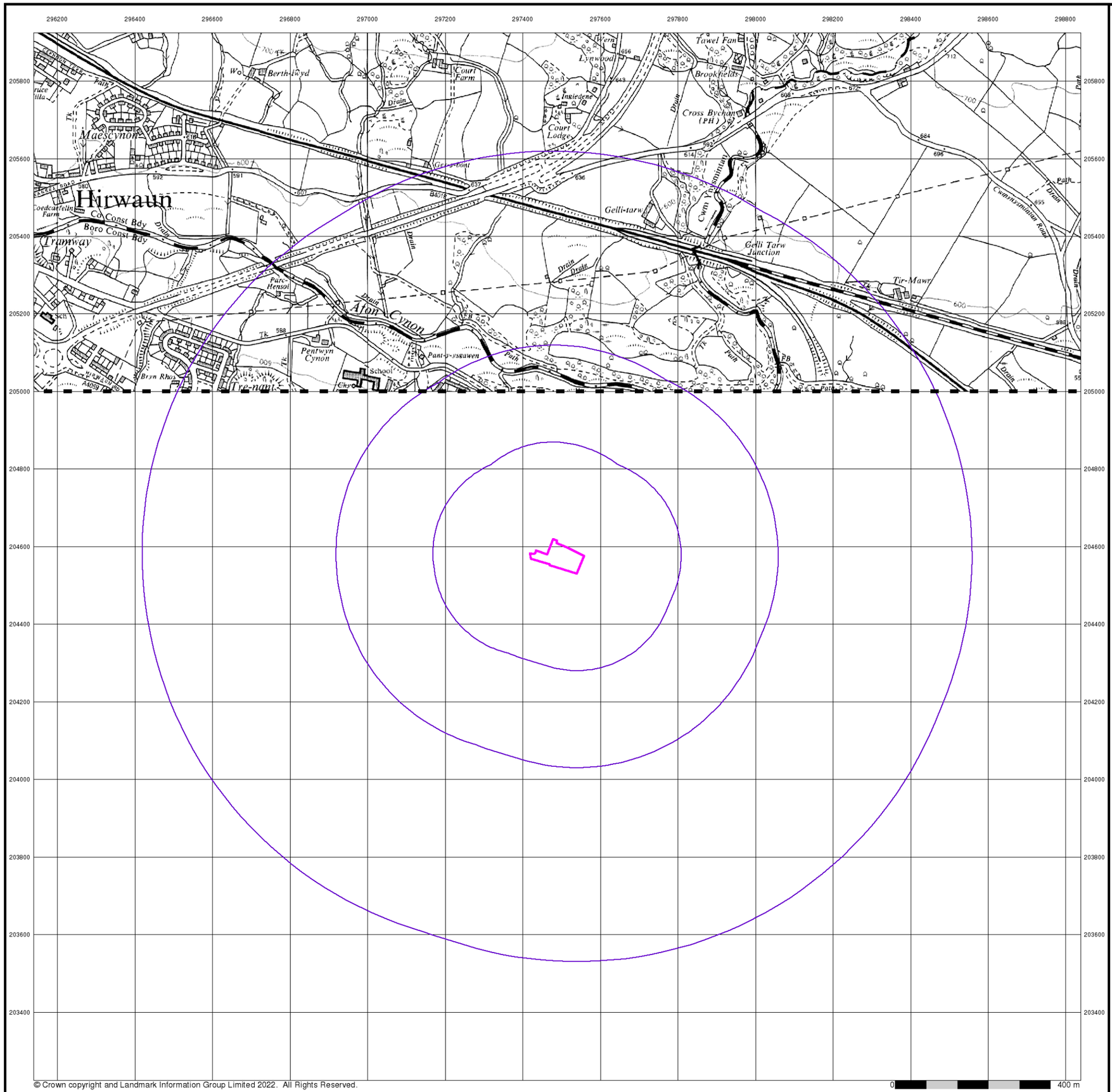

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Ordnance Survey Plan

Published 1968

Source map scale - 1:10,000

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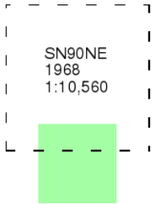
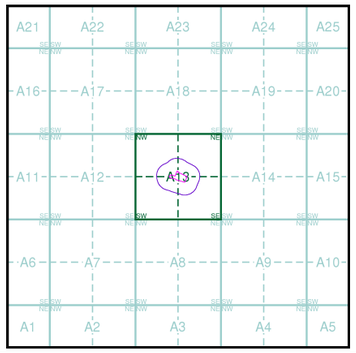
Map Name(s) and Date(s)



Historical Map - Slice A



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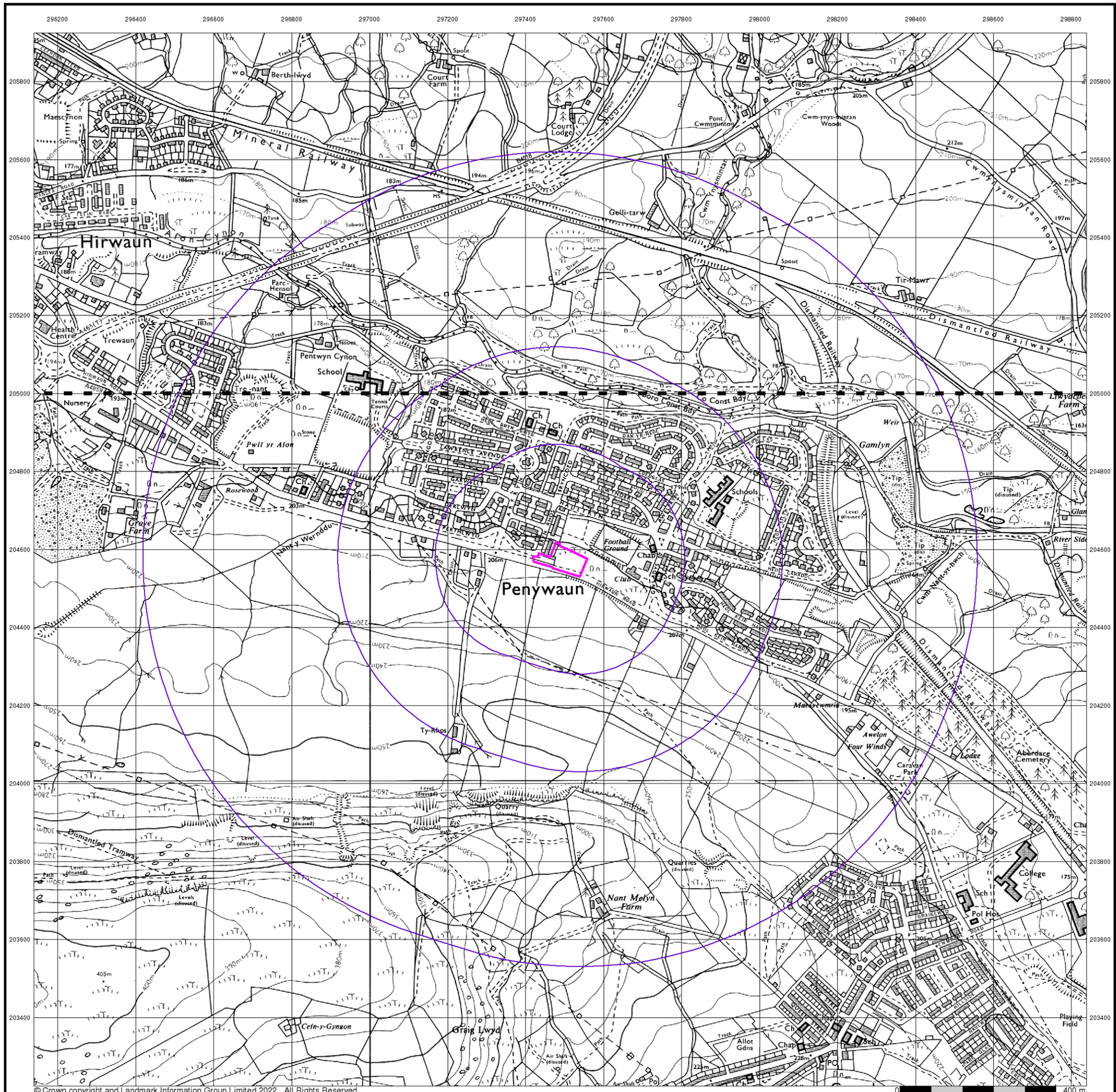

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Ordnance Survey Plan

Published 1978

Source map scale - 1:10,000

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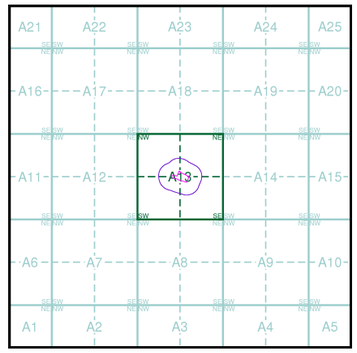
Map Name(s) and Date(s)

SN90NE
1978
1:10,000

SN90SE
1978
1:10,000

Historical Map - Slice A



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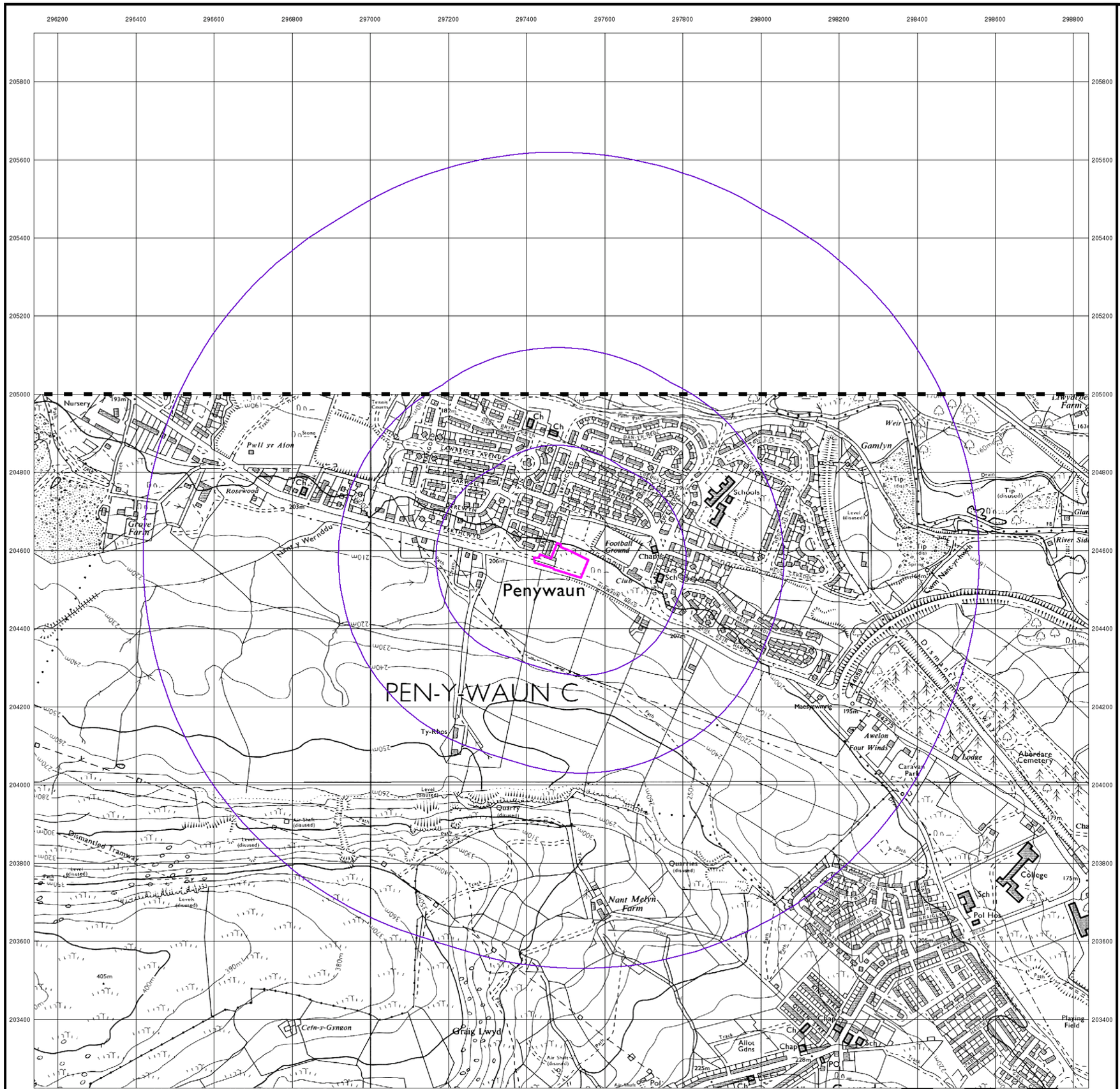

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Ordnance Survey Plan

Published 1990

Source map scale - 1:10,000

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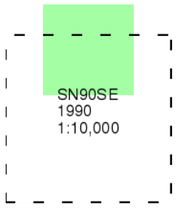
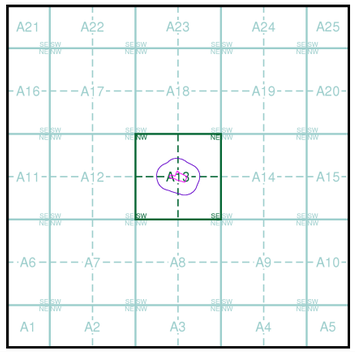
Map Name(s) and Date(s)



Historical Map - Slice A



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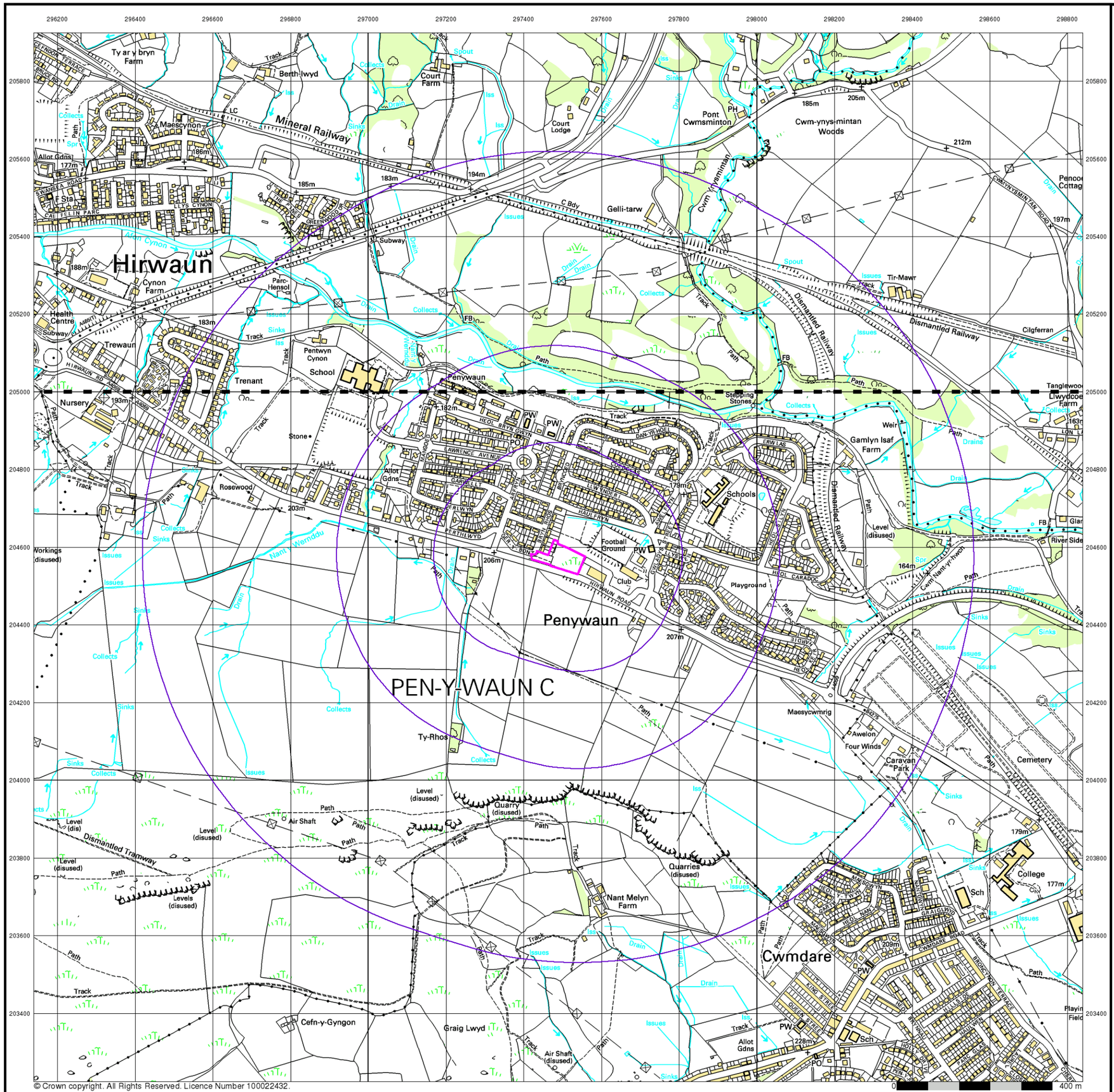

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10k Raster Mapping

Published 1999

Source map scale - 1:10,000

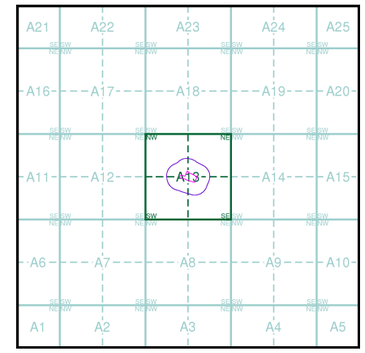
The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks 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)

SN90NE
1999
1:10,000

SN90SE
1999
1:10,000

Historical Map - Slice A



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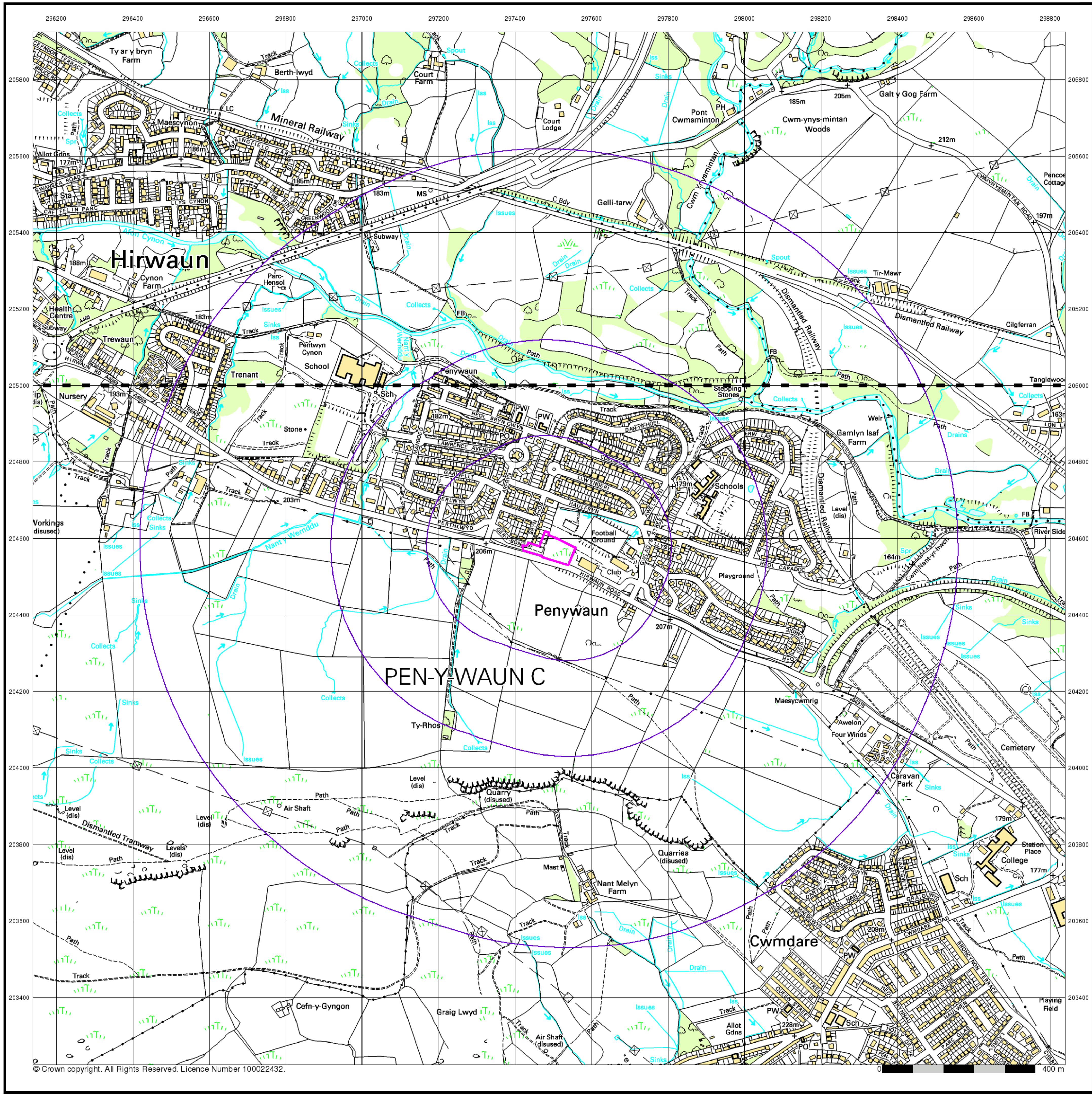

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Geotechnical & Geoenvironmental Specialists

10k Raster Mapping

Published 2006

Source map scale - 1:10,000

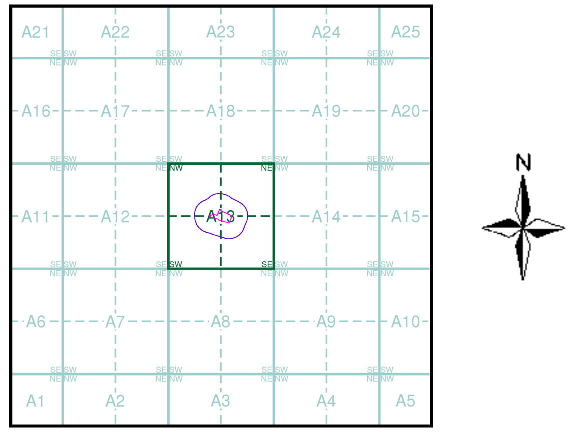
The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks 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)

SN90NE
2006
1:10,000

SN90SE
2006
1:10,000

Historical Map - Slice A



Order Details

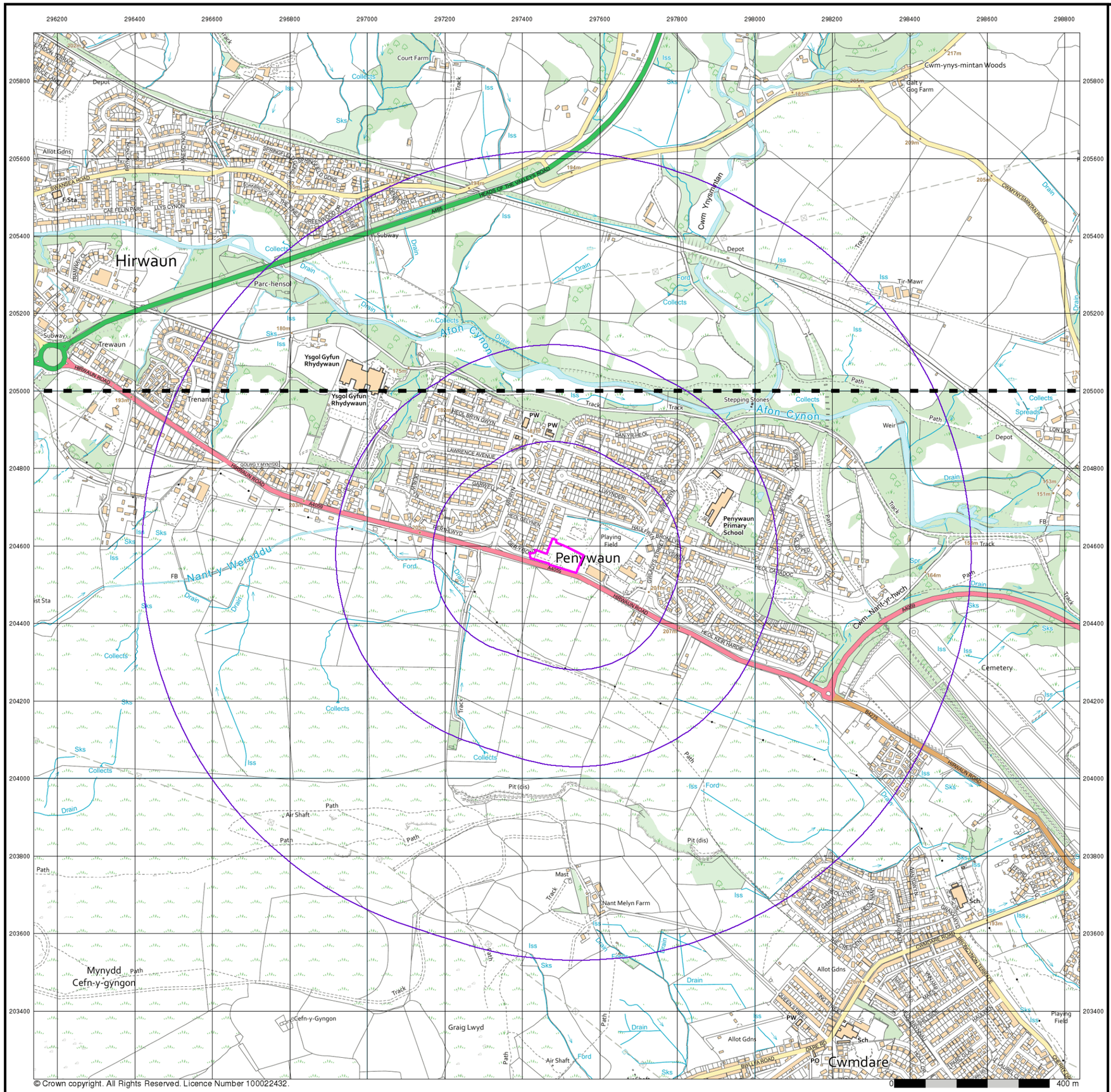
Order Number: 304681434_1_1
Customer Ref: 17264TM Penywaun
National Grid Reference: 297490, 204570
Slice: A
Site Area (Ha): 0.6
Search Buffer (m): 1000

Site Details

Penywaun, Aberdare, CF44 9EE

Landmark INFORMATION GROUP

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



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VectorMap Local

Published 2022

Source map scale - 1:10,000

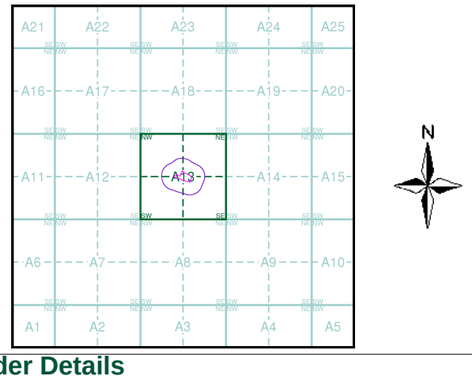
VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap 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)

SN90NE 2022 Variable

SN90SE 2022 Variable

Historical Map - Slice A



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Geology 1:50,000 Maps Legends

