



PHASE 1 ENVIRONMENTAL SITE
ASSESSMENT REPORT

PLOT 3
MAES Y MEILLION
FORGE
WALES
SY20 8RZ

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EnviroSolution Ltd Document Verification

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Executive Summary

The preliminary environmental site assessment indicates that the site can be classified as moderate risk in terms of contamination due to the site being situated within a medium-risk area for radon. However, it is considered that this risk classification can be reduced to low through the incorporation of basic radon protective measures in accordance with BRE 211 Radon: Guidance on protective measures for new buildings.

During site preparation works, if any unexpected visual or olfactory evidence of contamination is encountered, it is recommended that the material is removed and stockpiled on site and advice is sought from a suitably qualified person (Environmental Consultant) on how to deal with the material. Testing of the material will be necessary to identify whether it is suitable for re-use on site or if it will have to be taken off-site for disposal.

In addition, to ensure that they do not come into contact with contaminated soils and groundwater, it is recommended that workers wear appropriate personal protective equipment (PPE) and that suitable Health and Safety procedures be adopted to ensure that ingestion of contaminated soils and groundwater is avoided (e.g. by washing hands prior to eating, drinking and smoking).

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1 Introduction

1.1 Background

EnviroSolution Ltd was commissioned to undertake a Phase 1 Environmental Site Assessment at land located at Forge in Wales. This report was commissioned to provide an assessment on the likely contamination status of the site.

1.2 Objectives

The objective of the preliminary environmental site assessment was:

1. To provide a summary of the environmental setting and historical land use of the site and immediate surrounding area.
2. To obtain information on the ground conditions present beneath the site.
3. To develop a conceptual site model and complete a generic quantitative risk assessment to identify any environmental risks and liabilities associated with ground conditions at the site.

1.3 Scope of Work

To achieve the objectives, the following scope of work was completed:

1. A desk-based study of the site comprising a review of available environmental information for the site such as geological and hydrogeological data and historical land use information.
2. A site walkover survey.
3. Assessment of potential hazards and constraints during construction and longer term.

This work has been devised to generally comply with the relevant principles and requirements of the following legislation and guidance:

Part IIA of the Environmental Protection Act, 1990 and Section 57 of the Environmental Act 1995;
Contaminated Land (Wales) Regulations 2001;
Welsh Government (2012) Contaminated Land Statutory Guidance;
Planning Policy Wales (2021) and Mineral Planning Policy Wales;
BS10175: 2011 +A2:2017 "Investigation of Potentially Contaminated Sites- Code of Practice"; and
Environment Agency (2020) Land Contamination Risk Management Report LCRM "How to assess and manage the risks from land contamination".

1.4 Information Sources

Historical Ordnance Survey maps have been obtained from historical records, ranging from 1887 to 2022. These maps provide high quality information on historical site use.

The British Geological Survey Geoindex database has been used to provide information on geo-environmental aspects of the site and the immediate surrounding area such as geological, hydrogeological and hydrological data.

The Environment Agency website (www.gov.uk/government/organisations/environment-agency), Magic website (www.magic.gov.uk) and the Natural Resources Wales website were used to obtain environmental information.

Industry Profiles produced by the Department of the Environment were utilised to obtain information on processes, materials and wastes associated potential contaminative land uses near the site.

Readily available information sources have been used to produce this desk-based study. Additional information may be requested by the Local Planning Authority (e.g. local authority environmental information request).

2 The Site

2.1 Site Location

The site is located at Plot 3 Maes Meillion, Forge, Wales, SY20 8RZ. The British National Grid Reference for the approximate site centre is GR: 276425 299962.

The site location is shown on Figure 1 in Appendix A.

2.2 Site Description

The site description is aided by the completion of a site walkover survey conducted by EnviroSolution on the 26th of January 2022. The site photographs are included in Appendix B.

The site is rectangular in shape and covers an approximate area of 1,120 square meters.

The site comprises a small, wooded area which separates two dwellings along Forge Road. The plot is overgrown with bushes and mature trees.

The topography of the site slopes south-westwards and falls approximately 5m from Forge Road to the western boundary.

The site boundaries consist of hedging on all sides.

The site is bounded by residential properties to the southeast and northwest, Forge Road to the north and Afon Dulas to the southwest.

No petrol filling stations have been identified within a 250m radius of the site.

The existing site plan is shown on Figure 2 which is included in Appendix A.

2.3 Development Proposals

It is understood that the development plans include the construction of a new residential dwelling with the installation of a septic tank. The development plans include areas of soft landscaping to be used as private gardens.

The current planning application reference number is 21/1701/FUL with Powys Council.

A copy of the development plans is included in Figure 3 in Appendix A.

2.4 Site History

The development site and surrounding area has been reviewed with reference to historical Ordnance Survey (OS) maps. The history of the site and immediate surrounding area is summarised in Table 1. Copies of the historical OS maps are included in Appendix C. A search buffer of 250m has been used.

