



Penrhys Village, Rhondda Cynon Taff

Phase 1 Ground Conditions Desk Study

For Trivallis

Date: 9 November 2023

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Executive summary

Site information and setting

Objectives	The objectives of the Phase 1 Desk Study are to formulate a preliminary Ground Model, undertake geomorphological mapping of the site, and produce an initial Conceptual Site Model (iCSM) of the site to identify preliminary geotechnical and geo-environmental hazards/risks to the proposed plans for site redevelopment.
Client	Trivallis.
Site name and location	Penrhys Village, Rhondda Cynon Taff. Penrhys Road, Penrhys, Ferndale, CF43 3RN.
Proposed development	Hydrock understands that the development proposals are on-going but it is expected to comprise nearly 700 homes with recreational and sports facilities, allotments, outdoor recreation trails, a new primary school, bio-swales, and a renewable energy infrastructure.
Site description	The site is irregular in shape, and has an approximate area of 29.86 Ha.

Desk study summary

Topography	The site is located on top of a hill, and overall slopes towards the south.
Hydrology	The site lies on a hill above two rivers; the River Rhondda to the west and the Afon Rhondda Fach to the east.
Site History	The site was previously open land, until occupied by a social housing estate (northern area) circa 1974. The south of the site remains open land. The site is within an area historically mined for coal.
Geology	Superficial: None. Solid: Rhondda Member.
Anthropomorphic geotechnical hazards	The site lies within the South Wales Coalfield and has been historically mined 181m below ground level and deeper. Landslides have been historically mapped in the area around the site on the slopes mainly to the east.
Hydrogeology	Solid: Rhondda Member – Secondary A Aquifer.
UXO risk	A non-specialist UXO assessment indicates a low bomb risk.

Preliminary conceptual site model based on desk study

Potential contaminant sources	<ul style="list-style-type: none"> » Made Ground, associated with historical construction activities and imported fill, possibly including elevated concentrations of metals, metalloids, asbestos fibres, Asbestos Containing Materials, PAH and petroleum hydrocarbons (S01). » PCBs and oils from transformers in the electricity sub-station on site (S02). » Ground gases (carbon dioxide and methane) from organic materials in the Made Ground (S03). » Asbestos within existing buildings / structures (S04). » Hydrocarbon fuels, lubricants, solvents and asbestos associated with the boiler house in the north of the site and potentially across the heating network area from leaking/damaged pipes (S05). » Fly tipped wastes potentially including solvents, metals, metalloids, asbestos and Asbestos Containing Materials (S06).
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	<ul style="list-style-type: none"> » Made Ground containing asbestos and Asbestos Containing Materials associated with the demolition of former pipe work from the district heat network (S07). » Bonfire rubble including metalloids, metals, PAHs and petroleum hydrocarbons (S08).
Potential contaminant linkages (for receptors for which there is or will be a pathway)	<ul style="list-style-type: none"> » People (neighbours, site end users) (R01). » Development end use (buildings, utilities and landscaping) (R02). » Groundwater: Secondary A aquifer status of the Rhondda Member (R03). » Surface water bodies: River Rhondda and the Afon Rhondda Fach (R04).

Assessment and conclusions

Preliminary geotechnical hazards	<p>The following plausible geotechnical risks are identified:</p> <ul style="list-style-type: none">» Variable Made Ground - settlement or differential settlement of foundations, floor slabs, roads and infrastructure elements.» Low strength, compressible ground – risk of shear failure and excessive settlement of foundations, roads and infrastructure elements.» Attack of buried concrete by aggressive ground conditions – the development site may contain Made Ground and potentially sulfate bearing soils.» Instability of slopes and impact on foundations, floor slabs, roads and infrastructure and construction plant.» Potential for obstructions and the risk of instability of excavations with the impact on construction staff, vehicles and plant operators.» Earthworks – Low bearing capacity or settlement of new fill and impact on foundations, floor slabs, roads and infrastructure and construction plant.» Potential for unforeseen ground conditions and the risks associated with limited data.															
Preliminary geo-environmental hazards	<p>It is considered that it is unlikely that the site would be classified as Contaminated Land under Part 2A of the EPA 1990.</p> <p>The potentially moderate and high risks that require further consideration are summarised as:</p> <table><tr><th>Source(s)</th><th>◀ potential impact on ▶</th><th>Receptor(s)</th></tr><tr><td>Made Ground, associated with historical construction activities, possibly including elevated concentrations of metals, metalloids, asbestos fibres, Asbestos Containing Materials, PAH and petroleum hydrocarbons.</td><td></td><td>Site end users. Groundwater/ surface waters.</td></tr><tr><td>Ground gases (carbon dioxide and methane) from organic materials in the Made Ground.</td><td></td><td>Site end users. Development end use.</td></tr><tr><td>Asbestos within existing buildings / structures.</td><td></td><td>Site end users.</td></tr><tr><td>Hydrocarbon fuels, lubricants, solvents and asbestos associated with the boiler house in the north of the site and across the historic heating network from leaking/damaged pipework.</td><td></td><td>Site end users Groundwater/ surface waters.</td></tr></table>	Source(s)	◀ potential impact on ▶	Receptor(s)	Made Ground, associated with historical construction activities, possibly including elevated concentrations of metals, metalloids, asbestos fibres, Asbestos Containing Materials, PAH and petroleum hydrocarbons.		Site end users. Groundwater/ surface waters.	Ground gases (carbon dioxide and methane) from organic materials in the Made Ground.		Site end users. Development end use.	Asbestos within existing buildings / structures.		Site end users.	Hydrocarbon fuels, lubricants, solvents and asbestos associated with the boiler house in the north of the site and across the historic heating network from leaking/damaged pipework.		Site end users Groundwater/ surface waters.
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Fly tipped wastes potentially including solvents, metals, metalloids, asbestos and Asbestos Containing Materials.	Site end users.
Made Ground containing asbestos and Asbestos Containing Materials associated with the demolition of former pipe work from the district heat network.	Site end users.
Bonfire rubble including metalloids, metals, PAHs and petroleum hydrocarbons.	Site end users.

Future considerations

Further work

- Following the Phase 1 Desk Study undertaken to date, the following further works will be required:
- » Demolition/ Refurbishment asbestos survey of existing structures on site;
 - » Discussion with specialists with regard to invasive plant species;
 - » Preliminary, site wide ground investigation, to confirm the initial ground model and identify areas that require more detailed investigation;
 - » Additional detailed intrusive site investigation for the various phases of the development to allow detailed design of structures, SuDS, remedial strategies, slope stability assessments and earthworks; and
 - » If required following intrusive site investigation, Remedial Strategy & Verification Plan, Earthworks Strategy, Material Management Plan.

This Executive Summary forms part of Hydrock Consultants Limited report number 30603-HYD-XX-XX-RP-GE-1001 and should not be used as a separate document.

1. Introduction

1.1 Terms of reference

In September 2023, Hydrock Consultants Limited (Hydrock) was commissioned by Trivallis (the Client) to undertake site investigation, comprising a Phase 1 Ground Conditions Desk Study with detailed geomorphological mapping at Penrhys Village. The site is located at Penrhys Road, Penrhys, Ferndale, CF43 3RN.

The site encapsulates part of the village of Penrhys which is situated on a hillside overlooking both valleys of the Rhondda Fawr and Rhondda Fach and is around 310m Above Ordnance Datum (AOD). The village is comprised of approximately 268 houses, most of which are social housing, and there are a limited number of facilities including two green parks, a church, primary school, post office convenience store, cemetery and fast-food takeaway.

Hydrock understands that the development proposals are on-going but it is expected to comprise nearly 700 homes with recreational and sports facilities, allotments, outdoor recreation trails, a new primary school, bio-swales, renewable energy infrastructure including solar and wind generation and the general afforestation of the site. At the time of writing a proposed development layout is not available.

These works have been undertaken in accordance with Hydrock's proposal referenced (Ref: 30603 – Penrhys Village, Rhondda Cynon Taff – Fee proposal for Geo Consultancy Phase 1 and Initial Phase 2 Ground Investigation, dated 22 June 2023) and the Client's instructions to proceed (Ref: Email Rachel Leigh of Trivallis 20th September 2023).

1.2 Objectives

The works have been commissioned to support the on-going planning of the development and assist in establishing potential ground and contamination constraints that need to be considered for the development.

The objectives of the Phase 1 Desk Study are to formulate a preliminary Ground Model and an Initial Conceptual Site Model (CSM) of the site to identify and make a preliminary assessment of any potential geo-environmental and geotechnical risks to the proposed development.

1.3 Scope

The scope of the Phase 1 Desk Study comprises:

- » a field reconnaissance (walkover) to determine the nature of the site and its surroundings including current and former land uses, topography and hydrology, and to identify any geomorphological features within the landscape;
- » acquisition and review of:
 - » historical Ordnance Survey maps, to identify any; former potentially contaminative uses shown at the site and immediately surrounding it, and an assessment of the associated contamination risks;
 - » a third-party environmental report to identify any; flooding warning areas, local landfills, pollution incidents, abstractions, environmental permits etc. All of which may have had the potential to have environmental impact on the site;
 - » topographical, geological and hydrogeological maps;
 - » British Geological Survey (BGS) archive records;
 - » regional UXO risk maps;
 - » a site-specific Coal Authority 'Consultants Coal Mining Report';

- » the Coal Authority's Interactive Viewer;
- » a site-specific BGS Radon Report;
- » a site-specific BGS SuDs Report;
- » a review of previous investigations carried out at the site;
- » development of a geomorphological map of the site highlighting any important features and risks;
- » development of a preliminary Ground Model representing ground conditions at the site;
- » development of an initial CSM, including identification of potential contaminant linkages;
- » a qualitative assessment of any geo-environmental risks identified; and
- » identification of any plausible geotechnical hazards.

1.4 Available information

The following documents, reports etc have been provided to Hydrock by Client for use in the preparation of this report:

- » Yellow Sub Geo (Yellow Sub). September 2020. 'Penrhys: Master Planning Support – A report for the Urbanists Ltd'. Ref: P20217 R1 (Yellow Sub, 2020).

It is understood that the Client defined in Section 1.1 has reliance on the above documents and therefore Hydrock has assumed full reliance can be placed upon their contents. Should this not be the case, Hydrock should be informed at the earliest opportunity.

1.5 Regulatory context and guidance

The investigation work has been carried out in general compliance with recognised best practice, including (but not limited to) BS 5930:2015, BS 10175:2011+A2:2017 and the AGS (2006) 'Good Practice Guidelines for Site Investigations'.

The geo-environmental section of this report is written in broad accordance with BS 10175:2011+A2:2017, EA LCRM (2023) and the AGS (2006) 'Good Practice Guidelines for Site Investigations'.

The methods used follow a risk-based approach, the first stage of which is a Phase 1 desk study and field reconnaissance, with any potential geo-environmental risks assessed qualitatively. This is done using the 'source-pathway-receptor contaminant linkage' concept to assess risk as introduced in the Environmental Protection Act 1990 (EPA, 1990). Any potential geotechnical risks are also assessed from the Phase 1 desk study and site reconnaissance stage.

Professional judgement is then used to evaluate the findings of the risk assessments and to provide recommendations for the development.

The geo-environmental and geotechnical aspects are discussed in separate sections. Throughout the report the term 'geotechnical' is used to describe aspects relating to the physical nature of the site (such as foundation requirements). The term 'geo-environmental' is used to describe aspects relating to ground-related environmental issues (such as potential contamination). However, it should be appreciated that this is an integrated investigation and these two main aspects are inter-related. Designers should take all aspects of the investigation into account.

Remaining uncertainties and recommendations for further work are listed in Section 6 and Section 7.

2. Desk study (and field reconnaissance)

2.1 Data

A number of desk study sources have been used to assemble the following information. These are presented in Appendix C and Appendix D and include:

- » Third-party environmental report (Groundsure, Ref: GS-OSP-W82-C21-6L1) (Appendix D);
- » Historical Ordnance Survey mapping (Appendix C);
- » BGS Archive Records (Appendix D);
- » Zetica UXO Risk Maps (<https://zeticauxo.com/downloads-and-resources/risk-maps/>) (Appendix D);
- » Coal Authority Interactive Map (<https://mapapps2.bgs.ac.uk/coalauthority/home.html>);
- » Coal Authority 'Consultants Coal Mining Report' (Ref: 51003381902001) (Appendix D);
- » BGS Radon Report (Ref: BGS_335154_49016) (Appendix D); and
- » BGS Infiltration SuDS Report (Ref: BGS_335154_49017) (Appendix D).

2.2 Site referencing

Table 2.1: Site referencing information

Item	Brief Description
Site name	Penrhys Village, Rhondda Cynon Taff.
Site address	The village is located at Penrhys Road, Penrhys, Ferndale, CF43 3RN.
Site location and grid reference	The site is located in the South Wales Valleys. The National Grid Reference of the approximate centre of the site is 300257E, 194890N. The site is approximately 29.86 Ha in area
Site boundaries	The site is bound in the northern section by the Heol Pendyrus ring road, which marks the limit of existing properties. The southern area of open undeveloped land is bordered by fence lines to the east, and roadways to the north, west and south.

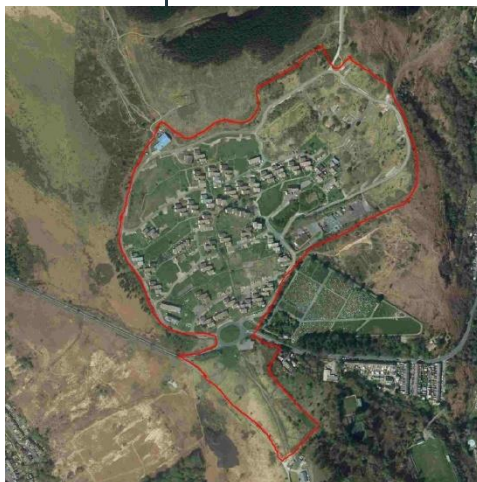


Figure 2.1: Site location

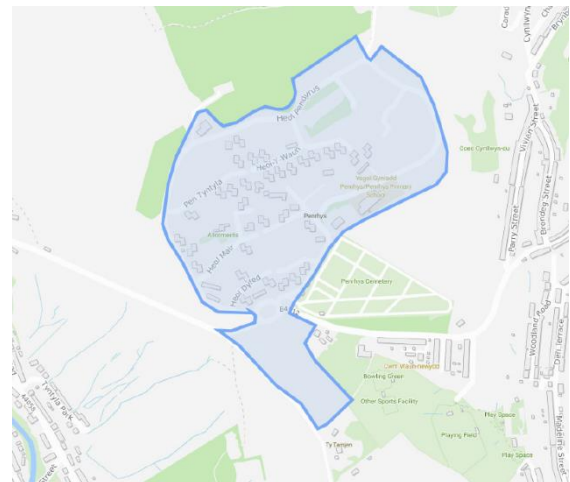


Figure 2.2: Extract from the Ordnance Survey Map.

A site location plan (Hydrock Drawing 30603-HYD-XX-XX-DR-GE-1004) is presented in Appendix A.

2.3 Site description and field reconnaissance survey

A field reconnaissance survey was undertaken on 4 October 2023 to visually identify and assess potential geotechnical hazards, contaminant sources for future investigation and identification of possible source-pathway-receptor linkages. This walkover was to gather supplementary photographs following a previous walkover on 25 July 2023. The weather during the field reconnaissance survey was showers with intermittent clouds (October 2023).

A description of the site is presented in Appendix B.

Table 2.2 and selected photographs are presented in Figure 2.3 to Figure 2.6. Additional photographs are presented in Appendix B.

Table 2.2: Site description

Item	Brief Description
Site access	The site was accessed from St Mary's Well car park. Other access points are along the Heol Pendyrus ring road around the Penrhys estate.
Site area	The site is irregular in shape and has an area of approximately 29.86 ha.
Elevation, topography and any geomorphic features	The site overall slopes towards the south, with platforms/breaks in slope within the northern section for housing foundations and areas of car parking. Retaining walls are at regular intervals to support the changes in levels, many of which are in poor condition, due to insufficient drainage behind the walls. The site is situated at an approximately elevation of 310m AOD sloping down the Rhondda Fawr in the west (135m AOD) and the Rhondda Fach in the east (165m AOD).
Site boundaries and surrounding land	To the west and east of the site is open land, which slopes steeply towards the floors of the Rhondda Fach (east) and Rhondda Fawr (west) valleys below. To the north of the site is an area of coniferous forest.
Present land use	The land is presently occupied in the north by council owned residential housing, about half of which are unoccupied. Many of the properties were in poor condition (broken windows etc) due to poor maintenance and vandalism. Existing infrastructure is largely confined to the northern area of the site, which comprises of the housing estate and boiler house and includes electricity sub-stations, and gas governors. One of the gas governors lies to the south of the site. The former boiler house supplied a district heating network across the housing estate, and buried asbestos pipework is therefore likely to be present in any Made Ground. In addition to this fly tipped asbestos tile was observed on the ground near to the boiler house which may be associated with its former operation. Possible asbestos and Asbestos Containing Materials (ACM) were also observed at five separate locations in the north-east demolished area of the housing estate, and appears to have been fly tipped. It is also possible that the various bonfires (remains of) in the north of the site have potential to comprise remnants of asbestos and ACM, fuels and hydrocarbons, all of which may be harmful to human health.

Vegetation	Sporadic vegetation was observed across the soft landscaped areas, but was mostly lawn space in the northern portion of the site. The south of the site was largely open fields, with small amounts of woodland close to the site boundary. Potential cotoneaster was noted in the north-east of the site. A previous site walkover (July 2023) undertaken by Hydrock identified what may potentially be Japanese Knotweed behind the former pumphouse in the north of the site.
General site sensitivity	The site is within a generally residential area. The surrounding area of Penrhys is considered rural.

A site walkover plan (Hydrock Drawing 30603-HYD-XX-XX-DR-GE-1005) is presented in Appendix A.



Figure 2.3: Former boiler house in the north of the site.



Figure 2.4: Collapsing Retaining wall in north east of the site.



Figure 2.5: Rubble at the site of a former bonfire in the northern residential portion of the site.



Figure 2.6: Fly tipping of asbestos sheeting in the north-east of the site.

2.4 Site history

A study of historical Ordnance Survey maps (Appendix C) has been undertaken to identify any former land uses at the site and surrounding areas which may have geotechnical or geo-environmental implications for the proposed development. The key findings are summarised in Table 2.3.

Table 2.3: Site history review

Reference	Key features on site	Key features off-site
OS Map ¹ 1875: 1:10,560	Northern portion of the site is open fields and marshland, with springs mapped on the northern boundary to the site. This fielded area is labelled Erw Beddau, Site of Battle. 4 buildings are recorded to be mapped in the centre west of the site.	<p>Ffynnon Fair is recorded off site, circa 50m to the west, and is identified as a sulphurous water outlet, flowing downslope towards the Rhondda River 500m south-west of the site. The Taff Vale Railway line lies beyond this, in a north-west to south-east orientation, circa 725m south-west of the site.</p> <p>Trial levels are mapped at various locations including circa 50m west, 250m west, 400m east, and 1100m north-east of the site.</p> <p>Pont-y-gwaith Colliery is within 350m of the east of the site, with adjacent shafts and an engine house to the east</p> <p>The Afon Rhondda Fach lies 400m east of the site, and is orientated roughly north to south, with the Taff Vale Railway line running adjacent along this same orientation.</p> <p>Pendyrys Colliery lies circa 850m north-east of the site, and features two shafts and an engine house.</p>
OS Map 1898: 1:10,560	No significant change.	<p>A quarry is mapped circa 25m west of the site, and another two are mapped circa 30m and 200m west of the site. In addition, an old quarry is recorded 200m to the south-west of the site. On the south-east of the site are further quarries, 300m from the site, and 550m and 600m to the south-east.</p> <p>4 quarries are located circa 800m east of the site, and there are 3 more north-east of the site, one circa 550m away, and 2 further circa 800m away,</p> <p>Tyntyla Reservoir (Ystrad Gas and Water Works Company) constructed circa 250m south-west of the site.</p> <p>Tylorstown has become largely residential, following construction of terraced homes, running parallel to (west of) the Afon Rhondda Fach and the Taff Vale Railway line.</p> <p>Old coal levels are recorded to the north-west of the site at 4 locations, between 600m and 950m from site.</p>

¹ Ordnance Survey Historical Map Information provided by Groundsure

OS Map 1915: 1:10,560	No significant change.	Pont-y-gwaith Colliery is renamed Cynllwyn-du Colliery. Penrhys Isolation Hospital constructed circa 25m south of the site.
OS Map 1921: 1:10,560	No significant change.	No significant change.
OS Map 1948: 1:10,560	No significant change.	No significant change.
OS Map 1965: 1:10,560	No significant change.	Penrhys Cemetery is mapped adjacent to the south-eastern site boundary. Penrhys Isolation Hospital is now Penrhys Smallpox Hospital. A football ground has been built circa 200m south-east of the site. Further residential expansion towards the site from the east.
OS Map 1974: 1:10,000*	The northern area of the site is covered by a residential housing estate. A school and Police Station have been built in the south-east of the site.	A reservoir has been constructed immediately north of the site. Penrhys Smallpox Hospital no longer detailed on maps.
OS Map 1992: 1:10,000	No significant change.	No significant change.
OS Map 2001: 1:10,000	Partial demolition of the north-east portion of the housing estate.	No significant change.
OS Map 2010: 1:10,000	Further demolition of property across the housing estate, with the number of homes reducing by approximately half.	No significant change.
OS Map 2023: 1:10,000	No significant change.	No significant change.

*Note, there was no OS Map coverage at this scale for the area to the west of the site.

2.5 Geology

The geology of the site area is shown on the 1:10,000 British Geological Survey (BGS) map extract reproduced as part of the Groundsure report and is summarised below:

Table 2.4: Geology

Ref. for Figures	Location	Stratigraphic Name	Description
Superficial Deposits (Figure 2.7)			
Not present on site.			
1	Off-site East boundary (Black Hatch)	Landslip	Landslip material.
2	Off-site South and west (Light blue)	Till	Consists of a heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape (diamicton)
6	Off-site 391m North	Peat	Peat is a partially decomposed mass of semi-carbonized vegetation which has grown under waterlogged, anaerobic conditions, usually in bogs or swamps.
Solid Geology (Figure 2.8)			
1	On site.	Rhondda Member	Green-grey Pennant Sandstones with thin mudstone and siltstone interbedded and thin coal pairings.

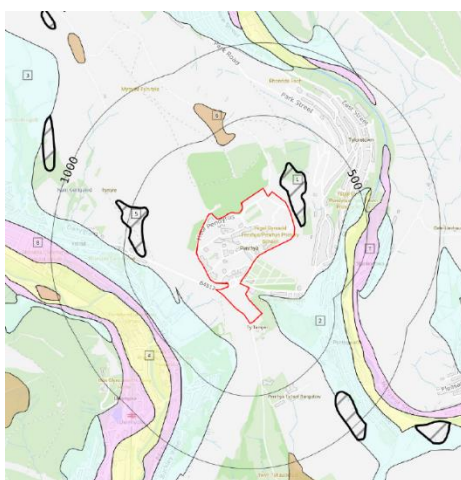


Figure 2.7: Superficial deposits.



Figure 2.8: Solid geology.

The BGS mapping indicates that there are no superficial deposits over the vast majority of the study area with a small area of peat mapped in the far north of the site and a small band of Glacial Till in the southeast of the site. Landslide deposits are mapped on the eastern boundary of the site and are thought to be related to the steeply sloping topography in this area.

The underlying solid geology comprises the Rhondda Member which is part of the Pennant Sandstone Formation and is not a significant coal bearing unit. The base of the Rhondda Member is placed at the base of the No.2 Rhondda Coal Seam, the coal seam rests conformable on sandstones and mudstones of the underlying Llynfi Member. The top of the Rhondda Member is defined by the Brithdir coal seam and is in turn overlain by sandstones and mudstones of the Brithdir Member.

There are no shallow coal outcrops mapped within the study area, with the nearest coal seams recorded to the west, north and east of the site. These coal seams are the No1 Rhondda Rider, and the No1 Rhondda. These coal seams are shown to circle the hillside in which the Penrhys village is situated.

2.6 Hydrogeology

2.6.1 Aquifer designations

Based on the inferred geological sequence presented in Section 0 the aquifer system presented in Table 2.5 applies.

Table 2.5: Aquifer system

Stratum	Aquifer Designation	Comments
Superficial Deposits		
Not present at this site.		
Solid Geology		
Rhondda Member	Secondary A Aquifer	Dominated by low permeability and low porosity clay, which is interbedded with moderate to high permeability layers of sandstone. Potentially faulted and fractured, with high secondary permeability.

2.6.2 Groundwater abstraction

There are no active licensed groundwater abstractions within 1000m of the site.

2.6.3 Groundwater source protection zones and groundwater vulnerability

The site is not within a groundwater Source Protection Zone (SPZ)

2.6.4 Groundwater levels, recharge, and flow

Shallow groundwater is likely to be present within the Made Ground (northern section), with a deeper groundwater body in the Rhondda Member bedrock. Recharge to the groundwater body is likely to be inhibited due to extensive surface covering in the northern section surrounding the Penrhys housing estate, and the drainage system installed in this same section. Groundwater is likely to be at depth in line with the level of the Rhondda River and Afon Rhondda Fach at the base of Penrhys Hill, and drain locally to the south following the topography. Regionally, groundwater is expected to be flowing south towards the River Severn Estuary.

A sulphurous spring of water is recorded off site, circa 50m to the west, and named Ffynnon Fair. It is considered that this is a secondary shallow groundwater body that is directly linked to surface water rather than the main deeper groundwater body at depth.

2.6.5 Groundwater quality

The groundwater body beneath the site (South East Valleys Carboniferous Coal Measures) is currently (2021, Cycle 3) classified under the Water Framework Directive as 'poor'.

The water body is currently given a 'poor' status due to 'chemical dependant groundwater body' conditions.

2.6.6 Groundwater flooding

The environmental data report indicates a negligible risk of groundwater flooding.

2.7 Hydrology

2.7.1 Surface water system and drainage

The surface water features in the vicinity of the site (250m) are listed in Table 2.6

Table 2.6: Surface water features

Feature	Location Relative to Site
Inland river (3 records).	On site (north).
Inland river (3 records).	Circa 1m north-east of site.
Inland river (4 records).	Circa 10m west of site.
Stream/spring network connecting to Rhondda River.	Circa 60m to 248m south-west of site.
Inland stream network.	Circa 159m to 221m north-east of site.

2.7.2 Surface water abstractions and discharges

There are no active surface water abstractions within 1000m of the site.

There are no active licensed surface water discharges within 1000m of the site.

2.7.3 Surface water quality

Reference to the Natural Resource Wales web site shows the site is located within the 2 catchment areas. These are the Rhondda River – source to confluence Afon Rhondda Fach in the west, and the Afon Rhondda Fach – source to confluence Rhondda River in the east. The specific river water bodies being the Rhondda River (in the west) and the Afon Rhondda Fach (in the east). The current (2021 Cycle 3) overall status under the Water Framework Directive is described as 'moderate' for the east of the site, and 'good' in the west of the site,

2.7.4 Surface water flooding

The desk study information indicates the proposed development is mostly outside of a flood risk area. The highest surface water flood risk area on site (1 in 30 (3.3%)) is at the site of one of the houses on the Penrhys estate, and is likely to be associated with the area of hardstanding around the building.

No further consideration of flood risk is undertaken in this report. Specialist flood risk advice should be sought with regard to drainage and flooding.

2.8 Mining and mineral extraction

2.8.1 Mine Working Stability

Based on the Coal Authority Interactive Viewer, the site is located within a 'Coal Mining Reporting Area' but is not within a 'Development High Risk Area'.

As the site is not within a Development High Risk Area, any past coal mining activity is at sufficient depth that it poses a low risk to new development. As such, a Coal Mining Risk Assessment does not need to be submitted to the Planning Authority as part of any planning application.

However, as there is a potential for past mine workings being present in coal seams beneath the site, albeit at depth, and due to the potential for previously worked coal seams beneath the site, a 'Consultants Coal Mining Report' was obtained from the Coal Authority and is included in Appendix D.

The report outlines no probable unrecorded shallow workings, and lists 70 locations where past underground coal mining has taken place, within 500m of the site boundary. Of these known workings, most are at significant depth, beyond 400m. Only one of the workings is at a shallower depth of 181m below ground level, with an extraction thickness of 100cm, as recorded in Tabel 2.8, however, this is off-site to the south west.

Table 2.7: Coal Seams beneath site.

Seam	Depth	Direction of working from site.	Dipping Rate (degrees)	Dipped Direction of seam	Extraction thickness (cm)	Year last mined
No.2 Rhondda	181m	South-west	5.4	North east	100	1916
Two foot Nine	402	Beneath Site	11.1	South	70	1919
Two foot Nine	404	West	5.5	South	100	1914

The No1. Rhondda Rider, and No1 Rhondda, circle the hillside at a similar elevation on both sides mainly due to the shallow dip of coal seam at between 5-7 degrees. Numerous adits are recorded on the eastern outcrop of these seams with much fewer adits recorded on the western outcrop. Evidence from the 1:50,000 BGS maps indicates that these two coal seams were no greater than 3ft in thickness, and pursuing these seams to great distances into the hillside would not have been economically viable. It is therefore expected that these seams are unlikely to have been extensively worked beneath the village of Penrhys.

Mine abandonment plans have been obtained to understand the distribution of these coal seams beneath the site. These plans are recorded on drawings 30603-HYD-XX-XX-DR-GE-1009/1010/1011 saved within Appendix A. The main tramways/roadways from the plans have been highlighted on these drawings as these would be the larger workings within the seam.

Hydrock drawing number 30603-HYD-XX-XX-RP-DR-GE-1009 shows the location of historic coal mine workings associated with mining of the 2 Ft 9 coal seam, in relation to the site boundary. The south of the site is intersected by circa 15 linear roadways. An airshaft lies approximately 75m to the south-west of the southernmost point of the site. Further roadways intersect the northern region of the site, and follow linear orientations. Largely, the centre of the housing development (at present) is not underlain by roadways associated with the 2 Ft 9 coal workings, as shown on Hydrock

drawing 30603-HYD-XX-XX-DR-GE-1010. The region impacted by previous landslips as discussed previously is not underlain by any features associated with mining of the 2 Ft 9 coal seam.

Hydrock drawing number 30603-HYD-XX-XX-DR-GE-1011 shows the location of underground mine workings associated with the No.2 Rhondda coal seam in relation to the site boundary. These mine plans show that previous workings associated with this seam do not intersect the site boundary, as workings are confined to the area south of the site.

Coal mine workings were often propped up with wooden beams, which over time degrade and cause coal mine collapse. The upwards propagation is limited due to the bulking affect that occurs when fractured rock collapses and fills a void. The general rule of thumb used within the coal mining industry is ten times the height of the mined void. Most road ways or tramways were over extracted to accommodate machinery and were often around 2m in height, even if the coal seam was only 1m thick. Therefore, a 2m roadway would propagate 20m upwards which allows for 160m of rock cover. Overall, coal mining is considered unlikely to pose a significant hazard to ground stability at the site.

2.8.2 Thermal potential from abandoned mines.

The British Geological Survey and Coal Authority have released maps that indicate the heat stored within abandoned mines across Britain. This provides a generalised overview of the thermal potential that may exist within abandoned mineworking's beneath the site, an extract has been provided within Figure 2.9 below.

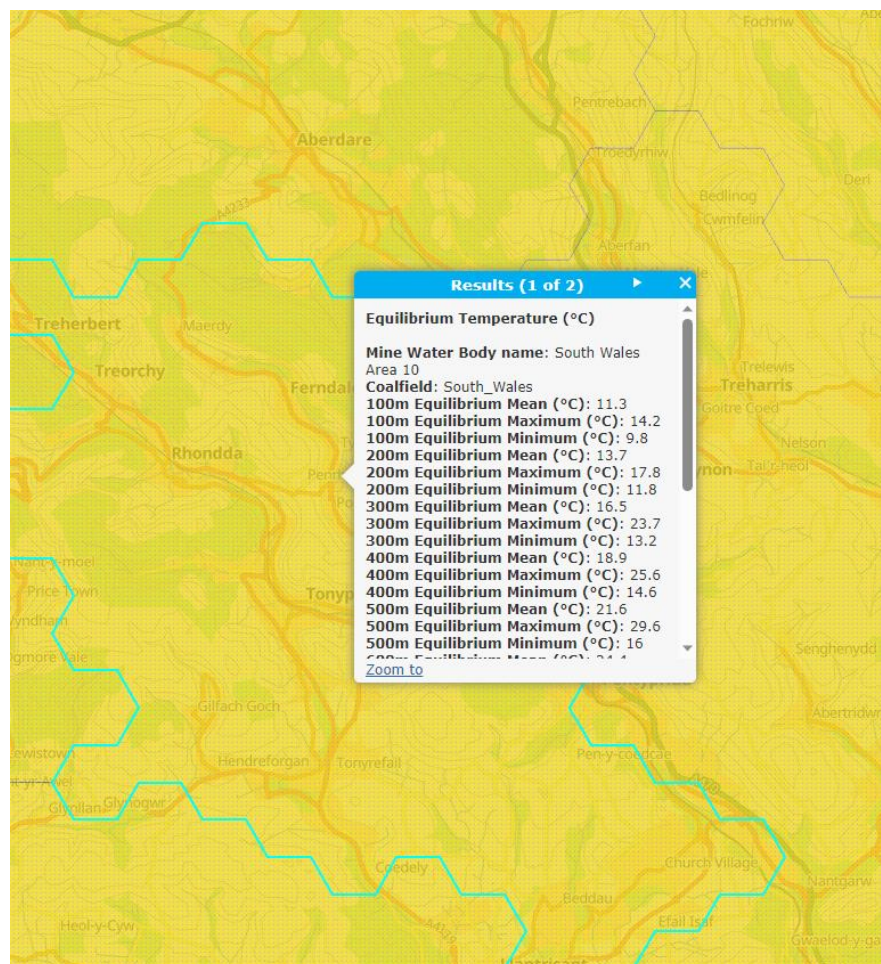


Figure 2.9 Extract from Coal Authority mapping regarding thermal potential within abandoned mines.

This indicates that the thermal potential may range between 9°C at 100m bgl to 29°C at 500m bgl. A detailed site investigation would need to be completed to determine actual abandoned mineworking's present beneath the site and their thermal potential, prior to designing ground source heat loop for the development.

On 4th October 2023 the Coal Authority mine water heat team agreed to a preliminary meeting with Hydrock to discuss the potential of a geothermal heat scheme at Penrhys utilising warm water stored in abandoned mines beneath the site. The mine water heat team discussed the process of how the Coal Authority can assist and how the project would be completed. However, in this instance the shallowest viable mine working is over 180m bgl, and with the neighbouring rivers situated at approximately 175m bgl from the site level, the coal workings are likely situated at the interface with groundwater and at a significant depth.

The Coal Authority indicated that an operation borehole would cost £1,500/£2,000 per metre of borehole drilled. This means that for two operational boreholes the cost is likely to be around £650,000 to £900,000 excluding any design and investigations required prior to the installation to confirm viability.

Most of the existing mine water heat schemes in the UK that have been progressed successfully have only required boreholes to around 100m bgl. Based on experience of the mine water heat team, they indicated that this scheme would not be viable due to the depth of investigation boreholes which would have to extend past the 200m bgl.

A previous heat scheme at Caerau in the Llynfi Valley (which is similar to Penrhys) did undertake preliminary intrusive investigation to assess the geothermal potential of mine workings at depth. This intrusive investigation consisted of one preliminary borehole drilled to a depth of 234m bgl, and through discussions with Cardiff University and the drilling contractor who drilled this borehole it would cost between £150,000 and £200,000 in 2023 to drill a similar borehole. Whilst this borehole did prove mine water heat scheme was viable; it was reliant on EU funding and in 2021 this scheme has not progressed as a viable solution.

Following all of these additional discussions and advice given to by the Coal Authority, Hydrock believe at the time of writing this report it would not be viable to progress a Mine Water Heat scheme for this site unless significant funding could be sort.

2.9 Natural ground instability

The Groundsure environmental report indicated a low risk of landslips on site, however the areas to the east and west of the site are shown to be moderate and high risk for occurrence of landslips. This is as the slopes to the east and west of Penrhys are very steeply inclined, and surface water is likely present along the planes of slope failure. The risk of slope failure is discussed further in Section 2.16.

The site is also identified to be very low risk for the presence of collapsible deposits occurring, likely due to the lack of superficial deposits across the site.

2.10 Waste management

There are no current or historical waste management sites recorded within 250m of the site.

2.11 Regulatory Information

Information in the GroundSure Report (Appendix D), relating to various regulatory controls has been reviewed, with a summary presented below in Table 2.8.

Table 2.8: Regulatory information within 500m of the site

Regulatory Data	Distance from Site	Details	Potential Risk	Comment
Discharge Consents	216m west.	Rees Street Pumping Station – sewage discharge (two entries).	No	Due to being down gradient of the site.
	295m east.	Brondeg and Penrhys Street junction – sewage discharge.	No.	
	424m-433m east.	Ferndale Road – sewage discharge (two entries).	No.	
	469m east.	Tylorstown Primary School – sewage discharge.	No.	
Pollution Incidents	396m east.	October 2014, contaminated water – firefighting run-off, Category 4 – no impact.	No.	Due to the Category 4 classification of the incident.
	398m east.	February 2014, sewage materials – grey water, Category 4 – no impact.	No.	Due to the Category 4 classification of the incident.
Control of major accident hazards sites (COMAH)	N/A	No entries on COMAH sites were recorded within 500m of the site.	No.	-
Registered radioactive substances	N/A	No entries on registered radioactive substances were recorded within 500m of the site.	No	-
Notification of installations handling hazardous substances	N/A	No entries on notification of installations handling hazardous substances were recorded within 500m of the site.	No	-

2.12 Natural soil chemistry

Information contained within the environmental report (Appendix D) gives indicative (estimated) concentration values for the natural soils at the site for a selection of Contaminants of Potential Concern (CoPC). These have been reproduced in Table 2.9.

Table 2.9: Natural soil chemistry

Element	Arsenic	Cadmium	Chromium	Lead	Nickel
Concentration (mg/kg)	15-25	<1.8	60 - 90	100	15 - 30

The data in Table 2.9 has been compared against Hydrock's Generic Assessment criteria (GAC) (assessment for risk to human health), and no exceedances were recorded.

2.13 Radon

The guidance indicates that the site is in a Radon Affected Area where recorded radon levels in 1-3% of homes are above the action level and no radon protection measures are required for new buildings at this location in line with current guidance.

2.14 Unexploded ordnance (UXO)

In general accordance with CIRIA Report C681 (Stone et al 2009) a non-specialist UXO screening exercise has been undertaken for the purposes of ground investigation and is presented in Table 2.10.

Table 2.10: Non-specialist UXO screening (for the purposes of ground investigation)

Data	Comment	Further Assessment Required
Site History	There is no indication of former military site use from the desk study.	No.
Post War Development	OS mapping shows no evidence of bombing damage to property following the end of World War Two.	No.
Geology Type	The ground conditions comprise the Rhondda Member sandstones, with an absence of superficial coverings. It is unlikely UXO would remain undetected.	No.
Surface Cover during WWI	The surface cover during WWII comprised open fields. However, as the site has been a pilgrimage since before WW2 and there is an absence of superficial deposits it is considered unlikely that any UXO would remain undetected.	No
Indicator of Aerial Delivered UXO	Screening against the site specific bomb risk map (Rhondda Cynon Taff) (Appendix D) indicates the site to be in an area where the bombing density was low (less than 15 bombs per 1000 acres).	No.

The non-specialist UXO screening exercise has indicated that there is a low risk of UXO to remain undetected on site and no further assessment is required with regard to UXO in relation to ground investigation as there is an absence of superficial deposits, and any UXOs dropped are likely to have therefore exploded upon impact. Further assessment may be considered prudent for construction activities.

2.15 Previous investigations at the site

Yellow Sub Geo (Yellow Sub). September 2020. 'Penrhys: Master Planning Support – A report for the Urbanists Ltd'. Ref: P20217 R1 (Yellow Sub, 2020).

The Yellow Sub Phase 1 report outlined preliminary geotechnical and geo-environmental risks to the site. The site referenced in this report utilises a different site boundary than that of Hydrock (2023), and includes the forested area north of the existing housing development.

The report outlines that mine water discharge from historic mining of the South Wales Coalfield has potential to be utilised for the purposes of geothermal heat. The report identifies two shallow coal horizons which wrap around the study area to the east and west; the No.1 Rhondda, and the No.1 Rhondda Rider. Along these coal seams, particularly to the north-east of Yellow Sub's site boundary are a number of mine adits. Overall Yellow Sub evaluate the risk of shallow undermining by coal workings resulting in instability as low to moderate.

Yellow Sub report that the shallowest mine workings in the area are at 180m below ground level, and therefore assessed the risk of surface instability due to collapse as negligible.

The site is identified to previously have been occupied only by residential dwellings, and has no industrial history. The main sources of contamination as identified by Yellow Sub include the boiler house in the north of the site and possible asbestos pipe insulation for transport of heated water to the residential properties, demolition wastes and fly tipping, and the electrical substation which may have leaked PCBs and oils into soils below.

2.16 Geomorphological Characterisation of the Site

Data sourced from Groundsure by Hydrock shows the extent of former mining and quarrying of the slopes in relation to the site area, and position of previous landslides. This GIS data, combined with visual observations during field reconnaissance carried out by Hydrock in October 2023 has been utilised to produce a series of geomorphological and slope maps. The maps referenced in the section of the report illustrate the slope aspect, previous known mining below the site, and other geomorphological features on site. The geomorphological maps discussed below are included in Appendix E of this report.

A historical landslide is shown via LIDAR mapping to the north-east of the site, which extends to the south, following the orientation of the Rhondda Fach Valley. Partially overlapping this area is the BGS Landslide extent, which includes the area to the north of the LiDAR extent shown (further upslope). Two abandoned quarries are also included on this map to the west of the site, which are covered by vegetation, and recorded in the walkover photograph log (Appendix B).

The slope angle map (drawing ref: 30603-HYD-XX-XX-DR-GE-1008) shows the changes in slope aspect across the site. The colour ramp for the slope angle across the site and to the area beyond ranges from green, representing no or low slope angle, to dark red/black which represents the steepest areas. In the northern areas of the site across the housing development, and the derelict land to the east are a number of small plateaus. These plateaued areas represent regions of carparking, and foundations from former buildings and garages that have been demolished in the north-east of the site. Also shown as a plateau is the location of the school in the east of the site. These plateaus across the site are joined by steep, short breaks in slope (sloping circa 30-40 degrees) shown by the red lines trending north-east to south-west across the northern zone of the site.

The surface of the site is more continuous in the southern area, and sloping to the south generally in the region of 0-10 degrees. Beyond the site to the west the slope angle increases to circa 30 degrees. Along this slope there are some breaks in the profile, which match up with the position of the two quarries along this slope face, and the road down the slope towards Ystrad. To the east of the site the slope angle increases to circa 40-60 degrees. The morphology of the landslide shown in the site features plan can be viewed at the north of the map as this interrupts the steep slope angle which continues parallel to the Rhondda Fach Valley.

The site generally slopes to the south, with steep topography displayed on the map (grey arrows) to the east and west of the site, representative of the slopes down to the valleys below. Two

plateaued areas have been delineated to the south of the derelict area of the housing estate in the east of the site, and in the north of the site.

Retaining walls are not uncommon across the northern area of the site, supporting the various breaks and changes in slope. The condition of the retaining walls have been categorised as good (green), fair (orange) and poor (red), with their heights in metres displayed on the map.

Approximately two thirds of the retaining walls across the site have been assigned either a fair or poor assessment. The walls classified as fair may show minor cracking, water seepage and some deformation, whereas walls classified as poor are at risk of collapse, or have experienced severe cracking, deformation, and wash out of blocks. Many of the walls assessed as poor, have insufficient drainage installed, which is likely to be the cause of structural failings. If these retaining walls are to be retained then a structural assessment should be completed.

To the west of the recorded landslip is a flood water defunct drain that at the time of the walkover was dry, but appeared to have been installed to accommodate surface water runoff in order to prevent surface water flooding. A stream outflow is shown on the map to the south of the boiler house.

Other water features in the proximity of the site include the reservoir (covered) circa 60m north-west of the boiler house, and Ffynon Fair (St Mary's Well) 50m south-west of the western site boundary. Ffynon Fair, as discussed above is a sulphurous water outfall to the Rhondda Fawr Valley below.

3. Initial conceptual site model

3.1 Introduction

The initial Conceptual Site Model (CSM) incorporates evidence from the site walkover, the Desk Study and previous investigations carried out at the site. The formulation of an initial CSM is a key component of the LCRM methodology, and incorporates: a ground model of the site physical conditions; and an exposure model of the possible contaminant linkages. It forms the basis for Generic Quantitative Risk Assessment (GQRA) in accordance with current guidelines.

3.2 Ground model

The preliminary ground model provides an understanding of the ground conditions and is the basis for preparing the preliminary geotechnical hazard assessment (Section 3.3) and the preliminary geo-environmental exposure model (Section 3.4).

3.3 Geotechnical hazard identification

3.3.1 Context

The preliminary geotechnical hazard identification has been undertaken in accordance with the general requirements of ICE/DETR Document 'Managing Geotechnical Risk' and the HE documents HD 41/15 and CD 622.

The following section sets out the identified geotechnical hazards and the development elements potentially affected (see Table F.1 in Appendix F for further information).

3.3.2 *Plausible geotechnical hazards*

Plausible geotechnical hazards identified at the site are:

- » Uncontrolled Made Ground (variable strength and compressibility).
- » Soft / loose compressible ground (low strength and high settlement potential).
- » Variable lateral and vertical changes in ground conditions.
- » Attack of buried concrete by aggressive ground conditions.
- » Adverse chemical ground conditions, (e.g., expansive slag).
- » Obstructions.
- » Loose Made Ground, leading to difficulty with excavation and collapse of side walls.
- » Slope stability issues – general slopes.
- » Slope stability issues – retaining walls.
- » Earthworks – poor bearing capacity of new fill / unsuitability of site won material to be reused as fill.

3.3.3 *Potential development elements affected*

Development elements potentially affected by geotechnical hazards are:

- » Buildings – foundations.
- » Buildings – floor slabs.
- » Roads and pavements.
- » Services.
- » General slopes.
- » Retaining walls.

- » Gardens.
- » Construction staff, vehicles and plant operators.
- » Concrete below ground.
- » Earthworks control, inability to place and compact fill./ insufficient fill to complete earthworks.

Health and safety risks to site Contractors and maintenance workers have not been assessed during these works and will need to be considered separately during design.

The above plausible geotechnical hazards and development elements affected have been carried forward for investigation and assessment.

3.4 Geo-environmental exposure model

3.4.1 Context

The preliminary exposure model is used to identify geo-environmental hazards and to establish potential contaminant linkages, based on the source-pathway-receptor (SPR) approach.

A viable contaminant linkage requires all the components of an SPR to be present. If only one or two are present, there is no linkage and no further assessment is required.

3.4.2 Potential contaminants

For the purpose of this assessment the potential contaminants have been separated according to whether they are likely to have originated from an on-site or off-site source.

3.4.2.1 Potential on-site sources of contamination

- » Made Ground, associated with historical construction activities and imported fill, possibly including elevated concentrations of metals, metalloids, asbestos fibres, Asbestos Containing Materials, PAH and petroleum hydrocarbons (S01).
- » PCBs and oils from transformers in the electricity sub-station on site (S02).
- » Ground gases (carbon dioxide and methane) from organic materials in the Made Ground (S03).
- » Asbestos within existing buildings / structures (S04).
- » Hydrocarbon fuels, lubricants, solvents and asbestos associated with the boiler house in the north of the site and potentially across the heating network area from leaking/damaged pipes (S05).
- » Fly tipped wastes potentially including solvents, metals, metalloids, asbestos and Asbestos Containing Materials (S06).
- » Made Ground containing asbestos and Asbestos Containing Materials associated with the demolition of former pipe work from the district heat network (S07).
- » Bonfire rubble including metalloids, metals, PAHs and petroleum hydrocarbons (S08).

3.4.2.2 Potential off-site sources of contamination

No potential off-site sources of contamination have been identified.

3.4.3 Potential receptors

The following potential receptors in relation to the proposed land use have been identified.

- » People (neighbours, site end users) (R01).
- » Development end use (buildings, utilities and landscaping) (R02).
- » Groundwater: Secondary A aquifer status of the Rhondda Member (R03).
- » Surface water bodies: River Rhondda and the Afon Rhondda Fach (R04).

3.4.4 Potential pathways

The following potential pathways have been identified.

- » Ingestion, skin contact, inhalation of dust and outdoor air by people (P01).
- » Methane/carbon dioxide (ground gas) ingress via permeable soils and/or construction gaps (P02).
- » Surface water via overland flow (P03).
- » Surface water, via drainage discharge (P04).
- » Surface water via base flow from groundwater (P05).
- » Migration of contaminant via leachate migration through the unsaturated zone into the Rhondda Member Sandstone (P06).

Health and safety risks to site development contractors and maintenance workers have not been assessed as part of this study and will need to be considered separately.

The above sources, pathways and receptors have been considered as part of the Preliminary Risk Assessment in accordance with LCRM (2023), are considered to be plausible in the context of this site and have been carried forward for investigation and assessment. An assessment of the Source – Pathway – Receptor linkages is undertaken is presented in Appendix G (Table G.1).

A summary of the plausible linkages is presented on the Initial Conceptual Model provided in Appendix A (Hydrock Drawing 30603-HYD-XX-XX-DR-GE-1006).

3.4.5 Potential implications of climate change

Climate change has the potential to change the risk profile for conceptual site models and associated contaminant linkages. The impact of climate change on the CSM is site-specific, and a qualitative assessment of the potential impact of climate change on the CSM for this site is summarised below. The assessment has primarily utilised the guidance in Environment Agency (2010)² and SoBRA (2022)³ which set out the UK context to climate change and land contamination. Both guidance documents advocate a “what if” scenario approach in the context of changes in ambient temperatures, an increase in the frequency of extreme rainfall/storm events and heatwaves/droughts, and long-term changes in groundwater and sea levels.

Those “what if” scenarios that are relevant to this CSM are:

- » Increased long-term rainfall leading to increased infiltration and seasonally higher groundwater and water levels in surface waters.
- » Increased frequency and/or magnitude of extreme rainfall events leading to short-term surface flooding, surface water run-off, groundwater flooding, and/or land-based erosion.
- » Increased frequency and/or magnitude of storm events leading to short-term drops in barometric pressure and/or high winds.
- » Occurrence of extreme cold and hot weather events leading to changes in ground conditions such as soil temperature, evapo(trans)piration, and soil moisture (for example freeze-thaw effects and desiccation), decreased infiltration and fall in groundwater and surface water levels.

² Environment Agency, 2010. *Guiding Principles for Land Contamination. Part 2. FAQs, technical information, detailed advice and references*, March 2010.

³ SoBRA, 2022. *Guidance on Assessing Risk to Controlled Waters from UK Land Contamination Under Conditions of Future Climate Change*, Society of Brownfield Risk Assessment, August 2022.

- » Long-term decrease in rainfall leading to lower infiltration and fall in groundwater and surface water levels.

4. Desk study conclusions

4.1 Geotechnical conclusions

The following plausible geotechnical risks are identified:

- » Variable Made Ground - settlement or differential settlement of foundations, floor slabs, roads and infrastructure elements.
- » Low strength, compressible ground – risk of shear failure and excessive settlement of foundations, roads and infrastructure elements.
- » Attack of buried concrete by aggressive ground conditions – the development site may contain Made Ground and potentially sulfate bearing soils.
- » Instability of slopes and impact on foundations, floor slabs, roads and infrastructure and construction plant.
- » Potential for obstructions and the risk of instability of excavations with the impact on construction staff, vehicles and plant operators.
- » Earthworks – Low bearing capacity or settlement of new fill and impact on foundations, floor slabs, roads and infrastructure and construction plant.
- » Potential for unforeseen ground conditions and the risks associated with limited data.

These plausible risks require further investigation and assessment

4.2 Geo-environmental conclusions

Based on historical and current land uses:

- » It is considered unlikely that the site would be classified as Contaminated Land under Part 2A of the EPA 1990.
- » The overall risk from land contamination at the site is considered to be medium for the current development due to the presence of asbestos and ACM on the surface. However, as the site is covered by hard standing and buildings, this will limit the possibility of contact with the soils and reduce the infiltration of water, overall reducing the risk for the other types of potential contaminants.

The possible pollutant linkages (for risk levels of moderate or greater) on an unremediated redeveloped site, as determined by the desk study and walk-over, are summarised in Table 4.1:

Table 4.1: Possible Pollutant Linkages (for Risk Levels of Moderate or Greater)

Source(s)	◀ potential impact on ▶	Receptor(s)
Made Ground, associated with historical construction activities, possibly including elevated concentrations of metals, metalloids, asbestos fibres, Asbestos Containing Materials, PAH and petroleum hydrocarbons.		Site end users. Groundwater.
Ground gases (carbon dioxide and methane) from organic materials in the Made Ground.		Site end users. Development end use.
Asbestos within existing buildings / structures.		Site end users.
Hydrocarbon fuels, lubricants, solvents and asbestos associated with the boiler house in the north of the site and potentially across the heating network area from leaking/damaged pipes.		Site end users. Groundwater

Source(s)	◀ potential impact on ▶	Receptor(s)
Fly tipped wastes potentially including solvents, metals, metalloids, asbestos and Asbestos Containing Materials.		Site end users.
Made Ground containing asbestos and Asbestos Containing Materials associated with the demolition of former pipe work from the district heat network.		Site end users.
Bonfire rubble including metalloids, metals, PAHs and petroleum hydrocarbons.		Site end users.

These possible pollutant linkages require further investigation and assessment.

5. Preliminary development constraints

Based on the Desk Study information presented above, preliminary development constraints with regards to the development of the site, are presented in Table 5.1. Hydrock believe there are no geotechnical or environmental development constraints anticipated which would not be able to be mitigated using standard engineering practices.

It should be noted that these recommendations are based on the limited data available from the Desk Study and Hydrock's experience. All preliminary development constraint comments are subject to review and change in the light of the site investigation, assessment and design.

Table 5.1: Preliminary development constraints / recommendations (at desk study stage)

Site Preparation, Earthworks and Groundworks	<p>Topsoil and any organic Made Ground should be removed ahead of any earthworks, and prior to the construction of any new buildings and hardstanding areas.</p> <p>Obstructions are likely in the areas of previous construction and may require breaking equipment or heavy-duty plant to remove them.</p> <p>Excavations should be readily achievable using standard plant.</p> <p>Excavations are likely to be stable in the short to medium term. However, collapse of excavation faces in the coarse soils is to be anticipated. If person-entry is required, or excavations are left open, they should be battered back or shored.</p> <p>Water seepages into excavations is possible. However, significant seepages are unlikely and should be adequately controlled by sump pumping.</p> <p>Excavated soils should be suitable for reuse, if required, subject to chemical testing, earthworks testing and testing in accordance with the British Standard for Topsoil.</p> <p>Some management of soils and remediation will be required with regards to the Made Ground (if present).</p> <p>Asbestos may prohibit Made Ground soils from being re-used and hand picking may be required to prevent disposal of Made Ground as Hazardous waste.</p> <p>Excavated natural soils generally should be suitable for reuse, subject to testing and placement in accordance with a suitable Specification.</p>
Foundations	<p>Strip or trench fill foundations are likely to be appropriate across the majority of the site, founding onto the near surface underlying bedrock. A weathered sequence of the bedrock may also offer shallow founding, the firm or stiffer clays, or medium dense and denser coarse soils.</p> <p>Foundations should be reinforced to allow for variable founding strata.</p> <p>Deepening will be required where construction is in close proximity to trees or locally due to low strength soils. If deepening due to trees means that the foundation depth is >2.5m bgl piling may be required.</p>
Floor Slabs	<p>Where volume change potential is low and Made Ground is less than 0.50m thick ground bearing floor slabs are likely to be suitable. Suspended slabs (over a suitable void where within the influencing distance of trees) are recommended to comply with NHBC Standards.</p>
Roads	<p>Assume an equilibrium design CBR value of 3% on natural soils, or earthworks fill. If Made ground is left in place a CBR of <2.5% is recommended.</p>

Soakaways	Soakaway drainage may be viable on site however positioning of soakaway features will need to be led by a geotechnical engineer to prevent causing destabilization with retaining walls and possible unstable slopes. At this stage Hydrock would suggest soakaways are only utilised in the centre of the site away from slopes and retaining walls. Due to the site being positioned on a hill positive drainage may have to supplement on site infiltration to prevent flooding of areas at a lower elevation beneath the site.
Water Supply Pipework	Likely, based on existing data, to be 'Protectaline' pipework (or similar), but confirmation should be sought from the water supply company, following completion of intrusive works.
Remediation	<p>Until intrusive investigation works are completed the extent of any remediation works cannot be advised, particularly in relation to any hydrocarbon contamination that may be present from the former heating network.</p> <p>It is likely that hand picking of ACM will be required, and will need to be disposed of at a suitably licensed disposal facility.</p> <p>A cover system in soft landscaping may be required if elevated metals, PAH and asbestos is identified. A typical cover system would comprise a geogrid at the base, to act as a break/separator layer; 450mm of subsoil; and 150mm (minimum) of topsoil.</p> <p>A Materials Management Plan will be required for the earthworks as the site is likely to be constructed by various contractors.</p>
Protection from Ground Gases	<p>Radon protective measures are not required.</p> <p>The requirement for ground gas protection measures will be confirmed following the site investigation and monitoring. However, based on the available data, it is considered that CS₂ gas protection measures may be required (suspended slab, venting and verified membrane).</p>
Waste Disposal	<p>Topsoil is potentially classified as non-hazardous waste. However, this is dependent upon the organic matter in the soil and if >6% organics would be classified as hazardous waste if disposed.</p> <p>Made Ground soils are likely to be classified as non-hazardous waste. Unless contaminated with Asbestos fibres over 0.1% or pieces of ACM (sheeting) are present.</p> <p>Natural uncontaminated soils are likely to be able to be disposed of at an inert landfill.</p>

6. Uncertainties and limitations

6.1 Site-specific comments

Some of the land beyond the site to the east and west was unable to be fully surveyed due to thick vegetation coverage, and the steep slope faces.

6.2 General comments

Hydrock Consultants Limited (Hydrock) has prepared this report in accordance with the instructions of Trivallis (the Client), by e-mail dated September 2023 under the terms of appointment for Hydrock, for the sole and specific use of the Client and parties commissioned by them to undertake work where reliance is placed on this report. Any third parties who use the information contained herein do so at their own risk. Hydrock shall not be responsible for any use of the report or its contents for any purpose other than that for which it was prepared or for use of the report by any parties not defined in Hydrock's appointment.

This report details the findings of work carried out in October 2023. The report has been prepared by Hydrock on the basis of available information obtained during the study period. Although every reasonable effort has been made to gather all relevant information, not all potential environmental constraints or liabilities associated with the site may have been revealed.

Hydrock has used reasonable skill, care and diligence in the design of the investigation of the site and in its interpretation of the information obtained. The inherent variation of ground conditions allows only definition of the actual conditions at the locations and depths of trial pits and boreholes at the time of the investigation. At intermediate locations, conditions can only be inferred.

Unless otherwise stated, the recommendations in this report assume that ground levels will remain as existing. If there is to be any re-profiling (e.g. to create development platforms or for flood alleviation) then the recommendations may not apply.

Information provided by third parties has been used in good faith and is taken at face value; however, Hydrock cannot guarantee its accuracy or completeness.

Where the existing report(s) prepared by others have been provided by the Client, it is assumed that these have been either commissioned by the Client, or can be assigned to the Client, and can be relied upon by Hydrock. Should this not be the case Hydrock should be informed immediately as additional work may be required. Hydrock is not responsible for any factual errors or omissions in the supplied data, or for the opinions and recommendations of others. It is possible that the conditions described may have since changed through natural processes or later activities.

The work has been carried out in general accordance with recognised best practice. Unless otherwise stated, no assessment has been made for the presence of radioactive substances or unexploded ordnance. Where the phrase 'suitable for use' is used in this report, it is in keeping with the terminology used in planning control and does not imply any specific warranty or guarantee offered by Hydrock.

Whilst the preliminary risk assessment process has identified potential risks to construction workers, consideration of occupational health and safety issues is beyond the scope of this report.

The non-specialist UXO screening has been undertaken for the purposes of ground investigation only (i.e. low risk activity in accordance with CIRIA Report C681). Further assessment should be undertaken with regards to other higher risk activities e.g. construction.

Please note that notwithstanding any site observations concerning the presence or otherwise of archaeological sites, ACM or invasive weeds, this report does not constitute a formal survey of these potential constraints and specialist advice should be sought.

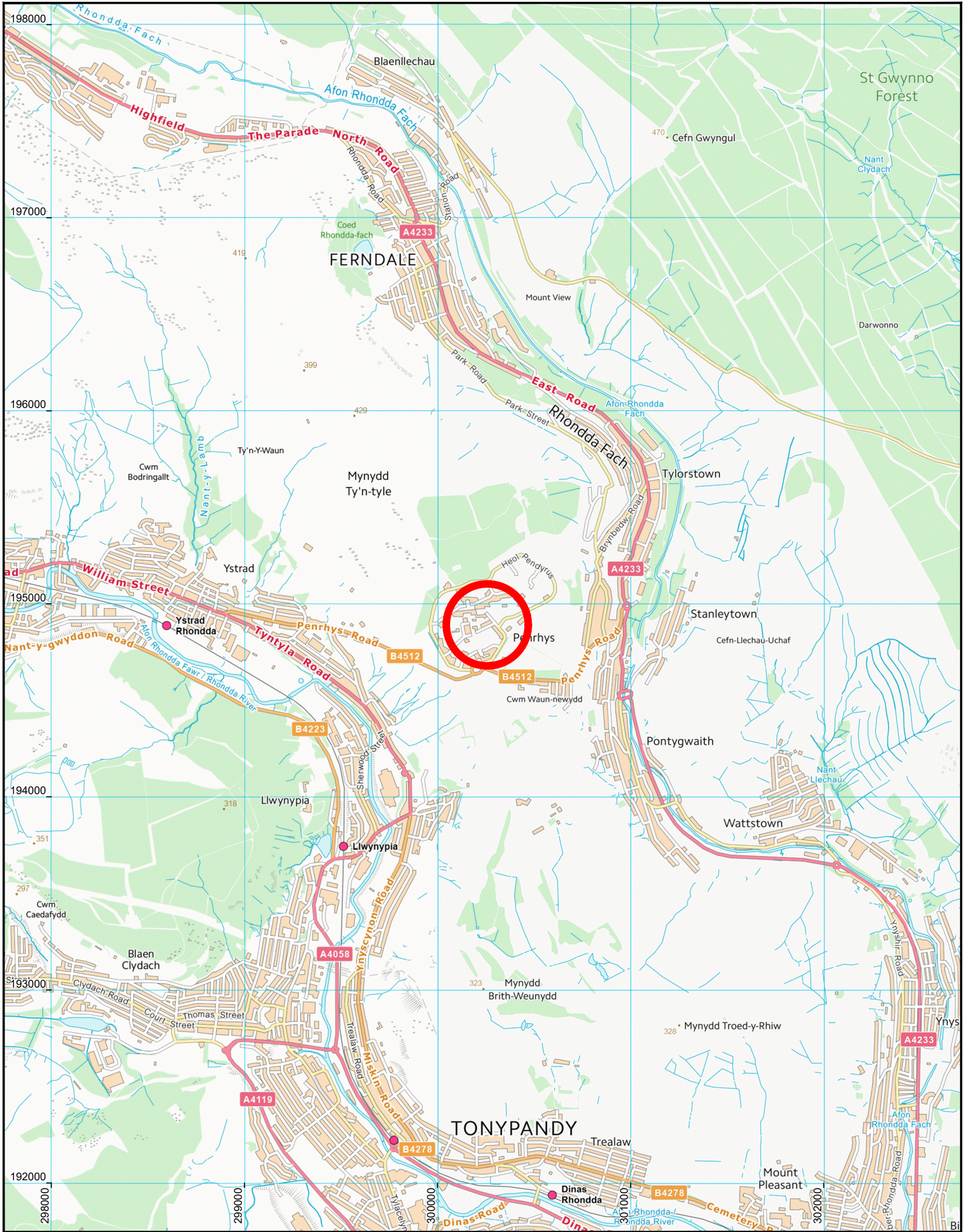
Any site boundary line depicted on plans does not imply legal ownership of land.


7. Recommendations for further work

Following the Phase 1 Desk Study undertaken to date, the following further works will be required:

- » Demolition/ Refurbishment asbestos survey of existing structures on site;
- » Discussion with specialists with regard to invasive plant species;
- » Preliminary, site wide ground investigation, to confirm the initial ground model and identify areas that require more detailed investigation;
- » Detailed intrusive site investigation for the various phases of the development to allow detailed design of structures, SuDS, remedial strategies, slope stability assessments and earthworks; and
- » If required following intrusive site investigation, Remedial Strategy & Verification Plan, Earthworks Strategy, Material Management Plan.


Appendix A Drawings






OS NORTH

Site Ref: ST09



CARMAETHENSHIRE
PONTYPRIDD
MONMOUTHSHIRE
BROMLEY
NORTH POOL
TALBOT
BROMLEY
MERTHYR TYDFIL
CHERPPHILL
NEWPORT
THE VALLEY OF GLAMORGAN
CARDIFF

P1	FIRST ISSUE	EP	12/10/23	EW	12/10/23	AE	12/10/23
REV.	REVISION NOTES/COMMENTS						
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE	



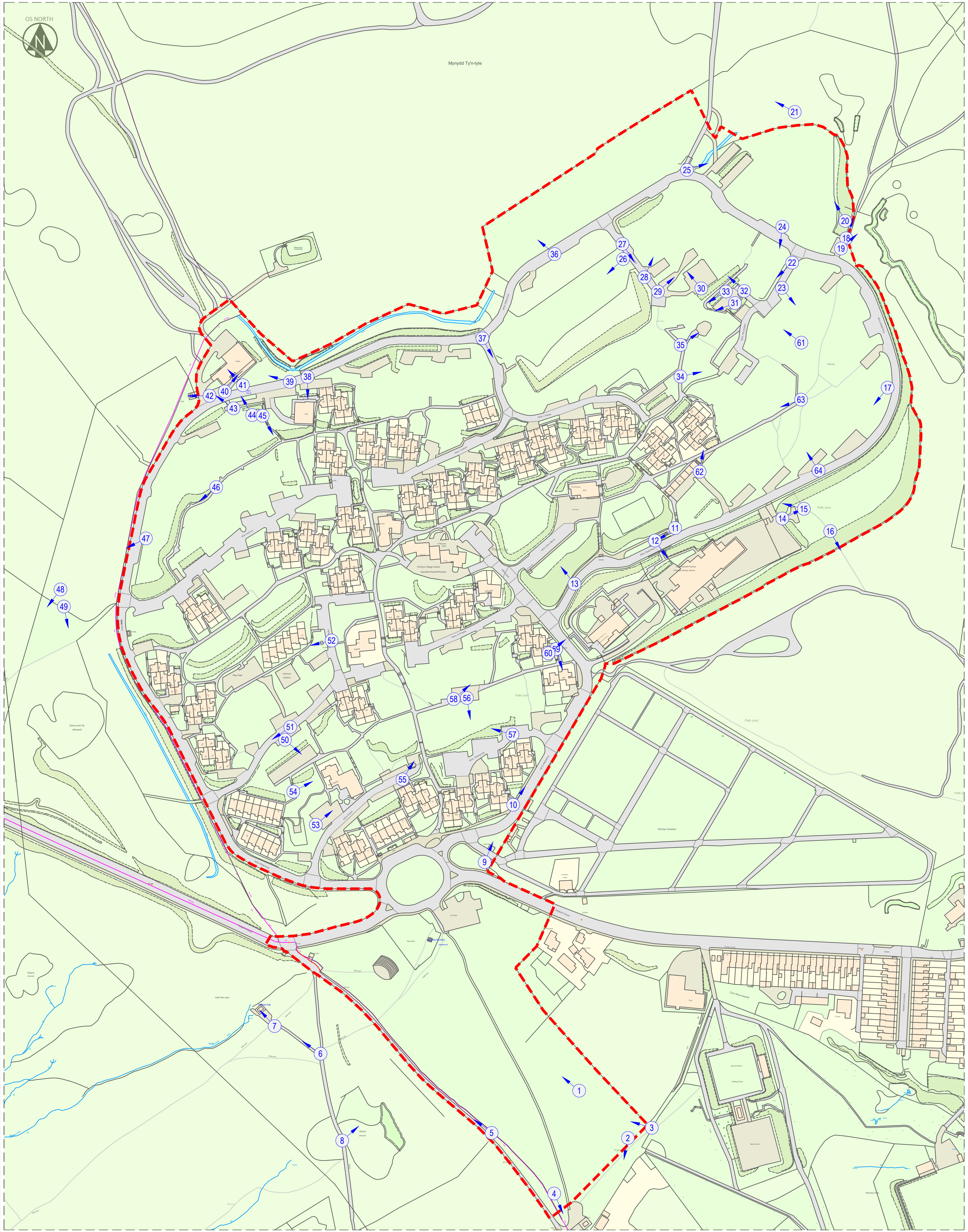
3rd Floor Wharton Place
13 Wharton Street
Cardiff
CF10 1GS
e: +44(0) 2920 023 665
t: cardiff@hydrock.com

CLIENT
TRIVALLIS


PROJECT
PENRHYS VILLAGE, RHONDDA CYNON TAFF

TITLE
SITE LOCATION PLAN

HYDROCK PROJECT NO. C-30603	SCALE @ A4 1:25,000
PURPOSE OF ISSUE SUITABLE FOR INFORMATION	STATUS S2
DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER) 30603-HYD-XX-XX-DR-GE-1004	REVISION P1



KEY



Site investigation boundary




Photo location and reference

NOTES

1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.

2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.

P1	FIRST ISSUE					
	EP	12/10/23	EW	12/10/23	AE	12/10/23
REV.	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE



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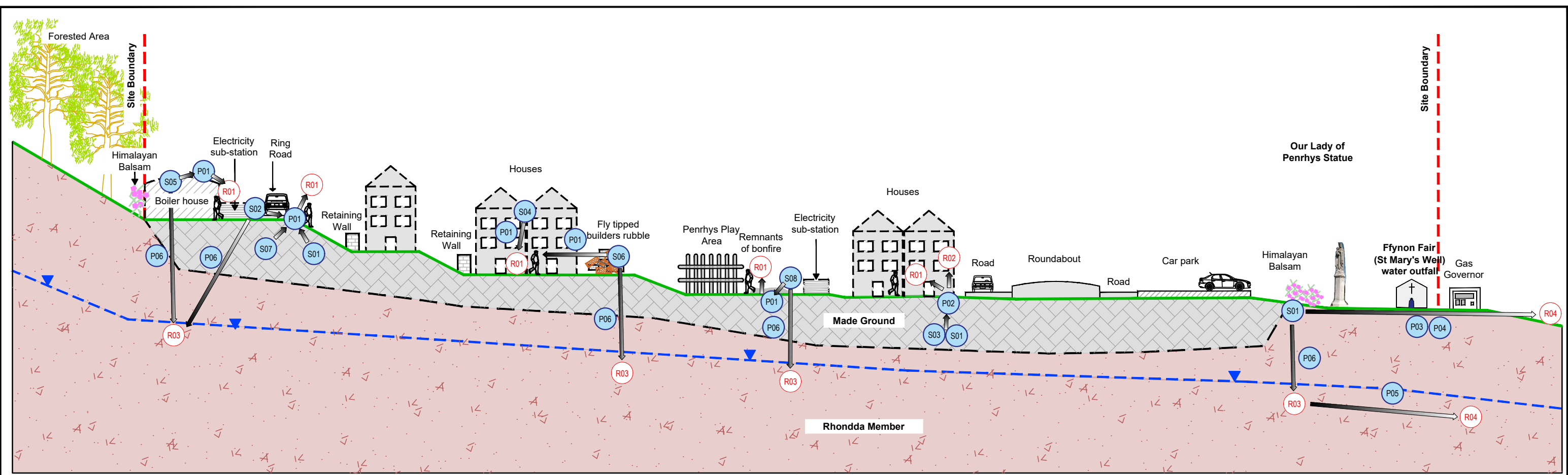
CLIENT

TRIVALLIS

PROJECT

PENRHYS VILLAGE, RHONDDA CYNON TAFF

TITLE			
SITE WALKOVER PLAN			
HYDROCK PROJECT NO. C-30603		SCALE @ A2 1:2000	
PURPOSE OF ISSUE SUITABLE FOR INFORMATION			STATUS S2
DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER) 30603-HYD-XX-XX-DR-GE-1005			REVISION P1



Potential on-site sources of contamination

- S01. Made Ground, associated with historical construction activities and imported fill, possibly including elevated concentrations of metals, metalloids, asbestos fibres, Asbestos Containing Materials, PAH and petroleum hydrocarbons.
- S02. PCBs and oils from transformers in the electricity sub-station on site.
- S03. Ground gases (carbon dioxide and methane) from organic materials in the Made Ground.
- S04. Asbestos within existing buildings / structures.
- S05. Hydrocarbon fuels, lubricants, solvents and asbestos associated with the boiler house in the north of the site and potentially across the heating network from leaking/damaged pipes.
- S06. Fly tipped wastes potentially including solvents, metals, metalloids, asbestos and Asbestos Containing Materials.
- S07. Made Ground containing asbestos and Asbestos Containing Materials associated with the demolition of former pipe work from the district heat network.
- S08. Bonfire rubble including metalloids, metals, PAHs and petroleum hydrocarbons.

Potential off-site sources of contamination

No potential off-site sources of contamination have been identified.

Potential receptors

The following potential receptors in relation to the proposed land use have been identified.

- R01. People (neighbours, site end users).
- R02. Development end use (buildings, utilities and landscaping).
- R03. Groundwater: Secondary A aquifer status of the Rhondda Member.
- R04. Surface water bodies: River Rhondda and the Afon Rhondda Fach.

Potential pathways

The following potential pathways have been identified.