Artificial Ground and Landslip

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	WGR	Worked Ground (Undivided)	Void	Not Supplied - Holocene
	MGR	Made Ground (Undivided)	Artificial Deposit	Not Supplied - Holocene
	SLIP	Landslide Deposit	Unknown/Unclassified Entry	Not Supplied - Quaternary

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	ALV	Alluvium	Clay, Silt, Sand and Gravel	Not Supplied - Holocene
	TILLD	Till, Devensian	Diamicton	Not Supplied - Devensian
	PEAT	Peat	Peat	Not Supplied - Quaternary

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	SWUCM	South Wales Upper Coal Measures Formation	Mudstone, Siltstone and Sandstone	Not Supplied - Westphalian
	LLFB	Llynfi Member	Sandstone	Not Supplied - Westphalian
	LLFB	Llynfi Member	Mudstone, Siltstone and Sandstone	Not Supplied - Westphalian
	RA	Rhondda Member	Sandstone	Not Supplied - Westphalian
	SWMCM	South Wales Middle Coal Measures Formation	Mudstone, Siltstone and Sandstone	Not Supplied - Westphalian
	SWMCM	South Wales Middle Coal Measures Formation	Sandstone	Not Supplied - Westphalian
	SWLCM	South Wales Lower Coal Measures Formation	Mudstone, Siltstone and Sandstone	Not Supplied - Westphalian
	BISHM	Bishopston Mudstone Formation	Mudstone, Siltstone and Sandstone	Not Supplied - Namurian
		Rock Segments		
		Faults		

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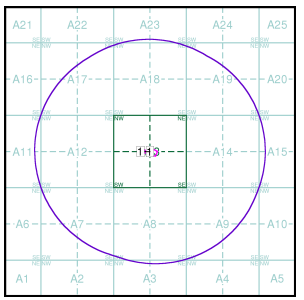
Geology 1:50,000 Maps

This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published paper maps.
The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page. Not all layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:50,000 Maps Coverage

Map ID: 1
Map Sheet No: 231
Map Name: Merthyr Tydfil
Map Date: 1979
Bedrock Geology: Available
Superficial Geology: Available
Artificial Geology: Available
Faults: Not Supplied
Landslip: Available
Rock Segments: Not Supplied

Geology 1:50,000 Maps - Slice A



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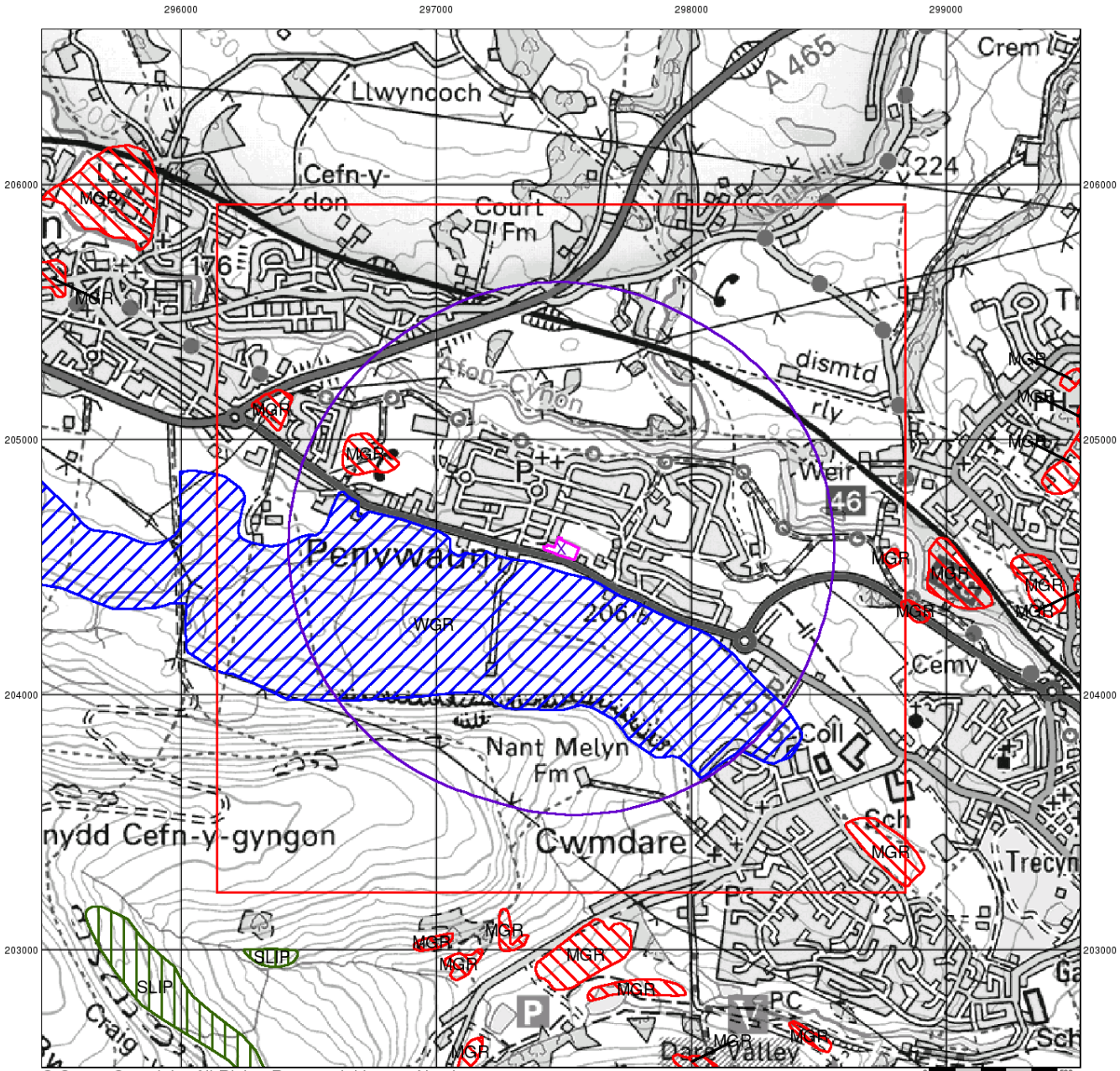

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Artificial Ground and Landslip

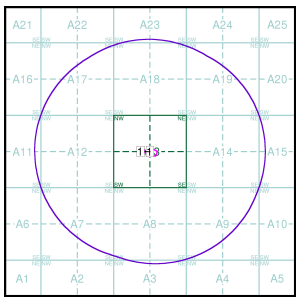
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground - man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground - areas where the ground has been cut away such as quarries and road cuttings.
- Infilled ground - areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground - areas where the surface has been reshaped.
- Disturbed ground - areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes foundered strata, where the ground has collapsed due to subsidence.

Artificial Ground and Landslip Map - Slice A



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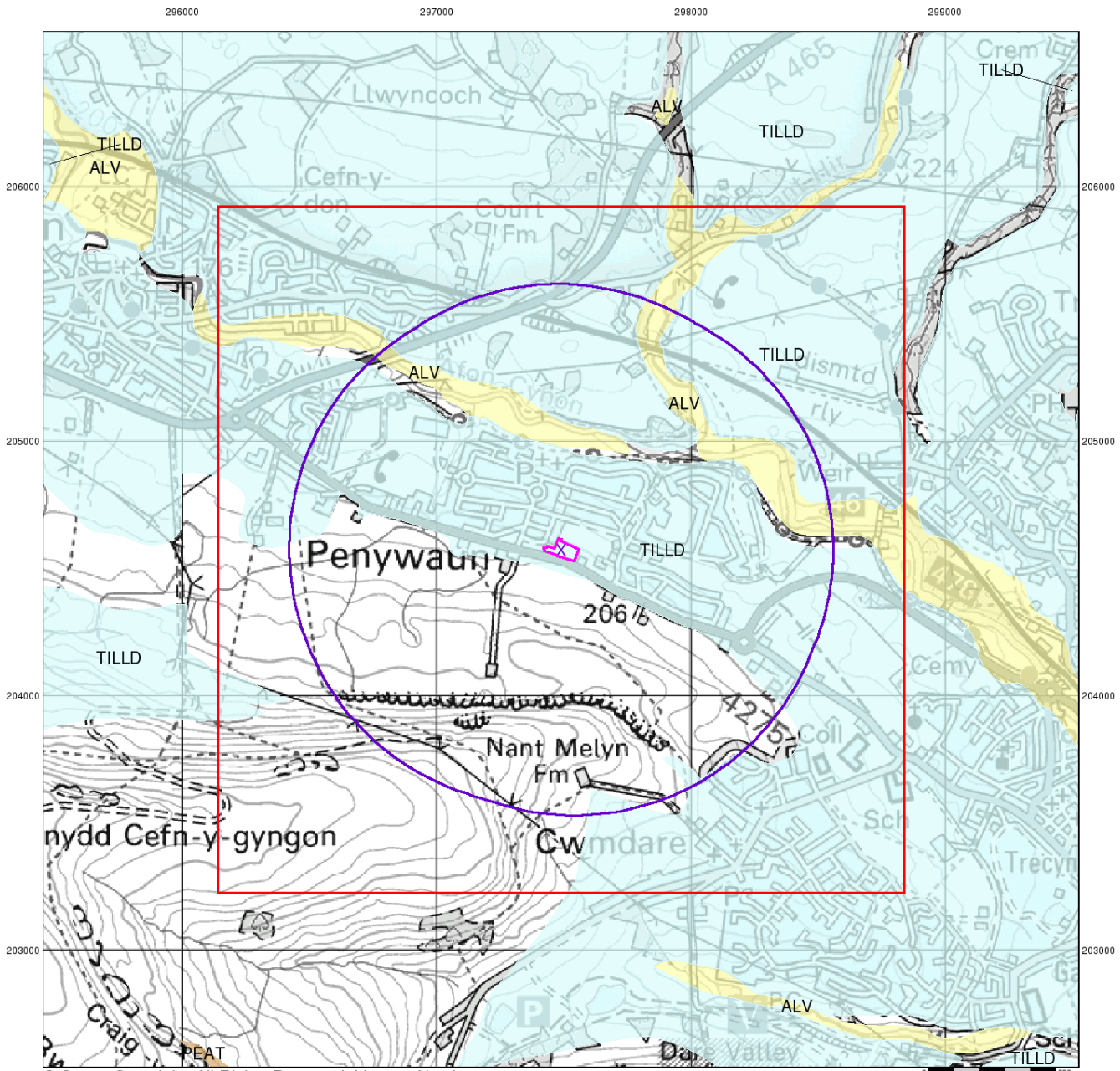

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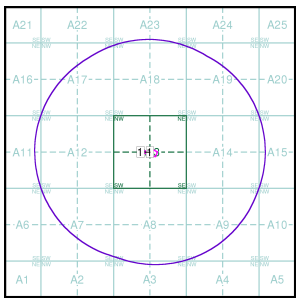
Superficial Geology

Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

Superficial Geology Map - Slice A



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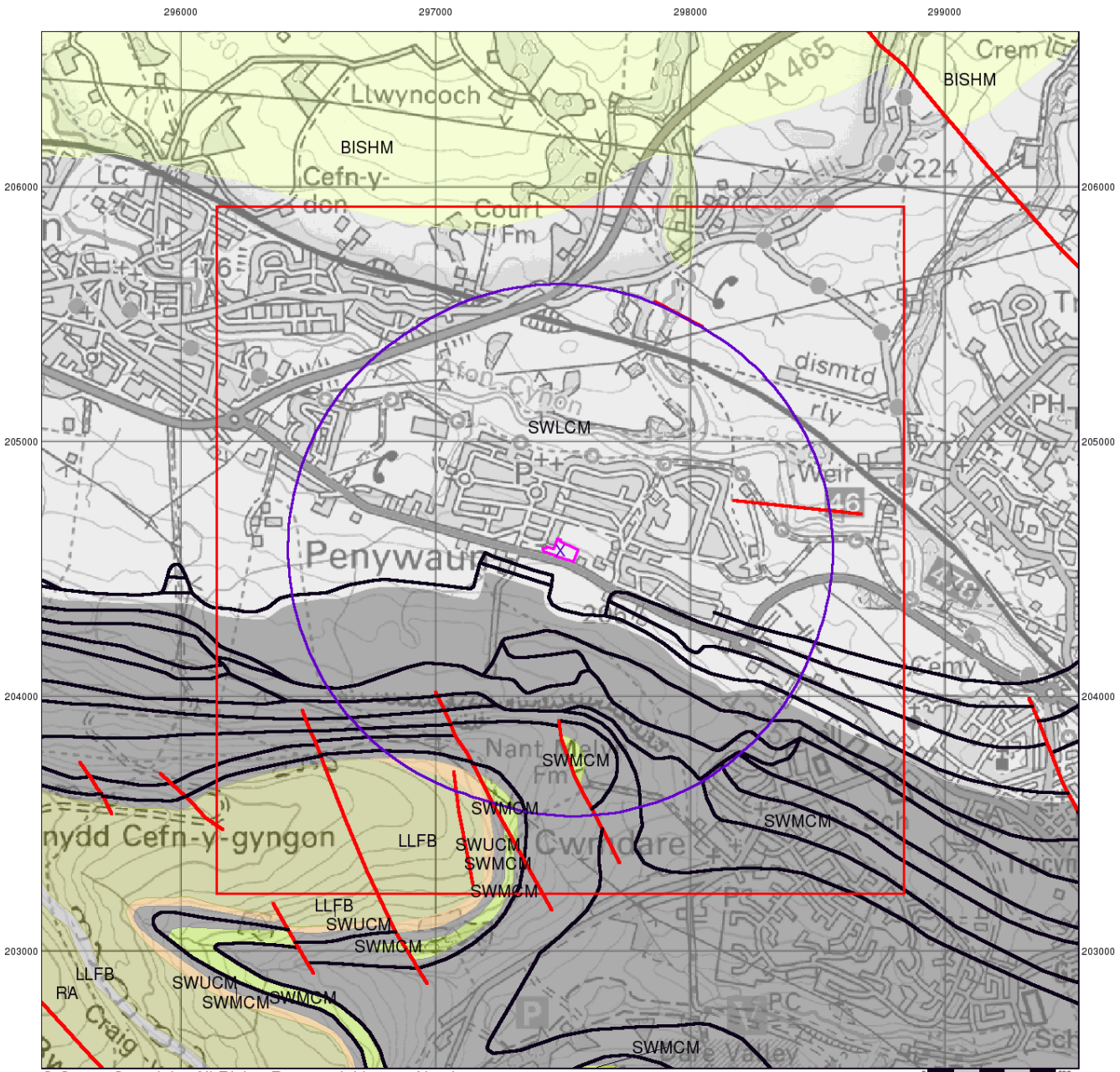

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Bedrock and Faults

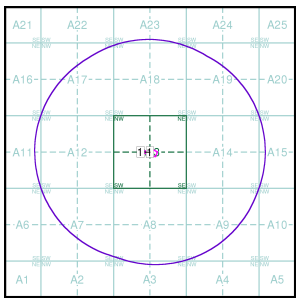
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults (e.g. normal, thrust), and thin beds mapped as lines (e.g. coal seam, gypsum bed). Some of these are linked to other particular 1:50,000 Geology datasets, for example, coal seams are part of the bedrock sequence, most faults and mineral veins primarily affect the bedrock but cut across the strata and post date its deposition.

Bedrock and Faults Map - Slice A



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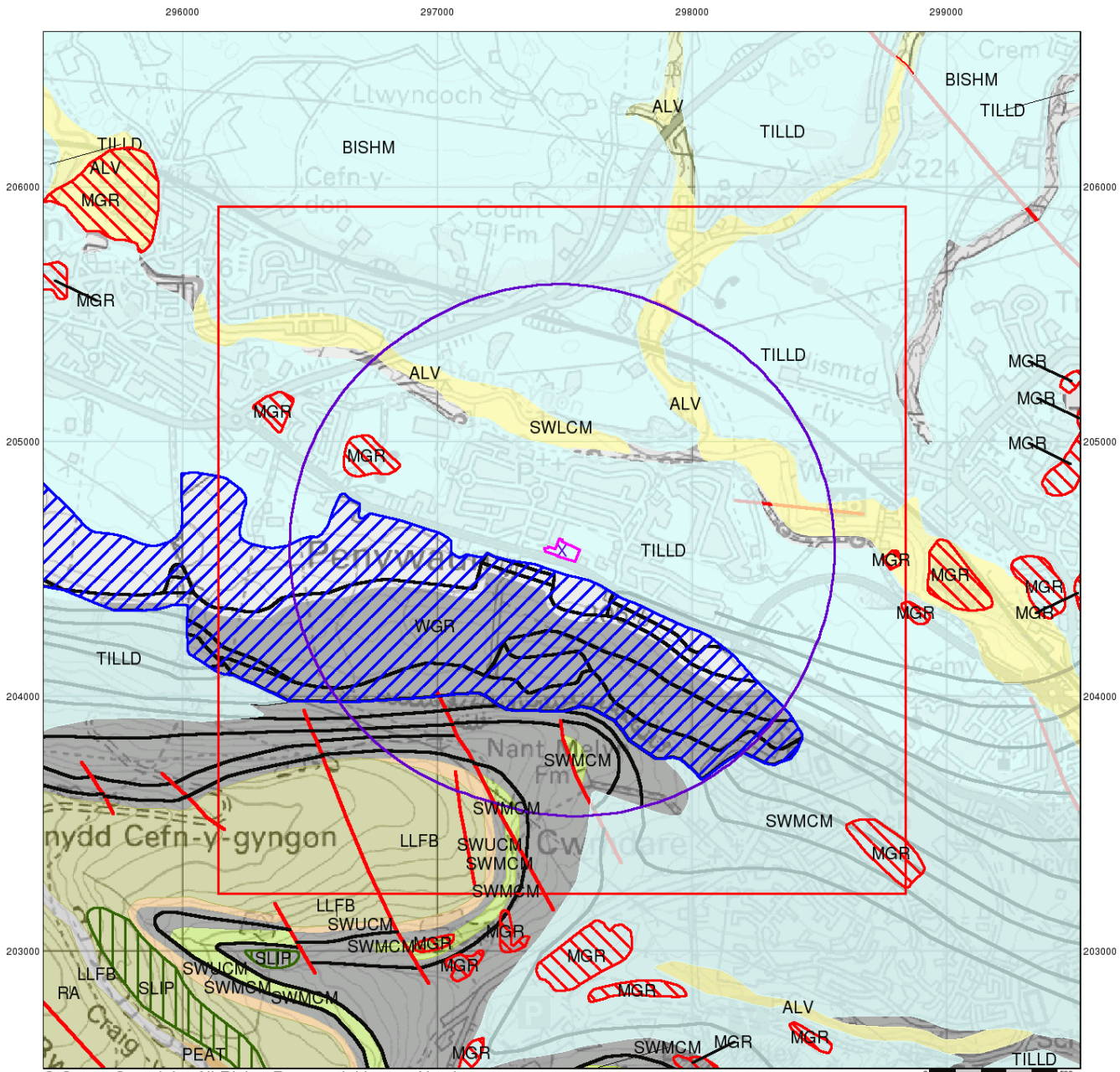

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Combined Surface Geology

The Combined Surface Geology map combines all the previous maps into one combined geological overview of your site.

Please consult the legends to the previous maps to interpret the Combined "Surface Geology" map.

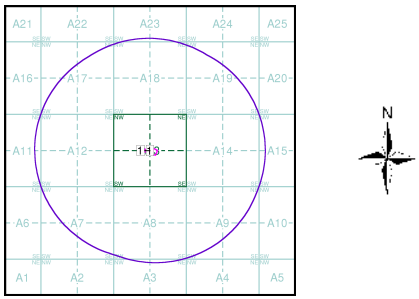
Additional Information

More information on 1:50,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

Contact

British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Telephone: 0115 936 3143
Fax: 0115 936 3276
email: enquiries@bgs.ac.uk
website: www.bgs.ac.uk

Combined Geology Map - Slice A



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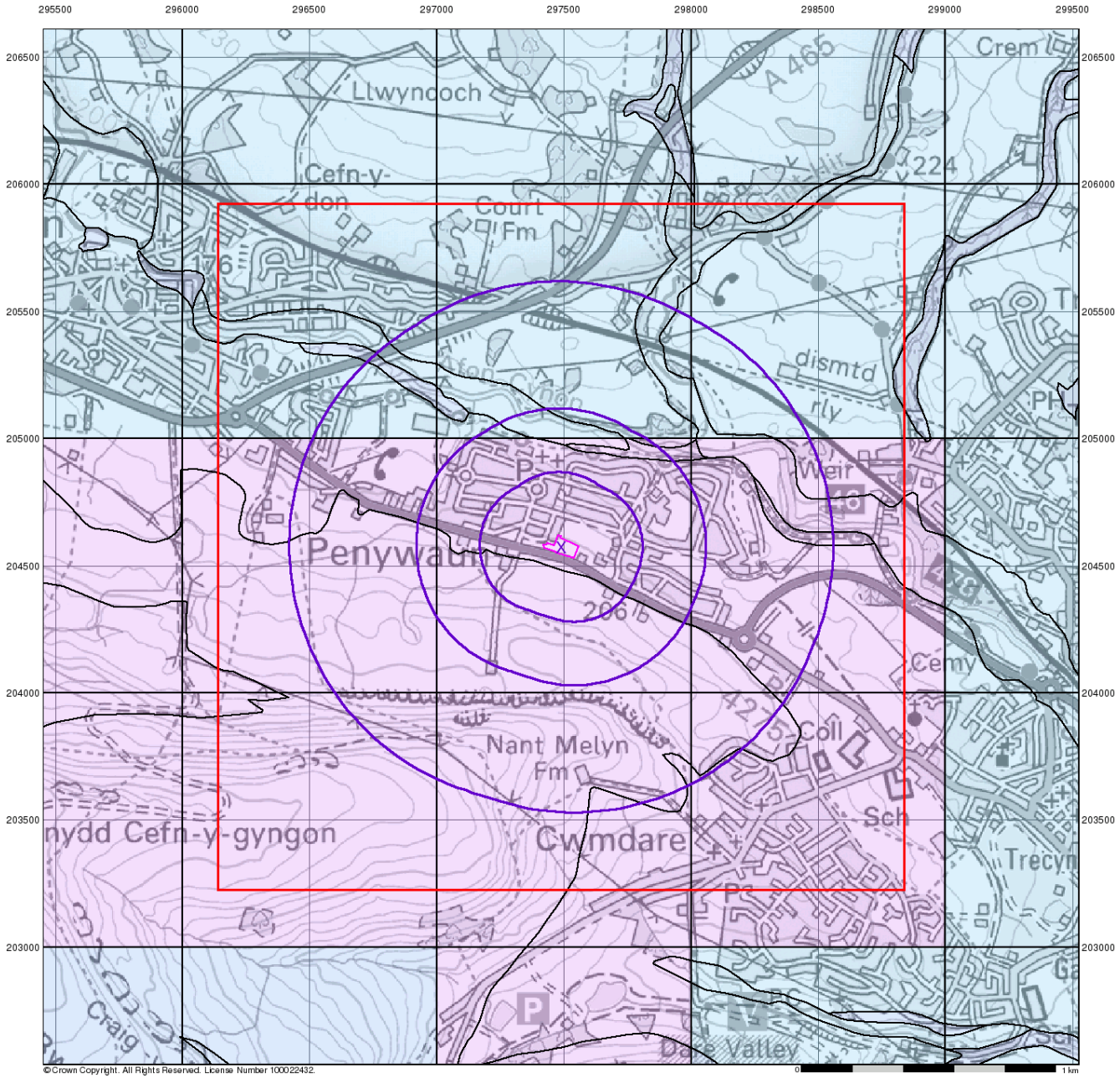

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Groundwater Vulnerability

General

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

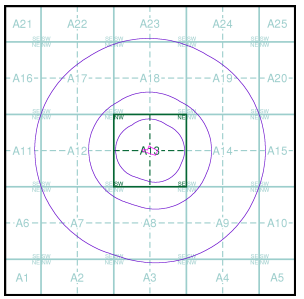
Agency and Hydrological

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



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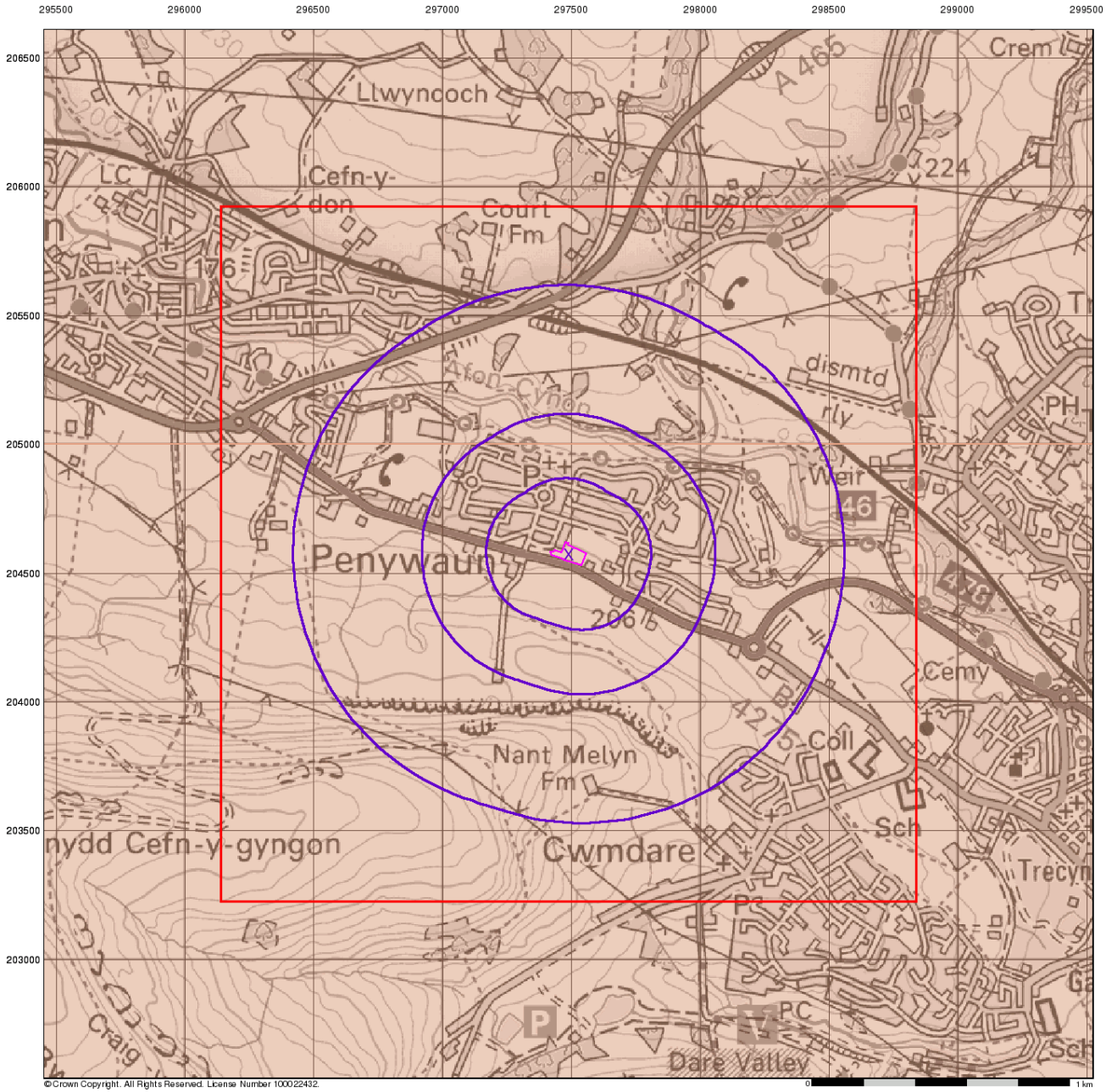