Table 1 - Historic Mapping Review

Date	Scale	On Site	Off Site
1887	1:2,500	The site is an undeveloped parcel of land to the south of Forge Road.	Afon Dulas 5m southwest of the site. Forge Woollen Factory 10m southwest of the site. Woollen factory 105m south and 150m northwest of the site. Old quarry 130m northwest of the site.
1901	1:2,500	No significant change.	Smithy 60m northwest of the site. Quarry noted as pond.
1938	1:10,560	No significant change.	No significant change.
1953	1:10,560	No significant change.	No significant change.
1975	1:2,500	No significant change.	Smithy converted to residential dwelling. Forge Woollen Factory converted to metal foundry.
1995	1:2,500	No significant change.	Small residential development in the surrounding area.
2021	1:10,000	No significant change.	No significant change.

3 Environmental Setting

3.1 Geology

Geological maps of the area indicate that the site is not directly underlain by superficial deposits.

The underlying bedrock geology consists of the Devils Bridge Formation which generally consists of interbedded mudstones and sandstones.

The nearest geological fault is located 150m east of the site.

A copy of the geological maps is included in Appendix D.

3.2 Radon

The site lies within an elevated band of radon potential where it is estimated that between 3-5% of the properties are above the action level (medium probability). Basic radon protective measures would be required for any future development.

Further guidance can be found in BR 211 (2015) 'Radon: Guidance on protective measures for new buildings'.

3.3 Coal Mining Activity

The site does not lie within a coal mining area described as having minable coal deposits and does not lie within a 'Development High Risk Area' for coal mining, as defined by the Coal Authority. As such, it is considered that there are no coal mining related hazards which could affect the site.

3.4 Hydrogeology

The underlying Devils Bridge Formation is designated as a Secondary B Aquifer, defined as; Predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.

The site is not located within a Source Protection Zone and there are no records of sites that hold groundwater abstraction licences held within a 1km radius of the site.

A copy of the hydrogeological maps is included in Appendix E.

3.5 Hydrology

There are no significant surface water features (lakes, rivers, reservoirs) located within a 1km radius of the site.

Afon Dulas is located 5m southwest of the site.

A pond is located 130m northwest of the site.

3.6 Flood Risk

The site lies within a Flood Zone 1, land assessed as having less than a 1 in 1,000 annual probability of river flooding (0.01%) in any year (low risk). The completion of a detailed Flood Risk Assessment is not deemed necessary for this site.

3.7 Waste Management Facilities

There is a single record of a historic landfill site located within a 1km radius of the site. The Forge Landfill is located 200m northwest of the site. No information is held on the dates of operation, or the type of waste stored there. Historical mapping indicates that landfilling had ceased by 1975.

There are no records of currently authorised sites or sites operating under an environmental permit for waste operations located within a 1km radius of the site.

3.8 Environmental Permits, Incidents and Registers

There are no records of sites located within a 1km radius of the development site operating under an environmental permit for discharges to water and groundwater.

There are no records of any pollution events having occurred within a 1km radius of the site.

3.9 Designated Environmentally Sensitive Sites

There are no records of designated environmentally sensitive sites located within a 1km radius of the site.

4 Preliminary Conceptual Site Model

4.1 Introduction

In order to assess the environmental risks present, a preliminary conceptual model has been developed for the site. This model has been developed using best practice guidelines in conjunction with the current assessment framework taking into account the development proposals. This preliminary conceptual model is based on the gathered desk-based information (e.g. historical OS data and data sourced from the EA, Geoindex and Magic databases).

The conceptual site model is a representation of the hypothesised relationships between sources, pathways and receptors which allows the identification of potential pollutant linkages and whether these linkages have the potential to comprise significant harm and/or pollution of controlled waters in relation to the site. This model comprises three elements:

Source – the key pollutant hazards associated with the site

Receptor – the key targets at risk from the sources

Pathway – the means by which the contaminant can cause harm to the receptor

If all three elements are present, then a potential pollutant linkage exists, and this may require further assessment.

4.2 Potential Contamination Sources

The site has historically remained undeveloped and therefore is not likely to have resulted in the direct contamination of the shallow soils beneath the site.

Several potential sources of contamination have been identified in the surrounding area. The sources and their associated contaminants are summarised in Table 2 below:

Table 2 – Off-Site Sources Summary

Land Use	Distance from Site	Potential Contaminants
Woollen Mills	10m, 105m, 130m	Heavy metals, PAHs, solvents, pesticides
Metal Foundry	10m	Heavy metals, PAHs, sulphates, solvents
Smithy	60m	Heavy metals, PAHs, sulphates
Forge Landfill	200m	Heavy metals, PAHs, asbestos, ground gases (carbon dioxide and methane)

The above land uses lie on the opposite side of Afon Dulas and therefore it is unlikely that any ground contamination associated with these land uses will be present at the site. The locations of the contaminant sources will not be in hydraulic connectivity with the site.

The landfill can be discounted as a potential source of contamination due to the distance from site (i.e.200m) and the fact that the bedrock in the area consists of low permeability strata.

Additionally, the landfilling operations were discontinued by the 1970s and therefore it should have a low gas generation potential.

The site is located within a medium probability area of naturally occurring radon gas.