- P01. Ingestion, skin contact, inhalation of dust and outdoor air by people.
- P02. Methane/carbon dioxide (ground gas) ingress via permeable soils and/or construction gaps.
- P03. Surface water via overland flow.
- P04. Surface water, via drainage discharge.
- P05. Surface water via base flow from groundwater.
- P06. Migration of contaminant via leachate migration through the unsaturated zone into the Rhondda Member Sandstone.

<div>KEY</div> <div><div><div></div>Existing ground profile</div><div><div></div>Conjectural geological boundary</div><div><div></div>Groundwater elevation</div><div><div></div>Made Ground</div><div><div></div>Rhondda Member Sandstone</div></div>	<div>NOTES</div> <div>1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.</div> <div>2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.</div>											<div><div><div><div>Hydrock</div><div>3rd Floor Wharton Place 13 Wharton Street Cardiff CF10 1GS t: +44(0) 2920 023 665 e: cardiff@hydrock.com</div></div><div>CLIENT</div><div>TRIVALLIS</div></div><div><div>PROJECT</div><div>PENRHYS VILLAGE, RHONDDA CYNON TAFF</div></div></div>										<div><div>TITLE</div><div>INITIAL CONCEPTUAL SITE MODEL</div></div> <div><div>HYDROCK PROJECT NO. C-30603</div><div>SCALE @ A3 NTS</div></div> <div><div>PURPOSE OF ISSUE SUITABLE FOR INFORMATION</div><div>STATUS S2</div></div> <div><div>DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER) 30603-HYD-XX-XX-DR-GE-1006</div><div>REVISION P01</div></div>									
		<div>P01</div> <div>FIRST ISSUE</div> <div><div>EP</div><div>12/10/23</div><div>EW</div><div>12/10/23</div><div>AE</div><div>12/10/23</div></div>																													
		<div>REV.</div> <div>REVISION NOTES/COMMENTS</div> <div><div>DRAWN BY</div><div>DATE</div><div>CHECKED BY</div><div>DATE</div><div>APPROVED BY</div><div>DATE</div></div>																													

Appendix B Field reconnaissance photographs

Desk Study Photograph 1	
Date: 4/10/23	
Direction Photograph Taken: North-west.	
Description: Looking towards Penrhys housing estate from the south of the site.	

Desk Study Photograph 2	
Date: 4/10/23	
Direction Photograph Taken: South.	
Description: Looking over the southern site boundary.	


Desk Study Photograph 3	
Date: 4/10/23	
Direction Photograph Taken: North-west.	
Description: Path through the open land in the southern zone of the site.	


Desk Study Photograph 4	
Date: 4/10/23	
Direction Photograph Taken: South-east.	
Description: Gas governor just beyond the southern site boundary.	

Desk Study Photograph 5	
Date: 4/10/23	
Direction Photograph Taken: North-west.	
Description: Road running along the south-west site boundary line.	

Desk Study Photograph 6	
Date: 4/10/23	
Direction Photograph Taken: North-west.	
Description: Path to Ffynon Fair beyond the western site boundary.	


Desk Study Photograph 7	
Date: 4/10/23	
Direction Photograph Taken: North-west.	
Description: Ffynon Fair (St Mary's Well) to the west of the site boundary, which outfalls to the valley below.	

Desk Study Photograph 8	
Date: 4/10/23	
Direction Photograph Taken: North-east.	
Description: Vegetated area concealing former quarry from view.	

Desk Study Photograph 9	
Date: 25/07/23	
Direction Photograph Taken: North-east.	
Description: Gas governor to the south of the Penrhys housing development.	

Desk Study Photograph 10	
Date: 25/07/23	
Direction Photograph Taken: North-east.	
Description: View up the ring road to the east of the housing estate.	

Desk Study Photograph 11	
Date: 4/10/23	
Direction Photograph Taken: South-west.	
Description: Subway with 3m high walls in poor condition, leading to Penrhys Primary School.	

Desk Study Photograph 12	
Date: 4/10/23	
Direction Photograph Taken: South-east.	
Description: Closed subway connecting Penrhys housing estate and Penrhys Primary School.	

Desk Study Photograph 13	
Date: 25/07/23	
Direction Photograph Taken: North-west.	
Description: Looking north-west towards vegetated area.	

Desk Study Photograph 14	
Date: 4/10/23	
Direction Photograph Taken: North-east.	
Description: Change in slope between the level of the ring road, and the land below to the east of Penrhys Primary School.	

Desk Study Photograph 15	
Date: 4/10/23	
Direction Photograph Taken: North-east.	
Description: Retaining wall below access road for Penrhys Primary School.	

Desk Study Photograph 16	
Date: 4/10/23	
Direction Photograph Taken: South-east.	
Description: View across the south-east site boundary down the valley.	

Desk Study Photograph 17	
Date: 25/07/23	
Direction Photograph Taken: South-west.	
Description: Vegetation in the east of the site.	

Desk Study Photograph 18	
Date: 4/10/23	
Direction Photograph Taken: North-east.	
Description: Track leading beyond the eastern site boundary.	

Desk Study Photograph 19	
Date: 4/10/23	
Direction Photograph Taken: North-east.	
Description: Fly tipped corrugated asbestos sheeting.	

Desk Study Photograph 20	
Date: 25/07/23	
Direction Photograph Taken: North-west.	
Description: Vegetated slope in the east of the site.	

Desk Study Photograph 21	
Date: 25/07/23	
Direction Photograph Taken: North-east.	
Description: Vegetated slope just north of the site boundary.	


Desk Study Photograph 22	
Date: 4/10/23	
Direction Photograph Taken: South-west.	
Description: Retaining wall in the north-east of the site in poor condition, with insufficient drainage causing block washout.	

Desk Study Photograph 23	
Date: 4/10/23	
Direction Photograph Taken: South-east.	
Description: View of vacant land in the north-east of the site.	

Desk Study Photograph 24	
Date: 4/10/23	
Direction Photograph Taken: South-west.	
Description: Looking towards access road to derelict north-east area of Penrhys estate.	

Desk Study Photograph 25	
Date: 4/10/23	
Direction Photograph Taken: East.	
Description: Drain in the north of the site.	


Desk Study Photograph 26	
Date: 4/10/23	
Direction Photograph Taken: South-west.	
Description: Change in slope at the north of the site.	

Desk Study Photograph 27	
Date: 4/10/23	
Direction Photograph Taken: South.	
Description: Old road through previously demolished area of housing.	

Desk Study Photograph 28	
Date: 4/10/23	
Direction Photograph Taken: North-east.	
Description: Rubble including asbestos board in the north-east of the site.	

Desk Study Photograph 29	
Date: 4/10/23	
Direction Photograph Taken: East.	
Description: Foundations of former houses in the north-east of the site.	

Desk Study Photograph 30	
Date: 4/10/23	
Direction Photograph Taken: North.	
Description: Plateau of land at former site of houses in north-east of the site.	

Desk Study Photograph 31	 A photograph showing a dark, weathered retaining wall made of stone or concrete blocks. The wall is situated on a grassy slope. To the left of the wall, there are concrete steps leading up the slope. The ground in front of the wall is covered with dark, loose material, possibly soil or debris, and some scattered leaves. The background shows more greenery and a cloudy sky.
Date: 4/10/23	
Direction Photograph Taken: South-west.	
Description: Retaining wall in the previously demolished area of the site in the north-east.	

Desk Study Photograph 32	 A photograph showing a steep, grassy slope. The slope is covered with dense green vegetation, including grass and small shrubs. In the middle of the slope, there are concrete steps that are partially covered by the vegetation. The steps appear to be remnants of a former path or road. The background shows more greenery and a cloudy sky.
Date: 4/10/23	
Direction Photograph Taken: North-east.	
Description: Vegetation covered steps which formerly connected the differing levels across the north-east area of the now demolished housing estate.	

Desk Study Photograph 33	
Date: 4/10/23	
Direction Photograph Taken: South-west.	
Description: Holes in the ground possibly associated with former utilities for now demolished houses in the east of the housing estate.	

Desk Study Photograph 34	
Date: 4/10/23	
Direction Photograph Taken: East.	
Description: Remains of a bonfire in grassed area adjacent to existing property.	

Desk Study Photograph 35	
Date: 4/10/23	
Direction Photograph Taken: North-east.	
Description: Strip of what appears to be the invasive cotoneaster plant (dark green vegetation) amongst other vegetation in the north-east of the site.	

Desk Study Photograph 36	
Date: 25/07/23	
Direction Photograph Taken: North-east.	
Description: Vegetated slope in the north of the site between the top of the ring road and forest behind.	

Desk Study Photograph 37	
Date:	
Direction Photograph Taken: South-east.	
Description: Looking into Penrhys housing from the top of the ring road in the north of the site.	

Desk Study Photograph 38	
Date: 25/07/23	
Direction Photograph Taken: South.	
Description: Former club house building in the north of the housing estate.	

Desk Study Photograph 39	
Date: 25/07/23	
Direction Photograph Taken: North-west.	
Description: View to the former boiler house from the ring road.	

Desk Study Photograph 40	
Date: 25/07/23	
Direction Photograph Taken: North-east.	
Description: Front of derelict boiler house in the north of the site.	

Desk Study Photograph 41	
Date: 4/10/23	
Direction Photograph Taken: North-east.	
Description: Pile of possible asbestos tiles next to the boiler house.	

Desk Study Photograph 42	
Date: 25/07/23	
Direction Photograph Taken: East.	
Description: Electricity sub-station near to the former boiler house.	


Desk Study Photograph 43	
Date: 4/10/23	
Direction Photograph Taken: North-east.	
Description: Retaining wall between concreted area associated with former structures, and the level of the ring road above.	


Desk Study Photograph 44	
Date: 4/10/23	
Direction Photograph Taken: North-east.	
Description: 2.5m high retaining wall in the north of the site in poor condition.	

Desk Study Photograph 45	
Date: 25/07/23	
Direction Photograph Taken: South-east.	
Description: Overgrown former path into the housing estate.	

Desk Study Photograph 46	
Date: 4/10/23	
Direction Photograph Taken: South-west.	
Description: 1.5m high retaining wall along a walkway in the north-west of the site.	

Desk Study Photograph 47	
Date: 4/10/23	
Direction Photograph Taken: South-west.	
Description: Minor cracking in the road surface in the west of the site.	

Desk Study Photograph 48	
Date: 4/10/23	
Direction Photograph Taken: South-west.	
Description: View across the valley which lies to the west of the site.	

Desk Study Photograph 49	
Date: 4/10/23	
Direction Photograph Taken: South-east.	
Description: Steep slope to the west of the site, looking towards the location of the former quarry/tip beneath the vegetation.	

Desk Study Photograph 50	
Date: 25/07/23	
Direction Photograph Taken: South-east.	
Description: Looking downslope in the housing estate towards the hardstanding games compound.	

Desk Study Photograph 51	
Date: 25/07/23	
Direction Photograph Taken: South-west.	
Description: Looking towards houses close to the western site boundary.	

Desk Study Photograph 52	
Date: 25/07/23	
Direction Photograph Taken: South-west.	
Description: Electricity sub-station in the west of the housing estate.	

Desk Study Photograph 53	
Date: 25/07/23	
Direction Photograph Taken: North-east.	
Description: Area of car parking in front of the Rhys Centre (community centre).	

Desk Study Photograph 54	
Date: 4/10/23	
Direction Photograph Taken: North-east.	
Description: Bonfire rubble adjacent to hardstanding games area.	

Desk Study Photograph 55	
Date: 4/10/23	
Direction Photograph Taken: North-east.	
Description: Electricity sub-station in the south of the housing estate.	

Desk Study Photograph 56	
Date: 25/07/23	
Direction Photograph Taken: South.	
Description: View downslope in the centre of the housing estate.	

Desk Study Photograph 57	
Date: 25/07/23	
Direction Photograph Taken: North-west.	
Description: Looking across the sloped lawn area towards the south of the housing estate.	

Desk Study Photograph 58	
Date: 25/07/23	
Direction Photograph Taken: North-east.	
Description: Retaining wall at the bottom of the slope protecting the area of car parking.	

Desk Study Photograph 59	
Date: 4/10/23	
Direction Photograph Taken: South-east.	
Description: Subway exit to Flying Start Childrens Centre.	

Desk Study Photograph 60	
Date: 4/10/23	
Direction Photograph Taken: North-east.	
Description: Subway connecting the housing estate with Flying Start Childrens Centre.	

Desk Study Photograph 61	
Date: 25/07/23	
Direction Photograph Taken: North-west.	
Description: 1m washed out retaining wall with insufficient drainage in derelict area of former houses.	

Desk Study Photograph 62	
Date: 25/07/23	
Direction Photograph Taken: North-east.	
Description: Change in levels upslope in the east of the housing estate.	

Desk Study Photograph 63	
Date: 25/07/23	
Direction Photograph Taken: South-west.	
Description: Cracked 1.5m high retaining wall in the east of the site in poor condition.	

Desk Study Photograph 64	
Date: 25/07/23	
Direction Photograph Taken: North-east.	
Description: Plateaued area of concrete along the slope associated with former parking garage/sheds in the east of the site.	

Appendix C Historical ordnance survey maps

Site Details:

428, HEOL-Y-WAUN, PEN-RHYS,
FERNDALE, CF43 3NW

Client Ref: PO29122
Report Ref: GS-6I5-4IX-Z6U-SEX_1250_1_3
Grid Ref: 300042, 195347

Map Name: National Grid
Map date: 1993
Scale: 1:1,250
Printed at: 1:2,000

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Revised N/A
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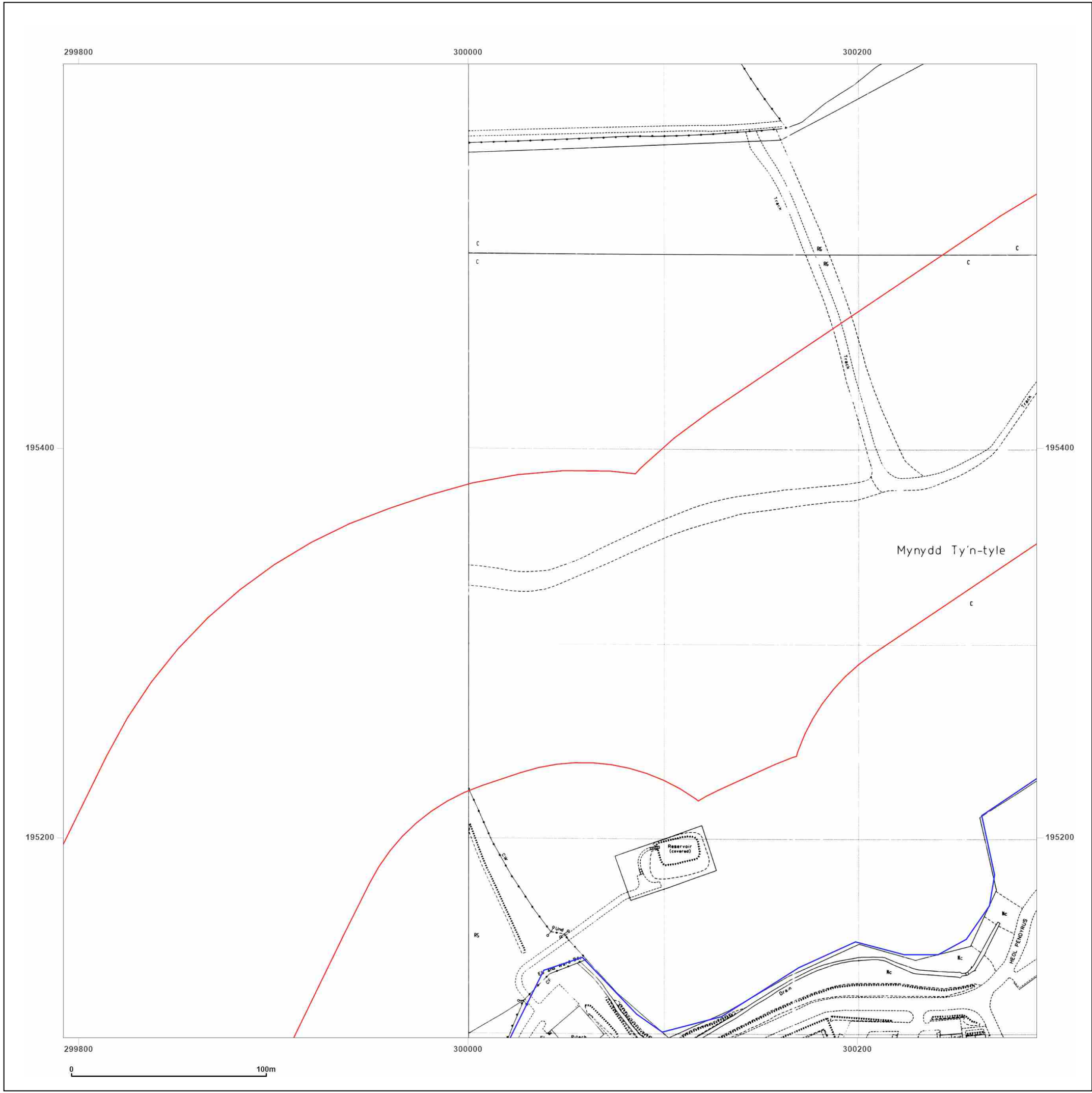


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Site Details:

428, HEOL-Y-WAUN, PEN-RHYS,
FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_1250_2_1
Grid Ref: 300542, 194347

Map Name: National Grid

Map date: 1957

Scale: 1:1,250

Printed at: 1:2,000



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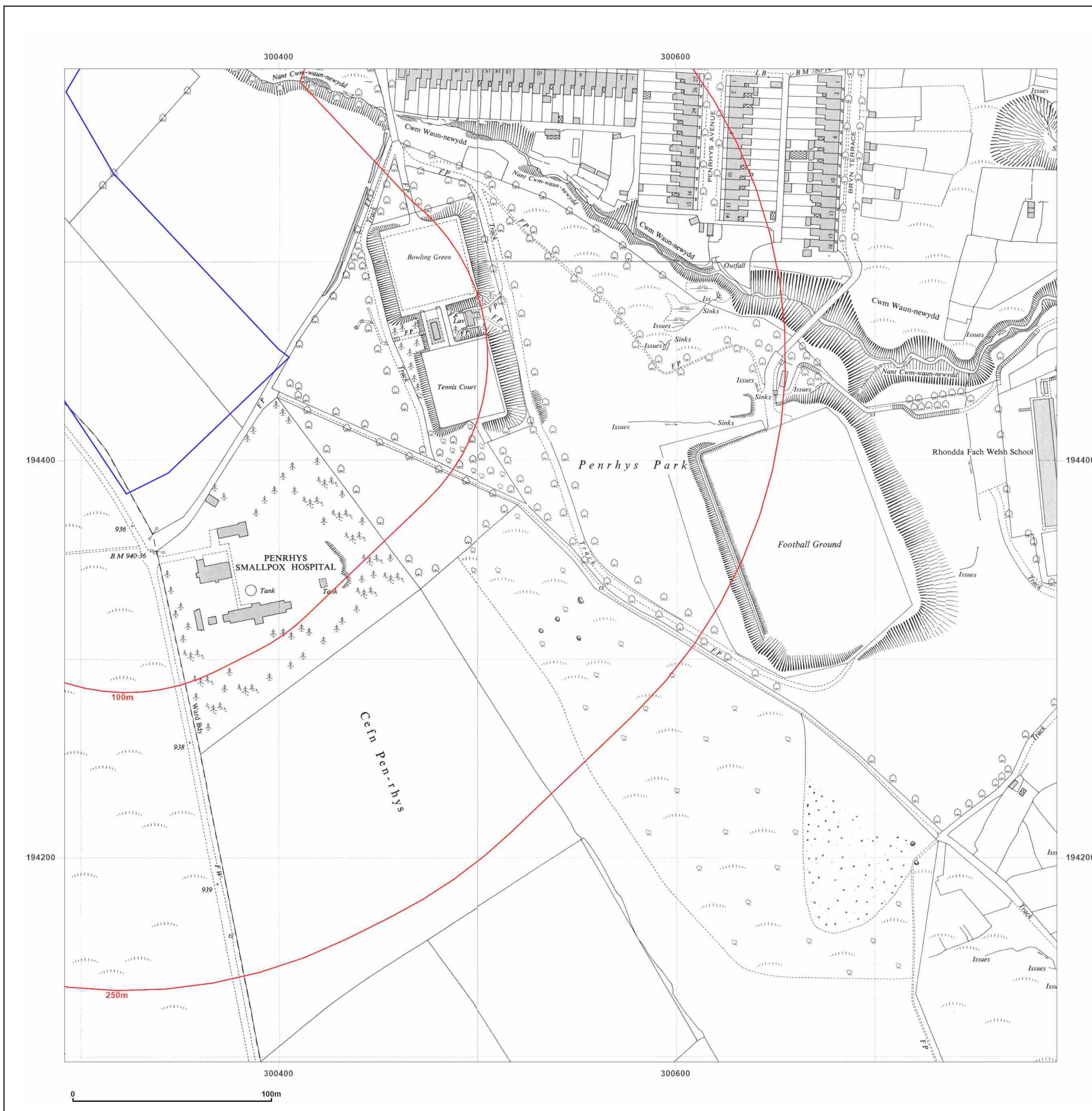


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Site Details:

428, HEOL-Y-WAUN, PEN-RHYS,
FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_1250_2_1
Grid Ref: 300542, 194347

Map Name: National Grid

Map date: 1958

Scale: 1:1,250

Printed at: 1:2,000



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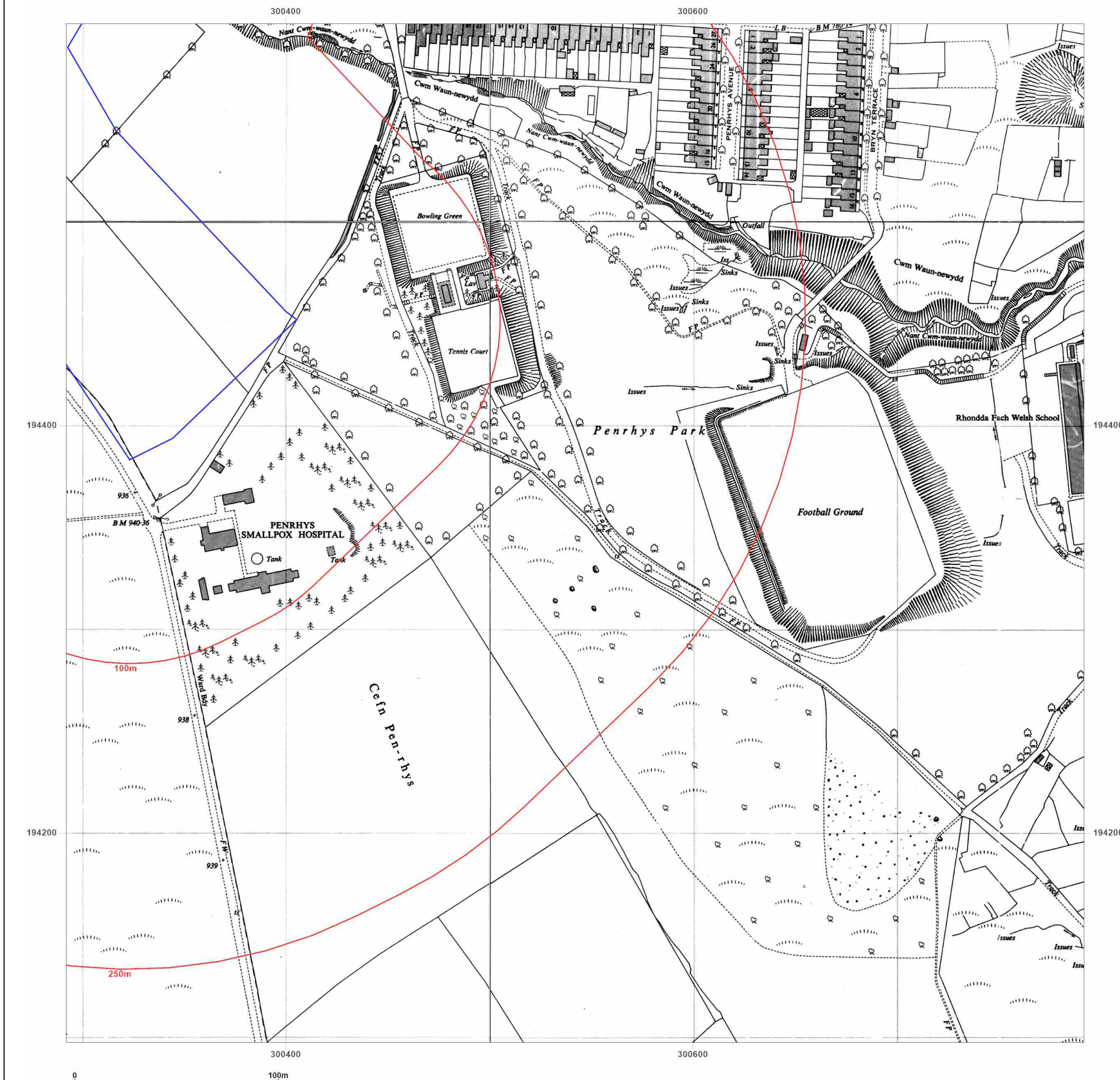


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Site Details:

428, HEOL-Y-WAUN, PEN-RHYS,
FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_1250_2_1
Grid Ref: 300542, 194347

Map Name: National Grid

Map date: 1958

Scale: 1:1,250

Printed at: 1:2,000



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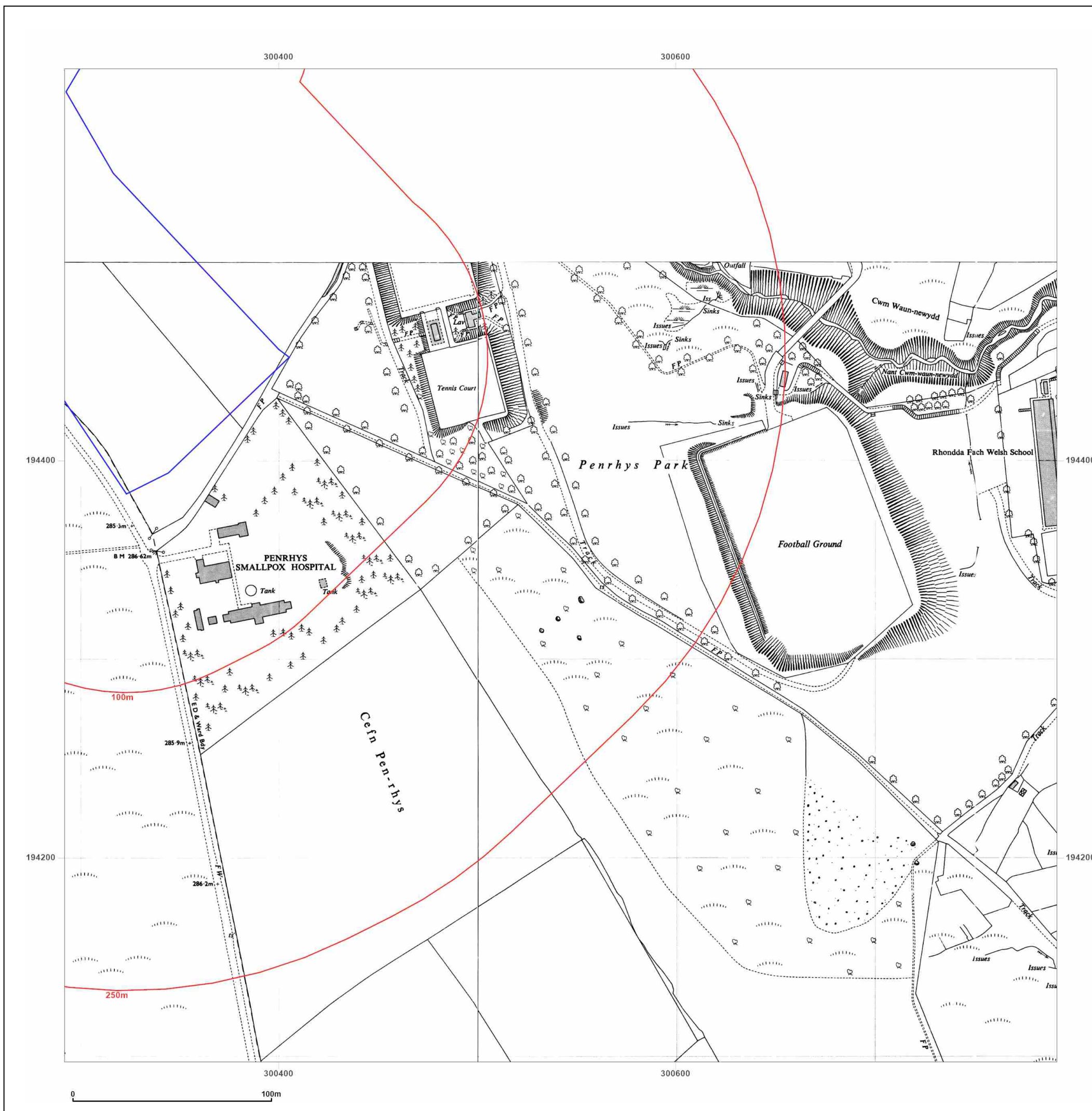


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Grid Ref: 300542, 194347

Map Name: National Grid

Map date: 1988-1993

Scale: 1:1,250

Printed at: 1:2,000



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Revised 1988
Edition N/A
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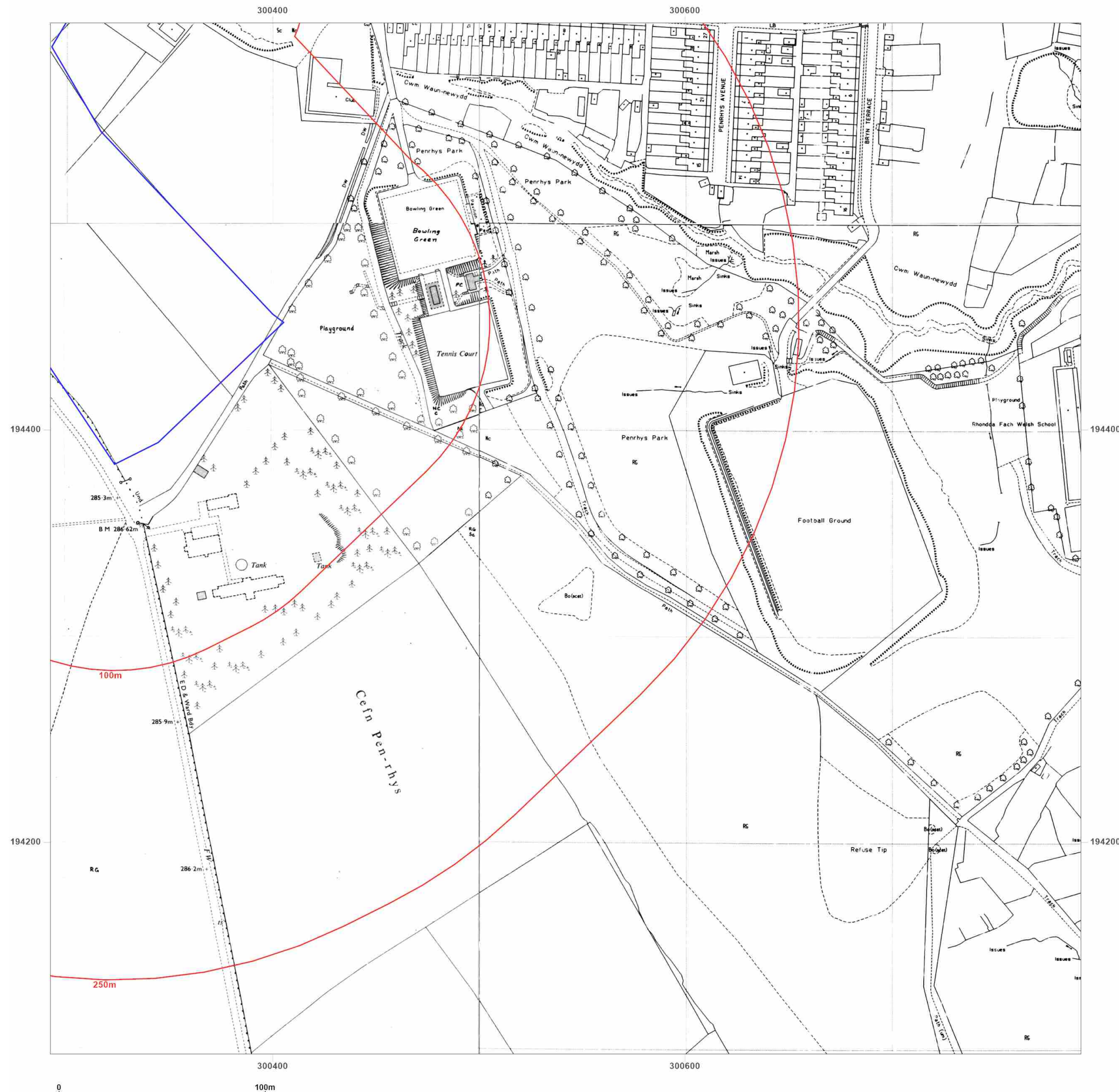


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Site Details:

428, HEOL-Y-WAUN, PEN-RHYS,
FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_1250_2_1
Grid Ref: 300542, 194347

Map Name: National Grid

Map date: 1993-1994

Scale: 1:1,250

Printed at: 1:2,000



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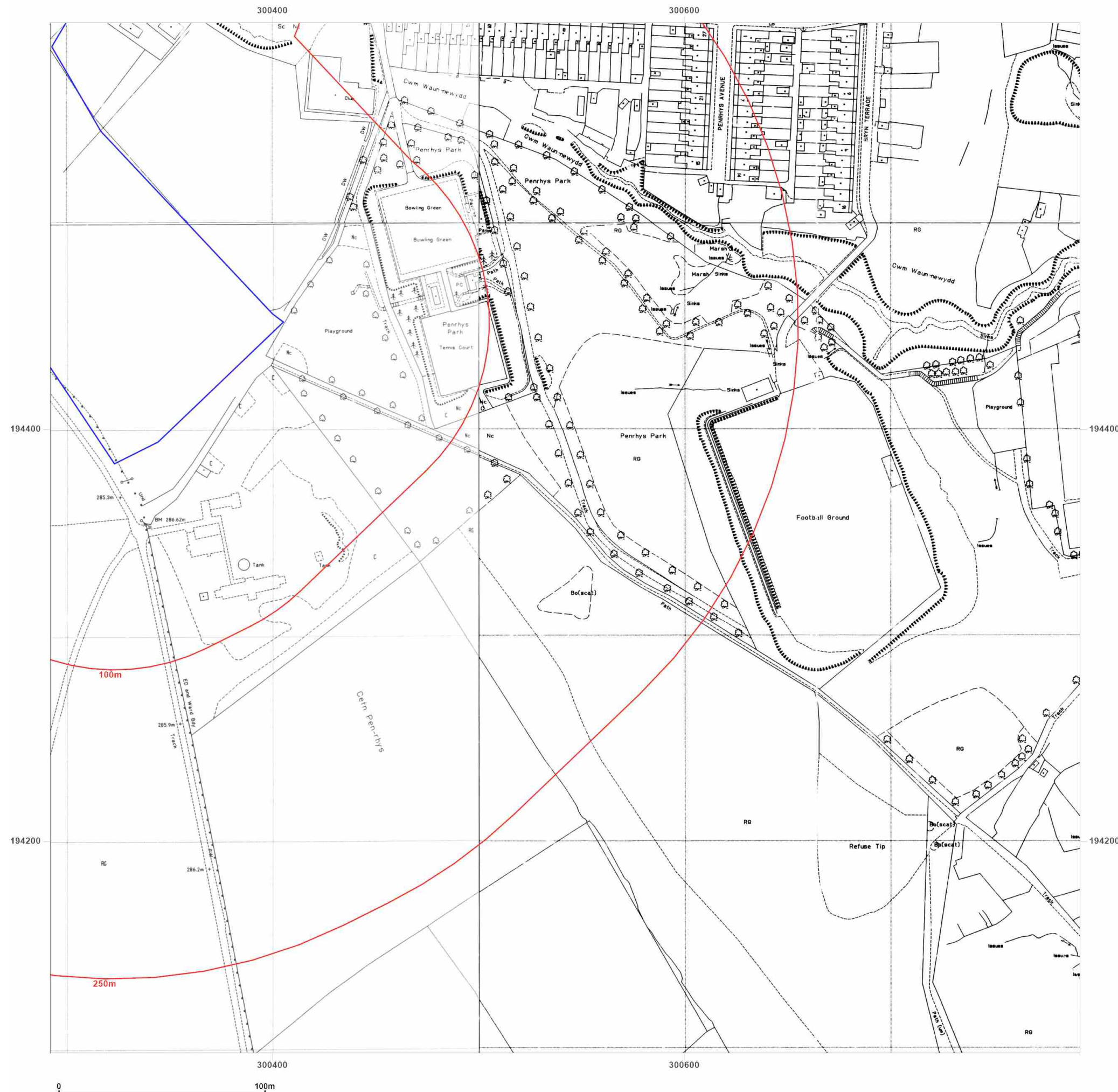


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Site Details:

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Report Ref: GS-615-4IX-Z6U-SEX_1250_2_1
Grid Ref: 300542, 194347

Map Name: National Grid

Map date: 1994

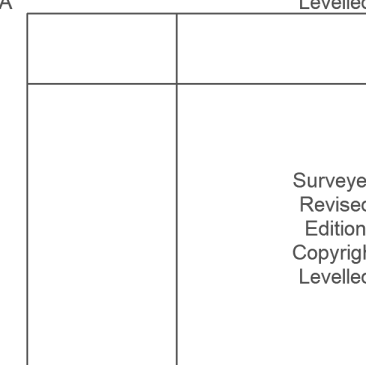
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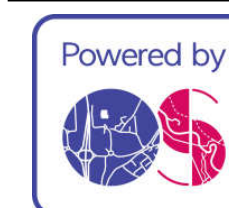


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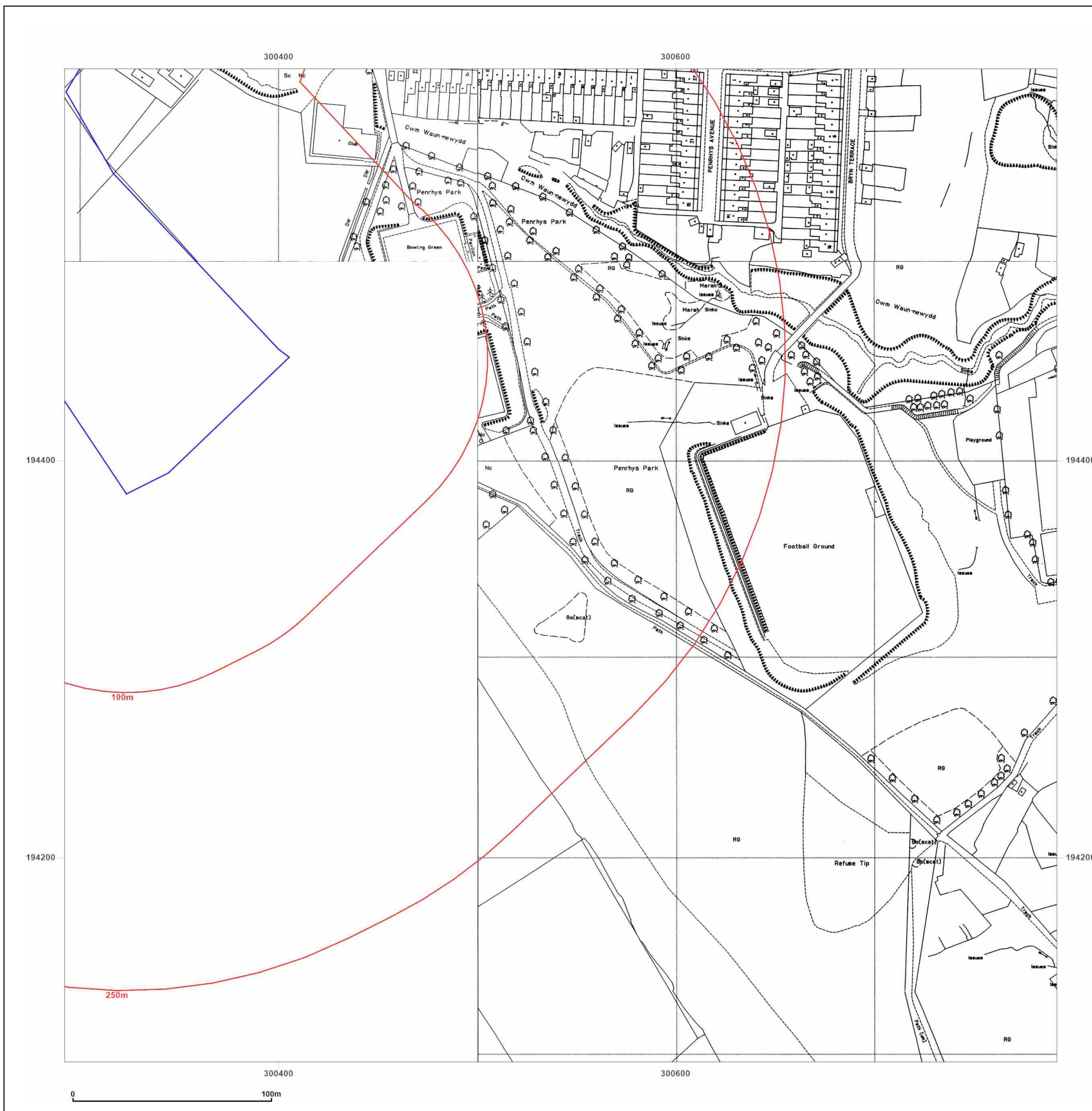


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_1250_2_2
Grid Ref: 300542, 194847

Map Name: National Grid

Map date: 1957

Scale: 1:1,250

Printed at: 1:2,000



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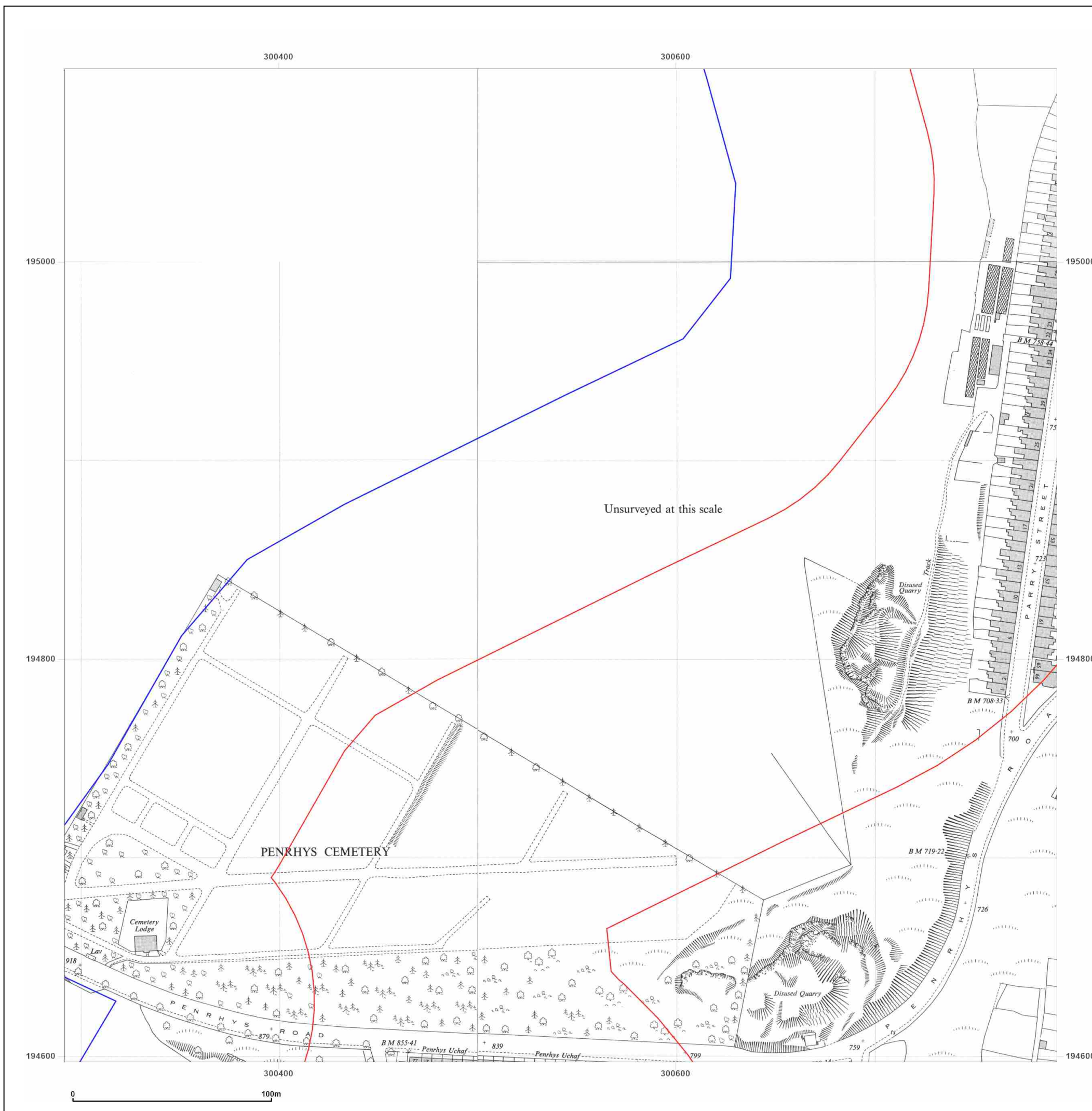


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_1250_2_2
Grid Ref: 300542, 194847

Map Name: National Grid

Map date: 1958

Scale: 1:1,250

Printed at: 1:2,000



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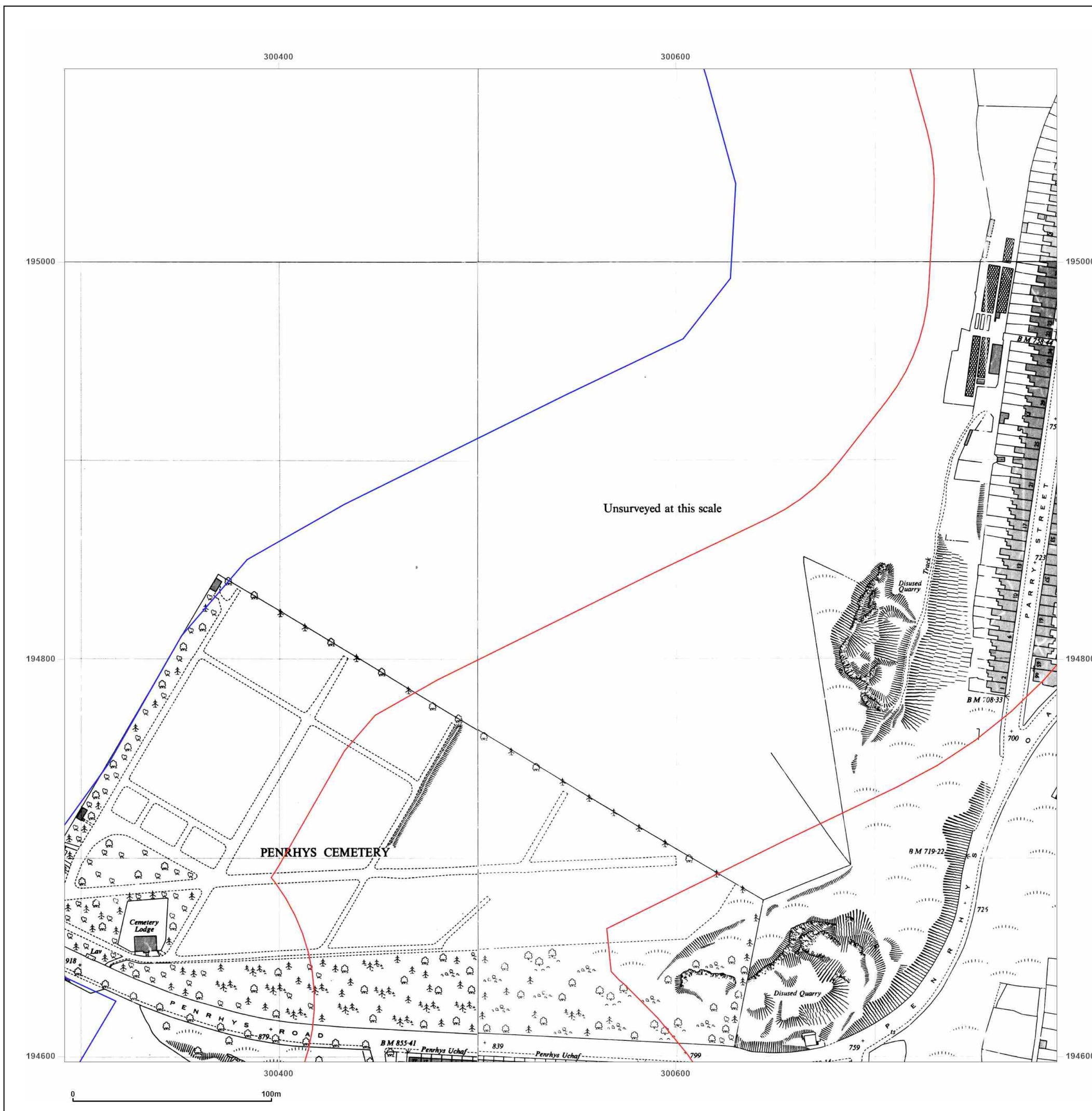


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_1250_2_2
Grid Ref: 300542, 194847

Map Name: National Grid

Map date: 1972

Scale: 1:1,250

Printed at: 1:2,000



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Site Details:

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FERNDAL, CF43 3NW

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Report Ref: GS-615-4IX-Z6U-SEX_1250_2_2
Grid Ref: 300542, 194847

Map Name: National Grid

Map date: 1974

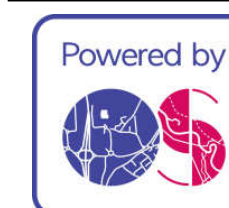
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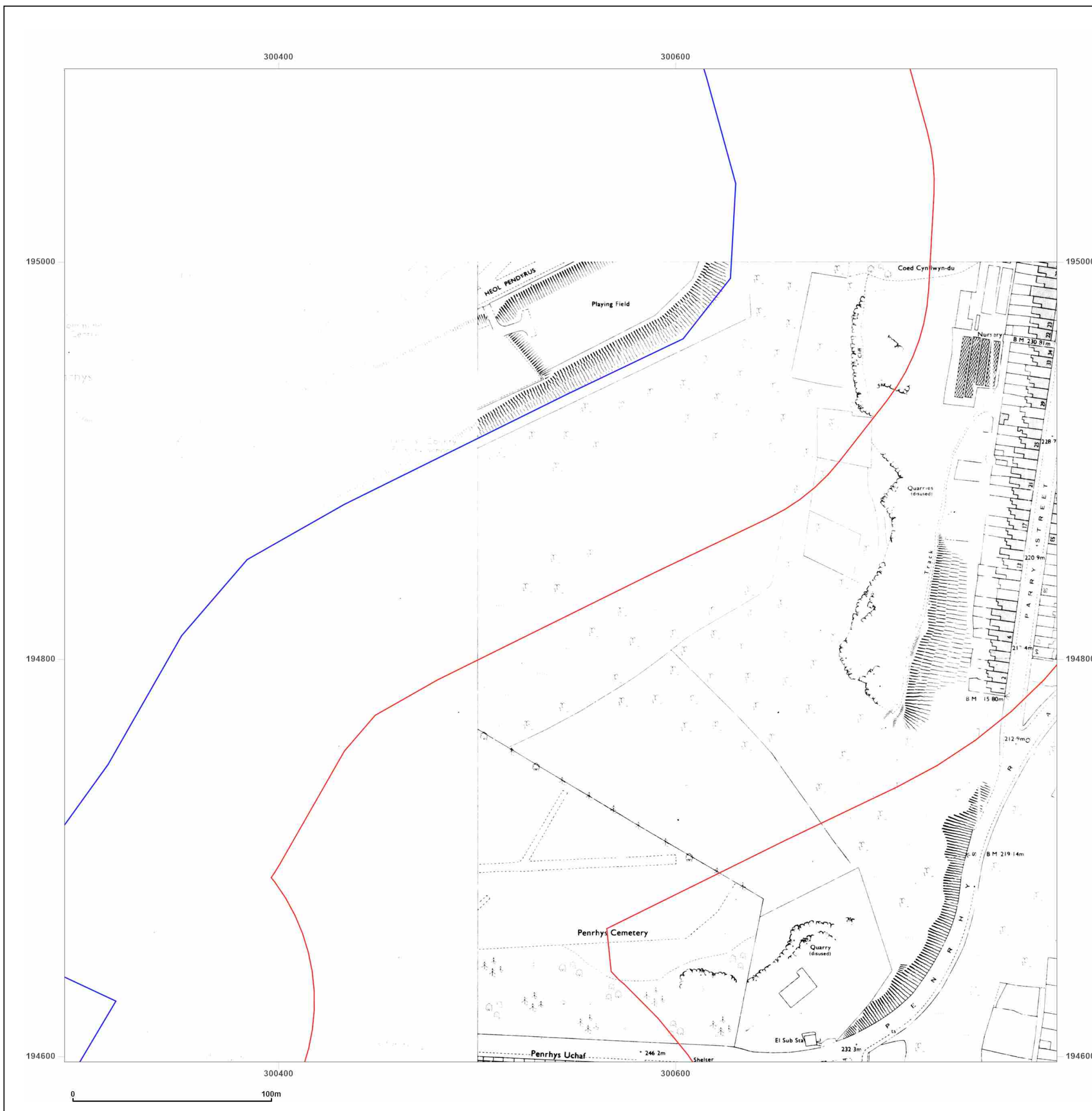


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_1250_2_2
Grid Ref: 300542, 194847

Map Name: National Grid

Map date: 1994

Scale: 1:1,250

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_1250_2_2
Grid Ref: 300542, 194847

Map Name: National Grid

Map date: 1994

Scale: 1:1,250

Printed at: 1:2,000



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Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_1250_2_3
Grid Ref: 300542, 195347

Map Name: National Grid

Map date: 1957

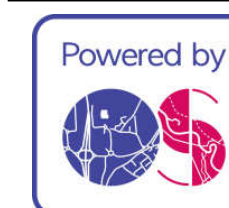
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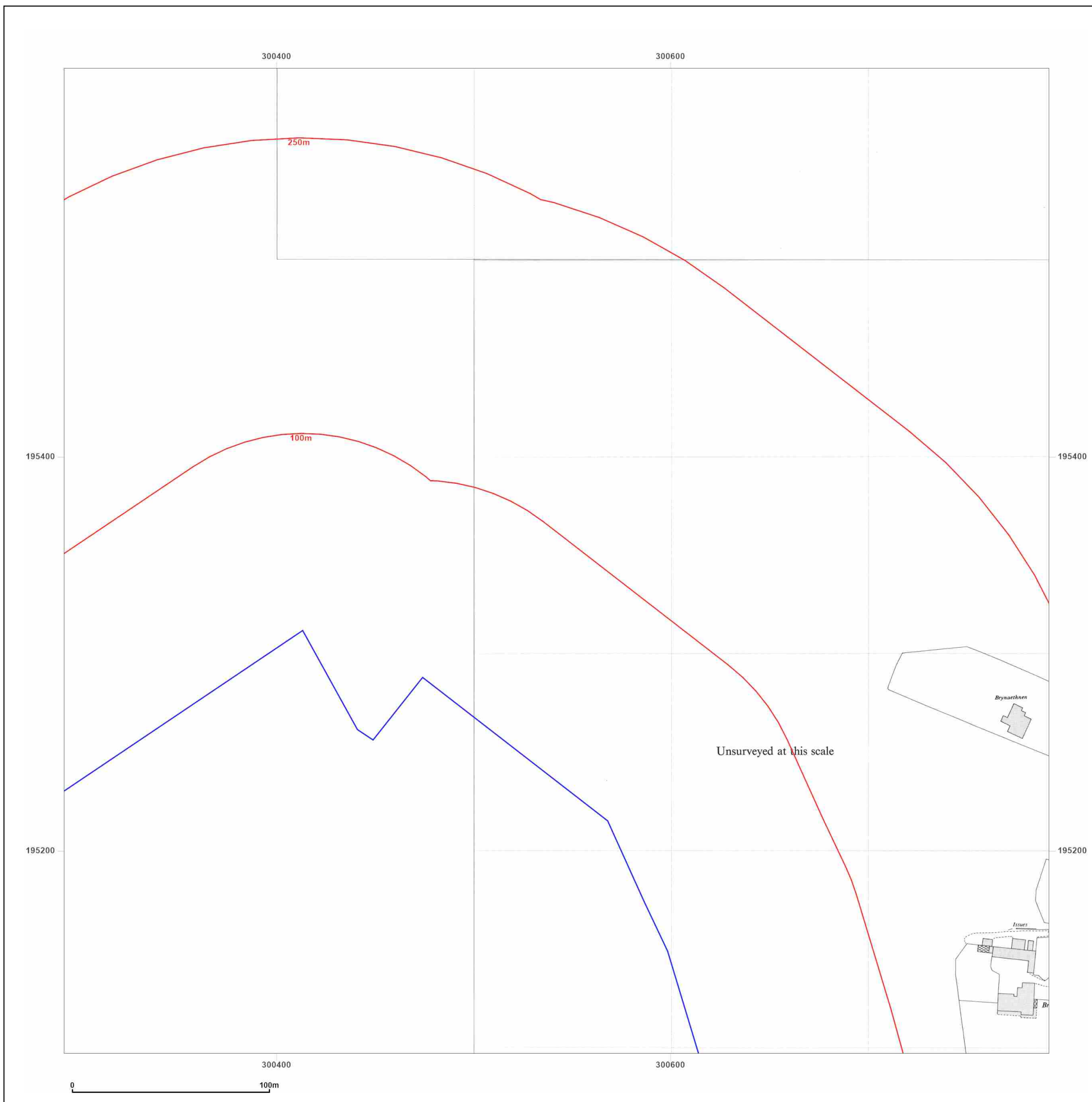


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Grid Ref: 300542, 195347

Map Name: National Grid

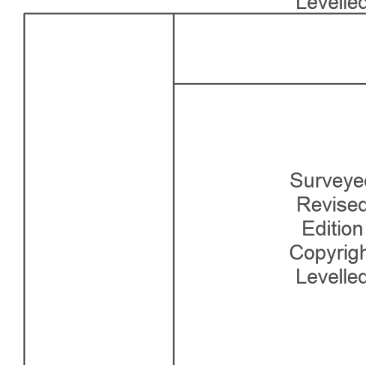
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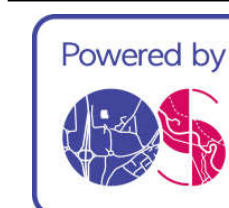
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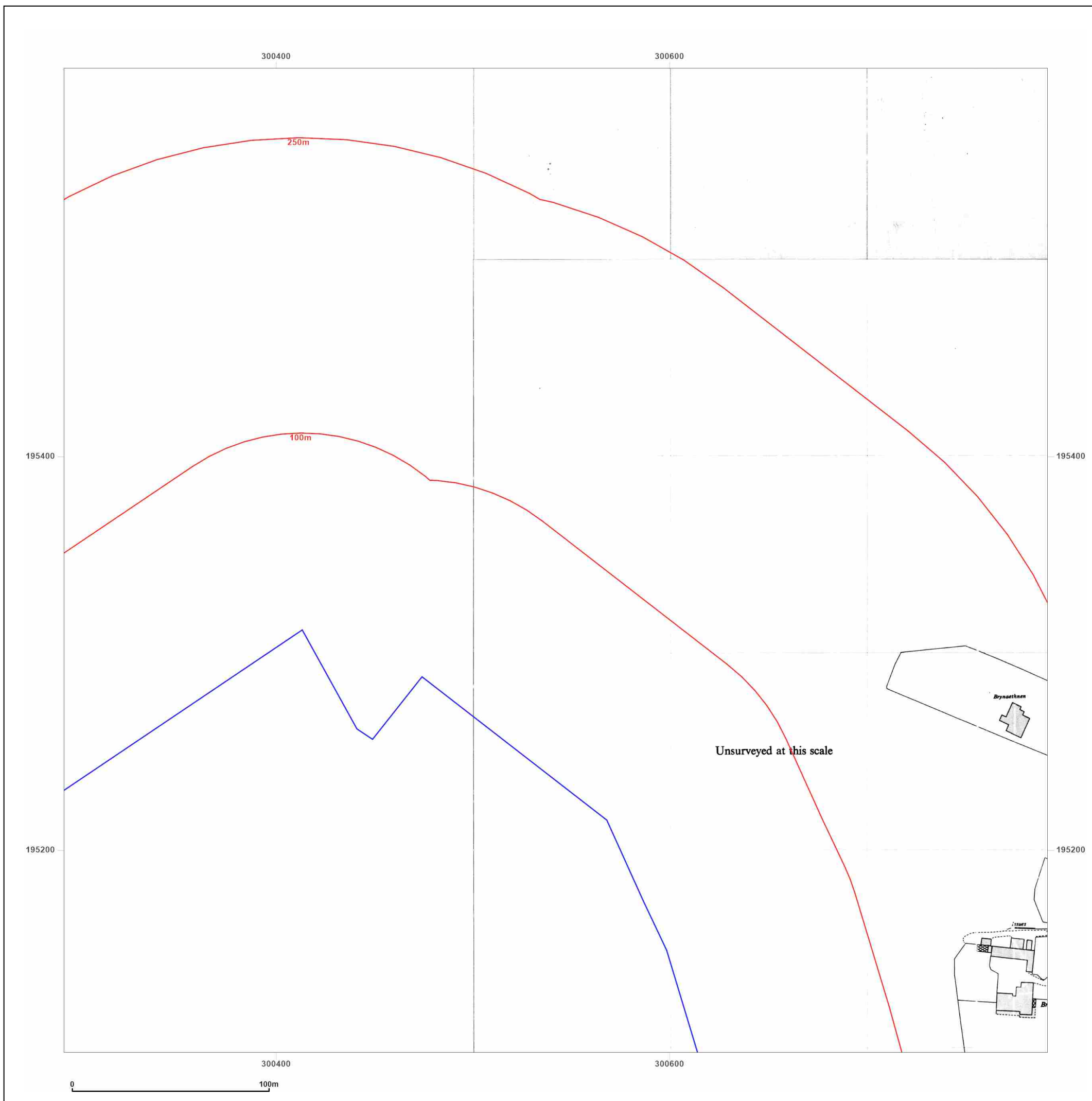


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Site Details:

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Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_1250_2_3
Grid Ref: 300542, 195347

Map Name: National Grid

Map date: 1972

Scale: 1:1,250

Printed at: 1:2,000



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Edition N/A
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Edition N/A
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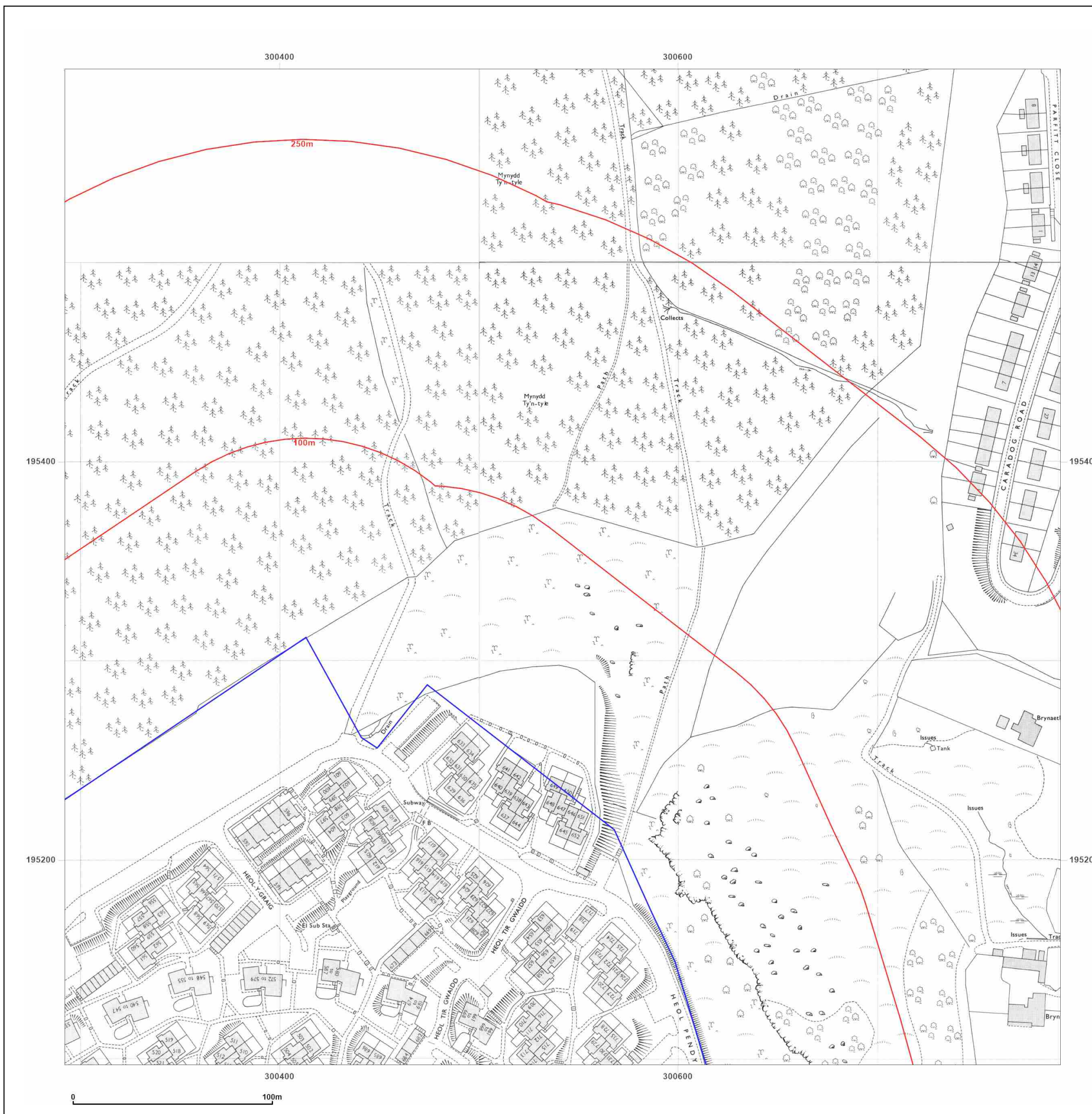


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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_1250_2_3
Grid Ref: 300542, 195347

Map Name: National Grid

Map date: 1993

Scale: 1:1,250

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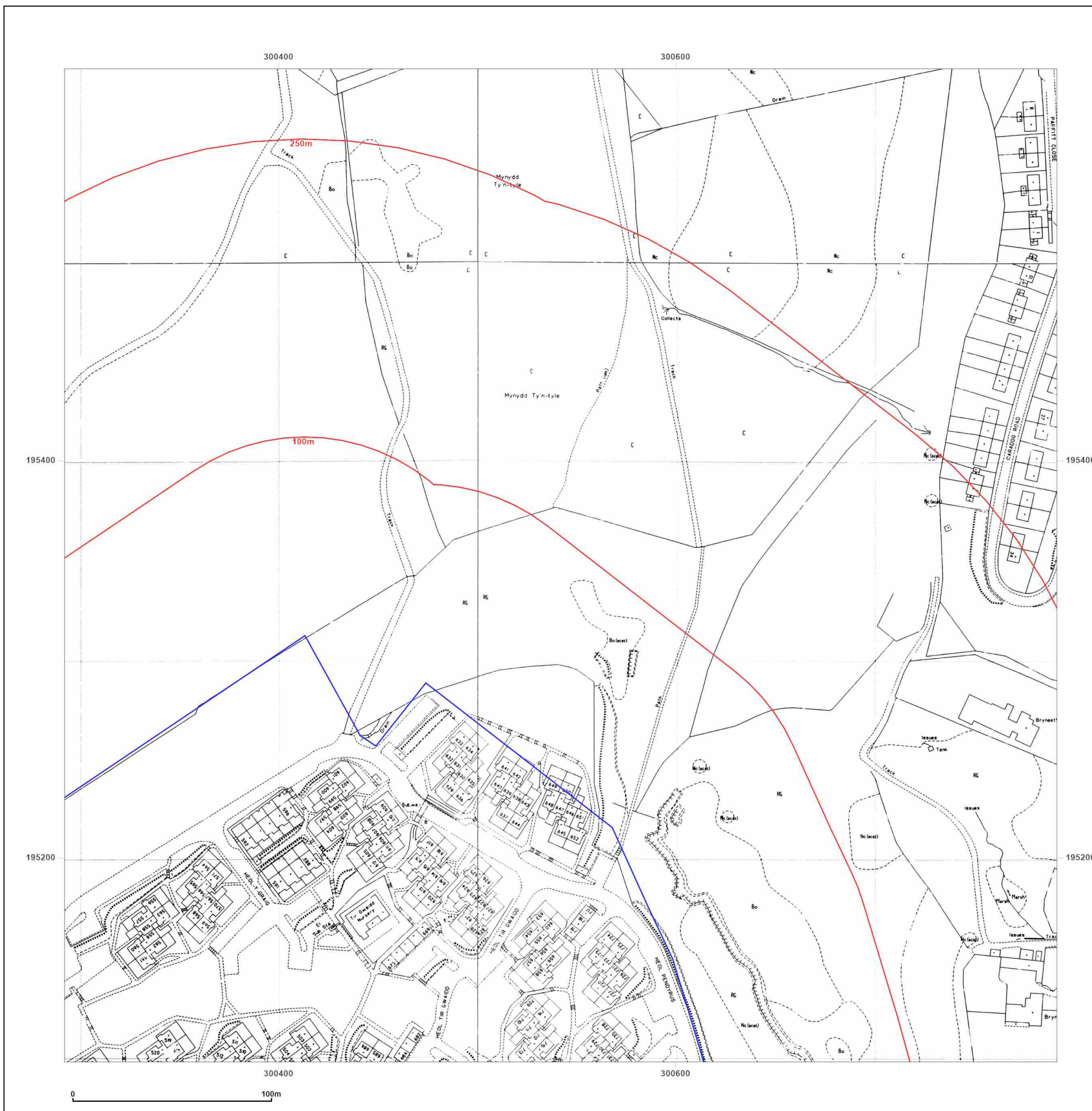


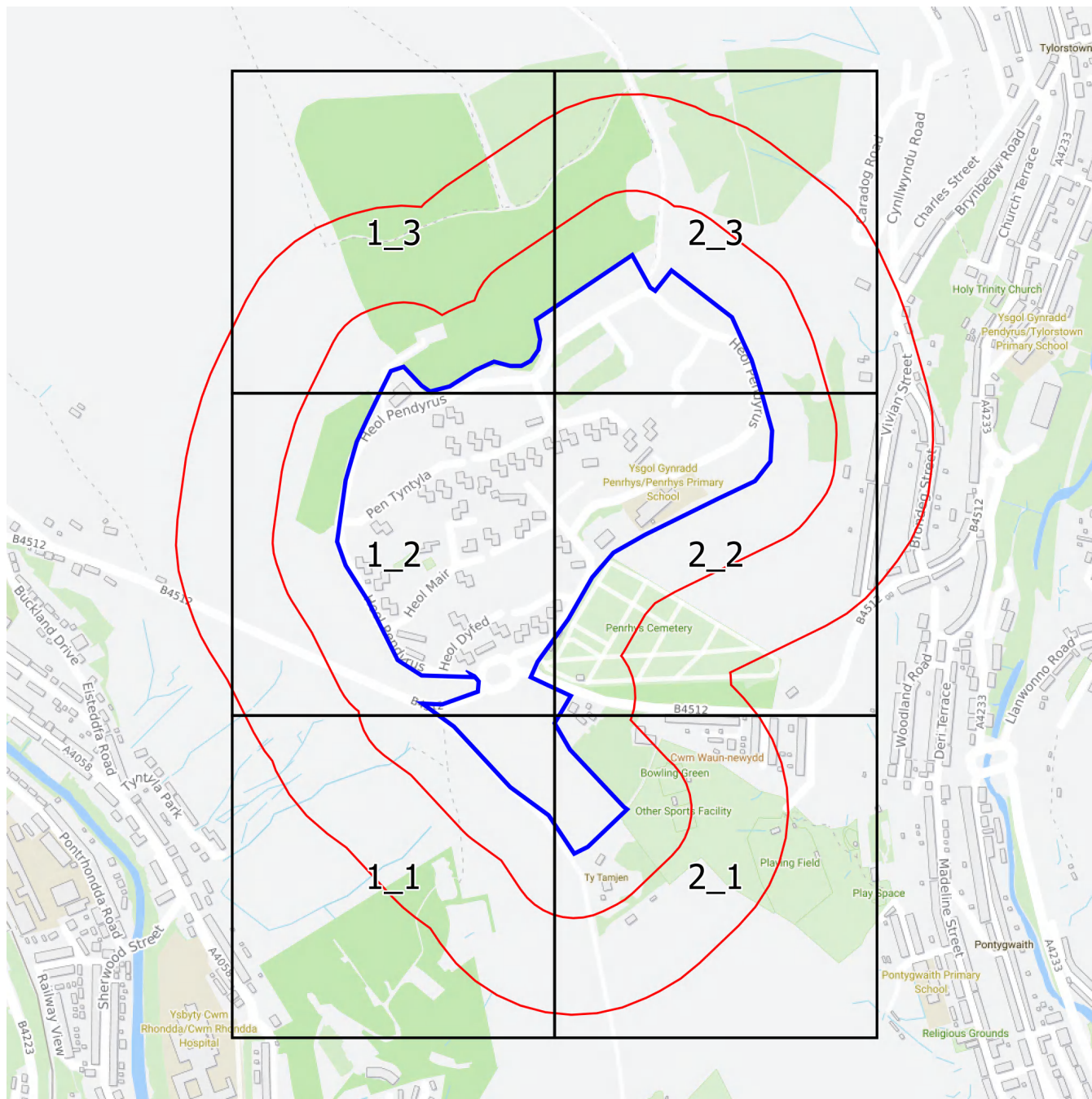
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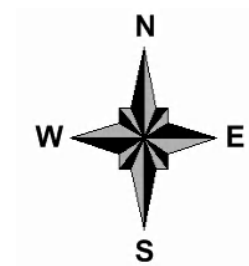
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1:1,250 Scale Grid Index



Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-41X-Z6U-SEX_1250_1_1
Grid Ref: 300042, 194347

Map Name: National Grid

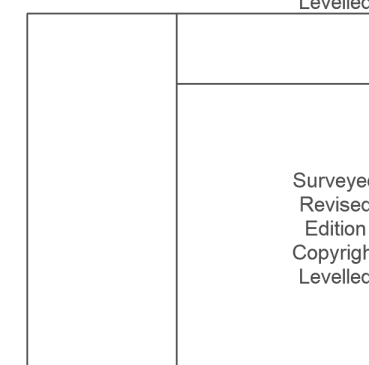
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Scale: 1:1,250

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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_1250_1_1
Grid Ref: 300042, 194347

Map Name: National Grid

Map date: 1958

Scale: 1:1,250

Printed at: 1:2,000



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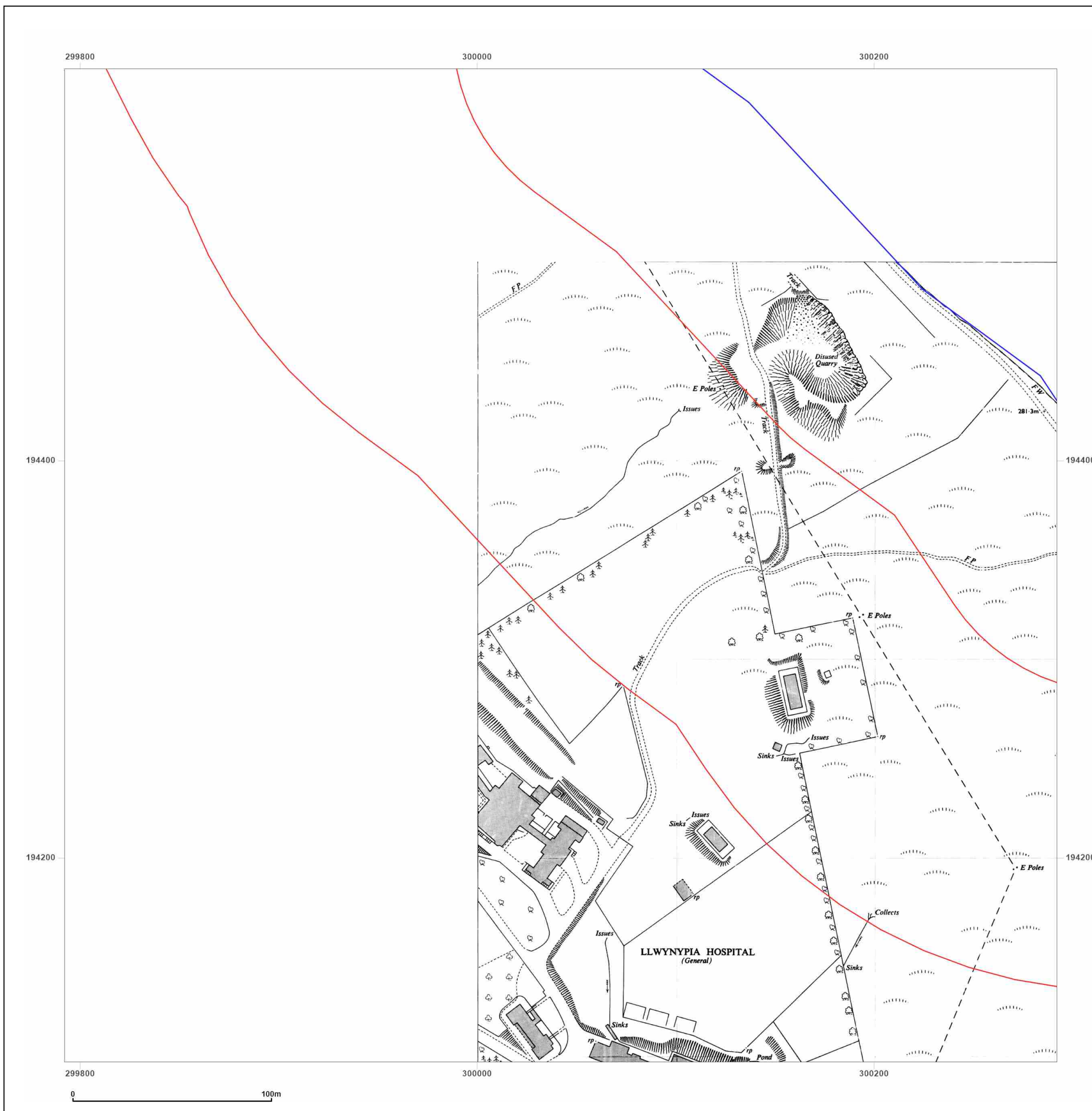


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_1250_1_1
Grid Ref: 300042, 194347

Map Name: National Grid

Map date: 1957-1961

Scale: 1:1,250

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Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_1250_1_1
Grid Ref: 300042, 194347

Map Name: National Grid

Map date: 1987-1988

Scale: 1:1,250

Printed at: 1:2,000



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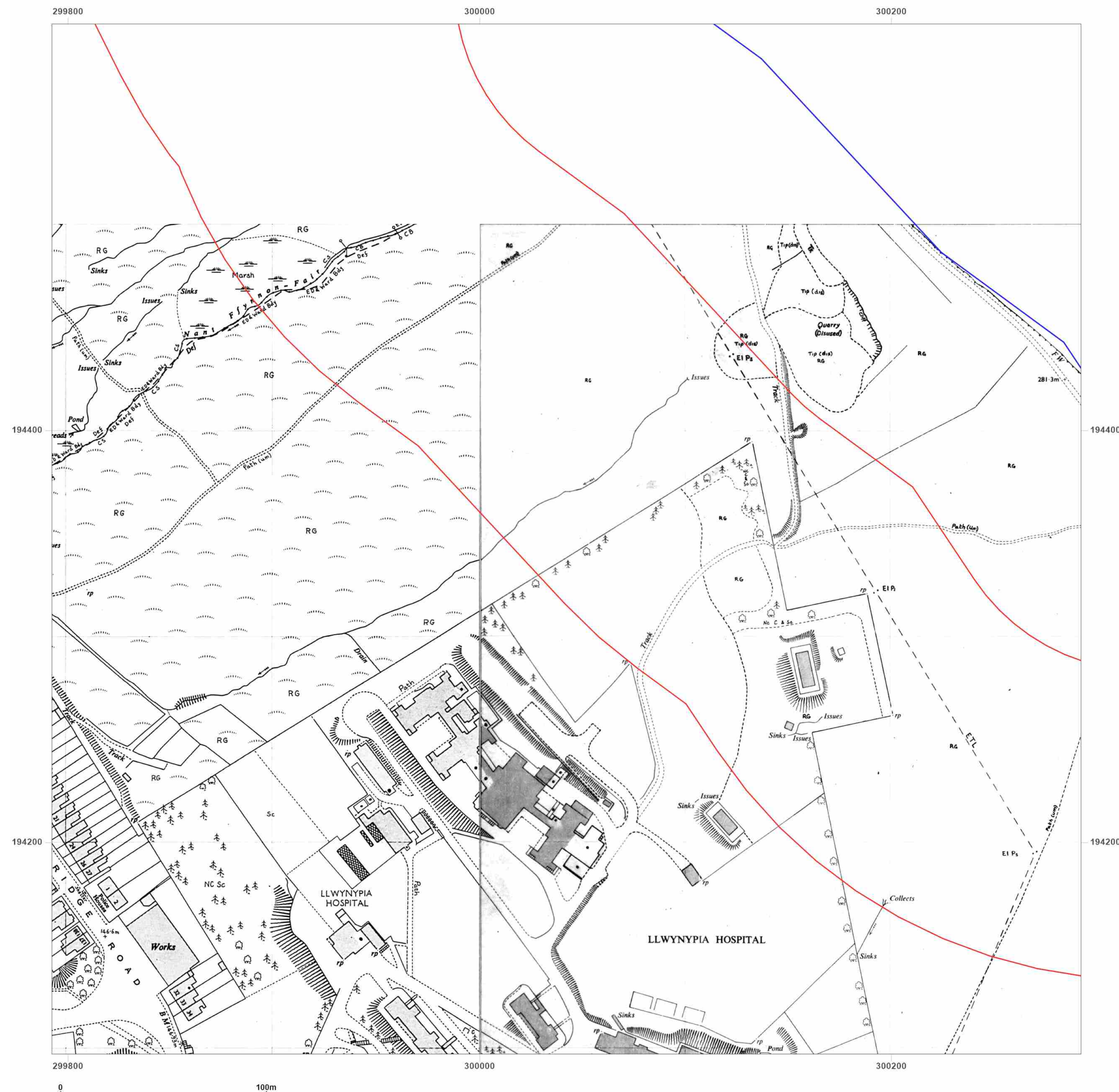


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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_1250_1_1
Grid Ref: 300042, 194347

Map Name: National Grid

Map date: 1994

Scale: 1:1,250

Printed at: 1:2,000



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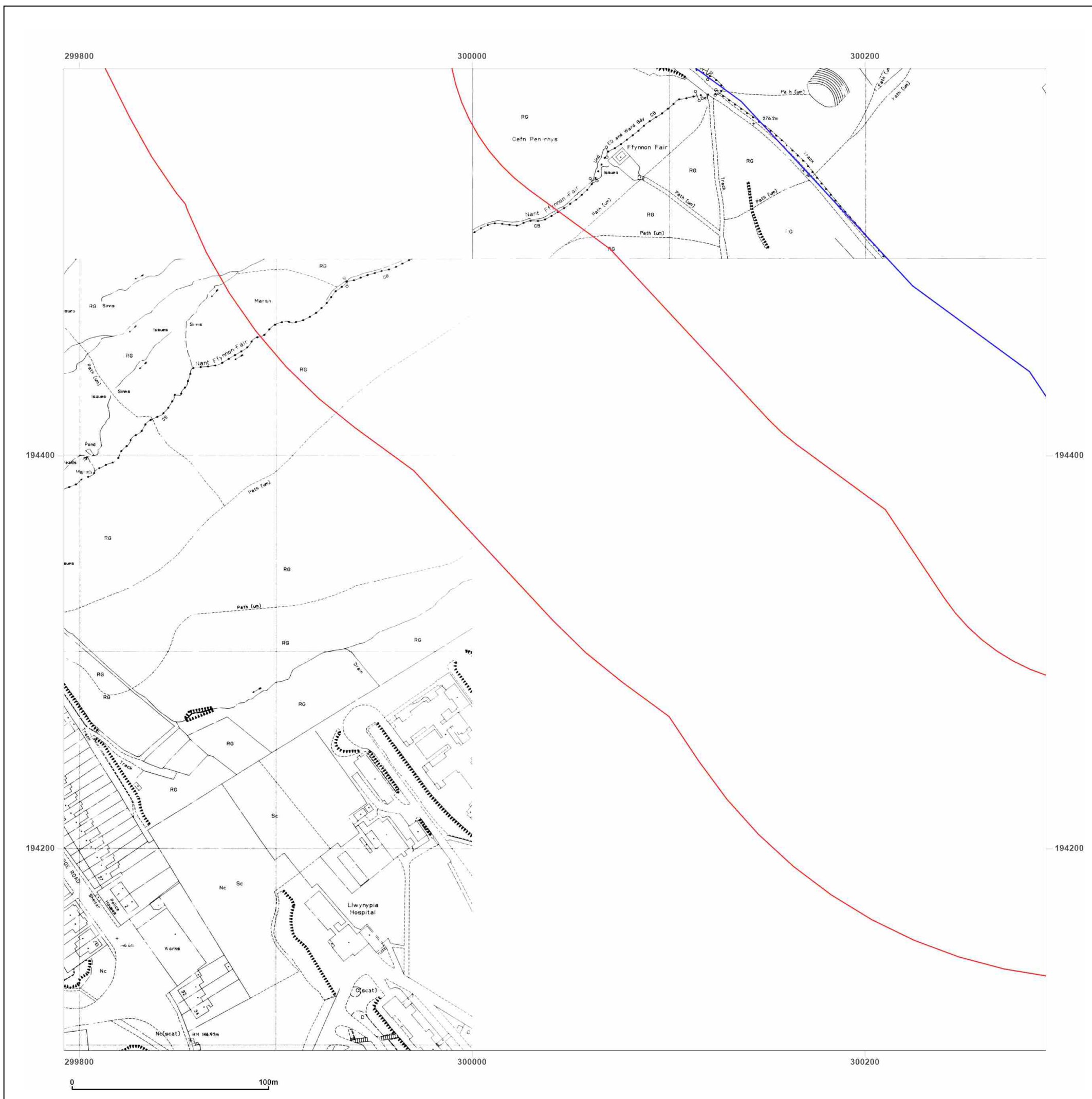


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FERNDAL, CF43 3NW

Client Ref:

PO29122

Report Ref:

GS-6I5-4IX-Z6U-SEX_1250_1_2

Grid Ref:

300042, 194847

Map Name:

National Grid

Map date:

1958

Scale:

1:1,250

Printed at:

1:2,000

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Unsurveyed at this scale

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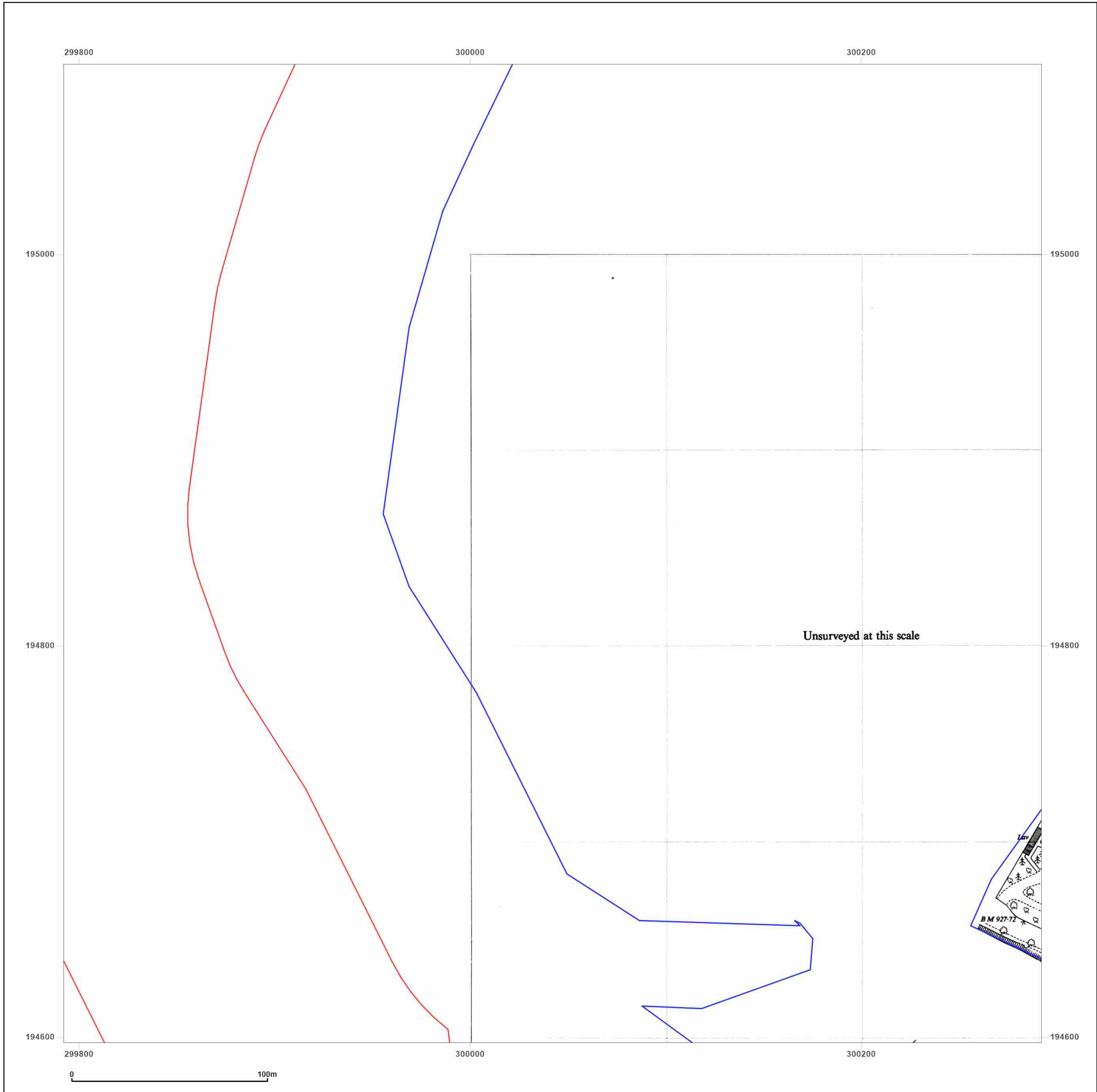
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Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_1250_1_2
Grid Ref: 300042, 194847

Map Name: National Grid

Map date: 1957-1961

Scale: 1:1,250

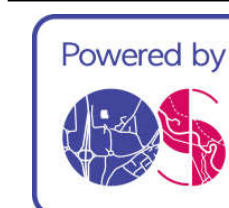
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Revised 1957
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Levelled 1948

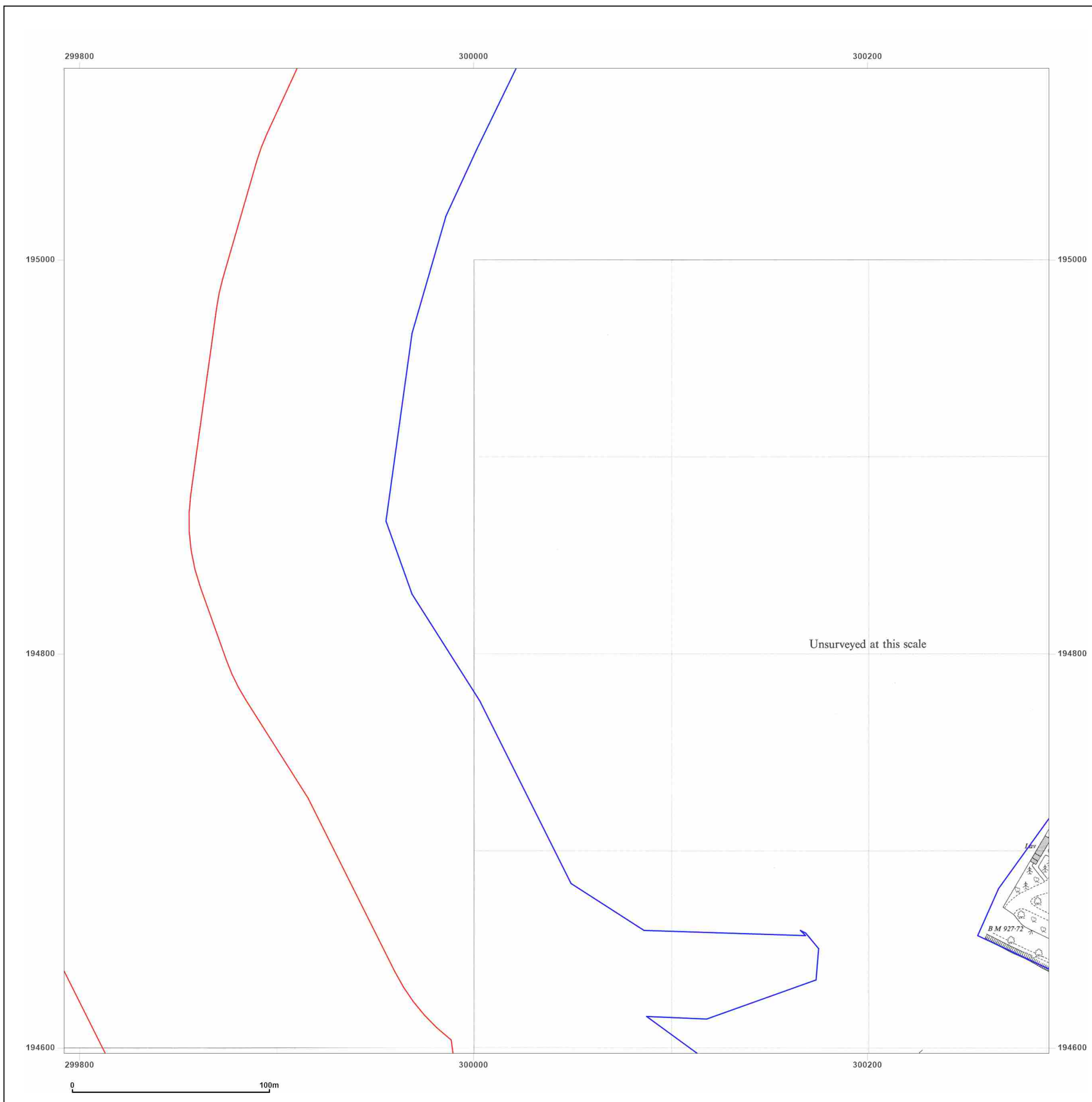


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Client Ref:

PO29122

Report Ref:

GS-6I5-4IX-Z6U-SEX_1250_1_2

Grid Ref:

300042, 194847

Map Name:

National Grid

Map date:

1974

Scale:

1:1,250

Printed at:

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The figure is an aerial photograph overlaid with a grid. A red line and a blue line form a boundary. The red line starts at the bottom left, goes up and right, then curves down and right. The blue line starts at the top left, goes down and right, then curves down and right. The grid has labels 299800, 300000, 300200 on the x-axis and 194600, 194800, 195000 on the y-axis. A scale bar at the bottom left shows 0 to 100m.

Site Details:

428, HEOL-Y-WAUN, PEN-RHYS,
FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_1250_1_2
Grid Ref: 300042, 194847

Map Name: National Grid

Map date: 1993

Scale: 1:1,250

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Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

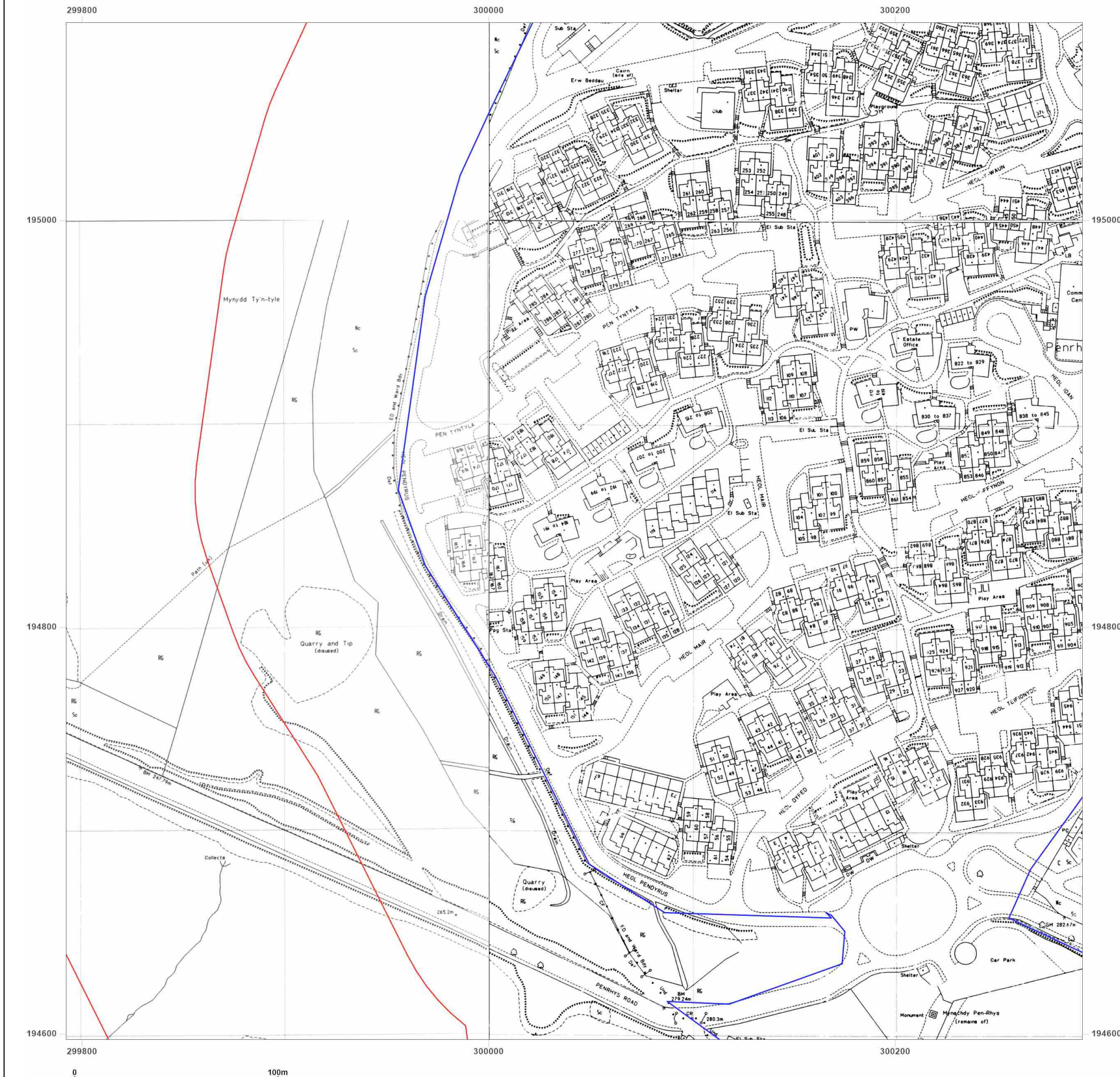


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Site Details:

428, HEOL-Y-WAUN, PEN-RHYS,
FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_1250_1_2
Grid Ref: 300042, 194847

Map Name: National Grid

Map date: 1994

Scale: 1:1,250

Printed at: 1:2,000



Surveyed N/A
Revised N/A
Edition N/A
Copyright 1994
Levelled N/A

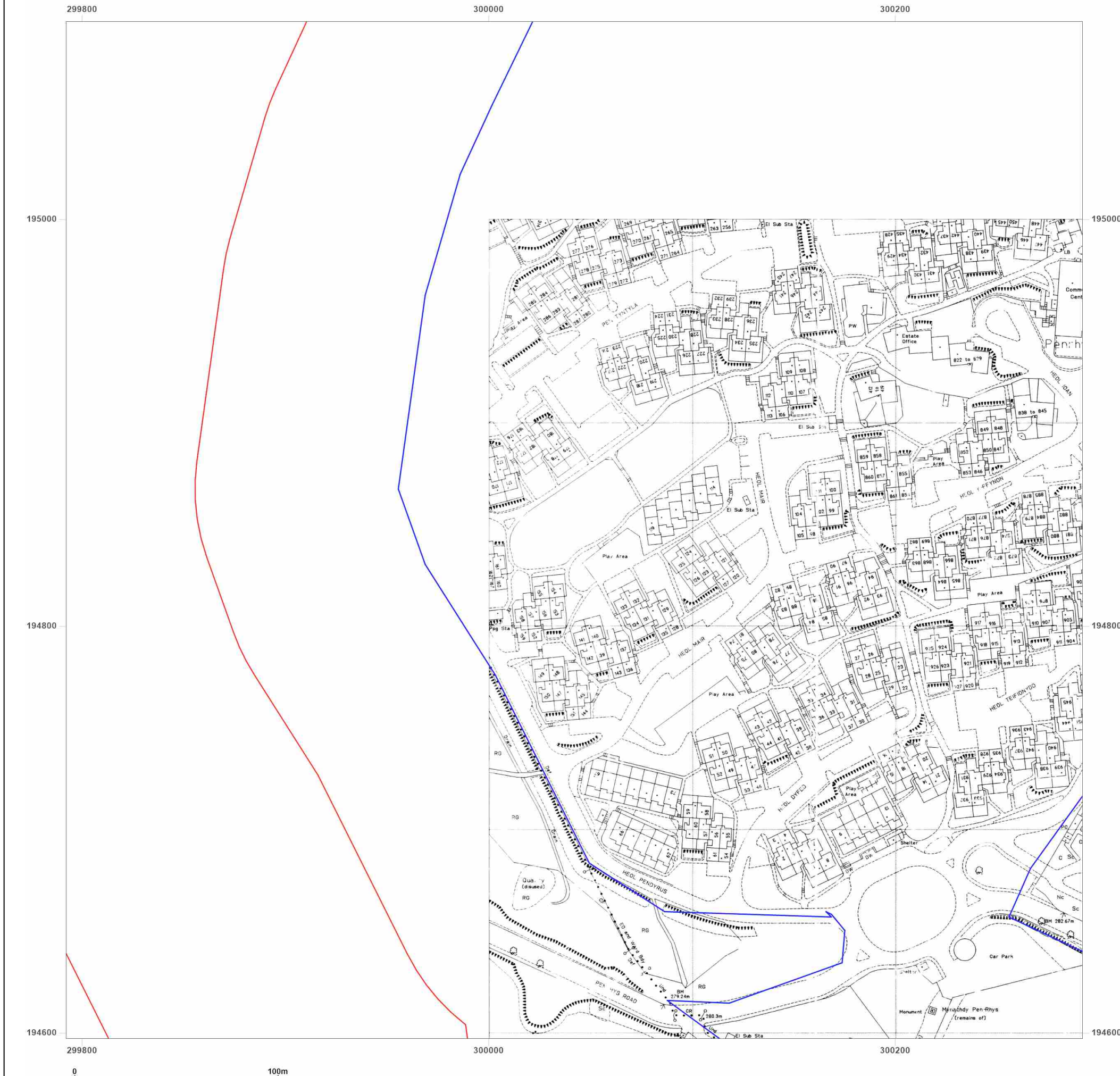


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-6I5-4IX-Z6U-SEX_LS_1_1
Grid Ref: 299979, 194534

Map Name: County Series

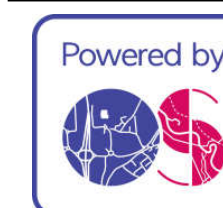
Map date: 1879

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1879
Revised 1879
Edition N/A
Copyright N/A
Levelled N/A

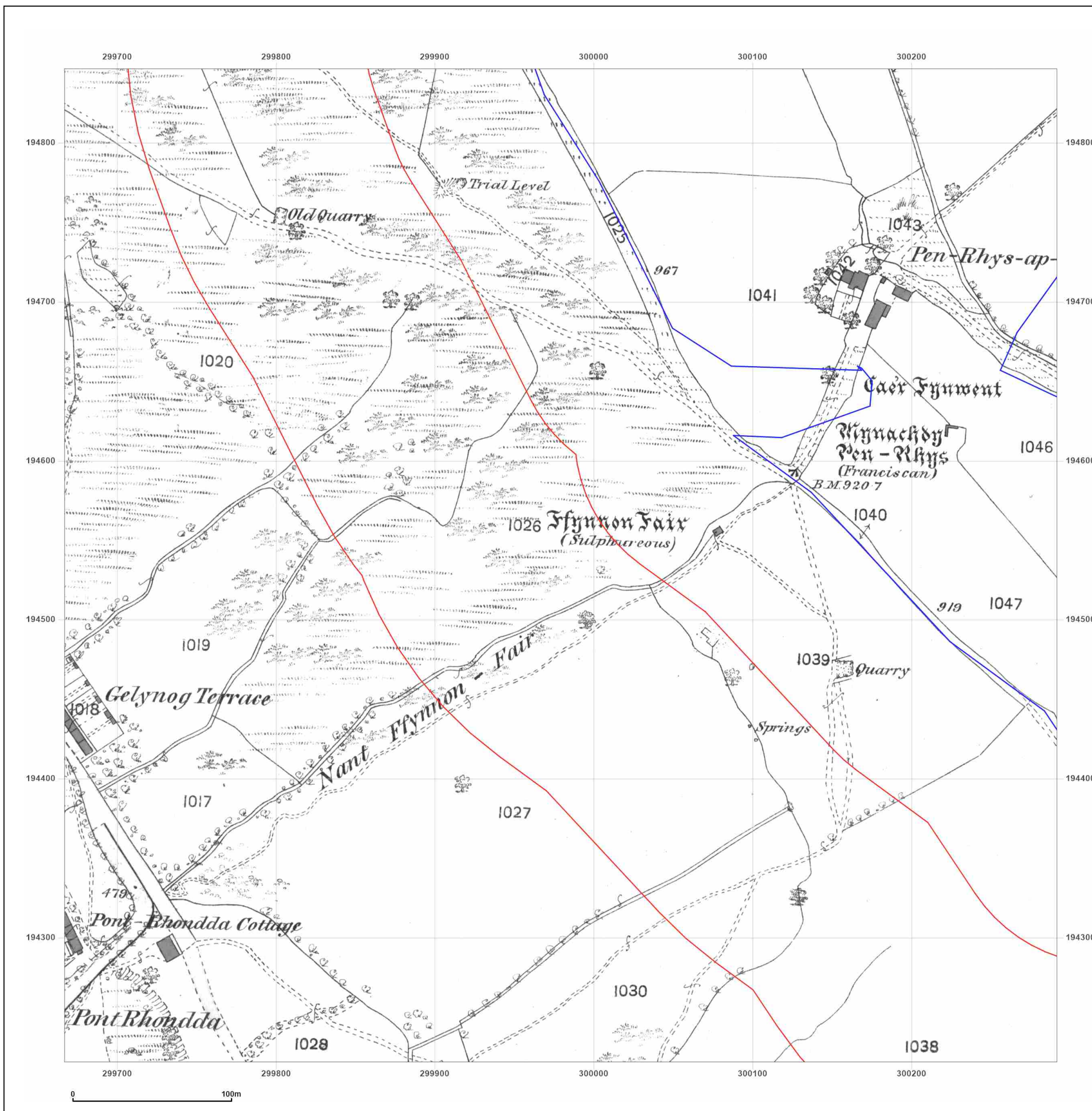


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_LS_1_1
Grid Ref: 299979, 194534

Map Name: County Series

Map date: 1900

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1900
Revised 1900
Edition N/A
Copyright N/A
Levelled N/A

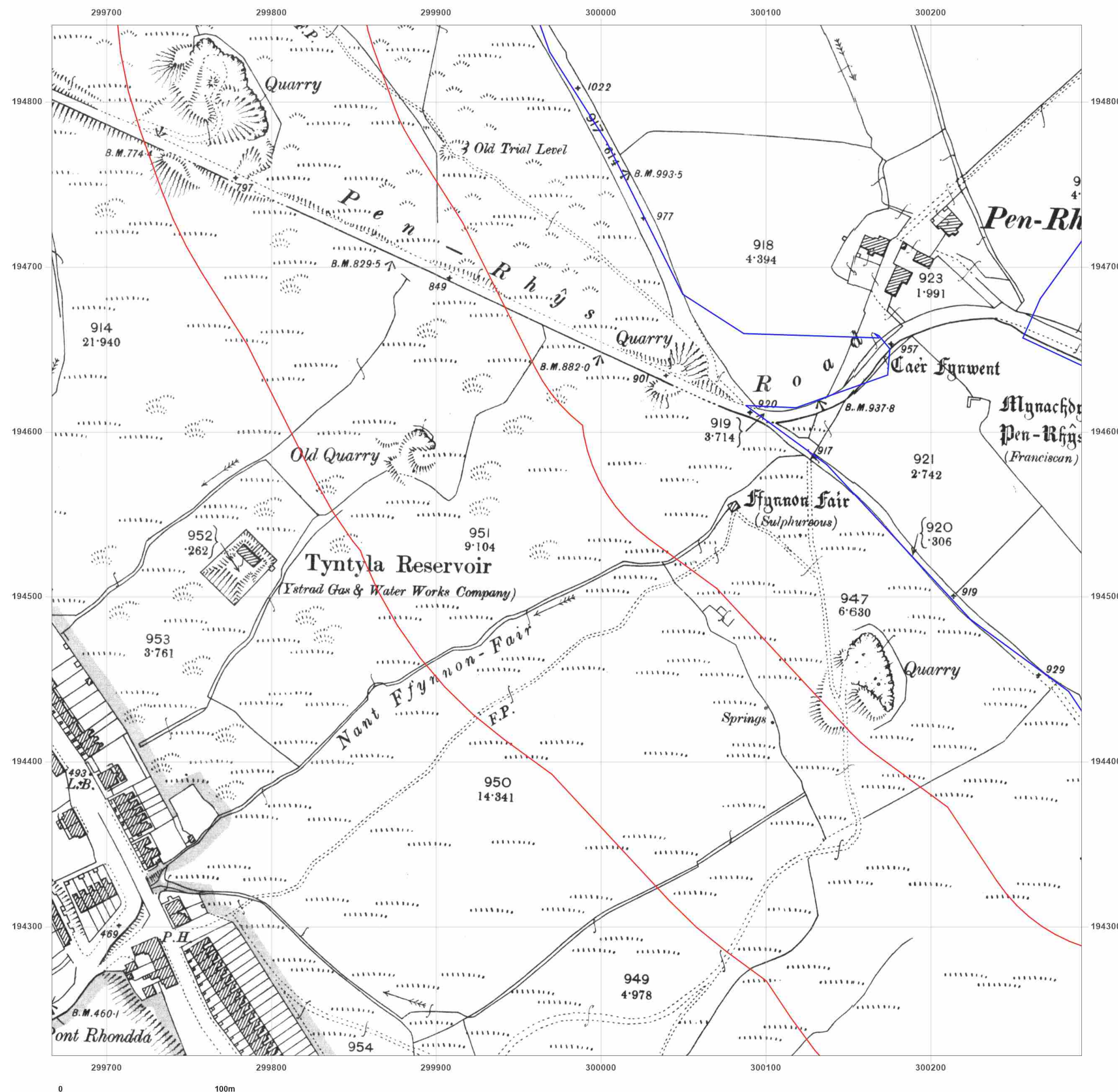


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_LS_1_1
Grid Ref: 299979, 194534

Map Name: County Series

Map date: 1920

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1920
Revised 1920
Edition N/A
Copyright N/A
Levelled N/A

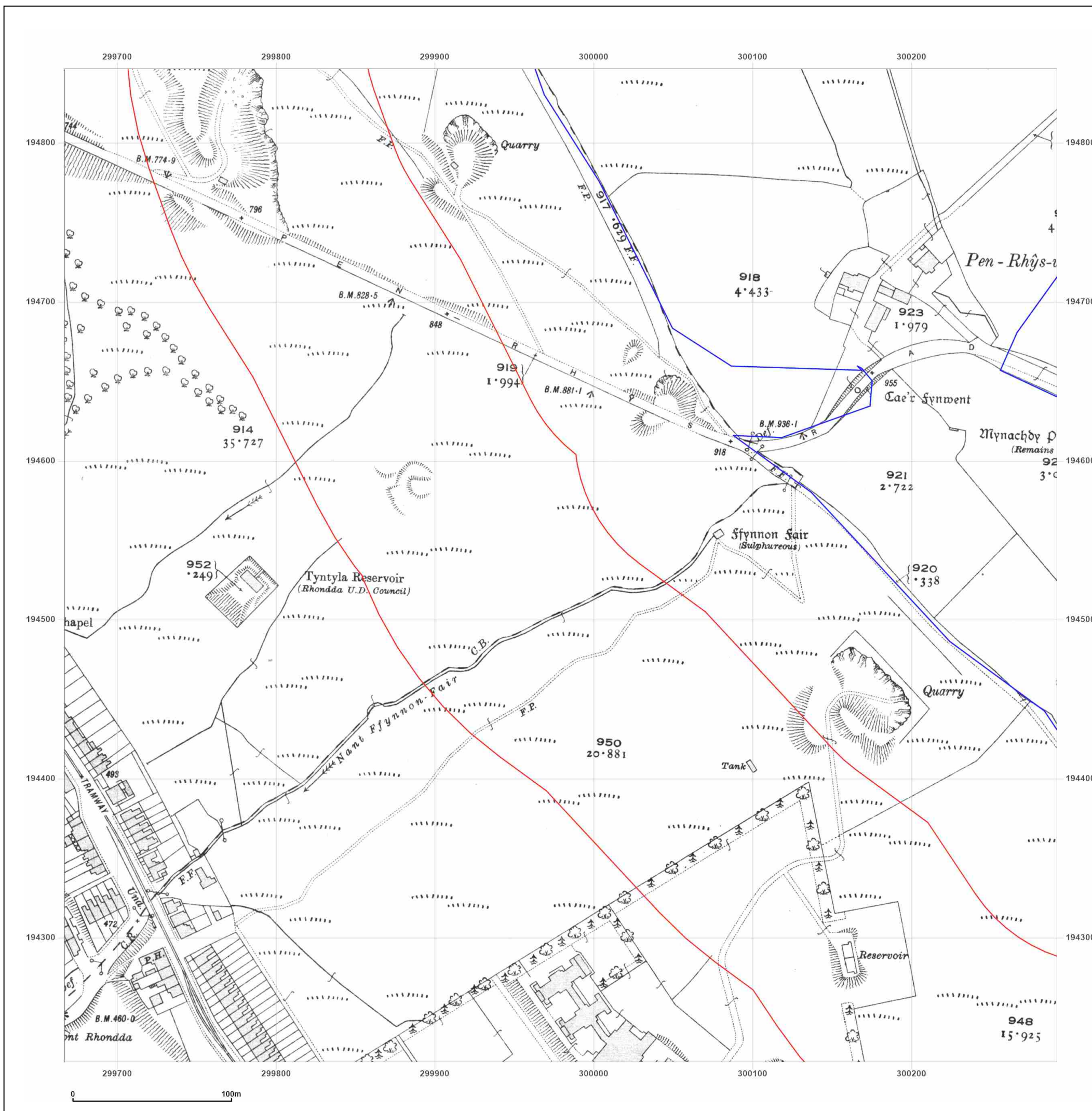


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_LS_1_1
Grid Ref: 299979, 194534

Map Name: National Grid

Map date: 1961

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1961
Revised 1961
Edition N/A
Copyright 1962
Levelled 1957

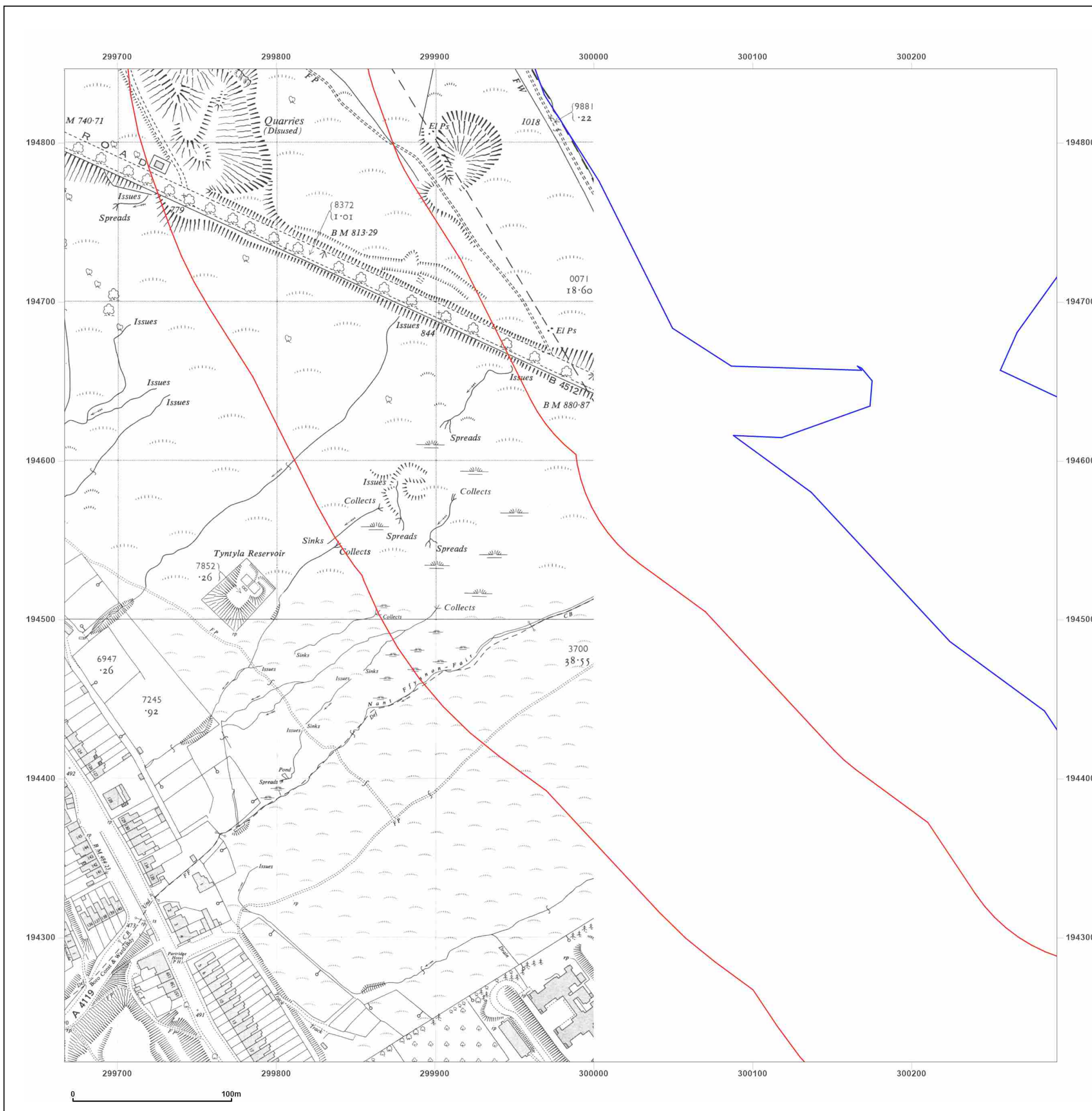


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Site Details:

428, HEOL-Y-WAUN, PEN-RHYS,
FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_LS_1_2
Grid Ref: 299979, 195159

Map Name: County Series

Map date: 1877-1879

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1877
Revised 1877
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1879
Revised 1879
Edition N/A
Copyright N/A
Levelled N/A

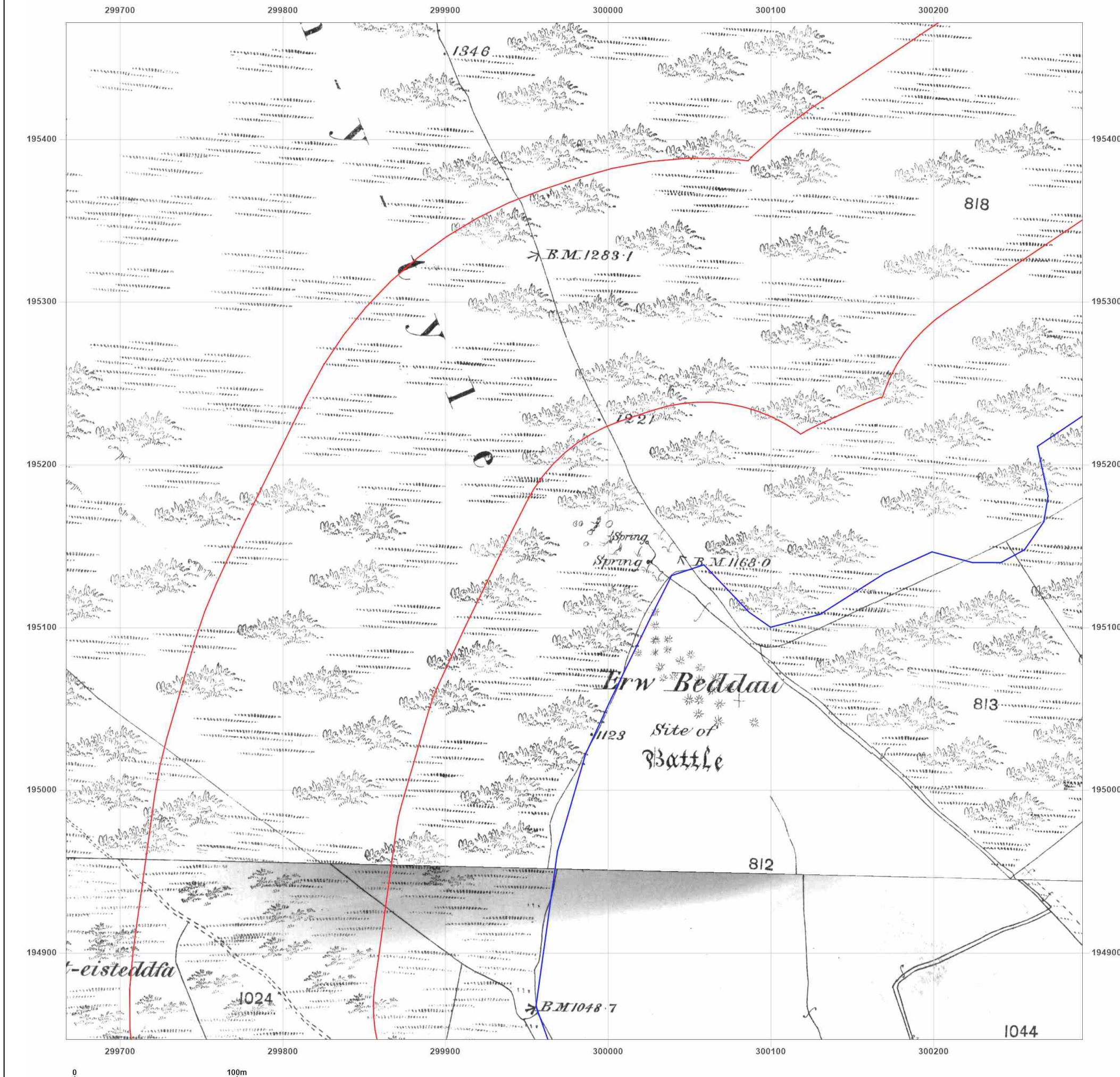


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Site Details:

428, HEOL-Y-WAUN, PEN-RHYS,
FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_LS_1_2
Grid Ref: 299979, 195159

Map Name: County Series

Map date: 1919-1920

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1919
Revised 1919
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1920
Revised 1920
Edition N/A
Copyright N/A
Levelled N/A

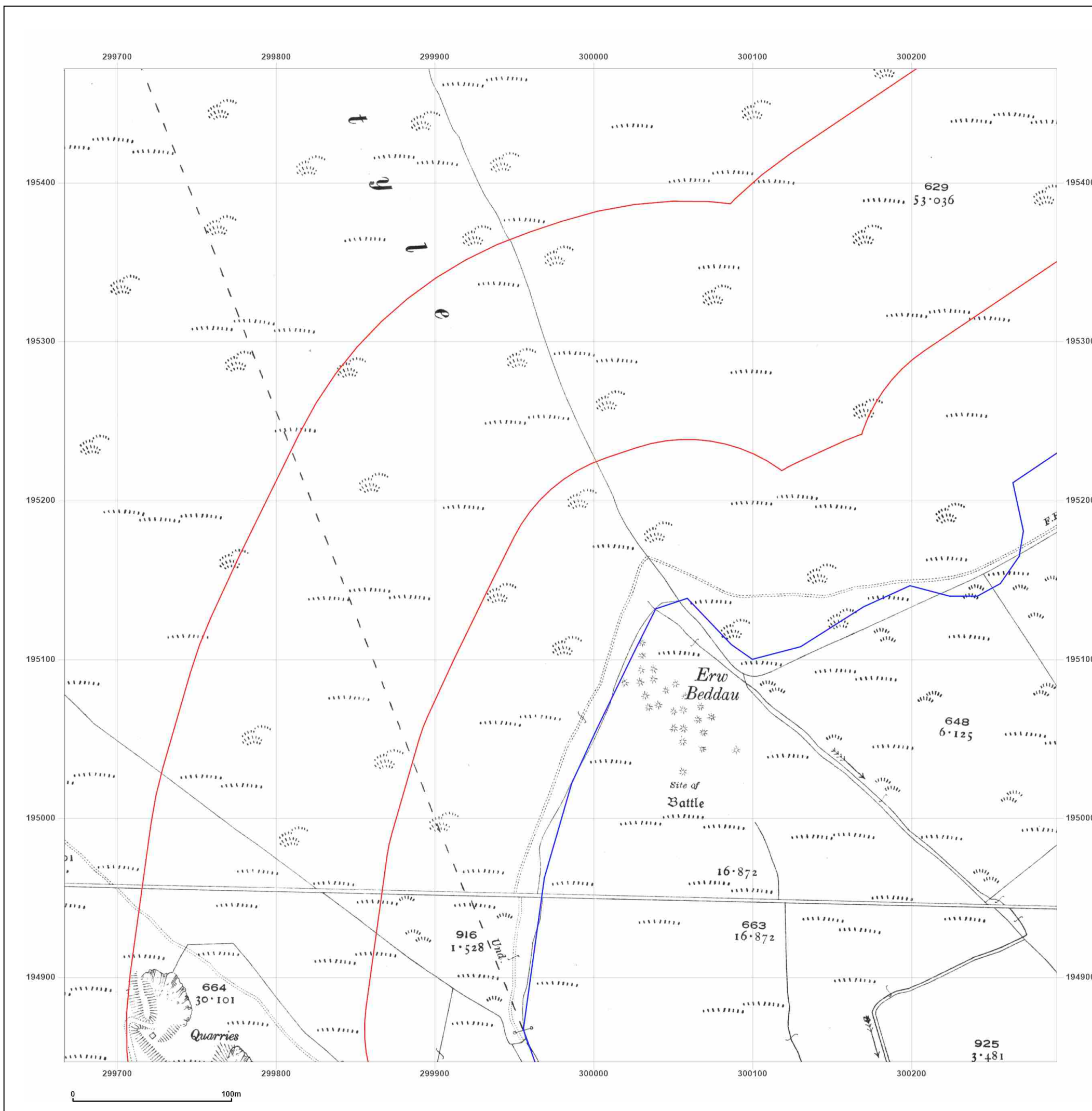


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_LS_1_2
Grid Ref: 299979, 195159

Map Name: National Grid

Map date: 1960-1961

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1961
Revised 1961
Edition 1962
Copyright 1962
Levelled 1957

Surveyed 1961
Revised 1961
Edition 1962
Copyright 1962
Levelled 1957

Surveyed 1961
Revised 1961
Edition N/A
Copyright 1962
Levelled 1957

Surveyed 1960
Revised 1960
Edition 1962
Copyright 1962
Levelled 1957

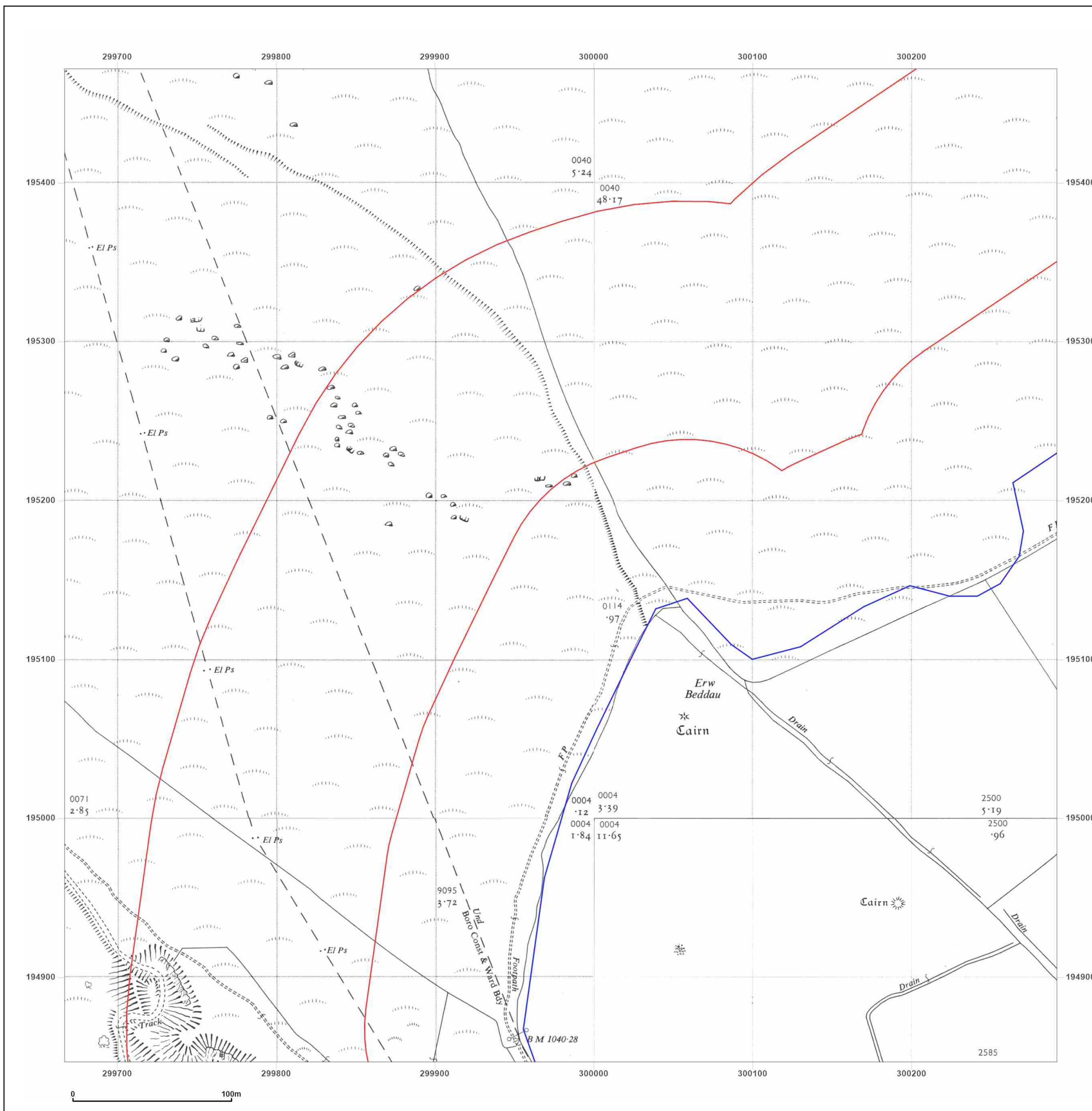


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-6I5-4IX-Z6U-SEX_LS_1_2
Grid Ref: 299979, 195159

Map Name: National Grid

Map date: 1962

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed N/A
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Edition N/A
Copyright N/A
Levelled N/A

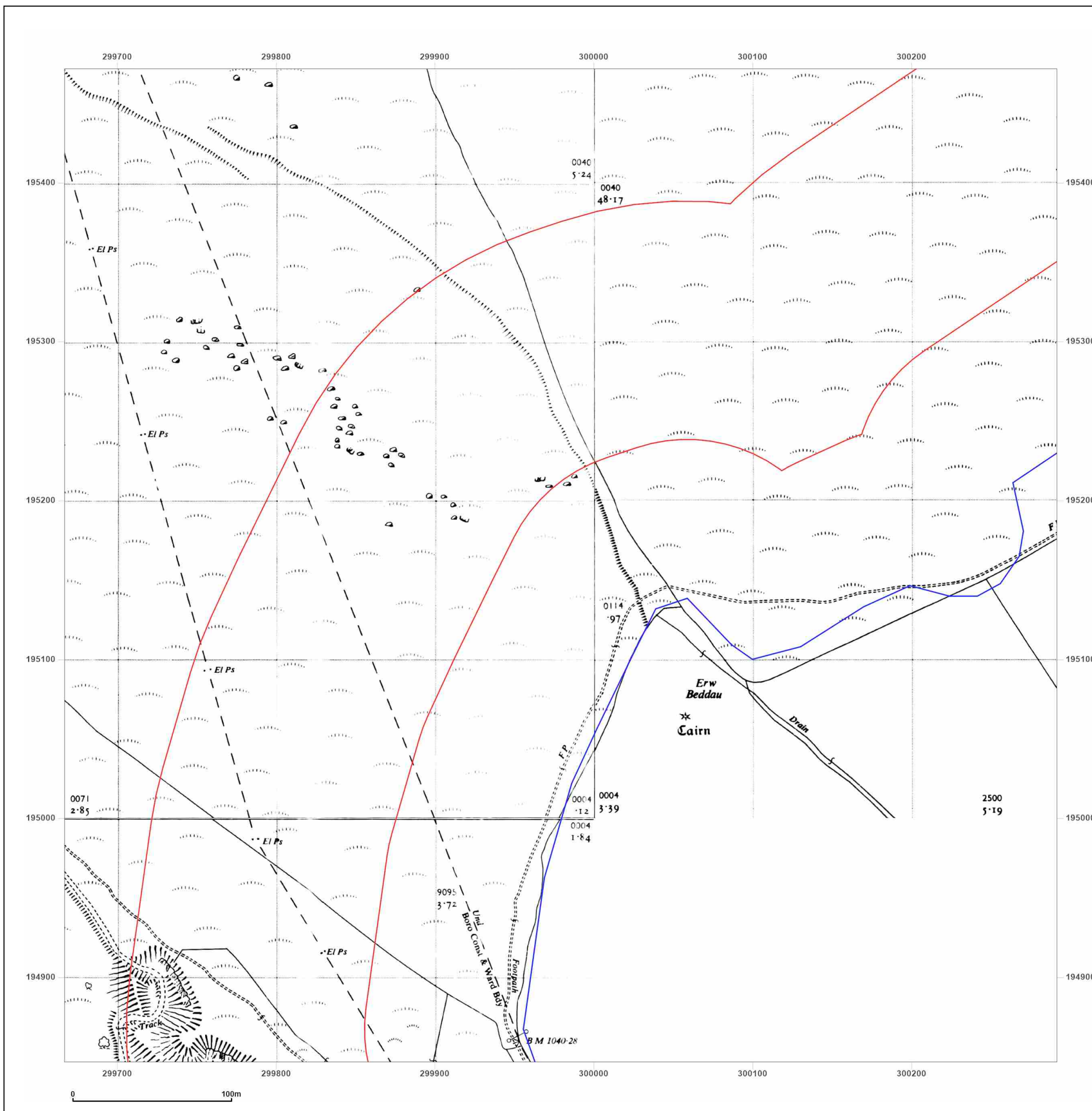


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_LS_1_2
Grid Ref: 299979, 195159

Map Name: National Grid

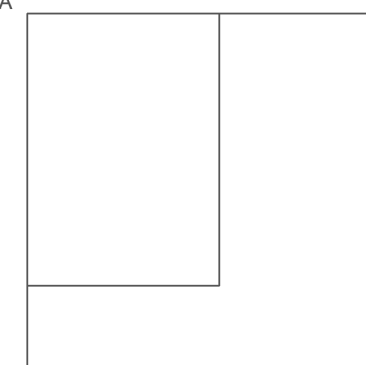
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Printed at: 1:2,500



Surveyed 1961
Revised 1961
Edition N/A
Copyright 1991
Levelled N/A

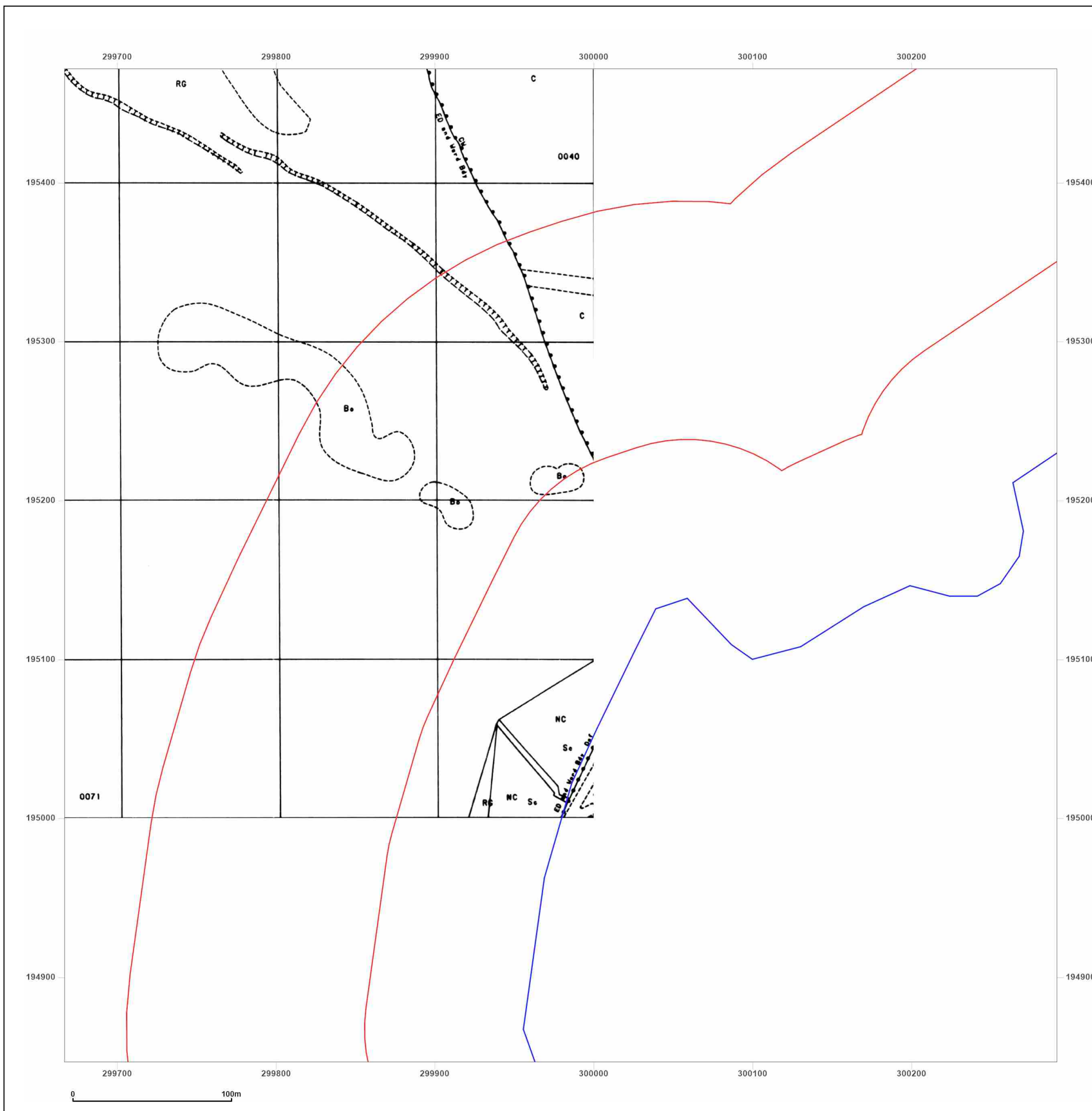


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_LS_2_1
Grid Ref: 300604, 194534

Map Name: County Series

Map date: 1878-1879

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1879
Revised 1879
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1878
Revised 1878
Edition N/A
Copyright N/A
Levelled N/A

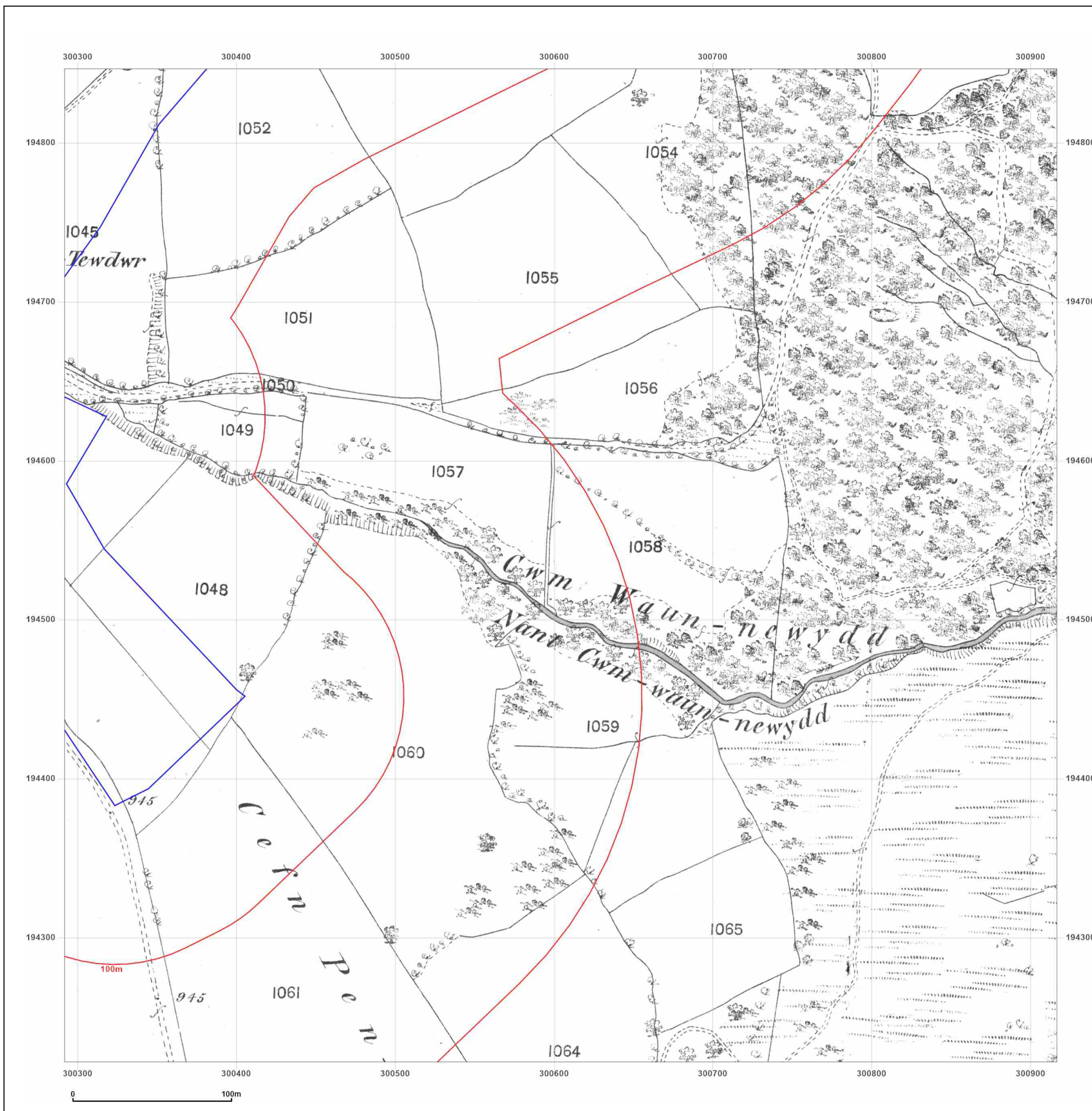


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_LS_2_1
Grid Ref: 300604, 194534

Map Name: County Series

Map date: 1900

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1900
Revised 1900
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1900
Revised 1900
Edition N/A
Copyright N/A
Levelled N/A

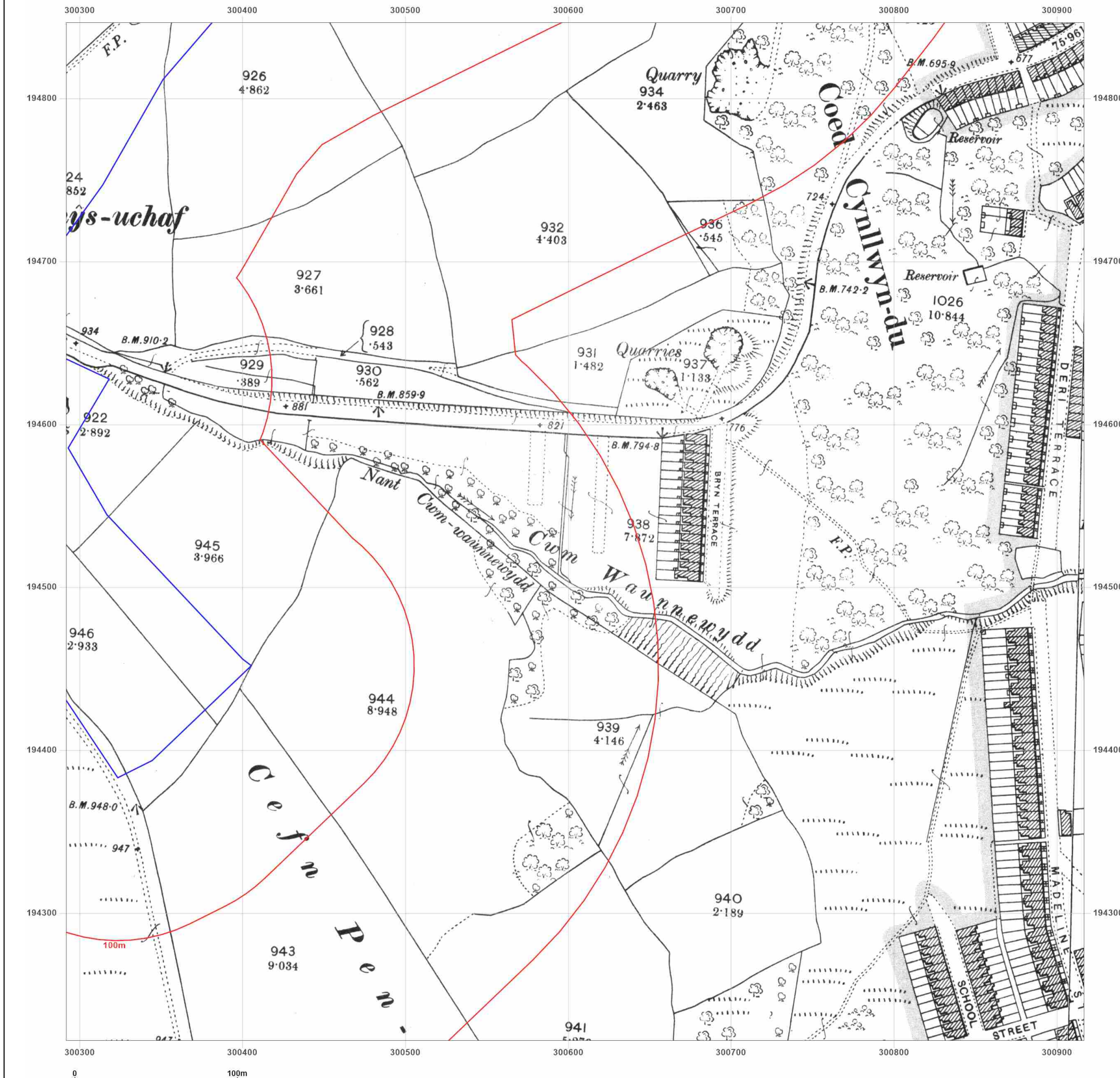


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_LS_2_1
Grid Ref: 300604, 194534