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Bedrock Aquifer Designation

General

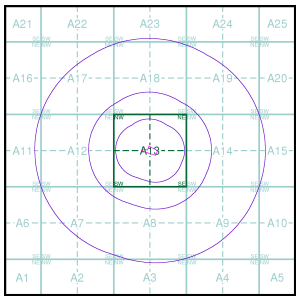
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

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



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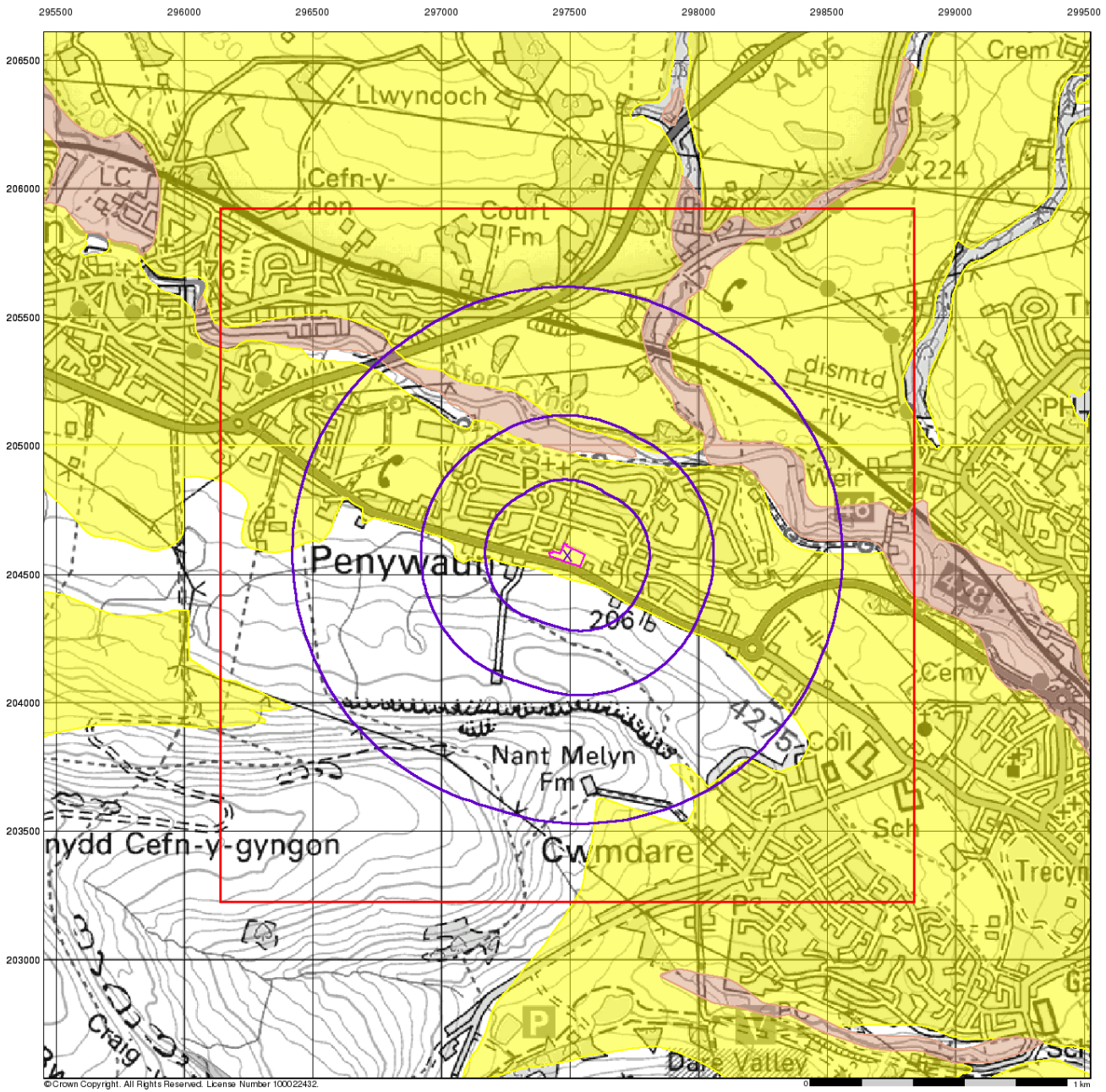

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Superficial Aquifer Designation

General

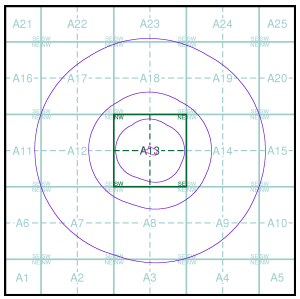
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

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



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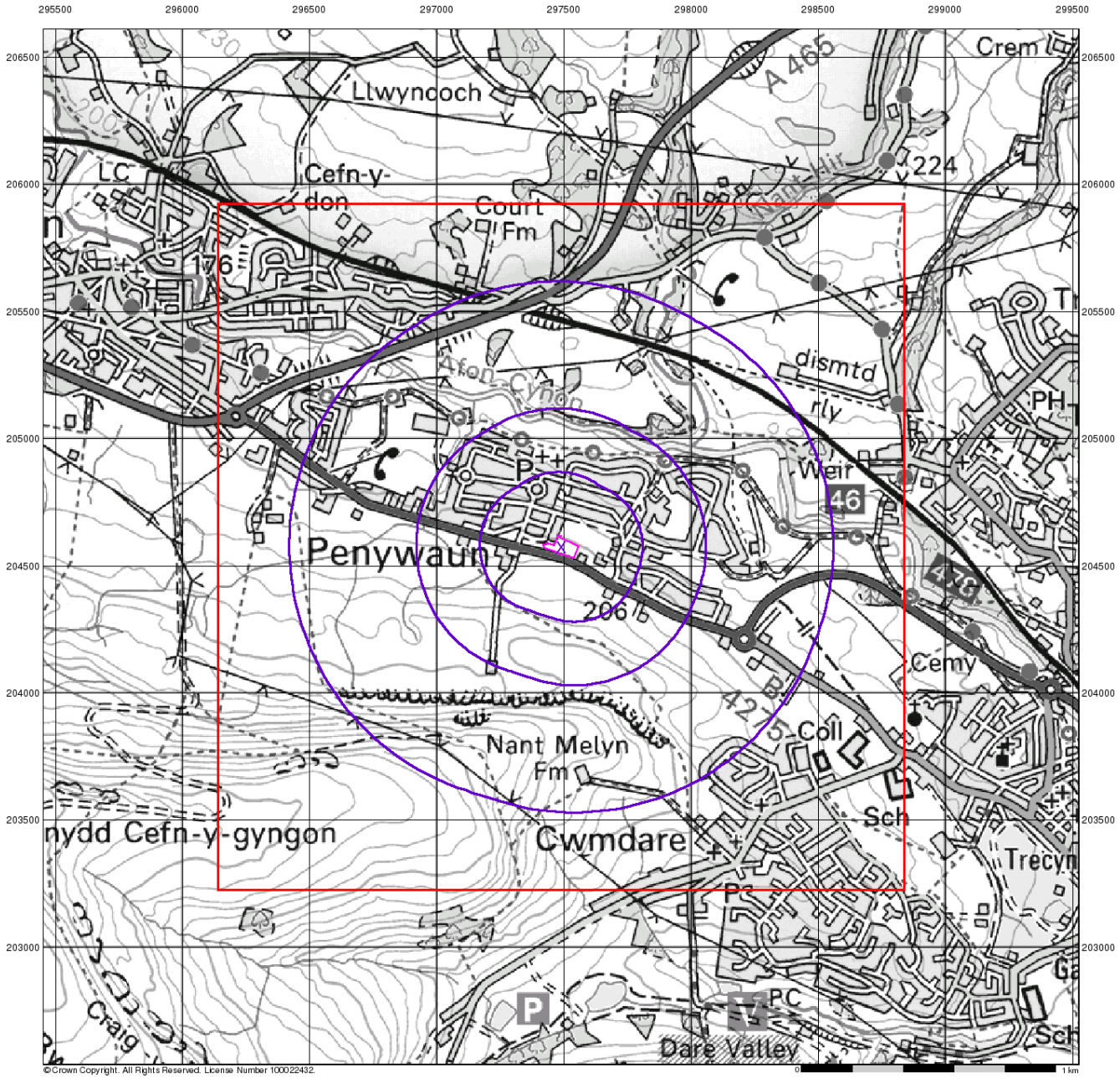

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Source Protection Zones

General

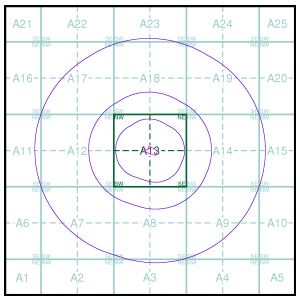
Specified Site | Specified Buffer(s) | Bearing Reference Point

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



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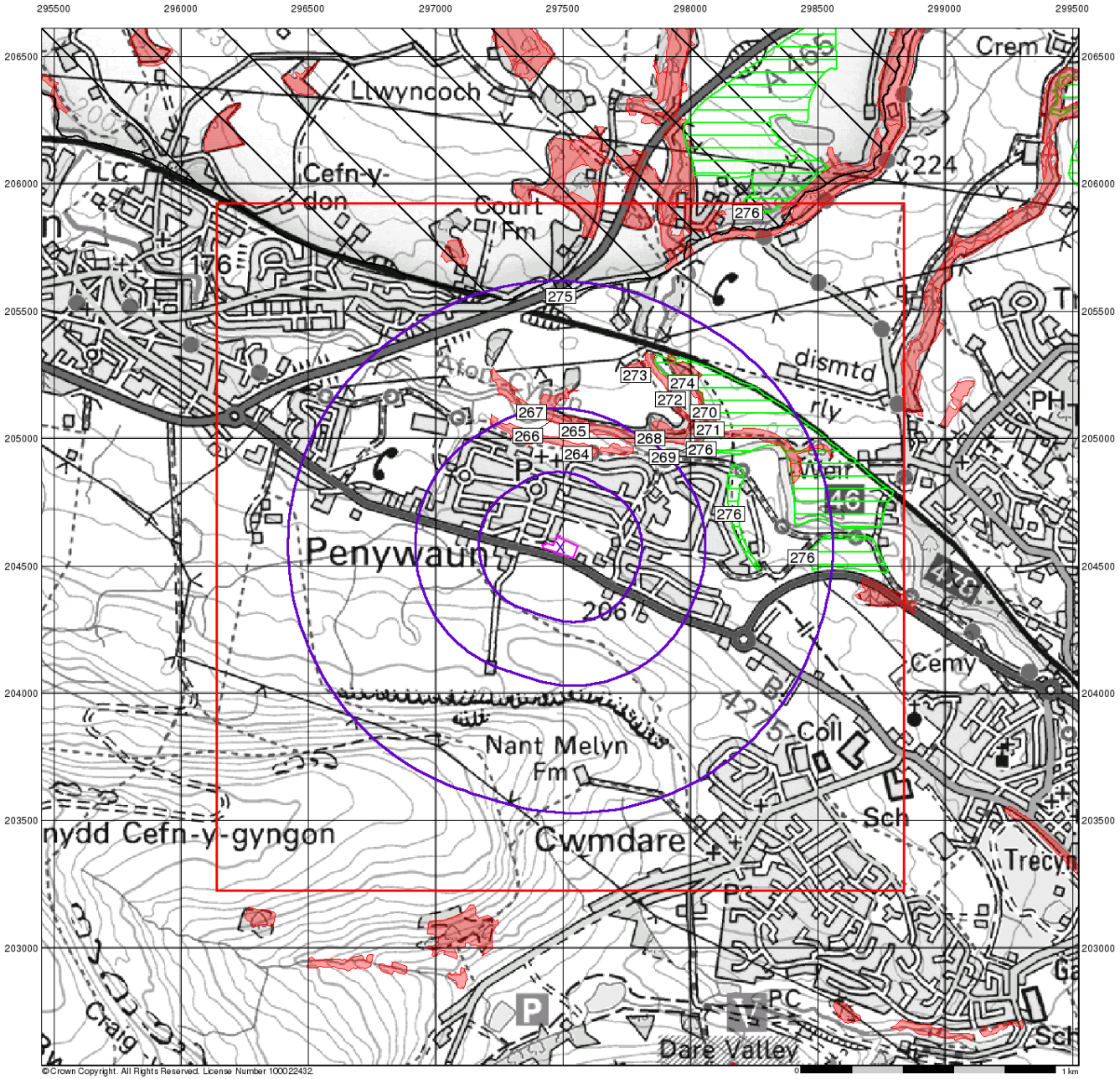

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Sensitive Land Uses

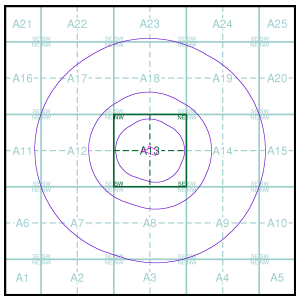
General

- 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



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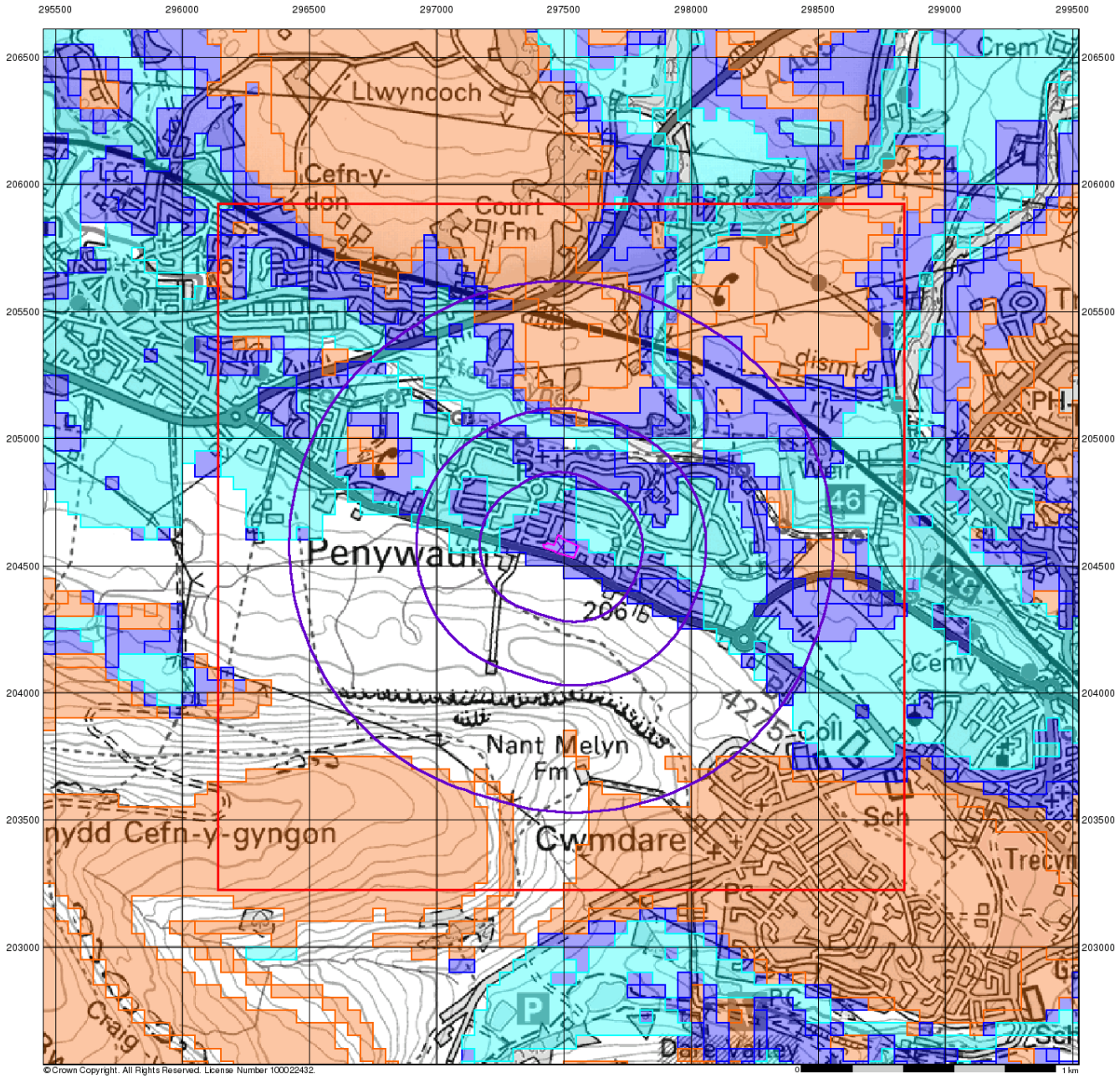

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BGS Flood GFS Data

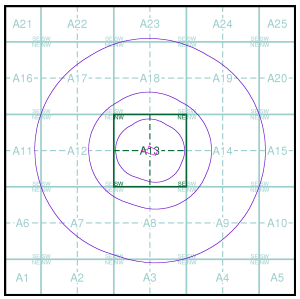
General

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



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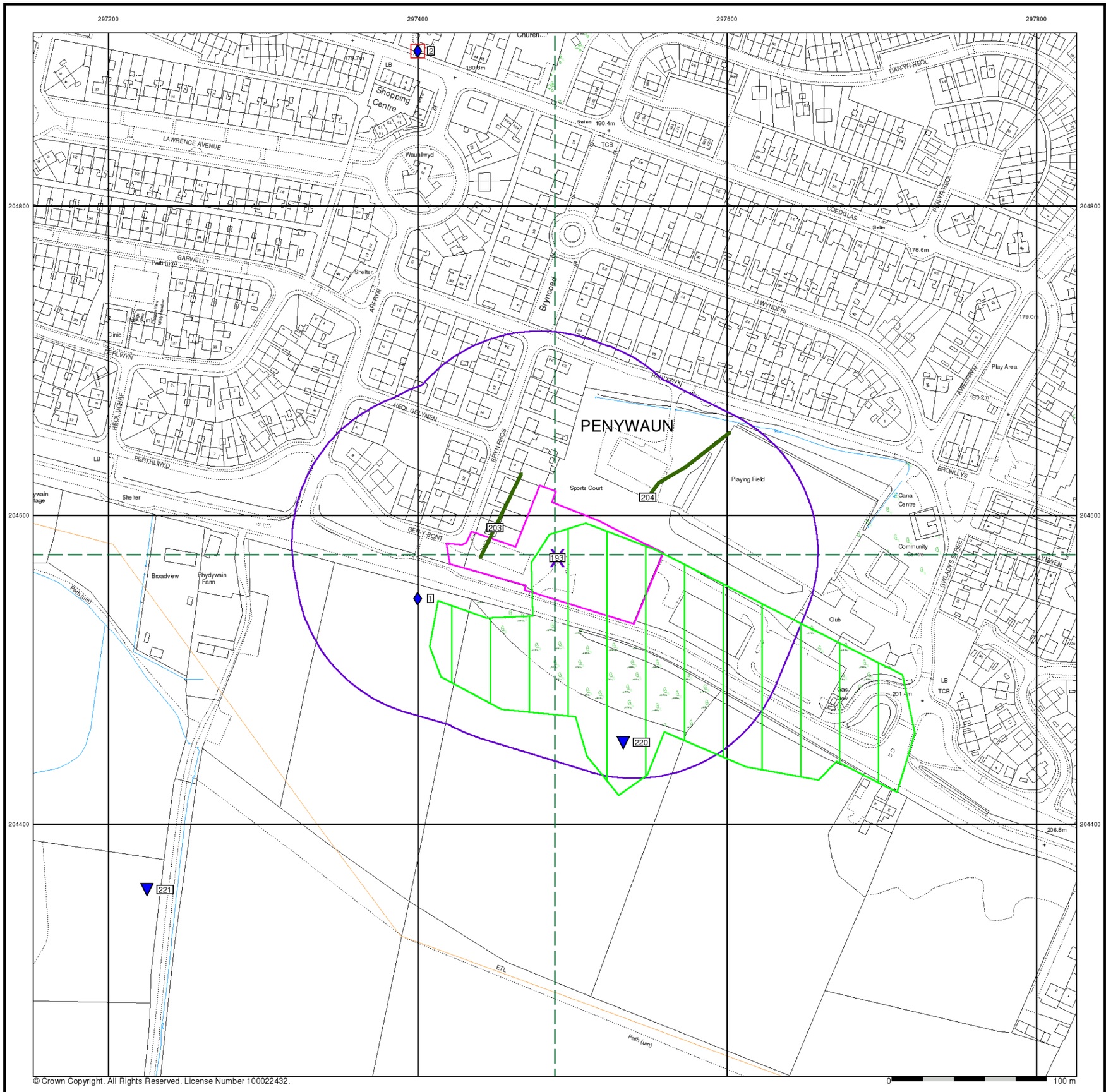

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General

- 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

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

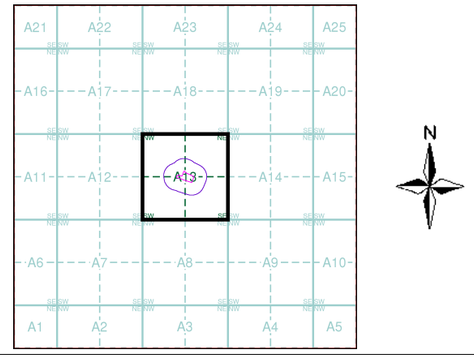
Hazardous Substances

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

Geological

- BGS Recorded Mineral Site

Site Sensitivity Map - Segment A13



Order Details

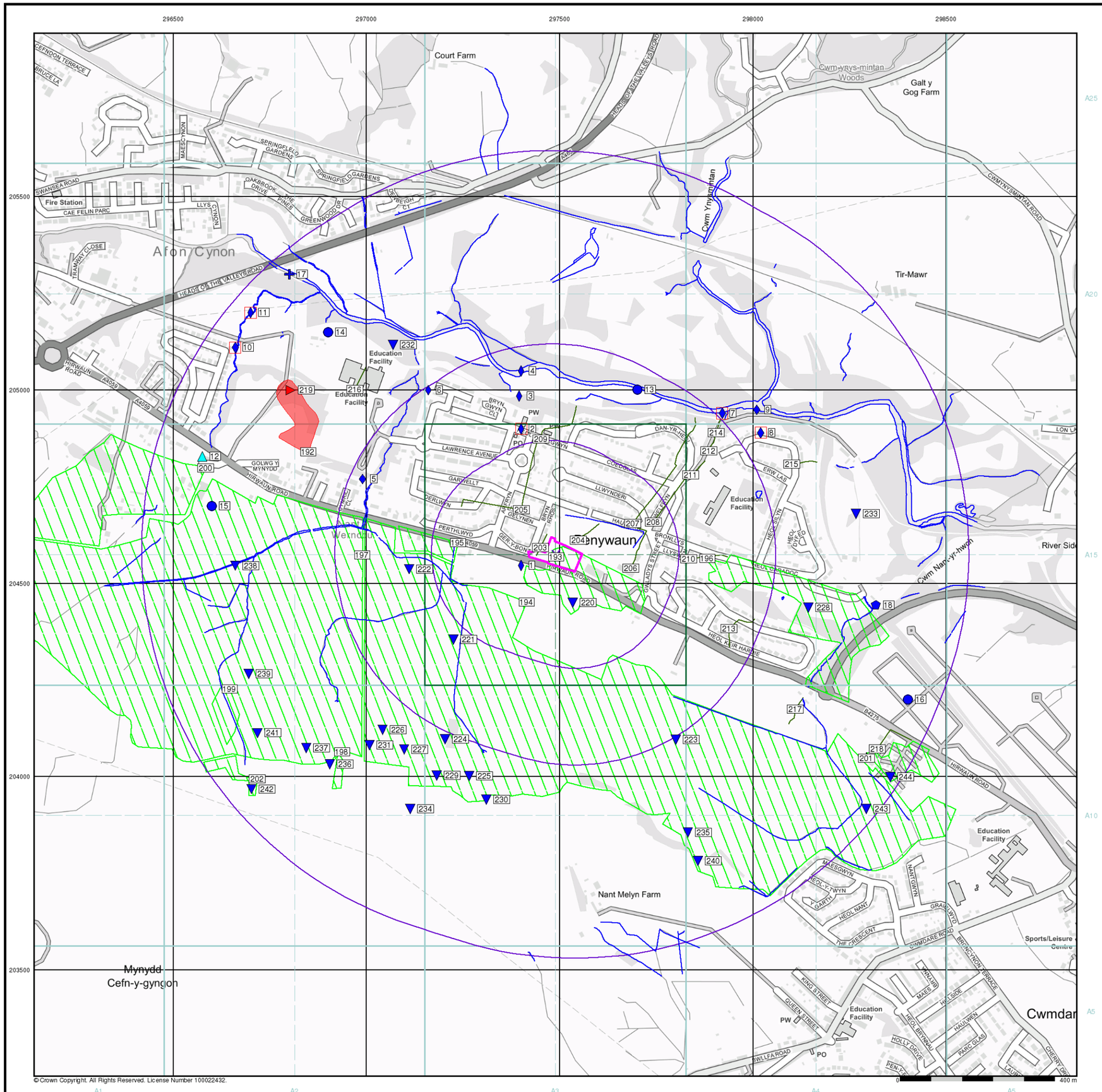
Order Number:	304681434_1_1
Customer Ref:	17264TM Penywaun
National Grid Reference:	297490, 204570
Slice:	A
Site Area (Ha):	0.6
Plot Buffer (m):	100

Site Details

Penywaun, Aberdare, CF44 9EE

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) | 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
- 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