4.3 Receptors

The potential receptors considered to be at risk from soil and groundwater contamination associated with the site are summarised in Table 3 below:

Table 3 - Receptor Description

Receptor	Details
Human (On Site)	<ul style="list-style-type: none"> - Construction workers - Future site users - Site visitors
Human (Off Site)	<ul style="list-style-type: none"> - Adjacent site users
Controlled Waters	<ul style="list-style-type: none"> - Secondary B Aquifer - Afon Dulas - Pond
Building/ construction materials	<ul style="list-style-type: none"> - Foundations and buried services

4.4 Pathways

The potential exposure pathways linking contamination with the receptors identified above are summarised in Table 4 below:

Table 4 - Exposure Pathways Summary

Receptor	Details of Exposure Pathway
Human (on-site)	<ul style="list-style-type: none"> - Direct ingestion of contaminated soil/groundwater - Dermal contact with soil/groundwater - Inhalation of gases and vapours - Inhalation of fibres and particulates
Human (off-site)	<ul style="list-style-type: none"> - Inhalation of migrating gases and vapours - Inhalation of fibres and particulates
Controlled waters	<ul style="list-style-type: none"> - Vertical and lateral migration of dissolved phase contaminants via preferential pathways to groundwater aquifers - Direct surface water run-off to surface water features

Receptor	Details of Exposure Pathway
Building/construction	- Buried materials/services - Contact with contaminated soil and/or groundwater

4.5 Potential Pollution Linkages

4.5.1 Human Health

It is understood that the final development plans include the construction of a new residential dwelling with the installation of a septic tank. Final development plans include areas of soft landscaping to be used as private gardens. This is considered to be a sensitive end use.

The presence of any proposed buildings and hardstanding would eliminate the risk of exposure, via the dermal contact and ingestion pathways to future site users to any ground contamination that may remain following development.

There could be a potential risk of exposure to any ground contamination that remains following redevelopment in any proposed areas of soft landscaping (i.e. gardens), to future site users, via all possible exposure pathways.

Any ground gases (i.e. methane, carbon dioxide, radon) and vapours that are present within the soils beneath the site could potentially ingress into any future buildings at the site through preferential pathways (e.g. service entry points). Therefore, there would be a risk of exposure via inhalation to future site users.

There is the potential for construction workers and adjacent land users to be exposed to soil and groundwater contamination during future site redevelopment. However, the use of appropriate PPE and the adoption of suitable Health and Safety methods will help to reduce the risks posed to human health during this work.

4.5.2 Controlled Waters

The site is directly underlain by the Devils Bridge Formation which is designated as a Secondary B Aquifer. If Made Ground is present at the surface, there is the potential for contaminants to migrate into the groundwater aquifer below; however, the bedrock aquifer is not considered to be an important local aquifer. The site is not located within a Source Protection Zone and there are no groundwater abstraction licences held within a 1km radius of the site.

Afon Dulas is located in close proximity to the site. If contaminants are present within the shallow soils at the site, it is feasible that they could reach the stream via direct surface water run-off. What about the pond?

Overall, the risk to controlled waters is deemed to be low.

4.5.3 Building/ Construction Materials/ Buried Services

The presence of any soil and groundwater contaminants beneath the site could potentially impact on construction materials, such as below ground structures and services. Concrete foundations are particularly sensitive to aggressive ground conditions, i.e. sulphate attack.

If ground gases and vapour are present in the soil beneath the site, then there would be the potential risk of ingress into any future properties which could present a risk of explosion.

4.6 Preliminary Hazard Assessment

A preliminary hazard assessment is presented in Table 5. The preliminary hazard assessment is a qualitative assessment of the risks posed by each potential pollutant linkage described above and is used to identify the requirement for additional work (e.g. intrusive ground investigation).

Table 5 – Preliminary Hazard Assessment

Source 1	Pathway	Receptor	Likelihood	Effect	Risk	Assessment
Contaminated soil (heavy metals)	Ingestion (via soil dust), inhalation (via soil dust), ingestion through dirty hands, dermal contact with soil/water.	Future site users Adjacent site users Construction workers	1	3	Low	No source potential identified.
Contaminated soil/ groundwater	Direct contact	Buildings/services	1	3	Low	No source potential identified.
Contaminated groundwater	Downward or lateral migration Surface water run-off	Secondary B Aquifer Afon Dulas Pond	1	3	Low	No contamination source identified.
Ground gas (radon)	Inhalation, ingress into buildings	Buildings / services Future site users Adjacent site users Construction workers	2	4	Moderate	Site located within a medium probability area for radon. Can be readily mitigated through the incorporation of basic radon protective measures.
Ground gas (methane and carbon dioxide)	Inhalation, ingress into buildings	Buildings / services Future site users Adjacent site users Construction workers	1	4	Low	No on-site source of carbon dioxide or methane identified. Off-site sources discounted due to distance and geology.
Vapours (volatile organic compounds)	Inhalation, ingress into buildings	Buildings / services Future site users Adjacent site users Construction workers	1	4	Low	No on-site vapour source identified.