Map Name: County Series

Map date: 1919-1920

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1920
Revised 1920
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1919
Revised 1919
Edition N/A
Copyright N/A
Levelled N/A

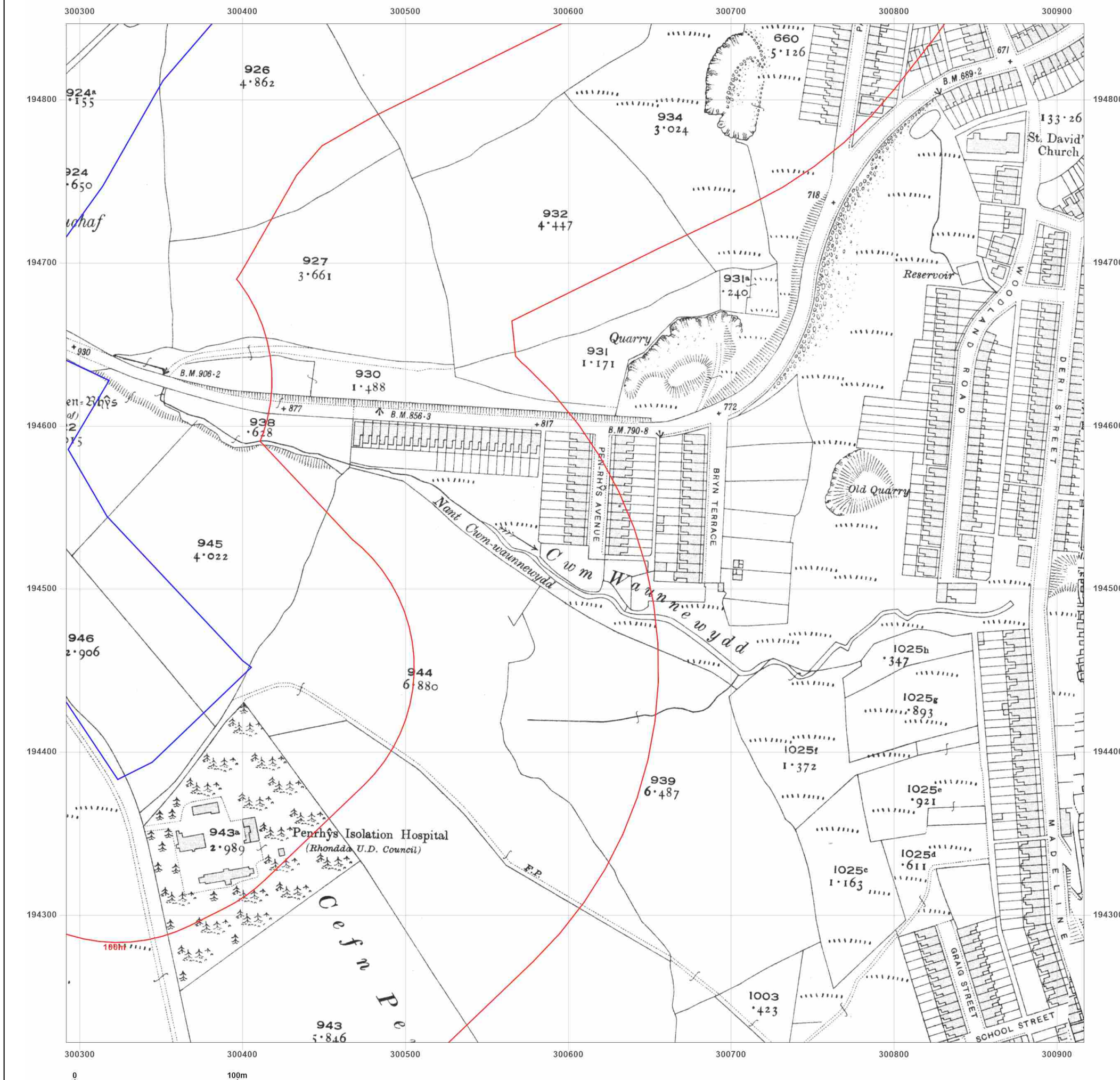


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_LS_2_1
Grid Ref: 300604, 194534

Map Name: National Grid

Map date: 1960

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1960
Revised 1960
Edition 1962
Copyright 1962
Levelled 1957

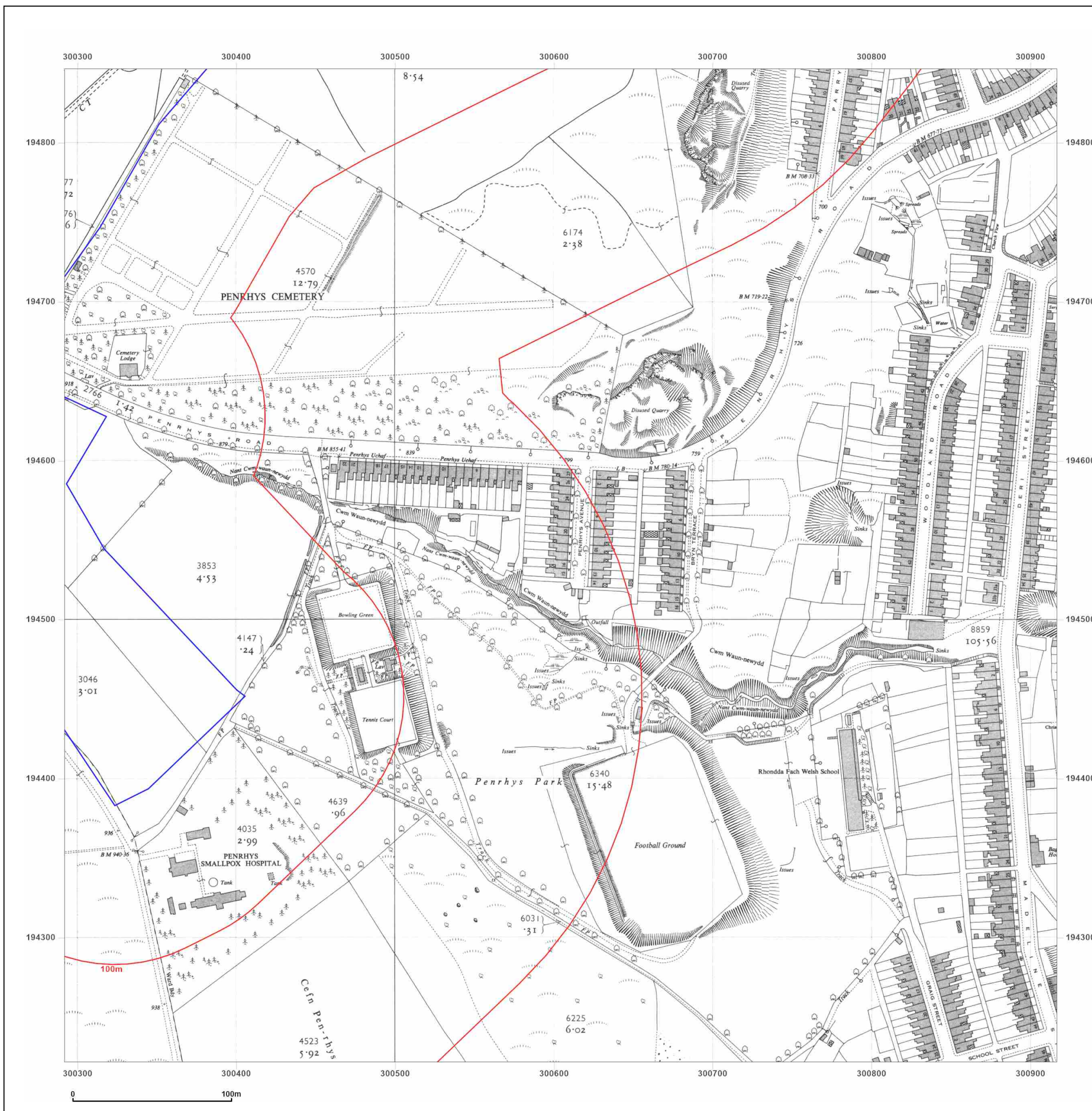


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_LS_2_2
Grid Ref: 300604, 195159

Map Name: County Series

Map date: 1877-1879

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1877
Revised 1877
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1879
Revised 1879
Edition N/A
Copyright N/A
Levelled N/A

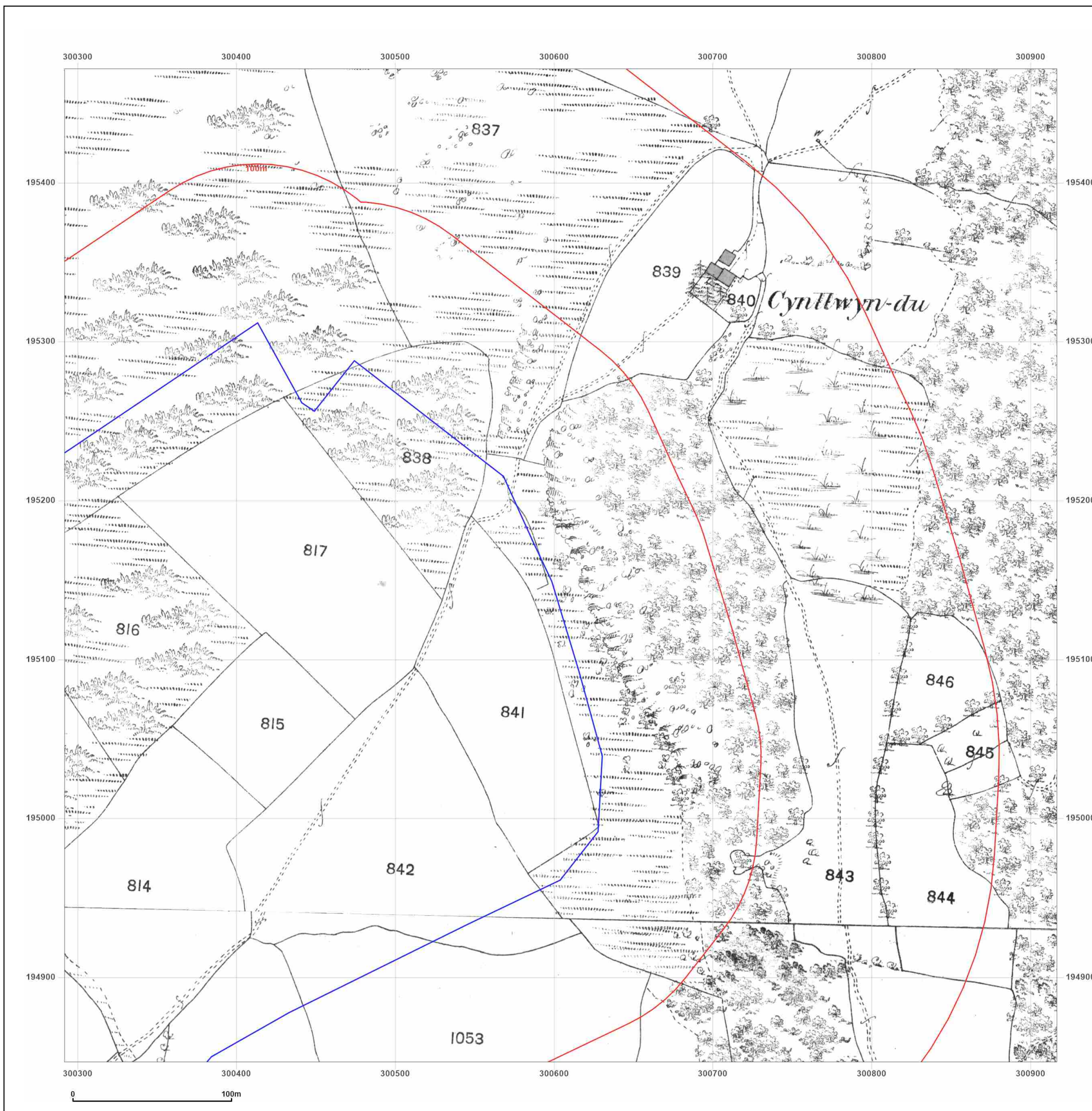


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_LS_2_2
Grid Ref: 300604, 195159

Map Name: County Series

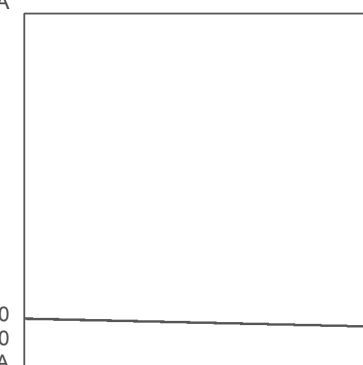
Map date: 1900

Scale: 1:2,500

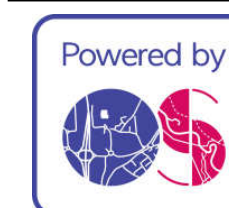
Printed at: 1:2,500



Surveyed 1900
Revised 1900
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1900
Revised 1900
Edition N/A
Copyright N/A
Levelled N/A

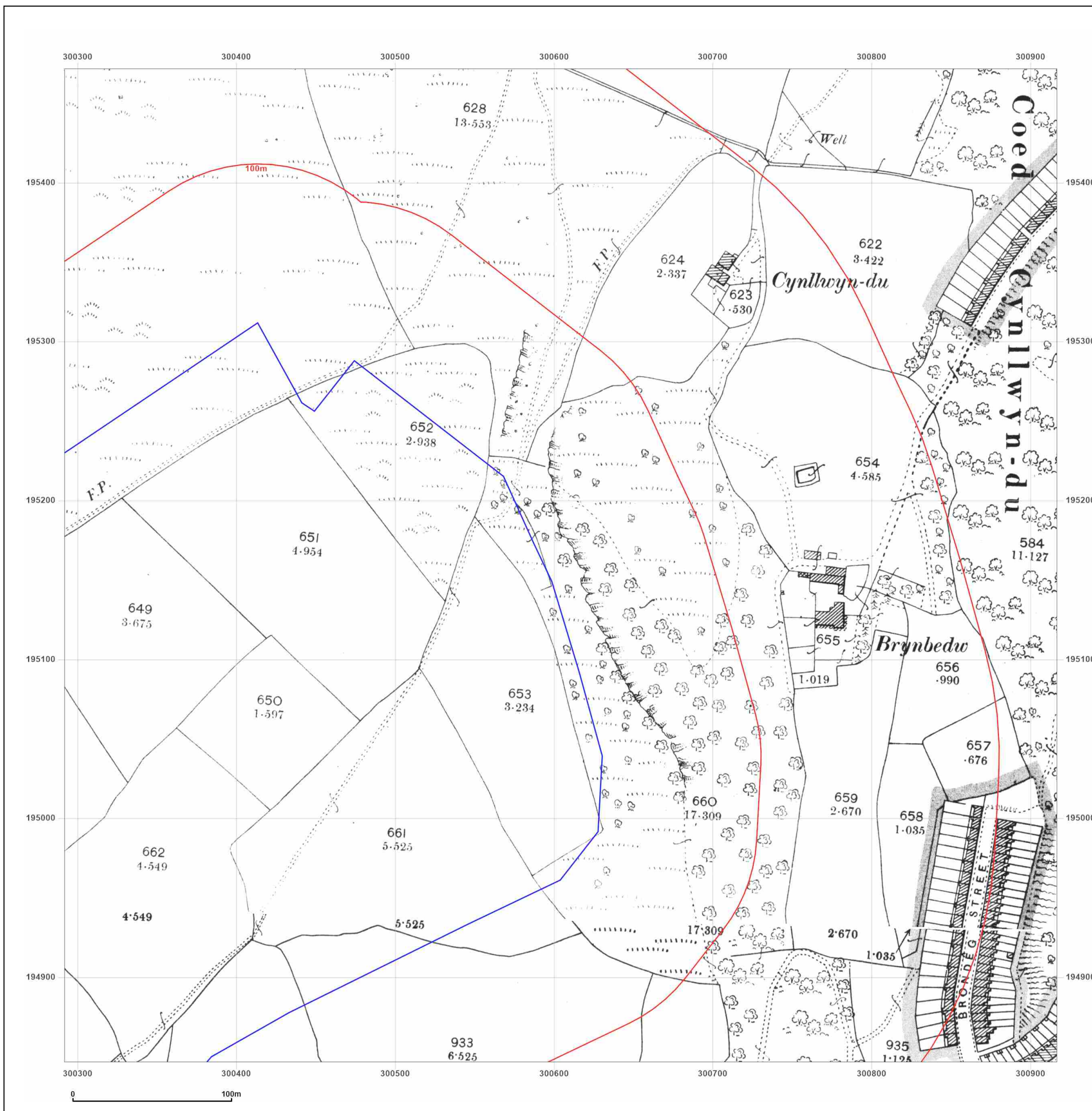


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Site Details:

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FERNDALE, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_LS_2_2
Grid Ref: 300604, 195159

Map Name: County Series

Map date: 1919-1920

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1919
Revised 1919
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1920
Revised 1920
Edition N/A
Copyright N/A
Levelled N/A

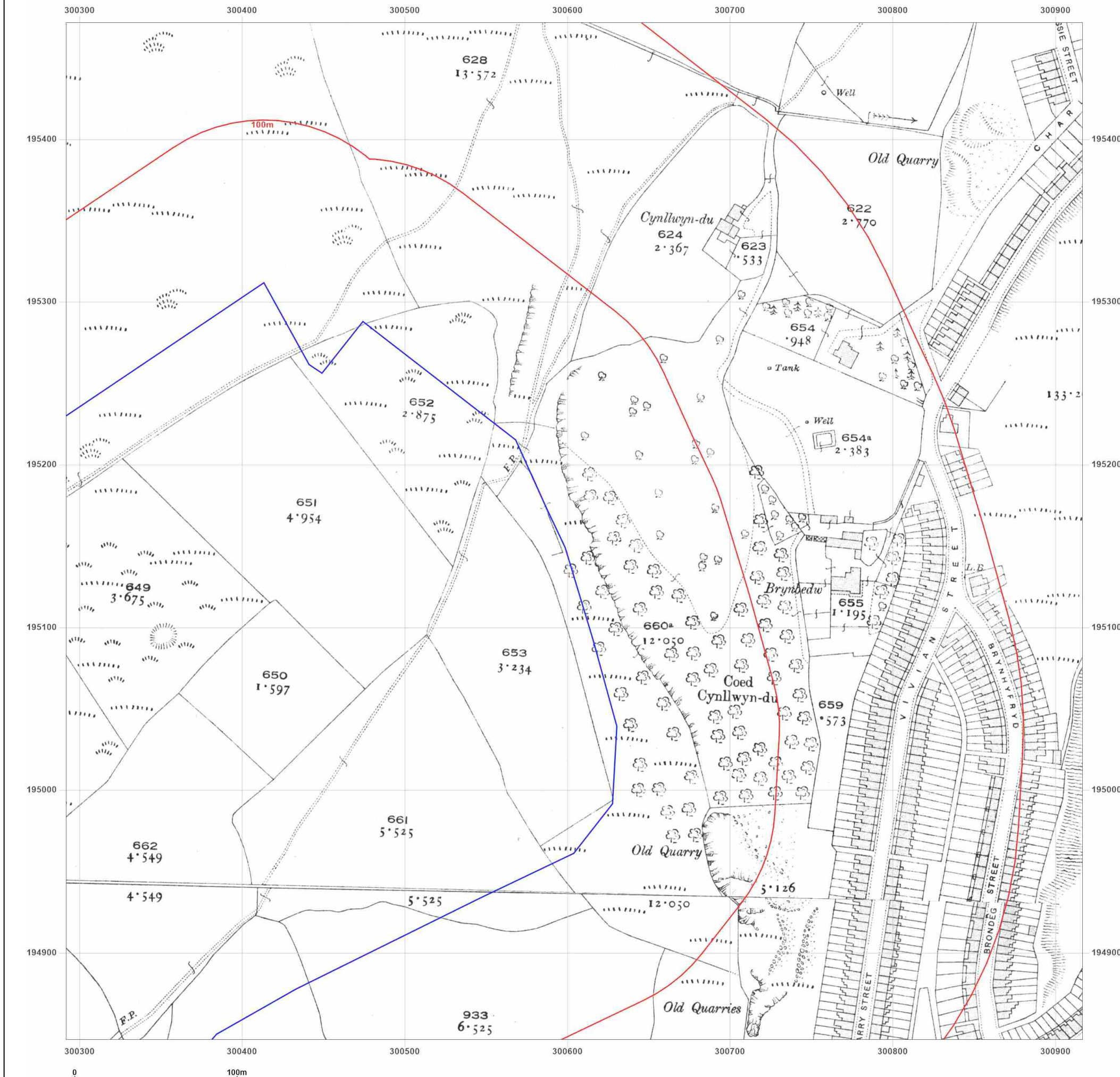


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_LS_2_2
Grid Ref: 300604, 195159

Map Name: National Grid

Map date: 1961

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1961
Revised 1961
Edition 1962
Copyright 1962
Levelled 1957

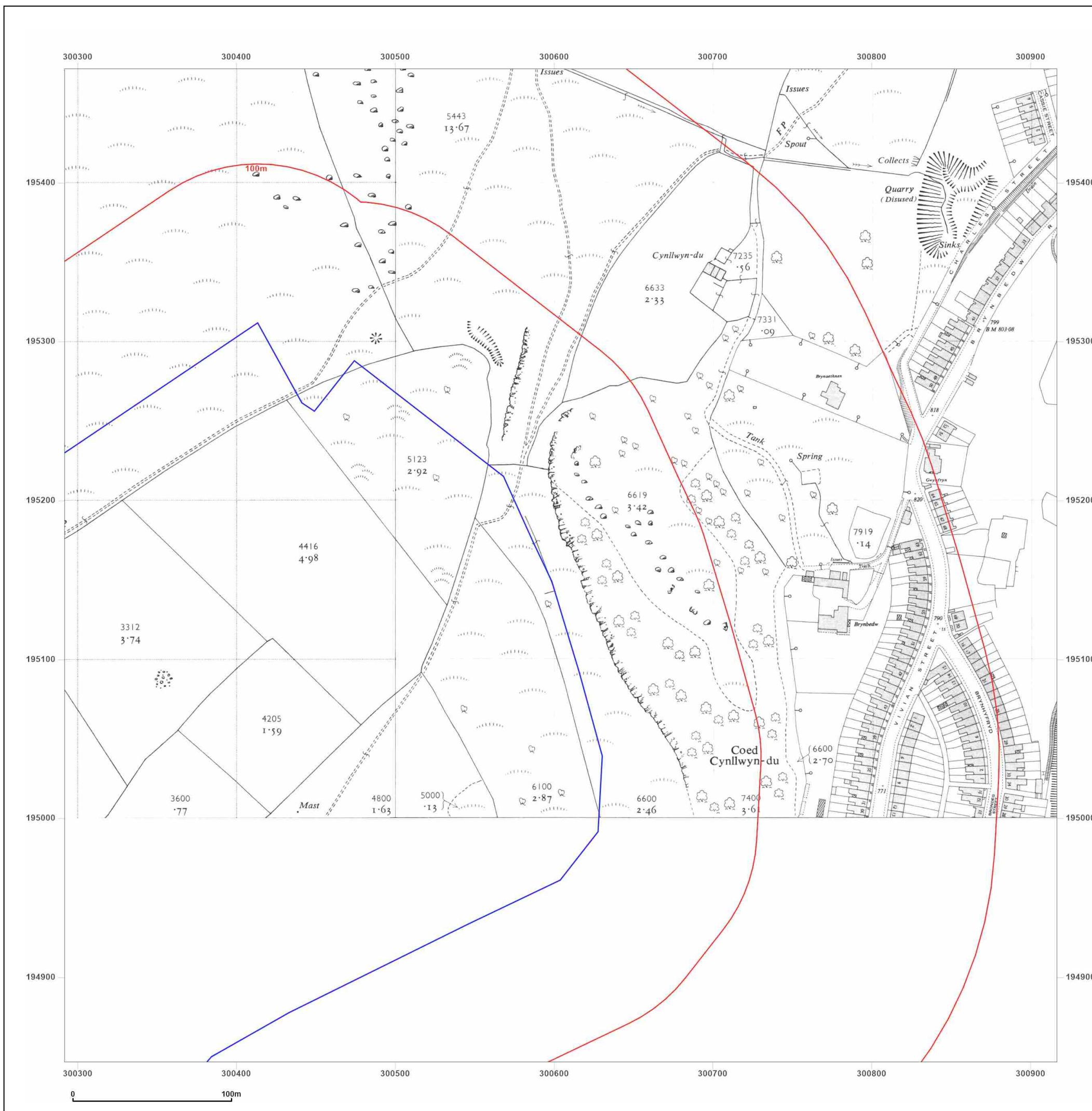


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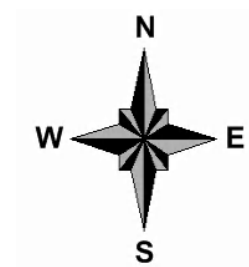
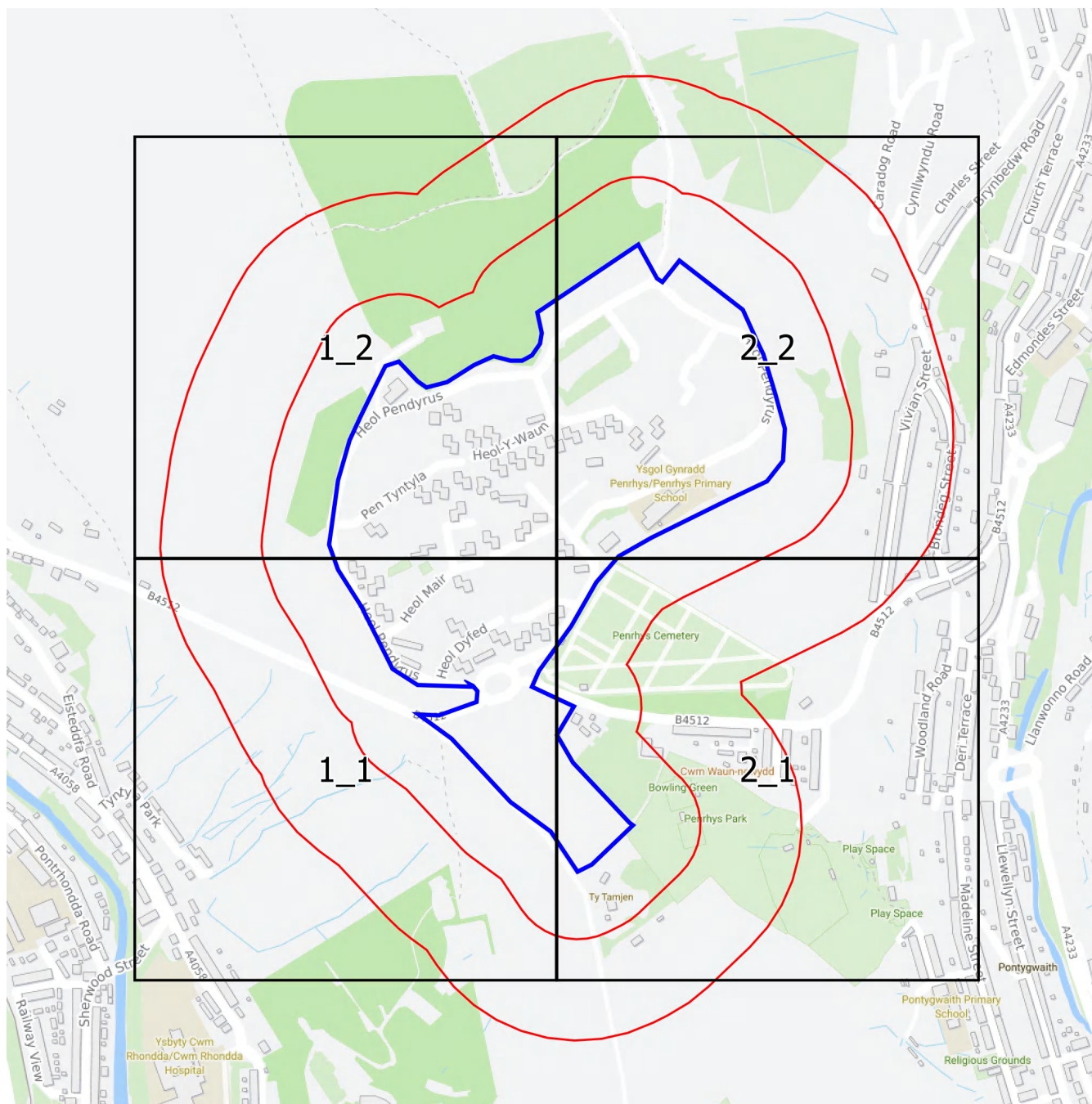
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1:2,500 Scale Grid Index



Site Details:

428, HEOL-Y-WAUN, PEN-RHYS,
FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_Landline_1_3
Grid Ref: 299992, 194997

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250



2003

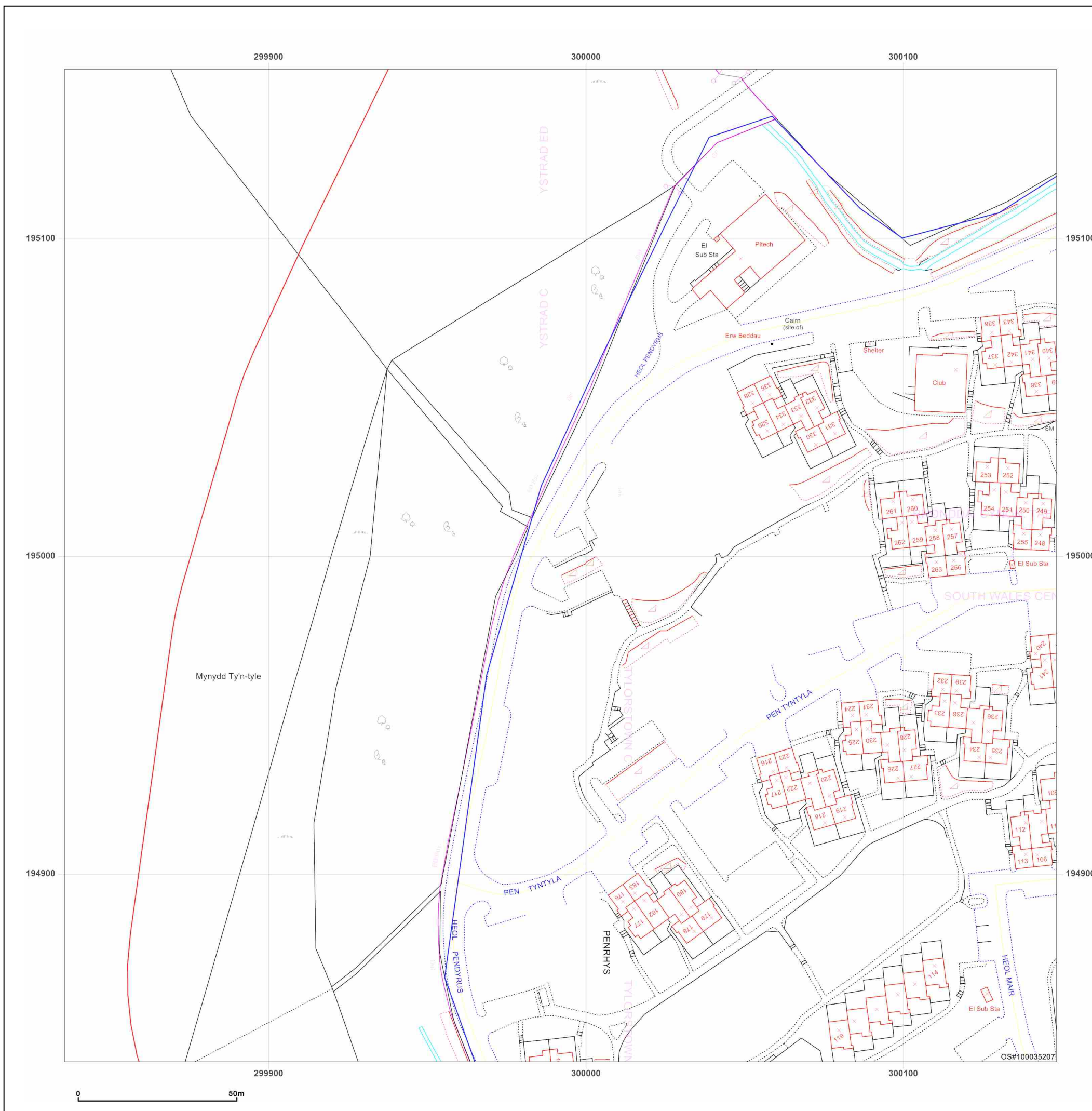


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Site Details:

428, HEOL-Y-WAUN, PEN-RHYS,
FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_Landline_2_1
Grid Ref: 300292, 194397

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250



2003



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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-41X-Z6U-SEX_Landline_2_2
Grid Ref: 300292, 194697

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250



2003



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Site Details:

428, HEOL-Y-WAUN, PEN-RHYS,
FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_Landline_2_4
Grid Ref: 300292, 195297

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250



2003

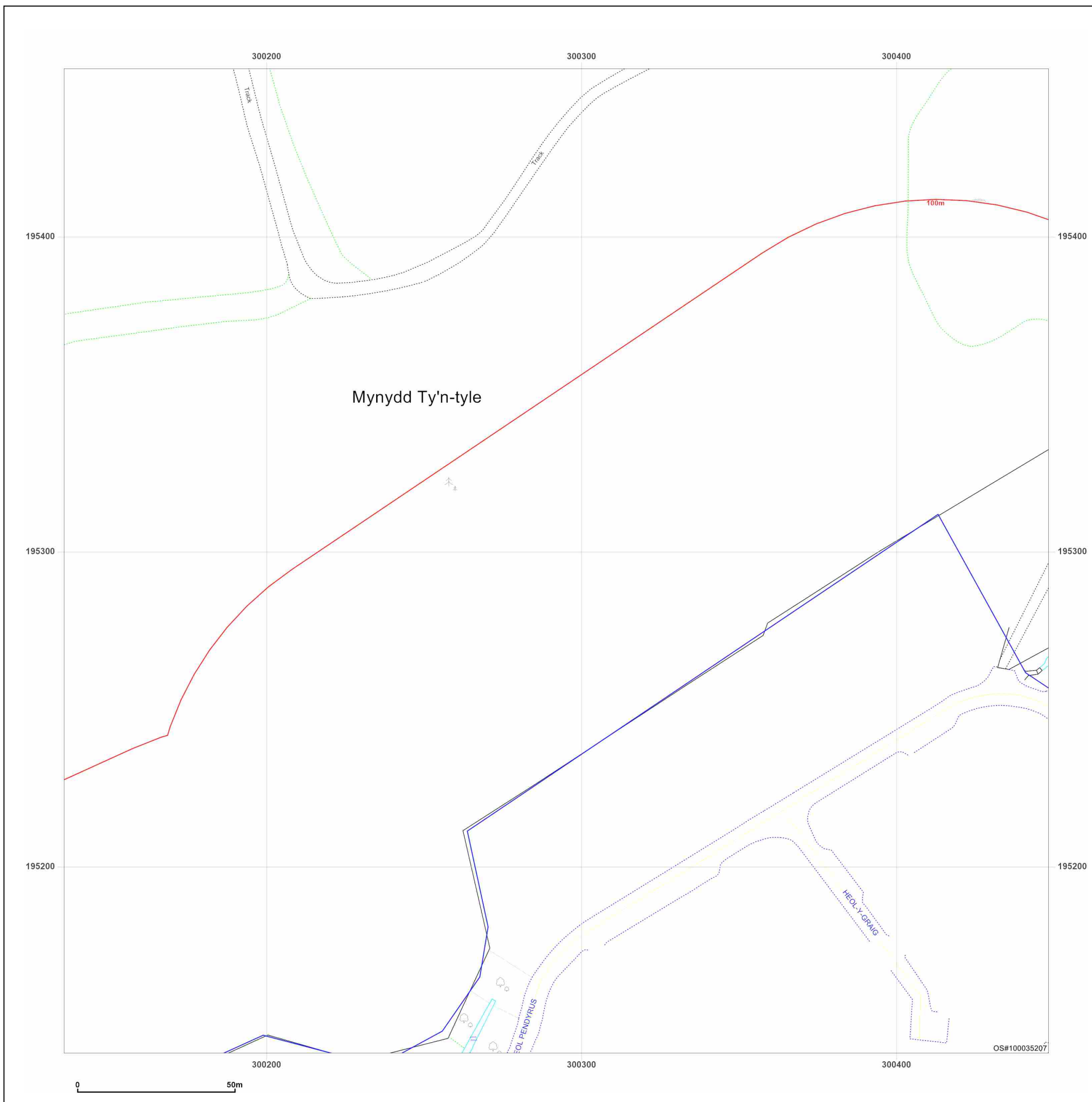


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Site Details:

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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-41X-Z6U-SEX_Landline_3_3
Grid Ref: 300592, 194997

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250



2003



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Site Details:

428, HEOL-Y-WAUN, PEN-RHYS,
FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX_Landline_3_4
Grid Ref: 300592, 195297

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250



2003

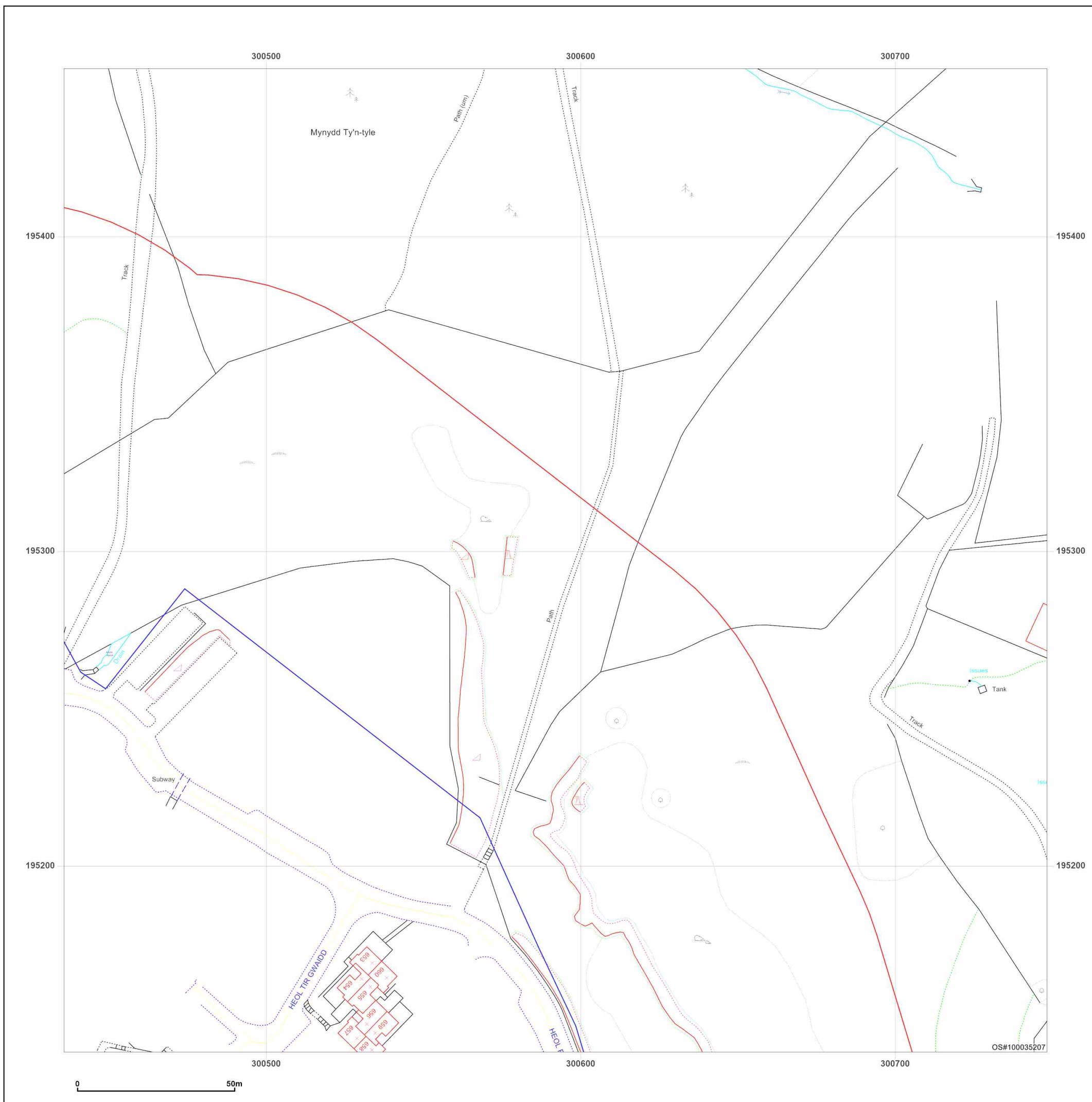


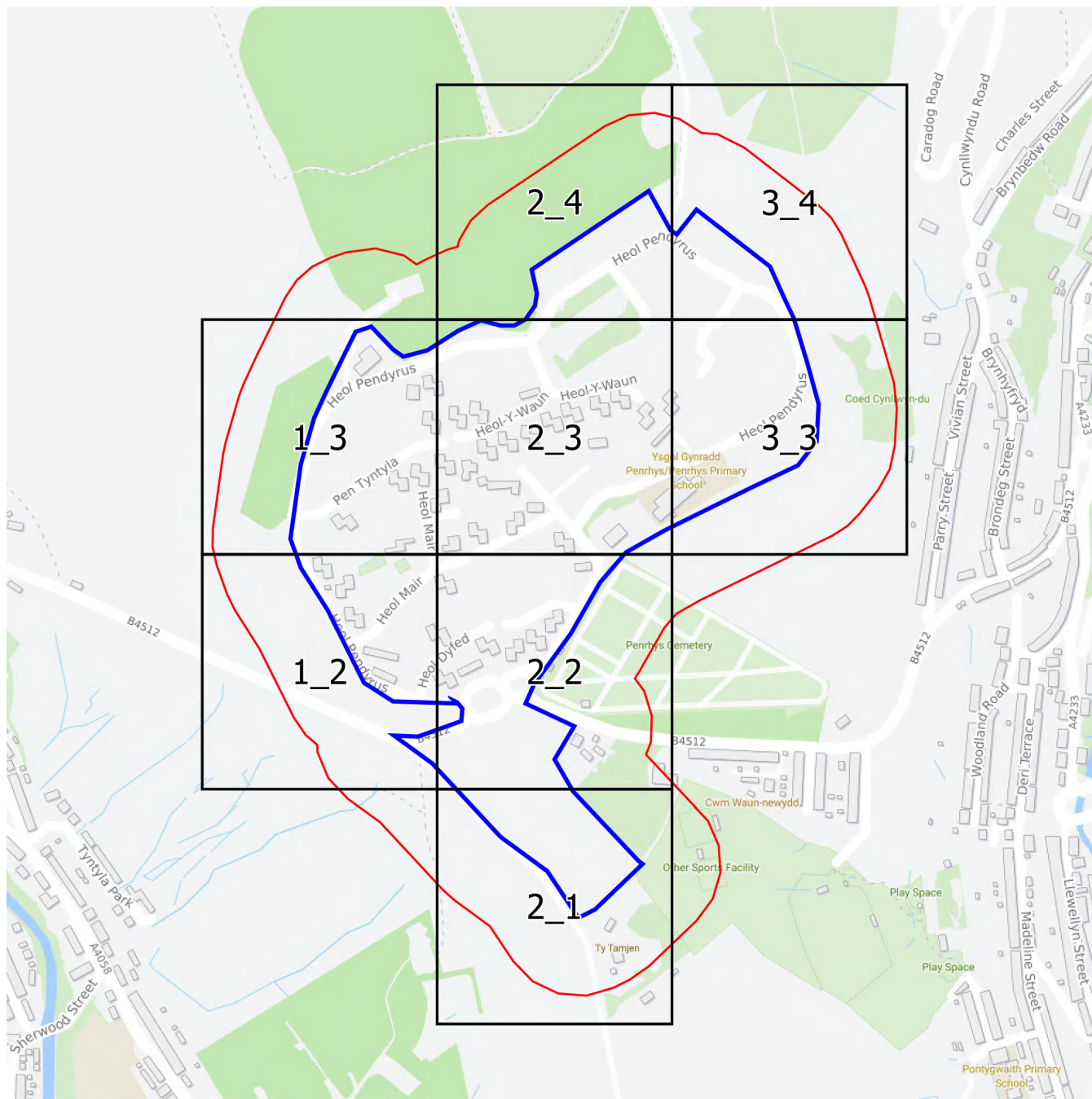
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Production date: 05 October 2023

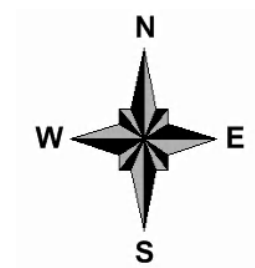
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INSIGHTS

Landline Scale Grid Index



Site Details:

428, HEOL-Y-WAUN, PEN-RHYS,
FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-6I5-4IX-Z6U-SEX
Grid Ref: 300292, 194847

Map Name: County Series

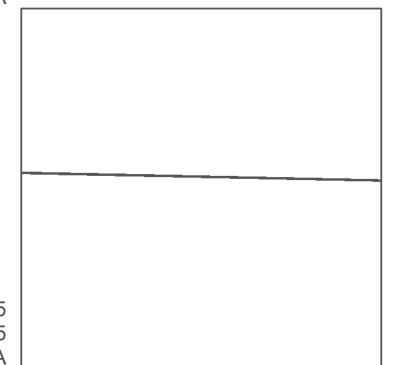
Map date: 1875

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1875
Revised 1875
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1875
Revised 1875
Edition N/A
Copyright N/A
Levelled N/A

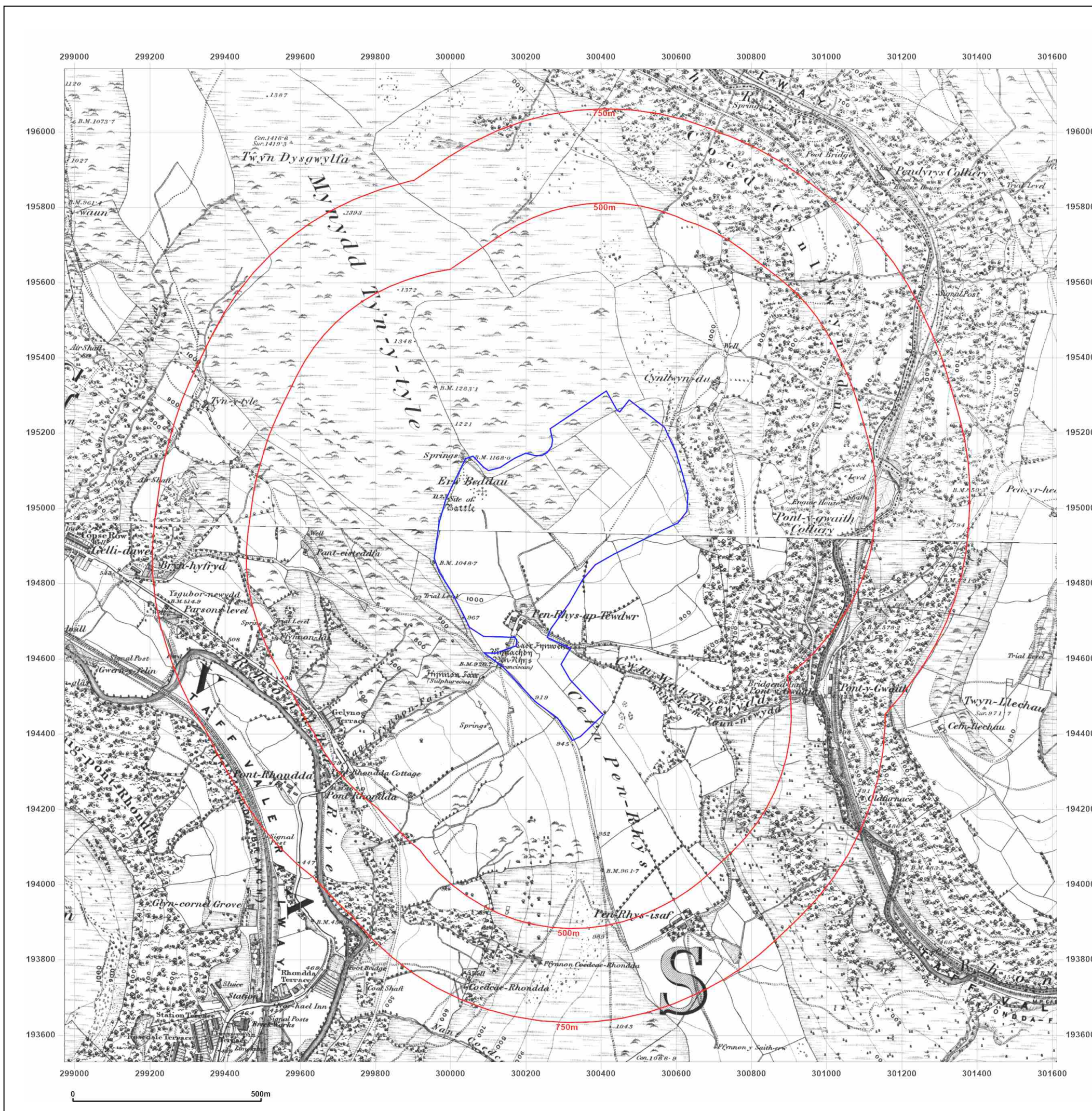


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Site Details:

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Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX
Grid Ref: 300292, 194847

Map Name: County Series

Map date: 1898

Scale: 1:10,560

Printed at: 1:10,560



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Revised 1898
Edition N/A
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Surveyed 1874
Revised 1898
Edition N/A
Copyright N/A
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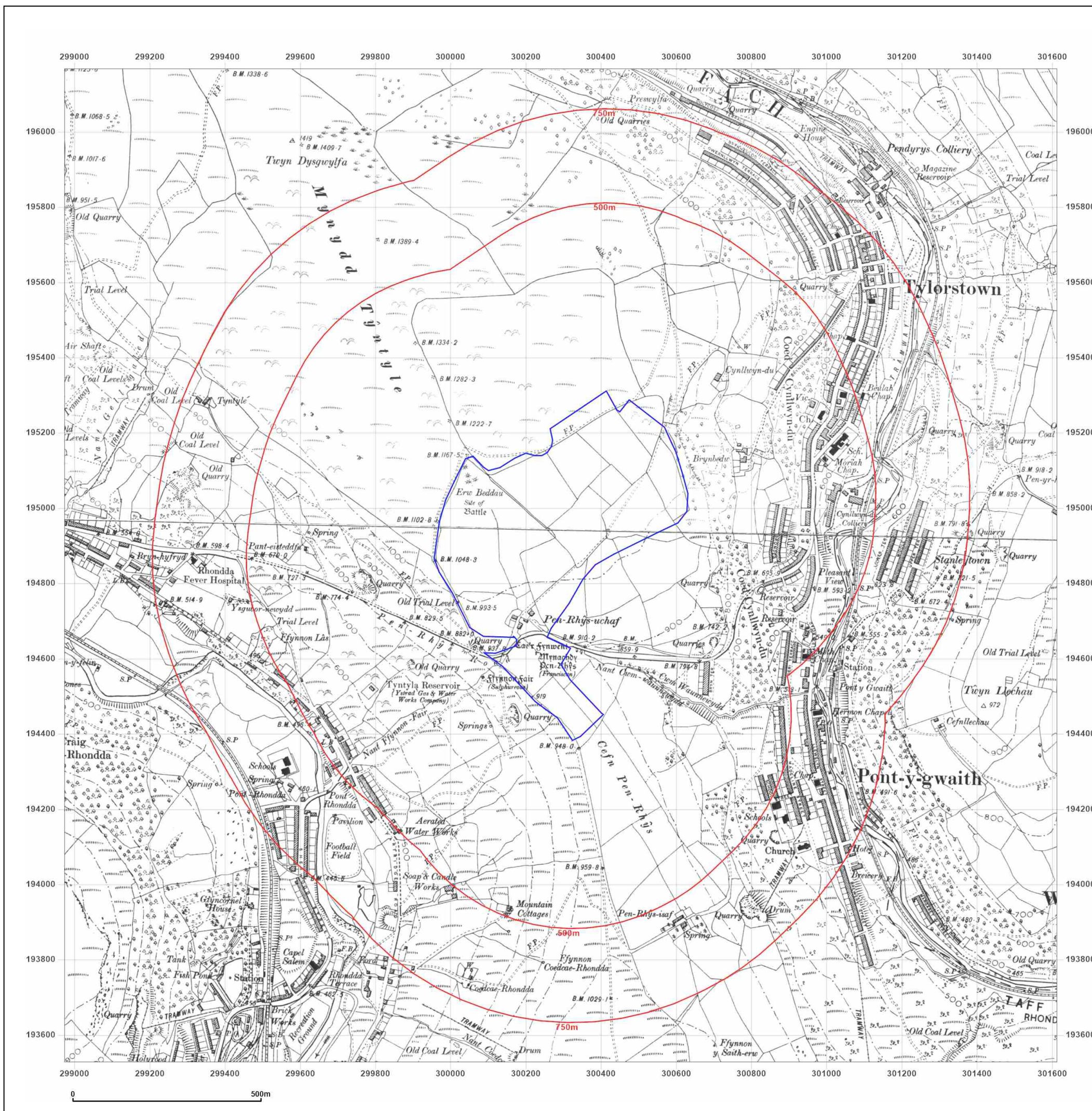


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Site Details:

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Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX
Grid Ref: 300292, 194847

Map Name: County Series

Map date: 1915

Scale: 1:10,560

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Surveyed 1874
Revised 1915
Edition N/A
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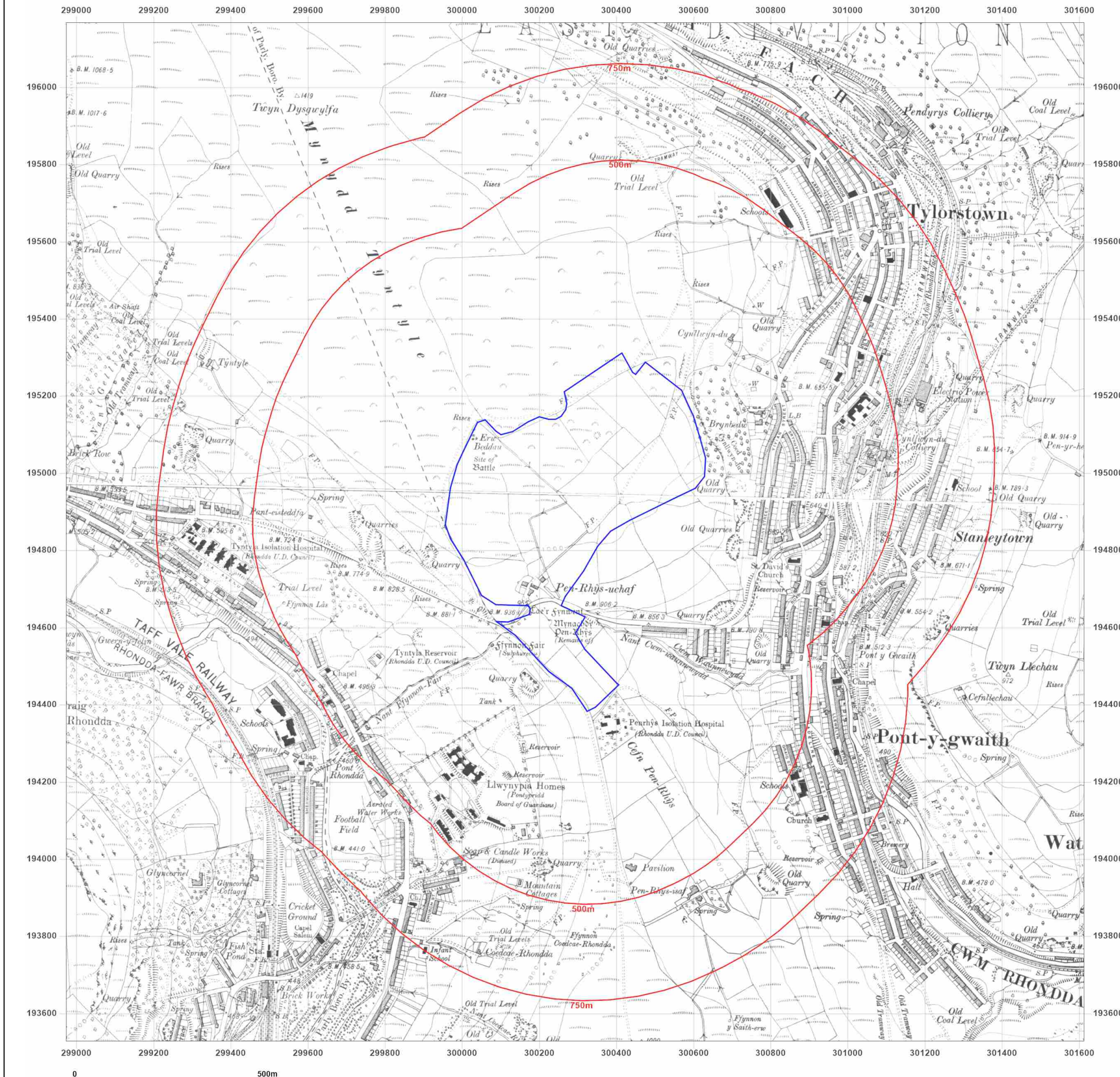


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Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX
Grid Ref: 300292, 194847

Map Name: County Series

Map date: 1921

Scale: 1:10,560

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Revised 1921
Edition N/A
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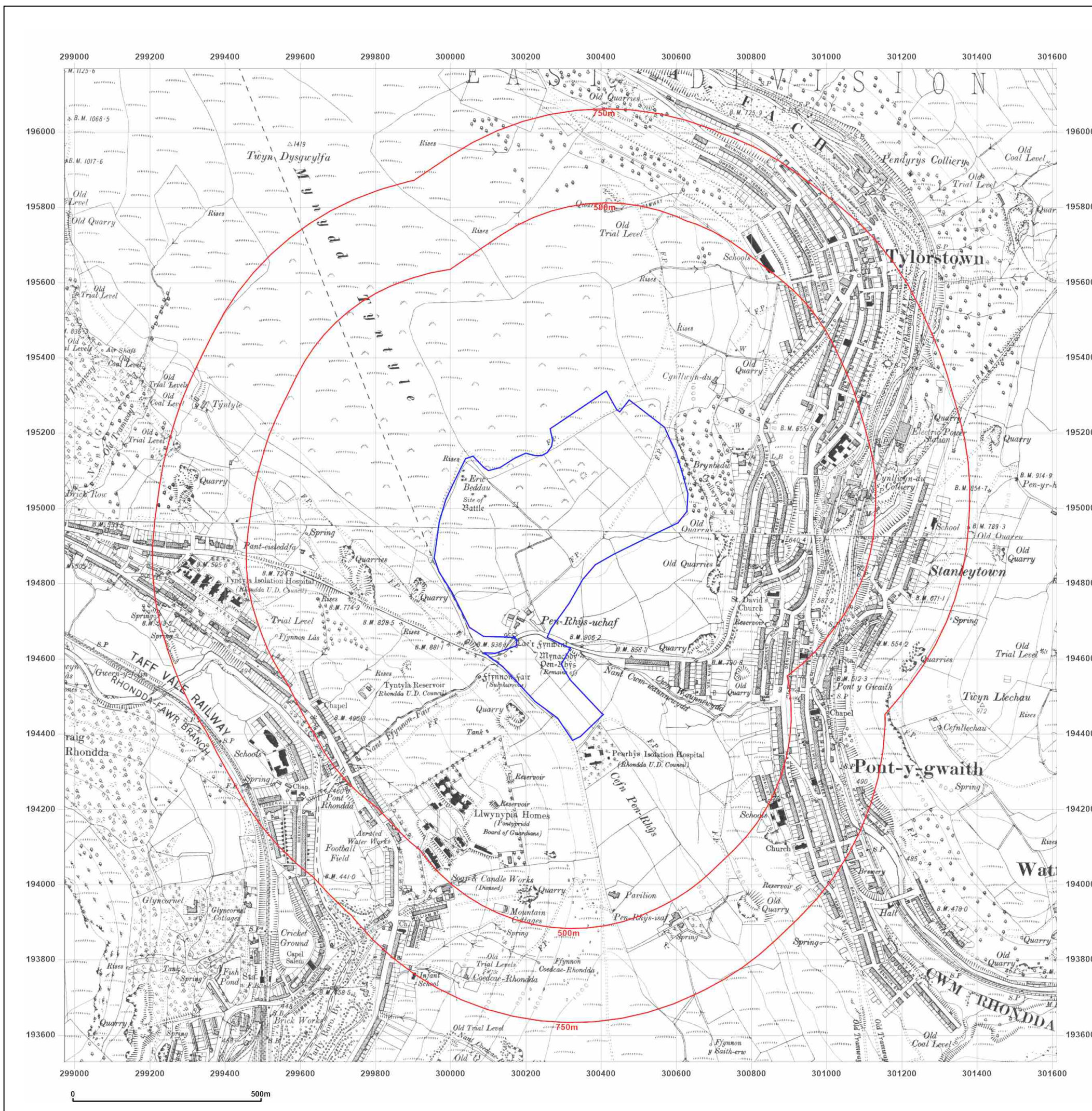


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Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX
Grid Ref: 300292, 194847

Map Name: County Series

Map date: 1948

Scale: 1:10,560

Printed at: 1:10,560



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Revised 1948
Edition 1948
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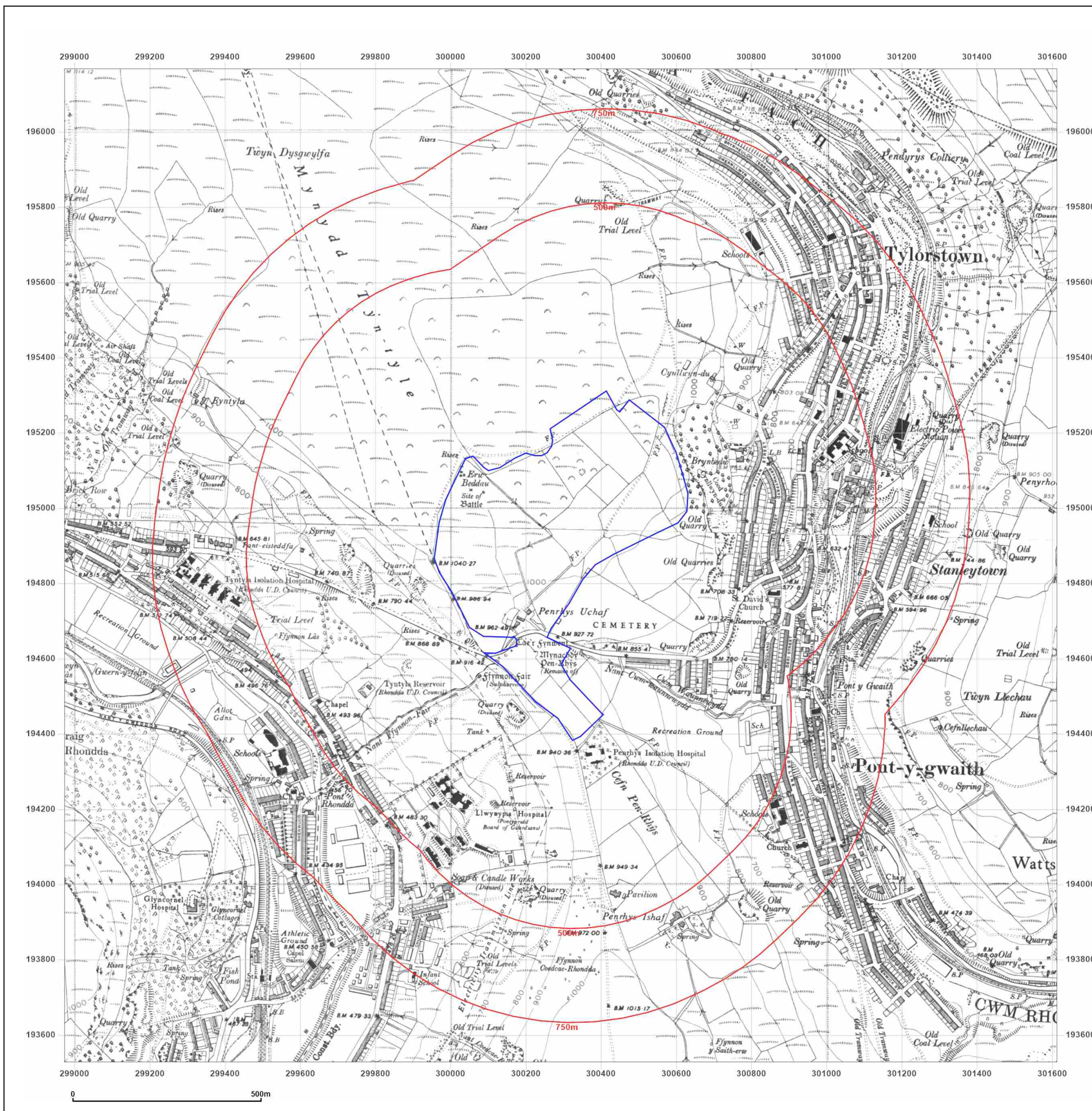


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Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX
Grid Ref: 300292, 194847

Map Name: Provisional

Map date: 1964-1965

Scale: 1:10,560

Printed at: 1:10,560



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Revised 1965
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Surveyed 1965
Revised 1965
Edition N/A
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Revised 1965
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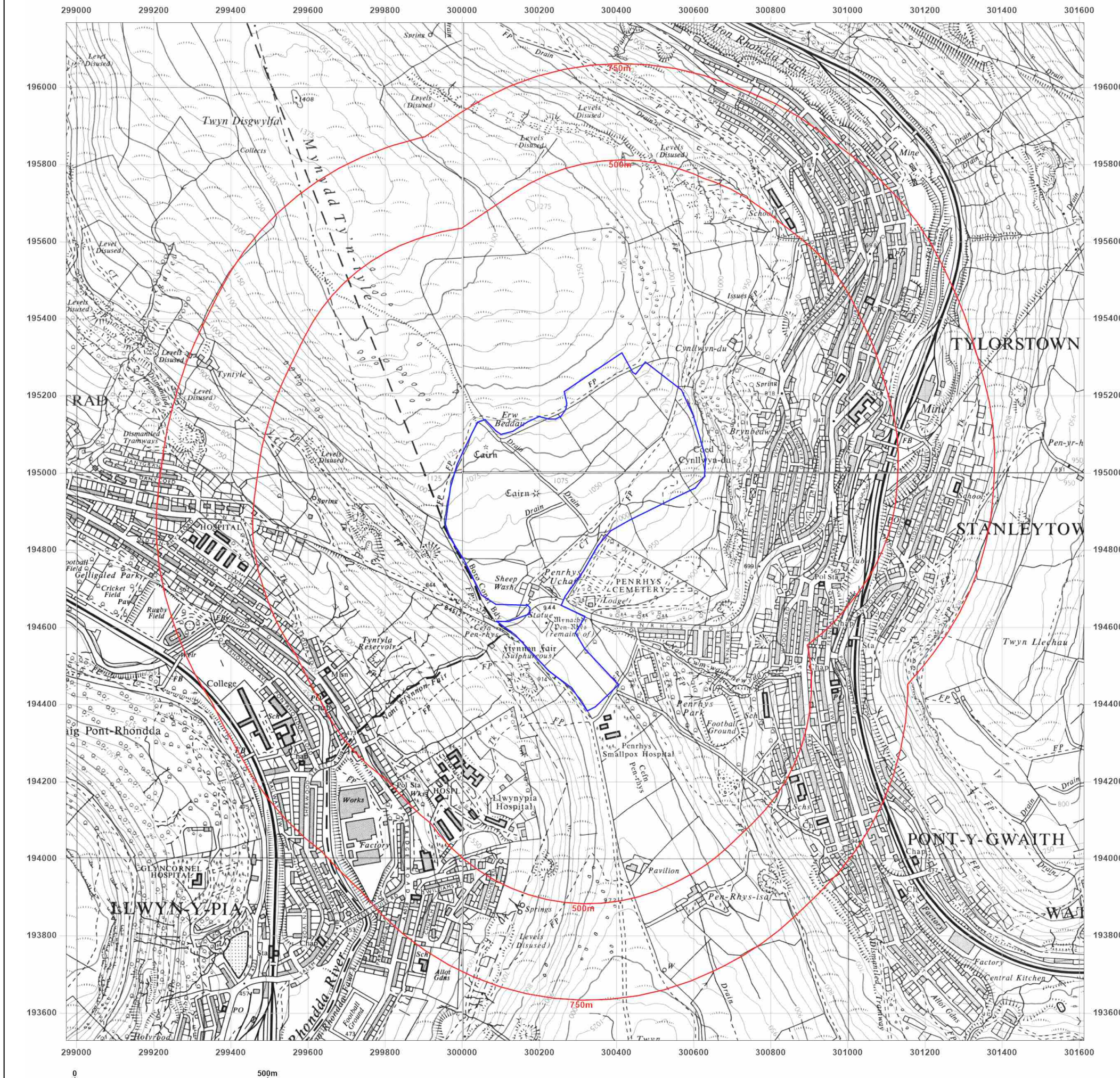


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Site Details:

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FERNDALE, CF43 3NW

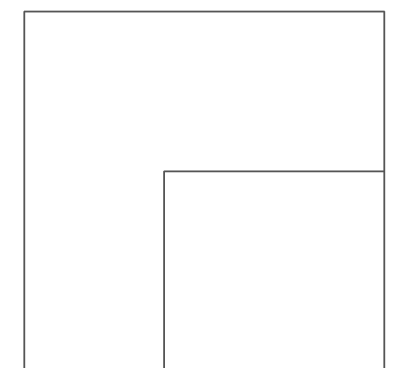
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Grid Ref: 300292, 194847

Map Name: Provisional

Map date: 1968

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1968
Revised 1968
Edition N/A
Copyright N/A
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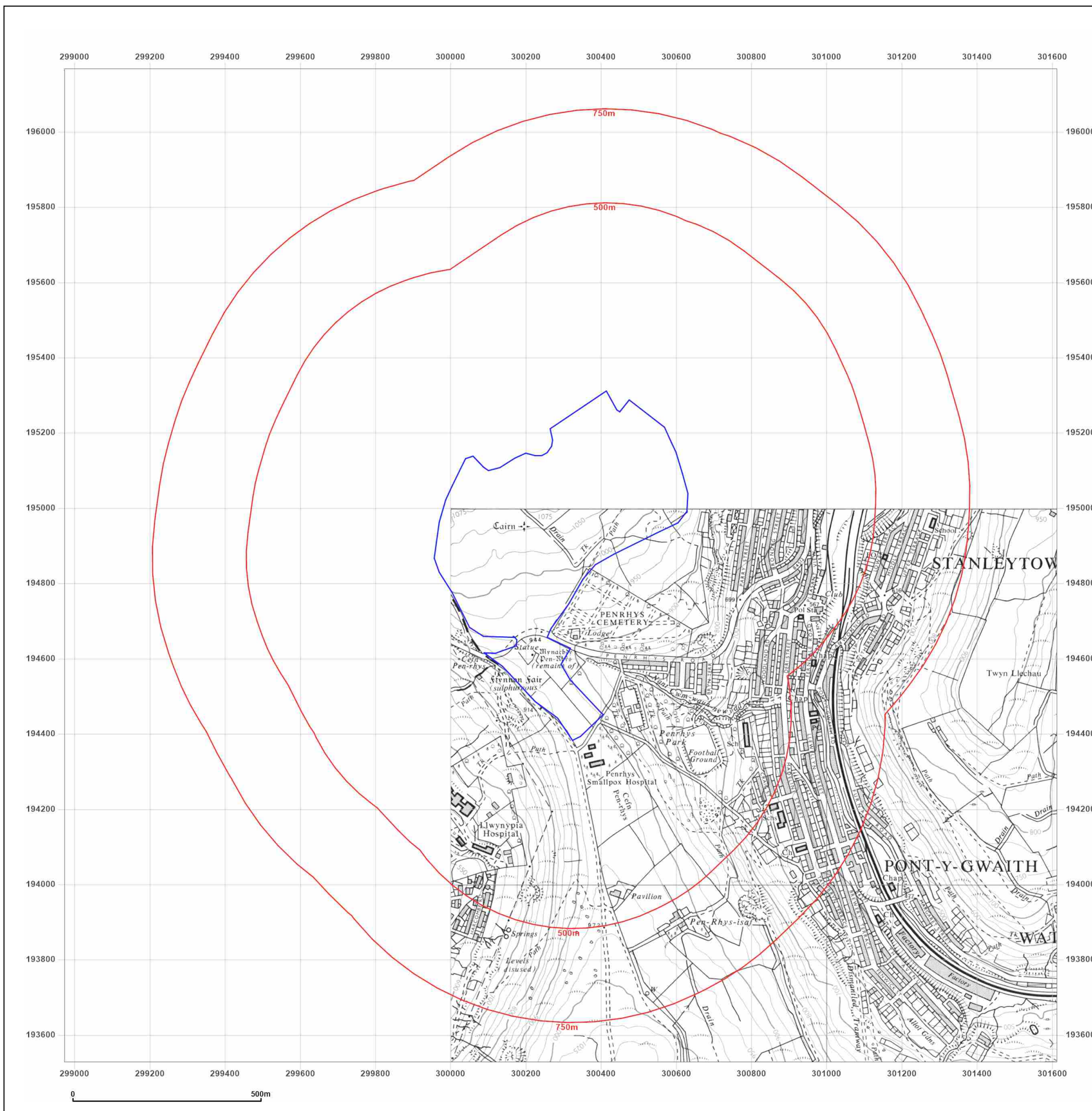


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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-41X-Z6U-SEX
Grid Ref: 300292, 194847