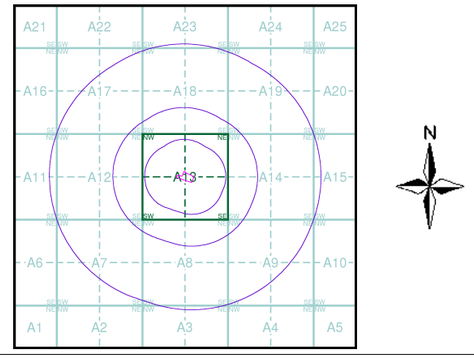
Geological

- 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 - Slice A



Order Details

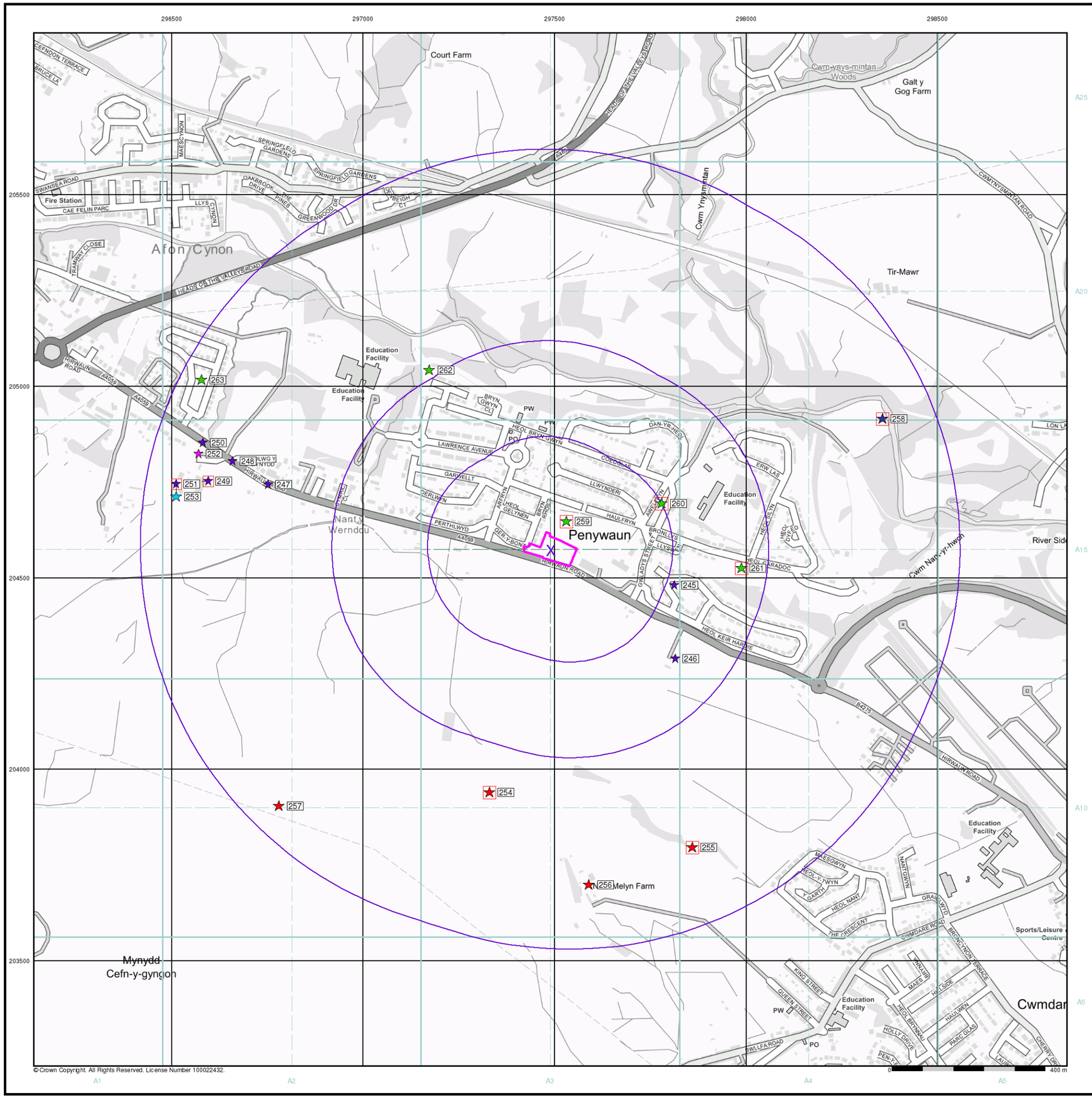
Order Number:	304681434_1_1
Customer Ref:	17264TM Penywaun
National Grid Reference:	297490, 204570
Slice:	A
Site Area (Ha):	0.6
Search Buffer (m):	1000

Site Details

Penywaun, Aberdare, CF44 9EE

Landmark INFORMATION GROUP

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



0 400 m

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Industrial Land Use Map

General

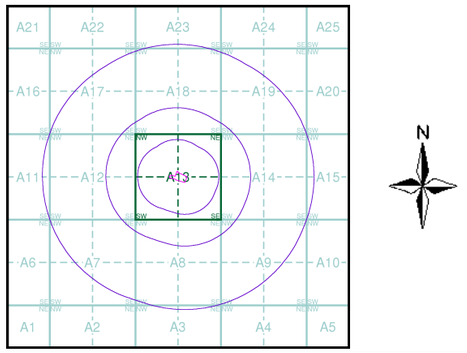
Specified Site | Specified Buffer(s) | Bearing Reference Point

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

Order Number:	304681434_1_1
Customer Ref:	17264TM Penywaun
National Grid Reference:	297490, 204570
Slice:	A
Site Area (Ha):	0.6
Search Buffer (m):	1000

Site Details

Penywaun, Aberdare, CF44 9EE

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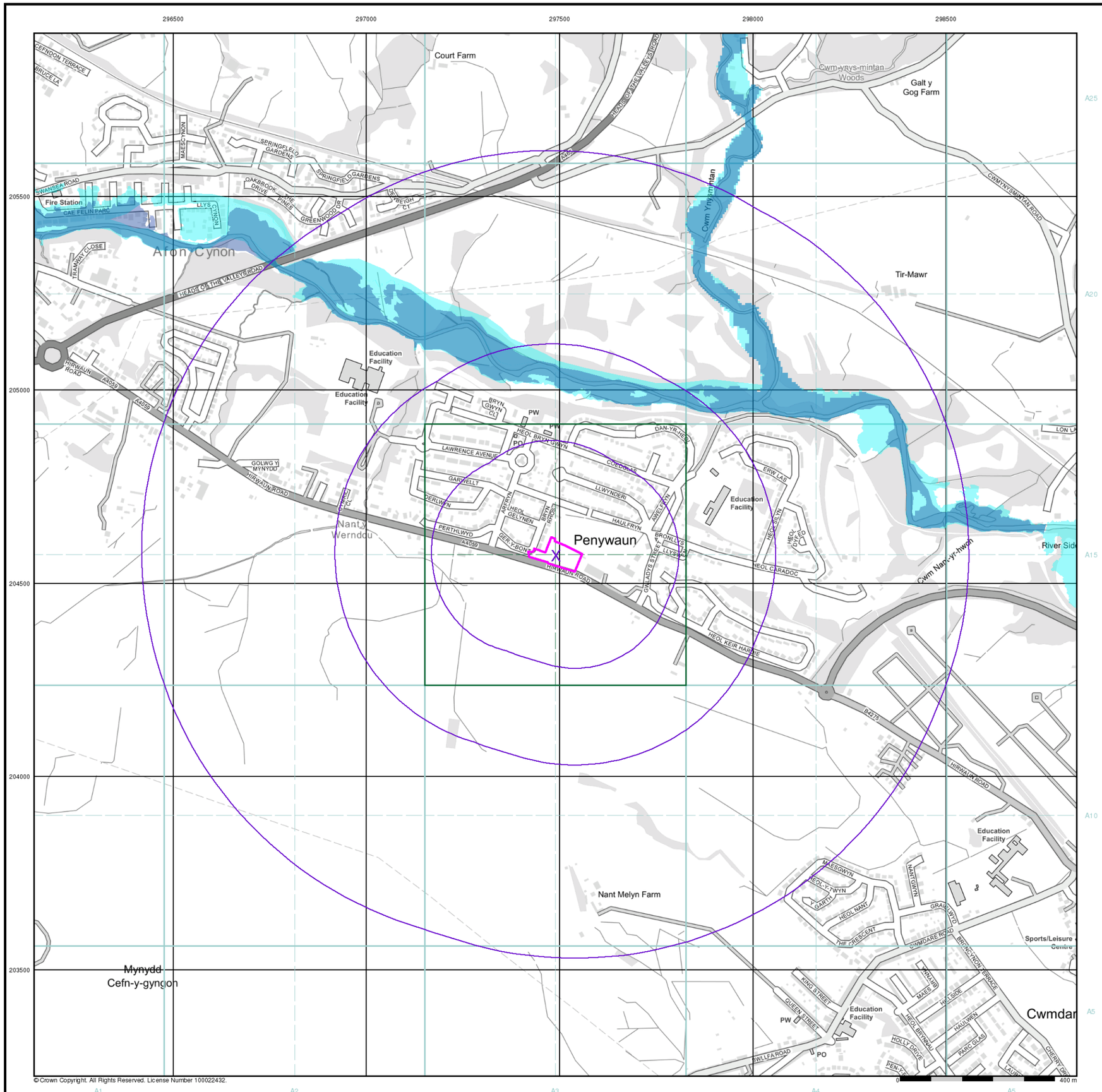

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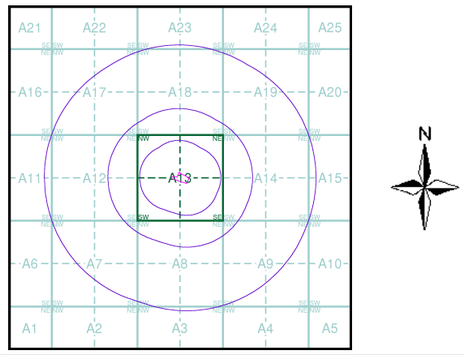
General

- Specified Site
- Specified Buffer(s)
- X 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

Order Number:	304681434_1_1
Customer Ref:	17264TM Penywaun
National Grid Reference:	297490, 204570
Slice:	A
Site Area (Ha):	0.6
Search Buffer (m):	1000

Site Details

Penywaun, Aberdare, CF44 9EE

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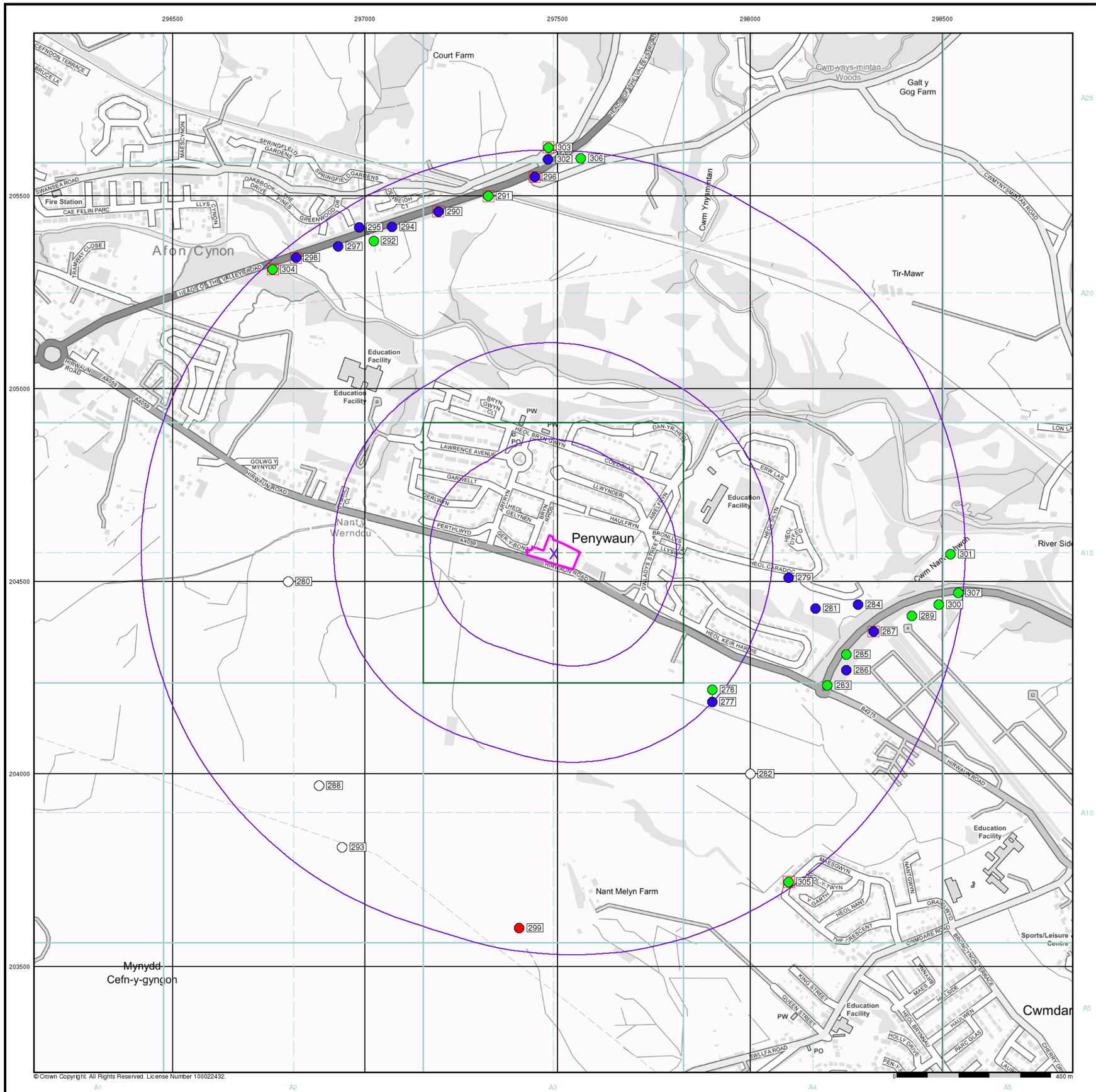
Web: www.envirocheck.co.uk



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General

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

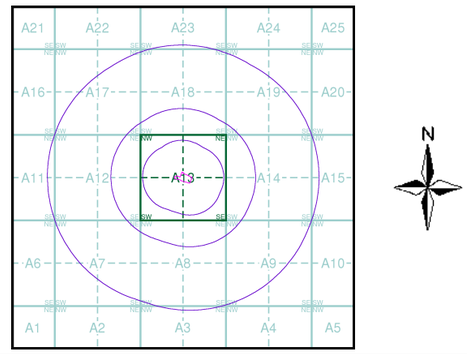
Agency and Hydrological (Boreholes)

- 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

Order Number:	304681434_1_1
Customer Ref:	17264TM Penywaun
National Grid Reference:	297490, 204570
Slice:	A
Site Area (Ha):	0.6
Search Buffer (m):	1000

Site Details

Penywaun, Aberdare, CF44 9EE

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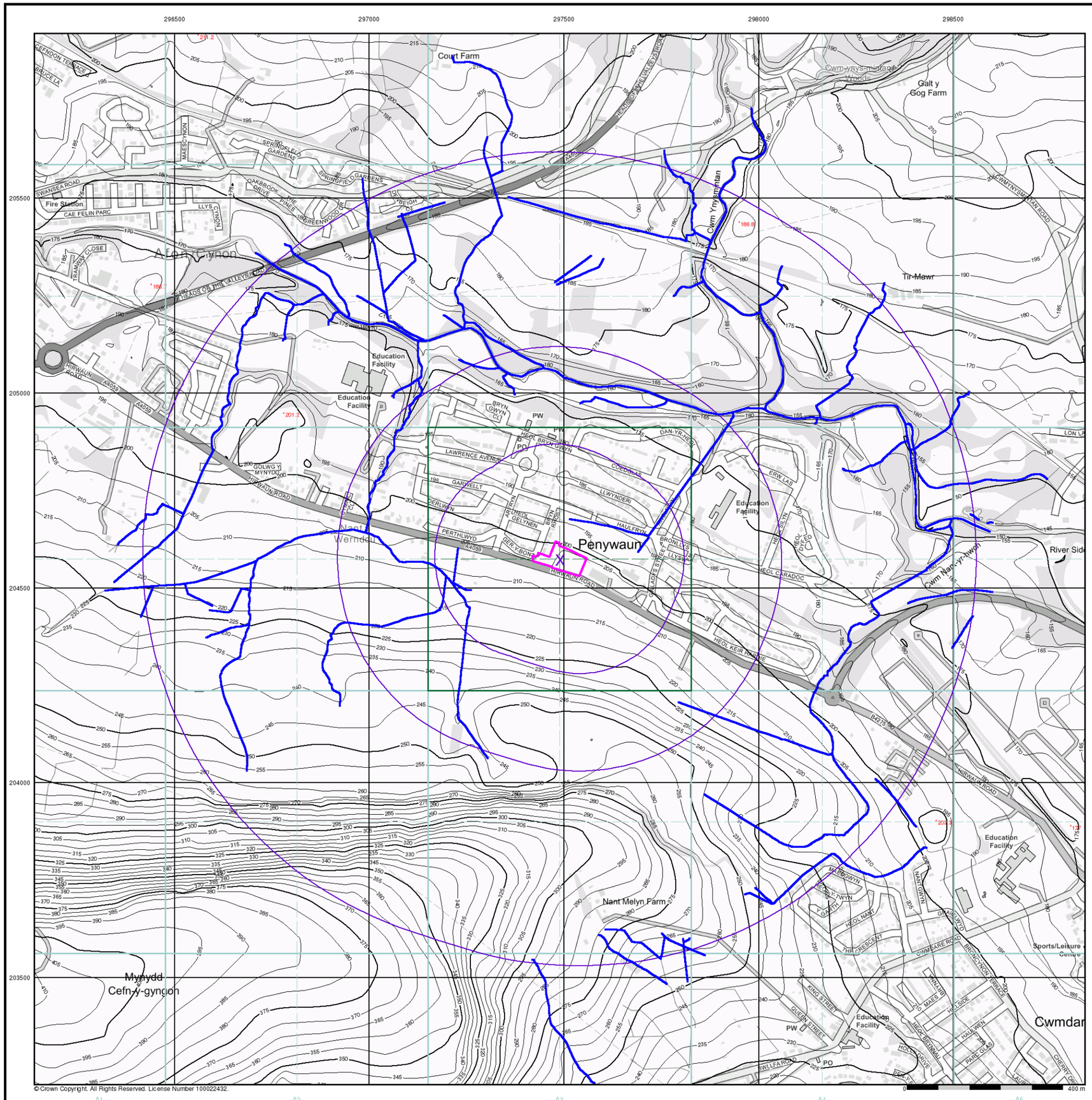

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General

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

OS Water Network Data

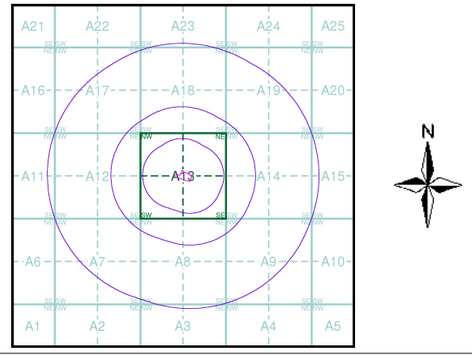
- Canal
- Reservoir
- Foreshore
- Marsh
- Tidal River
- Inland River
- Drain
- Other
- Lake
- Transfer
- Lock Or Flight Of Locks
- Sea

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



Order Details

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Customer Ref:	17264TM Penywaun
National Grid Reference:	297490, 204570
Slice:	A
Site Area (Ha):	0.6
Search Buffer (m):	1000

Site Details

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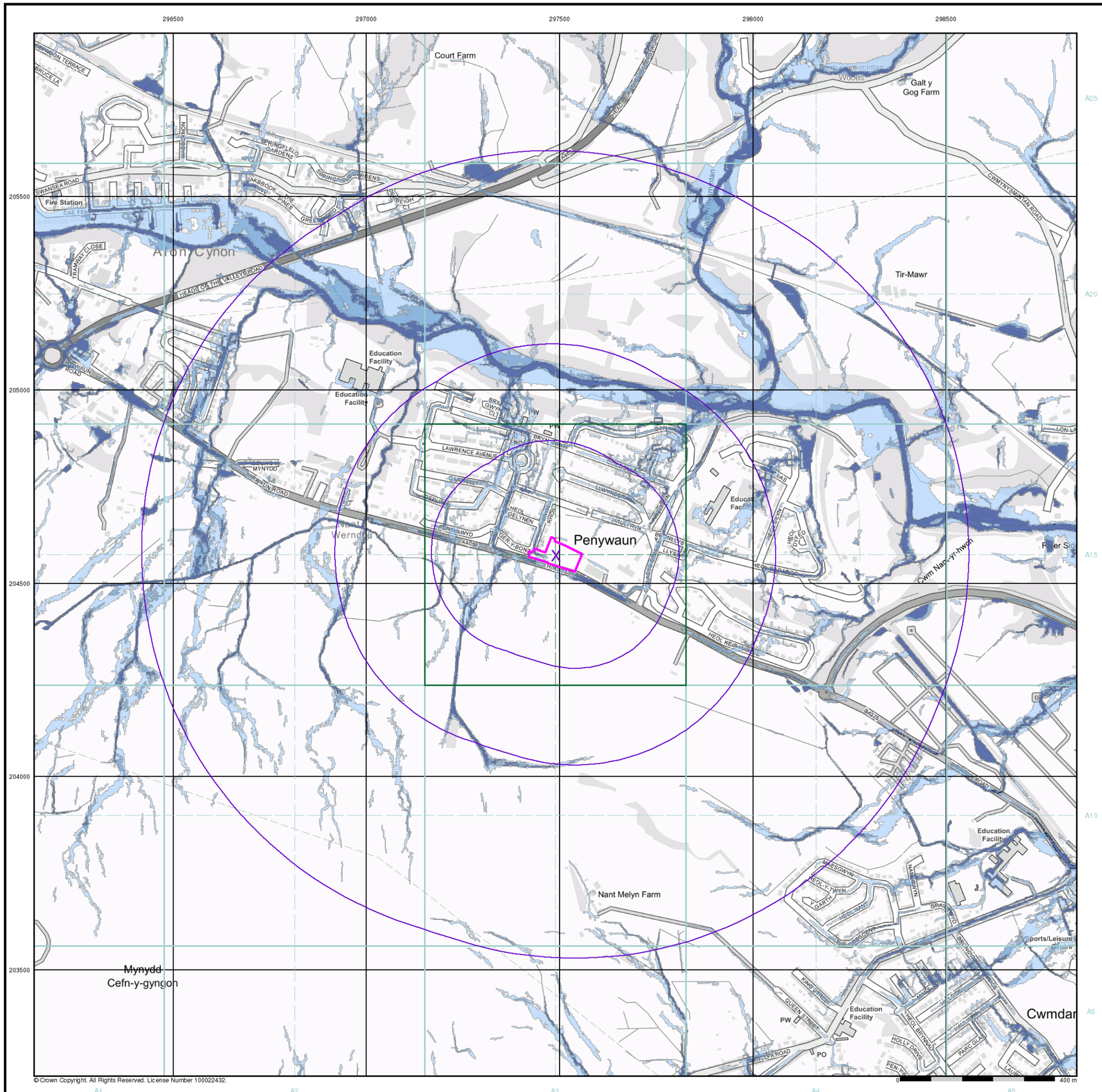

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Geotechnical & Geoenvironmental Specialists

General

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

Risk of Flooding from Surface Water

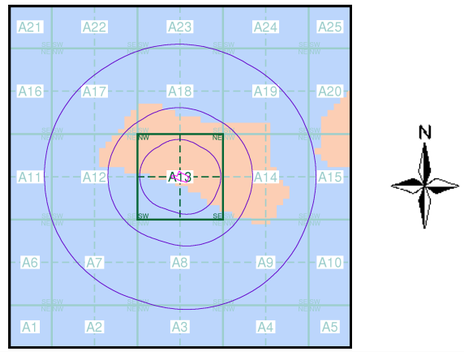
- High - 30 Year Return
- Medium - 100 Year Return
- Low - 1000 Year Return

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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National Grid Reference:	297490, 204570
Slice:	A
Site Area (Ha):	0.6
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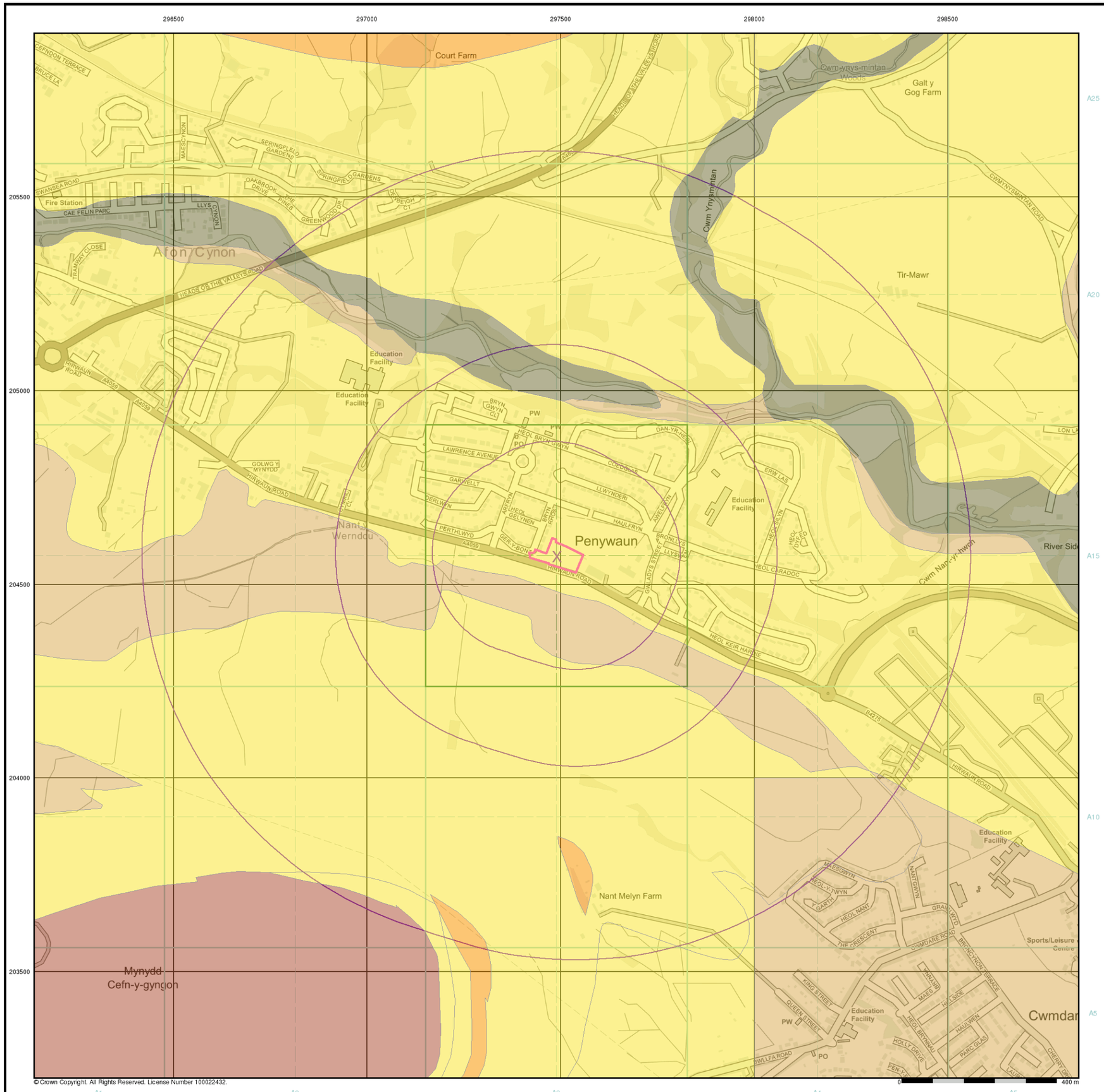

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Geotechnical & Geoenvironmental Specialists

General

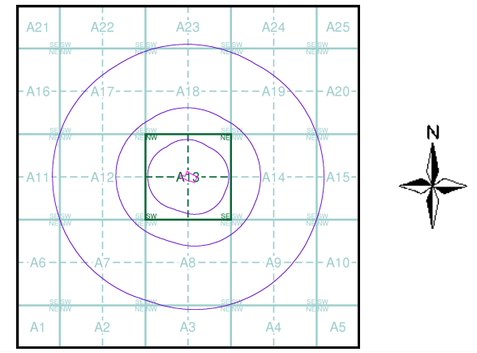
Specified Site | Specified Buffer(s) | X Bearing Reference Point

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



Order Details

Order Details:	304681434_1_1
Customer Ref:	17264TM Penywaun
National Grid Reference:	297490, 204570
Slice:	A
Site Area (Ha):	0.6
Search Buffer (m):	1000