Using Risk Matrix (Table 6) Degree of Risk (R) = Likelihood (L) x Effect (E)

Table 6 - Risk Matrix, Degree of Risk (R) = Likelihood (L) x Effect (E)

Likelihood	Description	Probability	Effect (E)	Description
5	Almost certain	>70%		
4	Probable	50-70%	4	Severe
3	Likely	30-50%	3	Medium
2	Unlikely	10-30%	2	Mild
1	Negligible	<10%	1	Minor
Risk (R)	Risk Level	Action		
1-5	Low	None required		
6-10	Moderate	Further assessment via Phase 2 intrusive ground investigation.		
>10	High	Further assessment via Phase 2 intrusive ground investigation.		

5 Conclusions and Recommendations

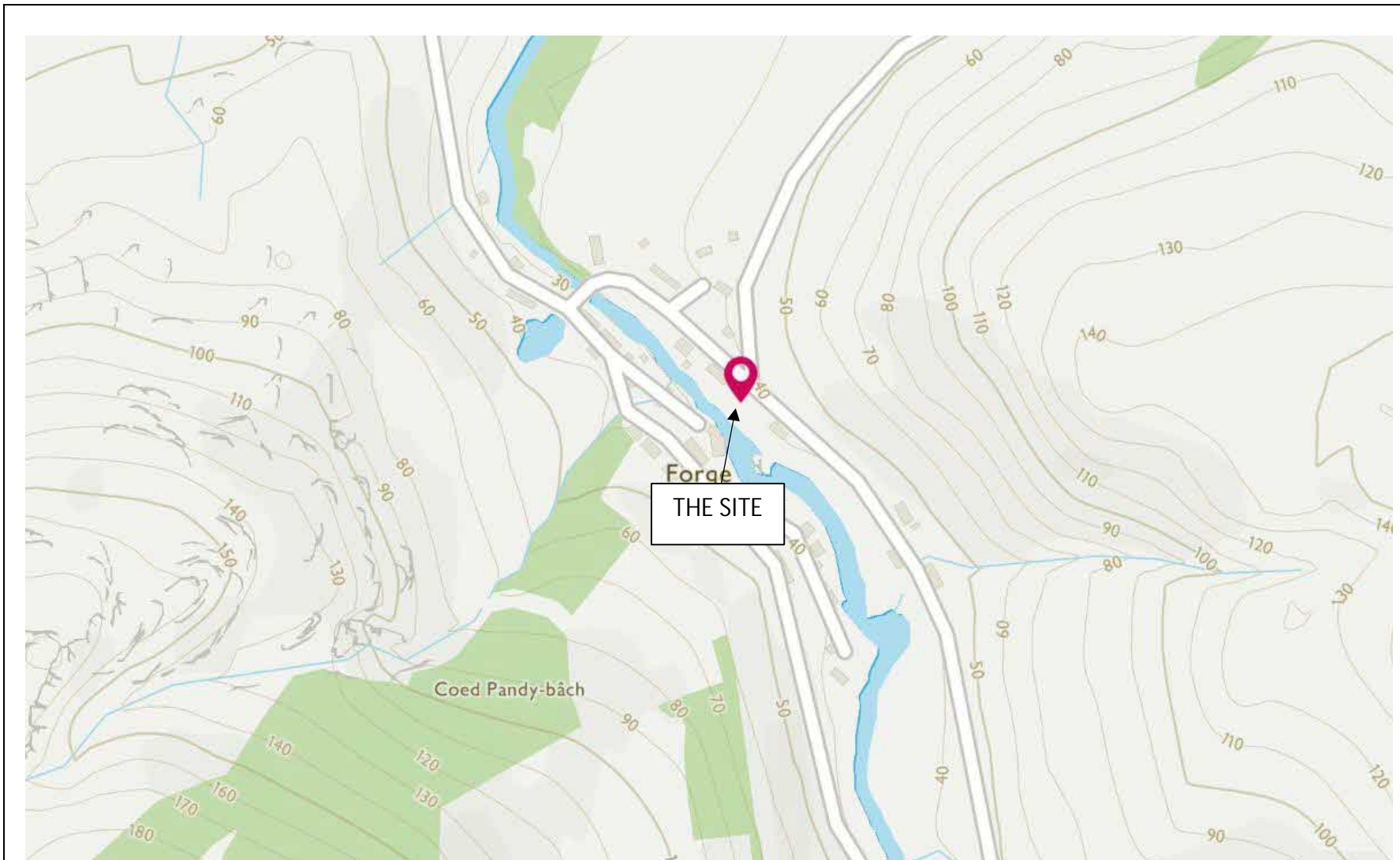
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APPENDICES