Map Name: National Grid

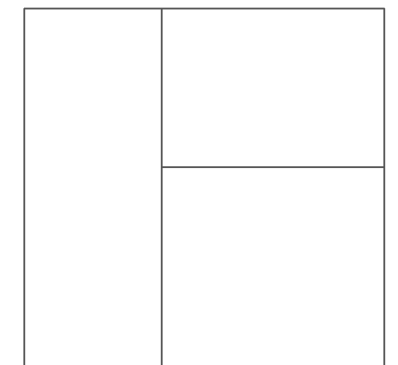
Map date: 1974

Scale: 1:10,000

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Surveyed 1973
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Edition N/A
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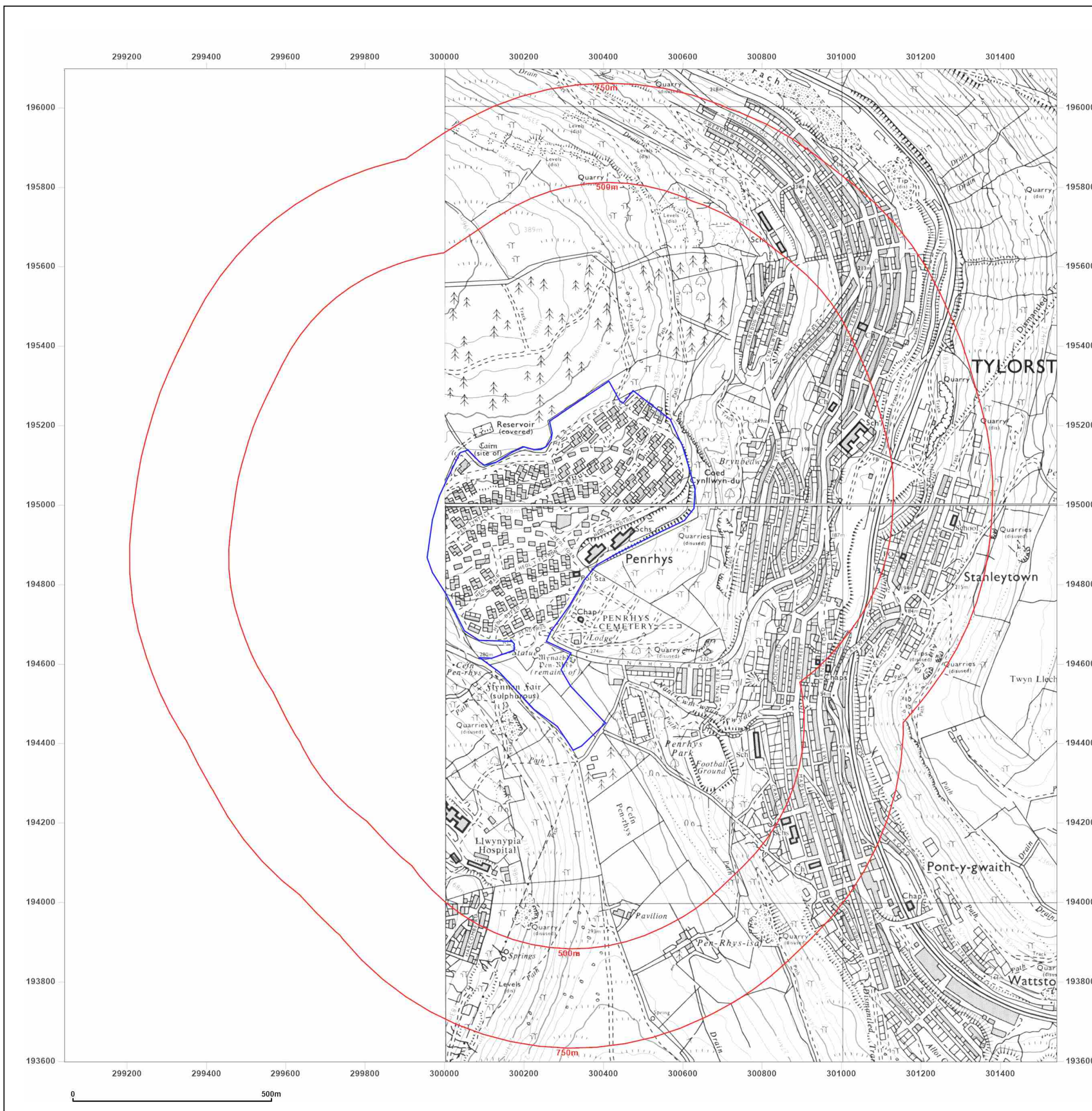


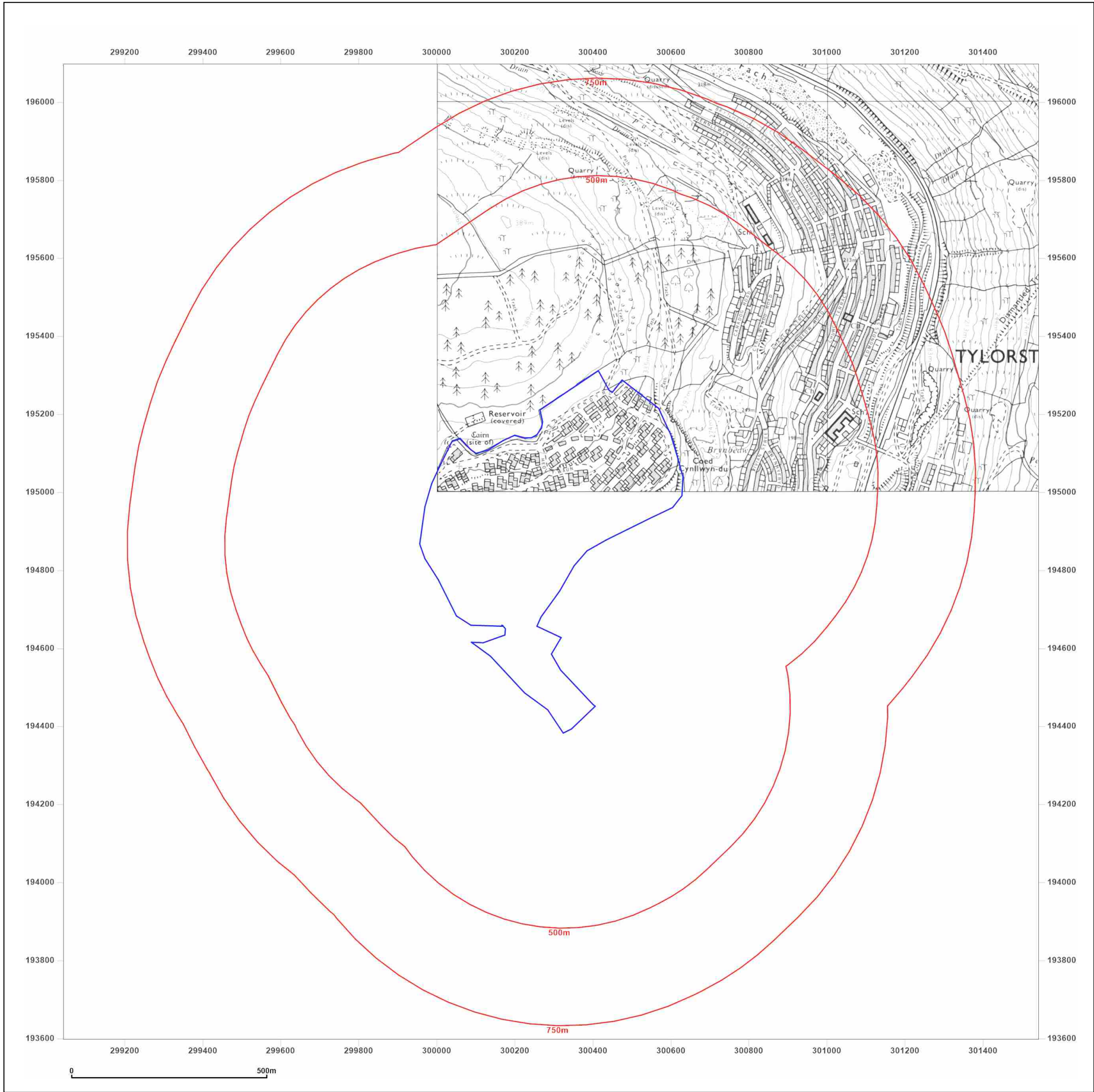
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Site Details:

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Client Ref: PO29122
Report Ref: GS-6I5-4IX-Z6U-SEX
Grid Ref: 300292, 194847

Map Name: National Grid
Map date: 1974
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Printed at: 1:10,000

Map Legend:

0 500m

Scale: 1:10,000

Printed at: 1:10,000

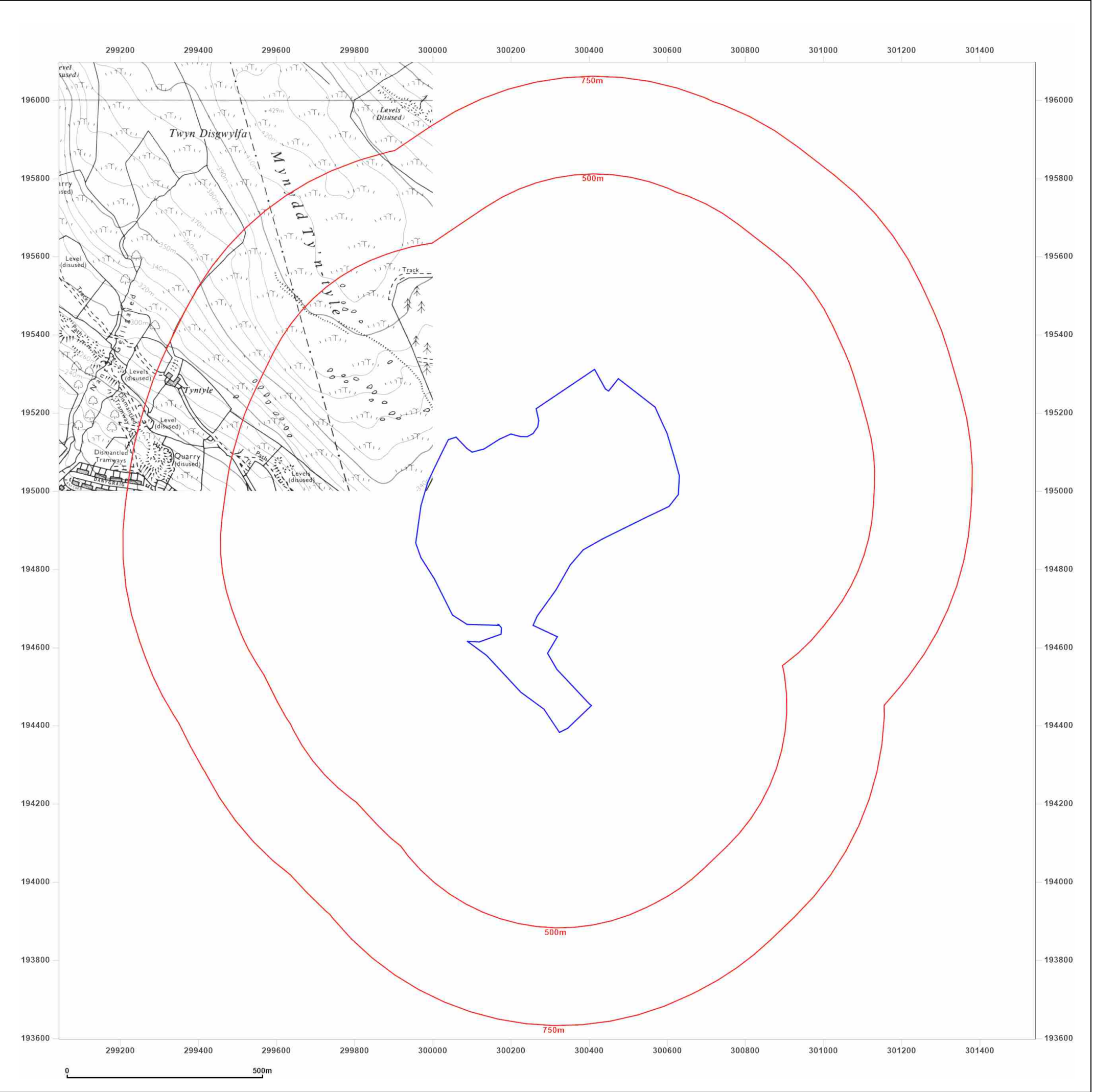
Surveyed 1974
Revised 1974
Edition N/A
Copyright N/A
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A map legend showing a blue line and a red line. The blue line is labeled 'Site Boundary' and the red line is labeled 'Contour Lines'.

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Client Ref: PO29122
Report Ref: GS-615-4IX-Z6U-SEX
Grid Ref: 300292, 194847

Map Name: National Grid

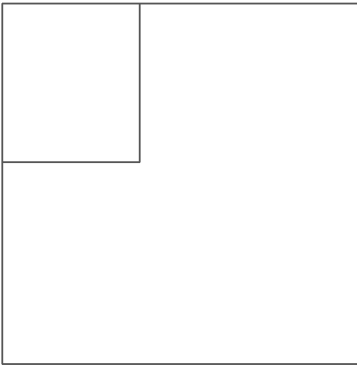
Map date: 1981

Scale: 1:10,000

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Site Details:

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FERNDALE, CF43 3NW

Client Ref: PO29122
Report Ref: GS-6I5-4IX-Z6U-SEX
Grid Ref: 300292, 194847

Map Name: National Grid

Map date: 1989-1992

Scale: 1:10,000

Printed at: 1:10,000



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Edition N/A
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Levelled N/A

Surveyed 1988
Revised 1990
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1973
Revised 1989
Edition N/A
Copyright N/A
Levelled N/A

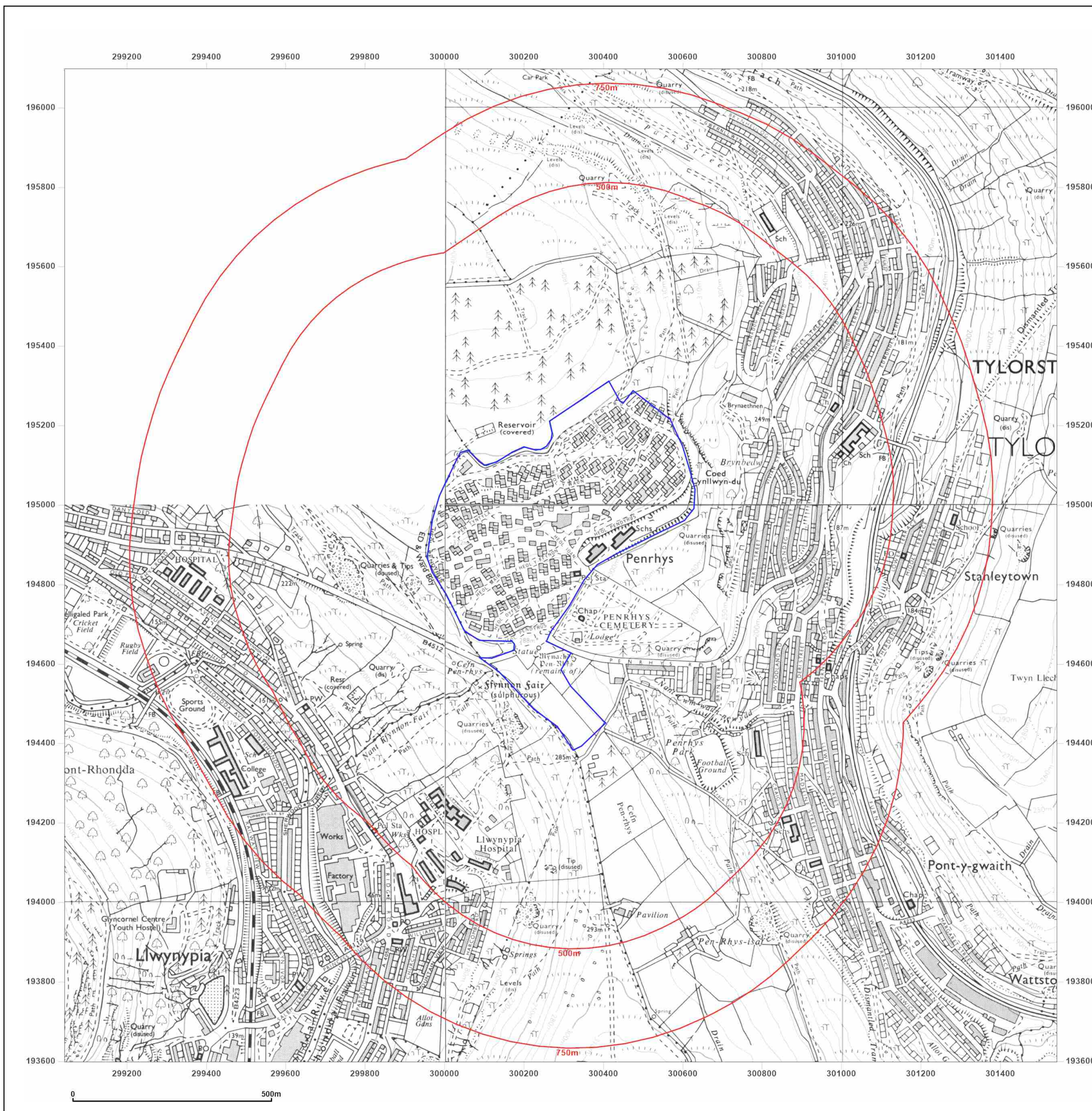


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FERNDAL, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-41X-Z6U-SEX
Grid Ref: 300292, 194847

Map Name: National Grid

Map date: 2001

Scale: 1:10,000

Printed at: 1:10,000



2001

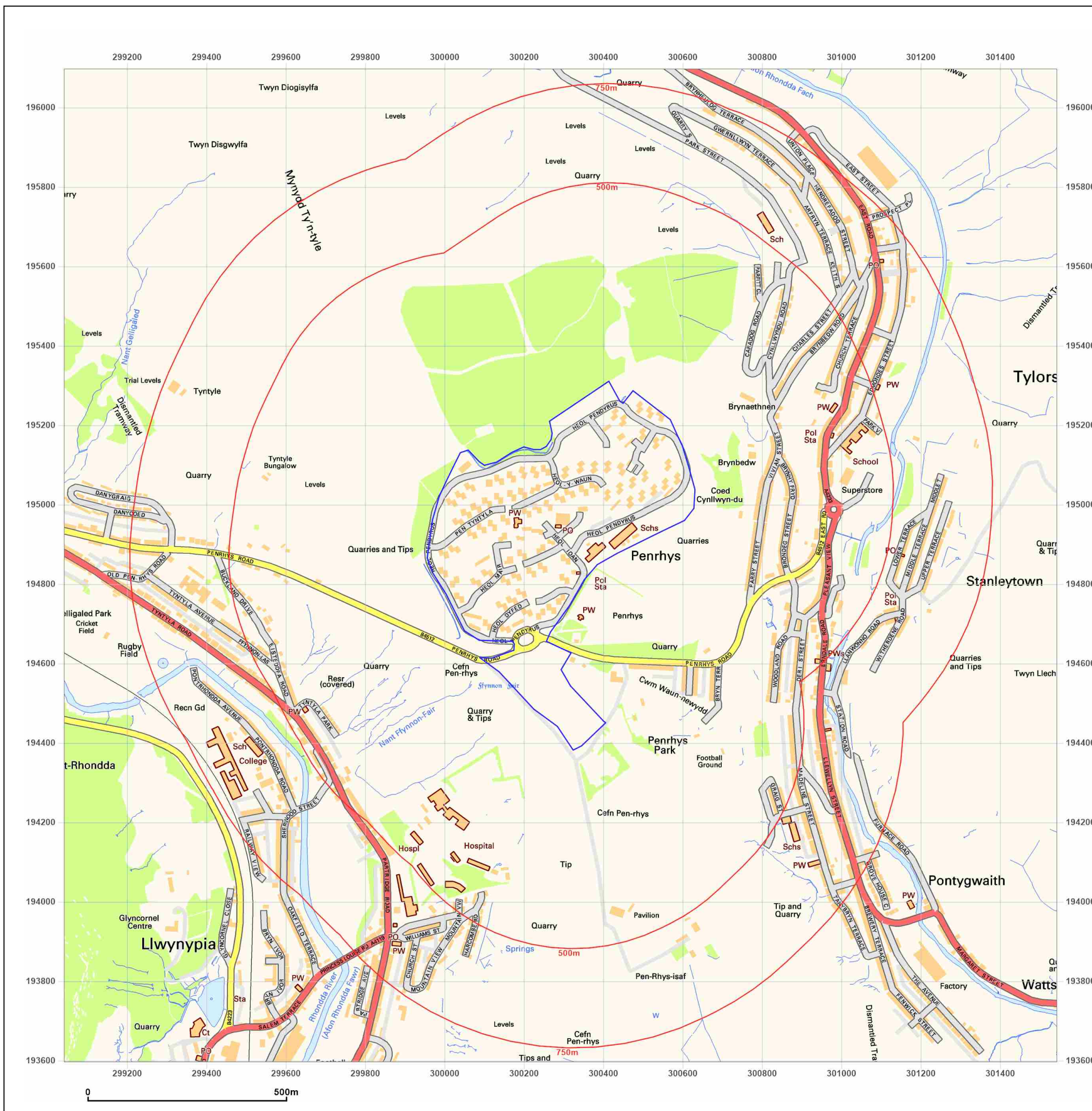


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Site Details:

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FERNDALE, CF43 3NW

Client Ref: PO29122
Report Ref: GS-6I5-4IX-Z6U-SEX
Grid Ref: 300292, 194847

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



2010

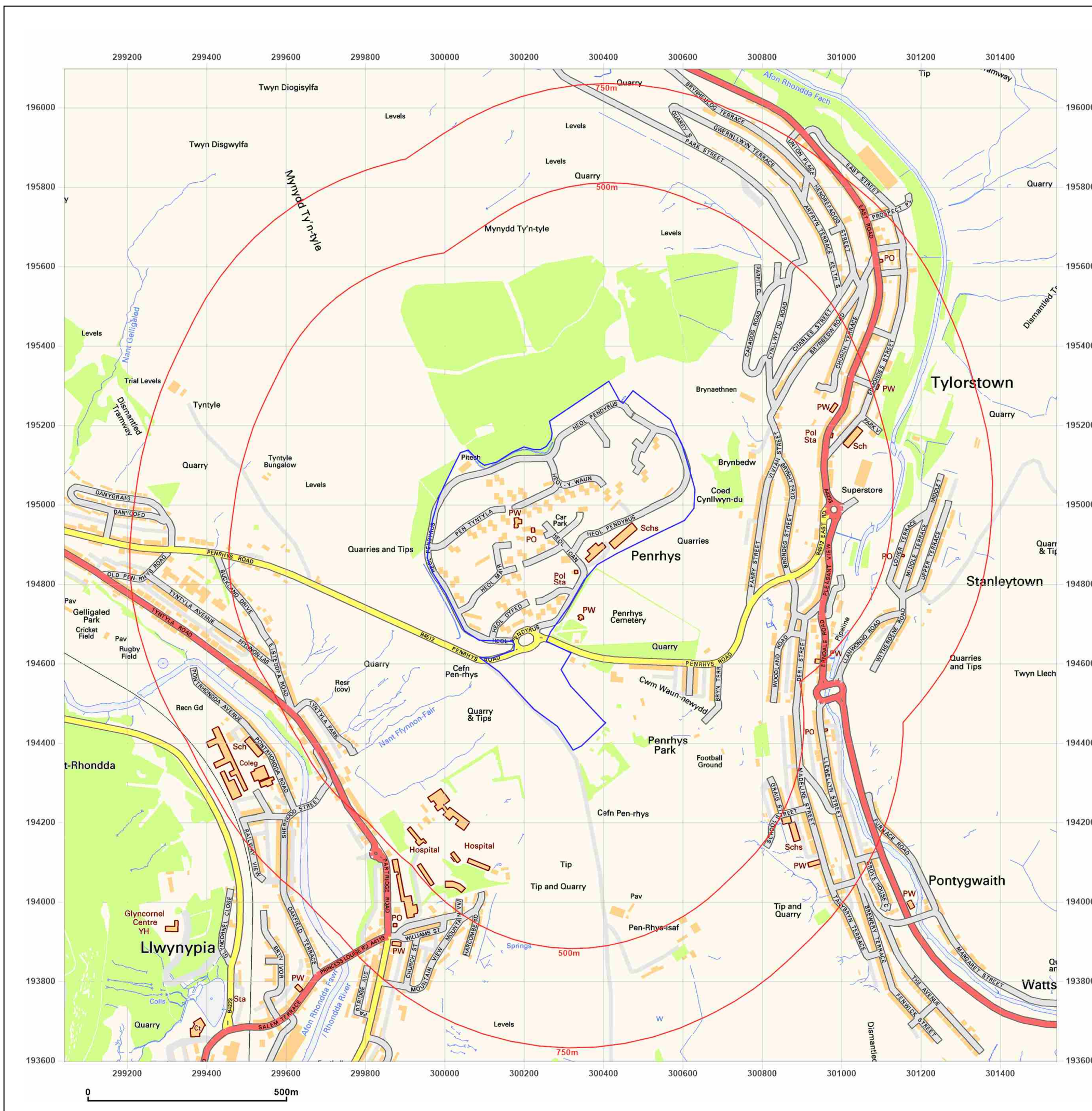


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Site Details:

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FERNDALE, CF43 3NW

Client Ref: PO29122
Report Ref: GS-615-41X-Z6U-SEX
Grid Ref: 300292, 194847

Map Name: National Grid

Map date: 2023

Scale: 1:10,000

Printed at: 1:10,000



2023

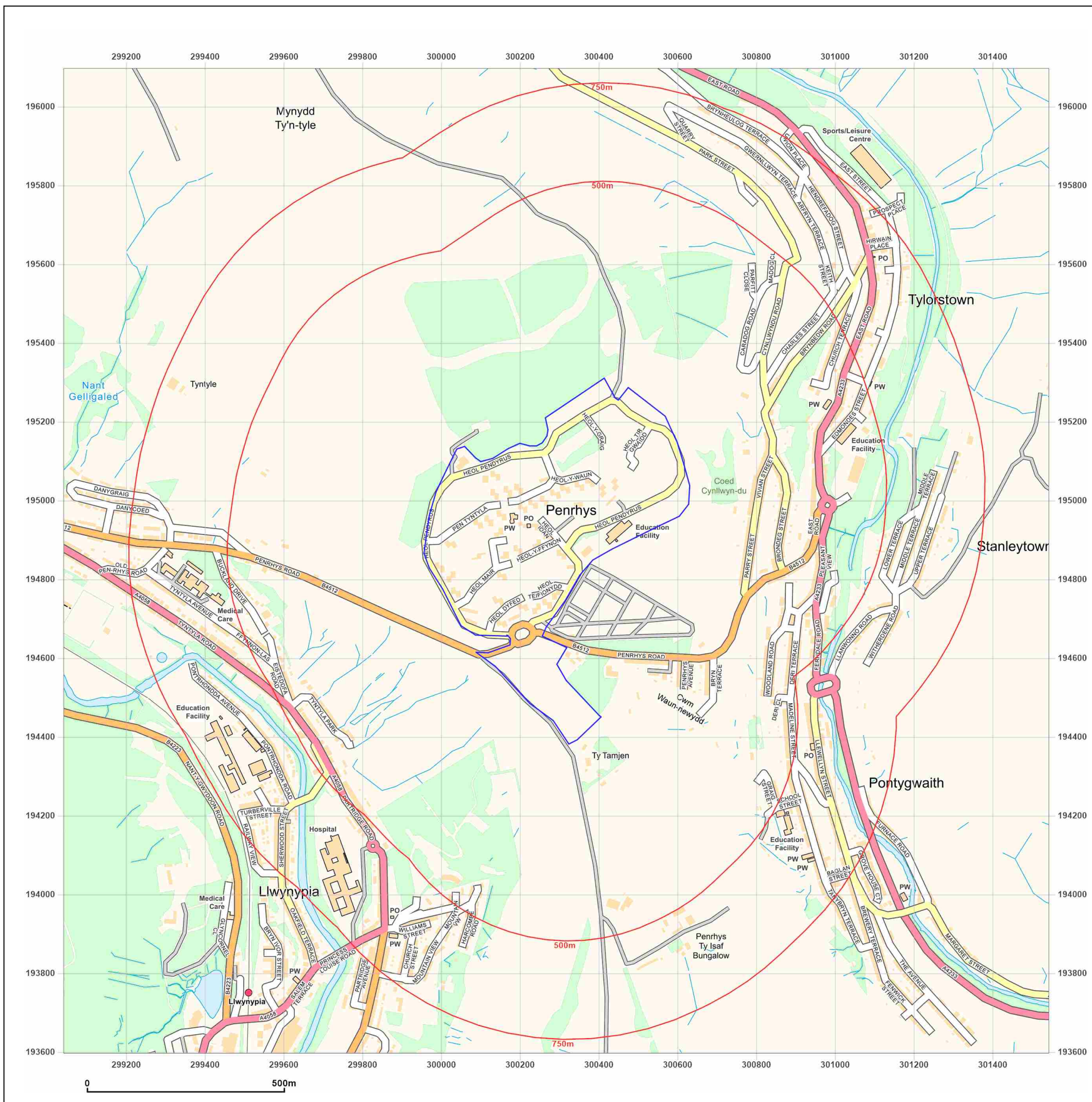


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Appendix D Desk study research information

Groundsure Enviro Insight

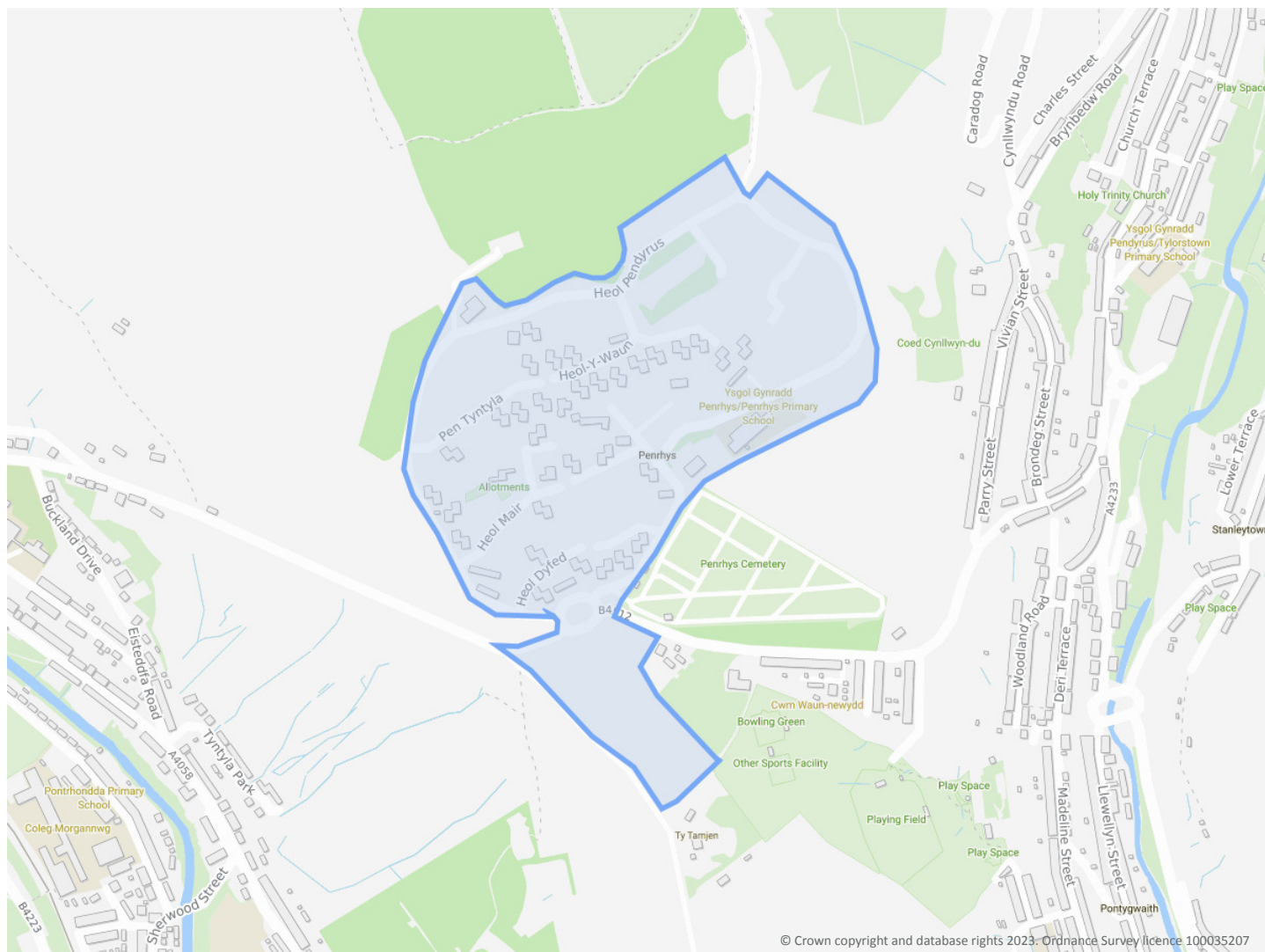
428, HEOL-Y-WAUN, PEN-RHYS, FERNDAL, CF43 3NW

Order Details

Date: 05/10/2023
Your ref: PO29122
Our Ref: GS-OSP-W82-C21-6L1

Site Details

Location: 300257 194890
Area: 29.86 ha
Authority: [Rhondda Cynon Taf County Borough Council](#) ↗



Summary of findings

[p. 2 >](#)

Aerial image

[p. 9 >](#)

OS MasterMap site plan

N/A: >10ha

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Contact us with any questions at:

info@groundsure.com ↗

01273 257 755

Summary of findings

Page	Section	Past land use >	On site	0-50m	50-250m	250-500m	500-2000m
14 >	1.1 >	Historical industrial land uses >	7	22	29	112	-
21 >	1.2 >	Historical tanks >	0	0	10	0	-
21 >	1.3 >	Historical energy features >	20	0	0	7	-
23	1.4	Historical petrol stations	0	0	0	0	-
23 >	1.5 >	Historical garages >	0	0	0	8	-
24	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped >	On site	0-50m	50-250m	250-500m	500-2000m
25 >	2.1 >	Historical industrial land uses >	13	32	37	162	-
34 >	2.2 >	Historical tanks >	0	0	16	0	-
35 >	2.3 >	Historical energy features >	32	0	0	14	-
37	2.4	Historical petrol stations	0	0	0	0	-
37 >	2.5 >	Historical garages >	0	0	0	13	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
39	3.1	Active or recent landfill	0	0	0	0	-
39	3.2	Historical landfill (BGS records)	0	0	0	0	-
39	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
39	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
39	3.5	Historical waste sites	0	0	0	0	-
40	3.6	Licensed waste sites	0	0	0	0	-
40	3.7	Waste exemptions	0	0	0	0	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
41 >	4.1 >	Recent industrial land uses >	8	1	7	-	-
42 >	4.2 >	Current or recent petrol stations >	0	0	0	1	-
43	4.3	Electricity cables	0	0	0	0	-
43	4.4	Gas pipelines	0	0	0	0	-
43	4.5	Sites determined as Contaminated Land	0	0	0	0	-



43	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
44	4.7	Regulated explosive sites	0	0	0	0	-
44	4.8	Hazardous substance storage/usage	0	0	0	0	-
44	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
44	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
44	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
45	4.12	Radioactive Substance Authorisations	0	0	0	0	-
45 >	4.13 >	Licensed Discharges to controlled waters >	2	0	2	6	-
46	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
47	4.15	Pollutant release to public sewer	0	0	0	0	-
47	4.16	List 1 Dangerous Substances	0	0	0	0	-
47	4.17	List 2 Dangerous Substances	0	0	0	0	-
47 >	4.18 >	Pollution Incidents (EA/NRW) >	0	0	0	2	-
48	4.19	Pollution inventory substances	0	0	0	0	-
48	4.20	Pollution inventory waste transfers	0	0	0	0	-
48	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology >	On site	0-50m	50-250m	250-500m	500-2000m
49 >	5.1 >	Superficial aquifer >	Identified (within 500m)				
51 >	5.2 >	Bedrock aquifer >	Identified (within 500m)				
53 >	5.3 >	Groundwater vulnerability >	Identified (within 50m)				
54	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
54	5.5	Groundwater vulnerability- local information	None (within 0m)				
55 >	5.6 >	Groundwater abstractions >	0	0	0	0	3
56 >	5.7 >	Surface water abstractions >	0	0	0	3	0
57	5.8	Potable abstractions	0	0	0	0	0
58	5.9	Source Protection Zones	0	0	0	0	-
58	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology >	On site	0-50m	50-250m	250-500m	500-2000m
59 >	6.1 >	Water Network (OS MasterMap) >	3	7	36	-	-



63 >	6.2 >	Surface water features >	0	0	22	-	-
63 >	6.3 >	WFD Surface water body catchments >	2	-	-	-	-
64 >	6.4 >	WFD Surface water bodies >	0	0	0	-	-
64 >	6.5 >	WFD Groundwater bodies >	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
66	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
66	7.2	Historical Flood Events	0	0	0	-	-
66	7.3	Flood Defences	0	0	0	-	-
67	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
67	7.5	Flood Storage Areas	0	0	0	-	-
68	7.6	Flood Zone 2	None (within 50m)				
68	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding >					
69 >	8.1 >	Surface water flooding >	1 in 30 year, Greater than 1.0m (within 50m)				
Page	Section	Groundwater flooding >					
71 >	9.1 >	Groundwater flooding >	Negligible (within 50m)				
Page	Section	Environmental designations >	On site	0-50m	50-250m	250-500m	500-2000m
72 >	10.1 >	Sites of Special Scientific Interest (SSSI) >	0	0	0	0	1
73	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
73	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
73	10.4	Special Protection Areas (SPA)	0	0	0	0	0
73	10.5	National Nature Reserves (NNR)	0	0	0	0	0
74 >	10.6 >	Local Nature Reserves (LNR) >	0	0	0	0	3
74 >	10.7 >	Designated Ancient Woodland >	0	1	1	5	52
76	10.8	Biosphere Reserves	0	0	0	0	0
77	10.9	Forest Parks	0	0	0	0	0
77	10.10	Marine Conservation Zones	0	0	0	0	0
77	10.11	Green Belt	0	0	0	0	0
77	10.12	Proposed Ramsar sites	0	0	0	0	0



77	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
78	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
78	10.15	Nitrate Sensitive Areas	0	0	0	0	0
78	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
79	10.17	SSSI Impact Risk Zones	0	-	-	-	-
79	10.18	SSSI Units	0	0	0	0	0
Page	Section	Visual and cultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
80	11.1	World Heritage Sites	0	0	0	-	-
81	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
81	11.3	National Parks	0	0	0	-	-
81 >	11.4 >	Listed Buildings >	0	0	1	-	-
82	11.5	Conservation Areas	0	0	0	-	-
82	11.6	Scheduled Ancient Monuments	0	0	0	-	-
82	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
83 >	12.1 >	Agricultural Land Classification >	Grade 5 (within 250m)				
84 >	12.2 >	Open Access Land >	2	1	0	-	-
85	12.3	Tree Felling Licences	0	0	0	-	-
85	12.4	Environmental Stewardship Schemes	0	0	0	-	-
85	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
86	13.1	Priority Habitat Inventory	0	0	0	-	-
86	13.2	Habitat Networks	0	0	0	-	-
86	13.3	Open Mosaic Habitat	0	0	0	-	-
86	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
87 >	14.1 >	10k Availability >	Identified (within 500m)				
88	14.2	Artificial and made ground (10k)	0	0	0	0	-
89	14.3	Superficial geology (10k)	0	0	0	0	-

89	14.4	Landslip (10k)	0	0	0	0	-
90	14.5	Bedrock geology (10k)	0	0	0	0	-
90	14.6	Bedrock faults and other linear features (10k)	0	0	0	0	-
Page	Section	Geology 1:50,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
91 >	15.1 >	50k Availability >	Identified (within 500m)				
92	15.2	Artificial and made ground (50k)	0	0	0	0	-
92	15.3	Artificial ground permeability (50k)	0	0	-	-	-
93 >	15.4 >	Superficial geology (50k) >	0	0	2	4	-
94	15.5	Superficial permeability (50k)	None (within 50m)				
94 >	15.6 >	Landslip (50k) >	0	1	0	1	-
94 >	15.7 >	Landslip permeability (50k) >	Identified (within 50m)				
95 >	15.8 >	Bedrock geology (50k) >	1	1	3	2	-
96 >	15.9 >	Bedrock permeability (50k) >	Identified (within 50m)				
96 >	15.10 >	Bedrock faults and other linear features (50k) >	0	0	3	7	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
98	16.1	BGS Boreholes	0	0	0	-	-
Page	Section	Natural ground subsidence >					
99 >	17.1 >	Shrink swell clays >	Very low (within 50m)				
100 >	17.2 >	Running sands >	Negligible (within 50m)				
101 >	17.3 >	Compressible deposits >	Negligible (within 50m)				
102 >	17.4 >	Collapsible deposits >	Very low (within 50m)				
103 >	17.5 >	Landslides >	High (within 50m)				
105 >	17.6 >	Ground dissolution of soluble rocks >	Negligible (within 50m)				
Page	Section	Mining and ground workings >	On site	0-50m	50-250m	250-500m	500-2000m
107 >	18.1 >	BritPits >	0	2	5	7	-
110 >	18.2 >	Surface ground workings >	11	26	37	-	-
113 >	18.3 >	Underground workings >	0	0	4	13	69
116	18.4	Underground mining extents	0	0	0	0	-
117	18.5	Historical Mineral Planning Areas	0	0	0	0	-



117 >	18.6 >	Non-coal mining >	0	0	0	0	2
117 >	18.7 >	JPB mining areas >	Identified (within 0m)				
118	18.8	The Coal Authority non-coal mining	0	0	0	0	-
118	18.9	Researched mining	0	0	0	0	-
118	18.10	Mining record office plans	0	0	0	0	-
119	18.11	BGS mine plans	0	0	0	0	-
119 >	18.12 >	Coal mining >	Identified (within 0m)				
119	18.13	Brine areas	None (within 0m)				
119	18.14	Gypsum areas	None (within 0m)				
119	18.15	Tin mining	None (within 0m)				
120	18.16	Clay mining	None (within 0m)				
Page	Section	Ground cavities and sinkholes	On site	0-50m	50-250m	250-500m	500-2000m
121	19.1	Natural cavities	0	0	0	0	-
121	19.2	Mining cavities	0	0	0	0	0
121	19.3	Reported recent incidents	0	0	0	0	-
121	19.4	Historical incidents	0	0	0	0	-
122	19.5	National karst database	0	0	0	0	-
Page	Section	Radon >					
123 >	20.1 >	Radon >	Between 1% and 3% (within 0m)				
Page	Section	Soil chemistry >	On site	0-50m	50-250m	250-500m	500-2000m
125 >	21.1 >	BGS Estimated Background Soil Chemistry >	9	1	-	-	-
126	21.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
126	21.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects >	On site	0-50m	50-250m	250-500m	500-2000m
127	22.1	Underground railways (London)	0	0	0	-	-
127	22.2	Underground railways (Non-London)	0	0	0	-	-
128	22.3	Railway tunnels	0	0	0	-	-
128 >	22.4 >	Historical railway and tunnel features >	0	1	0	-	-
128	22.5	Royal Mail tunnels	0	0	0	-	-

128	22.6	Historical railways	0	0	0	-	-
129	22.7	Railways	0	0	0	-	-
129	22.8	Crossrail 1	0	0	0	0	-
129	22.9	Crossrail 2	0	0	0	0	-
129	22.10	HS2	0	0	0	0	-



Recent aerial photograph



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Capture Date: 14/04/2020

Site Area: 29.86ha



Recent site history - 2017 aerial photograph

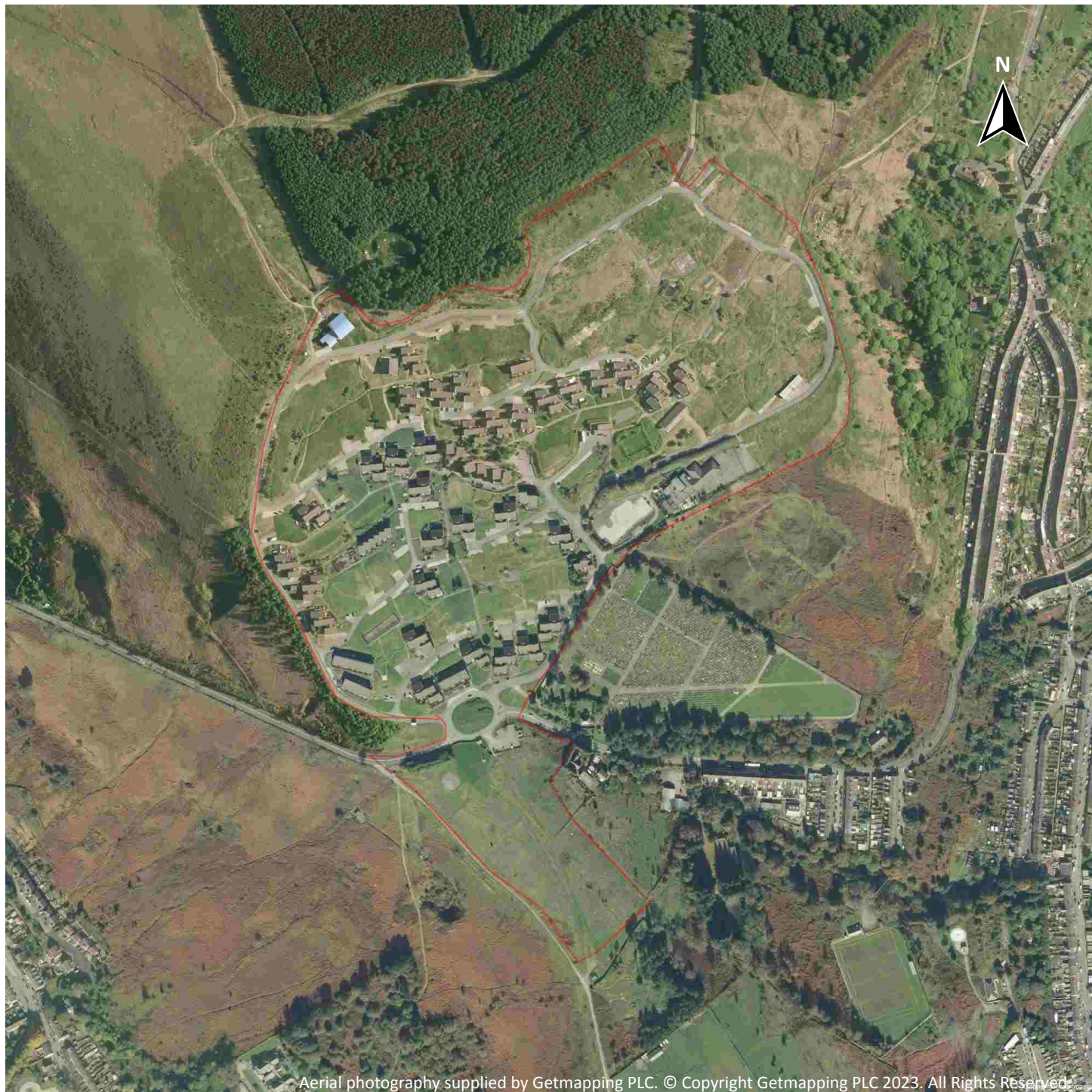


Capture Date: 26/05/2017

Site Area: 29.86ha



Recent site history - 2010 aerial photograph



Capture Date: 23/05/2010

Site Area: 29.86ha



Recent site history - 2009 aerial photograph

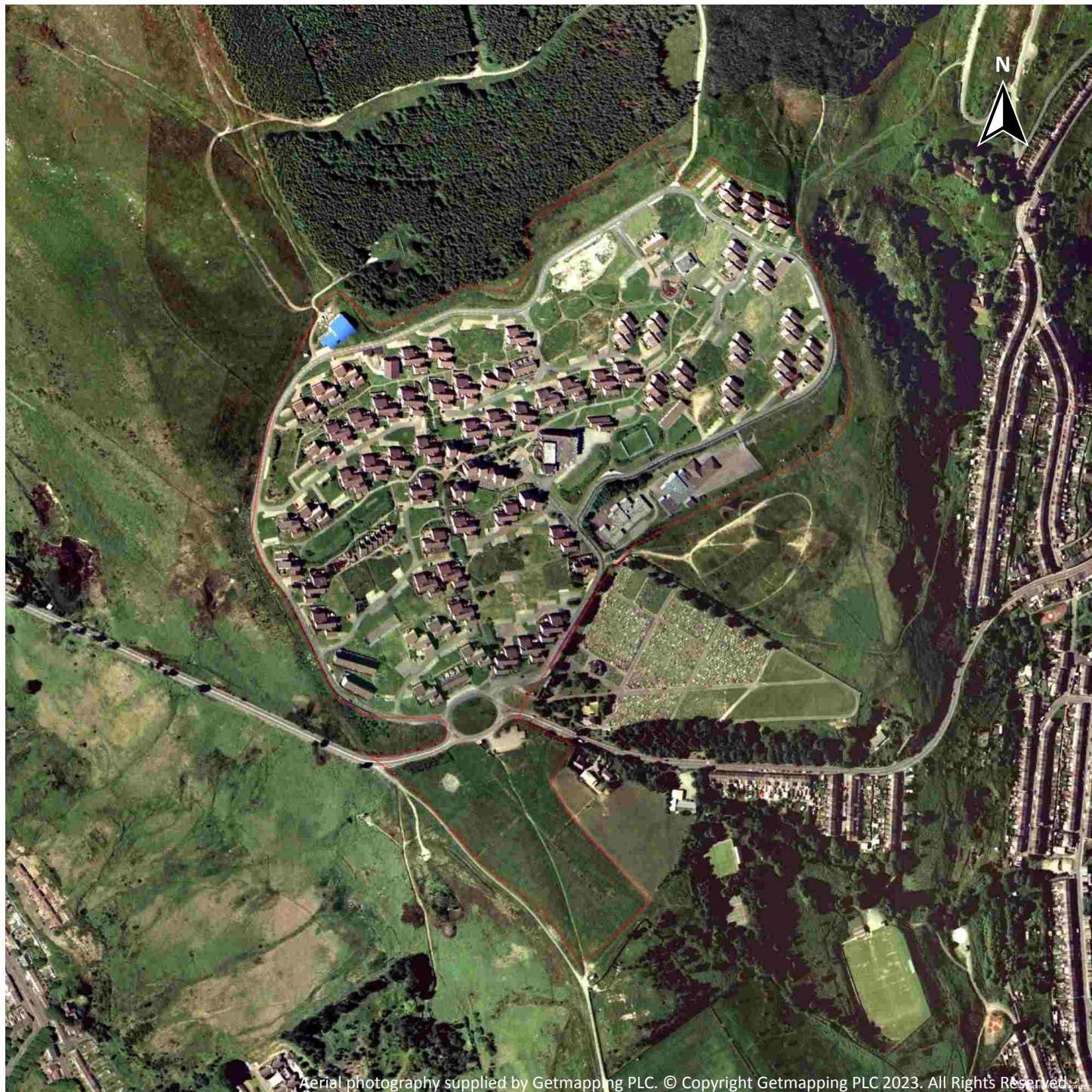


Capture Date: 12/10/2009

Site Area: 29.86ha



Recent site history - 2000 aerial photograph

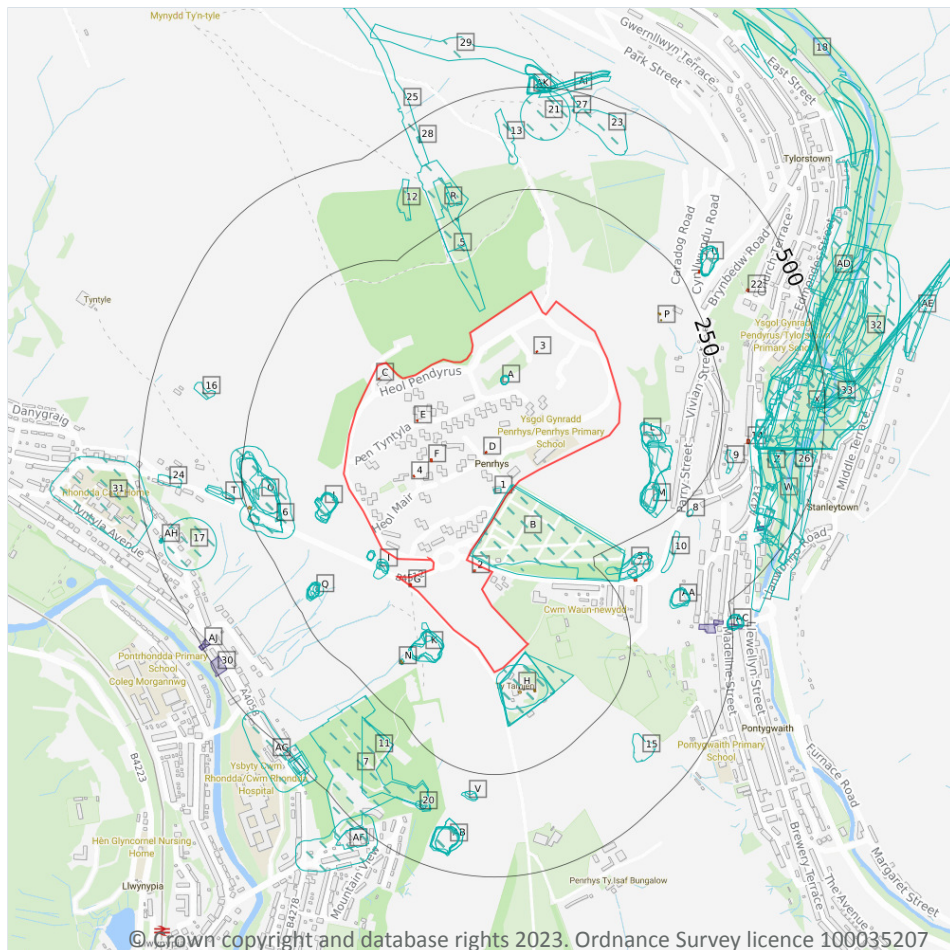


Capture Date: 18/06/2000

Site Area: 29.86ha



1 Past land use



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features
- Historical garages

1.1 Historical industrial land uses

Records within 500m

170

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on [page 14](#) >

ID	Location	Land use	Dates present	Group ID
1	On site	Police Station	1974 - 1989	1192458



ID	Location	Land use	Dates present	Group ID
A	On site	Unspecified Pit	1921	1222537
A	On site	Unspecified Pit	1948	1230844
A	On site	Unspecified Pit	1945	1232950
A	On site	Unspecified Pit	1915	1262851
B	On site	Cemetery	1948	1224379
B	On site	Cemetery	1965 - 1989	1243929
H	4m S	Isolation Hospital	1948	1251139
H	9m S	Isolation Hospital	1915 - 1921	1253770
H	10m S	Isolation Hospital	1948	1250939
H	11m S	Small Pox Hospital	1965 - 1968	1252814
I	19m SW	Unspecified Ground Workings	1948	1262057
I	20m SW	Unspecified Pit	1965 - 1968	1263213
I	21m SW	Unspecified Pit	1921 - 1948	1191856
I	22m SW	Unspecified Quarry	1898	1169631
I	25m SW	Unspecified Pit	1915	1210913
I	26m SW	Unspecified Pit	1921	1185670
I	26m SW	Unspecified Ground Workings	1948	1256863
5	29m N	Railway Sidings	1875	1157619
J	37m W	Unspecified Pit	1965	336195
J	37m W	Disused Quarries and Tips	1990	339159
K	38m S	Unspecified Disused Quarries	1974 - 1989	1257114
K	39m S	Unspecified Quarry	1898 - 1915	1229725
K	39m S	Unspecified Quarry	1948	1249353
J	41m W	Unspecified Quarry	1948	376970
J	44m W	Unspecified Quarry	1915 - 1921	340172
J	45m W	Unspecified Disused Quarries	1948	320754
K	45m S	Unspecified Disused Quarry	1948	1183072
K	45m S	Unspecified Quarry	1921	1244736



ID	Location	Land use	Dates present	Group ID
K	52m S	Unspecified Quarry	1875	1211405
L	52m E	Unspecified Old Quarry	1915	1242166
L	54m E	Unspecified Old Quarry	1945	1212713
L	54m E	Unspecified Old Quarry	1948	1243046
L	54m E	Unspecified Old Quarry	1921	1256488
M	64m E	Unspecified Disused Quarries	1974 - 1989	1204940
J	74m SW	Trial Level	1875	337943
M	85m E	Unspecified Old Quarries	1948	1248794
M	88m E	Unspecified Old Quarries	1915	1195990
M	91m E	Unspecified Old Quarries	1921	1262149
N	140m S	Unspecified Tank	1915 - 1948	1195763
O	141m W	Unspecified Quarries	1948	356708
M	151m E	Unspecified Old Quarries	1948	1193098
M	162m E	Unspecified Quarry	1898	1169632
O	168m W	Unspecified Ground Workings	1965	334131
O	169m W	Unspecified Quarries	1915 - 1921	340601
O	169m W	Unspecified Disused Quarries	1948	320753
O	171m W	Disused Quarries and Tips	1990	339158
Q	173m SW	Unspecified Old Quarry	1898	330464
O	173m W	Unspecified Quarry	1898	325796
Q	174m SW	Unspecified Ground Workings	1948	349137
6	176m W	Old Trial Level	1898	328551
Q	177m SW	Unspecified Ground Workings	1948	372471
Q	177m SW	Unspecified Ground Workings	1915	361491
Q	179m SW	Unspecified Ground Workings	1921	344010
Q	179m SW	Unspecified Disused Quarry	1990	319533
R	183m N	Colliery	1875	1159663
O	230m W	Unspecified Heap	1915	327453



ID	Location	Land use	Dates present	Group ID
R	244m N	Unspecified Shafts	1875	1165426
S	258m SE	Unspecified Disused Quarry	1974 - 1989	1263331
7	267m SW	Hospital	1948 - 1990	2365540
8	267m E	Refuse Heap	1915	1178140
S	270m SE	Unspecified Quarry	1948	1221305
9	272m E	Unspecified Ground Workings	1921	1160428
R	272m N	Engine House	1875	1177820
T	274m W	Unspecified Pit	1948	336194
T	274m W	Unspecified Pits	1915 - 1921	367099
S	276m SE	Unspecified Quarry	1915 - 1921	1233385
R	279m N	Smithy	1875	1188865
10	284m E	Refuse Heap	1915	1178139
S	295m SE	Unspecified Pit	1965 - 1968	1231952
U	296m NE	Unspecified Old Quarry	1915	1191596
V	296m S	Unspecified Disused Tip	1989	1165248
S	297m SE	Unspecified Quarries	1898	1184484
U	297m NE	Unspecified Old Quarry	1921	1246859
U	297m NE	Unspecified Old Quarry	1948	1247744
U	299m NE	Unspecified Pit	1992	1185688
T	299m W	Unspecified Ground Workings	1948	334132
V	299m S	Unspecified Quarry	1921	1169630
U	299m NE	Unspecified Old Quarry	1945	1210829
11	308m SW	Hospital	1974 - 1989	1256852
12	309m N	Railway Sidings	1875	1157620
S	313m SE	Unspecified Quarries	1898	1184485
13	314m N	Unspecified Quarries	1875	1184486
R	322m N	Engine House	1875	1177821
W	324m E	Railway Sidings	1948	1222809



ID	Location	Land use	Dates present	Group ID
X	332m E	Colliery	1915	1217674
Y	333m E	Colliery	1945	1199674
W	334m E	Railway Sidings	1968	1231584
X	334m E	Railway Sidings	1965	1272192
Y	335m E	Unspecified Commercial/Industrial	1948	1159093
X	339m E	Railway Sidings	1948	1260459
15	339m SE	Refuse Heap	1965 - 1968	1262255
Y	341m E	Colliery	1921	1203905
Y	341m E	Railway Sidings	1915 - 1921	1204106
16	343m W	Unspecified Disused Levels	1964 - 1981	376320
W	346m E	Railway Sidings	1921	1211162
17	347m W	Trial Level	1875 - 1898	374691
Z	350m E	Railway Sidings	1898	1189986
18	352m E	Railway Sidings	1945	1236936
19	353m E	Tramway Sidings	1915	1192016
AA	359m SE	Unspecified Old Quarry	1921 - 1948	1246143
Y	363m E	Colliery	1898	1200621
X	364m E	Tramway Sidings	1898	1198334
AA	364m SE	Unspecified Old Quarry	1915	1250392
20	364m S	Refuse Heap	1915	1178138
AA	365m SE	Unspecified Pit	1965 - 1989	1254117
AA	366m SE	Unspecified Old Quarry	1948	1241047
21	372m N	Old Trial Level	1921 - 1948	1253215
W	372m E	Refuse Heap	1915	1217371
AB	373m S	Unspecified Ground Workings	1965 - 1968	1193482
AB	373m S	Unspecified Disused Quarry	1974 - 1989	1201061
Z	374m E	Refuse Heap	1898	1191982
W	374m E	Refuse Heap	1948	1260367



ID	Location	Land use	Dates present	Group ID
Y	383m E	Refuse Heap	1948	1244559
23	387m NE	Unspecified Disused Levels	1965 - 1992	1244687
W	391m E	Railway Buildings	1948	1181754
AB	391m S	Unspecified Quarry	1948	1269273
AB	391m S	Unspecified Quarry	1915	1241345
W	392m E	Railway Building	1948	1172158
AB	394m S	Unspecified Disused Quarry	1948	1227435
Y	394m E	Refuse Heap	1921	1248428
24	396m W	Cuttings	1915 - 1921	346589
AB	396m S	Unspecified Quarry	1921	1222951
25	400m N	Railway Sidings	1875	2367714
W	401m E	Railway Building	1948	1172157
W	403m E	Police Station	1965 - 1968	1194939
W	406m E	Railway Building	1921	1172160
W	407m E	Railway Building	1948	1172159
W	416m E	Railway Buildings	1948	1181753
W	416m E	Railway Building	1948	1172161
26	417m E	Railway Sidings	1898	1260874
W	437m E	Unspecified Heaps	1875	1179540
AD	447m E	Refuse Heap	1948	1267996
AD	451m E	Refuse Heap	1921	1252189
27	452m N	Old Trial Level	1915	1251995
28	454m N	Railway Building	1875	1172168
29	458m N	Unspecified Disused Levels	1965 - 1992	1236677
AE	465m E	Tramway Sidings	1915	1199817
AF	466m S	Soap and Candle Works	1898 - 1948	2367690
AG	468m SW	Water Works	1948	363536
AH	470m W	Trial Level	1948	353177



ID	Location	Land use	Dates present	Group ID
AH	472m W	Trial Level	1915	376475
AH	472m W	Trial Level	1921	340977
AH	473m W	Trial Level	1948	352883
AG	473m SW	Water Works	1915 - 1921	377334
AG	473m SW	Police Station	1965 - 1990	378790
AI	475m N	Tramway Sidings	1921	1248619
31	478m W	Hospital	1948	362345
AG	480m SW	Unspecified Works	1965 - 1990	343774
Y	481m E	Refuse Heap	1948	1209826
32	482m E	Unspecified Mine	1965	1187487
33	482m E	Refuse Heap	1921	1244932
AK	483m N	Unspecified Quarry	1948	1232028
AK	483m N	Unspecified Quarry	1921	1237673
AK	484m N	Unspecified Disused Quarry	1974 - 1992	1269468
AK	485m N	Unspecified Quarry	1915	1245834
AK	486m N	Unspecified Quarry	1945	1190517
AC	488m SE	Unspecified Ground Workings	1989	1239324
AC	488m SE	Unspecified Pit	1974	1242635
AC	488m SE	Unspecified Pit	1921 - 1948	1228335
AG	489m SW	Water Works	1898	347407
AI	489m N	Tramway Sidings	1948	1207051
AC	490m SE	Unspecified Ground Workings	1948	1263685
AC	491m SE	Unspecified Pit	1915	1200590
AI	491m N	Tramway Sidings	1915	1230815
AI	492m N	Tramway Sidings	1945	1236367
AE	493m E	Tramway Sidings	1921	1268024
AF	494m S	Disused Soap and Candle Works	1915 - 1948	2366259
AK	497m N	Refuse Heap	1921	1196399



ID	Location	Land use	Dates present	Group ID
AK	497m N	Refuse Heap	1948	1247974

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	10
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Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on [page 14](#) >

ID	Location	Land use	Dates present	Group ID
H	69m S	Unspecified Tank	1957 - 1993	183915
H	91m S	Unspecified Tank	1960 - 1993	192100
H	91m S	Unspecified Tank	1957	189603
N	144m S	Unspecified Tank	1920	172755
P	157m NE	Unspecified Tank	1961	172758
P	159m NE	Unspecified Tank	1919	172756
P	161m NE	Unspecified Tank	1972	179164
P	162m NE	Unspecified Tank	1996	178573
P	162m NE	Unspecified Tank	1993	191937
O	240m W	Unspecified Tank	1972 - 1993	42223

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	27
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Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.



Features are displayed on the Past land use map on [page 14 >](#)

ID	Location	Land use	Dates present	Group ID
2	On site	Gas Governor	1996	99409
3	On site	Electricity Substation	1972 - 1996	104244
4	On site	Electricity Substation	1972 - 1996	107383
C	On site	Electricity Substation	1972	100091
C	On site	Electricity Substation	1996	100402
C	On site	Electricity Substation	1993	101431
D	On site	Electricity Substation	1996	100404
D	On site	Electricity Substation	1994	101572
D	On site	Electricity Substation	1994	102172
D	On site	Electricity Substation	1993	102193
D	On site	Electricity Substation	1972	102277
E	On site	Electricity Substation	1994	100865
E	On site	Electricity Substation	1996	100867
E	On site	Electricity Substation	1972	100944
E	On site	Electricity Substation	1994	102171
E	On site	Electricity Substation	1993	102400
F	On site	Electricity Substation	1972	102582
F	On site	Electricity Substation	1993 - 1996	103555
G	On site	Electricity Substation	1993 - 1996	102895
G	On site	Electricity Substation	1972	112558
U	290m NE	Electricity Substation	1996	112273
U	293m NE	Electricity Substation	1993	112124
U	293m NE	Electricity Substation	1972	105068
S	302m SE	Electricity Substation	1972	106649
S	302m SE	Electricity Substation	1993 - 1994	112603
14	315m E	Electricity Substation	1972 - 1994	105308
22	377m NE	Electricity Substation	1972 - 1996	110743



This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m

0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m

8

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on [page 14 >](#)

ID	Location	Land use	Dates present	Group ID
AC	419m SE	Garage	1993 - 1994	36920
W	422m E	Garage	1960	33370
W	423m E	Garage	1957 - 1972	36930
AC	456m SE	Garage	1972	32848
30	474m SW	Garage	1987 - 1994	7622
AJ	480m SW	Garage	1961 - 1987	7801
AC	488m SE	Garage	1994	32085
AJ	492m SW	Garage	1961	6926

This data is sourced from Ordnance Survey / Groundsure.



1.6 Historical military land

Records within 500m

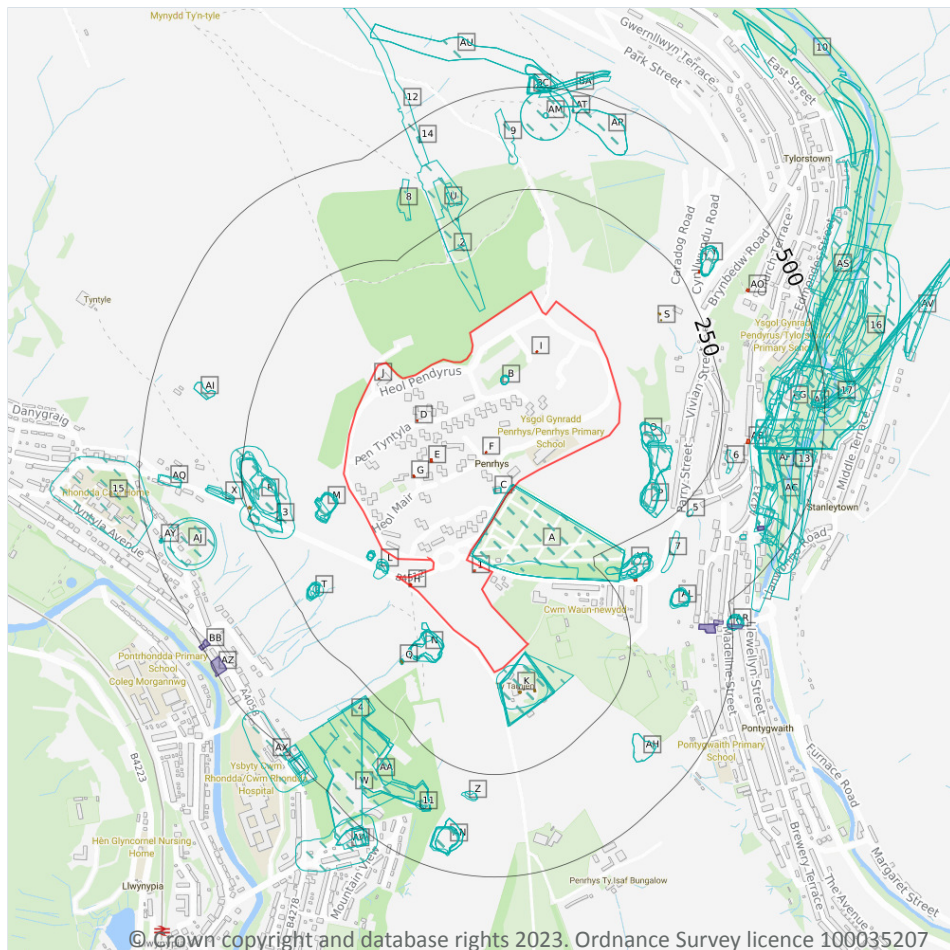
0

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

This data is sourced from Ordnance Survey / Groundsure / other sources.