Site Details

Penywaun, Aberdare, CF44 9EE

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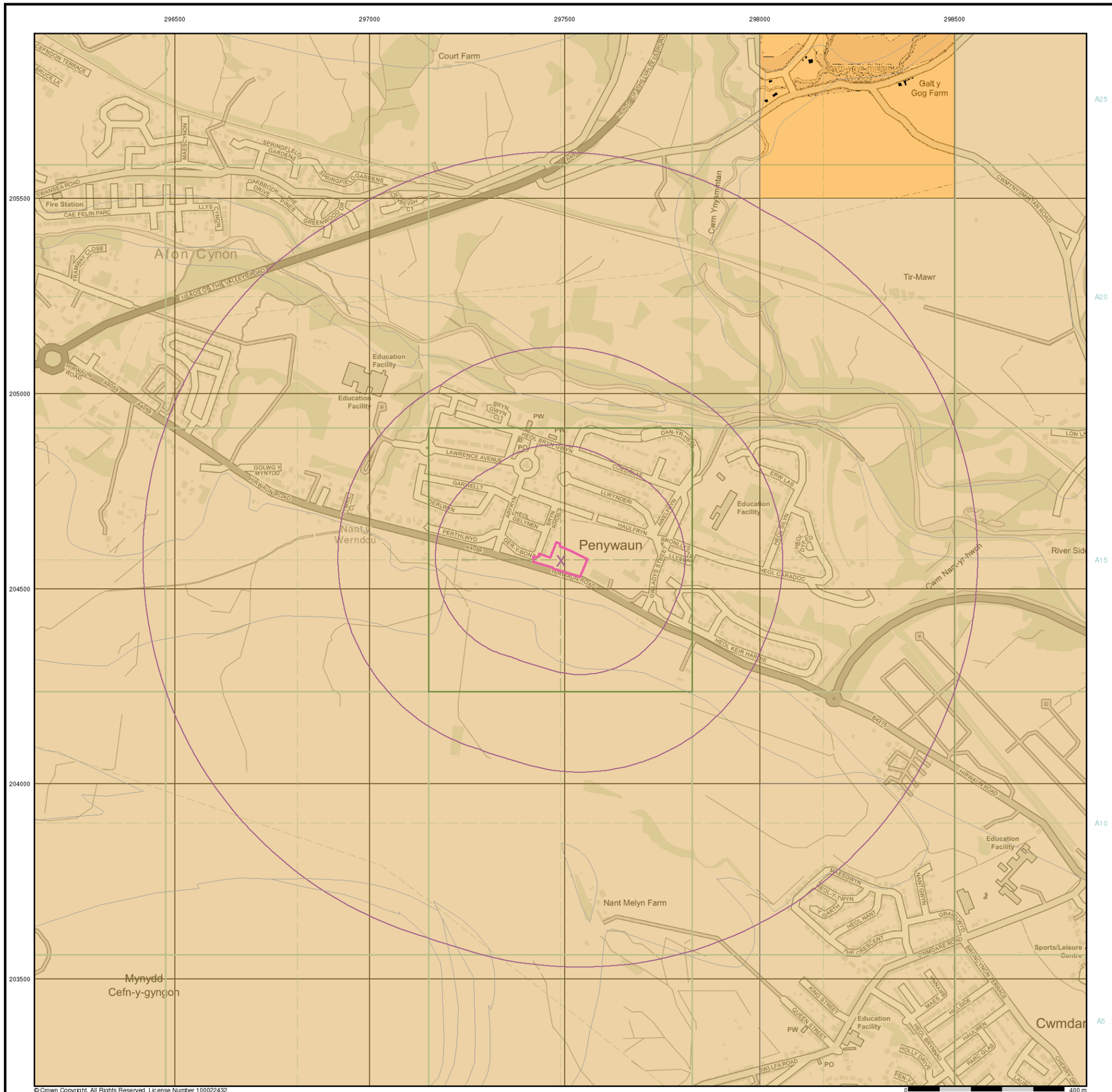
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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Geotechnical & Geoenvironmental Specialists

General

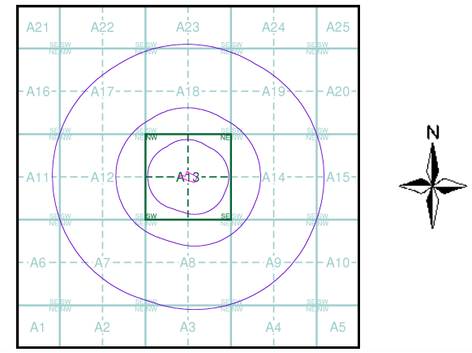
Specified Site | Specified Buffer(s) | X Bearing Reference Point

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:	304681434_1_1
Customer Ref:	17264TM Penywaun
National Grid Reference:	297490, 204570
Slice:	A
Site Area (Ha):	0.6
Search Buffer (m):	1000

Site Details

Penywaun, Aberdare, CF44 9EE

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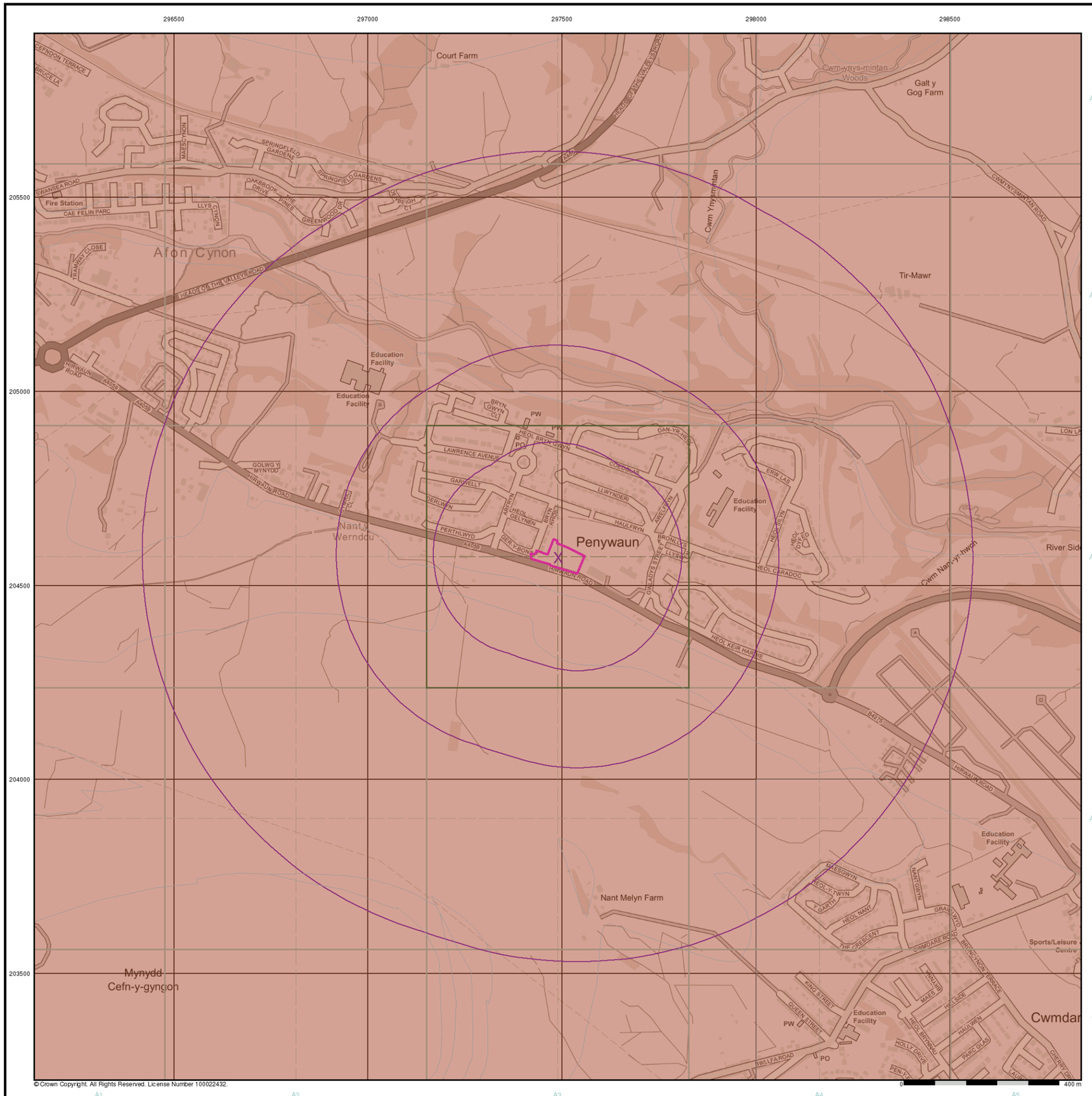

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General

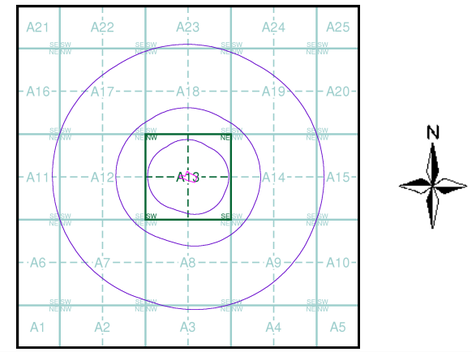
Specified Site | Specified Buffer(s) | X Bearing Reference Point

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



Order Details

Order Details:	304681434_1_1
Customer Ref:	17264TM Penywaun
National Grid Reference:	297490, 204570
Slice:	A
Site Area (Ha):	0.6
Search Buffer (m):	1000

Site Details

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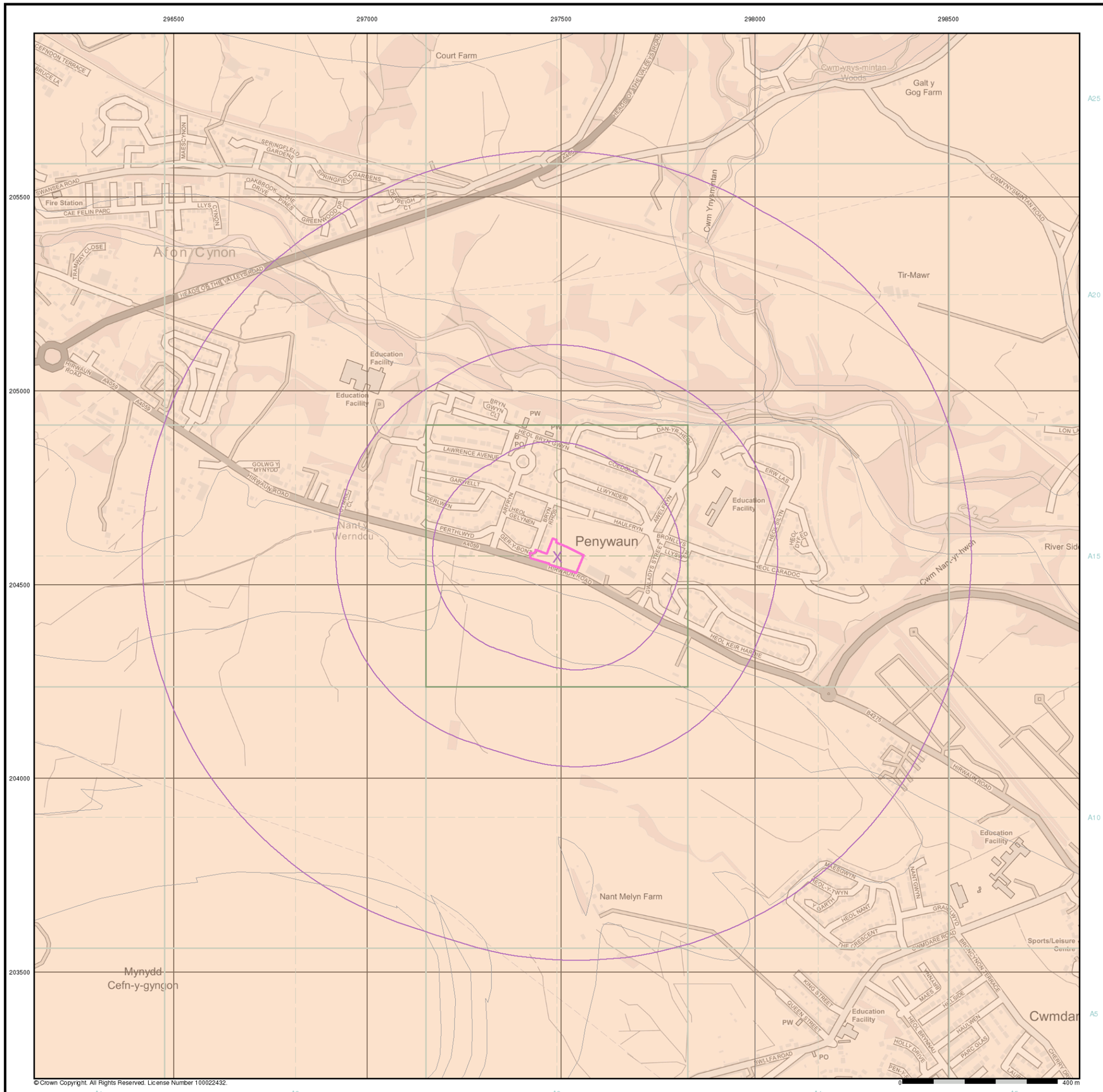

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Geotechnical & Geoenvironmental Specialists

General

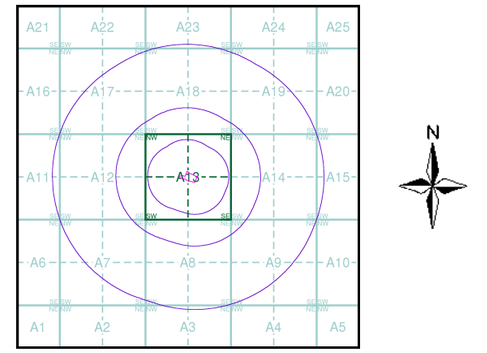
Specified Site | Specified Buffer(s) | X Bearing Reference Point

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



Order Details

Order Details:	304681434_1_1
Customer Ref:	17264TM Penywaun
National Grid Reference:	297490, 204570
Slice:	A
Site Area (Ha):	0.6
Search Buffer (m):	1000

Site Details

Penywaun, Aberdare, CF44 9EE

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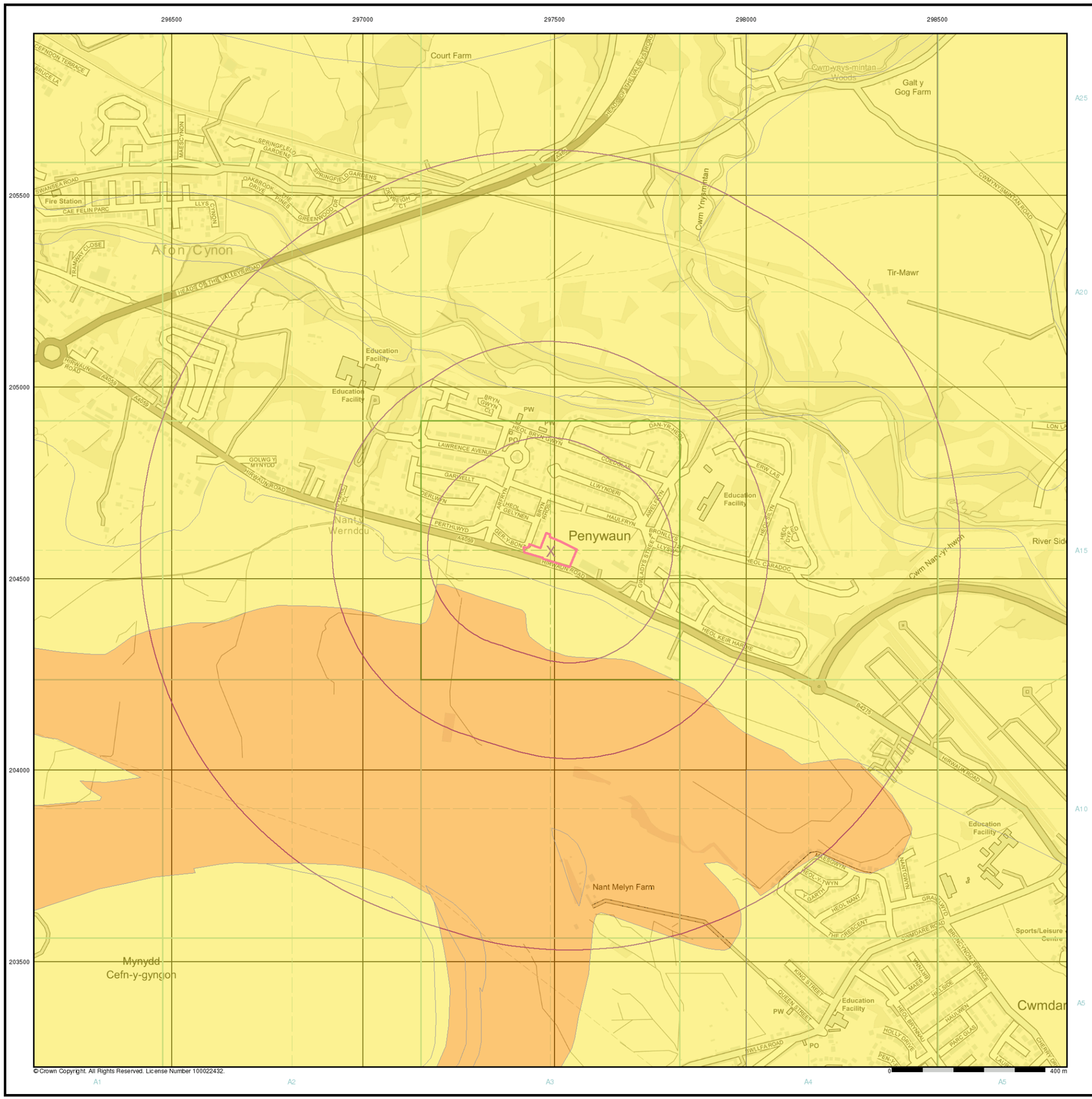

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Geotechnical & Geoenvironmental Specialists

General

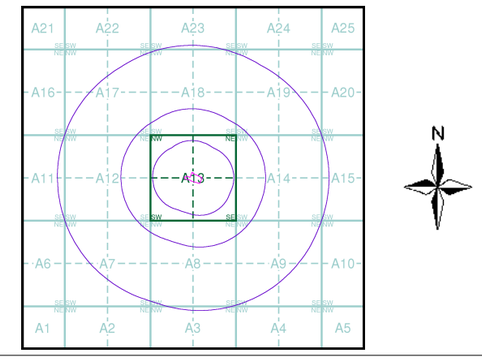
Specified Site | Specified Buffer(s) | X Bearing Reference Point

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



Order Details

Order Details:	304681434_1_1
Customer Ref:	17264TM Penywaun
National Grid Reference:	297490, 204570
Slice:	A
Site Area (Ha):	0.6
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Site Details

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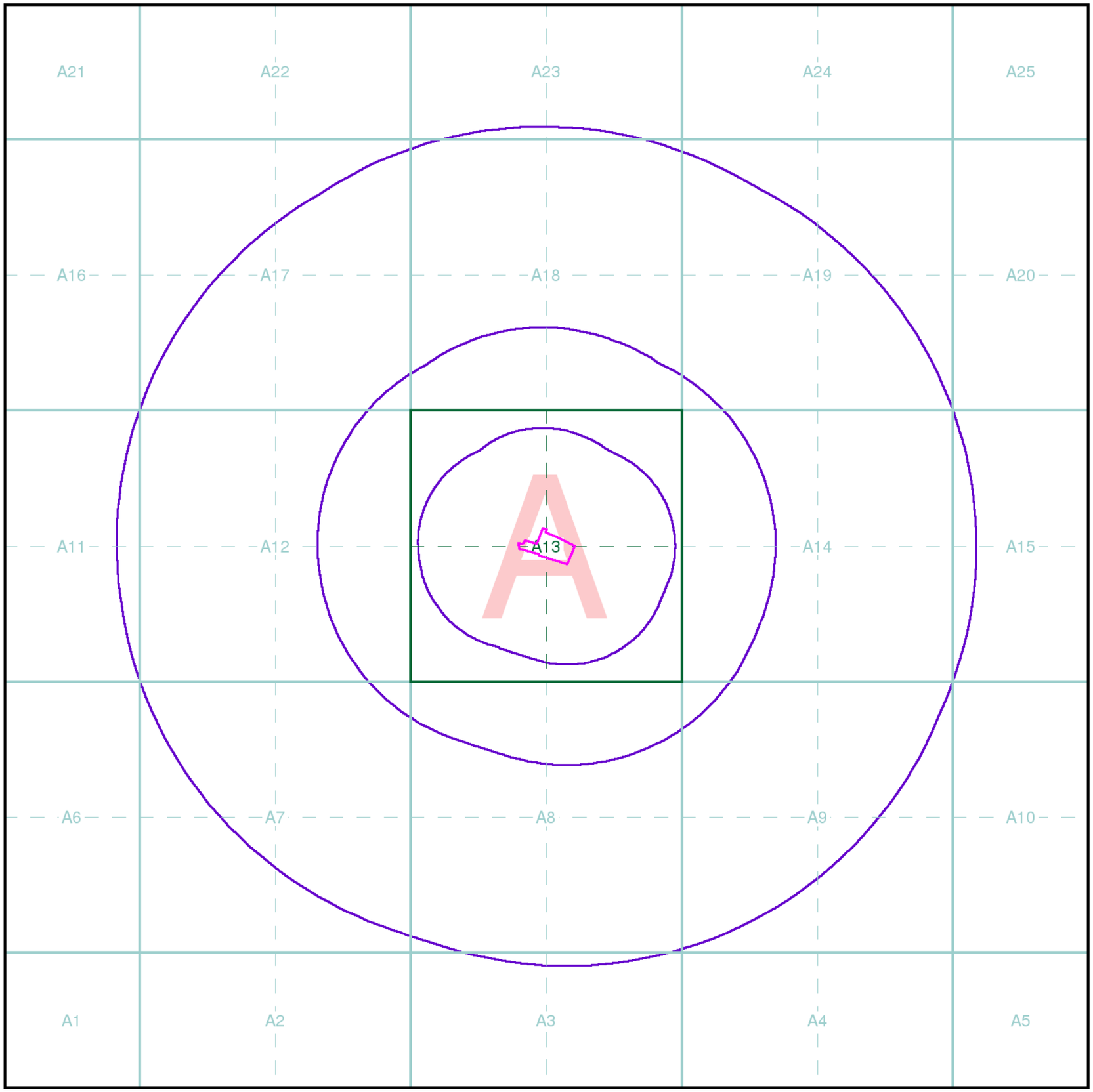

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Index Map

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

Ms R Liley, TFW Group Ltd, 5 Deryn Court, Wharfdale Road, Pentwyn, Cardiff, CF23 7HB

Order Details

Order Number:	304681434_1_1
Customer Ref:	17264TM Penywaun
National Grid Reference:	297500, 204570
Site Area (Ha):	0.6
Search Buffer (m):	1000

Site Details

Penywaun, Aberdare, CF44 9EE

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

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

ANNEX B
Coal Authority Report

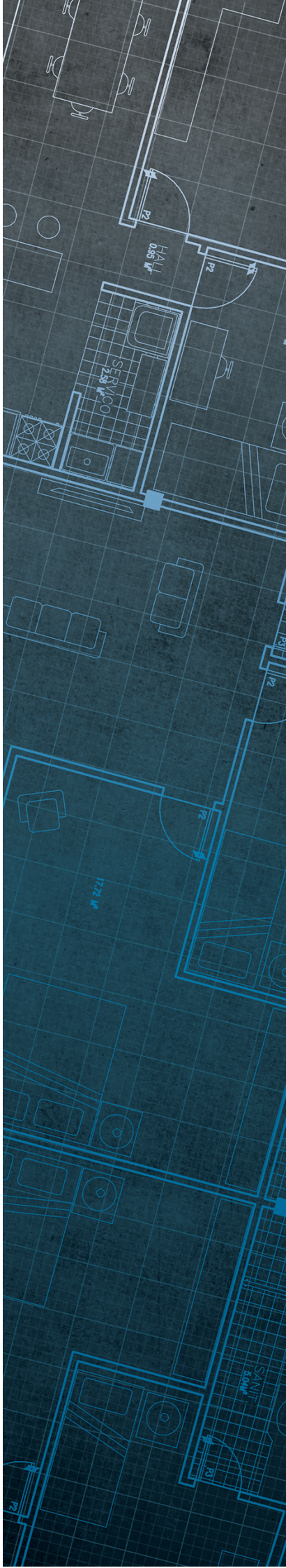
The Coal Authority

Consultants

Coal Mining Report

Draft

Penywaun
Aberdare
Rhondda Cynon Taff
CF44 9EE



Date of enquiry:	**5 December 2022**
Date enquiry received:	**5 December 2022**
Issue date:	**5 December 2022**
Our reference:	**51003328488001**
Your reference:	**304681434_2**

Consultants

Coal Mining Report

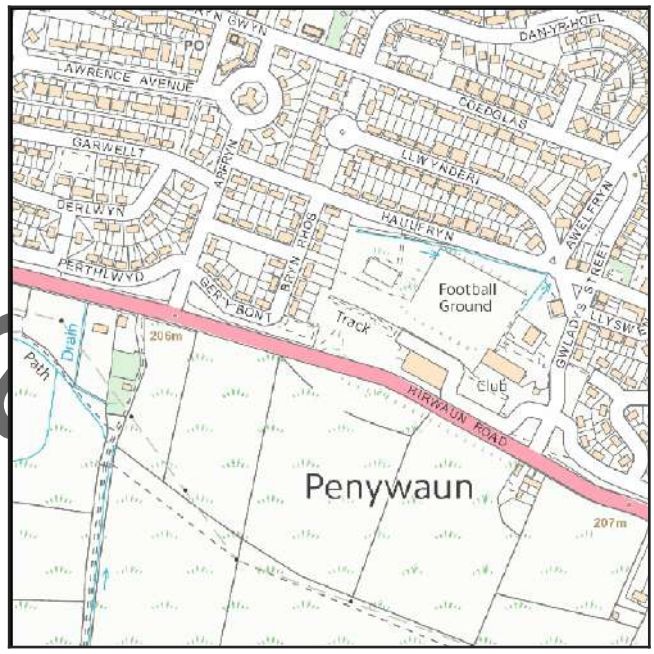
This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

NLIS Hub

Enquiry address

Penywaun
Aberdare
Rhondda Cynon Taff
CF44 9EE



Approximate position of property

Map data

How to contact us

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

www.groundstability.com

@coalauthority
/company/the-coal-authority
/thecoalauthority
/thecoalauthority

Section 1 – Mining activity and geology

Past underground mining
No past mining recorded.

Probable unrecorded shallow workings
None.

Spine roadways at shallow depth
No spine roadway recorded at shallow depth.

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Shaft	297204-012	297555 204495	This shaft has been filled at some time in the past by the Opencast Executive. There are no details of the fill material or date of filling.	Coal	
Adit	297204-054	297508 204679		Coal	

Abandoned mine plan catalogue numbers
The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

SWR2793	SWR3694	SWR2129
SWR2498	SWR2463	SWR2492
SWR3703	SWR3702	SWR2467

Our records show we have more plans than those shown above which could affect the enquiry boundary.

Please contact us on 0345 762 6848 to determine the exact abandoned mine plans you require based on your needs.

Outcrops

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
GELLIDEG	Coal	Yes	Within	N/A	115

Geological faults, fissures and breaklines
No faults, fissures or breaklines recorded.

Opencast mines

Please refer to the “Summary of findings” map (on separate sheet) for details of any opencast areas within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations
None recorded within 50 metres of the enquiry boundary.

Remediated sites
None recorded within 50 metres of the enquiry boundary.

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.

Mine gas
None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes
None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining
None recorded.

Coal mining licensing
None recorded within 200 metres of the enquiry boundary.

Court orders
None recorded.

Section 46 notices
No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

Withdrawal of support notices
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.

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.

Section 4 – Further information

Based on the responses in this report, no further information has been highlighted.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk.**

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines
Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips
Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations
Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites
Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence
Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas
Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission.