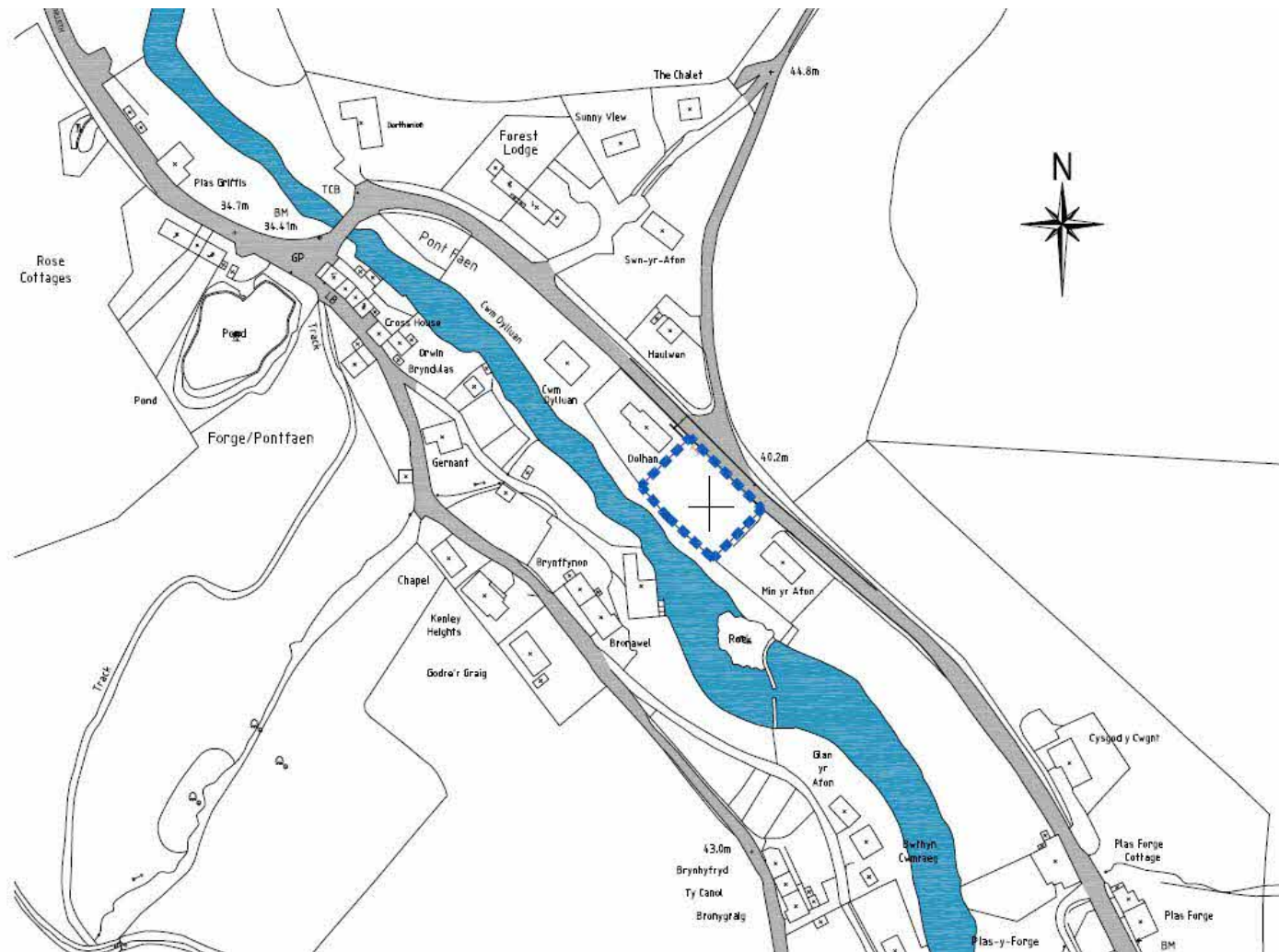
Appendix A – Site Location and Site Plan