2 Past land use - un-grouped



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features
- Historical garages

2.1 Historical industrial land uses

Records within 500m

244

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on [page 25 >](#)

ID	Location	Land Use	Date	Group ID
A	On site	Cemetery	1989	1243929
A	On site	Cemetery	1965	1243929
A	On site	Cemetery	1968	1243929



ID	Location	Land Use	Date	Group ID
A	On site	Cemetery	1974	1243929
A	On site	Cemetery	1948	1224379
B	On site	Unspecified Pit	1915	1262851
B	On site	Unspecified Pit	1915	1262851
B	On site	Unspecified Pit	1948	1230844
B	On site	Unspecified Pit	1921	1222537
B	On site	Unspecified Pit	1945	1232950
B	On site	Unspecified Pit	1945	1232950
C	On site	Police Station	1989	1192458
C	On site	Police Station	1974	1192458
K	4m S	Isolation Hospital	1948	1251139
K	9m S	Isolation Hospital	1915	1253770
K	10m S	Isolation Hospital	1948	1250939
K	11m S	Isolation Hospital	1921	1253770
K	11m S	Small Pox Hospital	1968	1252814
K	11m S	Small Pox Hospital	1965	1252814
L	19m SW	Unspecified Ground Workings	1948	1262057
L	20m SW	Unspecified Pit	1965	1263213
L	20m SW	Unspecified Pit	1968	1263213
L	21m SW	Unspecified Pit	1948	1191856
L	22m SW	Unspecified Quarry	1898	1169631
L	25m SW	Unspecified Pit	1915	1210913
L	25m SW	Unspecified Pit	1948	1191856
L	25m SW	Unspecified Pit	1948	1191856
L	26m SW	Unspecified Pit	1921	1185670
L	26m SW	Unspecified Ground Workings	1948	1256863
L	26m SW	Unspecified Ground Workings	1948	1256863
L	26m SW	Unspecified Pit	1921	1191856



ID	Location	Land Use	Date	Group ID
2	29m N	Railway Sidings	1875	1157619
M	37m W	Unspecified Pit	1965	336195
M	37m W	Disused Quarries and Tips	1990	339159
N	38m S	Unspecified Disused Quarries	1989	1257114
N	38m S	Unspecified Disused Quarries	1974	1257114
N	39m S	Unspecified Quarry	1915	1229725
N	39m S	Unspecified Quarry	1898	1229725
N	39m S	Unspecified Quarry	1948	1249353
M	41m W	Unspecified Quarry	1948	376970
M	44m W	Unspecified Quarry	1915	340172
M	45m W	Unspecified Disused Quarries	1948	320754
N	45m S	Unspecified Disused Quarry	1948	1183072
N	45m S	Unspecified Quarry	1921	1244736
M	46m W	Unspecified Quarry	1921	340172
N	52m S	Unspecified Quarry	1875	1211405
O	52m E	Unspecified Old Quarry	1915	1242166
O	52m E	Unspecified Old Quarry	1915	1242166
O	54m E	Unspecified Old Quarry	1945	1212713
O	54m E	Unspecified Old Quarry	1948	1243046
O	54m E	Unspecified Old Quarry	1921	1256488
P	64m E	Unspecified Disused Quarries	1989	1204940
P	64m E	Unspecified Disused Quarries	1974	1204940
M	74m SW	Trial Level	1875	337943
P	85m E	Unspecified Old Quarries	1948	1248794
P	88m E	Unspecified Old Quarries	1915	1195990
P	91m E	Unspecified Old Quarries	1921	1262149
P	92m E	Unspecified Old Quarries	1948	1248794
Q	140m S	Unspecified Tank	1948	1195763



ID	Location	Land Use	Date	Group ID
R	141m W	Unspecified Quarries	1948	356708
Q	142m S	Unspecified Tank	1915	1195763
Q	144m S	Unspecified Tank	1948	1195763
Q	145m S	Unspecified Tank	1921	1195763
P	151m E	Unspecified Old Quarries	1948	1193098
P	162m E	Unspecified Quarry	1898	1169632
R	168m W	Unspecified Ground Workings	1965	334131
R	169m W	Unspecified Quarries	1915	340601
R	169m W	Unspecified Disused Quarries	1948	320753
R	171m W	Unspecified Quarries	1921	340601
R	171m W	Disused Quarries and Tips	1990	339158
T	173m SW	Unspecified Old Quarry	1898	330464
R	173m W	Unspecified Quarry	1898	325796
T	174m SW	Unspecified Ground Workings	1948	349137
3	176m W	Old Trial Level	1898	328551
T	177m SW	Unspecified Ground Workings	1948	372471
T	177m SW	Unspecified Ground Workings	1948	372471
T	177m SW	Unspecified Ground Workings	1915	361491
T	179m SW	Unspecified Ground Workings	1921	344010
T	179m SW	Unspecified Disused Quarry	1990	319533
U	183m N	Colliery	1875	1159663
R	230m W	Unspecified Heap	1915	327453
U	244m N	Unspecified Shafts	1875	1165426
V	258m SE	Unspecified Disused Quarry	1989	1263331
V	258m SE	Unspecified Disused Quarry	1974	1263331
4	267m SW	Hospital	1948	2365540
5	267m E	Refuse Heap	1915	1178140
V	270m SE	Unspecified Quarry	1948	1221305



ID	Location	Land Use	Date	Group ID
6	272m E	Unspecified Ground Workings	1921	1160428
U	272m N	Engine House	1875	1177820
W	273m SW	Hospital	1948	2365540
X	274m W	Unspecified Pit	1948	336194
X	274m W	Unspecified Pits	1915	367099
V	276m SE	Unspecified Quarry	1921	1233385
X	276m W	Unspecified Pits	1921	367099
U	279m N	Smithy	1875	1188865
W	281m SW	Hospital	1990	2365540
W	281m SW	Hospital	1965	2365540
V	282m SE	Unspecified Quarry	1915	1233385
7	284m E	Refuse Heap	1915	1178139
V	284m SE	Unspecified Quarry	1948	1221305
V	295m SE	Unspecified Pit	1965	1231952
V	295m SE	Unspecified Pit	1968	1231952
Y	296m NE	Unspecified Old Quarry	1915	1191596
Y	296m NE	Unspecified Old Quarry	1915	1191596
Z	296m S	Unspecified Disused Tip	1989	1165248
V	297m SE	Unspecified Quarries	1898	1184484
Y	297m NE	Unspecified Old Quarry	1948	1247744
Y	297m NE	Unspecified Old Quarry	1921	1246859
Y	299m NE	Unspecified Pit	1992	1185688
X	299m W	Unspecified Ground Workings	1948	334132
Z	299m S	Unspecified Quarry	1921	1169630
Y	299m NE	Unspecified Old Quarry	1945	1210829
AA	303m S	Hospital	1965	2365540
AA	303m S	Hospital	1968	2365540
AA	308m SW	Hospital	1989	1256852



ID	Location	Land Use	Date	Group ID
AA	308m SW	Hospital	1974	1256852
8	309m N	Railway Sidings	1875	1157620
V	313m SE	Unspecified Quarries	1898	1184485
9	314m N	Unspecified Quarries	1875	1184486
U	322m N	Engine House	1875	1177821
AC	324m E	Railway Sidings	1948	1222809
AD	332m E	Colliery	1915	1217674
AD	332m E	Colliery	1915	1217674
AE	333m E	Colliery	1945	1199674
AE	333m E	Colliery	1945	1199674
AC	334m E	Railway Sidings	1968	1231584
AF	334m E	Railway Sidings	1965	1272192
AG	335m E	Unspecified Commercial/Industrial	1948	1159093
AD	339m E	Railway Sidings	1948	1260459
AH	339m SE	Refuse Heap	1965	1262255
AH	339m SE	Refuse Heap	1968	1262255
AD	341m E	Railway Sidings	1921	1204106
AG	341m E	Colliery	1921	1203905
AI	343m W	Unspecified Disused Levels	1981	376320
AI	343m W	Unspecified Disused Levels	1964	376320
AC	346m E	Railway Sidings	1921	1211162
AC	346m E	Railway Sidings	1948	1222809
AJ	347m W	Trial Level	1898	374691
AC	348m E	Railway Sidings	1915	1204106
AF	350m E	Railway Sidings	1898	1189986
AJ	351m W	Trial Level	1875	374691
10	352m E	Railway Sidings	1945	1236936
AK	353m E	Tramway Sidings	1915	1192016



ID	Location	Land Use	Date	Group ID
AK	353m E	Tramway Sidings	1915	1192016
AD	357m E	Railway Sidings	1965	1272192
AL	359m SE	Unspecified Old Quarry	1921	1246143
AL	362m SE	Unspecified Old Quarry	1948	1246143
AE	363m E	Colliery	1898	1200621
AD	364m E	Tramway Sidings	1898	1198334
AL	364m SE	Unspecified Old Quarry	1915	1250392
11	364m S	Refuse Heap	1915	1178138
AL	365m SE	Unspecified Pit	1989	1254117
AL	365m SE	Unspecified Pit	1965	1254117
AL	365m SE	Unspecified Pit	1968	1254117
AL	365m SE	Unspecified Pit	1974	1254117
AL	366m SE	Unspecified Old Quarry	1948	1241047
AM	372m N	Old Trial Level	1948	1253215
AM	372m N	Old Trial Level	1921	1253215
AC	372m E	Refuse Heap	1915	1217371
AN	373m S	Unspecified Disused Quarry	1989	1201061
AN	373m S	Unspecified Disused Quarry	1974	1201061
AN	373m S	Unspecified Ground Workings	1965	1193482
AN	373m S	Unspecified Ground Workings	1968	1193482
AF	374m E	Refuse Heap	1898	1191982
AC	374m E	Refuse Heap	1948	1260367
AC	374m E	Refuse Heap	1948	1260367
AG	383m E	Refuse Heap	1948	1244559
AP	387m NE	Unspecified Disused Levels	1992	1244687
AP	387m NE	Unspecified Disused Levels	1974	1244687
AP	387m NE	Unspecified Disused Levels	1965	1244687
AC	391m E	Railway Buildings	1948	1181754



ID	Location	Land Use	Date	Group ID
AN	391m S	Unspecified Quarry	1948	1269273
AN	391m S	Unspecified Quarry	1915	1241345
AC	392m E	Railway Building	1948	1172158
AN	394m S	Unspecified Disused Quarry	1948	1227435
AG	394m E	Refuse Heap	1921	1248428
AQ	396m W	Cuttings	1921	346589
AN	396m S	Unspecified Quarry	1921	1222951
AQ	398m W	Cuttings	1915	346589
12	400m N	Railway Sidings	1875	2367714
AC	401m E	Railway Building	1948	1172157
AC	403m E	Police Station	1965	1194939
AC	403m E	Police Station	1968	1194939
AC	406m E	Railway Building	1921	1172160
AC	407m E	Railway Building	1948	1172159
AC	416m E	Railway Buildings	1948	1181753
AC	416m E	Railway Building	1948	1172161
13	417m E	Railway Sidings	1898	1260874
AM	425m N	Old Trial Level	1945	1253215
AM	425m N	Old Trial Level	1945	1253215
AC	437m E	Unspecified Heaps	1875	1179540
AS	447m E	Refuse Heap	1948	1267996
AS	451m E	Refuse Heap	1921	1252189
AT	452m N	Old Trial Level	1915	1251995
AT	452m N	Old Trial Level	1915	1251995
14	454m N	Railway Building	1875	1172168
AU	458m N	Unspecified Disused Levels	1992	1236677
AU	458m N	Unspecified Disused Levels	1974	1236677
AU	458m N	Unspecified Disused Levels	1965	1236677



ID	Location	Land Use	Date	Group ID
AV	465m E	Tramway Sidings	1915	1199817
AV	465m E	Tramway Sidings	1915	1199817
AW	466m S	Soap and Candle Works	1948	2367690
AX	468m SW	Water Works	1948	363536
AY	470m W	Trial Level	1948	353177
AY	472m W	Trial Level	1915	376475
AY	472m W	Trial Level	1921	340977
AY	473m W	Trial Level	1948	352883
AX	473m SW	Water Works	1915	377334
AX	473m SW	Police Station	1990	378790
AX	473m SW	Police Station	1965	378790
BA	475m N	Tramway Sidings	1921	1248619
15	478m W	Hospital	1948	362345
AX	479m SW	Water Works	1921	377334
AX	480m SW	Unspecified Works	1990	343774
AX	480m SW	Unspecified Works	1965	343774
AE	481m E	Refuse Heap	1948	1209826
16	482m E	Unspecified Mine	1965	1187487
17	482m E	Refuse Heap	1921	1244932
BC	483m N	Unspecified Quarry	1948	1232028
BC	483m N	Unspecified Quarry	1921	1237673
BC	484m N	Unspecified Disused Quarry	1992	1269468
BC	484m N	Unspecified Disused Quarry	1974	1269468
BC	485m N	Unspecified Quarry	1915	1245834
BC	485m N	Unspecified Quarry	1915	1245834
BC	486m N	Unspecified Quarry	1945	1190517
AR	488m SE	Unspecified Ground Workings	1989	1239324
AR	488m SE	Unspecified Pit	1974	1242635



ID	Location	Land Use	Date	Group ID
AR	488m SE	Unspecified Pit	1921	1228335
AX	489m SW	Water Works	1898	347407
BA	489m N	Tramway Sidings	1948	1207051
AR	490m SE	Unspecified Ground Workings	1948	1263685
AR	490m SE	Unspecified Ground Workings	1948	1263685
AR	491m SE	Unspecified Pit	1915	1200590
BA	491m N	Tramway Sidings	1915	1230815
BA	491m N	Tramway Sidings	1915	1230815
BA	492m N	Tramway Sidings	1945	1236367
AR	493m SE	Unspecified Pit	1948	1228335
AV	493m E	Tramway Sidings	1921	1268024
AW	494m S	Disused Soap and Candle Works	1915	2366259
AW	494m S	Soap and Candle Works	1898	2367690
AW	495m S	Disused Soap and Candle Works	1948	2366259
BC	497m N	Refuse Heap	1948	1247974
BC	497m N	Refuse Heap	1921	1196399
AW	497m S	Disused Soap and Candle Works	1921	2366259

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m

16

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on [page 25 >](#)

ID	Location	Land Use	Date	Group ID
K	69m S	Unspecified Tank	1960	183915
K	69m S	Unspecified Tank	1988	183915
K	70m S	Unspecified Tank	1993	183915



ID	Location	Land Use	Date	Group ID
K	70m S	Unspecified Tank	1957	183915
K	91m S	Unspecified Tank	1988	192100
K	91m S	Unspecified Tank	1960	192100
K	91m S	Unspecified Tank	1957	189603
K	91m S	Unspecified Tank	1993	192100
Q	144m S	Unspecified Tank	1920	172755
S	157m NE	Unspecified Tank	1961	172758
S	159m NE	Unspecified Tank	1919	172756
S	161m NE	Unspecified Tank	1972	179164
S	162m NE	Unspecified Tank	1996	178573
S	162m NE	Unspecified Tank	1993	191937
R	240m W	Unspecified Tank	1993	42223
R	240m W	Unspecified Tank	1972	42223

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m

46

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on [page 25 >](#)

ID	Location	Land Use	Date	Group ID
1	On site	Gas Governor	1996	99409
D	On site	Electricity Substation	1994	100865
D	On site	Electricity Substation	1996	100867
D	On site	Electricity Substation	1972	100944
D	On site	Electricity Substation	1994	102171
D	On site	Electricity Substation	1993	102400
E	On site	Electricity Substation	1994	103555



ID	Location	Land Use	Date	Group ID
E	On site	Electricity Substation	1996	103555
E	On site	Electricity Substation	1972	102582
E	On site	Electricity Substation	1994	103555
E	On site	Electricity Substation	1993	103555
F	On site	Electricity Substation	1994	101572
F	On site	Electricity Substation	1996	100404
F	On site	Electricity Substation	1972	102277
F	On site	Electricity Substation	1994	102172
F	On site	Electricity Substation	1993	102193
G	On site	Electricity Substation	1994	107383
G	On site	Electricity Substation	1996	107383
G	On site	Electricity Substation	1972	107383
G	On site	Electricity Substation	1994	107383
G	On site	Electricity Substation	1993	107383
H	On site	Electricity Substation	1994	102895
H	On site	Electricity Substation	1996	102895
H	On site	Electricity Substation	1972	112558
H	On site	Electricity Substation	1994	102895
H	On site	Electricity Substation	1993	102895
I	On site	Electricity Substation	1996	104244
I	On site	Electricity Substation	1972	104244
I	On site	Electricity Substation	1993	104244
J	On site	Electricity Substation	1996	100402
J	On site	Electricity Substation	1972	100091
J	On site	Electricity Substation	1993	101431
Y	290m NE	Electricity Substation	1996	112273
Y	293m NE	Electricity Substation	1993	112124
Y	293m NE	Electricity Substation	1972	105068



ID	Location	Land Use	Date	Group ID
V	302m SE	Electricity Substation	1972	106649
V	302m SE	Electricity Substation	1994	112603
V	302m SE	Electricity Substation	1993	112603
V	302m SE	Electricity Substation	1994	112603
AB	315m E	Electricity Substation	1994	105308
AB	315m E	Electricity Substation	1993	105308
AB	315m E	Electricity Substation	1994	105308
AB	315m E	Electricity Substation	1972	105308
AO	377m NE	Electricity Substation	1996	110743
AO	377m NE	Electricity Substation	1993	110743
AO	378m NE	Electricity Substation	1972	110743

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m	0
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Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m	13
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Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on [page 25 >](#)

ID	Location	Land Use	Date	Group ID
AR	419m SE	Garage	1994	36920
AR	419m SE	Garage	1993	36920



ID	Location	Land Use	Date	Group ID
AR	419m SE	Garage	1994	36920
AC	422m E	Garage	1960	33370
AC	423m E	Garage	1957	36930
AC	423m E	Garage	1972	36930
AR	456m SE	Garage	1972	32848
AZ	474m SW	Garage	1994	7622
AZ	476m SW	Garage	1987	7622
BB	480m SW	Garage	1961	7801
BB	480m SW	Garage	1987	7801
AR	488m SE	Garage	1994	32085
BB	492m SW	Garage	1961	6926

This data is sourced from Ordnance Survey / Groundsure.



3 Waste and landfill

3.1 Active or recent landfill

Records within 500m

0

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m

0

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m

0

Landfill sites identified from Local Authority records and high detail historical mapping.

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m

0

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m

0

Waste site records derived from Local Authority planning records and high detail historical mapping.

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.



3.6 Licensed waste sites

Records within 500m

0

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.7 Waste exemptions

Records within 500m

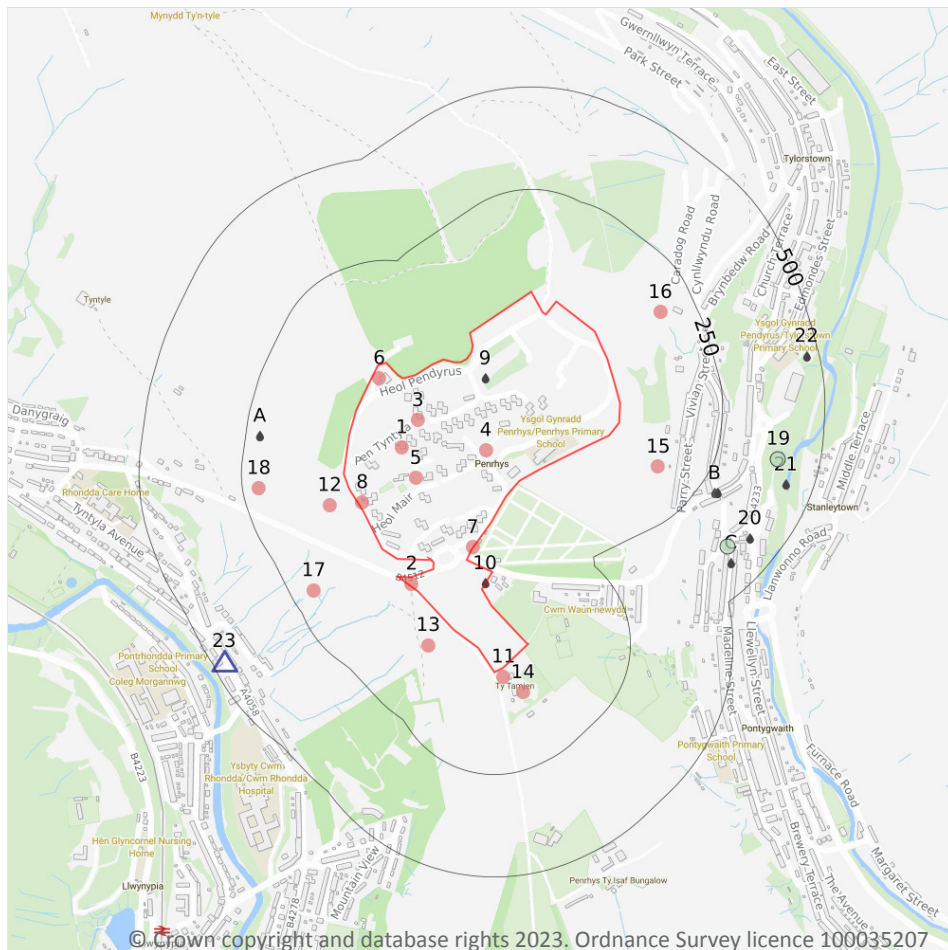
0

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

This data is sourced from the Environment Agency and Natural Resources Wales.



4 Current industrial land use



- Site Outline
- Search buffers in metres (m)
- Recent industrial land uses
- △ Current or recent petrol stations
- ◆ Licensed Discharges to controlled waters
- Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m

16

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on [page 41](#) >

ID	Location	Company	Address	Activity	Category
1	On site	Rhondda Records	226, Pen Tyntyla, Pen-Rhys, Ferndale, Mid Glamorgan, CF43 3RB	Recording Studios and Record Companies	IT, Advertising, Marketing and Media Services
2	On site	Electricity Sub Station	Mid Glamorgan, CF43	Electrical Features	Infrastructure and Facilities



ID	Location	Company	Address	Activity	Category
3	On site	Electricity Sub Station	Mid Glamorgan, CF43	Electrical Features	Infrastructure and Facilities
4	On site	Electricity Sub Station	Mid Glamorgan, CF43	Electrical Features	Infrastructure and Facilities
5	On site	Electricity Sub Station	Mid Glamorgan, CF43	Electrical Features	Infrastructure and Facilities
6	On site	Electricity Sub Station	Mid Glamorgan, CF41	Electrical Features	Infrastructure and Facilities
7	On site	Gas Governor Station	Mid Glamorgan, CF43	Gas Features	Infrastructure and Facilities
8	On site	Pumping Station	Mid Glamorgan, CF43	Water Pumping Stations	Industrial Features
11	20m S	Gas Governor	Mid Glamorgan, CF43	Gas Features	Infrastructure and Facilities
12	61m W	Quarry and Tip (Disused)	Mid Glamorgan, CF41	Refuse Disposal Facilities	Infrastructure and Facilities
13	71m S	Quarry (Disused)	Mid Glamorgan, CF43	Unspecified Quarries Or Mines	Extractive Industries
14	77m S	Tank	Mid Glamorgan, CF43	Tanks (Generic)	Industrial Features
15	141m E	Quarries (Disused)	Mid Glamorgan, CF43	Unspecified Quarries Or Mines	Extractive Industries
16	165m NE	Tank	Mid Glamorgan, CF43	Tanks (Generic)	Industrial Features
17	195m SW	Quarry (Disused)	Mid Glamorgan, CF40	Unspecified Quarries Or Mines	Extractive Industries
18	211m W	Quarry and Tips (Disused)	Mid Glamorgan, CF41	Refuse Disposal Facilities	Infrastructure and Facilities

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m

1

Open, closed, under development and obsolete petrol stations.

Features are displayed on the Current industrial land use map on [page 41](#) >



ID	Location	Company	Address	LPG	Status
23	472m SW	TEXACO	Tyntyla Road, Llwynpia, Tonypany, Rhondda Cynon Taf, CF40 2SX	Not Applicable	Obsolete

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m	0
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High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m	0
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High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m	0
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Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m	0
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Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m

0

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m

0

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m

0

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.10 Licensed industrial activities (Part A(1))

Records within 500m

0

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m

0

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m

0

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.13 Licensed Discharges to controlled waters

Records within 500m

10

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

Features are displayed on the Current industrial land use map on [page 41](#) >

ID	Location	Address	Details	
9	On site	PENRHYS (ESTATE)	Effluent Type: UNSPECIFIED Permit Number: AM0008101 Permit Version: 1 Receiving Water: SOAKAWAY	Status: CONSENT EXPIRED - TIME LIMIT Issue date: 02/10/1989 Effective Date: 02/10/1989 Revocation Date: 14/03/1994
10	On site	PENRHYS (HILL)	Effluent Type: UNSPECIFIED Permit Number: AM0008201 Permit Version: 1 Receiving Water: SOAKAWAY	Status: CONSENT EXPIRED - TIME LIMIT Issue date: 02/10/1989 Effective Date: 02/10/1989 Revocation Date: 14/03/1994
A	216m W	REES STREET PUMPING STATION GELLI, REES STREET PUMPING STATION, REES STREET, GELLI, RHONDDA CYNON TAFF	Effluent Type: SEWAGE DISCHARGES - PUMPING STATION - WATER COMPANY Permit Number: AE2018407 Permit Version: 3 Receiving Water: RHONDDA FAWR	Status: Effective Issue date: 15/02/2002 Effective Date: 16/02/2002 Revocation Date: -
A	216m W	REES STREET PUMPING STATION GELLI, REES STREET PUMPING STATION, REES STREET, GELLI, RHONDDA CYNON TAFF	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: AE2018407 Permit Version: 3 Receiving Water: RHONDDA FAWR	Status: Effective Issue date: 15/02/2002 Effective Date: 16/02/2002 Revocation Date: -
B	289m E	TYLORSTOWN - JUNCTION BRONDEG	Effluent Type: UNSPECIFIED Permit Number: AN0117701 Permit Version: 1 Receiving Water: RHONDDA FACH	Status: NEW CONSENT, BY APPLICATION (WRA 91, SECTION 88) Issue date: 20/10/1989 Effective Date: 20/10/1989 Revocation Date: 30/03/2004



ID	Location	Address	Details	
B	295m E	JUNCT OF BRONDEG AND PENRHYS ST CSO, Jct of Brondeg St / Penrhys St, Tylorstown, Rhondda, CF43 3AS	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: AN0117701 Permit Version: 0 Receiving Water: THE RHONDDA FACH RIVER	Status: Effective Issue date: 11/10/2019 Effective Date: 11/10/2019 Revocation Date: -
20	424m E	Ferndale Road CSO Tylorstown RCT, Nr 17 Ferndale Rd, Tylorstown, Ferndale, CF43 3HB	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: AN0350301 Permit Version: 0 Receiving Water: River Rhondda Fach	Status: Effective Issue date: 11/10/2019 Effective Date: 11/10/2019 Revocation Date: -
C	429m SE	TYLORSTOWN - DERI STREET	Effluent Type: UNSPECIFIED Permit Number: AN0118901 Permit Version: 1 Receiving Water: RHONDDA FACH	Status: REVOKED (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV Issue date: 20/10/1989 Effective Date: 20/10/1989 Revocation Date: 31/03/2004
21	433m E	FERNDAL ROAD CSO TYLORSTOWN RCT, FERNDAL ROAD CSO, ASSET NUMBER 71189, TYLORSTOWN, RHONDDA CYNON TAFF	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: AN0350301 Permit Version: 1 Receiving Water: THE RHONDDA FACH RIVER	Status: Effective Issue date: 31/10/2003 Effective Date: 31/03/2004 Revocation Date: -
22	469m E	R/O Tylorstown Primary School CSO Tylorstown, Rear Tylorstown Primary School Edmondes St, Tylorstown, Ferndale, CF43 3HH	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: AN0350501 Permit Version: 2 Receiving Water: Afon Rhondda Fach	Status: Effective Issue date: 21/08/2020 Effective Date: 21/08/2020 Revocation Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

4.14 Pollutant release to surface waters (Red List)

Records within 500m

0

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.



4.15 Pollutant release to public sewer

Records within 500m

0

Discharges of Special Category Effluents to the public sewer.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

Records within 500m

0

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m

0

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m

2

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

Features are displayed on the Current industrial land use map on [page 41](#) >

ID	Location	Details	
C	396m E	Incident Date: 29/10/2014 Incident Identification: 1290226 Pollutant: Contaminated Water Pollutant Description: Firefighting Run-Off	Water Impact: - Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
19	398m E	Incident Date: 11/02/2014 Incident Identification: 1205976 Pollutant: Sewage Materials Pollutant Description: Grey Water	Water Impact: - Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

This data is sourced from the Environment Agency and Natural Resources Wales.

4.19 Pollution inventory substances

Records within 500m

0

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.20 Pollution inventory waste transfers

Records within 500m

0

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.21 Pollution inventory radioactive waste

Records within 500m

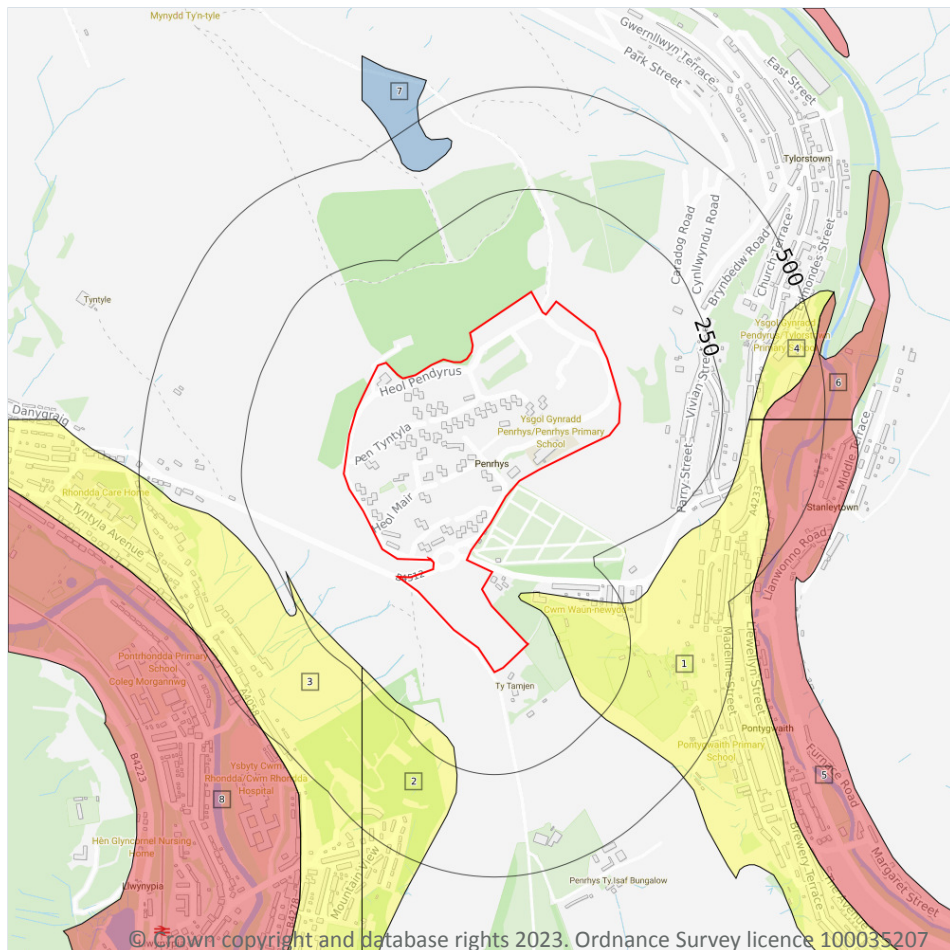
0

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.



5 Hydrogeology - Superficial aquifer



- Site Outline**
- Search buffers in metres (m)**
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive
 - Unknown

5.1 Superficial aquifer

Records within 500m

8

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on [page 49 >](#)

ID	Location	Designation	Description
1	62m S	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
2	195m S	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

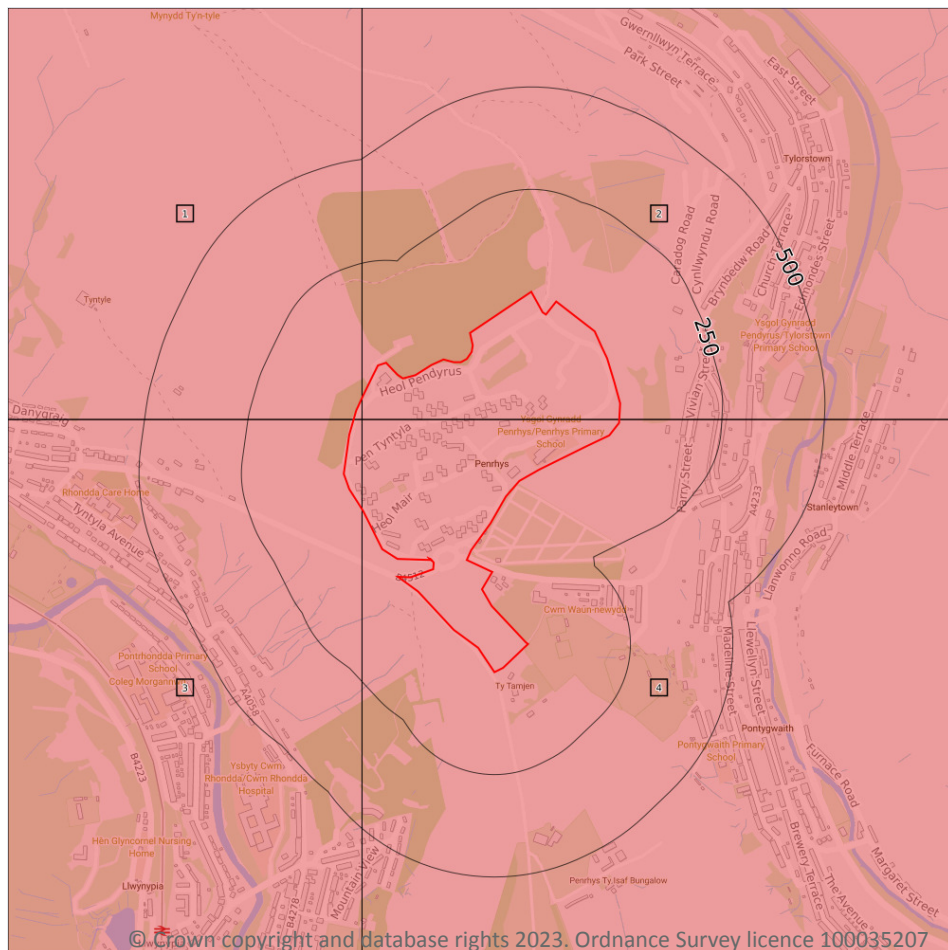


ID	Location	Designation	Description
3	219m SW	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
4	317m E	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
5	349m E	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
6	352m E	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
7	391m N	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
8	479m SW	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Bedrock aquifer



- Site Outline
- Search buffers in metres (m)
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive

5.2 Bedrock aquifer

Records within 500m

4

Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on [page 51](#) >

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

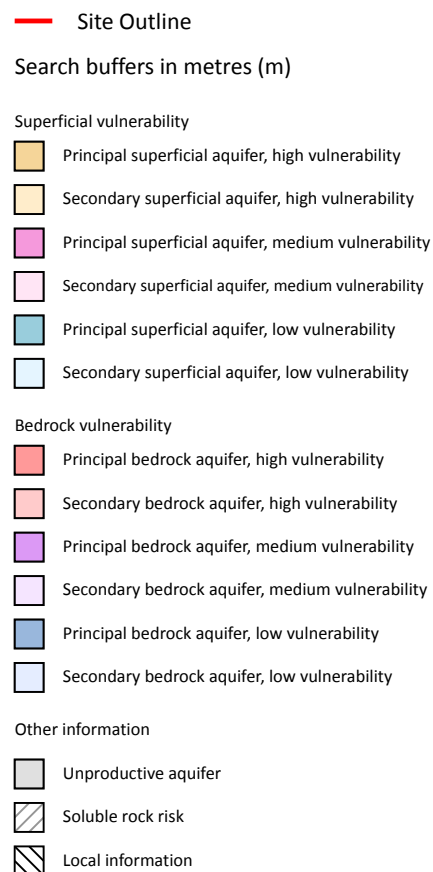
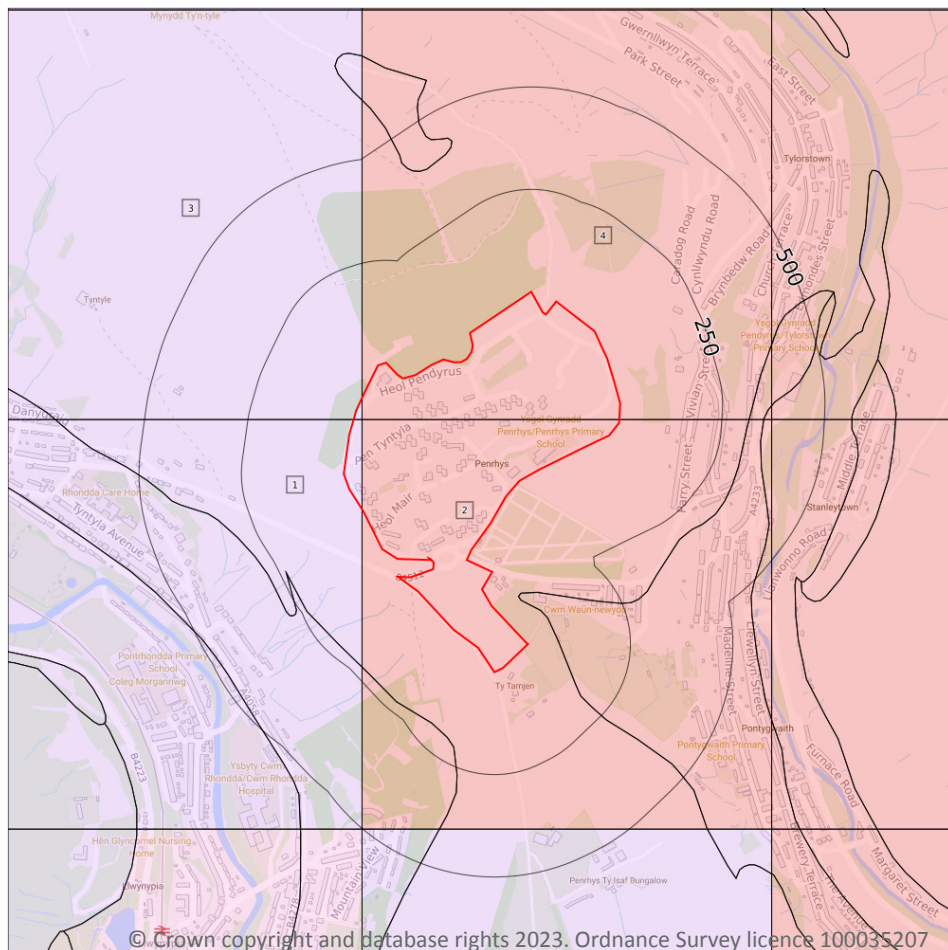


ID	Location	Designation	Description
3	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
4	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Groundwater vulnerability



5.3 Groundwater vulnerability

Records within 50m

4

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on [page 53](#) >



ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary bedrock aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: >550mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: Medium Aquifer type: Secondary Flow mechanism: Well connected fractures
2	On site	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: <40% Dilution value: >550mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures
3	On site	Summary Classification: Secondary bedrock aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: >550mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: Medium Aquifer type: Secondary Flow mechanism: Well connected fractures
4	On site	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: <40% Dilution value: >550mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site

0

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

This data is sourced from the British Geological Survey and the Environment Agency.

5.5 Groundwater vulnerability- local information

Records on site

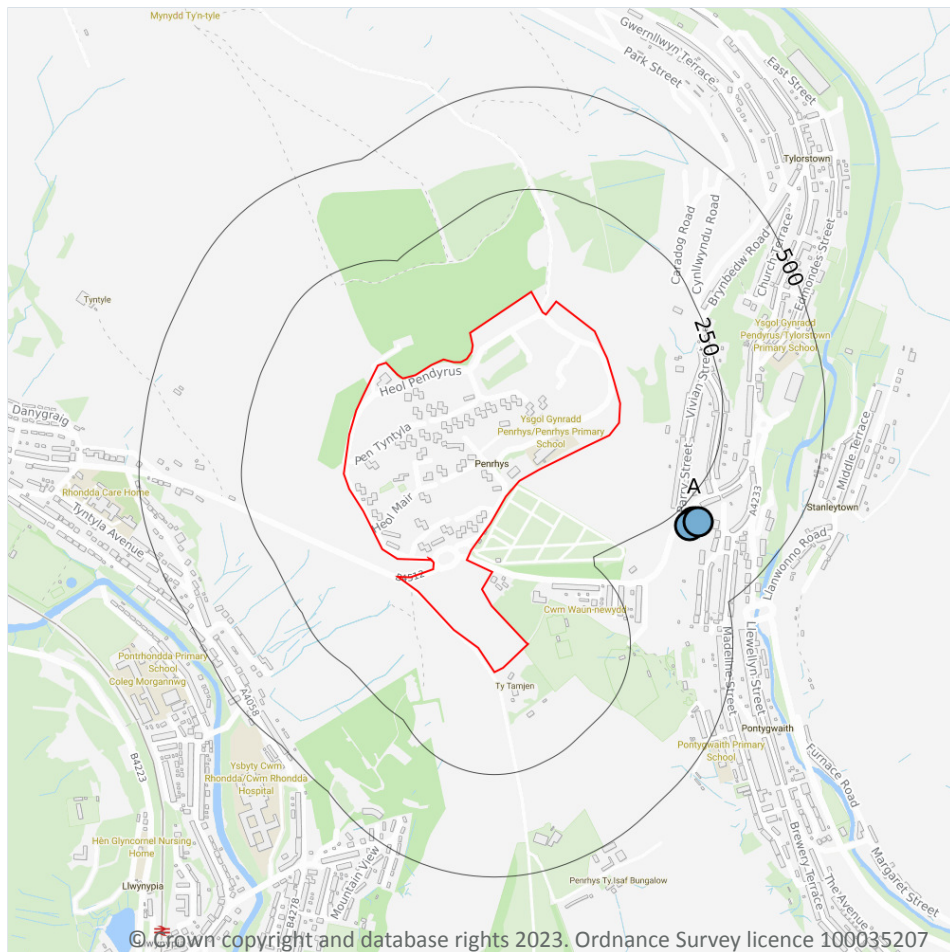
0

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk ↗.

This data is sourced from the British Geological Survey and the Environment Agency.



Abstractions and Source Protection Zones



- Site Outline
- Search buffers in metres (m)
- Source Protection Zone 1
Inner catchment
- Source Protection Zone 2
Outer catchment
- Source Protection Zone 3
Total catchment
- Source Protection Zone 4
Zone of Special Interest
- Source Protection Zone 1c
Inner catchment - confined aquifer
- Source Protection Zone 2c
Outer catchment - confined aquifer
- Source Protection Zone 3c
Total catchment - confined aquifer
- Drinking water abstraction licences
Point features
- Drinking water abstraction licences
Polygon features
- Drinking water abstraction licences
Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

5.6 Groundwater abstractions

Records within 2000m

3

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on [page 55](#) >

ID	Location	Details	
-	1161m S	Status: Historical Licence No: 21/57/24/0052 Details: Spray Irrigation - Direct Direct Source: EAW Groundwater Point: BOREHOLE AT RHONDDA GOLF CLUB Data Type: Point Name: Rhondda Golf ClubHouse Ltd Easting: 300580 Northing: 193250	Annual Volume (m ³): 5307 Max Daily Volume (m ³): 25 Original Application No: - Original Start Date: 04/08/1994 Expiry Date: - Issue No: 100 Version Start Date: 01/06/2004 Version End Date: -
-	1161m S	Status: Historical Licence No: 21/57/24/0052 Details: Spray Irrigation - Direct - High Direct Source: - Point: - Data Type: Point Name: - Easting: 300580 Northing: 193250	Annual Volume (m ³): 5307 Max Daily Volume (m ³): 24.96 Original Application No: - Original Start Date: 01/06/2004 Expiry Date: - Issue No: - Version Start Date: - Version End Date: -
-	1161m S	Status: Active Licence No: 21/57/24/0052 Details: Spray Irrigation - Direct - High Direct Source: - Point: - Data Type: Point Name: - Easting: 300580 Northing: 193250	Annual Volume (m ³): 5307 Max Daily Volume (m ³): 25 Original Application No: - Original Start Date: 01/06/2004 Expiry Date: - Issue No: - Version Start Date: - Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.7 Surface water abstractions

Records within 2000m

3

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on [page 55 >](#)



ID	Location	Details	
A	295m E	Status: Historical Licence No: 21/57/24/0054 Details: Lake & Pond Throughflow Direct Source: EAW Surface Water Point: UN-NAMED SPRING AT MAERDY AND FERNDAL ANGLING CLUB Data Type: Point Name: Maerdy and Ferndal Angling Club Easting: 300810 Northing: 194750	Annual Volume (m ³): 365000 Max Daily Volume (m ³): 1000 Original Application No: - Original Start Date: 16/03/2007 Expiry Date: 31/03/2017 Issue No: 1 Version Start Date: 16/03/2007 Version End Date: -
A	295m E	Status: Historical Licence No: 21/57/24/0054 Details: Lake & Pond Throughflow Direct Source: EAW Surface Water Point: UN-NAMED SPRING AT MAERDY AND FERNDAL ANGLING CLUB Data Type: Point Name: Maerdy and Ferndal Angling Club Easting: 300800 Northing: 194740	Annual Volume (m ³): 365000 Max Daily Volume (m ³): 1000 Original Application No: - Original Start Date: 16/03/2007 Expiry Date: 31/03/2017 Issue No: 1 Version Start Date: 16/03/2007 Version End Date: -
A	302m E	Status: Historical Licence No: 21/57/24/0054 Details: Lake & Pond Throughflow Direct Source: EAW Surface Water Point: UN-NAMED SPRING AT MAERDY AND FERNDAL ANGLING CLUB Data Type: Point Name: Maerdy and Ferndal Angling Club Easting: 300820 Northing: 194750	Annual Volume (m ³): 365000 Max Daily Volume (m ³): 1000 Original Application No: - Original Start Date: 16/03/2007 Expiry Date: 31/03/2017 Issue No: 1 Version Start Date: 16/03/2007 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.8 Potable abstractions

Records within 2000m

0

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.



5.9 Source Protection Zones

Records within 500m

0

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.10 Source Protection Zones (confined aquifer)

Records within 500m

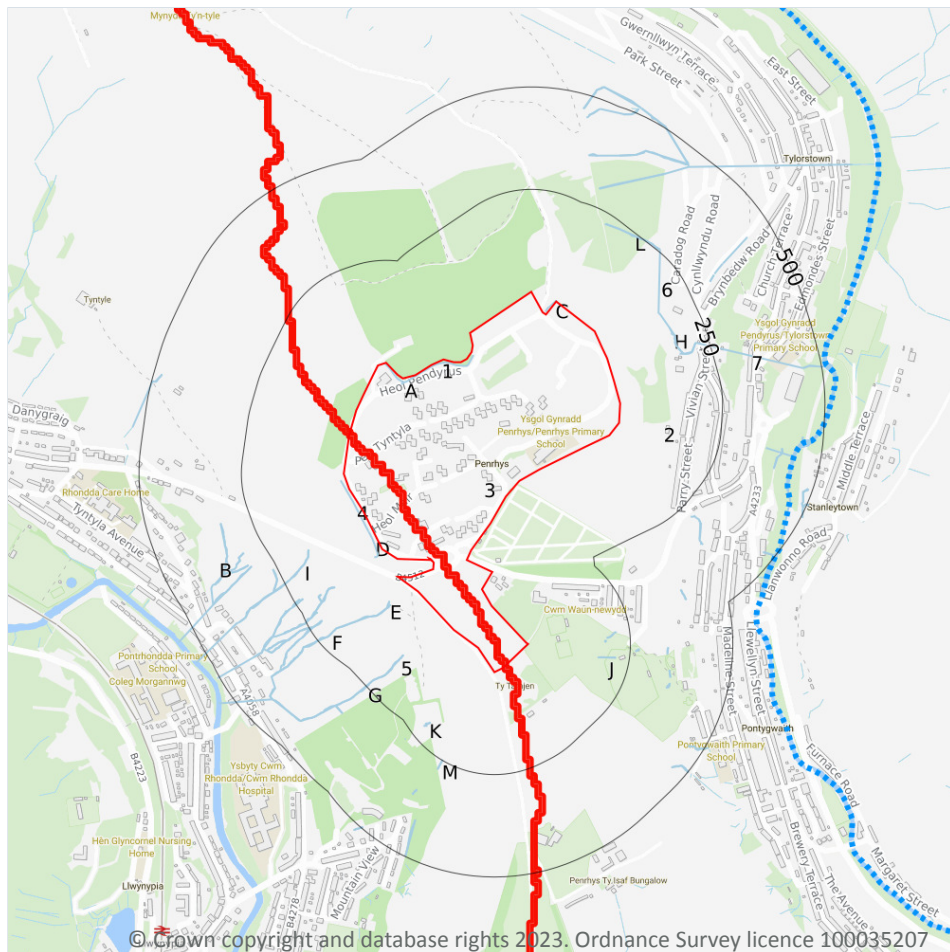
0

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.



6 Hydrology



- Site Outline
- Search buffers in metres (m)
- Water Network (OS MasterMap)
- Surface water features (wider than 5m)
- Surface water features (narrower than 5m)
- WFD River, canal and surface water transfer water bodies
- WFD Lake water bodies
- WFD Transitional and coastal water bodies
- WFD Surface water body catchments boundaries
- WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m

46

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on [page 59 >](#)

ID	Location	Type of water feature	Ground level	Permanence	Name
1	On site	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-



ID	Location	Type of water feature	Ground level	Permanence	Name
A	On site	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
A	On site	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	1m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	4m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	4m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
4	7m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	10m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	10m SW	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
D	14m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	60m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	66m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	77m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Nant Ffynnon-Fair
5	131m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-



ID	Location	Type of water feature	Ground level	Permanence	Name
F	148m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
6	159m NE	Inland river not influenced by normal tidal action.	Not provided	Watercourse contains water year round (in normal circumstances)	-
H	159m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
I	161m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
G	165m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
H	172m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
J	173m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
H	181m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	186m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
J	186m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
J	193m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	196m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
K	198m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-



ID	Location	Type of water feature	Ground level	Permanence	Name
K	209m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
J	211m SE	Marsh. An area that is predominantly waterlogged by freshwater.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
J	212m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	213m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
K	213m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	214m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	214m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	217m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	217m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
7	217m NE	Inland river not influenced by normal tidal action.	Not provided	Watercourse contains water year round (in normal circumstances)	-
L	221m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	228m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
I	232m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-



ID	Location	Type of water feature	Ground level	Permanence	Name
F	235m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	235m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
I	237m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	240m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	240m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
M	248m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m	22
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Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on [page 59 >](#)

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site	2
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The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on [page 59 >](#)



ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
2	On site	River WB catchment	Afon Rhondda Fach - source to conf Rhondda R	GB109057027210	Rhondda	South East Valleys
B	On site	River WB catchment	Rhondda R - source to conf Afon Rhondda Fach	GB109057027200	Rhondda	South East Valleys

This data is sourced from the Environment Agency and Natural Resources Wales.

6.4 WFD Surface water bodies

Records identified	2
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Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site.

Features are displayed on the Hydrology map on [page 59 >](#)

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
15	433m E	River	Afon Rhondda Fach - source to conf Rhondda R	GB109057027210	Poor	Good	Poor	2016
-	518m SW	River	Rhondda R - source to conf Afon Rhondda Fach	GB109057027200	Good	Good	Good	2016

This data is sourced from the Environment Agency and Natural Resources Wales.

6.5 WFD Groundwater bodies

Records on site	1
------------------------	----------

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place.

Features are displayed on the Hydrology map on [page 59 >](#)

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
3	On site	SE Valleys Carboniferous Coal Measures	GB40902G201900	Poor	Poor	Good	2017



This data is sourced from the Environment Agency and Natural Resources Wales.



7 River and coastal flooding

7.1 Risk of flooding from rivers and the sea

Records within 50m

0

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 chance) or High (greater than or equal to 1 in 30 chance).

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m

0

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m

0

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.



7.4 Areas Benefiting from Flood Defences

Records within 250m

0

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.5 Flood Storage Areas

Records within 250m

0

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

This data is sourced from the Environment Agency and Natural Resources Wales.



River and coastal flooding - Flood Zones

7.6 Flood Zone 2

Records within 50m

0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.7 Flood Zone 3

Records within 50m

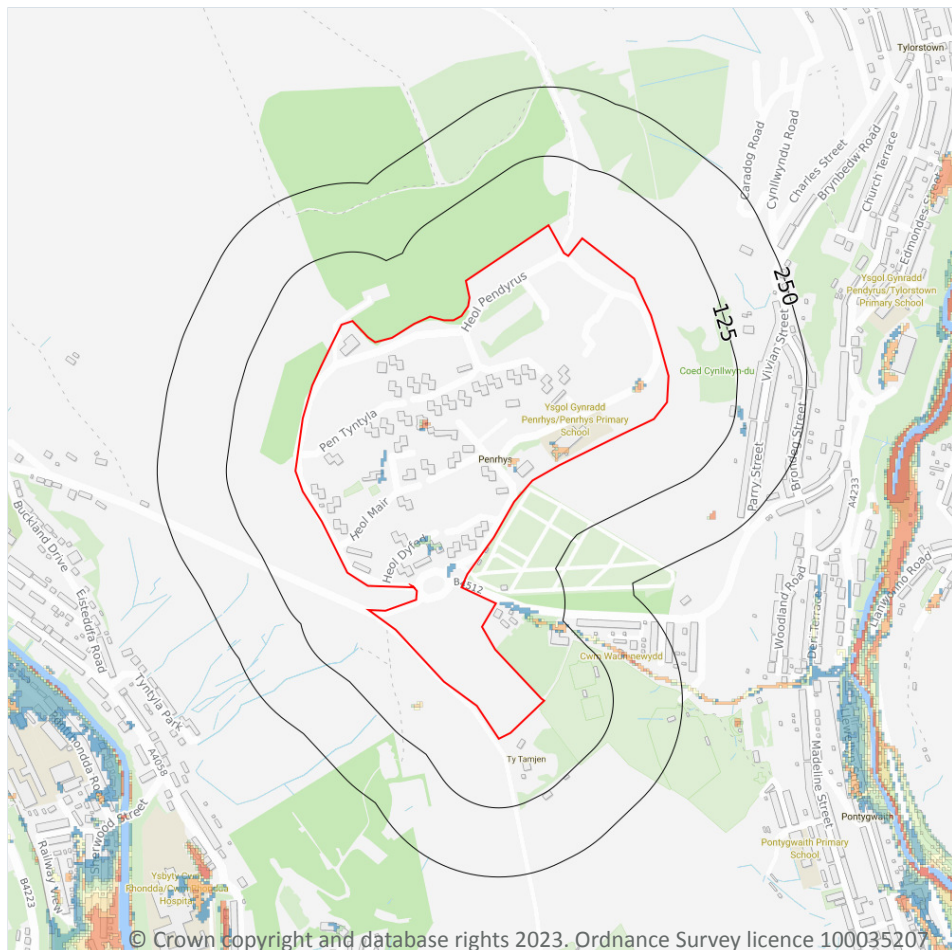
0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.



8 Surface water flooding



— Site Outline

Search buffers in metres (m)

1 in 1000 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

8.1 Surface water flooding

Highest risk on site

1 in 30 year, Greater than 1.0m

Highest risk within 50m

1 in 30 year, Greater than 1.0m

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on [page 69](#) >

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

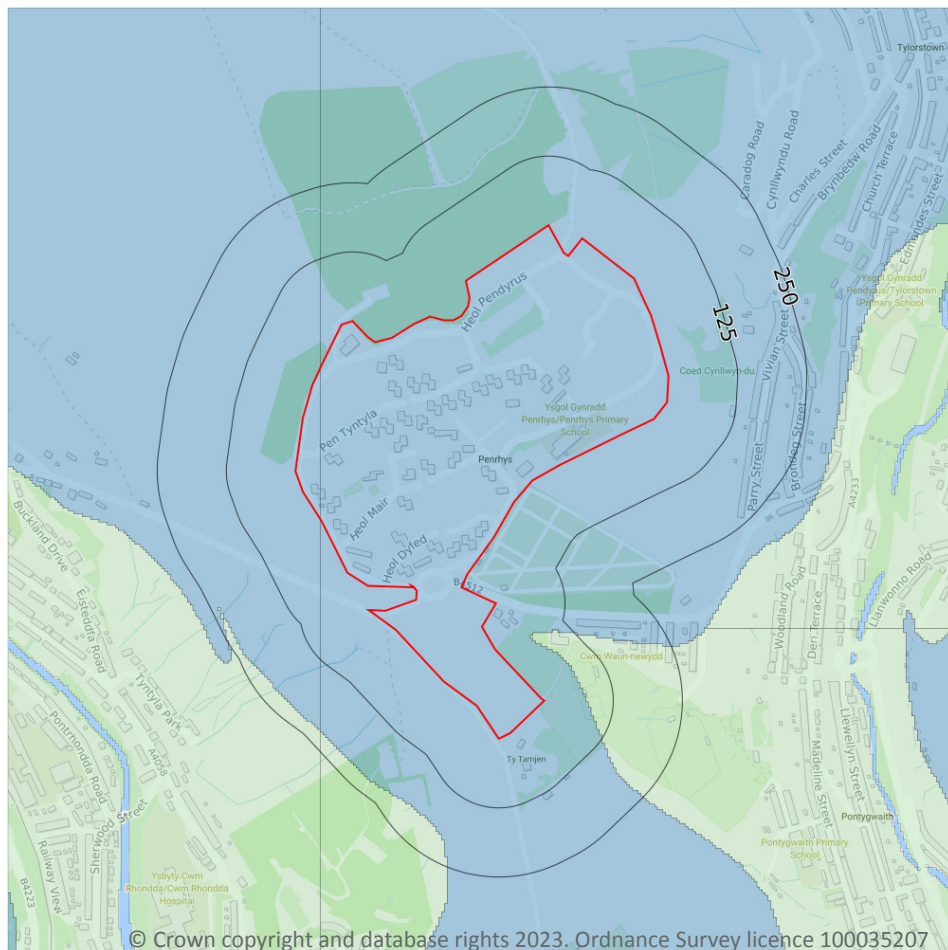
The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Greater than 1.0m
1 in 250 year	Greater than 1.0m
1 in 100 year	Greater than 1.0m
1 in 30 year	Greater than 1.0m

This data is sourced from Ambiantal Risk Analytics.



9 Groundwater flooding



— Site Outline
Search buffers in metres (m)

- High
- Moderate - High
- Moderate
- Low
- Negligible

9.1 Groundwater flooding

Highest risk on site

Negligible

Highest risk within 50m

Negligible

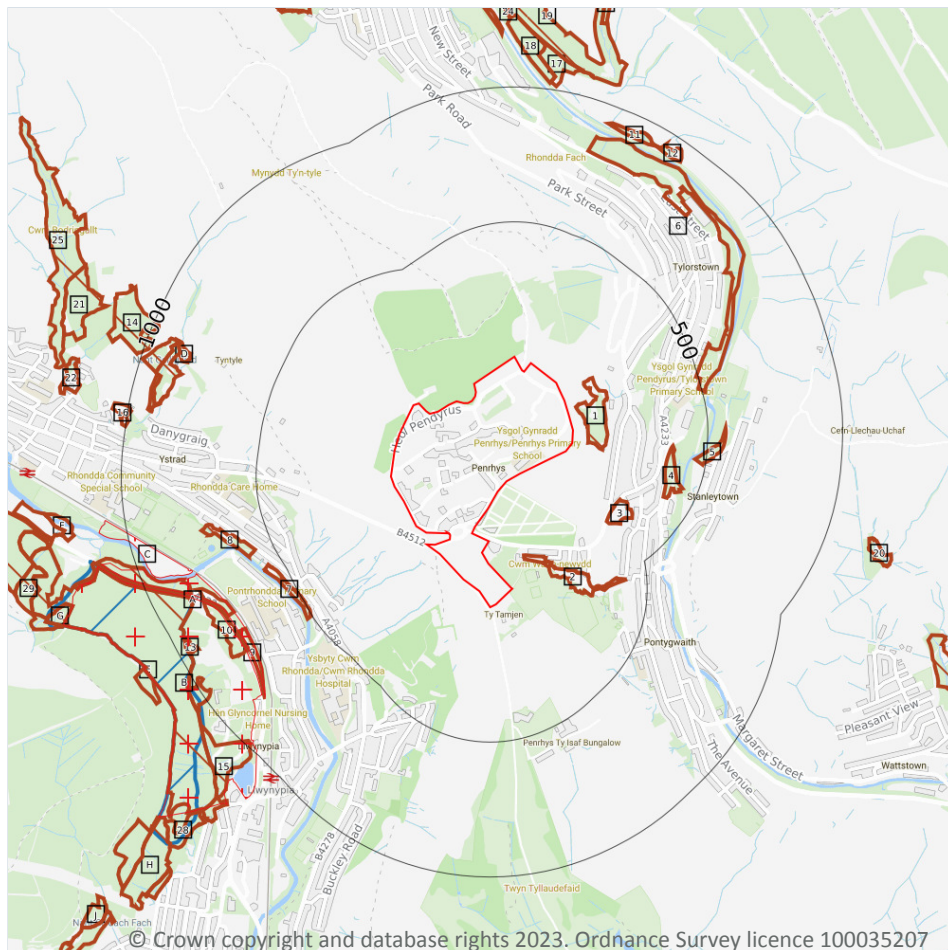
Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on [page 71](#) >

This data is sourced from Ambiantal Risk Analytics.



10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- Sites of Special Scientific Interest (SSSI)
- + Local Nature Reserves (LNR)
- ▨ Designated Ancient Woodland

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

1

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

Features are displayed on the Environmental designations map on [page 72](#) >

ID	Location	Name	Data source
E	862m SW	Craig Pont Rhondda	Natural Resources Wales



This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m

0

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m

0

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m

0

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.5 National Nature Reserves (NNR)

Records within 2000m

0

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.



10.6 Local Nature Reserves (LNR)

Records within 2000m

3

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

Features are displayed on the Environmental designations map on [page 72 >](#)

ID	Location	Name	Data source
A	738m SW	Glyncornel Grounds and Woodlands	Natural Resources Wales
B	776m SW	Glyncornel Grounds and Woodlands	Natural Resources Wales
C	812m W	Glyncornel Grounds and Woodlands	Natural Resources Wales

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m

59

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

Features are displayed on the Environmental designations map on [page 72 >](#)

ID	Location	Name	Woodland Type
1	34m NE	Unknown	Ancient Semi Natural Woodland
2	110m SE	Unknown	Ancient Semi Natural Woodland
3	269m E	Unknown	Ancient Semi Natural Woodland
4	356m E	Unknown	Ancient Semi Natural Woodland
5	459m E	Unknown	Ancient Semi Natural Woodland
6	489m E	Unknown	Ancient Semi Natural Woodland
7	496m SW	Unknown	Ancient Semi Natural Woodland
8	567m W	Unknown	Ancient Semi Natural Woodland
9	738m SW	Unknown	Ancient Semi Natural Woodland
A	746m SW	Unknown	Ancient Semi Natural Woodland



ID	Location	Name	Woodland Type
10	772m SW	Unknown	Ancient Semi Natural Woodland
D	824m W	Unknown	Ancient Semi Natural Woodland
D	837m W	Unknown	Ancient Semi Natural Woodland
C	844m SW	Unknown	Ancient Semi Natural Woodland
C	856m SW	Unknown	Ancient Semi Natural Woodland
E	862m SW	Unknown	Ancient Semi Natural Woodland
D	866m W	Unknown	Ancient Semi Natural Woodland
D	889m W	Unknown	Ancient Semi Natural Woodland
11	919m NE	Unknown	Ancient Semi Natural Woodland
12	922m NE	Unknown	Ancient Semi Natural Woodland
13	927m SW	Unknown	Ancient Semi Natural Woodland
B	966m SW	Unknown	Ancient Semi Natural Woodland
14	976m W	Unknown	Ancient Semi Natural Woodland
15	983m SW	Unknown	Ancient Semi Natural Woodland
16	987m W	Unknown	Ancient Semi Natural Woodland
17	1014m N	Unknown	Ancient Semi Natural Woodland
18	1023m N	Unknown	Plantation on Ancient Woodland Site
19	1074m N	Unknown	Ancient Semi Natural Woodland
E	1130m SW	Unknown	Ancient Woodland Site of Unknown Category
20	1156m E	Unknown	Ancient Woodland Site of Unknown Category
21	1183m NW	Unknown	Ancient Semi Natural Woodland
22	1191m W	Unknown	Ancient Semi Natural Woodland
F	1195m W	Unknown	Ancient Semi Natural Woodland
23	1199m N	Unknown	Ancient Semi Natural Woodland
F	1227m W	Unknown	Ancient Semi Natural Woodland
24	1256m N	Unknown	Ancient Semi Natural Woodland
25	1268m W	Unknown	Ancient Semi Natural Woodland
G	1273m W	Unknown	Ancient Semi Natural Woodland



ID	Location	Name	Woodland Type
26	1278m N	Unknown	Restored Ancient Woodland Site
27	1279m W	Unknown	Plantation on Ancient Woodland Site
F	1293m W	Unknown	Plantation on Ancient Woodland Site
28	1300m SW	Unknown	Ancient Woodland Site of Unknown Category
29	1329m W	Unknown	Plantation on Ancient Woodland Site
G	1334m W	Unknown	Ancient Semi Natural Woodland
H	1404m SW	Unknown	Plantation on Ancient Woodland Site
H	1416m SW	Unknown	Plantation on Ancient Woodland Site
I	1485m N	Unknown	Ancient Semi Natural Woodland
30	1509m E	Unknown	Ancient Semi Natural Woodland
I	1515m N	Unknown	Ancient Semi Natural Woodland
-	1516m N	Unknown	Ancient Semi Natural Woodland
H	1529m SW	Unknown	Plantation on Ancient Woodland Site
32	1542m E	Unknown	Ancient Semi Natural Woodland
J	1776m SW	Unknown	Restored Ancient Woodland Site
-	1789m S	Unknown	Ancient Semi Natural Woodland
J	1800m SW	Unknown	Restored Ancient Woodland Site
-	1926m N	Unknown	Ancient Semi Natural Woodland
-	1947m S	Unknown	Ancient Semi Natural Woodland
-	1971m SE	Unknown	Ancient Semi Natural Woodland
J	1981m SW	Unknown	Plantation on Ancient Woodland Site

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m

0

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.



10.9 Forest Parks

Records within 2000m

0

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m

0

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m

0

Areas designated to prevent urban sprawl by keeping land permanently open.

This data is sourced from the Ministry of Housing, Communities and Local Government.

10.12 Proposed Ramsar sites

Records within 2000m

0

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m

0

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

This data is sourced from Natural England and Natural Resources Wales.



10.14 Potential Special Protection Areas (pSPA)

Records within 2000m

0

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m

0

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

Records within 2000m

0

Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

This data is sourced from Natural England and Natural Resources Wales.

SSSI Impact Zones and Units

10.17 SSSI Impact Risk Zones

Records on site

0

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m

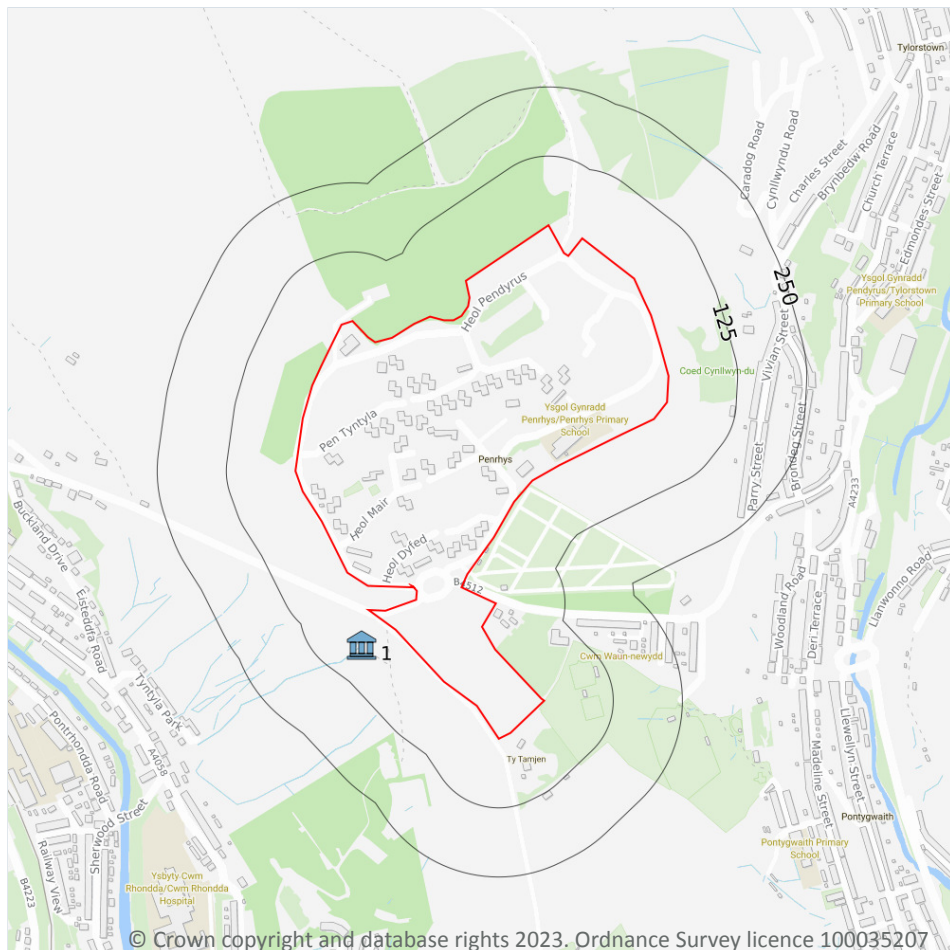
0

Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

This data is sourced from Natural England and Natural Resources Wales.



11 Visual and cultural designations



- Site Outline
- Search buffers in metres (m)
- Listed buildings
- Conservation areas
- Conservation areas - no data
- National Parks
- Areas of Outstanding Natural Beauty
- Registered parks and gardens
- Scheduled Monuments
- World Heritage Sites

11.1 World Heritage Sites

Records within 250m

0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.2 Area of Outstanding Natural Beauty

Records within 250m

0

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

11.3 National Parks

Records within 250m

0

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.

11.4 Listed Buildings

Records within 250m

1

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

Features are displayed on the Visual and cultural designations map on [page 80](#) >

ID	Location	Name	Grade	Reference Number	Listed date
1	59m SW	Wellhouse To Ffynnon Fair, High On The E Slope Of The Rhondda Valley Above Llwynypia And Just Sw Of Penrhys Modern Estate.	II	13113	20/06/1963

This data is sourced from Historic England, Cadw and Historic Environment Scotland.



11.5 Conservation Areas

Records within 250m

0

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.6 Scheduled Ancient Monuments

Records within 250m

0

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.7 Registered Parks and Gardens

Records within 250m

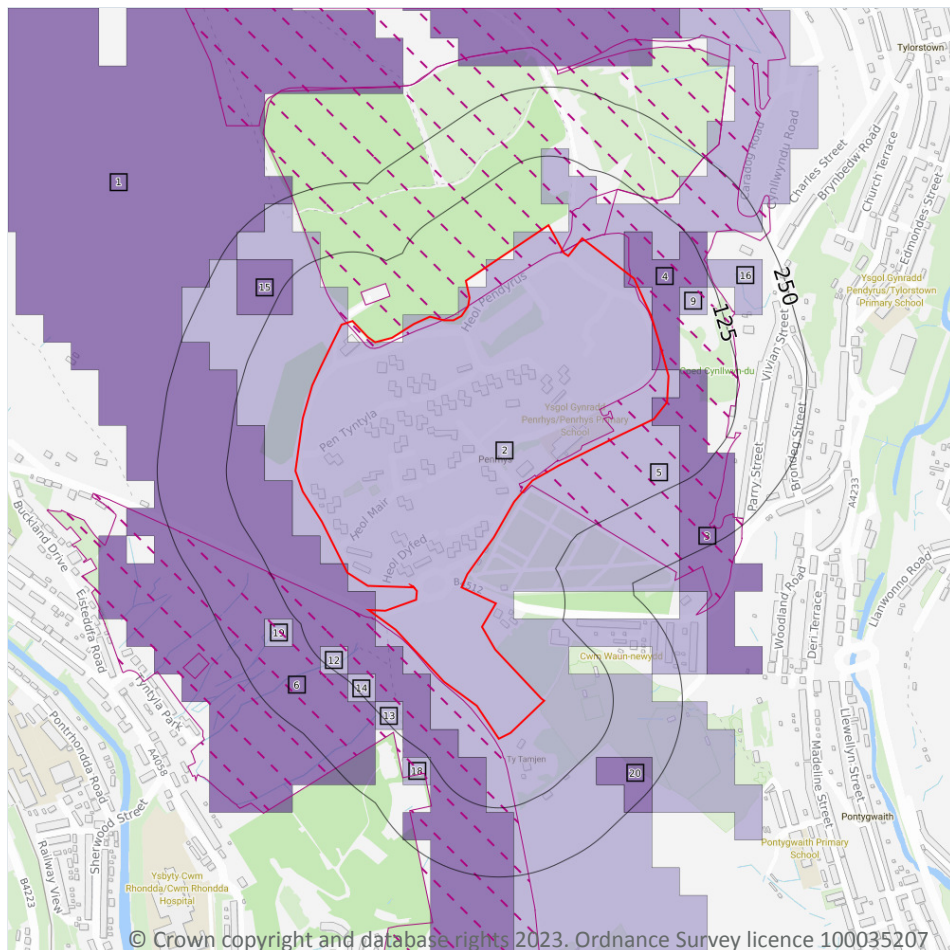
0

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.



12 Agricultural designations



- Site Outline
- Search buffers in metres (m)
- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Timber felling licences
- Open Access land

12.1 Agricultural Land Classification

Records within 250m

13

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on [page 83](#) >

ID	Location	Classification	Description
1	On site	Grade 5	Very poor quality agricultural land
2	On site	Grade 4	Poor quality agricultural land
3	On site	Grade 5	Very poor quality agricultural land



ID	Location	Classification	Description
4	On site	Grade 5	Very poor quality agricultural land
9	50m NE	Grade 4	Poor quality agricultural land
12	76m SW	Grade 4	Poor quality agricultural land
13	79m S	Grade 4	Poor quality agricultural land
14	82m SW	Grade 4	Poor quality agricultural land
15	88m NW	Grade 5	Very poor quality agricultural land
16	114m NE	Grade 4	Poor quality agricultural land
18	121m S	Grade 4	Poor quality agricultural land
19	130m SW	Grade 4	Poor quality agricultural land
20	139m S	Grade 5	Very poor quality agricultural land

This data is sourced from Natural Resources Wales.

12.2 Open Access Land

Records within 250m	3
----------------------------	----------

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

Features are displayed on the Agricultural designations map on [page 83](#) >

ID	Location	Name	Classification	Other relevant legislation
5	On site	-	Open Access Open Country	-
A	On site	-	NRW Public Forest 2014	-
6	2m S	-	Open Access Open Country	-

This data is sourced from Natural England and Natural Resources Wales.



12.3 Tree Felling Licences

Records within 250m

0

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m

0

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

This data is sourced from Natural England.

12.5 Countryside Stewardship Schemes

Records within 250m

0

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

This data is sourced from Natural England.

13 Habitat designations

13.1 Priority Habitat Inventory

Records within 250m

0

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m

0

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m

0

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

This data is sourced from Natural England.

13.4 Limestone Pavement Orders

Records within 250m

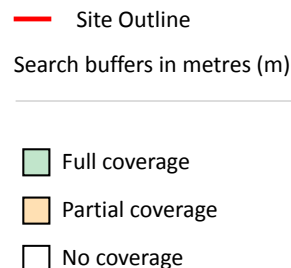
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Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

This data is sourced from Natural England.



14 Geology 1:10,000 scale - Availability



14.1 10k Availability

2

An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on [page 87 >](#)

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	No coverage	No coverage	No coverage	NoCov
2	On site	No coverage	No coverage	No coverage	No coverage	NoCov

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Artificial and made ground

14.2 Artificial and made ground (10k)

Records within 500m

0

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial

14.3 Superficial geology (10k)

Records within 500m

0

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m

0

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Bedrock

14.5 Bedrock geology (10k)

Records within 500m

0

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m

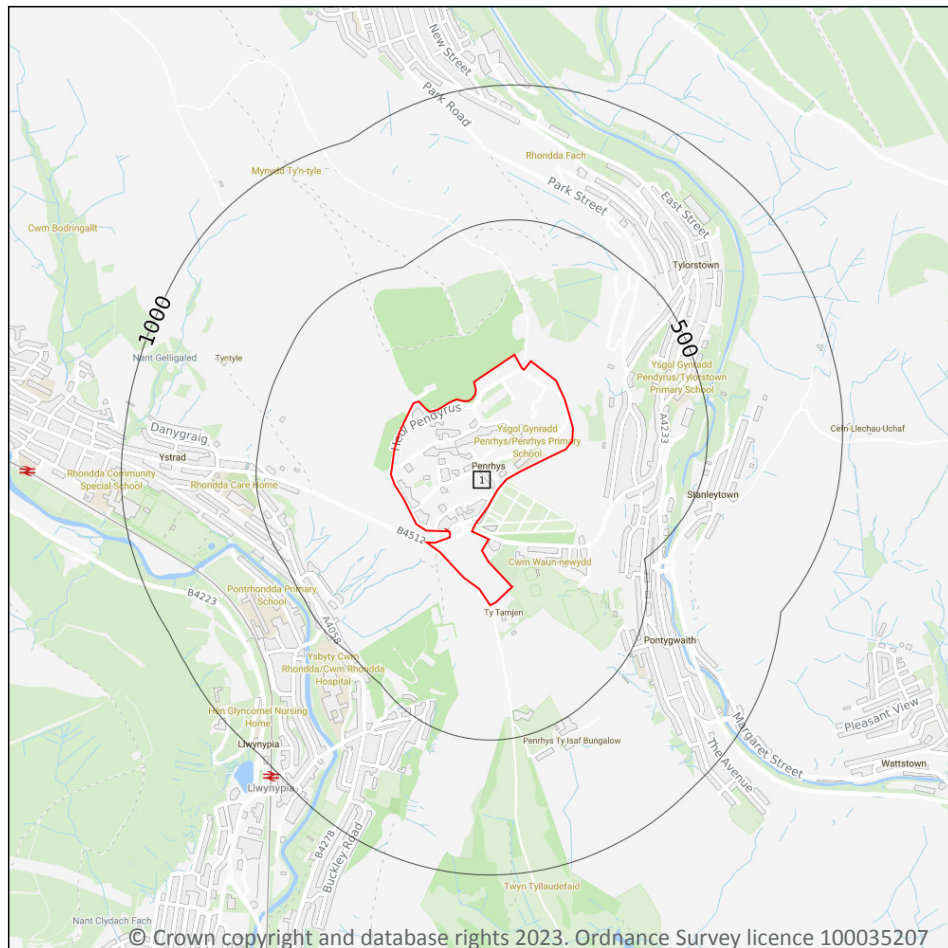
0

Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

This data is sourced from the British Geological Survey.