Mine water treatment schemes
Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining
Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing
Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders
Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices
Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices
Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land
Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

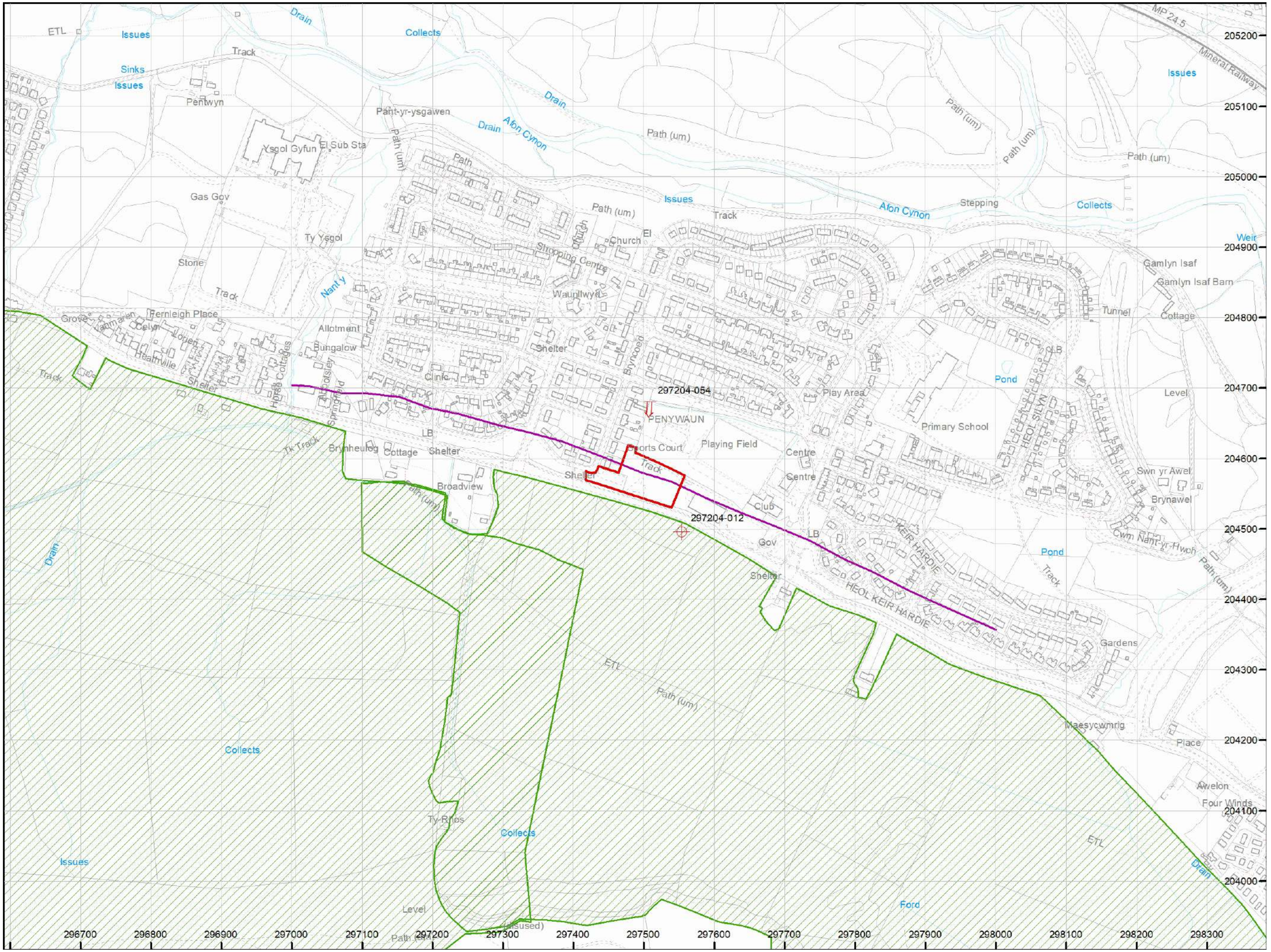
The Coal Authority

Summary of findings

The map highlights any specific surface or subsurface features within or near to the boundary of the site.

Key

- Approximate position of the enquiry boundary shown
- Disused mine shaft
- Disused adit
- Outcrop (Proven)
- Unlicensed opencast site



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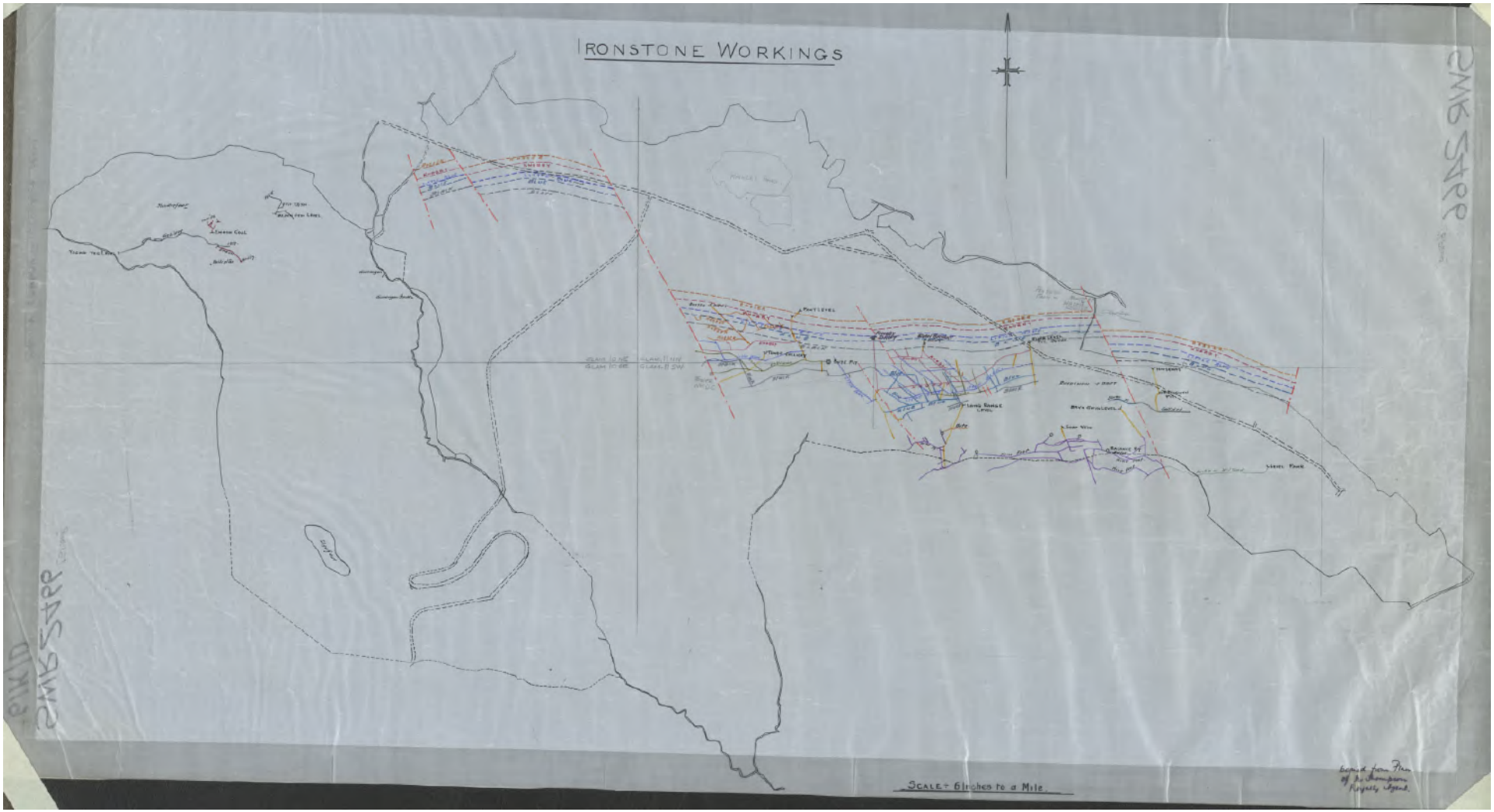
IRONSTONE WORKINGS
SCALE: 6 Inches to a Mile

ANNEX C
Risk Assessment Definitions

The contaminated land regime is set out in Part 2A of the Environmental Protection Act (EPA) 1990 and was introduced on the 1st April 2000 in England and 1st July 2001 in Wales. A similar regime was introduced in Scotland on 14th July 2000.

Part 2A was introduced to achieve three overreaching objectives:

(a) To identify and remove unacceptable risks to human health and the environment.
(b) To seek to ensure that contaminated land is made suitable for its current use.
(c) To ensure that the burdens faced by individuals, companies and society as a whole are proportionate, manageable and compatible with the principles of sustainable development.

Under Part 2A the statutory definition of 'contaminated land' is:

"any land which appears to the local authority in whose area it is situated, to be in such a condition, by reason of substances in, on, or under the land, that:

(a) Significant harm is being caused or there is a significant possibility of such harm being caused; or
(b) Pollution of controlled waters is being, or is likely to be, caused."

Under Part 2A, for land to be classified as 'Contaminated Land' there must be one or more contaminant, pathway, receptor linkages, known as the '**Pollutant Linkage**'. A pollutant linkage requires three essential elements:

(a) A **CONTAMINANT** (SOURCE) – a substance that is in, on or under the land and has the potential to cause harm or to cause pollution of controlled waters.
(b) A **RECEPTOR** – something which could be adversely affected by a contaminant.
(c) A **PATHWAY** – a route by which a receptor is or might be exposed to or affected by a contaminant.

The term 'Risk' is widely used in different contexts and situations, but a prescriptive definition is given by the Guidelines for Environmental Risk Assessment and Management (DEFRA *et al*, 2000):

'Risk is a combination of the probability, or frequency, of occurrence of a defined hazard and the magnitude of the consequences of the occurrence'.

Model Procedures for the Management of Land Contamination – Contamination Land Report 11 (2004) defines a 'Hazard' as

'*a property or situation that in particular circumstances could lead to harm'.*

A framework for qualitative risk assessment is provided in CIRIA publication C552 Contaminated Land Risk Assessment – A Guide to Good Practice (2001). The method requires an assessment of the magnitude of the probability of the risk occurring and the magnitude of the potential consequence. Classifications of consequences and probability, levels and descriptions of risk have been devised from the above publication and are defined in the following sections.

Classification of Consequence

Table A Classification of Consequence	
Classification	**Definition**
Severe	• Short term (acute) risk to human health likely to result in significant harm • Short term risk to controlled waters • Catastrophic damage to buildings/structures • Short term risk to an ecosystem or organism within the particular ecosystem
Medium	• Chronic damage to human health (long term risk) • Pollution of a sensitive water resource • A significant change in an ecosystem or organism within the ecosystem
Mild	• Pollution of non-sensitive water resources • Significant damage to buildings/structures • Damage to sensitive buildings/structure/services or the environment
Negligible	• Harm (not necessarily significant) which may result in financial loss • Non-permanent health effects to humans (easily prevented by PPE for example) • Easily repairable effects of structural (building) damage

Classification of Probability

Table B Classification of Probability	
Classification	**Definition**
High Likelihood	• There is a complete pollution linkage and an event appears very likely to occur in the short term and is inevitable in the long term. • Evidence of harm to the receptor
Likely	• There is a complete pollution linkage which means that is it probable that an event will occur • The event is not inevitable but possible in short term and likely in the long term
Low Likelihood	• There is a complete pollution linkage and circumstances are possible under which an event could occur • It is not certain that an event will occur in the long term, and it is less likely to occur in the short term
Unlikely	• There is a complete pollution linkage but circumstances are such that it is improbable that an event would occur even in the long term

Risk Assessment Matrix

By comparing the consequences of a risk and the probability of the risk of a pollution linkage, the likely risk category can be determined as shown in **Table C** below.

Table C Risk Assessment Matrix

Increasing acceptability →		Consequence			
		Severe	**Medium**	**Mild**	**Negligible**
Probability	**High Likelihood**	High risk	High risk	Medium risk	Low risk
	Likely	High risk	Medium risk	Low risk	Near zero risk
	Low Likelihood	Medium risk	Low risk	Low risk	Near zero risk
	Unlikely	Low risk	Near zero risk	Near zero risk	Near zero risk

Description of Risks and Likely Actions

High Risk
There is a high probability that severe harm could arise to a receptor, or there is evidence that a receptor is currently being severely harmed. The risk if realised is likely to result in liability, and urgent investigation or remediation will be required.

Medium Risk
It is probable that harm will arise to a receptor. However, it is relatively unlikely that such harm would be severe, or if harm does occur the harm is likely to be relatively mild. Investigation will be required to determine the liability, and some remedial works may be required in the long term.

Low Risk
It is possible that harm may arise to a receptor, but it is likely that the harm would be mild.

Near Zero Risk
There is a very low risk of harm to the receptor. In the event of harm being realised the harm is not likely to be severe.

ANNEX D
Trial Pit Logs

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Trial Pit Log

Trial Pit No: TP01
Sheet 1 of 1

Project Name: Penywaun	Project No: 17264	Co-ords: -	Date: 07/12/2022
Location: Hirwaun Road, Penywaun		Dimensions: 2.30 × 0.60, Depth 3.00	Scale: 1:25
Client: Newydd Housing Association			Logged: TM

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.30	ES					MADE GROUND: Grass over loose to medium dense dark grey clayey silty sandy angular to subangular fine to coarse GRAVEL of mudstone, brick, concrete, ceramic fragments, glass fragments with medium cobble and boulder content. Cobbles and boulder are subangular concrete, brick.
				1.00			
	1.10	D					COLLIERY SPOIL: Soft to firm dark grey silty gravelly CLAY with low cobble content. Gravel is angular to subangular fine to coarse mudstone. Cobbles are subangular mudstone.
				1.50			COLLIERY SPOIL: Medium dense dark grey clayey angular to subangular fine to coarse GRAVEL of mudstone.
				3.00			End of Pit at 3.000m

Stability: Stable

Remarks: 1] Consistency, strength and density indicators are based upon field judgement. 2] Infiltration test performed at 1.70m depth. 3] Trial pit terminated at 3.00m depth. 4] Trial pit backfilled with arisings on completion of test.

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Trial Pit Log

Trial Pit No: TP02
Sheet 1 of 1

Project Name: Penywaun	Project No: 17264	Co-ords: -	Date: 07/12/2022
Location: Hirwaun Road, Penywaun		Dimensions: 2.30 × 0.60, Depth 3.00	Scale: 1:25
Client: Newydd Housing Association			Logged: TM

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.50	ES					COLLIERY SPOIL: Grass over soft to firm dark grey silty gravelly CLAY with low cobble content. Gravel is angular to subangular fine to coarse mudstone. Cobbles are subangular mudstone.
				3.00			End of Pit at 3.000m

Stability: Stable

Remarks: 1] Consistency, strength and density indicators are based upon field judgement. 2] Infiltration test performed at 1.20m depth. 3] Trial pit terminated at 3.00m depth. 4] Trial pit backfilled with arisings on completion of test.

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Trial Pit Log

Trial Pit No: TP03
Sheet 1 of 1

Project Name: Penywaun	Project No: 17264	Co-ords: -	Date: 07/12/2022
Location: Hirwaun Road, Penywaun		Dimensions: 2.30 × 0.60, Depth 3.00	Scale: 1:25
Client: Newydd Housing Association			Logged: TM

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.10			TARMAC.
	0.30	ES					MADE GROUND: Loose black mottled brown clayey very gravelly fine to coarse SAND with high cobble content. Gravel is angular to subangular fine to coarse brick, concrete, mudstone. Cobbles are subangular brick, concrete.
				0.70			Soft to firm greenish brown mottled grey silty sandy gravelly CLAY. Gravel is angular to subrounded mudstone, sandstone.
				3.00			End of Pit at 3.000m

Stability: Stable

Remarks: 1] Consistency, strength and density indicators are based upon field judgement. 2] Infiltration test performed at 2.00m depth. 3] Trial pit terminated at 3.00m depth. 4] Trial pit backfilled with arisings on completion of test.

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Trial Pit Log

Trial Pit No: TP04
Sheet 1 of 1

Project Name: Penywaun	Project No: 17264	Co-ords: -	Date: 07/12/2022
Location: Hirwaun Road, Penywaun		Dimensions: 2.50 × 0.60	Scale: 1:25
Client: Newydd Housing Association		Depth 3.00	Logged: TM

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.50	ES		1.00			COLLIERY SPOIL: Soft to firm dark grey silty gravelly CLAY with low cobble content. Gravel is angular to subangular fine to coarse mudstone. Cobbles are subangular mudstone.
				3.00			COLLIERY SPOIL: Medium dense dark grey clayey angular to subangular fine to coarse GRAVEL of mudstone.
							End of Pit at 3.000m

Stability: Stable

Remarks: 1] Consistency, strength and density indicators are based upon field judgement. 2] Trial pit terminated at 3.00m depth. 3] Trial pit backfilled with arisings on completion of test.

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Trial Pit Log

Trial Pit No: TP05
Sheet 1 of 1

Project Name: Penywaun	Project No: 17264	Co-ords: -	Date: 07/12/2022
Location: Hirwaun Road, Penywaun		Dimensions: 2.40 × 0.60, Depth 3.00	Scale: 1:25
Client: Newydd Housing Association			Logged: TM

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.40	ES					COLLIERY SPOIL: Soft to firm dark grey silty gravelly CLAY with low cobble content. Gravel is angular to subangular fine to coarse mudstone. Cobbles are subangular mudstone.
				2.00			COLLIERY SPOIL: Medium dense dark grey clayey angular to subangular fine to coarse GRAVEL of mudstone.
				3.00			End of Pit at 3.000m

Stability: Stable

Remarks: 1] Consistency, strength and density indicators are based upon field judgement. 2] Trial pit terminated at 3.00m depth. 3] Trial pit backfilled with arisings on completion of test.

ANNEX E
Soakaway Results

SOAKAWAY TEST

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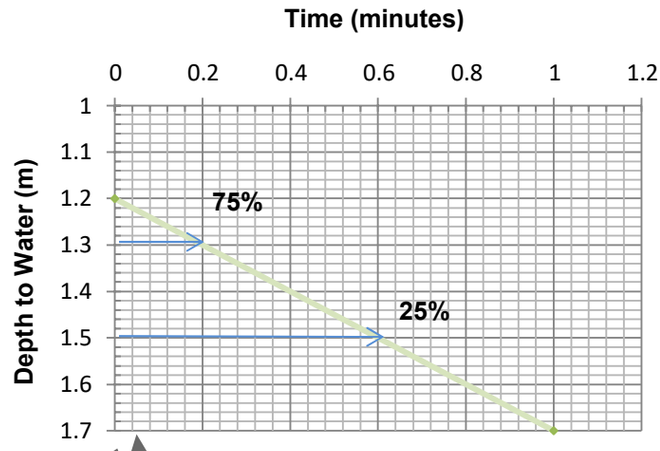
Site Name: Penywaun
Project Number: 17264
Date: 07/12/2022
Engineer: Tomas Marquez

Trial Pit: **TP01**

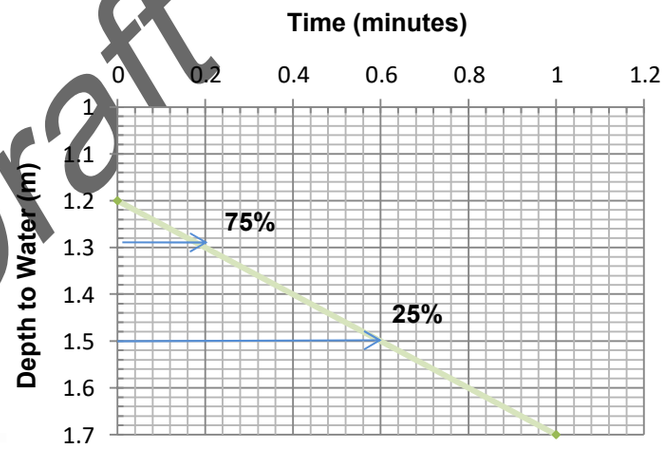
TEST 1

Length	2.30	m
Bredth	0.60	m
Depth	1.70	m
Fill Level	1.20	m
V_{p75-25}	0.345	m^3
a_{p50}	2.83	m^2
t_{p75-25}	0.4	minutes
Soil Infiltration Rate, f	**5.08E-03**	**ms^{-1}**



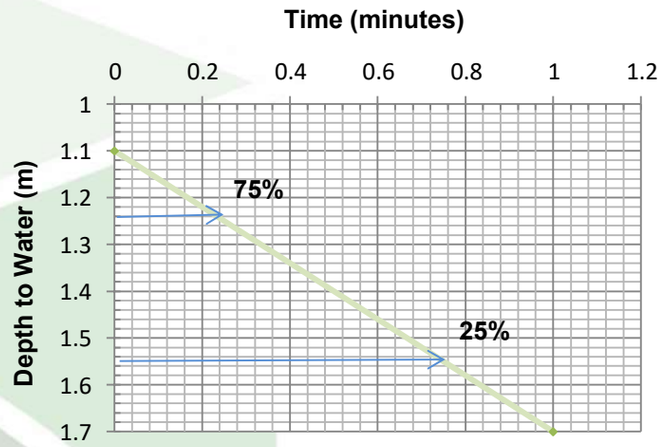
TEST 2

Length	2.30	m
Bredth	0.60	m
Depth	1.70	m
Fill Level	1.20	m
V_{p75-25}	0.345	m^3
a_{p50}	2.83	m^2
t_{p75-25}	0.4	minutes
Soil Infiltration Rate, f	**5.08E-03**	**ms^{-1}**



TEST 3

Length	2.30	m
Bredth	0.60	m
Depth	1.70	m
Fill Level	1.10	m
V_{p75-25}	0.414	m^3
a_{p50}	3.12	m^2
t_{p75-25}	0.51	minutes
Soil Infiltration Rate, f	**4.34E-03**	**ms^{-1}**



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

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SOAKAWAY TEST

Time (mins)	Depth to Water (m)
0	1.2
1	1.7

Effective Depth (m)	0.50
Height to 0.75H	1.325
Height to 0.25H	1.575
tp75	0.2
tp25	0.6

Time (mins)	Depth to Water (m)
0	1.2
1	1.7

Effective Depth (m)	0.50
Height to 0.75H	1.325
Height to 0.25H	1.575
tp75	0.2
tp25	0.6

Time (mins)	Depth to Water (m)
0	1.1
1	1.7

Effective Depth (m)	0.60
Height to 0.75H	1.25
Height to 0.25H	1.55
tp75	0.24
tp25	0.75

SOAKAWAY TEST

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Site Name: Penywaun
Project Number: 17264
Date: 07/12/2022
Engineer: Tomas Marquez

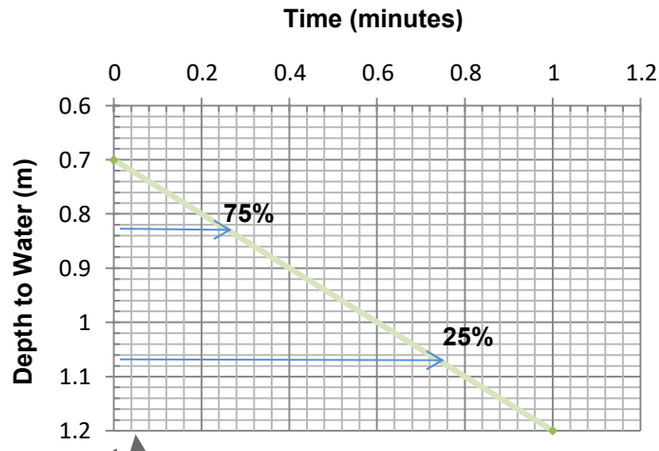
Trial Pit: **TP02**

TEST 1

Length	2.30	m
Bredth	0.60	m
Depth	1.20	m
Fill Level	0.70	m

V_{p75-25}	0.345	m^3
a_{p50}	2.83	m^2
t_{p75-25}	0.51	minutes

Soil Infiltration Rate, f **3.98E-03** **ms^{-1}**

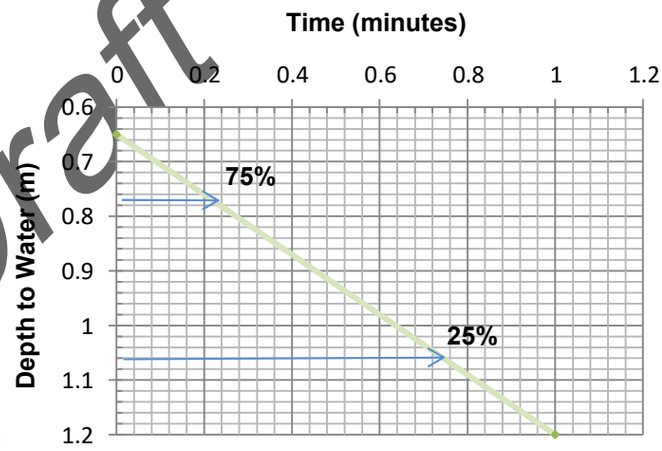


TEST 2

Length	2.30	m
Bredth	0.60	m
Depth	1.20	m
Fill Level	0.65	m

V_{p75-25}	0.38	m^3
a_{p50}	2.975	m^2
t_{p75-25}	0.53	minutes

Soil Infiltration Rate, f **4.01E-03** **ms^{-1}**

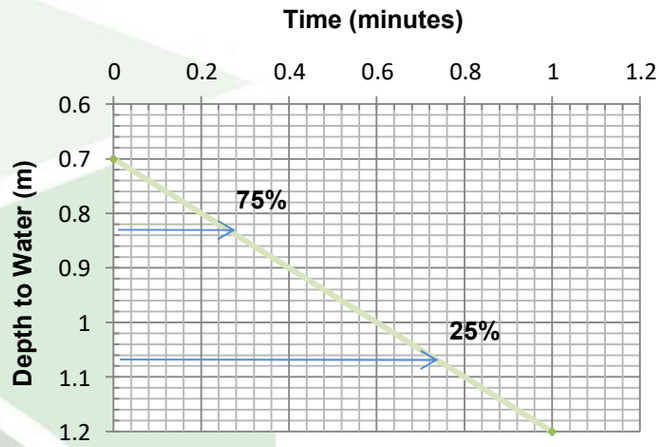


TEST 3

Length	2.30	m
Bredth	0.60	m
Depth	1.20	m
Fill Level	0.70	m

V_{p75-25}	0.345	m^3
a_{p50}	2.83	m^2
t_{p75-25}	0.51	minutes

Soil Infiltration Rate, f **3.98E-03** **ms^{-1}**



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

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SOAKAWAY TEST

Time (mins)	Depth to Water (m)
0	0.7
1	1.2

Effective Depth (m)	0.50
Height to 0.75H	0.825
Height to 0.25H	1.075
tp75	0.23
tp25	0.74

Time (mins)	Depth to Water (m)
0	0.65
1	1.2

Effective Depth (m)	0.55
Height to 0.75H	0.7875
Height to 0.25H	1.0625
tp75	0.21
tp25	0.74

Time (mins)	Depth to Water (m)
0	0.7
1	1.2

Effective Depth (m)	0.50
Height to 0.75H	0.825
Height to 0.25H	1.075
tp75	0.23
tp25	0.74

SOAKAWAY TEST

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Geotechnical & Geoenvironmental Specialists

Site Name: Penywaun
Project Number: 17264
Date: 07/12/2022
Engineer: Tomas Marquez

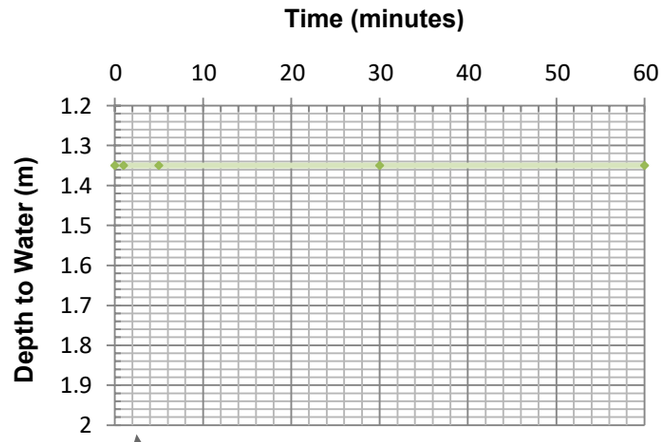
Trial Pit: **TP03**

TEST 1

Length	2.30	m
Bredth	0.60	m
Depth	2.00	m
Fill Level	1.35	m

V_{p75-25}	0.449	m^3
a_{p50}	3.265	m^2
t_{p75-25}	0	minutes

Soil Infiltration Rate, f **No Infiltration**



REMARKS:
Test carried out in accordance with BRE Digest 365 (2016)

terra firma
Geotechnical & Geoenvironmental Specialists
www.terrafirmawales.co.uk

SOAKAWAY TEST

Time (mins)	Depth to Water (m)
0	1.35
1	1.35
5	1.35
30	1.35
60	1.35

Effective Depth (m)	0.65
Height to 0.75H	1.5125
Height to 0.25H	1.8375
tp75	
tp25	

ANNEX F
Window Samples Logs

terra firma
Geotechnical & Geoenvironmental Specialists
Tel: 02920 735354
info@terrafirmawales.co.uk
www.terrafirmawales.co.uk

Borehole Log

Borehole No. **WS01**
Sheet 1 of 1

Project Name:	Penywaun	Project No: 17264	Co-ords:
Location:	Hirwaun Road, Penywaun		Level:
Client:	Newydd Housing Association		Dates: 07/12/2022 - 07/12/2022

Hole Type: WS
Scale: 1:50
Logged By: TM

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
	0.20	ES						COLLIERY SPOIL: Soft to firm dark grey silty gravelly CLAY with low cobble content. Gravel is angular to subangular fine to coarse mudstone. Cobbles are subangular mudstone.
	1.00	D						
	1.20	SPT	N=5 (2,3/2,1,1,1)	1.20				COLLIERY SPOIL: Loose to medium dense dark grey clayey angular to subangular fine to coarse GRAVEL of mudstone.
	2.00	SPT	N=12 (2,2/2,2,2,6)					
				3.00				End of Borehole at 3.000m

Remarks: WS was cancelled at 3.00m depth due to collapsing to 2.00m depth. Installation: 1m Plain + 1m Slotted.