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Site Location Map

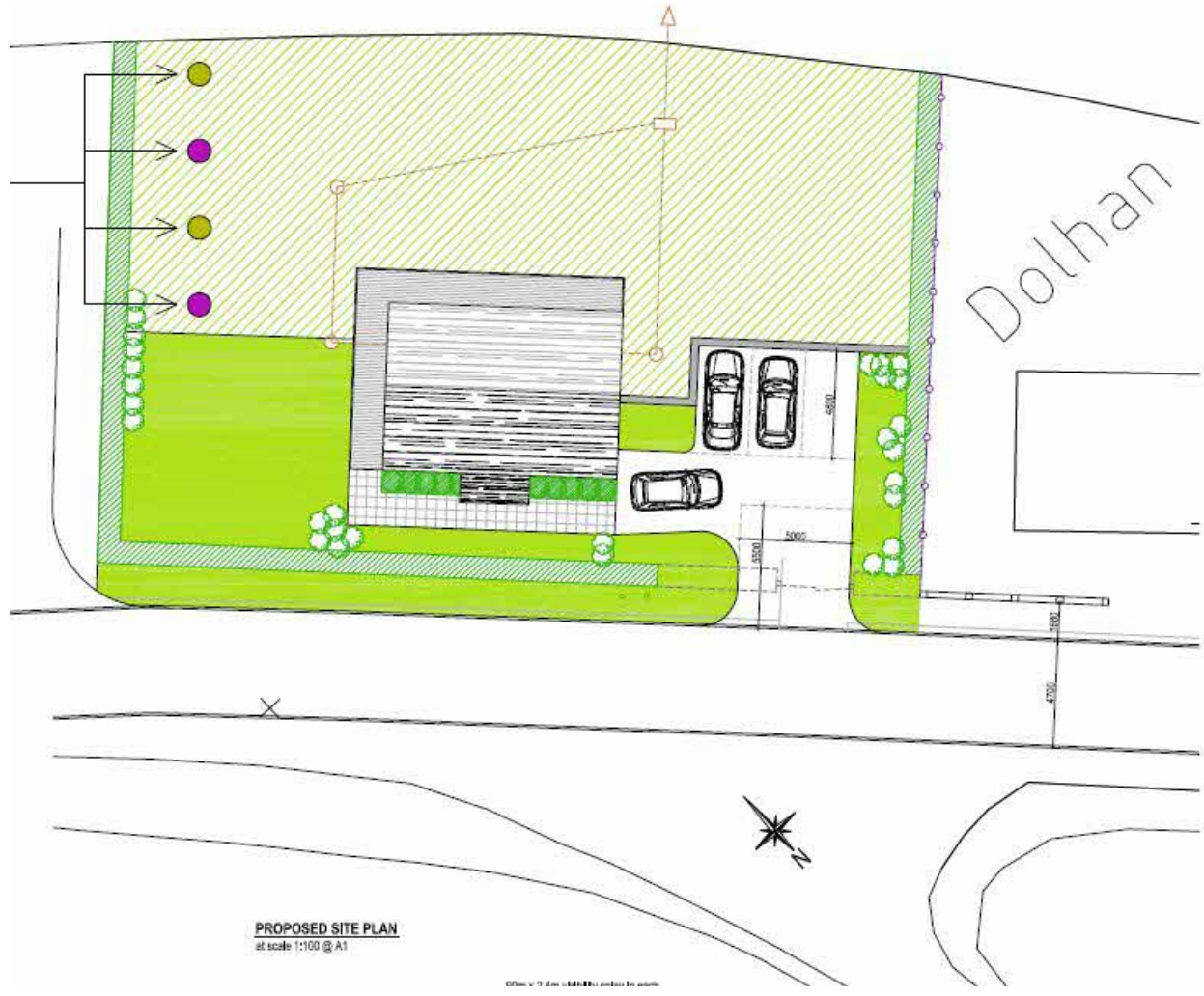
Figure 1



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Existing Site Plan

Figure 2



PROPOSED SITE PLAN
at scale 1:100 @ A1

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Proposed Development Plan

Figure 3

Appendix B – Site Photographs



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View of site looking west







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View of site looking west



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Northern site boundary



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Forge Road looking northwest



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View of site looking southeast

Appendix C - Historical Maps

Historical Mapping Legends

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

Quarry **Gravel Pit** **Sand Pit**
Clay Pit **Shingle** **Refuse Heap**
Sloping Masonry **Flat Rock**
Marsh **Reeds** **Osiers**
Rough Pasture **Furze** **Wood**
Mixed Wood **Brushwood** **Orchard**
Fir **Ford** **Stepping Stones**
Ferry **Waterfall** **Lock**
Trig. Station **Altitude at Trig. Station**
B.M. 325.9 **Bench Mark** **Surface Level**
Arrow denotes flow of water **Antiquities (site of)**
Cutting **Embankment**
Railway crossing Road **Level Crossing** **Road crossing Railway**
Railway crossing River or Canal **Road over single stream** **Road over River or Canal**
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
County Borough Boundary (England)
County Burgh Boundary (Scotland)
Co. Boro. Bdy.
Co. Burgh Bdy.
BP BS Boundary Post or Stone **P.C.B** Police Call Box
B.R. Bridle Road **P** Pump
E.P Electricity Pylon **S.P** Signal Post
F.B. Foot Bridge **SL** Sluice
F.P. Foot Path **Sp.** Spring
G.P Guide Post or Board **T.C.B** Telephone Call Box
M.S Mile Stone **Tr.** Trough
M.P M.R Mooring Post or Ring **W** Well

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

Inactive Quarry, Chalk Pit or Clay Pit **Active Quarry, Chalk Pit or Clay Pit**
Rock **Boulders**
Cliff **Slopes** **Top**
Roofed Building **Glazed Roof Building**
Sloping Masonry **Archway**
Non-Coniferous Tree (surveyed) **Coniferous Tree (surveyed)**
Non-Coniferous Trees (not surveyed) **Coniferous Trees (not surveyed)**
Orchard Tree **Scrub** **Bracken**
Coppice, Osier **Reeds** **Marsh, Saltings**
Rough Grassland **Heath** **Culvert**
Direction of water flow **Bench Mark** **Antiquity (site of)**
Cave Entrance **Triangulation Station** **Electricity Pylon**
Electricity Transmission Line
County Boundary (Geographical)
County & Civil Parish Boundary
Civil Parish Boundary
Admin. County or County Bor. Boundary
London Borough Boundary
Symbol marking point where boundary mereing changes
BH Beer House **P** Pillar, Pole or Post
BP, BS Boundary Post or Stone **PO** Post Office
Cn, C Capstan, Crane **PC** Public Convenience
Chy Chimney **PH** Public House
D Fn Drinking Fountain **Pp** Pump
EI P Electricity Pillar or Post **SB, S Br** Signal Box or Bridge
FAP Fire Alarm Pillar **SP, SL** Signal Post or Light
FB Foot Bridge **Spr** Spring
GP Guide Post **Tk** Tank or Track
H Hydrant or Hydraulic **TCB** Telephone Call Box
LC Level Crossing **TCP** Telephone Call Post
MH Manhole **Tr** Trough
MP Mile Post or Mooring Post **Wr Pt, Wr T** Water Point, Water Tap
MS Mile Stone **W** Well
NTL Normal Tidal Limit **Wd Pp** Wind Pump