15 Geology 1:50,000 scale - Availability



— Site Outline

Search buffers in metres (m)

□ Geological map tile

15.1 50k Availability

Records within 500m

1

An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme. Where 50k data is not available, this area has been filled in with 625k scale data.

Features are displayed on the Geology 1:50,000 scale - Availability map on [page 91](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	Full	EW248_pontypridd_v4

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Artificial and made ground

15.2 Artificial and made ground (50k)

Records within 500m

0

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

This data is sourced from the British Geological Survey.

15.3 Artificial ground permeability (50k)

Records within 50m

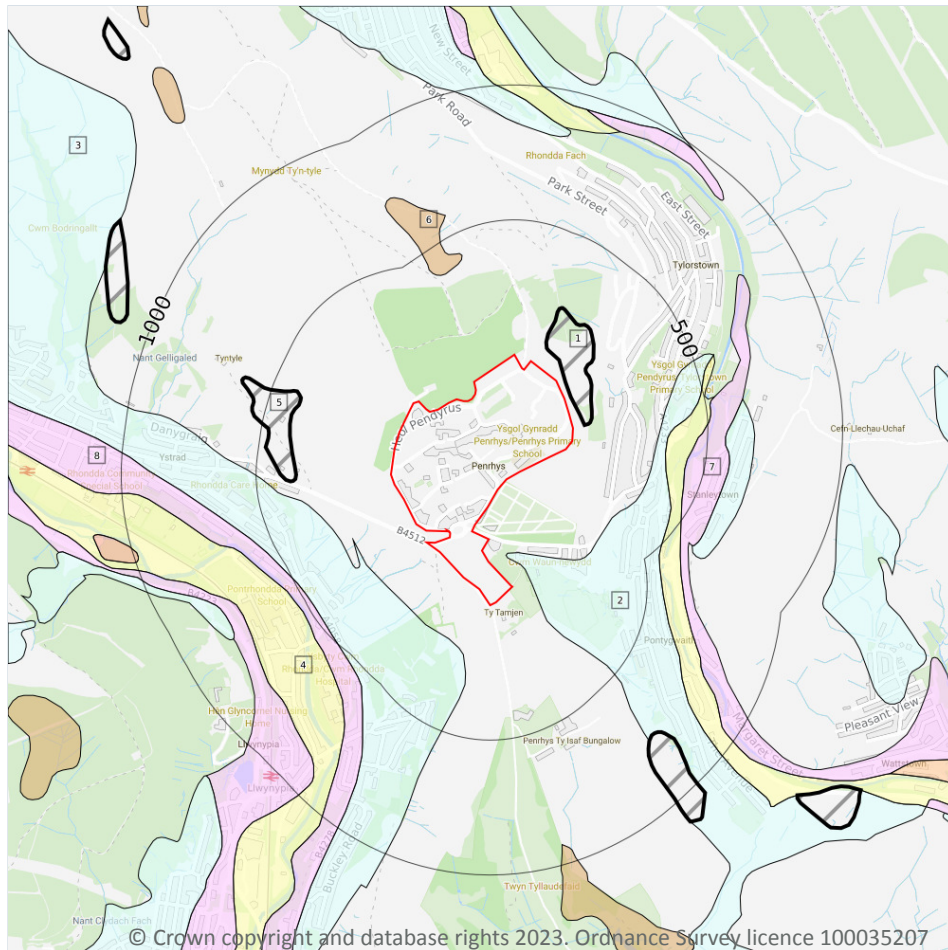
0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (50k)

Superficial geology (50k)
Please see table for more details.

15.4 Superficial geology (50k)

Records within 500m

6

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on [page 93](#) >

ID	Location	LEX Code	Description	Rock description
2	62m S	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
3	195m S	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
4	349m E	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
6	391m N	PEAT-P	PEAT	PEAT



ID	Location	LEX Code	Description	Rock description
7	430m E	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
8	479m SW	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m

0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m

2

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

Features are displayed on the Geology 1:50,000 scale - Superficial map on [page 93](#) >

ID	Location	LEX Code	Description	Rock description
1	24m NE	SLIP-UNKNOWN	LANDSLIDE DEPOSITS	UNKNOWN/UNCLASSIFIED ENTRY
5	351m W	SLIP-UNKNOWN	LANDSLIDE DEPOSITS	UNKNOWN/UNCLASSIFIED ENTRY

This data is sourced from the British Geological Survey.

15.7 Landslip permeability (50k)

Records within 50m

1

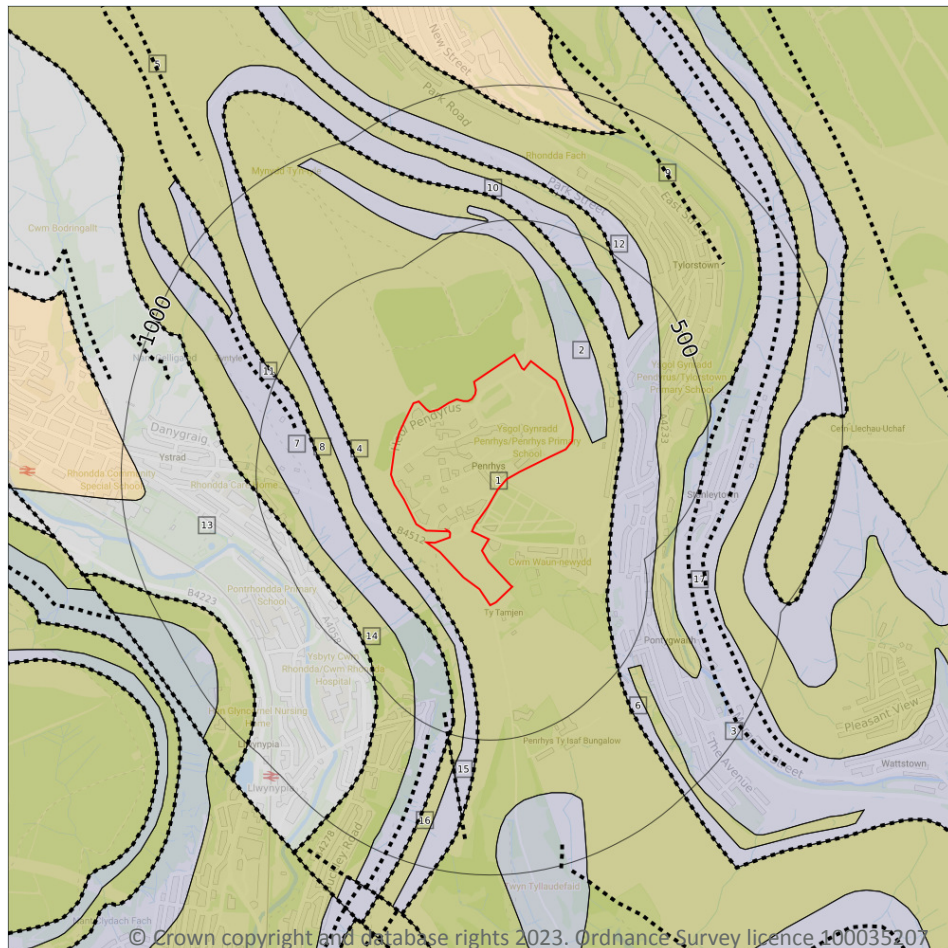
A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

Flow type	Maximum permeability	Minimum permeability
Mixed	Very High	Low

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Bedrock



— Site Outline

Search buffers in metres (m)

.... Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m

7

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on [page 95 >](#)

ID	Location	LEX Code	Description	Rock age
1	On site	RA-SDST	RHONDDA MEMBER - SANDSTONE	WESTPHALIAN
2	24m NE	RA-MDSS	RHONDDA MEMBER - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
3	86m SW	RA-MDSS	RHONDDA MEMBER - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN



ID	Location	LEX Code	Description	Rock age
5	140m SW	RA-SDST	RHONDDA MEMBER - SANDSTONE	WESTPHALIAN
7	219m SW	RA-MDSS	RHONDDA MEMBER - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
9	312m E	RA-SDST	RHONDDA MEMBER - SANDSTONE	WESTPHALIAN
13	393m SW	LLFB-MDSS	LLYNFI MEMBER - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m	5
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A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Fracture	High	Moderate
On site	Fracture	High	Moderate
On site	Fracture	High	Moderate
On site	Fracture	High	Moderate
24m NE	Fracture	Moderate	Low

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m	10
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Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on [page 95 >](#)

ID	Location	Category	Description
4	86m SW	ROCK	Coal seam, inferred
6	182m E	ROCK	Coal seam, inferred



ID	Location	Category	Description
8	219m SW	ROCK	Coal seam, inferred
10	315m NE	ROCK	Coal seam, observed
11	369m W	ROCK	Coal seam, inferred
12	379m NE	ROCK	Coal seam, inferred
14	393m SW	ROCK	Coal seam, inferred
15	430m S	FAULT	Fault, inferred, displacement unknown
16	456m S	ROCK	Coal seam, observed
17	499m E	ROCK	Coal seam, inferred

This data is sourced from the British Geological Survey.



16 Boreholes

16.1 BGS Boreholes

Records within 250m

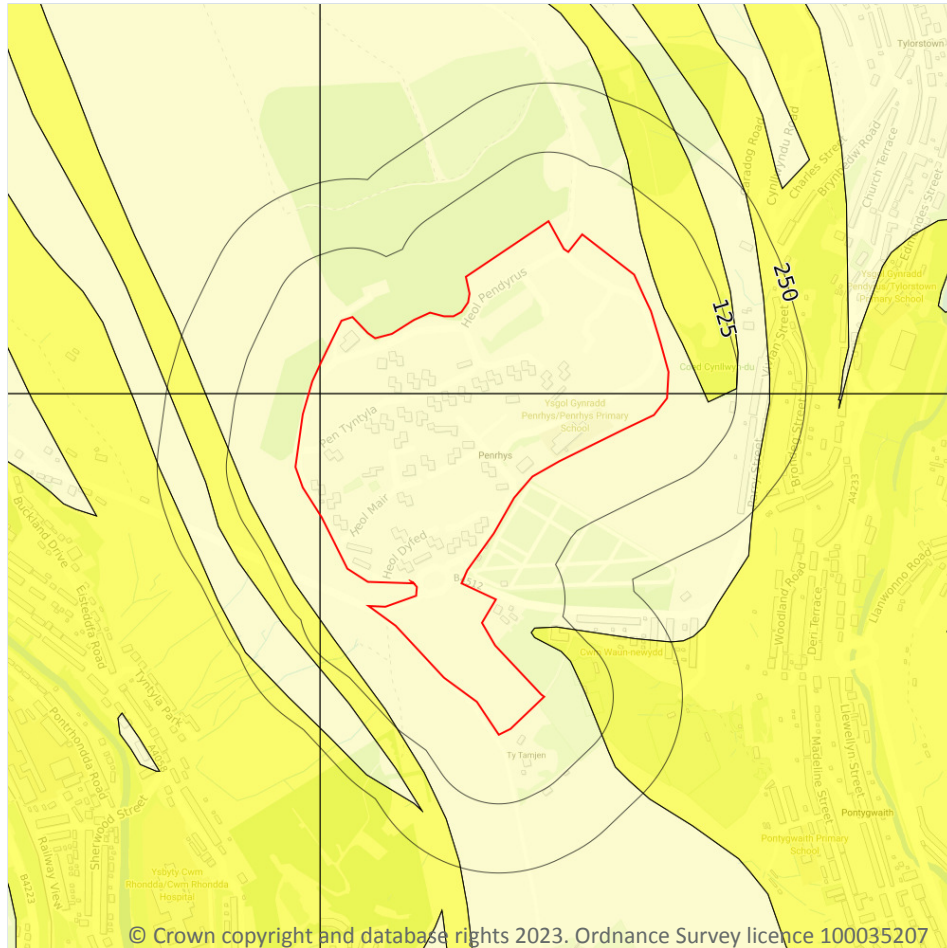
0

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

This data is sourced from the British Geological Survey.



17 Natural ground subsidence - Shrink swell clays



— Site Outline

Search buffers in metres (m)

□ No data

 Negligible

Very low

Low

 Moderate

 High

17.1 Shrink swell clays

Records within 50m

2

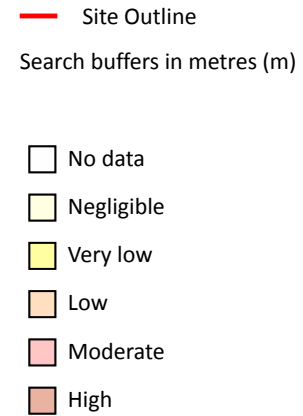
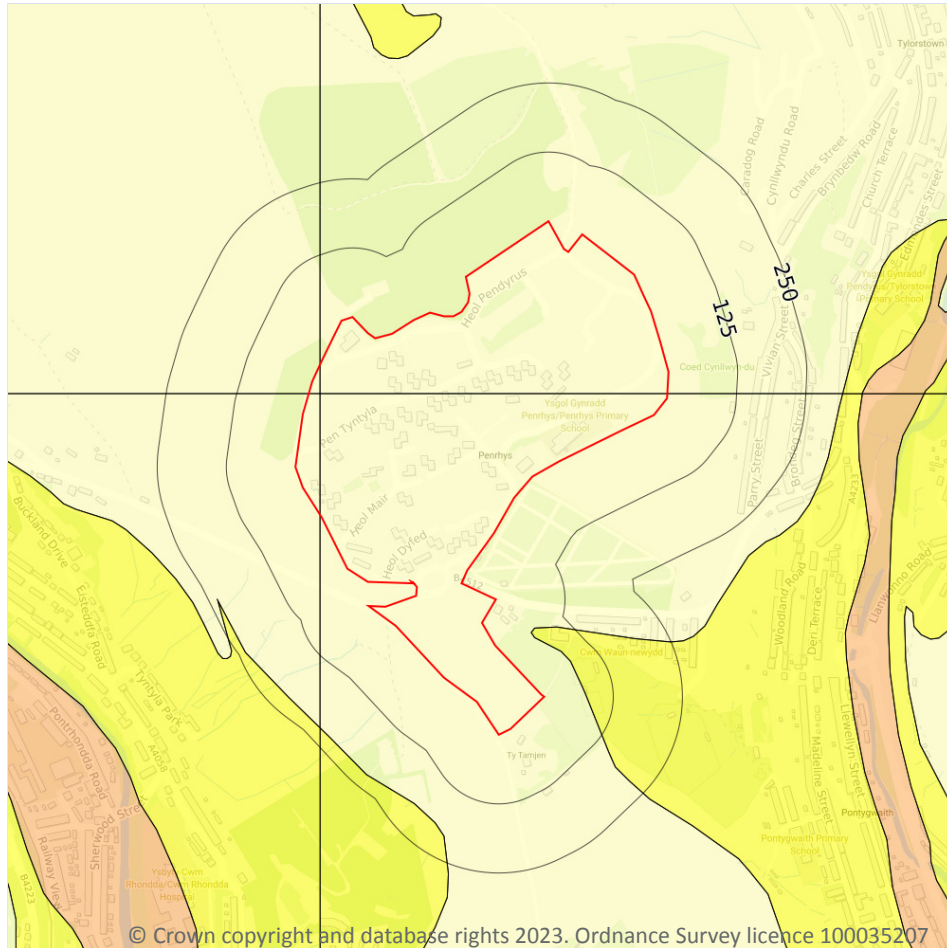
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

Features are displayed on the Natural ground subsidence - Shrink swell clays map on [page 99](#) >

Location	Hazard rating	Details
On site	Negligible	Ground conditions predominantly non-plastic.
24m NE	Very low	Ground conditions predominantly low plasticity.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Running sands



17.2 Running sands

Records within 50m

1

The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

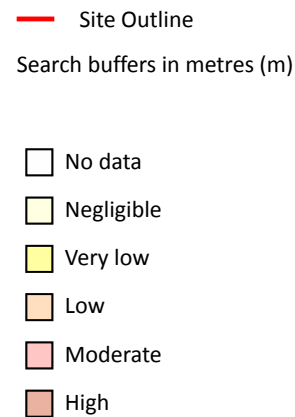
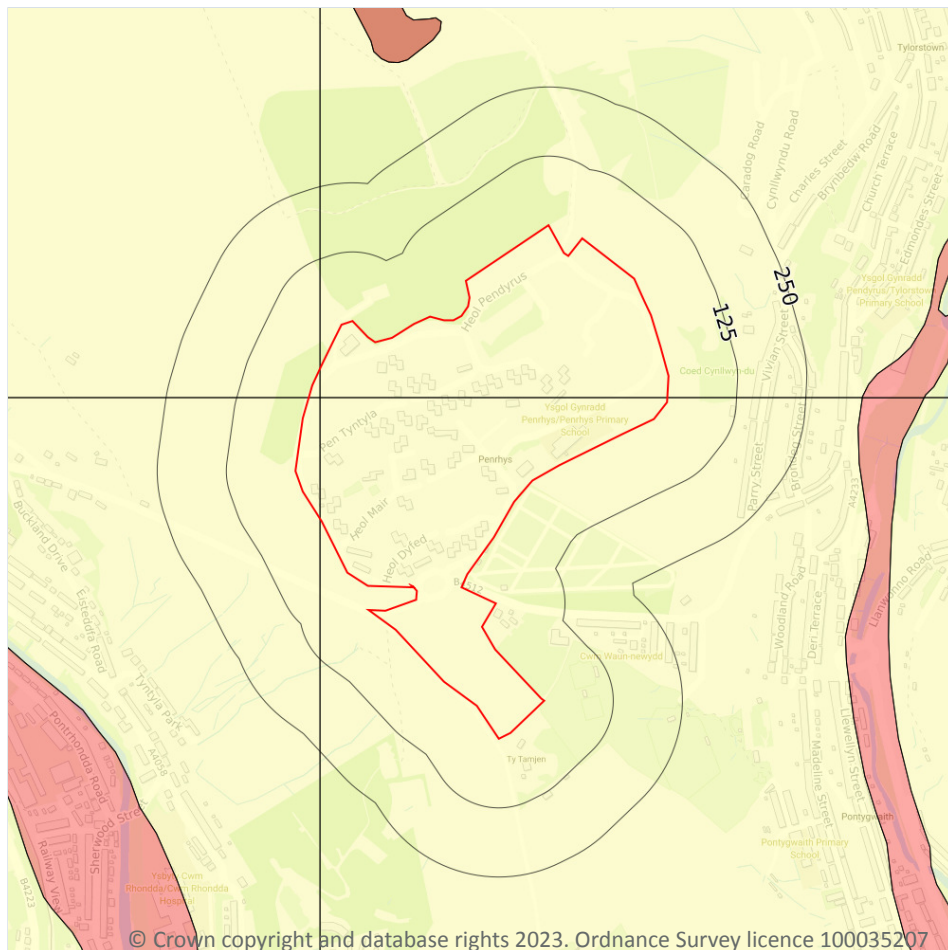
Features are displayed on the Natural ground subsidence - Running sands map on [page 100 >](#)

Location	Hazard rating	Details
On site	Negligible	Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



17.3 Compressible deposits

Records within 50m

1

The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on [page 101](#) >

Location	Hazard rating	Details
On site	Negligible	Compressible strata are not thought to occur.

This data is sourced from the British Geological Survey.



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

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Records within 50m	2
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Features are displayed on the Natural ground subsidence - Collapsible deposits map on [page 102 >](#)

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 No data
 Negligible
 Very low
 Low
 Moderate
 High

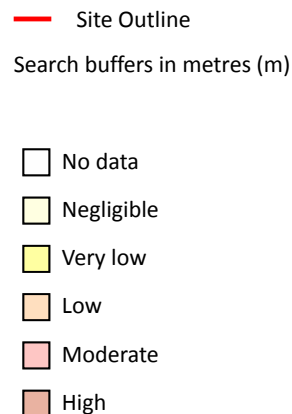
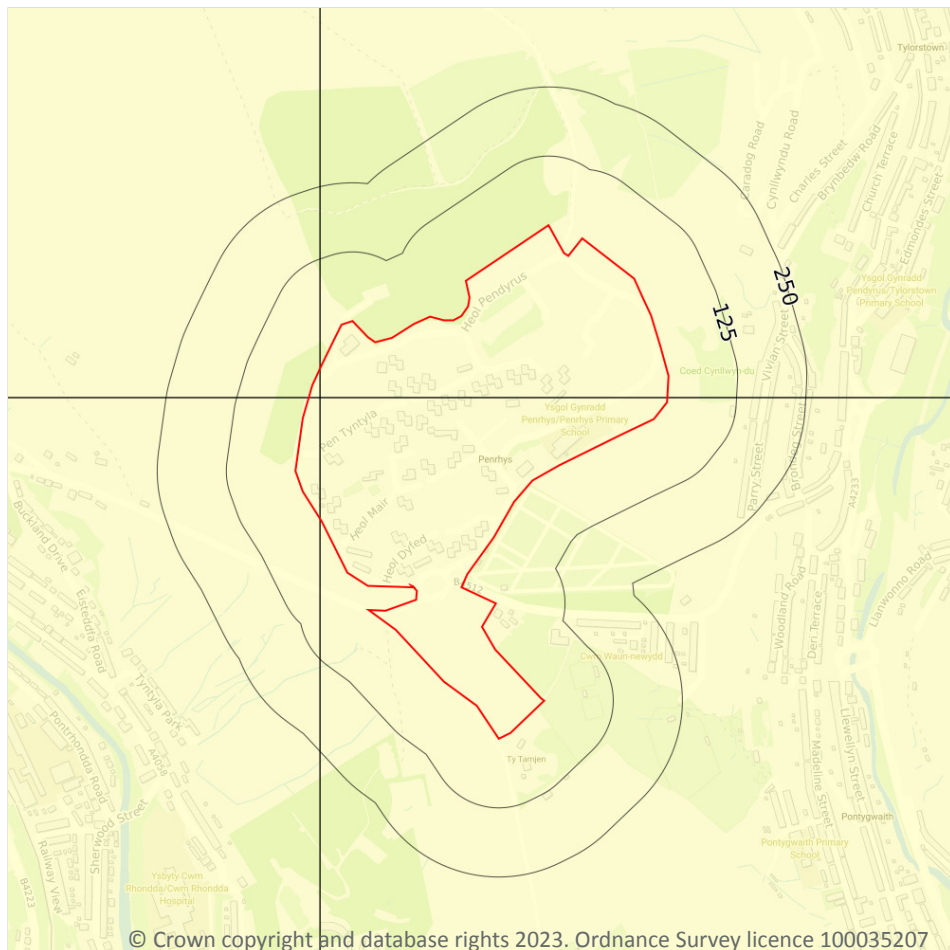
103

Location	Hazard rating	Details
24m NE	High	Slope instability problems almost certainly present and may be active. Significant constraint on land use.
44m E	Moderate	Slope instability problems are probably present or have occurred in the past. Land use should consider specifically the stability of the site.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Ground dissolution of soluble rocks



17.6 Ground dissolution of soluble rocks

Records within 50m

1

The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on [page 105](#) >

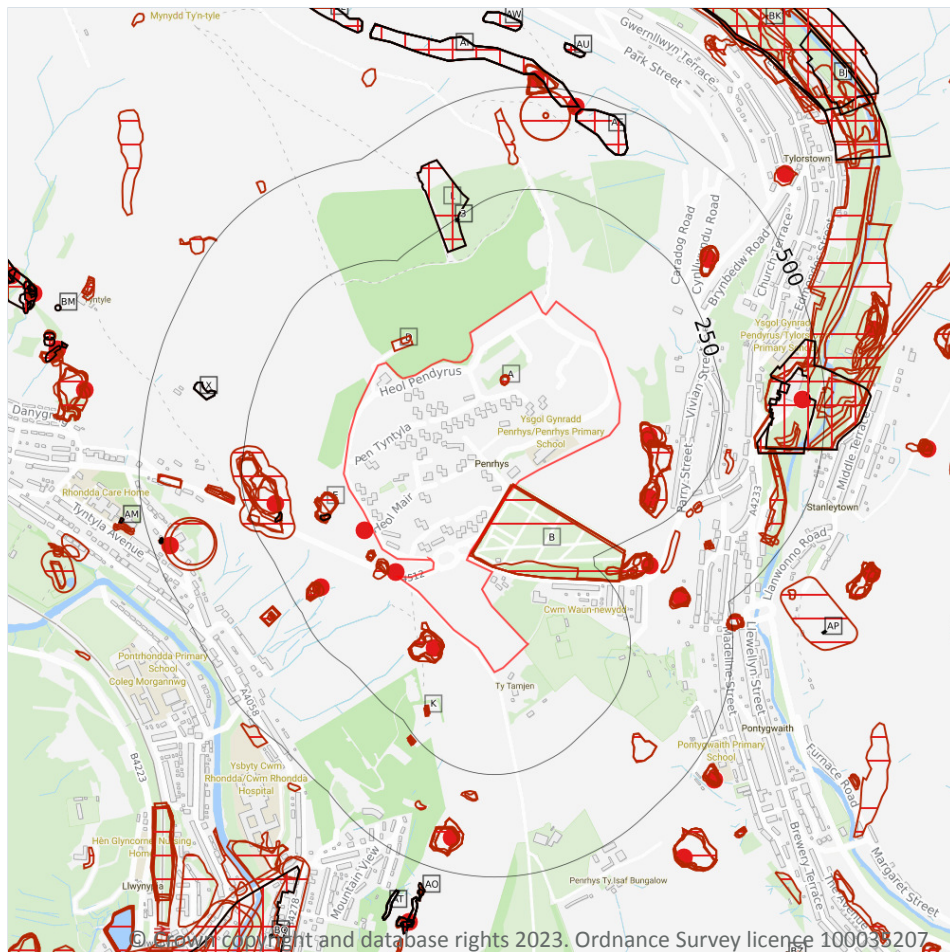
Location	Hazard rating	Details
On site	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.



This data is sourced from the British Geological Survey.



18 Mining and ground workings



- Site Outline
- Search buffers in metres (m)
- BritPits
- ▢ Surface ground workings
- ▢ Underground workings
- ▢ Underground mining extents
- ▢ Historical mineral planning areas
- ▢ TCA non-coal mining
- Non Coal Mining
- ▢ Sporadic underground mining of restricted extent possible
- ▢ Localised small scale underground mining possible
- ▢ Small scale mining possible
- ▢ Underground mining known or likely within or in close proximity
- ▢ Underground mining known within or in very close proximity

18.1 BritPits

Records within 500m

14

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

Features are displayed on the Mining and ground workings map on [page 107](#) >

ID	Location	Details	Description
C	12m SW	Name: Cae'r fynwent Address: Llwynypia, RHONDDA, Mid Glamorgan Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
1	17m SW	Name: Pant-visteddfa Address: Llwynypia, RHONDDA, Mid Glamorgan Commodity: Coal, Deep Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
F	65m S	Name: Tyntyla Address: Llwynypia, RHONDDA, Mid Glamorgan Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
G	78m E	Name: Coed Cynllwyn-du Address: Tylorstown, Ferndale, RHONDDA, Mid Glamorgan Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
J	175m SW	Name: Tyntyla Address: Llwynypia, RHONDDA, Mid Glamorgan Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
I	181m W	Name: Pant-visteddfa Address: Llwynypia, RHONDDA, Mid Glamorgan Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority



ID	Location	Details	Description
H	182m E	Name: Coed Cynllwyn-du Address: Penrhys, RHONDDA, Mid Glamorgan Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
N	329m SE	Name: Coed Cynllwyn-du Address: Penrhys, RHONDDA, Mid Glamorgan Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
R	329m NE	Name: Cynllwyn-du Address: Tylorstown, Ferndale, RHONDDA, Mid Glamorgan Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
AA	390m SE	Name: Pont y Gwaith Address: Llwynypia, RHONDDA, Mid Glamorgan Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
AD	416m S	Name: Mountain Cottages Quarry Address: Llwynypia, RHONDDA, Mid Glamorgan Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
U	444m E	Name: Ferndale No 8 Address: RHONDDA, Mid Glamorgan Commodity: Coal, Deep Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority



ID	Location	Details	Description
Y	457m W	Name: Ffynnon Las Address: Llwynypia, RHONDDA, Mid Glamorgan Commodity: Coal, Deep Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
AH	466m N	Name: Cynllwyn-du Address: Ferndale, RHONDDA, Mid Glamorgan Commodity: Coal, Deep Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.

18.2 Surface ground workings

Records within 250m	74
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Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining and ground workings map on [page 107 >](#)

ID	Location	Land Use	Year of mapping	Mapping scale
A	On site	Unspecified Pit	1921	1:10560
A	On site	Unspecified Pit	1945	1:10560
A	On site	Unspecified Pit	1945	1:10560
A	On site	Unspecified Pit	1948	1:10560
A	On site	Unspecified Pit	1915	1:10560
A	On site	Unspecified Pit	1915	1:10560
B	On site	Cemetery	1974	1:10000
B	On site	Cemetery	1989	1:10000
B	On site	Cemetery	1965	1:10560
B	On site	Cemetery	1968	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
B	On site	Cemetery	1948	1:10560
C	19m SW	Unspecified Ground Workings	1948	1:10560
C	20m SW	Unspecified Pit	1965	1:10560
C	20m SW	Unspecified Pit	1968	1:10560
C	21m SW	Unspecified Pit	1948	1:10560
C	22m SW	Unspecified Quarry	1898	1:10560
C	25m SW	Unspecified Pit	1915	1:10560
C	25m SW	Unspecified Pit	1948	1:10560
C	25m SW	Unspecified Pit	1948	1:10560
C	26m SW	Unspecified Pit	1921	1:10560
C	26m SW	Unspecified Ground Workings	1948	1:10560
C	26m SW	Unspecified Ground Workings	1948	1:10560
C	26m SW	Unspecified Pit	1921	1:10560
D	35m NW	Covered Reservoir	1992	1:10000
E	37m W	Unspecified Pit	1965	1:10560
E	37m W	Disused Quarries and Tips	1990	1:10000
F	38m S	Unspecified Disused Quarries	1974	1:10000
F	38m S	Unspecified Disused Quarries	1989	1:10000
F	39m S	Unspecified Quarry	1915	1:10560
F	39m S	Unspecified Quarry	1948	1:10560
F	39m S	Unspecified Quarry	1898	1:10560
E	41m W	Unspecified Quarry	1948	1:10560
E	44m W	Unspecified Quarry	1915	1:10560
E	45m W	Unspecified Disused Quarries	1948	1:10560
F	45m S	Unspecified Disused Quarry	1948	1:10560
F	45m S	Unspecified Quarry	1921	1:10560
E	46m W	Unspecified Quarry	1921	1:10560
F	52m S	Unspecified Quarry	1875	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
G	52m E	Unspecified Old Quarry	1915	1:10560
G	52m E	Unspecified Old Quarry	1915	1:10560
G	54m E	Unspecified Old Quarry	1945	1:10560
G	54m E	Unspecified Old Quarry	1948	1:10560
G	54m E	Unspecified Old Quarry	1921	1:10560
D	62m NW	Covered Reservoir	1974	1:10000
H	64m E	Unspecified Disused Quarries	1974	1:10000
H	64m E	Unspecified Disused Quarries	1989	1:10000
E	74m SW	Trial Level	1875	1:10560
H	85m E	Unspecified Old Quarries	1948	1:10560
H	88m E	Unspecified Old Quarries	1915	1:10560
H	91m E	Unspecified Old Quarries	1921	1:10560
H	92m E	Unspecified Old Quarries	1948	1:10560
I	141m W	Unspecified Quarries	1948	1:10560
H	151m E	Unspecified Old Quarries	1948	1:10560
H	162m E	Unspecified Quarry	1898	1:10560
I	168m W	Unspecified Ground Workings	1965	1:10560
I	169m W	Unspecified Quarries	1915	1:10560
I	169m W	Unspecified Disused Quarries	1948	1:10560
I	171m W	Unspecified Quarries	1921	1:10560
I	171m W	Disused Quarries and Tips	1990	1:10000
J	173m SW	Unspecified Old Quarry	1898	1:10560
I	173m W	Unspecified Quarry	1898	1:10560
J	174m SW	Unspecified Ground Workings	1948	1:10560
I	176m W	Old Trial Level	1898	1:10560
J	177m SW	Unspecified Ground Workings	1948	1:10560
J	177m SW	Unspecified Ground Workings	1948	1:10560
J	177m SW	Unspecified Ground Workings	1915	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
J	179m SW	Unspecified Ground Workings	1921	1:10560
J	179m SW	Unspecified Disused Quarry	1990	1:10000
K	180m S	Reservoir	1948	1:10560
K	182m S	Reservoir	1915	1:10560
L	183m N	Colliery	1875	1:10560
K	186m S	Reservoir	1948	1:10560
K	186m S	Reservoir	1921	1:10560
2	230m W	Unspecified Heap	1915	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.3 Underground workings

Records within 1000m

86

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

Features are displayed on the Mining and ground workings map on [page 107](#) >

ID	Location	Land Use	Year of mapping	Mapping scale
E	74m SW	Trial Level	1875	1:10560
I	176m W	Old Trial Level	1898	1:10560
L	183m N	Colliery	1875	1:10560
3	244m N	Unspecified Shafts	1875	1:10560
W	341m E	Colliery	1921	1:10560
X	343m W	Unspecified Disused Levels	1981	1:10000
X	343m W	Unspecified Disused Levels	1964	1:10560
U	363m E	Colliery	1898	1:10560
AE	387m NE	Unspecified Disused Levels	1992	1:10000
AE	387m NE	Unspecified Disused Levels	1974	1:10000
AE	387m NE	Unspecified Disused Levels	1965	1:10560
AI	458m N	Unspecified Disused Levels	1992	1:10000



ID	Location	Land Use	Year of mapping	Mapping scale
AI	458m N	Unspecified Disused Levels	1974	1:10000
AI	458m N	Unspecified Disused Levels	1965	1:10560
Y	470m W	Trial Level	1874	1:10560
Y	472m W	Trial Level	1915	1:10560
Y	472m W	Trial Level	1921	1:10560
AO	546m S	Old Trial Levels	1874	1:10560
AM	548m W	Unspecified Level	1875	1:10560
AO	560m S	Old Trial Levels	1921	1:10560
AS	582m S	Unspecified Disused Levels	1989	1:10000
AS	582m S	Unspecified Disused Levels	1965	1:10560
AS	582m S	Unspecified Disused Levels	1968	1:10560
AS	582m S	Unspecified Disused Levels	1974	1:10000
AT	584m S	Unspecified Disused Levels	1989	1:10000
AT	584m S	Unspecified Disused Levels	1965	1:10560
AT	584m S	Unspecified Disused Levels	1968	1:10560
AT	584m S	Unspecified Disused Levels	1974	1:10000
AU	585m N	Unspecified Disused Levels	1992	1:10000
AU	585m N	Unspecified Disused Levels	1974	1:10000
AU	585m N	Unspecified Disused Levels	1965	1:10560
AS	638m S	Old Trial Levels	1915	1:10560
AS	638m S	Old Trial Levels	1874	1:10560
AW	638m N	Unspecified Disused Levels	1992	1:10000
AW	638m N	Unspecified Disused Levels	1974	1:10000
AW	638m N	Unspecified Disused Levels	1965	1:10560
AS	643m S	Old Trial Levels	1921	1:10560
19	676m SW	Colliery	1915	1:10560
AP	709m SE	Unspecified Shaft	1875	1:10560
BI	722m W	Unspecified Disused Level	1981	1:10000



ID	Location	Land Use	Year of mapping	Mapping scale
BI	722m W	Unspecified Disused Level	1964	1:10560
BK	723m NE	Colliery	1948	1:10560
BI	736m W	Old Coal Level	1898	1:10560
BI	753m W	Old Trial Level	1921	1:10560
BI	758m W	Old Trial Level	1948	1:10560
BL	760m N	Unspecified Disused Levels	1981	1:10000
BL	760m N	Unspecified Disused Levels	1964	1:10560
BM	763m W	Old Coal Level	1921	1:10560
BK	779m NE	Colliery	1898	1:10560
BJ	801m NE	Unspecified Mine	1965	1:10560
BT	828m W	Old Coal Level	1898	1:10560
BT	829m W	Unspecified Disused Levels	1964	1:10560
BT	832m W	Unspecified Disused Levels	1981	1:10000
BT	832m W	Old Trial Levels	1921	1:10560
BT	836m W	Old Coal Level	1948	1:10560
BT	837m W	Old Trial Levels	1948	1:10560
BQ	840m SW	Coal Shaft	1875	1:10560
-	852m S	Old Coal Levels	1915	1:10560
-	853m S	Old Trial Level	1874	1:10560
-	858m S	Old Coal Level	1898	1:10560
-	858m S	Old Coal Levels	1874	1:10560
-	858m S	Old Trial Level	1921	1:10560
-	862m S	Old Coal Levels	1921	1:10560
-	886m N	Trial Level	1875	1:10560
BT	894m W	Old Coal Levels	1898	1:10560
BT	898m W	Old Coal Level	1948	1:10560
-	914m N	Colliery	1898	1:10560
-	923m S	Old Coal Levels	1915	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
-	923m S	Old Coal Levels	1874	1:10560
-	940m S	Old Coal Levels	1921	1:10560
-	964m S	Old Trial Levels	1915	1:10560
-	965m S	Old Trial Levels	1874	1:10560
-	967m W	Old Coal Levels	1898	1:10560
BY	967m E	Trial Level	1875	1:10560
-	969m W	Old Coal Level	1921	1:10560
-	970m S	Old Coal Levels	1921	1:10560
BZ	980m SE	Unspecified Level	1875	1:10560
-	982m SE	Colliery	1875	1:10560
-	991m N	Old Trial Level	1921	1:10560
-	992m W	Air Shaft	1921	1:10560
-	992m NW	Unspecified Disused Levels	1981	1:10000
-	993m NW	Air Shaft	1898	1:10560
-	993m NW	Air Shaft	1948	1:10560
-	997m N	Old Trial Level	1921	1:10560
-	999m S	Old Trial Levels	1915	1:10560
-	999m S	Old Trial Levels	1874	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground mining extents

Records within 500m

0

This data identifies underground mine workings that could present a potential risk, including adits and seam workings. These features have been identified from BGS Geological mapping and mine plans sourced from the BGS and various collections and sources.

This data is sourced from Groundsure.



18.5 Historical Mineral Planning Areas

Records within 500m

0

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m

2

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

Features are displayed on the Mining and ground workings map on [page 107 >](#)

ID	Location	Name	Commodity	Class	Likelihood
-	863m N	Not available	Iron Ore (Bedded)	B	Underground mine workings may have occurred in the past or current mines may be working at significant depth to modern engineering standards. Potential for difficult ground conditions are unlikely and are at a level where they need not be considered.
-	913m W	Not available	Iron Ore (Bedded)	B	Underground mine workings may have occurred in the past or current mines may be working at significant depth to modern engineering standards. Potential for difficult ground conditions are unlikely and are at a level where they need not be considered.

This data is sourced from the British Geological Survey.

18.7 JPB mining areas

Records on site

1

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.



Location	Details
On site	In addition to being located inside an area where The Coal Authority have information on coal mining activities, Johnson Poole & Bloomer (JPB) have information such as mining plans and maps held within their archive of mining activities that have occurred within 1km of this property which may supplement this information. Please note, the plans held by JPB may also relate to non-mining records. Further details and a quote for services (if appropriate) can be obtained by emailing this report to enquiries.gs@jpb.co.uk ↗.

This data is sourced from Johnson Poole and Bloomer.

18.8 The Coal Authority non-coal mining

Records within 500m	0
---------------------	---

This data provides an indication of the potential zone of influence of recorded underground non-coal mining workings. Any and all analysis and interpretation of Coal Authority Data in this report is made by Groundsure, and is in no way supported, endorsed or authorised by the Coal Authority. The use of the data is restricted to the terms and provisions contained in this report. Data reproduced in this report may be the copyright of the Coal Authority and permission should be sought from Groundsure prior to any re-use.

This data is sourced from The Coal Authority.

18.9 Researched mining

Records within 500m	0
---------------------	---

This data indicates areas of potential mining identified from alternative or archival sources, including; BGS Geological paper maps, Lidar data, aerial photographs (from World War II onwards), archaeological data services, websites, Tithe maps, and various text/plans from collected books and reports. Some of this data is approximate and Groundsure have interpreted the resultant risk area and, where possible, specific areas of risk have been captured.

This data is sourced from Groundsure.

18.10 Mining record office plans

Records within 500m	0
---------------------	---

This dataset is representative of Mining Record Office and/or plan extents held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.

18.11 BGS mine plans

Records within 500m**0**

This dataset is representative of BGS mine plans held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.

18.12 Coal mining

Records on site**1**

Areas which could be affected by past, current or future coal mining.

Location	Details
On site	The site is located within a coal mining area as defined by the Coal Authority. A Consultants Coal Mining Report is recommended to further assess coal mining issues at the site. This can be ordered directly through Groundsure or your preferred search provider.

This data is sourced from the Coal Authority.

18.13 Brine areas

Records on site**0**

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.

18.14 Gypsum areas

Records on site**0**

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.15 Tin mining

Records on site**0**

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.



18.16 Clay mining

Records on site	0
-----------------	---

Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).



19 Ground cavities and sinkholes

19.1 Natural cavities

Records within 500m

0

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

This data is sourced from Stantec UK Ltd.

19.2 Mining cavities

Records within 1000m

0

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

This data is sourced from Stantec UK Ltd.

19.3 Reported recent incidents

Records within 500m

0

This data identifies sinkhole information gathered from media reports and Groundsure's own records. This data goes back to 2014 and includes relative accuracy ratings for each event and links to the original data sources. The data is updated on a regular basis and should not be considered a comprehensive catalogue of all sinkhole events. The absence of data in this database does not mean a sinkhole definitely has not occurred during this time.

This data is sourced from Groundsure.

19.4 Historical incidents

Records within 500m

0

This dataset comprises an extract of 1:10,560, 1:10,000, 1:2,500 and 1:1,250 scale historical Ordnance Survey maps held by Groundsure, dating back to the 1840s. It shows shakeholes, deneholes and other 'holes' as noted on these maps. Dene holes are medieval chalk extraction pits, usually comprising a narrow shaft with a number of chambers at the base of the shaft. Shakeholes are an alternative name for suffusion sinkholes, most commonly found in the limestone landscapes of North Yorkshire but also extensively noted around the Brecon Beacons National Park.

Not all 'holes' noted on Ordnance Survey mapping will necessarily be present within this dataset.



This data is sourced from Groundsure.

19.5 National karst database

Records within 500m

0

This is a comprehensive database of national karst information gathered from a wide range of sources. BGS have collected data on five main types of karst feature: Sinkholes, stream links, caves, springs, and incidences of associated damage to buildings, roads, bridges and other engineered works.

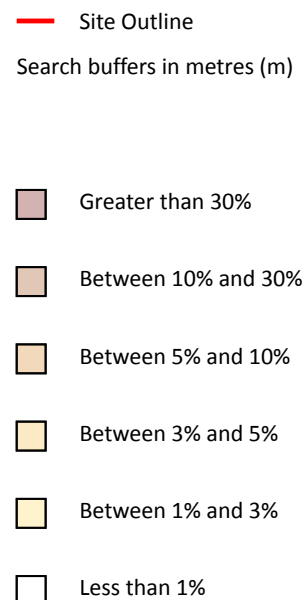
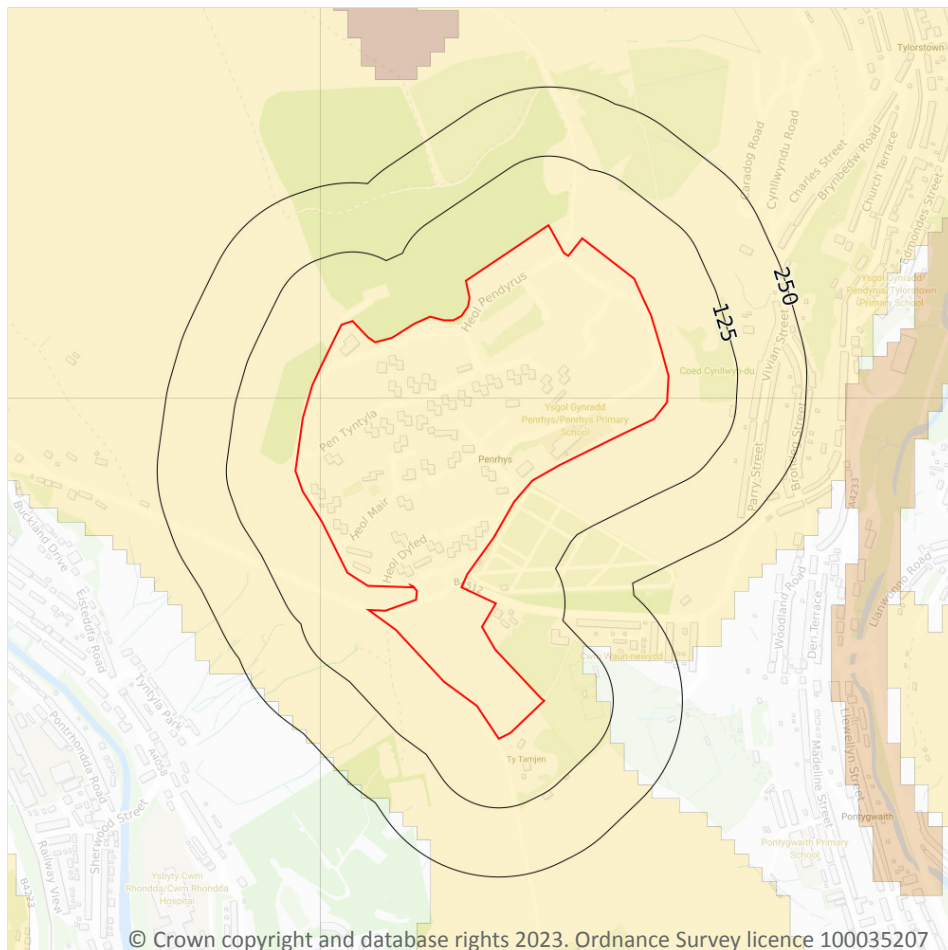
Since the database was set up in 2002 data covering most of the evaporite karst areas of the UK have now been added, along with data covering about 60% of the Chalk, and 35% of the Carboniferous Limestone outcrops. Many of the classic upland karst areas have yet to be included. Recorded so far are: Over 800 caves, 1300 stream sinks, 5600 springs, 10,000 sinkholes.

The database is not yet complete, and not all records have been verified. The absence of data does not mean that karst features are not present at a site. A reliability rating is included with each record.

This data is sourced from the British Geological Survey.



20 Radon



20.1 Radon

Records on site

1

The Radon Potential data classifies areas based on their likelihood of a property having a radon level at or above the Action Level in Great Britain. The dataset is intended for use at 1:50,000 scale and was derived from both geological assessments and indoor radon measurements (more than 560,000 records). A minimum 50m buffer should be considered when searching the maps, as the smallest detectable feature at this scale is 50m. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain (1:100,000 scale).

Features are displayed on the Radon map on [page 123](#) >

Location	Estimated properties affected	Radon Protection Measures required
On site	Between 1% and 3%	None



This data is sourced from the British Geological Survey and UK Health Security Agency.



21 Soil chemistry

21.1 BGS Estimated Background Soil Chemistry

Records within 50m

10

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km². In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km²; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	25 - 35 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	25 - 35 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	25 - 35 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	25 - 35 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
24m NE	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg

This data is sourced from the British Geological Survey.



21.2 BGS Estimated Urban Soil Chemistry

Records within 50m

0

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km²).

This data is sourced from the British Geological Survey.

21.3 BGS Measured Urban Soil Chemistry

Records within 50m

0

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km².

This data is sourced from the British Geological Survey.



This data is sourced from publicly available information by Groundsure.

22.3 Railway tunnels

Records within 250m

0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

22.4 Historical railway and tunnel features

Records within 250m

1

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

Features are displayed on the Railway infrastructure and projects map on [page 127 >](#)

Location	Land Use	Year of mapping	Mapping scale
29m N	Railway Sidings	1875	10560

This data is sourced from Ordnance Survey/Groundsure.

22.5 Royal Mail tunnels

Records within 250m

0

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

This data is sourced from Groundsure/the Postal Museum.

22.6 Historical railways

Records within 250m

0

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

This data is sourced from OpenStreetMap.



22.7 Railways

Records within 250m

0

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

This data is sourced from Ordnance Survey and OpenStreetMap.

22.8 Crossrail 1

Records within 500m

0

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

22.9 Crossrail 2

Records within 500m

0

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

22.10 HS2

Records within 500m

0

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 Ltd.



Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see <https://www.groundsure.com/sources-reference> ↗.

Terms and conditions

Groundsure's Terms and Conditions can be accessed at this link: <https://www.groundsure.com/terms-and-conditions-april-2023/> ↗.



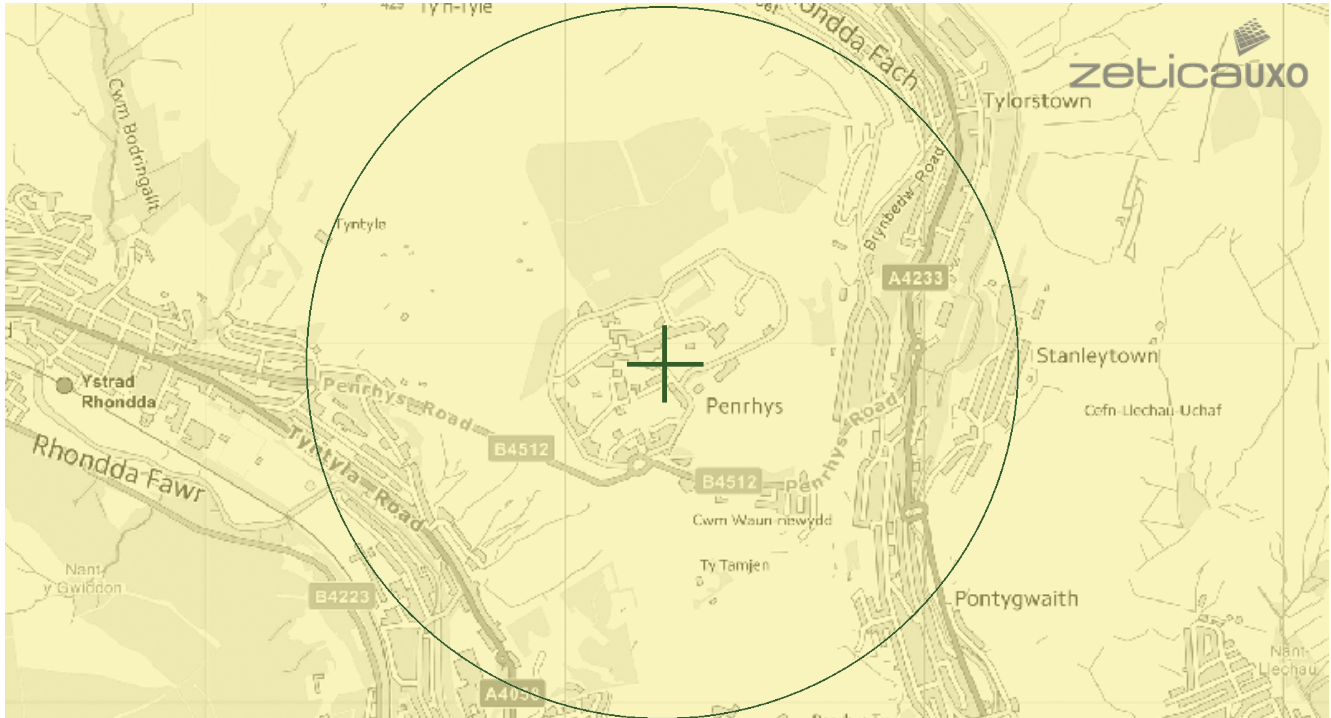
Zetica UXB risk maps

UNEXPLODED BOMB RISK MAP



SITE LOCATION

Map Centre: 300283,194946



LEGEND

- High:** Areas indicated as having a bombing density of 50 bombs per 1000acre or higher.
- Moderate:** Areas indicated as having a bombing density of 15 to 49 bombs per 1000acre.
- Low:** Areas indicated as having 15 bombs per 1000acre or less.

- military**
- industry**
- UXO find**
- transport**
- dock**
- Luftwaffe targets**
- utilities**
- Bombing decoy**
- other**

How to use your Unexploded Bomb (UXB) risk map?

The map indicates the potential for Unexploded Bombs (UXB) to be present as a result of World War Two (WWII) bombing.

You can incorporate the map into your preliminary risk assessment* for potential Unexploded Ordnance (UXO) for a site. Using this map, you can make an informed decision as to whether more in-depth detailed risk assessment* is necessary.

What do I do if my site is in a moderate or high risk area?

Generally, we recommend that a detailed UXO desk study and risk assessment is undertaken for sites in a moderate or high UXB risk area.

Similarly, if your site is near to a designated Luftwaffe target or bombing decoy then additional detailed research is recommended.

More often than not, this further detailed research will conclude that the potential for a significant UXO hazard to be present on your site is actually low.

Never plan site work or undertake a risk assessment using these maps alone. More detail is required, particularly where there may be a source of UXO from other military operations which are not reflected on these maps.

If my site is in a low risk area, do I need to do anything?

If both the map and other research confirms that there is a low potential for UXO to be present on your site then, subject to your own comfort and risk tolerance, works can proceed with no special precautions.

A low risk really means that there is no greater probability of encountering UXO than anywhere else in the UK.

If you are unsure whether other sources of UXO may be present, you can ask for one of our **pre-desk study assessments (PDSA)**

If I have any questions, who do I contact?

tel: **+44 (0) 1993 886682**

email: **uxo@zetica.com**

web: **www.zeticauxo.com**

The information in this UXB risk map is derived from a number of sources and should be used in conjunction with the accompanying notes on our website: (<https://zeticauxo.com/downloads-and-resources/risk-maps/>)

Zetica cannot guarantee the accuracy or completeness of the information or data used and cannot accept any liability for any use of the maps. These maps can be used as part of a technical report or similar publication, subject to acknowledgment. The copyright remains with Zetica Ltd.

It is important to note that this map is not a UXO risk assessment and should not be reported as such when reproduced.

*Preliminary and detailed UXO risk assessments are advocated as good practice by industry guidance such as CIRIA C681 'Unexploded Ordnance (UXO), a guide for the construction industry'.

BGS radon report

Hydrock
Third Floor Wharton Place,
13 Wharton Street
Cardiff
CF10 1GS

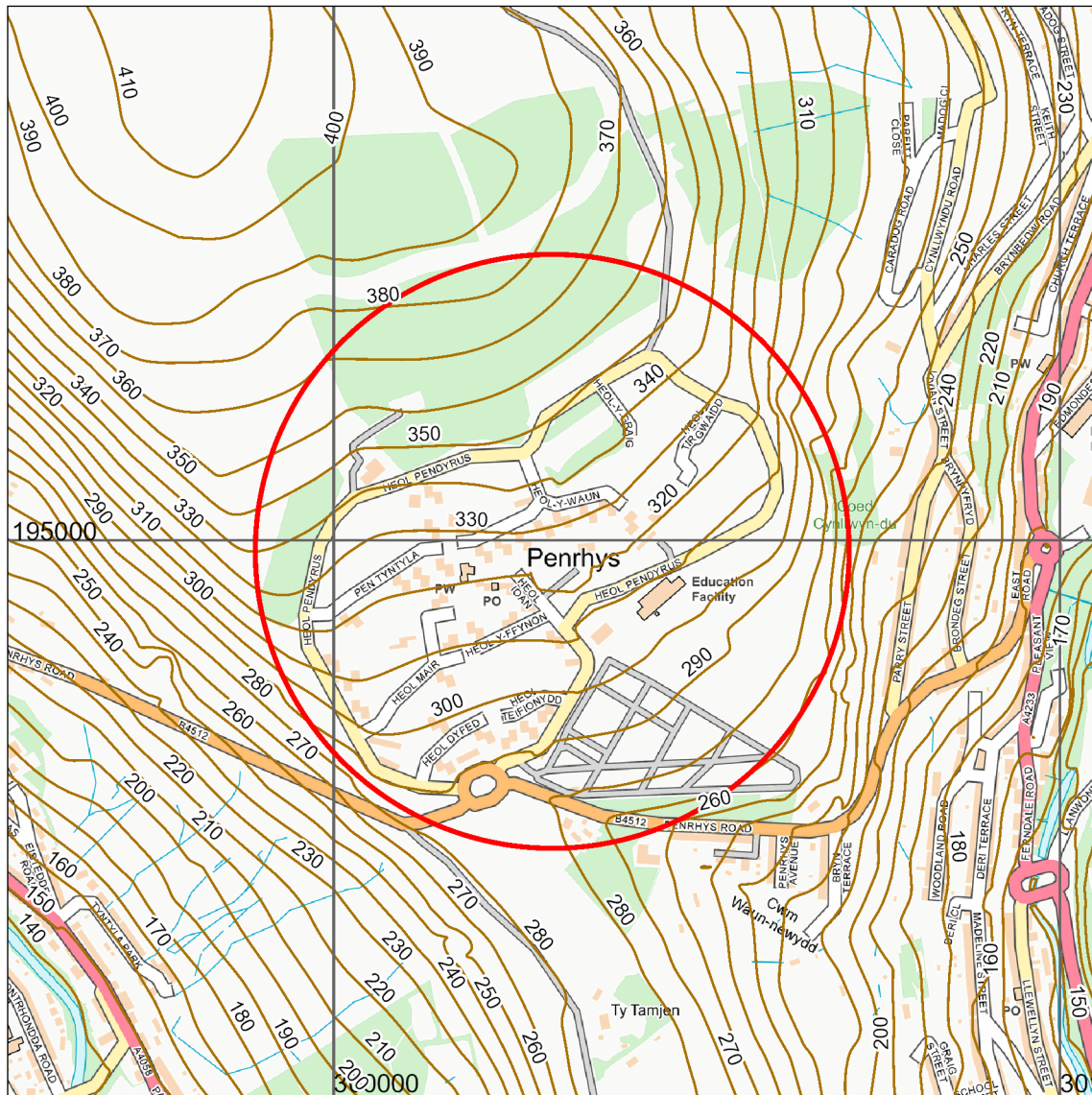
Radon Report

Advisory report on the requirement for radon protective measures in new buildings, conversions and extensions to existing buildings. The report also indicates whether a site is located within a radon Affected Area

Report Id: *BGS_335154/49016*

Client reference: 30603

Search location



Contains OS data © Crown Copyright and database right 2023. OS OpenMap Local: Scale: 1:10 000 (1cm = 100 m)

Search location indicated in red

Area centred at: 300301,194985

Radius of site area: 409 metres

Radon Report: UK

When extensions are made to existing buildings in high radon areas, or new buildings are constructed in these areas, the Building Regulations for England, Wales, Scotland and Northern Ireland require that protective measures are taken against radon entering the building.

This report provides information on whether radon protective measures are required. Depending on the probability of buildings having high radon levels, the Regulations may require either:

1. No protective measures
2. Basic protective measures
3. Full protective measures

This is an advisory report on the requirement for radon protective measures in new buildings, conversions and extensions. The report also indicates whether a site is located within a radon Affected Area

Requirement for radon protective measures

The determination below follows advice in *BR211 Radon: Guidance on protective measures for new buildings (2023 edition)*, which also provides guidance on what to do if the result indicates that protective measures are required.

Is the property in an area where radon protective measures are required for new buildings or extensions to existing ones as described in publication BR211 (2023 edition) Radon: Guidance on protective measures for new buildings?

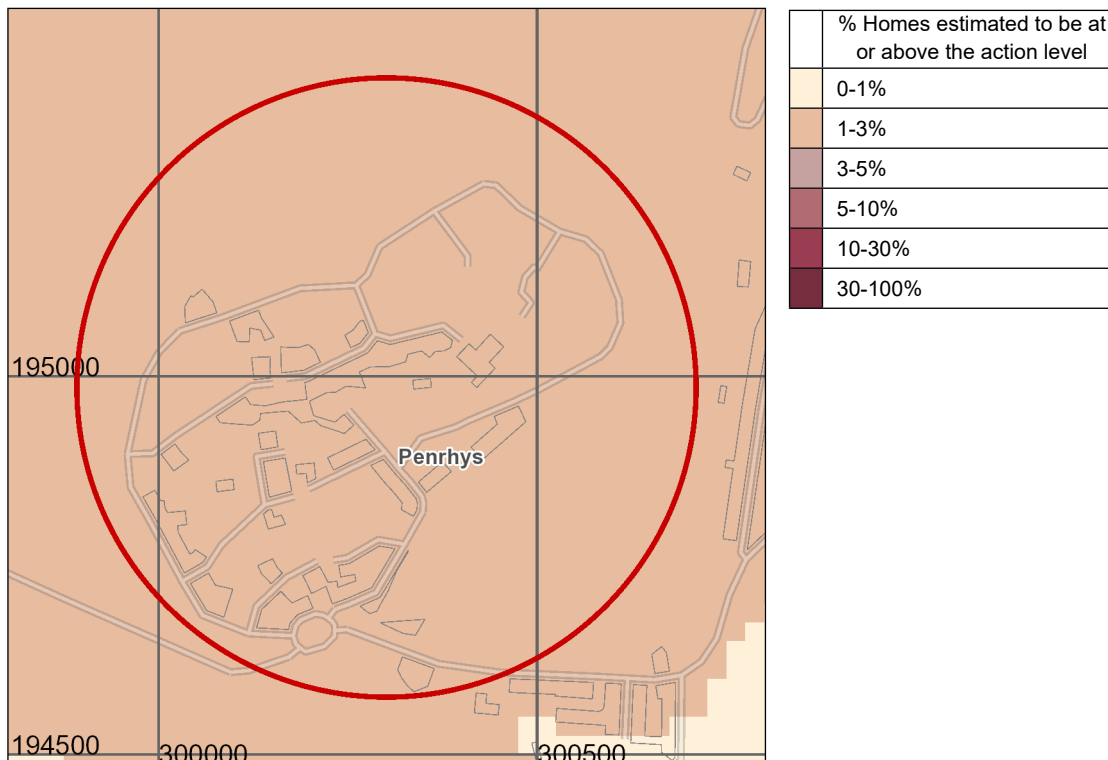
NO RADON PROTECTIVE MEASURES ARE REQUIRED FOR THE REPORT AREA.

More details of the protective measures required are available in *BR211 Radon: Guidance on protective measures for new buildings (2023 Edition)*. Additional information and guidance is available from the Building Research Establishment website (<http://www.bre.co.uk/radon/>).

Whether or not the radon level in a building is above or below the radon Action Level can only be established by having the building tested. The UKHSA provides a radon testing service which can be accessed at www.ukradon.org or by telephone (01235 822622).

If you require further information or guidance, you should contact your local authority building control officer or approved inspector.

Radon Affected Area



Contains OS data © Crown Copyright and database right 2023

Scale: 1:10 000 (1cm = 100 m)

Search area indicated in red

Is the property in a radon Affected Area as defined by the UK Health Security Agency (UKHSA) and if so what percentage of homes are estimated to be at or above the Action Level? YES

Additional Information

THE PROPERTY IS IN A RADON AFFECTED AREAS WHERE 1 TO 3% OF HOMES ARE ESTIMATED TO BE AT OR ABOVE THE ACTION LEVEL.

The UKHSA recommends a radon 'Action Level' of 200 Becquerels per cubic metre of air (Bq m^{-3}) for the annual average of the radon gas concentration in a home. Where 1% or more of homes are estimated to be at or above the Action Level the area should be regarded as a radon Affected Area.

This report informs you whether the property is in a radon Affected Area and the percentage of homes that are estimated to be at or above the radon Action Level at this location. Being in an Affected Area does not necessarily mean there is a high radon level within the property; the only way to determine the radon level is to carry out a radon measurement.

The UKHSA advises that radon gas should be measured in all properties within radon Affected Areas and that homes with radon levels at or above the Action Level (200 Bq m⁻³) should be remediated. Householders with levels between the Target Level (100 Bq m⁻³) and Action Level should seriously consider reducing their radon level, especially if they are at greater risk, such as if they are current or ex smokers. Whether or not a home is in fact above or below the Action Level or Target Level can only be established by having the building tested. The UKHSA provides a validated radon testing service which can be accessed at www.ukradon.org.

The information in this report provides an answer to one of the standard legal enquiries on house purchase in England and Wales, known as Law Society CON29 Enquiries of the Local Authority (2016); 3.14 Radon Gas: Do records indicate that the property is in a “Radon Affected Area” as identified by the UKHSA. The data can also be used to advise house buyers and sellers in Scotland and Northern Ireland.

If you are buying a new build property in a Radon Affected Area, you should ask the builder whether radon protective measures were incorporated in the construction of the property.

If you are buying a currently occupied property in a radon Affected Area, you should ask the present owner whether radon levels have been measured in the property. If they have, ask whether the results were at or above the radon Action Level and if so, whether remedial measures were installed, radon levels were re-tested, and if the results of re-testing confirmed the effectiveness of the measures.

Further information on radon is available from the UKHSA at www.ukradon.org.

What is radon?

Radon is a naturally occurring radioactive gas, which is produced by the radioactive decay of radium which, in turn, is derived from the radioactive decay of uranium. Uranium is found in small quantities in all soils and rocks, although the amount varies from place to place. Radon released from rocks and soils is quickly diluted in the atmosphere. Concentrations in the open air are normally very low and do not present a hazard. Radon that enters enclosed spaces such as some buildings (particularly basements), caves, mines, and tunnels may reach high concentrations in some circumstances. The construction method and degree of ventilation will influence radon levels in individual buildings. A person's exposure to radon will also vary according to how particular buildings and spaces are used.

Inhalation of the radioactive decay products of radon gas increases the chance of developing lung cancer. If individuals are exposed to high concentrations for significant periods of time, there may be cause for concern. In order to limit the risk to individuals, the Government has adopted an Action Level for radon in homes of 200 becquerels per cubic metre (Bq m^{-3}). The Government advises householders that, where the radon level is at or above the Action Level, measures should be taken to reduce the concentration.

Radon in workplaces

The Ionising Radiation Regulations 2017 require employers to take action when radon is present above a defined level in the workplace. Advice may be obtained from your local Health and Safety Executive Area Office or the Environmental Health Department of your local authority. The BRE publishes a guide (BR293): **Radon in the workplace**. BRE publications may be obtained from the BRE Bookshop, Tel: 01923 664262, email: bookshop@bre.co.uk website: www.brebookshop.com

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**Report issued by
BGS Enquiry Service**

BGS SuDS Report

Hydrock
Third Floor Wharton Place,
13 Wharton Street
Cardiff
CF10 1GS

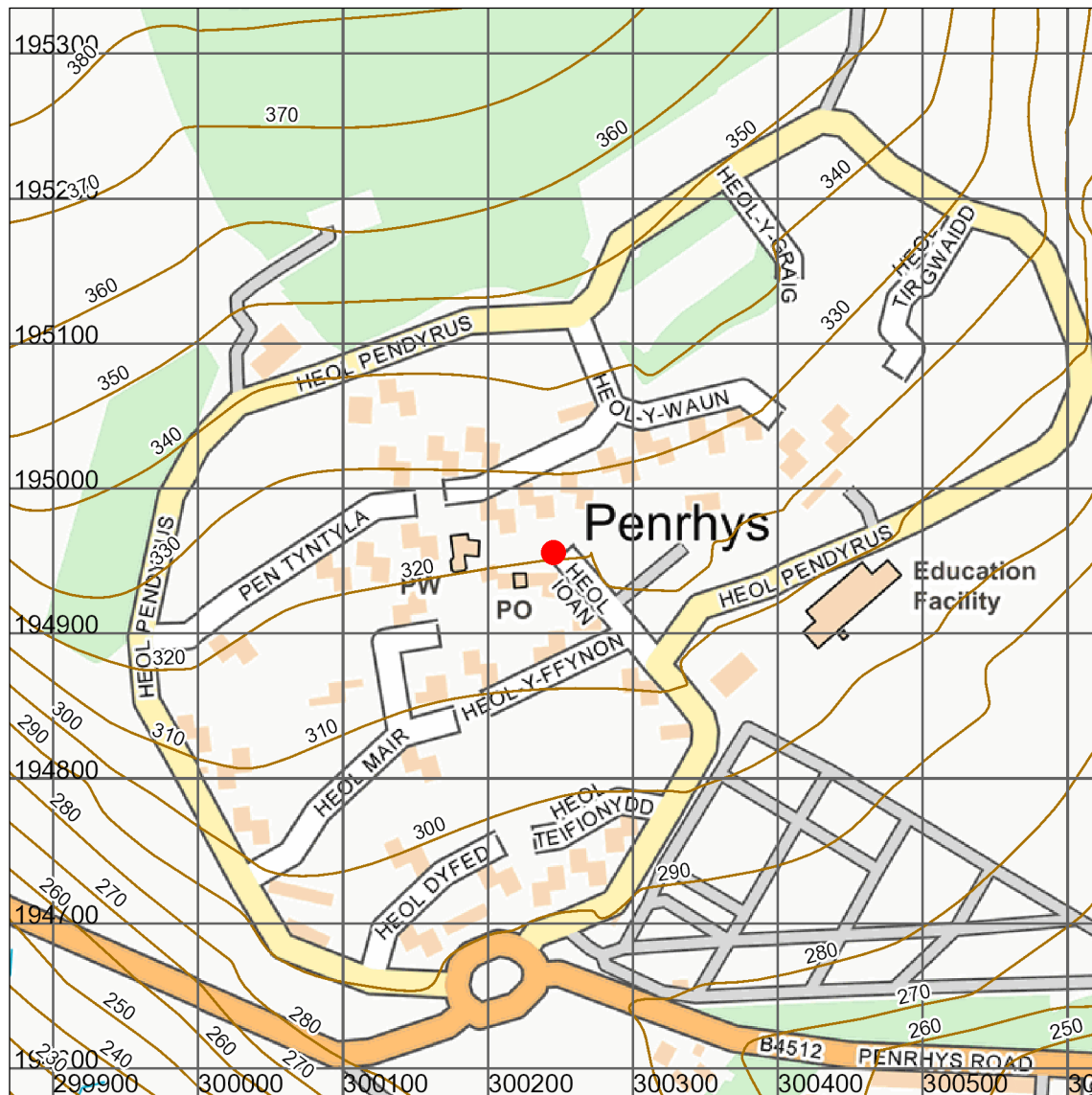
Infiltration SuDS GeoReport:

This report provides information on the suitability of the subsurface for the installation of infiltration sustainable drainage systems (SuDS). It provides information on the properties of the subsurface with respect to significant constraints, drainage, ground stability and groundwater quality protection.

Report Id: *BGS_335154/49017*

Client reference: 30603

Search location



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Search location indicated in red

Point centred at: 300245,194956

Assessment for an infiltration sustainable drainage system

Introduction

Sustainable drainage systems (SuDS) are drainage solutions that manage the volume and quality of surface water close to where it falls as rain. They aim to reduce flow rates to rivers, increase local water storage capacity and reduce the transport of pollutants to the water environment. There are four main types of SuDS, which are often designed to be used in sequence. They comprise:

- **source control:** systems that control the rate of runoff
- **pre-treatment:** systems that remove sediments and pollutants
- **retention:** systems that delay the discharge of water by providing surface storage
- **infiltration:** systems that mimic natural recharge to the ground.

This report focuses on infiltration SuDS. It provides subsurface information on the properties of the ground with respect to drainage, ground stability and groundwater quality protection. It is intended principally for those involved in the preliminary assessment of the suitability of the ground for infiltration SuDS, and those involved in assessing proposals from others for sustainable drainage, but it may also be useful to help house-holders judge whether or not further professional advice should be sought. If in doubt, users should consult a suitably-qualified professional about the results in this report before making any decisions based upon it.

This GeoReport is structured in two parts:

- **Part 1. Summary data.**

Comprises three maps that summarise the data contained within Part 2.

- **Part 2. Detailed data.**

Comprises a further 24 maps in four thematic sections:

- **Very significant constraints.** Maps highlight areas where infiltration may result in adverse impacts due to factors including: ground instability (soluble rocks, non-coal shallow mining and landslide hazards); persistent shallow groundwater, or the presence of made ground, which may represent a ground stability or contamination hazard.
- **Drainage potential.** Maps indicate the drainage potential of the ground, by considering subsurface permeability, depth to groundwater and the presence of floodplain deposits.
- **Ground stability.** Maps indicate the presence of hazards that have the potential to cause ground instability resulting in damage to some buildings and structures, if water is infiltrated to the ground.
- **Groundwater protection.** Maps provide key indicators to help determine whether the groundwater may be susceptible to deterioration in quality as a result of infiltration.

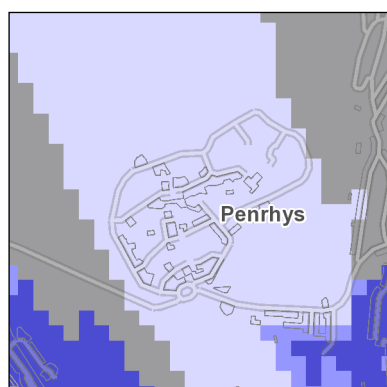
This report considers the suitability of the subsurface for the installation of infiltration SuDS, such as soakaways, infiltration basins or permeable pavements. It provides subsurface data to indicate whether, and which type of infiltration system may be appropriate. It does not state that infiltration SuDS are, or are not, appropriate as this is highly dependent on the design of the individual system. This report therefore describes the subsurface conditions at the site, allowing the reader to determine the suitability of the site for infiltration SuDS.