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www.terrafirmawales.co.uk

Borehole Log

Borehole No. **WS02**
Sheet 1 of 1

Project Name:	Penywaun	Project No: 17264	Co-ords:
Location:	Hirwaun Road, Penywaun		Level:
Client:	Newydd Housing Association		Dates: 07/12/2022 - 07/12/2022

Hole Type: WS
Scale: 1:50
Logged By: TM

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
	0.20	ES						COLLIERY SPOIL: Soft to firm dark grey silty gravelly CLAY with low cobble content. Gravel is angular to subangular fine to coarse mudstone. Cobbles are subangular mudstone.
	0.80	D						
	1.20	SPT	N=13 (4,4/3,3,4,3)	1.20				COLLIERY SPOIL: Very loose to loose dark grey clayey angular to subangular fine to coarse GRAVEL of mudstone.
	2.00	SPT	N=12 (3,2/2,2,3,5)					
	3.00	SPT	N=12 (2,2/3,4,2,3)					
				3.80				Soft to firm dark brown sandy SILT.
	4.00	SPT	N=13 (3,2/3,3,3,4)	4.00				End of Borehole at 4.000m

Remarks: Installation: 2m Plain + 1m Slotted.

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www.terrafirmawales.co.uk

Borehole Log

Borehole No. **WS03**
Sheet 1 of 1

Project Name:	Penywaun	Project No: 17264	Co-ords:
Location:	Hirwaun Road, Penywaun		Level:
Client:	Newydd Housing Association		Dates: 07/12/2022 - 07/12/2022

Hole Type: WS
Scale: 1:50
Logged By: TM

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
	0.20	ES						COLLIERY SPOIL: Soft to firm dark grey silty gravelly CLAY with low cobble content. Gravel is angular to subangular fine to coarse mudstone. Cobbles are subangular mudstone.
	1.00	D						
	1.20	SPT	N=9 (1,2/2,3,2,2)					
	2.00	SPT	N=3 (1,1/0,1,1,1)					
	3.00	SPT	N=7 (2,3/2,2,1,2)	3.00				COLLIERY SPOIL: Medium dense dark grey clayey angular to subangular fine to coarse GRAVEL of mudstone.
	4.00	SPT	N=13 (2,2/3,4,3,3)	4.00				End of Borehole at 4.000m

Remarks: Installation: 2m Plain + 1m Slotted.

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www.terrafirmawales.co.uk

Borehole Log

Borehole No. **WS04**
Sheet 1 of 1

Project Name:	Penywaun	Project No: 17264	Co-ords:
Location:	Hirwaun Road, Penywaun		Level:
Client:	Newydd Housing Association		Dates: 07/12/2022 - 07/12/2022

Hole Type: WS
Scale: 1:50
Logged By: TM

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description
	Depth (m)	Type	Results					
	0.30	ES						COLLIERY SPOIL: Soft to firm dark grey silty gravelly CLAY with low cobble content. Gravel is angular to subangular fine to coarse mudstone. Cobbles are subangular mudstone.
	1.20	SPT	N=12 (2,3/3,3,3,3)	1.20				COLLIERY SPOIL: Medium dense dark grey clayey angular to subangular fine to coarse GRAVEL of mudstone.
	2.00	SPT	N=9 (4,2/2,3,2,2)					
	3.00	SPT	N=10 (2,3/3,2,3,2)					
	4.00	SPT	N=16 (3,3/4,3,5,4)	3.60 3.70 3.90 4.00				Firm dark brown sandy SILT. Firm grey mottled brown silty CLAY. Firm greenish brown silty sandy CLAY. End of Borehole at 4.000m

Remarks:

ANNEX G
TRL - DCP Results

Dynamic Cone Penetrometer Testing

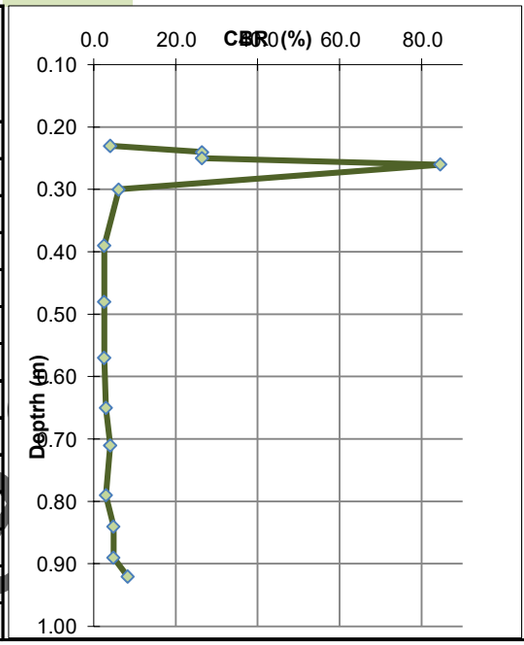
terrafirma

Client: Newydd Housing Association
Site Name: Penywaun
Project Number: 17264
Date: **12/01/2023**

TRL 1

Initial Scale Reading (mm) 170 Datum bgl (mm) 0

no. of blows	scale reading (mm)	penetration increment (mm)	depth bgl (m)	DCP (mm/blow)	CBR (%)
1	230	60	0.23	60	4.0
1	240	10	0.24	10	26.5
1	250	10	0.25	10	26.5
3	260	10	0.26	3	84.6
1	300	40	0.30	40	6.1
1	390	90	0.39	90	2.6
1	480	90	0.48	90	2.6
1	570	90	0.57	90	2.6
1	650	80	0.65	80	2.9
1	710	60	0.71	60	4.0
1	790	80	0.79	80	2.9
1	840	50	0.84	50	4.8
1	890	50	0.89	50	4.8
1	920	30	0.92	30	8.3



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

Dynamic Cone Penetrometer Testing

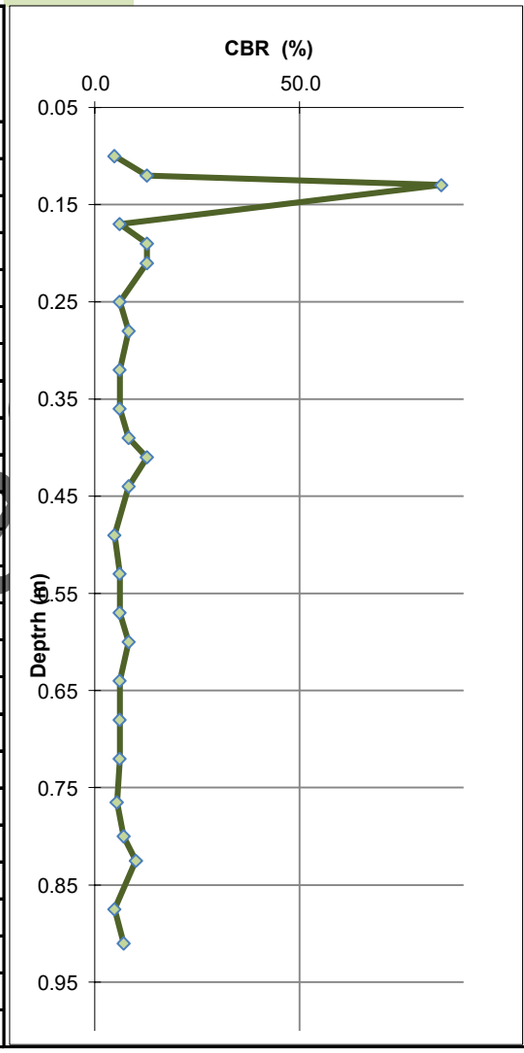
terrafirma

Client: Newydd Housing Association
Site Name: Penywaun
Project Number: 17264
Date: **12/01/2023**

TRL 2

Initial Scale Reading (mm) 50 Datum bgl (mm) 0

no. of blows	scale reading (mm)	penetration increment (mm)	depth bgl (m)	DCP (mm/blow)	CBR (%)
1	100	50	0.10	50	4.8
1	120	20	0.12	20	12.7
3	130	10	0.13	3	84.6
1	170	40	0.17	40	6.1
1	190	20	0.19	20	12.7
1	210	20	0.21	20	12.7
1	250	40	0.25	40	6.1
1	280	30	0.28	30	8.3
1	320	40	0.32	40	6.1
1	360	40	0.36	40	6.1
1	390	30	0.39	30	8.3
1	410	20	0.41	20	12.7
1	440	30	0.44	30	8.3
1	490	50	0.49	50	4.8
1	530	40	0.53	40	6.1
1	570	40	0.57	40	6.1
1	600	30	0.60	30	8.3
1	640	40	0.64	40	6.1
1	680	40	0.68	40	6.1
1	720	40	0.72	40	6.1
1	765	45	0.77	45	5.4
1	800	35	0.80	35	7.0
1	825	25	0.83	25	10.1
1	875	50	0.88	50	4.8
1	910	35	0.91	35	7.0



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

Dynamic Cone Penetrometer Testing

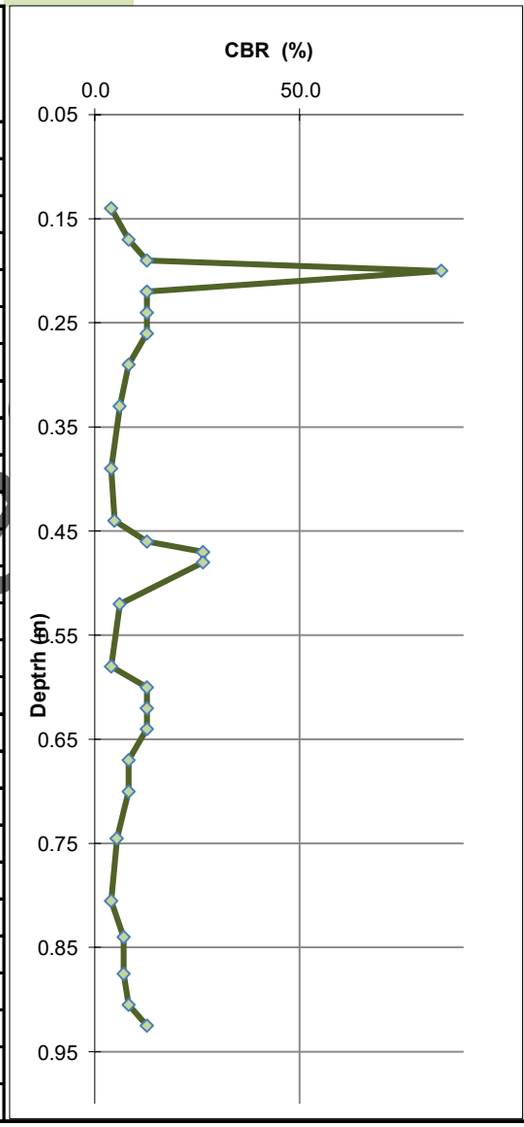
terrafirma

Client: Newydd Housing Association
Site Name: Penywaun
Project Number: 17264
Date: **12/01/2023**

TRL 3

Initial Scale Reading (mm) 80 Datum bgl (mm) 0

no. of blows	scale reading (mm)	penetration increment (mm)	depth bgl (m)	DCP (mm/blow)	CBR (%)
1	140	60	0.14	60	4.0
1	170	30	0.17	30	8.3
1	190	20	0.19	20	12.7
3	200	10	0.20	3	84.6
1	220	20	0.22	20	12.7
1	240	20	0.24	20	12.7
1	260	20	0.26	20	12.7
1	290	30	0.29	30	8.3
1	330	40	0.33	40	6.1
1	390	60	0.39	60	4.0
1	440	50	0.44	50	4.8
1	460	20	0.46	20	12.7
1	470	10	0.47	10	26.5
1	480	10	0.48	10	26.5
1	520	40	0.52	40	6.1
1	580	60	0.58	60	4.0
1	600	20	0.60	20	12.7
1	620	20	0.62	20	12.7
1	640	20	0.64	20	12.7
1	670	30	0.67	30	8.3
1	700	30	0.70	30	8.3
1	745	45	0.75	45	5.4
1	805	60	0.81	60	4.0
1	840	35	0.84	35	7.0
1	875	35	0.88	35	7.0
1	905	30	0.91	30	8.3
1	925	20	0.93	20	12.7



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

Dynamic Cone Penetrometer Testing

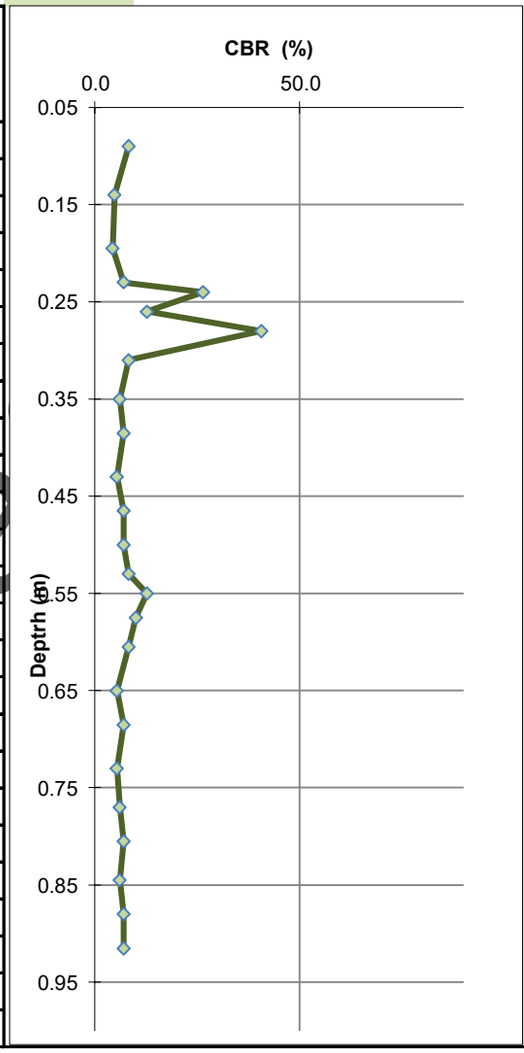
terrafirma

Client: Newydd Housing Association
Site Name: Penywaun
Project Number: 17264
Date: **12/01/2023**

TRL 4

Initial Scale Reading (mm) 60 Datum bgl (mm) 0

no. of blows	scale reading (mm)	penetration increment (mm)	depth bgl (m)	DCP (mm/blow)	CBR (%)
1	90	30	0.09	30	8.3
1	140	50	0.14	50	4.8
1	195	55	0.20	55	4.4
1	230	35	0.23	35	7.0
1	240	10	0.24	10	26.5
1	260	20	0.26	20	12.7
3	280	20	0.28	7	40.7
1	310	30	0.31	30	8.3
1	350	40	0.35	40	6.1
1	385	35	0.39	35	7.0
1	430	45	0.43	45	5.4
1	465	35	0.47	35	7.0
1	500	35	0.50	35	7.0
1	530	30	0.53	30	8.3
1	550	20	0.55	20	12.7
1	575	25	0.58	25	10.1
1	605	30	0.61	30	8.3
1	650	45	0.65	45	5.4
1	685	35	0.69	35	7.0
1	730	45	0.73	45	5.4
1	770	40	0.77	40	6.1
1	805	35	0.81	35	7.0
1	845	40	0.85	40	6.1
1	880	35	0.88	35	7.0
1	915	35	0.92	35	7.0



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

Dynamic Cone Penetrometer Testing

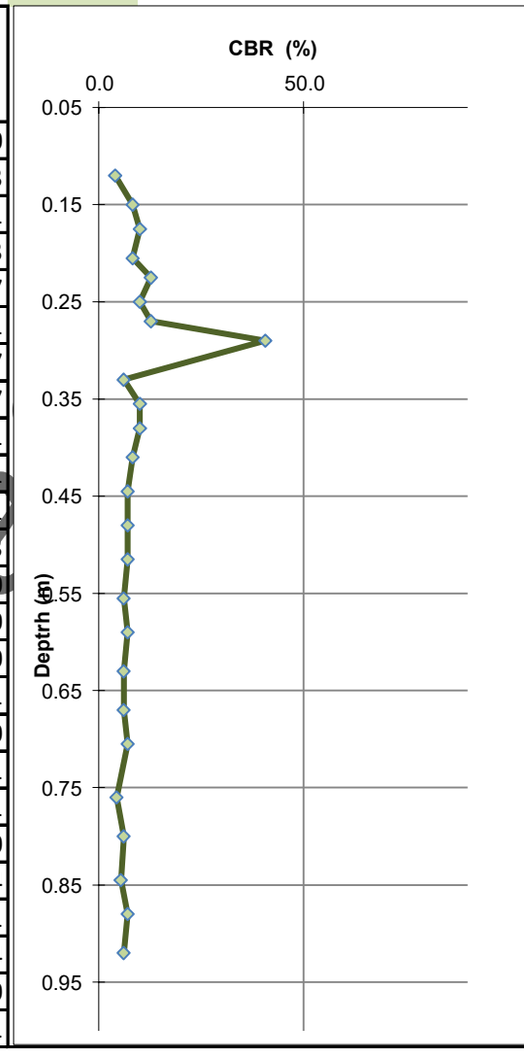
terrafirma

Client: Newydd Housing Association
Site Name: Penywaun
Project Number: 17264
Date: **12/01/2023**

TRL 5

Initial Scale Reading (mm) 60 Datum bgl (mm) 0

no. of blows	scale reading (mm)	penetration increment (mm)	depth bgl (m)	DCP (mm/blow)	CBR (%)
1	120	60	0.12	60	4.0
1	150	30	0.15	30	8.3
1	175	25	0.18	25	10.1
1	205	30	0.21	30	8.3
1	225	20	0.23	20	12.7
1	250	25	0.25	25	10.1
1	270	20	0.27	20	12.7
3	290	20	0.29	7	40.7
1	330	40	0.33	40	6.1
1	355	25	0.36	25	10.1
1	380	25	0.38	25	10.1
1	410	30	0.41	30	8.3
1	445	35	0.45	35	7.0
1	480	35	0.48	35	7.0
1	515	35	0.52	35	7.0
1	555	40	0.56	40	6.1
1	590	35	0.59	35	7.0
1	630	40	0.63	40	6.1
1	670	40	0.67	40	6.1
1	705	35	0.71	35	7.0
1	760	55	0.76	55	4.4
1	800	40	0.80	40	6.1
1	845	45	0.85	45	5.4
1	880	35	0.88	35	7.0
1	920	40	0.92	40	6.1



REMARKS:

Test carried out in accordance with operating instructions for the dynamic cone penetrometer Model A2465 by CNS Farnell Ltd.

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from The Highways Agency Interim Advice Note 73/06 - Design Guidance for Road Pavement Foundations (2009)

ANNEX H
Laboratory Soil Geotechnical Test Results

Results Summary

Apex Testing Solutions Limited
Sturmi Way
Village Farm Industrial Estate
Pyle
Bridgend
CF33 6BZ

Telephone: 01656 746762
E-mail: andrew.grogan@apex-drilling.com
laura.davis@apex-drilling.com

Reporting Details		**Key Information**	
Company Name:	TFW Group Ltd	**Site Name:**	Penywaun
Address:	5 Deryn Court	**Job Number:**	D22571
	Wharfdale Road	**Date Received:**	09/12/2022
	Cardiff	**Job Coordinator:**	G. Llewellyn
	CF23 7HA		
Contact Name:	**Tomas**		
Contact Number:	**07716046885**		

Item No.	Tests Undertaken	Number of Tests
1	Atterburg Limits (4 point) - BS1377-2: 1990	4

Results Issued: 15/12/2022

Comments

Results herein relate only to samples received in the laboratory and where not sampled by Apex Testing Solutions personnel relate to the samples as received.
Where tests are UKAS accredited any Opinion and/or Interpretation expressed herein are outside the scope of the UKAS Accreditation. The reports shall not be reproduced in full without the written approval of the laboratory.

Please contact the job coordinator should any further information be required.

TEST REPORT
LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX
BS 1377:Part 2:1990. Clause 4.3/5.3/5.4

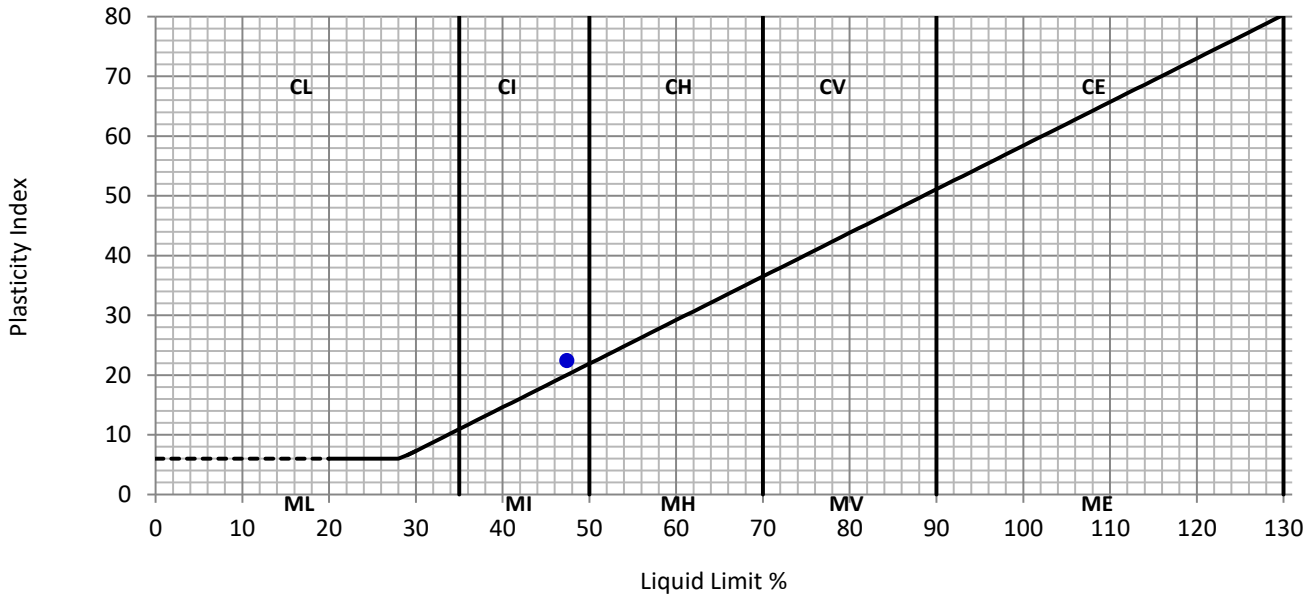
Project No:	D22571	**Client:**	TFW Group Ltd
Project Name:	17264 - Penywaun	**Address:**	5 Deryn Court Wharfdale Road Cardiff
ATS Sample No:	30772		CF23 7HA

Site Ref / Hole ID:	TP01	**Depth (m):**	1.10
Sample No:		**Sample Type:**	Disturbed
Sampling Certificate Received:	No	**Material Description:**	Grey sandy clayey GRAVEL
Location in Works:	N/A	**Material Source:**	Site Generated
Date Sampled:	Unknown	**Material Supplier:**	Site Generated
Sampled By:	Client	**Specification:**	BS1377
Date Received:	09 December 2022	**Date Tested:**	13 December 2022

Test Results

Liquid Limit	47	%
Plastic Limit	25	%
Plasticity Index	22	%

Preparation:	4.2.4 Sieved Specimen	
Proportion retained on 425µm sieve:	70	%



Remarks:

QA Ref.	**Apex Testing Solutions**	Approver	Date	Fig.
BS1377 - 2 Rev. 3.0	Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096 7771	G Llewellyn	14/12/2022	**ATT**
		G Llewellyn, Senior Technician		

TEST REPORT
LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX
BS 1377:Part 2:1990. Clause 4.3/5.3/5.4

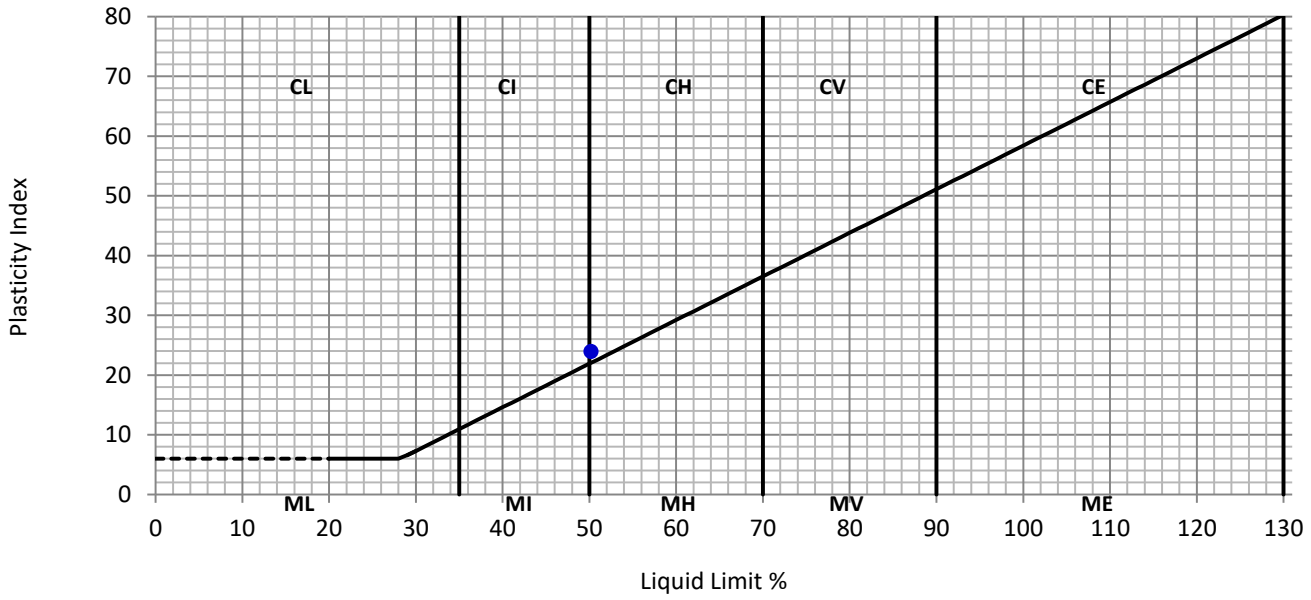
Project No:	D22571	**Client:**	TFW Group Ltd
Project Name:	17264 - Penywaun	**Address:**	5 Deryn Court Wharfdale Road Cardiff
ATS Sample No:	30773		CF23 7HA