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

Cliff **Slopes** **Top**
Rock **Rock (scattered)**
Boulders **Boulders (scattered)**
Positioned Boulder **Scree**
Non-Coniferous Tree (surveyed) **Coniferous Tree (surveyed)**
Non-Coniferous Trees (not surveyed) **Coniferous Trees (not surveyed)**
Orchard Tree **Scrub** **Bracken**
Coppice, Osier **Reeds** **Marsh, Saltings**
Rough Grassland **Heath** **Culvert**
Direction of water flow **Triangulation Station** **Antiquity (site of)**
Electricity Transmission Line **Electricity Pylon**
B.M. 231.60m **Bench Mark** **Buildings with Building Seed**
Roofed Building **Glazed Roof Building**
Civil parish/community boundary
District boundary
County boundary
Boundary post/stone
Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)
Bks Barracks **P** Pillar, Pole or Post
Bty Battery **PO** Post Office
Cemy Cemetery **PC** Public Convenience
Chy Chimney **Pp** Pump
Cis Cistern **Ppg Sta** Pumping Station
Dismtd Rly Dismantled Railway **PW** Place of Worship
EI Gen Sta Electricity Generating Station **Sewage Ppg Sta** Sewage Pumping Station
EI P Electricity Pole, Pillar **SB, S Br** Signal Box or Bridge
EI Sub Sta Electricity Sub Station **SP, SL** Signal Post or Light
FB Filter Bed **Spr** Spring
Fn / D Fn Fountain / Drinking Ftn. **Tk** Tank or Track
Gas Gov Gas Valve Compound **Tr** Trough
GVC Gas Governor **Wd Pp** Wind Pump
GP Guide Post **Wr Pt, Wr T** Water Point, Water Tap
MH Manhole **Wks** Works (building or area)
MP, MS Mile Post or Mile Stone **W** Well

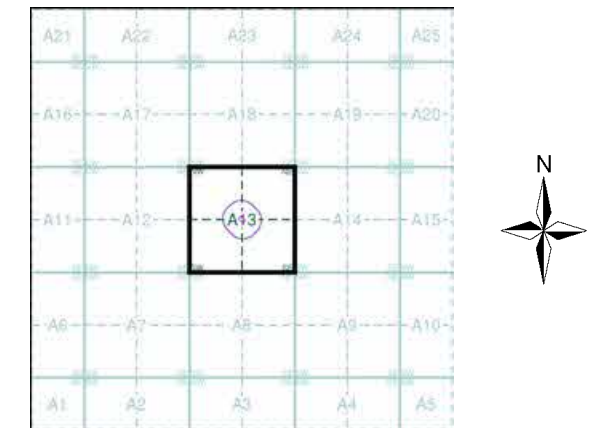
Envirocheck

LANDMARK INFORMATION GROUP

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Montgomeryshire	1:2,500	1887 - 1888	2
Merionethshire	1:2,500	1889	3
Merionethshire	1:2,500	1901	4
Montgomeryshire	1:2,500	1901	5
Ordnance Survey Plan	1:2,500	1975	6
Additional SIMs	1:2,500	1978	7
Additional SIMs	1:2,500	1989	8
Large-Scale National Grid Data	1:2,500	1995	9

Historical Map - Segment A13



Order Details

Order Number: 290035929_1_1
 Customer Ref: ES200122a
 National Grid Reference: 276420, 299960
 Slice: A
 Site Area (Ha): 0.11
 Search Buffer (m): 100

Site Details

Maes Y Wern, Forge, MACHYNLLETH, SY20 8RZ

Landmark
 INFORMATION GROUP

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

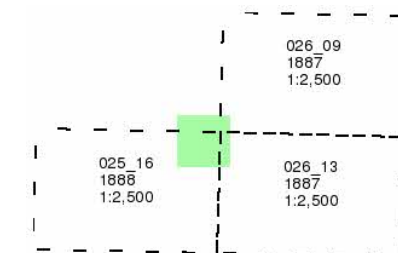
Montgomeryshire

Published 1887 - 1888

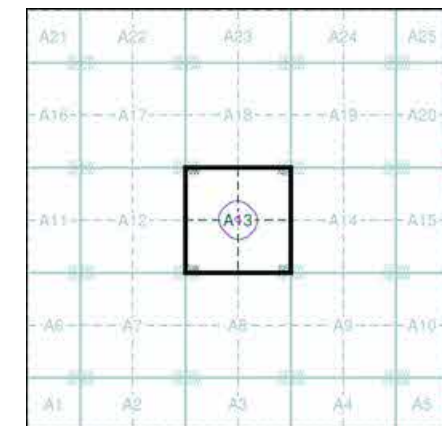
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13