The map and text data in this report is similar to that provided in the '*Infiltration SuDS Map: Detailed*' national map product. For further information about the data, consult the '*User Guide for the Infiltration SuDS Map: Detailed*', available from <http://nora.nerc.ac.uk/16618/>.





PART 1: SUMMARY DATA

This section provides a summary of the data.

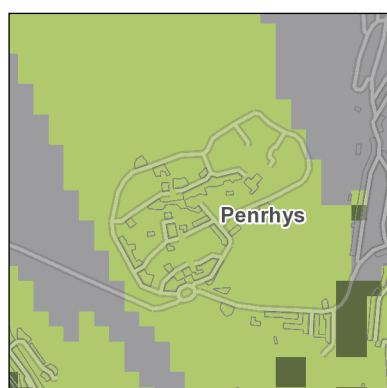
In terms of the drainage potential, is the ground suitable for infiltration SuDS?







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-  Highly compatible for infiltration SuDS. The subsurface is likely to be suitable for free-draining infiltration SuDS.
-  Probably compatible for infiltration SuDS. The subsurface is probably suitable although the design may be influenced by the ground conditions.
-  Opportunities for bespoke infiltration SuDS. The subsurface is potentially suitable although the design will be influenced by the ground conditions.
-  Very significant constraints are indicated. There is a very significant potential for one or more hazards associated with infiltration.

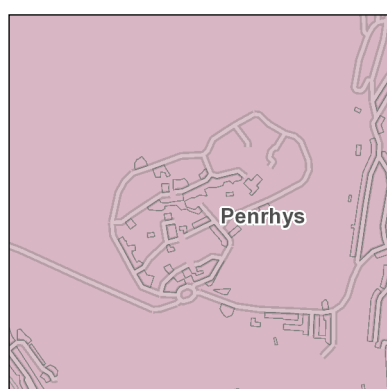
Is ground instability likely to be a problem?







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-  Increased infiltration is very unlikely to result in ground instability.
-  Ground instability problems may be present or anticipated, but increased infiltration is unlikely to result in ground instability.
-  Ground instability problems are probably present. Increased infiltration may result in ground instability.
-  There is a very significant potential for one or more geohazards associated with infiltration.

Is the groundwater susceptible to deterioration in quality?



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-  The groundwater is not expected to be especially vulnerable to contamination.
-  The groundwater may be vulnerable to contamination.
-  The groundwater is likely to be vulnerable to contaminants.
-  Made ground is present at the surface. Infiltration may increase the possibility of remobilising pollutants.

PART 2: DETAILED DATA

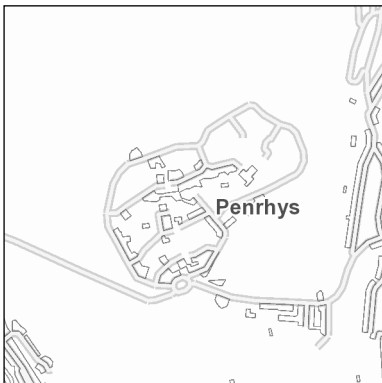
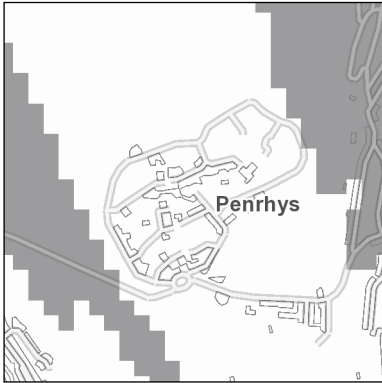
This section provides further information about the properties of the ground and will help assess the suitability of the ground for infiltration SuDS.

Section 1. Very significant constraints

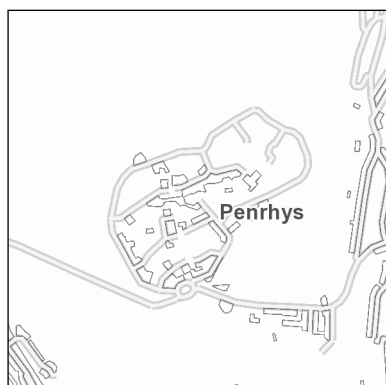
Where maps are overlain by grey polygons, geological or hydrogeological hazards may exist that could be made worse by infiltration. The following hazards are considered:

- soluble rocks
- landslides
- shallow mining (not including coal)
- shallow groundwater
- made ground

For more information read 'Explanation of terms' at the end of this report.

Soluble rock hazard	
 <p>Contains OS data © Crown Copyright and database right 2023</p>	<p><input checked="" type="checkbox"/> Very significant soluble rock hazard.</p> <p>Soluble rocks are present with a very significant possibility of localised subsidence that could be initiated or made worse by infiltration. The site investigation should consider whether the potential for or the consequences of subsidence as a result of infiltration are significant.</p>
	<p><input type="checkbox"/> Very significant soluble rock hazards are not present; however this hazard may still need to be considered. See Part 3.</p>
Landslide hazard	
 <p>Contains OS data © Crown Copyright and database right 2023</p>	<p><input checked="" type="checkbox"/> Very significant landslide hazard.</p> <p>Slope instability problems are almost certainly present and may be active. An increase in moisture content as a result of infiltration may cause the slope to fail. The site investigation should consider whether the potential for or the consequences of landslide as a result of infiltration are significant.</p>
	<p><input type="checkbox"/> Very significant landslide hazards are not present; however this hazard may still need to be considered. See Part 3.</p>

Shallow mining hazard (not including coal)

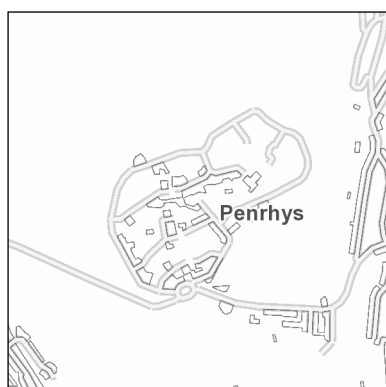


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☒ Very significant mining hazard.
Shallow mining is likely to be present with a very significant possibility of localised subsidence that could be initiated or made worse by increased infiltration. Also, infiltration may increase the possibility of remobilising pollutants. The site investigation should consider whether the potential for or consequences of subsidence and/or remobilisation of pollutants as a result of infiltration are significant.

☐ Very significant mining hazards are not present; however this hazard may still need to be considered. See Part 3.

Persistent shallow groundwater



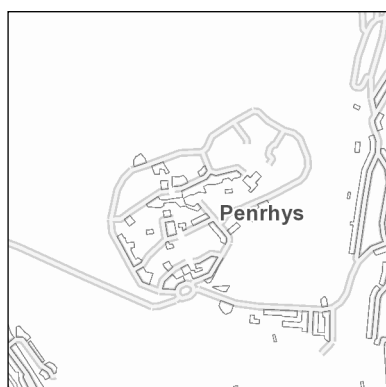
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☒ Very high likelihood of persistent or seasonally shallow groundwater.

Persistent or seasonally shallow groundwater is likely to be present. Infiltration may increase the likelihood of soakaway inundation, or groundwater emergence at the surface. The site investigation should consider whether the potential for or the consequences of groundwater level rise as a result of infiltration are significant.

☐ See Part 2 for the likely depth to water table.

Made ground



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☒ Made ground present.
Made ground is present at the surface. Infiltration may affect ground stability or increase the possibility of remobilising pollutants. The site investigation should consider whether the potential for or consequences of ground instability and/or pollutant leaching as a result of infiltration are significant.

☐ None recorded

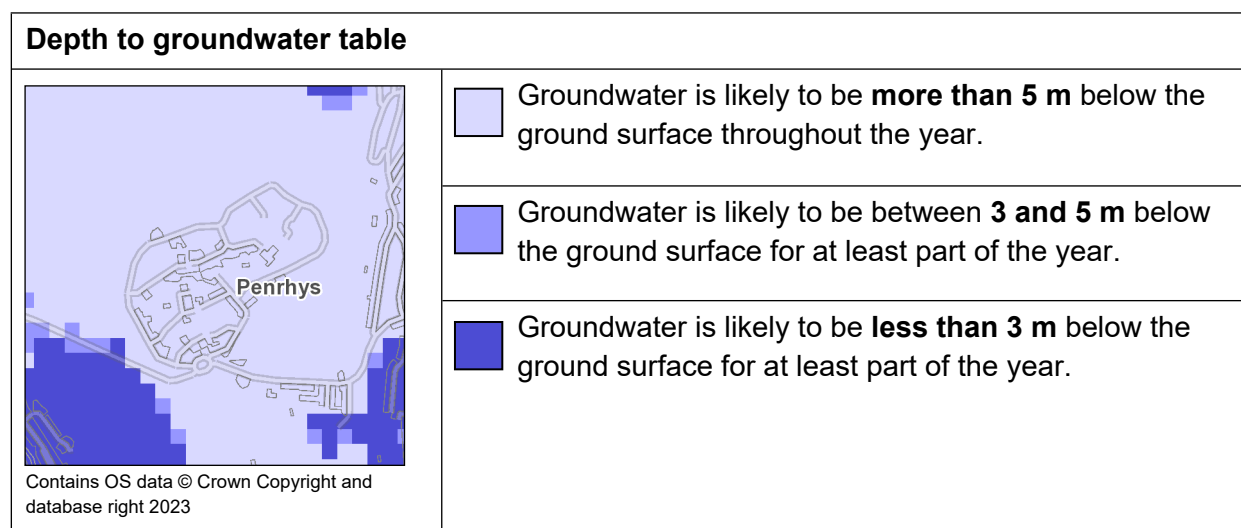
Section 2. Drainage potential

The following pages contain maps that will help you assess the drainage potential of the ground by considering the:

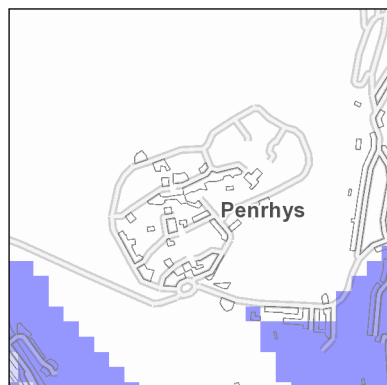
- depth to water table
- permeability of the superficial deposits
- thickness of the superficial deposits
- permeability of the bedrock
- presence of floodplains

Superficial deposits are not present everywhere and therefore some areas of the *superficial deposit permeability* map may not be coloured. Where this is the case, the *bedrock permeability* map shows the likely permeability of the ground. Superficial deposits in some places are very thin and hence in these places you may wish to consider both the permeability of the superficial deposits and the permeability of the bedrock. The *superficial thickness* map will tell you whether the superficial deposits are thin (< 3 m thick) or thick (>3 m). Where they are over 3 m thick, the permeability of the bedrock may not be relevant.

For more information read 'Explanation of terms' at the end of this report.



Superficial deposit permeability



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Superficial deposits are likely to be **free-draining**.



The superficial deposit permeability is **spatially variable**, but likely to permit moderate infiltration.

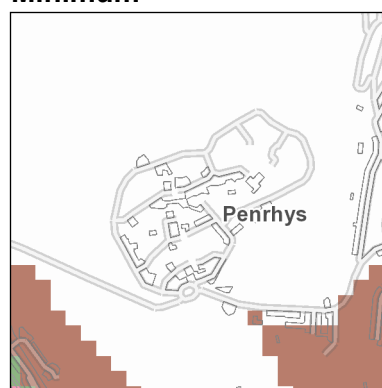


Superficial deposits are likely to be **poorly draining**.

These maps show the permeability range that is summarised above.

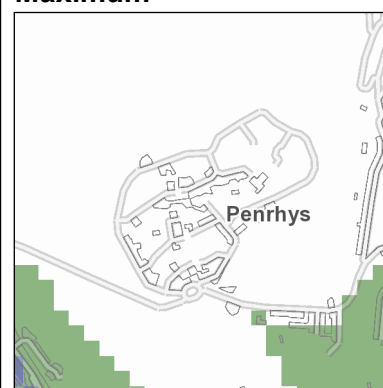
- Very Low
- Low
- Moderate
- High
- Very High

Minimum



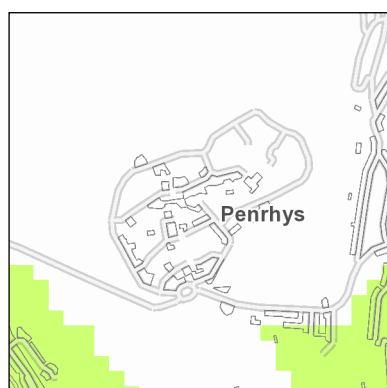
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Maximum



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Superficial deposit thickness



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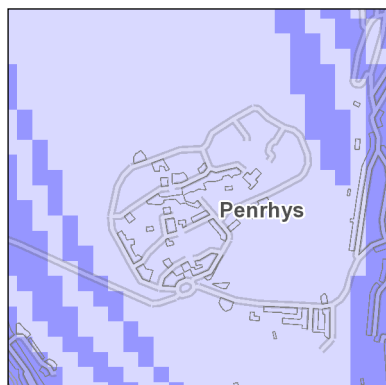


The thickness of superficial deposits is **< 3 m** and hence the permeability of the ground may be dependent on both the superficial deposits (where present) and underlying bedrock (see below).



The thickness of superficial deposits is **> 3 m** and hence the permeability of the superficial deposits is likely to determine the permeability of the ground.

Bedrock permeability



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Bedrock deposits are likely to be **free-draining**.



The bedrock permeability is **spatially variable**, but likely to permit moderate infiltration.



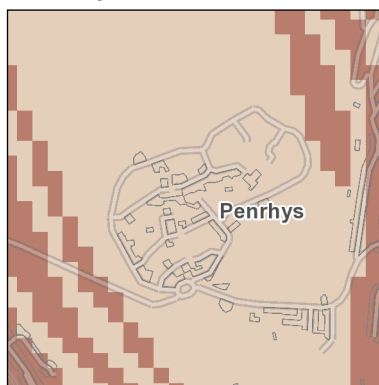
Bedrock deposits are likely to be **poorly draining**.

These maps show the permeability range that is summarised above.

Key

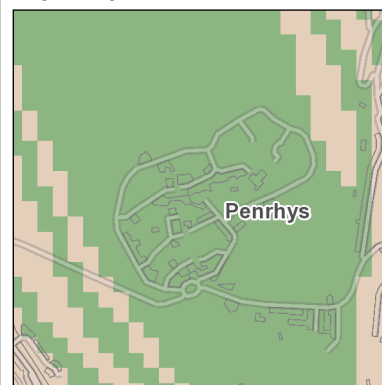
-  Very Low
-  Low
-  Moderate
-  High
-  Very High

Minimum



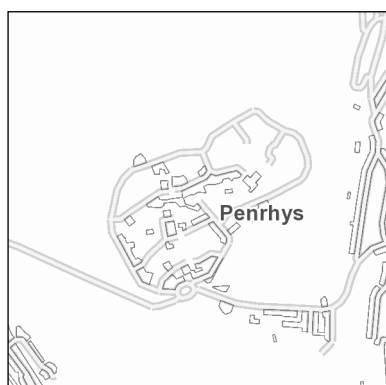
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Maximum



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Geological indicators of flooding



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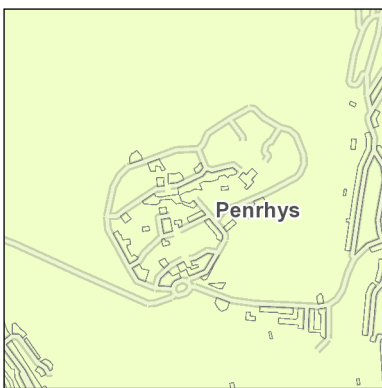




Superficial floodplain deposits or low-lying coastal areas have been identified. Groundwater levels may rise in response to high river or tide levels, potentially causing inundation of subsurface infiltration SuDS.

Section 3. Ground stability

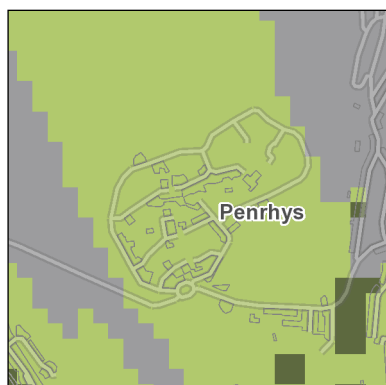
The following pages contain maps that will help you assess whether infiltration may impact the stability of the ground. They consider hazards associated with:

- soluble rocks
- landslides
- shallow mining
- running sands
- swelling clays
- compressible ground, and
- collapsible ground





In the following maps, geohazards that are identified in green are unlikely to prevent infiltration SuDS from being installed, but they should be considered during design. For more information read 'Explanation of terms' at the end of this report.

Soluble rocks	
 <p>Contains OS data © Crown Copyright and database right 2023</p>	<p> Increased infiltration is unlikely to result in subsidence.</p>
	<p> Increased infiltration is unlikely to cause localised subsidence, but potential impacts should be considered.</p>
	<p> Increased infiltration may result in localised subsidence. The potential for or the consequences of subsidence associated with soluble rocks should be considered.</p>
	<p> Very significant possibility of localised subsidence that could be initiated or made worse by infiltration.</p>

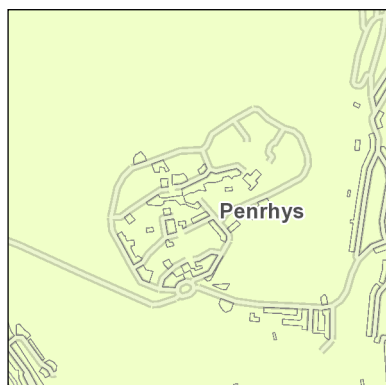
Landslides







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-  Increased infiltration is unlikely to lead to slope instability.
-  Slope instability problems may be present or anticipated, but increased infiltration is unlikely to cause instability
-  Slope instability problems are probably present or have occurred in the past, and increased infiltration may result in slope instability.
-  Slope instability problems are almost certainly present and may be active. An increase in moisture content as a result of infiltration may cause the slope to fail.

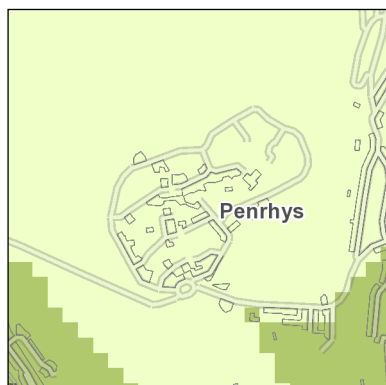
Shallow mining






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-  Increased infiltration is unlikely to lead to subsidence.
-  Shallow mining is possibly present. Increased infiltration is unlikely to cause a geohazard, but potential impacts should be considered.
-  Shallow mining could be present with a significant possibility that localised subsidence could be initiated or made worse by increased infiltration.
-  Shallow mining is likely to be present, with a very significant possibility that localised subsidence may be initiated or made worse by increased infiltration.

Running sand






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-  Increased infiltration is unlikely to cause ground collapse associated with running sands.
-  Running sand is possibly present. Increased infiltration is unlikely to cause a geohazard, but potential impacts should be considered.
-  Significant possibility for running sand problems. Increased infiltration may result in a geohazard.

Swelling clays





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-  Increased infiltration is unlikely to cause shrink-swell ground movement.
-  Ground is susceptible to shrink-swell ground movement. Increased infiltration is unlikely to cause a geohazard, but potential impacts should be considered.
-  Ground is susceptible to shrink-swell ground movement. Increased infiltration may result in a geohazard.

Compressible ground






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-  Increased infiltration is unlikely to lead to ground compression.
-  Compressibility and uneven settlement hazards are probably present. Increased infiltration may result in a geohazard.

Collapsible ground



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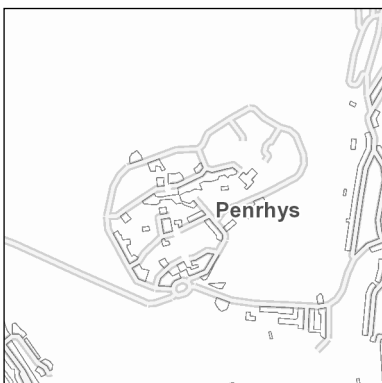








-  Increased infiltration is unlikely to result in subsidence.
-  Deposits with potential to collapse when loaded and saturated are possibly present in places. Increased infiltration is unlikely to cause a geohazard, but potential impacts should be considered.
-  Deposits with potential to collapse when loaded and saturated are probably present in places. Increased infiltration may result in a geohazard.

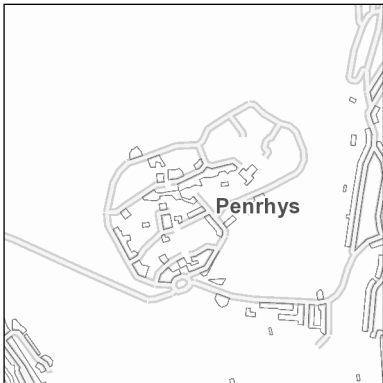

Section 4. Groundwater quality protection

The following pages contain maps showing some of the information required to ensure the protection of groundwater quality. Data presented includes:

- groundwater source protection zones (Environment Agency data)
- predominant flow mechanism
- made ground

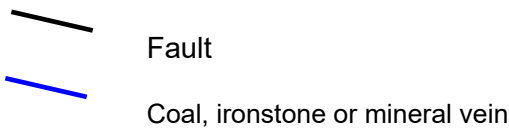
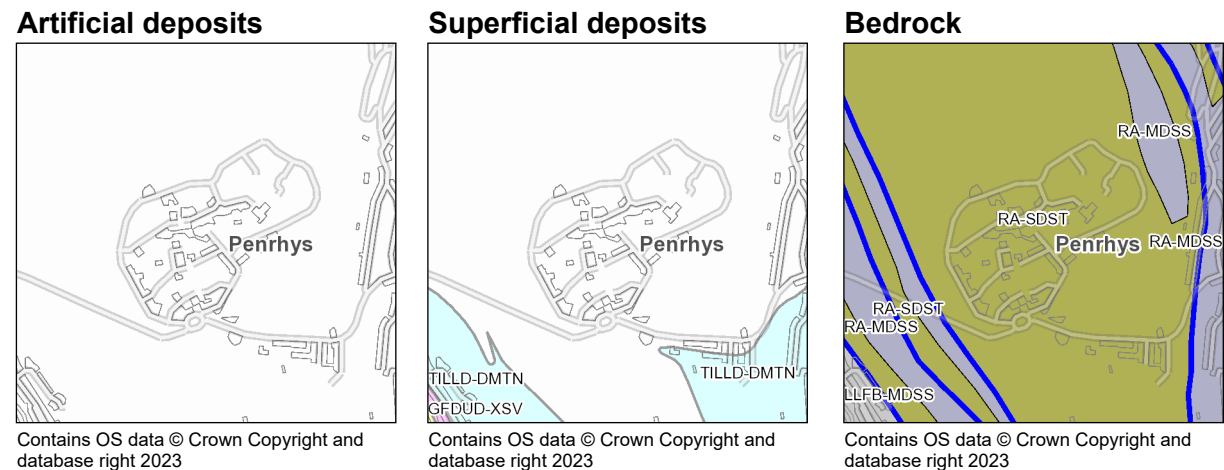
For more information read 'Explanation of terms' at the end of this report.

Groundwater source protection zones	
 <p>Contains OS data © Crown Copyright and database right 2023</p> <p>Derived in part from Source Protection Zone data provided under licence from the Environment Agency © Environment Agency 2023.</p>	<div>  Groundwater is not within a source protection zone. </div>
	<div>  Source protection zone IV </div>
	<div>  Source protection zone III </div>
	<div>  Source protection zone II </div>
	<div>  Source protection zone I </div>
Predominant flow mechanism	
 <p>Contains OS data © Crown Copyright and database right 2023</p>	<div>  Water is likely to percolate through the unsaturated zone to the groundwater through either the pore space in granular media or through porespace and fractures; these processes have some potential for contaminant removal and breakdown. </div>
	<div>  Water is likely to percolate through the unsaturated zone to the groundwater through fractures, a process which has little potential for contaminant removal and breakdown. </div>

Made ground	
<div><p>Contains OS data © Crown Copyright and database right 2023</p></div>	<div><div></div><div>Made ground is present at the surface. Infiltration may increase the possibility of remobilising pollutants.</div></div>

Section 5. Geological Maps




The following maps show the artificial, superficial and bedrock geology within the area of interest.






Note: Faults and Coals, ironstone & mineral veins are shown for illustration and to aid interpretation of the map. Not all such features are shown and their absence on the map face does not necessarily mean that none are present

Key to Artificial deposits:
No deposits recorded by BGS in the search area

Key to Superficial deposits:

Map colour	Computer Code	Rock name	Rock type
	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON

Key to Bedrock geology:

Map colour	Computer Code	Rock name	Rock type
	LLFB-MDSS	LLYNFI MEMBER	MUDSTONE, SILTSTONE AND SANDSTONE
	RA-MDSS	RHONDDA MEMBER	MUDSTONE, SILTSTONE AND SANDSTONE
	RA-SDST	RHONDDA MEMBER	SANDSTONE

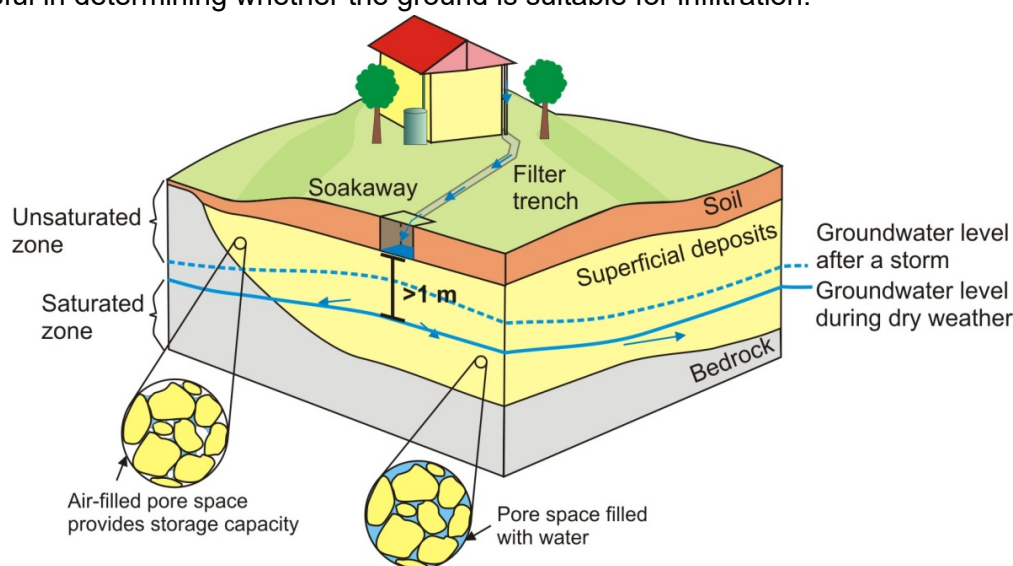
Limitations of this report:

- This report is concerned with the potential for infiltration-to-the-ground to be used as a SuDS technique at the site described. It only considers the subsurface beneath the search area and does NOT consider potential surface or subsurface impacts outside of that area.
- This report is NOT an alternative for an on-site investigation or soakaway test, which might reach a different conclusion.
- This report must NOT be used to justify disposal of foul waste or grey water.
- This report is based on and limited to an interpretation of the records held by the British Geological Survey (BGS) at the time the search is performed. The datasets used (with the exception of that showing depth to water table) are based on 1:50 000 digital geological maps and not site-specific data.
- Other more specific and detailed ground instability information for the site may be held by BGS, and an assessment of this could result in a modified assessment.
- To interpret the maps correctly, the report must be viewed and printed in colour.
- The search does NOT consider the suitability of sites with regard to:
 - previous land use,
 - potential for, or presence of contaminated land
 - presence of perched water tables
 - shallow mining hazards relating to coal mining. Searches of coal mining should be carried out via The Coal Authority Mine Reports Service: www.coalminingreports.co.uk.
 - made ground, where not recorded
 - proximity to landfill sites (searches for landfill sites or contaminated land should be carried out through consultation with local authorities/Environment Agency)
 - zones around private water supply boreholes that are susceptible to groundwater contamination.
- This report is supplied in accordance with the GeoReports Terms & Conditions available separately, and the copyright restrictions described at the end of this report

Explanation of terms

Depth to groundwater

In the shallow subsurface, the ground is commonly unsaturated with respect to water. Air fills the spaces within the soil and the underlying superficial deposits and bedrock. At some depth below the ground surface, there is a level below which these spaces are full of water. This level is known as the groundwater level, and the water below it is termed the groundwater. When water is infiltrated, the groundwater level may rise temporarily. To ensure that there is space in the unsaturated zone to accommodate this, there should be a minimum thickness of 1 m between the base of the infiltration system and the water table. An estimate of the *depth to groundwater* is therefore useful in determining whether the ground is suitable for infiltration.



Groundwater flooding

Groundwater flooding occurs when a rise in groundwater level results in very shallow groundwater or the emergence of groundwater at the surface. If infiltration systems are installed in areas that are susceptible to groundwater flooding, it is possible that the system could become inundated. The susceptibility map seeks to identify areas where the geological conditions and water tables indicate that groundwater level rise could occur under certain circumstances. A high susceptibility to groundwater flooding classification does not mean that groundwater flooding has ever occurred in the past, or will do so in the future as the susceptibility maps do not contain information on how often flooding may occur. The susceptibility maps are designed for planning; identifying areas where groundwater flooding might be an issue that needs to be taken into account.

Geological indicators of flooding

In floodplain deposits, groundwater level can be influenced by the water level in the adjacent river. Groundwater level may increase during periods of fluvial flood and therefore this should be taken into account when designing infiltration systems on such deposits. The *geological indicators of flooding* dataset shows where there is geological evidence (floodplain deposits) that flooding has occurred in the past.

For further information on flood-risk, the likely frequency of its recurrence in relation to any proposed development of the site, and the status of any flood prevention measures in place, you are advised to contact the local office of the Environment Agency (England and Wales) at www.environment-agency.gov.uk/ or the Scottish Environment Protection Agency (Scotland) at www.sepa.org.uk.

Artificial ground

Artificial ground comprises deposits and excavations that have been created or modified by human activity. It includes ground that is worked (quarries and road cuttings), infilled (back-filled quarries), landscaped (surface re-shaping), disturbed (near surface mineral workings) or classified as made ground (embankments and spoil heaps). The composition and properties of artificial ground are often unknown. In particular, the permeability and chemical composition of the artificial ground should be determined to ensure that the ground will drain and that any contaminants present will not be remobilised.

Superficial permeability

Superficial deposits are those geological deposits that were formed during the most recent period of geological time (as old as 2.6 million years before present). They generally comprise relatively thin deposits of gravel, sand, silt and clay and are present beneath the pedological soil in patches or larger spreads over much of Britain. The ease with which water can percolate through these deposits is controlled by their permeability and varies widely depending on their composition. Those deposits comprising clays and silts are less permeable and thus infiltration is likely to be slow, such that water may pool on the surface. In comparison, deposits comprising sands and gravels are more permeable allowing water to percolate freely.

Bedrock permeability

Bedrock forms the main mass of rock forming the Earth. It is present everywhere, commonly beneath superficial deposits. Where the superficial deposits are thin or absent, the ease with which water will percolate into the ground depends on the permeability of the bedrock.

Natural ground instability

Natural ground instability refers to the propensity for upward, lateral or downward movement of the ground that can be caused by a number of natural geological hazards (e.g. ground dissolution/compressible ground). Some movements associated with particular hazards may be gradual and of millimetre or centimetre scale, whilst others may be sudden and of metre or tens of metres scale. Significant natural ground instability has the potential to cause damage to buildings and structures, especially when the drainage characteristics of a site are altered. It should be noted, however, that many buildings, particularly more modern ones, are built to such a standard that they can remain unaffected in areas of significant ground movement.

Shrink-swell

A shrinking and swelling clay changes volume significantly according to how much water it contains. All clay deposits change volume as their water content varies, typically swelling in winter and shrinking in summer, but some do so to a greater extent than others. Contributory circumstances could include drought, leaking service pipes, tree roots drying-out the ground or changes to local drainage patterns, such as the creation of soakaways. Shrinkage may remove support from the foundations of buildings and structures, whereas clay expansion may lead to uplift (heave) or lateral stress on part or all of a structure; any such movements may cause cracking and distortion.

Landslides (slope stability)

A landslide is a relatively rapid outward and downward movement of a mass of ground on a slope, due to the force of gravity. A slope is under stress from gravity but will not move if its strength is greater than this stress. If the balance is altered so that the stress exceeds the strength, then movement will occur. The stability of a slope can be reduced by removing ground at the base of the slope, by placing material on the slope, especially at the top, or by increasing the water content of the materials forming the slope. Increase in subsurface water content beneath a soakaway could increase susceptibility to landslide hazards. The assessment of landslide hazard refers to the stability of the present land surface. It does not encompass a consideration of the stability of excavations.

Soluble rocks (dissolution)

Some rocks are soluble in water and can be progressively removed by the flow of water through the ground. This process tends to create cavities, potentially leading to the collapse of overlying materials and possibly subsidence at the surface. The release of water into the subsurface from infiltration systems may increase the dissolution of rock or destabilise material above or within a cavity. Dissolution cavities may create a pathway for rapid transport of contaminated water to an aquifer or water course.

Compressible ground

Many ground materials contain water-filled pores (the spaces between solid particles). Ground is compressible if a building (or other load) can cause the water in the pore space to be squeezed out, causing the ground to decrease in thickness. If ground is extremely compressible the building may sink. If the ground is not uniformly compressible, different parts of the building may sink by different amounts, possibly causing tilting, cracking or distortion. The compressibility of the ground may alter as a result of changes in subsurface water content caused by the release of water from soakaways.

Collapsible deposits

Collapsible ground comprises certain fine-grained materials with large pore spaces (the spaces between solid particles). It can collapse when it becomes saturated by water and/or a building (or other structure) places too great a load on it. If the material below a building collapses it may cause the building to sink. If the collapsible ground is variable in thickness or distribution, different parts of the building may sink by different amounts, possibly causing tilting, cracking or distortion. The subsurface underlying a soakaway will experience an increase in water content that may affect the stability of the ground. This hazard is most likely to be encountered only in parts of southern England.

Running sand

Running sand conditions occur when loosely-packed sand, saturated with water, flows into an excavation, borehole or other type of void. The pressure of the water filling the spaces between the sand grains reduces the contact between the grains and they are carried along by the flow. This can lead to subsidence of the surrounding ground. Running sand is potentially hazardous during the drainage system installation. During installation, excavation of the ground may create a space into which sand can flow, potentially causing subsidence of surrounding ground.

Shallow mining hazards (non coal)

Current or past underground mining for coal or for other commodities can give rise to cavities at shallow or intermediate depths, which may cause fracturing, general settlement, or the formation of crown-holes in the ground above. Spoil from mineral workings may also present a pollution hazard. The release of water into the subsurface from soakaways may destabilise material above or within a cavity. Cavities arising as a consequence of mining may also create a pathway for rapid transport of contaminated water to an aquifer or watercourse. The mining hazards map is derived from the geological map and considers the potential for subsidence associated with mining on the basis of geology type. Therefore if mining is known to occur within a certain rock, the map will highlight the potential for a hazard within the area covered by that geology.

For more information regarding underground and opencast **coal mining**, the location of mine entries (shafts and adits) and matters relating to subsidence or other ground movement induced by **coal mining** please contact the Coal Authority, Mining Reports, 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG; telephone 0845 762 6848 or at www.coal.gov.uk. For more information regarding other types of mining (i.e. non-coal), please contact the British Geological Survey.

Groundwater source protection zones

In England and Wales, the Environment Agency has defined areas around wells, boreholes and springs that are used for the abstraction of public drinking water as source protection zones. In conjunction with Groundwater Protection Policy the zones are used to restrict activities that may impact groundwater quality, thereby preventing pollution of underlying aquifers, such that drinking water quality is upheld. The Environment Agency can provide advice on the location and implications of source protection zones in your area (www.environment-agency.gov.uk/)

Contact Details

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- The data, information and related records supplied in this Report by BGS can only be indicative and should not be taken as a substitute for specialist interpretations, professional advice and/or detailed site investigations. You must seek professional advice before making technical interpretations on the basis of the materials provided.
- Geological observations and interpretations are made according to the prevailing understanding of the subject at the time. The quality of such observations and interpretations may be affected by the availability of new data, by subsequent advances in knowledge, improved methods of interpretation, and better access to sampling locations.
- Raw data may have been transcribed from analogue to digital format, or may have been acquired by means of automated measuring techniques. Although such processes are subjected to quality control to ensure reliability where possible, some raw data may have been processed without human intervention and may in consequence contain undetected errors.
- Detail, which is clearly defined and accurately depicted on large-scale maps, may be lost when small-scale maps are derived from them.
- Although samples and records are maintained with all reasonable care, there may be some deterioration in the long term.
- The most appropriate techniques for copying original records are used, but there may be some loss of detail and dimensional distortion when such records are copied.
- Data may be compiled from the disparate sources of information at BGS's disposal, including material donated to BGS by third parties, and may not originally have been subject to any verification or other quality control process.
- Data, information and related records, which have been donated to BGS, have been produced for a specific purpose, and that may affect the type and completeness of the data recorded and any interpretation. The nature and purpose of data collection, and the age of the resultant material may render it unsuitable for certain applications/uses. You must verify the suitability of the material for your intended usage.
- If a report or other output is produced for you on the basis of data you have provided to BGS, or your own data input into a BGS system, please do not rely on it as a source of information about other areas or geological features, as the report may omit important details.
- The topography shown on any map extracts is based on the latest OS mapping and is not necessarily the same as that used in the original compilation of the BGS geological map, and to which the geological linework available at that time was fitted.
- Note that for some sites, the latest available records may be historical in nature, and while every effort is made to place the analysis in a modern geological context, it is possible in some cases that the detailed geology at a site may differ from that described.

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**Report issued by
BGS Enquiry Service**

Coal Authority 'Consultants Coal Mining Report'



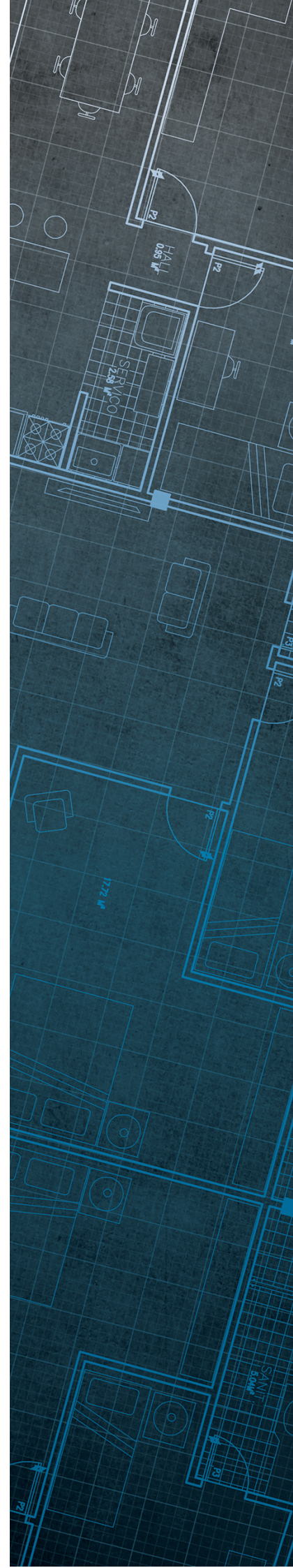
The Coal
Authority

Consultants Coal Mining Report

428, Heol-y-waun, Pen-rhys,
Ferndale
Rhondda Cynon Taff
CF43 3N

Date of enquiry:	5 October 2023
Date enquiry received:	5 October 2023
Issue date:	5 October 2023

Our reference:	51003381902001
Your reference:	GS-3DR-KQL-LSP-TX1



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

GROUNDSURE LIMITED

Enquiry address

428, Heol-y-waun, Pen-rhys, Ferndale
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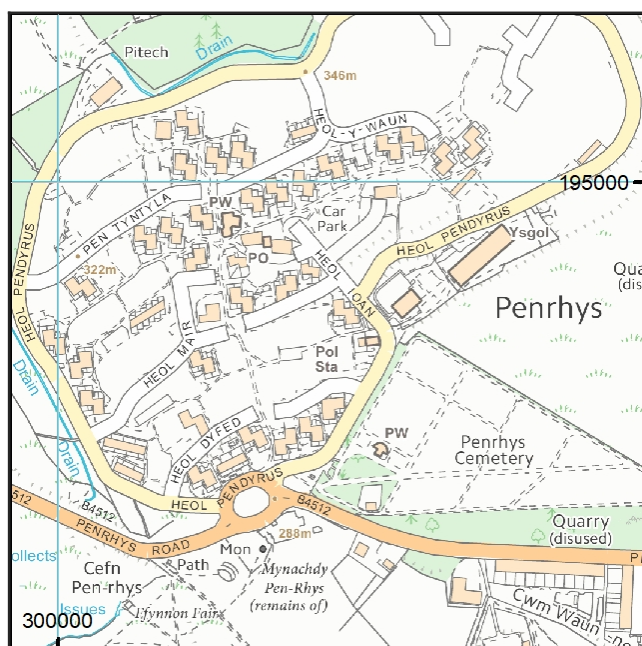
www.groundstability.com

 @coalauthority

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 /thecoalauthority



Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	NO.2 RHONDDA	Coal	44II	181	South-West	5.4	North-East	100	1916
unnamed	TWO FOOT NINE	Coal	43ZF	402	Beneath Property	11.1	South	70	1919
GLAMORGAN	TWO FOOT NINE	Coal	493H	404	West	5.5	South	100	1914
unnamed	FOUR FOOT	Coal	492T	411	North-West	6.6	South-East	210	1922
FERNDAL	TWO FOOT NINE	Coal	493G	414	North-West	3.9	South	100	1923
unnamed	FOUR FOOT	Coal	43Z1	426	West	9.7	South	210	1923
unnamed	6FT BOTTOM LEAF	Coal	43ZP	440	West	0.5	West	230	1899
unnamed	6FT BOTTOM LEAF	Coal	492X	442	Beneath Property	0.0	East	196	1898
unnamed	6FT BOTTOM LEAF	Coal	43ZO	449	South-West	42.2	East	230	1893
unnamed	TWO FOOT NINE	Coal	44HM	456	Beneath Property	6.7	South-East	147	1923
unnamed	TWO FOOT NINE	Coal	44HK	456	North-East	5.4	South-East	147	1915
unnamed	TWO FOOT NINE	Coal	44HI	465	Beneath Property	5.7	South-East	147	1927
unnamed	FOUR FOOT	Coal	44JE	466	Beneath Property	9.1	South-East	269	1930
unnamed	6FT BOTTOM LEAF	Coal	492V	468	North-West	4.9	South-East	196	1912
unnamed	TWO FOOT NINE	Coal	44HE	474	Beneath Property	4.0	South-East	155	1928
unnamed	6FT BOTTOM LEAF	Coal	492W	475	West	5.6	South-East	200	1898
unnamed	TWO FOOT NINE	Coal	44HD	476	Beneath Property	8.9	North	155	1929
unnamed	BUTE	Coal	4933	478	West	5.3	South-East	150	1909
unnamed	BUTE	Coal	4932	482	Beneath Property	7.0	South-East	180	1931
unnamed	TWO FOOT NINE	Coal	44HG	484	South-East	1.4	North-East	155	1929

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	FOUR FOOT	Coal	44F1	487	Beneath Property	4.8	South-East	280	1935
unnamed	FOUR FOOT	Coal	44F3	487	Beneath Property	1.6	North-West	280	1930
unnamed	TWO FOOT NINE	Coal	44HL	490	Beneath Property	7.1	South-East	147	1914
unnamed	6FT BOTTOM LEAF	Coal	43ZQ	494	Beneath Property	4.7	South-West	230	1930
unnamed	6FT BOTTOM LEAF	Coal	44D7	495	South-East	1.5	North-East	200	1912
unnamed	FOUR FOOT	Coal	44F4	495	Beneath Property	2.5	North-East	280	1902
unnamed	FOUR FOOT	Coal	44F2	499	Beneath Property	4.8	South-East	280	1936
unnamed	YARD	Coal	4938	505	North-West	7.0	South-East	140	1950
unnamed	FIVE FOOT	Coal	49FV	505	North-West	5.5	East	200	1918
unnamed	6FT BOTTOM LEAF	Coal	44JH	508	Beneath Property	4.6	South-East	195	1909
LLWYNPIA	UPPER SEVEN FOOT	Coal	439C	510	North-West	6.0	South	110	1938
unnamed	6FT BOTTOM LEAF	Coal	44D3	512	Beneath Property	3.2	North-East	200	1912
unnamed	UPPER NINE FOOT	Coal	41BA	515	South-East	1.7	North-East	150	1916
unnamed	UPPER NINE FOOT	Coal	41B2	516	South	3.7	North	220	1911
unnamed	YARD	Coal	4160	520	North-West	5.8	South-East	110	1933
unnamed	TWO FOOT NINE	Coal	44HF	522	Beneath Property	3.4	South	155	1916
unnamed	UPPER NINE FOOT	Coal	44JI	527	East	8.1	South-East	198	1911
unnamed	YARD	Coal	415Z	531	North	6.7	South-East	120	1948
unnamed	FIVE FOOT	Coal	412E	532	Beneath Property	45.7	South	120	1925
unnamed	YARD	Coal	415Y	532	North-East	4.0	South-East	120	1948
unnamed	BUTE	Coal	418L	533	South	2.1	South	250	1966
unnamed	BUTE	Coal	8184	534	South	4.3	North-East	220	1967
LLWYNPIA	FIVE FOOT GELLIDEG	Coal	4930	534	North-West	1.9	South	160	1918
unnamed	YARD	Coal	4161	535	Beneath Property	9.8	South-East	110	1935

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	6FT BOTTOM LEAF	Coal	44D4	535	Beneath Property	4.7	South-East	200	1930
unnamed	UPPER NINE FOOT	Coal	44JK	537	East	8.8	South-East	198	1908
unnamed	BUTE	Coal	418K	538	South	2.9	North-East	250	1968
unnamed	BUTE	Coal	44K3	539	Beneath Property	11.7	South	93	1928
PENTRE	FIVE FOOT	Coal	49FU	540	North-West	5.3	South-East	200	1921
unnamed	UPPER SEVEN FOOT	Coal	152	544	Beneath Property	7.0	South-East	152	1940
unnamed	BUTE	Coal	418A	545	South-East	4.0	North-East	220	1965
unnamed	BUTE	Coal	44K2	565	East	7.4	South-East	93	1911
unnamed	FIVE FOOT GELLIDEG	Coal	44JY	566	North	5.2	South-East	130	1923
unnamed	UPPER SEVEN FOOT	Coal	413R	569	South	6.0	North	120	1918
unnamed	BUTE	Coal	43ZW	579	West	4.9	South-West	295	1909
unnamed	FIVE FOOT GELLIDEG	Coal	44JZ	583	Beneath Property	6.5	South-East	142	1953
unnamed	BUTE	Coal	43ZV	588	South-West	1.4	West	295	1935
unnamed	YARD	Coal	415X	590	East	6.1	South-East	111	1935
unnamed	FIVE FOOT	Coal	43Z8	593	South-West	3.7	North	180	1925
unnamed	FIVE FOOT	Coal	411B	594	South-West	11.2	North-East	150	1905
unnamed	BUTE	Coal	418J	596	Beneath Property	6.1	South	250	1930
unnamed	UPPER SEVEN FOOT	Coal	413W	597	South-East	9.2	West	180	1923
unnamed	FIVE FOOT	Coal	411C	598	South	7.3	North	150	1920
unnamed	YARD	Coal	43Z0	603	South-West	4.0	North-East	100	1936
unnamed	FIVE FOOT	Coal	411H	603	South	2.4	North	150	1905
unnamed	BUTE	Coal	418I	607	Beneath Property	8.6	South	250	1930
unnamed	FIVE FOOT	Coal	411F	608	South	6.0	North	150	1905
unnamed	FIVE FOOT	Coal	411K	637	South-East	4.8	North-East	150	1920

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	FIVE FOOT	Coal	43ZC	646	South-West	17.0	North	180	1959
unnamed	YARD	Coal	415P	649	Beneath Property	5.9	South-West	120	1924

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
Adit	299194-012	299901 194757		Coal	

Abandoned mine plan catalogue numbers

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

SWR1333	SWR1263	SWR1261
7726	R14337	SWR1332
SWR1326	SWR1264	SWR1892

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

No outcrops recorded.

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

None recorded 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

The following potential risks have been identified and as part of your risk assessment should be investigated further.

Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority.

MINE GAS: Please note, if there are no recorded instances of mine gas within 500m of the enquiry boundary, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed. In these instances, the Coal Authority recommends that a more detailed Gas Risk Assessment is undertaken by a competent assessor.

Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.

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. Please note, if there are no recorded instances of mine gas reported, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded.

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.

0345 762 6848 (UK)
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Appendix E Geomorphological Maps



LEGEND

Site Boundary

Geotechnical Features

LiDAR Landslide Extent

BGS Landslide Extent

Plateau

Abandoned Quarry

Cracked Asphalt

Steep Topography

Hydrology

Stream Outflow

Defunct Drain

Feature

Infrastructure

Gas Station

Substation

Retaining Walls

Good

Fair

Poor

Invasive Species

Cottoneaster

Japanese Knotweed (possible)

Environmental Hazards

Asbestos

Fire

REVISIONS

REV.	DRAWN BY INITIALS	CHECKED BY INITIALS	DATE	REVISION NOTES/COMMENTS
P01	DK	MH	19/10/23	First issue

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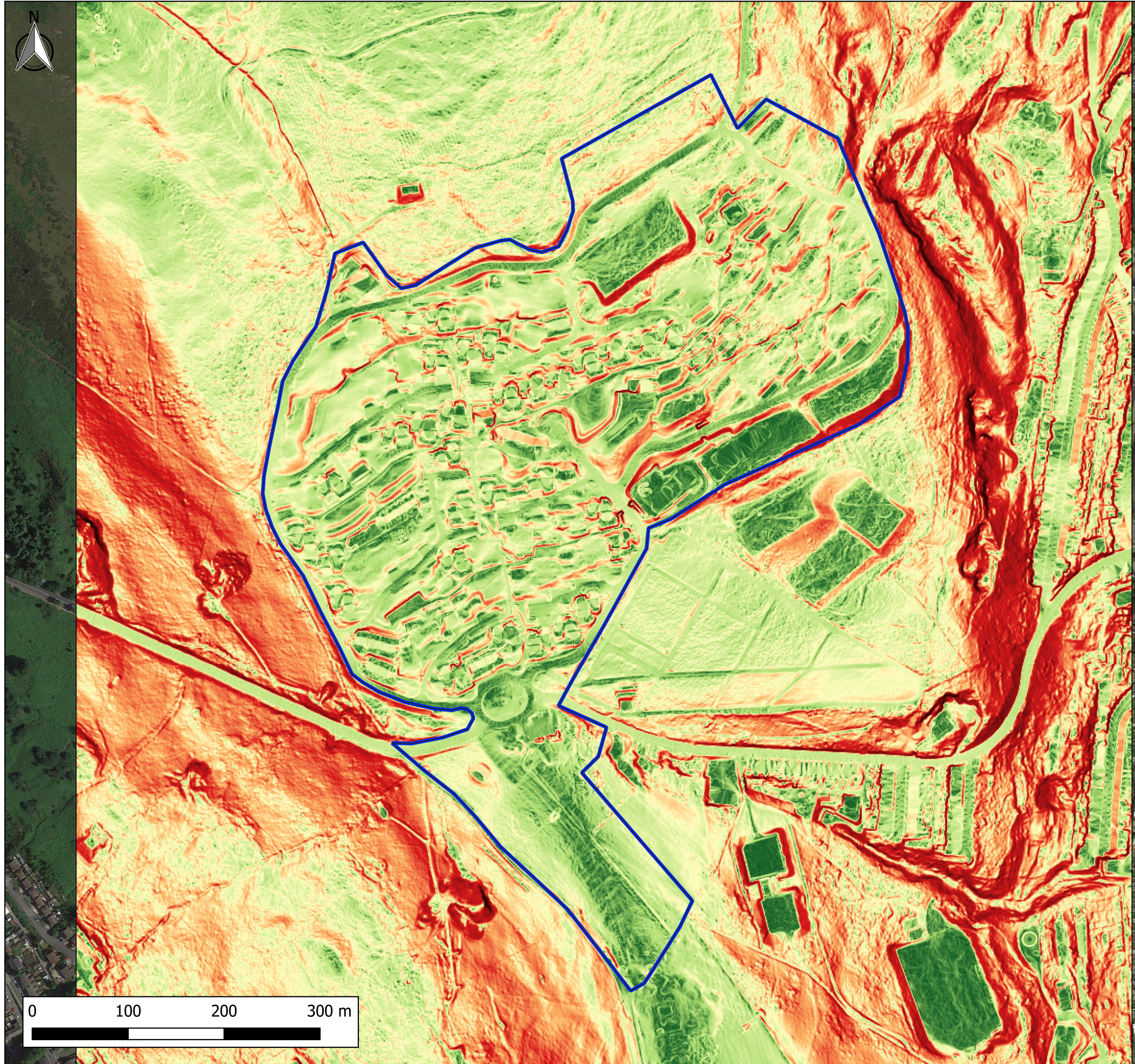
CLIENT
TRIVALLIS

PROJECT
PENRHYS VILLAGE, RHONDDA CYNON TAFF

TITLE
SITE FEATURES PLAN

HYDROCK PROJECT NO. C-30603	SCALE @ A3 1:4,000
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PURPOSE OF ISSUE SUITABLE FOR INFORMATION	STATUS S2
DRAWING NO. 30603-HYD-XX-XX-DR-GE-1007	REVISION P01



LEGEND

Site Boundary


Slope Angle	 0 degrees	 50 degrees
	 10 degrees	 60 degrees
	 20 degrees	 70 degrees
	 30 degrees	 80 degrees
	 40 degrees	 90 degrees

NOTES

1. Contains digital terrain model LiDAR data collected by the Welsh Government (ST0094, ST0095, SS9894, SS9994) (2011).

REVISIONS

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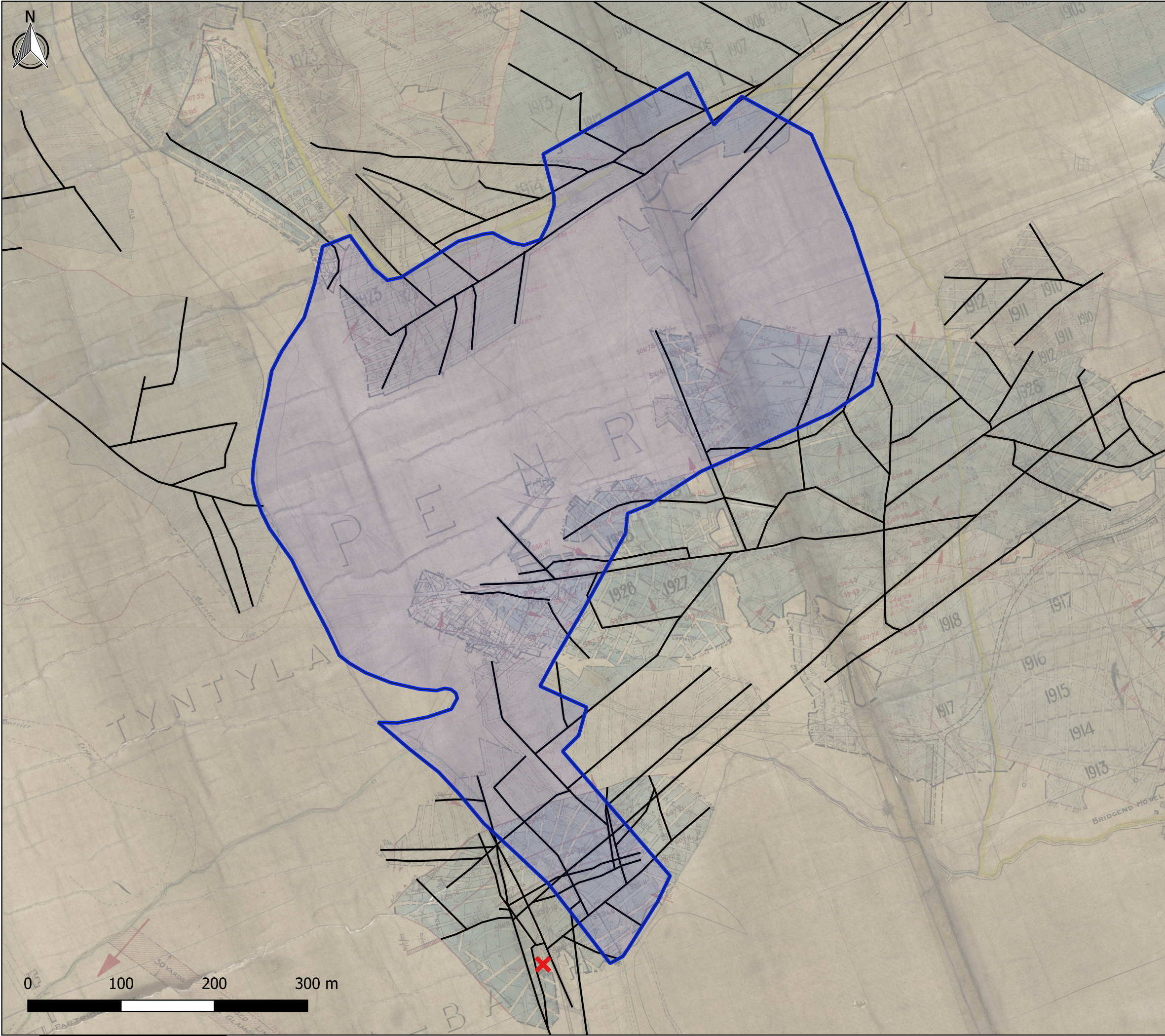
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SLOPE ANGLE MAP

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PURPOSE OF ISSUE SUITABLE FOR INFORMATION	STATUS S2
DRAWING NO. 30603-HYD-XX-XX-DR-GE-1008	REVISION P01



LEGEND

- Site Boundary
- ✕ 2ft9 Airshaft
- 2ft9 Roadway

NOTES

1. Contains Coal Authority data © from the drawing 'Plan Shewing Workings in the Two Feet Nine Seam: Ferndale Collieries' (1967).

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PROJECT
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TITLE
2FT9 SEAM ABANDONMENT PLAN

HYDROCK PROJECT NO. C-30603	SCALE @ A3 1:4,000
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PURPOSE OF ISSUE SUITABLE FOR INFORMATION	STATUS S2
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DRAWING NO. 30603-HYD-XX-XX-DR-GE-1005	REVISION P01
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LEGEND

Site Boundary

2ft9 Airshaft

2ft9 Roadway

NOTES

1. Contains Coal Authority data © from the drawing 'Plan Shewing Workings in the Two Feet Nine Seam: Ferndale Collieries' (1967).

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PENRHYS VILLAGE, RHONDDA CYNON TAFF

TITLE

2FT9 SEAM ABANDONMENT PLAN - SATELLITE IMAGERY

HYDROCK PROJECT NO.
C-30603

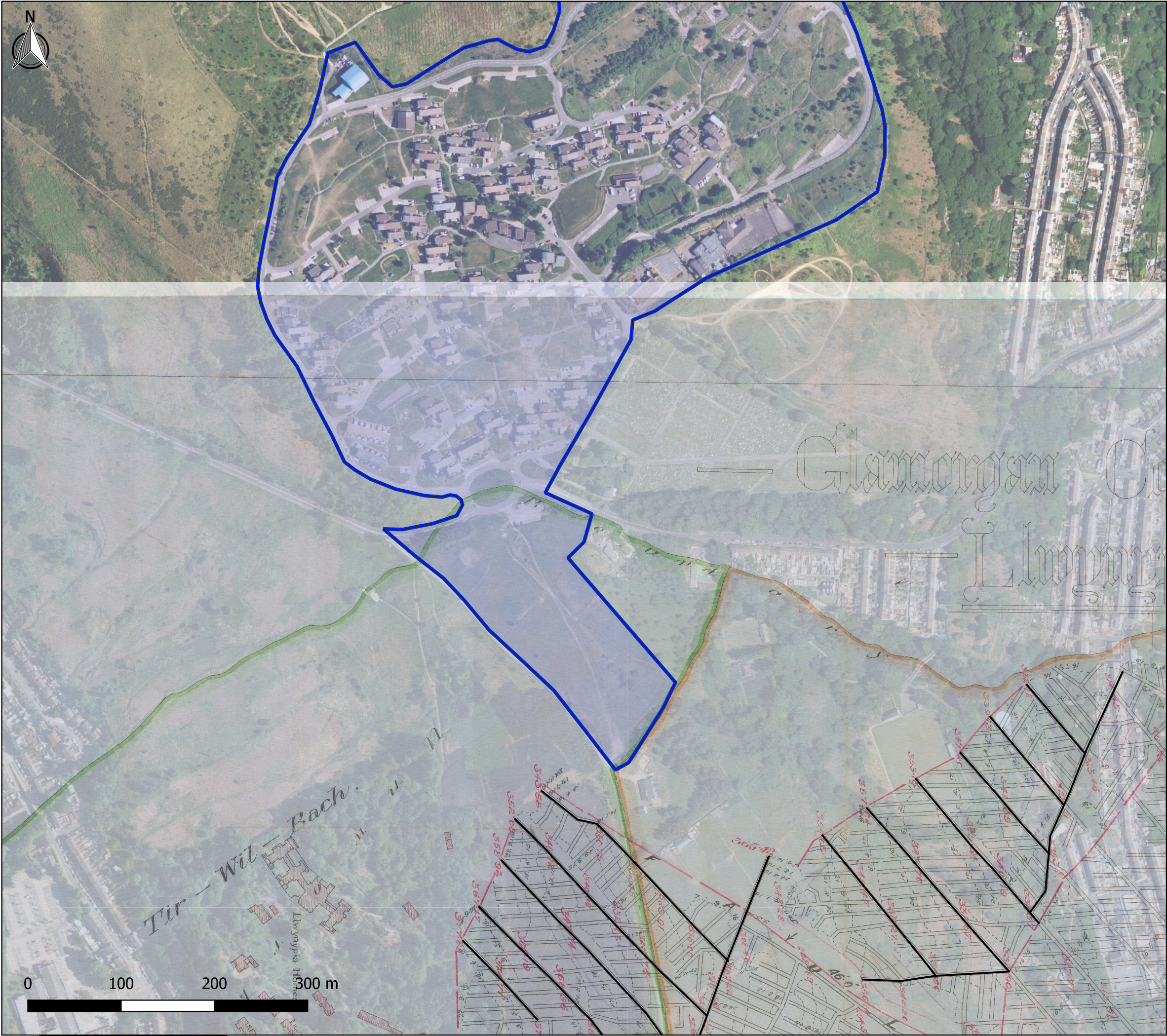
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1:4,000

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SUITABLE FOR INFORMATION

STATUS
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DRAWING NO.
30603-HYD-XX-XX-DR-GE-1010

REVISION
P01



LEGEND

Site Boundary


No.2 Rhondda Roadway

NOTES

1. Contains Coal Authority data © from the drawing 'Sherwood Level: No. 2 Rhondda Seam' (1951).

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PROJECT
PENRHYS VILLAGE, RHONDDA CYNON TAFF

TITLE
NO.2 RHONDDA SEAM ABANDONMENT PLAN

HYDROCK PROJECT NO. C-30603	SCALE @ A3 1:4,000
PURPOSE OF ISSUE SUITABLE FOR INFORMATION	STATUS S2
DRAWING NO. 30603-HYD-XX-XX-DR-GE-1011	REVISION P01

Appendix F Preliminary geotechnical risk register

Geotechnical hazard identification – desk study stage

Potential geotechnical hazards have been assessed in accordance with the general requirements of ICE/DETR Document 'Managing Geotechnical Risk' and the HE documents HD 41/15 and CD 622. The following pages set out the identified geotechnical risks and hazards which are associated with the proposed development and establish the approach which is to be taken to manage the risks including the geotechnical input and analysis.

Table F.1 is a preliminary assessment of possible geotechnical hazards at the site at Desk Study stage. This information is used to assist with ground investigation design.

Table F.1: Possible geotechnical hazards

Hazard	Comment	Hazard status based on desk study	
		Could be present and / or affect site (i.e. Plausible)	Unlikely to be present and/or affect site
Uncontrolled Made Ground (variable strength and compressibility).	Made Ground is anticipated to be present beneath the footprint of the existing constructions in the northern site, which is likely to vary in thickness and condition spatially. In turn, this may result in uneven rates of settlement across the ground profile.	✓	-
Soft / loose compressible ground (low strength and high settlement potential).		✓	-
Shrink swell of the clay fraction of soils under the influence of vegetation.	Shrink swell is indicated in the environmental report to be limited, and therefore is not deemed a risk to the development.	-	✓
Variable lateral and vertical changes in ground conditions.	The deposition of the Rhondda Member sandstones may vary spatially across the site, resulting in variable strength of the strata across the ground profile.	✓	-
High sulfates present in the soils.	The composition of the Made Ground in the north of the site beneath the Penrhys housing estate has not been investigated, and therefore it is plausible that there may be elevated levels of sulphates within the soils. Ffynnon Fair water outlet just west of the site has previously been identified as sulphurous, and sulphur enriched waters are therefore likely to be flowing through the soils beneath the site.	✓	-
Adverse chemical ground conditions, (e.g. expansive slag).	As the composition of Made Ground on site is unknown, it is possible that there may be adverse chemical ground conditions on site.	✓	-
Obstructions.	Obstructions may be present within the Made Ground or within the Rhondda Member sandstone bedrock.	✓	-

Shallow groundwater.	The BGS SuDS report indicated that groundwater is likely to be at a depth greater than 5m below ground level throughout the year. Therefore it is unlikely that changing groundwater conditions will impact the site, as groundwater is likely to remain at significant depth.	-	✓
Changing groundwater conditions.		-	✓
Risk from erosion.	Not anticipated at this site.	-	✓
Risk from flooding.	Not anticipated at this site.	-	✓
Running sands leading to difficulty with excavation and collapse of side walls.	Not anticipated at this site.	-	✓
Slope stability issues – general slopes.	The changes in levels in the northern section within the Heol Pendyrus are cut into the slopes, which in turn are supported by retaining walls. Many of these retaining walls at the time of the walkover (October 2023) were in poor condition, due to insufficient drainage, resulting in development of cracks, and in some cases, washout of bricks. Formal structural assessment of the retaining walls across the site may be required.	✓	-
Slope stability issues – retaining walls.		✓	-
Earthworks – settlement (due to placement of fill on soft / loose ground), poor bearing capacity of new fill and unsuitability of site won material.	Hydrock are not aware of any proposals for earthworks at this site.	-	✓
Solution features in Chalk.	Not present at this site.	-	✓
Cavities in the Superficial Deposits due to solution features.	Not present at this site.	-	✓
Dissolution (associated with “wet rock head”).	Not present at this site.	-	✓
Brine extraction.	Not present at this site.	-	✓
Mining.	The Consultants Coal Mining report obtained for use in this desk study identified 70 coal seams within the vicinity of the site. The shallowest of these seams was at 181m below ground level, and was extracted to a maximum thickness of 100cm. All the workings recorded were at significant depth, such that it is very unlikely that the site would be affected by subsidence.	-	✓
Cambered ground with gulls possibly present.	Not present at this site.	-	✓
Relict Slip Surfaces.	Not anticipated at this site.	-	✓

Solifluction.	Not anticipated at this site.	-	✓
Problematic soils (silts and rewetting etc.).	Not present at this site.	-	✓

Appendix G Plausible source-pathway-receptor contaminant linkages

Summary of potential contaminant linkages

Table G.2 lists the plausible contaminant linkages which have been identified. These are considered as potentially unacceptable risks in line with guidelines published in LCRM (2023) and additional risk assessment is required.

Source – Pathway – Receptor Linkages have been assessed in general accordance with guidance in CIRIA Report C552 (Rudland *et al* 2001) but modified to add a 'no linkage' category and to remove low/moderate risk (See Table F.1).

It should be noted that whilst the risk assessment process undertaken in this report may identify potential risks to site demolition and redevelopment workers, consideration of occupational health and safety issues is beyond the scope of this report and need to be considered separately in the Construction Phase Health and Safety Plan.

Table G.1: Consequence versus probability assessment.

Probability	Consequence				
		Severe	Medium	Mild	Minor
	High Likelihood	Very high risk	High risk	Moderate risk	Low risk
	Likely	High risk	Moderate risk	Low risk	Very low risk
	Low Likelihood	Moderate risk	Low risk	Low risk	Very low risk
	Unlikely	Low risk	Very low risk	Very low risk	Very low risk
	No Linkage	No risk			

Table G.2: Exposure model – final source-pathway-receptor contaminant linkages

Sources	Possible Pathways	Receptors	Probability	Consequence	Risk Level	Comments
Made Ground, associated with historical construction activities, possibly including elevated concentrations of metals, metalloids, asbestos fibres, Asbestos Containing Materials, PAH and petroleum hydrocarbons (S01).	Ingestion, skin contact, inhalation of dust and outdoor air by people (P01).	Site end users (R01).	Likely.	Medium.	Moderate.	Made Ground is anticipated to be present beneath the existing housing estate in the north of the site. The houses were built prior to 2000, and therefore it is likely asbestos will be present. Asbestos board was also observed fly tipped at various locations around the site.
	Surface water via overland flow (P03).	Groundwater: Secondary A aquifer status of the Rhondda Member (R03).	Likely	Medium.	Moderate.	There are some drainage features on site near to the site perimeter that may be contaminated by mobilisation of contaminants in Made Ground following interaction with surface water run-off.
	Surface water, via drainage discharge (P04).		Likely	Medium.	Moderate.	
	Downward leachate migration (P06).		Low likelihood	Medium	Low.	Groundwater is expected to be at depth, in keeping with the water level of the River Rhondda and Afon Rhondda Fach at the base of Penrhys hill, and therefore the likelihood of groundwater interacting with the base of the Made Ground is very low.
	Surface water via base flow from groundwater (P05).		Low likelihood	Medium	Low	
PCBs and oils from transformers in the electricity sub-stations on site (S02).	Ingestion, skin contact, inhalation of dust and outdoor air by people (P01).	Site end users (R01).	Low likelihood	Medium	Low.	There have been a number of electricity sub-stations present across the site which are thought to predate the 1970s, where PCBs were phased out of use from electricity sub-stations and transformers. PCBs are largely immobile, and therefore if these are present, it is unlikely they will have migrated any distance from the source. In addition, the sub-stations observed during the walkover appeared in a good condition, and no visible contamination was observed.
	Downward leachate migration (P06).	Groundwater: Secondary A aquifer status of the Rhondda Member (R03).	Low likelihood	Medium	Low	
Ground gases (carbon dioxide and methane) from organic materials in the Made Ground (S03).	Methane/carbon dioxide (ground gas) ingress via permeable soils and/or construction gaps (P02).	Site end users (R01).	Likely.	Medium.	Moderate.	The Made Ground which underlies the north of the site may contain organic materials, resulting in the generation of ground gases, which have potential to accumulate in buildings.
		Development end use (buildings, utilities and				

		landscaping) (R02).				
Asbestos within existing buildings / structures (S04).	Inhalation (P01).	Site end users (R01).	Likely.	Severe.	High.	The properties on the Penrhys estate were constructed prior to 2000, and therefore asbestos is likely to be present within the buildings. Fly tipped asbestos board was also observed during the time of the walkover.
Hydrocarbon fuels, lubricants, solvents and asbestos associated with the boiler house in the north of the site and potentially across the heating network area from leaking/damaged pipes (S05).	Ingestion, skin contact, inhalation of dust and outdoor air by people (P01).	Site end users (R01).	Likely.	Severe.	High.	Hydrocarbon fuels and solvents may be present in soils near to the area of the boiler house, which may have been used when the boiler house was operational. Asbestos is also likely to be present due to the age of the building, and may have been used to insulate the boiler house.
	Downward leachate migration (P06).	Groundwater: Secondary A aquifer status of the Rhondda Member (R03).	Low likelihood	Medium	Low	Groundwater is expected to be at depth, in keeping with the water level of the River Rhondda and Afon Rhondda Fach at the base of Penrhys hill, and it is therefore likely that most of the potential contaminants will naturally attenuate before reaching the groundwater.
Fly tipped wastes potentially including solvents, metals, metalloids, asbestos and Asbestos Containing Materials (S06).	Ingestion, skin contact, inhalation of dust and outdoor air by people (P01).	Site end users (R01).	Likely.	Severe.	High.	Fly tipped waste was observed across the site and included builders' rubble, asbestos, recyclables, wood etc. These wastes will need to be removed prior to construction works, and disposed of appropriately.
Made Ground containing asbestos and Asbestos Containing Materials associated with the demolition of former pipe work from the district heat network (S07).	Ingestion, skin contact, inhalation of dust and outdoor air by people (P01).	Site end users (R01).	Likely.	Severe	High	Made Ground is anticipated to be present beneath the existing housing estate in the north of the site, and comprise of ACM. Asbestos was likely used to insulate pipes which passed through the Made Ground to transport heated water from the boiler house in the north of the site into residential properties.

Bonfire rubble including metalloids, metals, PAHs and petroleum hydrocarbons (S08).	Ingestion, skin contact (P01).	Site end users (R01).	Likely.	Medium,	Moderate.	Waste has been burnt at 3 locations in the residential zone of the site, and burnt rubble from the fires remains in situ. Rubble appeared to comprise metals and metalloids, but there is potential that fuels were poured onto these to ignite fires, and therefore may be present in the soils below.
	Downward leachate migration (P06).	Groundwater: Secondary A aquifer status of the Rhondda Member (R03).	Low likelihood	Medium	Low	Groundwater is expected to be at depth, in keeping with the water level of the River Rhondda and Afon Rhondda Fach at the base of Penrhys hill, and it is therefore likely that most of the potential contaminants will naturally attenuate before reaching the groundwater.