Site Ref / Hole ID:	WS01	**Depth (m):**	1.00
Sample No:		**Sample Type:**	Disturbed
Sampling Certificate Received:	No	**Material Description:**	Grey sandy clayey GRAVEL
Location in Works:	N/A	**Material Source:**	Site Generated
Date Sampled:	Unknown	**Material Supplier:**	Site Generated
Sampled By:	Client	**Specification:**	BS1377
Date Received:	09 December 2022	**Date Tested:**	13 December 2022

Test Results

Liquid Limit	50	%
Plastic Limit	26	%
Plasticity Index	24	%

Preparation:	4.2.4 Sieved Specimen	
Proportion retained on 425µm sieve:	72	%



Remarks:

QA Ref. BS1377 - 2 Rev. 3.0	**Apex Testing Solutions** Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	UKAS TESTING 7771	Approver: *G Llewellyn* G Llewellyn, Senior Technician	Date: 14/12/2022	Fig. **ATT**

TEST REPORT
LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX
BS 1377:Part 2:1990. Clause 4.3/5.3/5.4

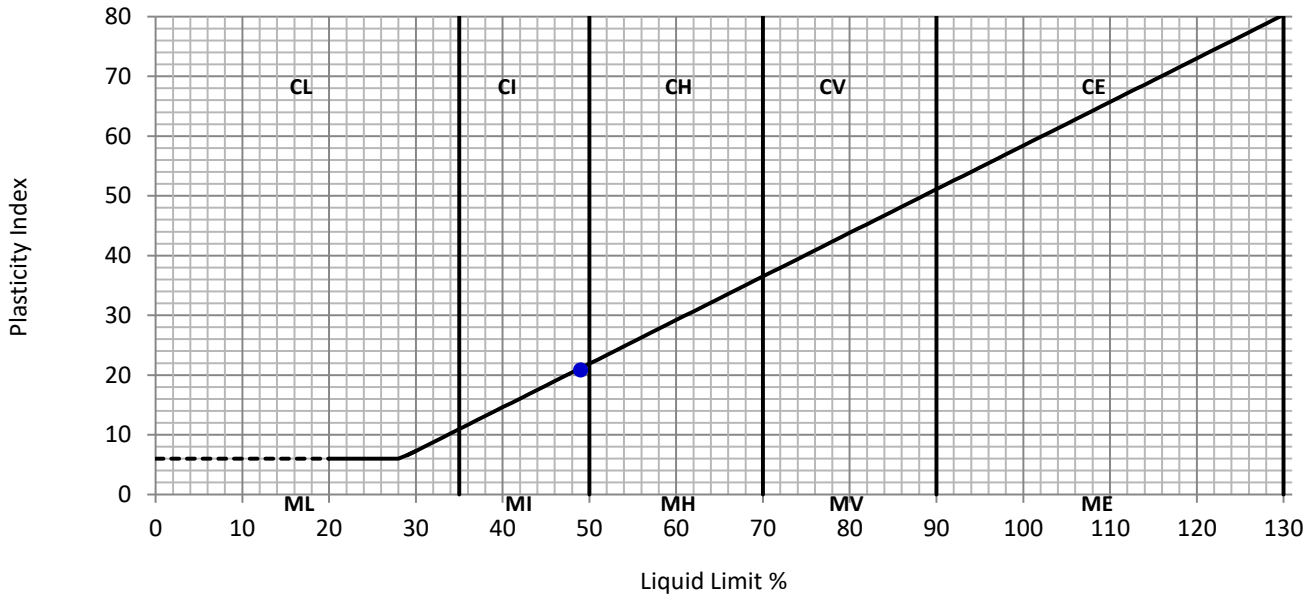
Project No:	D22571	**Client:**	TFW Group Ltd
Project Name:	17264 - Penywaun	**Address:**	5 Deryn Court Wharfdale Road Cardiff
ATS Sample No:	30774		CF23 7HA

Site Ref / Hole ID:	WS02	**Depth (m):**	0.80
Sample No:		**Sample Type:**	Disturbed
Sampling Certificate Received:	No	**Material Description:**	Grey sandy silty GRAVEL
Location in Works:	N/A	**Material Source:**	Site Generated
Date Sampled:	Unknown	**Material Supplier:**	Site Generated
Sampled By:	Client	**Specification:**	BS1377
Date Received:	09 December 2022	**Date Tested:**	14 December 2022

Test Results

Liquid Limit	49	%
Plastic Limit	28	%
Plasticity Index	21	%

Preparation:	4.2.4 Sieved Specimen	
Proportion retained on 425µm sieve:	82	%



Remarks:

QA Ref. BS1377 - 2 Rev. 3.0	**Apex Testing Solutions** Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	Approver: G Llewellyn G Llewellyn, Senior Technician	Date: 15/12/2022	Fig. **ATT**

TEST REPORT
LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX
BS 1377:Part 2:1990. Clause 4.3/5.3/5.4

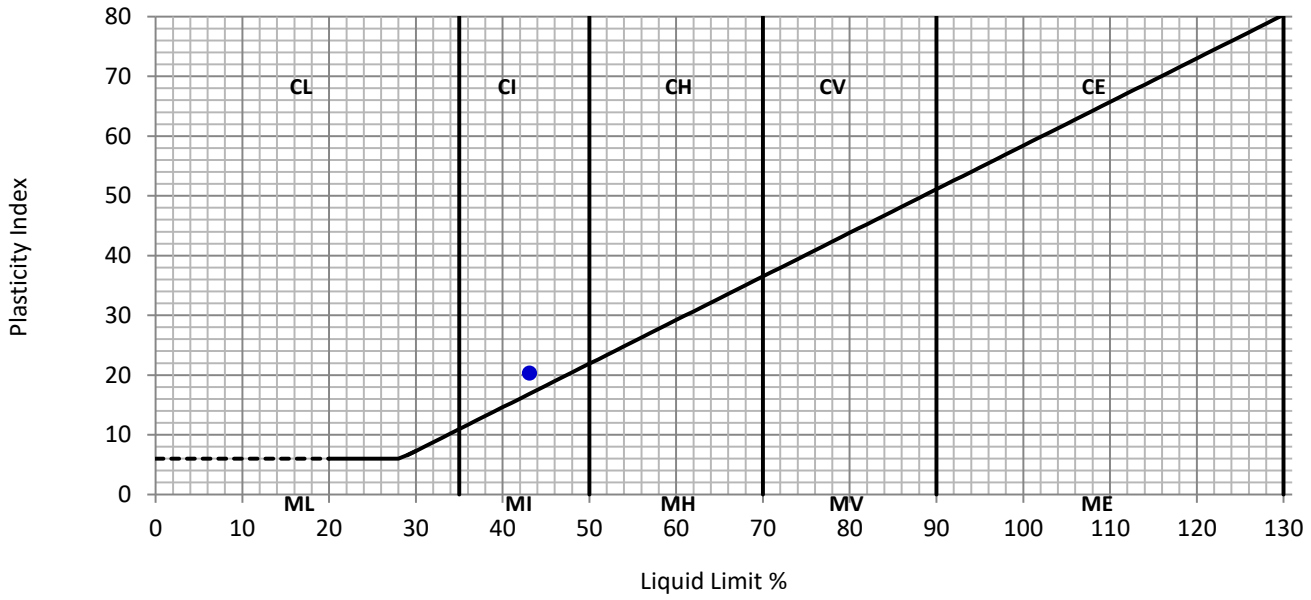
Project No:	D22571	**Client:**	TFW Group Ltd
Project Name:	17264 - Penywaun	**Address:**	5 Deryn Court Wharfdale Road Cardiff
ATS Sample No:	30775		CF23 7HA

Site Ref / Hole ID:	WS03	**Depth (m):**	1.00
Sample No:		**Sample Type:**	Disturbed
Sampling Certificate Received:	No	**Material Description:**	Grey sandy clayey GRAVEL
Location in Works:	N/A	**Material Source:**	Site Generated
Date Sampled:	Unknown	**Material Supplier:**	Site Generated
Sampled By:	Client	**Specification:**	BS1377
Date Received:	09 December 2022	**Date Tested:**	14 December 2022

Test Results

Liquid Limit	43	%
Plastic Limit	23	%
Plasticity Index	20	%

Preparation:	4.2.4 Sieved Specimen	
Proportion retained on 425µm sieve:	69	%



Remarks:

QA Ref. BS1377 - 2 Rev. 3.0	**Apex Testing Solutions** Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	7771	Approver: G Llewellyn G Llewellyn, Senior Technician	Date: 15/12/2022	Fig. **ATT**

ANNEX I
Laboratory Soil Chemical Test Results

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-47478-1
Initial Date of Issue:	16-Jan-2023
Client	Terra Firma (Wales) Ltd
Client Address:	5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA
Contact(s):	tomas@terrafirmawales.co.uk
Project	Penywaun
Quotation No.:	
Order No.:	17264TM
No. of Samples:	9
Turnaround (Wkdays):	10
Date Approved:	16-Jan-2023
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	12-Dec-2022
Date Instructed:	12-Dec-2022
Results Due:	23-Dec-2022

Results - Soil

Project: Penywaun

Client: Terra Firma (Wales) Ltd				**Chemtest Job No.:**	22-47478	22-47478	22-47478	22-47478	22-47478	22-47478	22-47478	22-47478
Quotation No.:				**Chemtest Sample ID.:**	1562436	1562437	1562438	1562439	1562440	1562441	1562442	1562443
Order No.: 17264TM				Client Sample Ref.:	TP01	TP02	TP03	TP04	TP05	WS01	WS02	WS03
				Client Sample ID.:	TP01	TP02	TP03	TP04	TP05	WS01	WS02	WS03
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.30	0.50	0.30	0.50	0.40	0.20	0.20	0.20
				Date Sampled:	08-Dec-2022	08-Dec-2022	08-Dec-2022	08-Dec-2022	08-Dec-2022	08-Dec-2022	08-Dec-2022	08-Dec-2022
				Time Sampled:	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00
				Asbestos Lab:	DURHAM	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	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	-	-	-	-	-	-
Moisture	N	2030	%	0.020	11	9.0	12	8.4	7.8	5.8	5.5	12
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones, Roots and Wood	Stones, Roots and Wood	Stones, Roots and Wood	Stones, Roots and Wood	Stones, Roots and Wood	Stones, Roots and Wood	Stones	Stones, Roots and Wood
Soil Texture	N	2040		N/A	Loam	Loam	Sand	Loam	Loam	Loam	Loam	Loam
pH	M	2010		4.0	8.3	7.1	8.2	8.0	7.4	7.7	7.4	6.9
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	0.50	0.41	< 0.40	0.47	< 0.40	< 0.40	< 0.40	0.52
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Sulphate (Acid Soluble)	U	2430	%	0.010	0.027	0.018	0.024	0.023	0.027	0.012	< 0.010	0.013
Arsenic	M	2455	mg/kg	0.5	14	14	11	17	18	13	10	11
Cadmium	M	2455	mg/kg	0.10	0.40	0.33	0.28	0.43	0.26	0.23	0.24	0.23
Chromium	M	2455	mg/kg	0.5	22	22	12	16	21	22	23	22
Mercury Low Level	M	2450	mg/kg	0.05	0.08	0.09	1.6	0.06	0.08	< 0.05	0.18	< 0.05
Copper	M	2455	mg/kg	0.50	61	60	28	59	52	59	54	49
Nickel	M	2455	mg/kg	0.50	45	51	20	25	44	55	53	50
Lead	M	2455	mg/kg	0.50	120	39	53	70	44	34	34	34
Selenium	M	2455	mg/kg	0.25	0.92	0.97	0.59	0.75	0.68	1.3	0.73	0.76
Zinc	M	2455	mg/kg	0.50	300	130	53	360	140	140	130	140
Chromium (Trivalent)	N	2490	mg/kg	1.0	22	22	12	16	21	22	23	22
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	N	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	N	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	N	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C8-C10	N	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.14	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	N	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12	N	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C12-C16	N	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic EPH >C16-C21	N	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C21-C35	N	2690	mg/kg	3.00	< 3.0	< 3.0	< 3.0	< 3.0	3.2	< 3.0	< 3.0	< 3.0
Aliphatic EPH >C35-C40	N	2690	mg/kg	1.00	< 1.0	1.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic EPH >C10-C35	N	2690	mg/kg	5.00	< 5.0	< 5.0	< 5.0	< 5.0	6.1	< 5.0	< 5.0	< 5.0
Aromatic VPH >C5-C7	N	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	N	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Results - Soil

Project: Penywaun

Client: Terra Firma (Wales) Ltd		**Chemtest Job No.:**			22-47478	22-47478	22-47478	22-47478	22-47478	22-47478	22-47478	22-47478
Quotation No.:		**Chemtest Sample ID.:**			1562436	1562437	1562438	1562439	1562440	1562441	1562442	1562443
Order No.: 17264TM		Client Sample Ref.:			TP01	TP02	TP03	TP04	TP05	WS01	WS02	WS03
		Client Sample ID.:			TP01	TP02	TP03	TP04	TP05	WS01	WS02	WS03
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.30	0.50	0.30	0.50	0.40	0.20	0.20	0.20
		Date Sampled:			08-Dec-2022	08-Dec-2022	08-Dec-2022	08-Dec-2022	08-Dec-2022	08-Dec-2022	08-Dec-2022	08-Dec-2022
		Time Sampled:			12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:			DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Aromatic VPH >C8-C10	N	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	N	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12	N	2690	mg/kg	1.00	1.1	< 1.0	< 1.0	1.1	1.5	< 1.0	1.0	< 1.0
Aromatic EPH >C12-C16	N	2690	mg/kg	1.00	1.7	1.3	1.4	1.5	1.3	2.5	1.8	1.3
Aromatic EPH >C16-C21	N	2690	mg/kg	2.00	4.1	2.4	2.5	5.3	3.9	3.3	2.0	3.0
Aromatic EPH >C21-C35	N	2690	mg/kg	2.00	7.1	5.8	3.7	11	12	5.2	3.5	5.0
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	3.1	4.1	2.9	3.5	4.2	3.9	4.3	4.3
Total Aromatic EPH >C10-C35	N	2690	mg/kg	5.00	14	10	8.2	19	18	12	8.4	9.5
Total VPH >C5-C10	N	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35	N	2690	mg/kg	10.00	19	14	13	24	24	15	12	13
Naphthalene	M	2800	mg/kg	0.10	0.33	0.43	0.16	0.31	0.20	0.31	0.30	0.16
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	0.49	0.18	0.15	0.34	0.16	0.14	0.13	0.13
Anthracene	M	2800	mg/kg	0.10	0.18	< 0.10	< 0.10	0.13	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	M	2800	mg/kg	0.10	1.0	0.18	0.25	0.75	< 0.10	0.13	0.16	0.11
Pyrene	M	2800	mg/kg	0.10	0.83	0.15	0.22	0.61	< 0.10	0.11	0.15	0.13
Benzo[a]anthracene	M	2800	mg/kg	0.10	0.82	< 0.10	< 0.10	0.46	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	M	2800	mg/kg	0.10	0.77	< 0.10	< 0.10	0.40	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	1.1	< 0.10	< 0.10	0.73	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	0.34	< 0.10	< 0.10	0.17	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2800	mg/kg	0.10	0.82	< 0.10	< 0.10	0.61	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	0.57	< 0.10	< 0.10	0.48	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	0.16	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	0.42	< 0.10	< 0.10	0.42	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	7.8	< 2.0	< 2.0	5.5	< 2.0	< 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	< 0.10	< 0.10
Organic Matter BS1377	N	2930	%	0.10	2.9	1.9	2.2	2.0	1.9	1.1	1.3	2.8

Results - Soil

Project: Penywaun

Client: Terra Firma (Wales) Ltd			**Chemtest Job No.:**		22-47478
Quotation No.:			**Chemtest Sample ID.:**		1562444
Order No.: 17264TM			Client Sample Ref.:		WS04
			Client Sample ID.:		WS04
			Sample Type:		SOIL
			Top Depth (m):		0.30
			Date Sampled:		08-Dec-2022
			Time Sampled:		12:00
			Asbestos Lab:		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-
Moisture	N	2030	%	0.020	9.9
Soil Colour	N	2040		N/A	Brown
Other Material	N	2040		N/A	Stones, Roots and Wood
Soil Texture	N	2040		N/A	Loam
pH	M	2010		4.0	8.0
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	0.49
Cyanide (Total)	M	2300	mg/kg	0.50	1.2
Sulphate (Acid Soluble)	U	2430	%	0.010	0.014
Arsenic	M	2455	mg/kg	0.5	7.3
Cadmium	M	2455	mg/kg	0.10	0.20
Chromium	M	2455	mg/kg	0.5	12
Mercury Low Level	M	2450	mg/kg	0.05	< 0.05
Copper	M	2455	mg/kg	0.50	36
Nickel	M	2455	mg/kg	0.50	22
Lead	M	2455	mg/kg	0.50	42
Selenium	M	2455	mg/kg	0.25	0.47
Zinc	M	2455	mg/kg	0.50	200
Chromium (Trivalent)	N	2490	mg/kg	1.0	12
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Aliphatic VPH >C5-C6	N	2780	mg/kg	0.05	< 0.05
Aliphatic VPH >C6-C7	N	2780	mg/kg	0.05	< 0.05
Aliphatic VPH >C7-C8	N	2780	mg/kg	0.05	< 0.05
Aliphatic VPH >C8-C10	N	2780	mg/kg	0.05	< 0.05
Total Aliphatic VPH >C5-C10	N	2780	mg/kg	0.25	< 0.25
Aliphatic EPH >C10-C12	N	2690	mg/kg	2.00	< 2.0
Aliphatic EPH >C12-C16	N	2690	mg/kg	1.00	< 1.0
Aliphatic EPH >C16-C21	N	2690	mg/kg	2.00	< 2.0
Aliphatic EPH >C21-C35	N	2690	mg/kg	3.00	< 3.0
Aliphatic EPH >C35-C40	N	2690	mg/kg	1.00	< 1.0
Total Aliphatic EPH >C10-C35	N	2690	mg/kg	5.00	< 5.0
Aromatic VPH >C5-C7	N	2780	mg/kg	0.05	< 0.05
Aromatic VPH >C7-C8	N	2780	mg/kg	0.05	< 0.05

Results - Soil

Project: Penywaun

Client: Terra Firma (Wales) Ltd			**Chemtest Job No.:**		22-47478
Quotation No.:			**Chemtest Sample ID.:**		1562444
Order No.: 17264TM			Client Sample Ref.:		WS04
			Client Sample ID.:		WS04
			Sample Type:		SOIL
			Top Depth (m):		0.30
			Date Sampled:		08-Dec-2022
			Time Sampled:		12:00
			Asbestos Lab:		DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Aromatic VPH >C8-C10	N	2780	mg/kg	0.05	< 0.05
Total Aromatic VPH >C5-C10	N	2780	mg/kg	0.25	< 0.25
Aromatic EPH >C10-C12	N	2690	mg/kg	1.00	< 1.0
Aromatic EPH >C12-C16	N	2690	mg/kg	1.00	1.7
Aromatic EPH >C16-C21	N	2690	mg/kg	2.00	7.8
Aromatic EPH >C21-C35	N	2690	mg/kg	2.00	20
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	3.4
Total Aromatic EPH >C10-C35	N	2690	mg/kg	5.00	30
Total VPH >C5-C10	N	2780	mg/kg	0.50	< 0.50
Total EPH >C10-C35	N	2690	mg/kg	10.00	35
Naphthalene	M	2800	mg/kg	0.10	0.43
Acenaphthylene	N	2800	mg/kg	0.10	0.11
Acenaphthene	M	2800	mg/kg	0.10	1.2
Fluorene	M	2800	mg/kg	0.10	1.4
Phenanthrene	M	2800	mg/kg	0.10	6.5
Anthracene	M	2800	mg/kg	0.10	1.7
Fluoranthene	M	2800	mg/kg	0.10	9.4
Pyrene	M	2800	mg/kg	0.10	6.0
Benzo[a]anthracene	M	2800	mg/kg	0.10	5.3
Chrysene	M	2800	mg/kg	0.10	5.8
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	6.2
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	2.2
Benzo[a]pyrene	M	2800	mg/kg	0.10	5.3
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	2.8
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	0.79
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	2.1
Total Of 16 PAH's	N	2800	mg/kg	2.0	57
Total Phenols	M	2920	mg/kg	0.10	< 0.10
Organic Matter BS1377	N	2930	%	0.10	2.1

Test Methods

SOP	Title	Parameters included	Method summary
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.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
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.
2930	Organic Matter	Organic Matter	Acid Dichromate digestion/Titration

Report Information

Key

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

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

ANNEX J
Ground Gas Monitoring Results

Gas Monitoring

In-situ Gas Monitoring Results – Penywaun - 17264

Gas monitoring round 1 20/12/2022 **Barometric Pressure:** 980mb			
Gas	**WS01**	**WS02**	**WS03**
CH_4 (%)	0.1	0.1	0.1
CO_2 (%)	0.8	1.2	0.4
O_2 (%)	20.6	20.2	20.9
CO (ppm)	0ppm	0ppm	0ppm
H_2S (ppm)	0ppm	0ppm	0ppm
Flow (l/hr)	0.4	0.4	0.2
Depth to Groundwater	-	-	-
Well Depth	2.00	3.00	3.00

In-situ Gas Monitoring Results – Penywaun - 17264

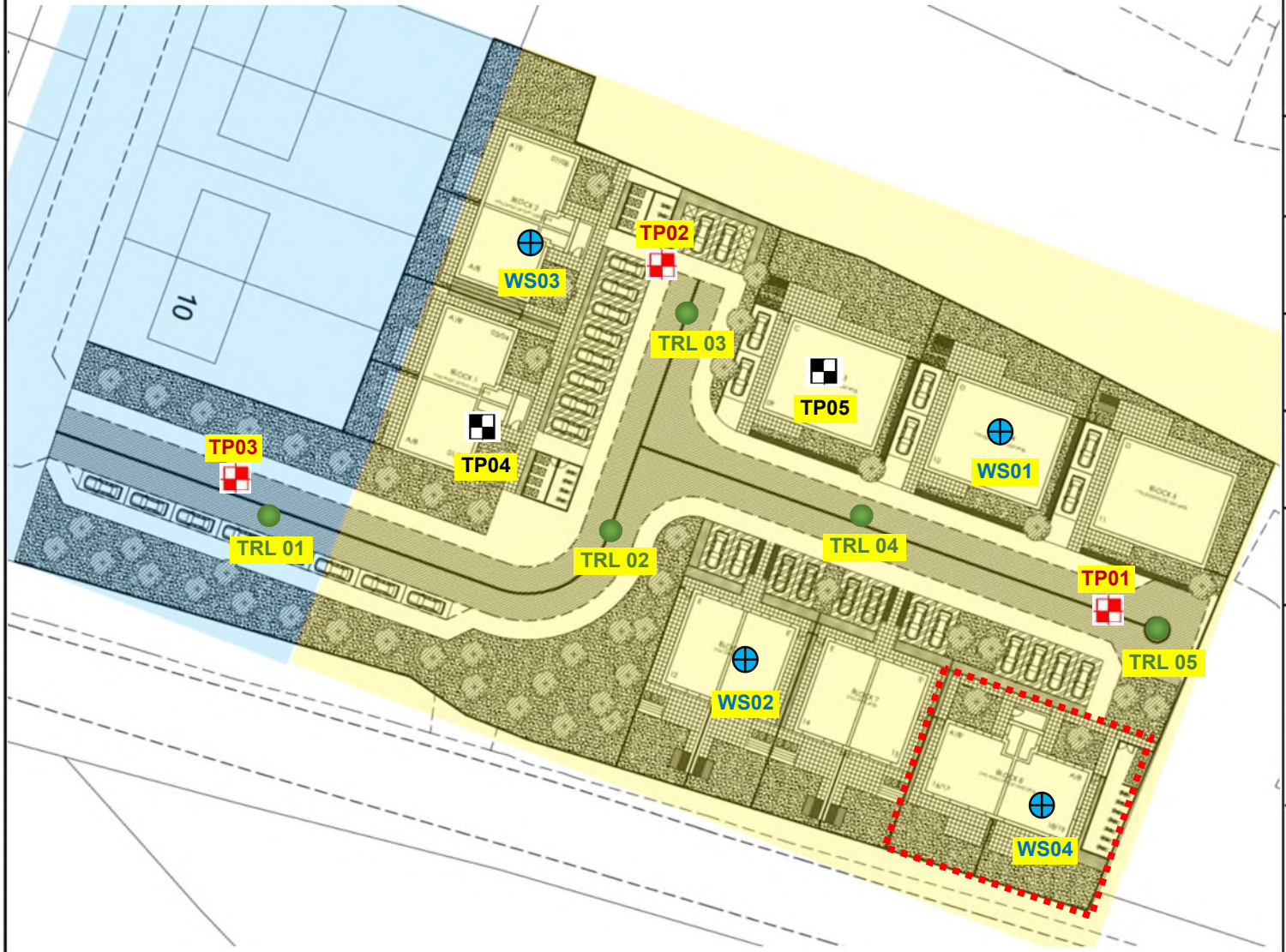
Gas monitoring round 2 03/12/2022 **Barometric Pressure:** 990mb			
Gas	**WS01**	**WS02**	**WS03**
CH_4 (%)	0	0	0
CO_2 (%)	0.2	0.6	0.7
O_2 (%)	21.8	21.6	21.2
CO (ppm)	0ppm	0ppm	0ppm
H_2S (ppm)	0ppm	0ppm	0ppm
Flow (l/hr)	0	0.2	0.1
Depth to Groundwater	-	-	-
Well Depth	2.00	3.00	3.00

Gas Monitoring

In-situ Gas Monitoring Results – Penywaun - 17264

Gas monitoring round 2 17/12/2022 **Barometric Pressure:** 979-980mb			
Gas	**WS01**	**WS02**	**WS03**
CH_4 (%)	0.1	0	0
CO_2 (%)	0.3	0.5	0.5
O_2 (%)	20.4	20	20.1
CO (ppm)	0ppm	0ppm	0ppm
H_2S (ppm)	0ppm	1ppm	0ppm
Flow (l/hr)	0.1	0	0
Depth to Groundwater	-	-	-
Well Depth	2.00	3.00	3.00

DRAWINGS



terrafirma

Job Number: 17264

Job Title: Penywaun

Drawing Title: Exploratory Hole Layout

Drawing Number: 01

Scale: Not To Scale

Legend:

- Trial Pit Location
- Soakaway Location
- Window Sample Location
- TRL-DCP Location
- Zone A
- Zone B
- Capping area

North

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