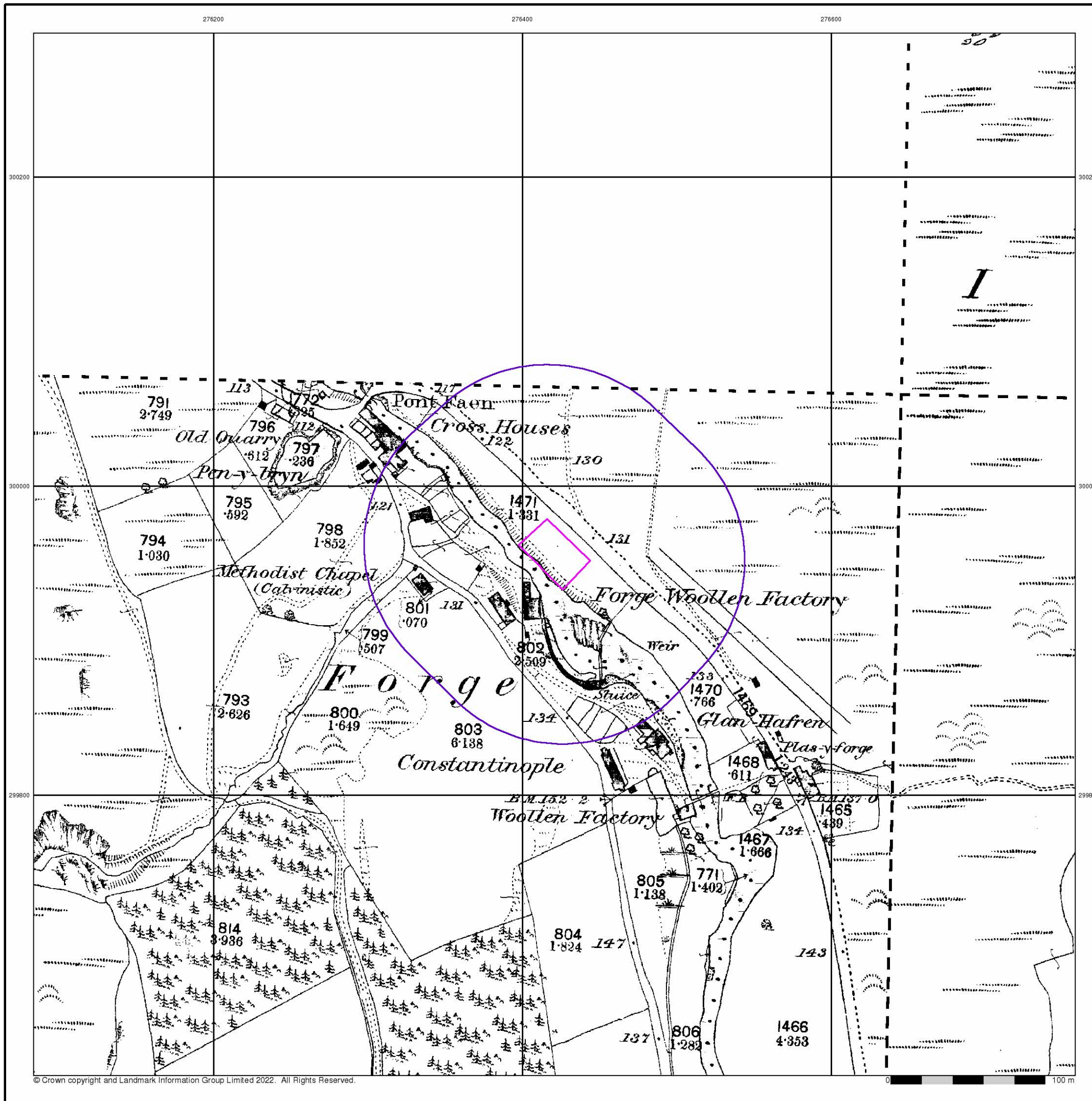


Order Details

Order Number: 290035929_1_1
 Customer Ref: ES200122a
 National Grid Reference: 276420, 299960
 Slice: A
 Site Area (Ha): 0.11
 Search Buffer (m): 100

Site Details

Maes Y Wern, Forge, MACHYNLLETH, SY20 8RZ



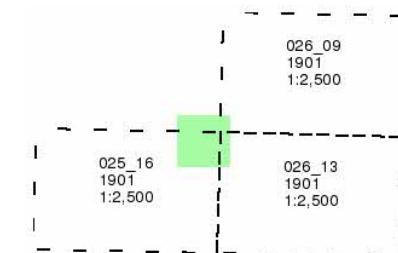
Montgomeryshire

Published 1901

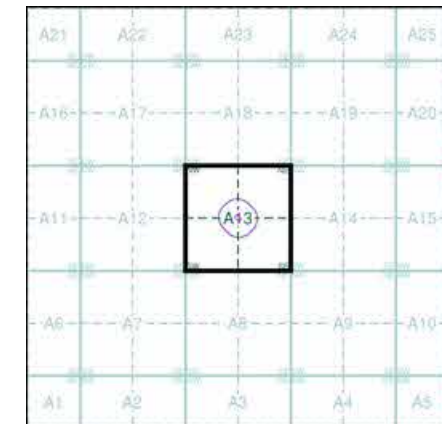
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13

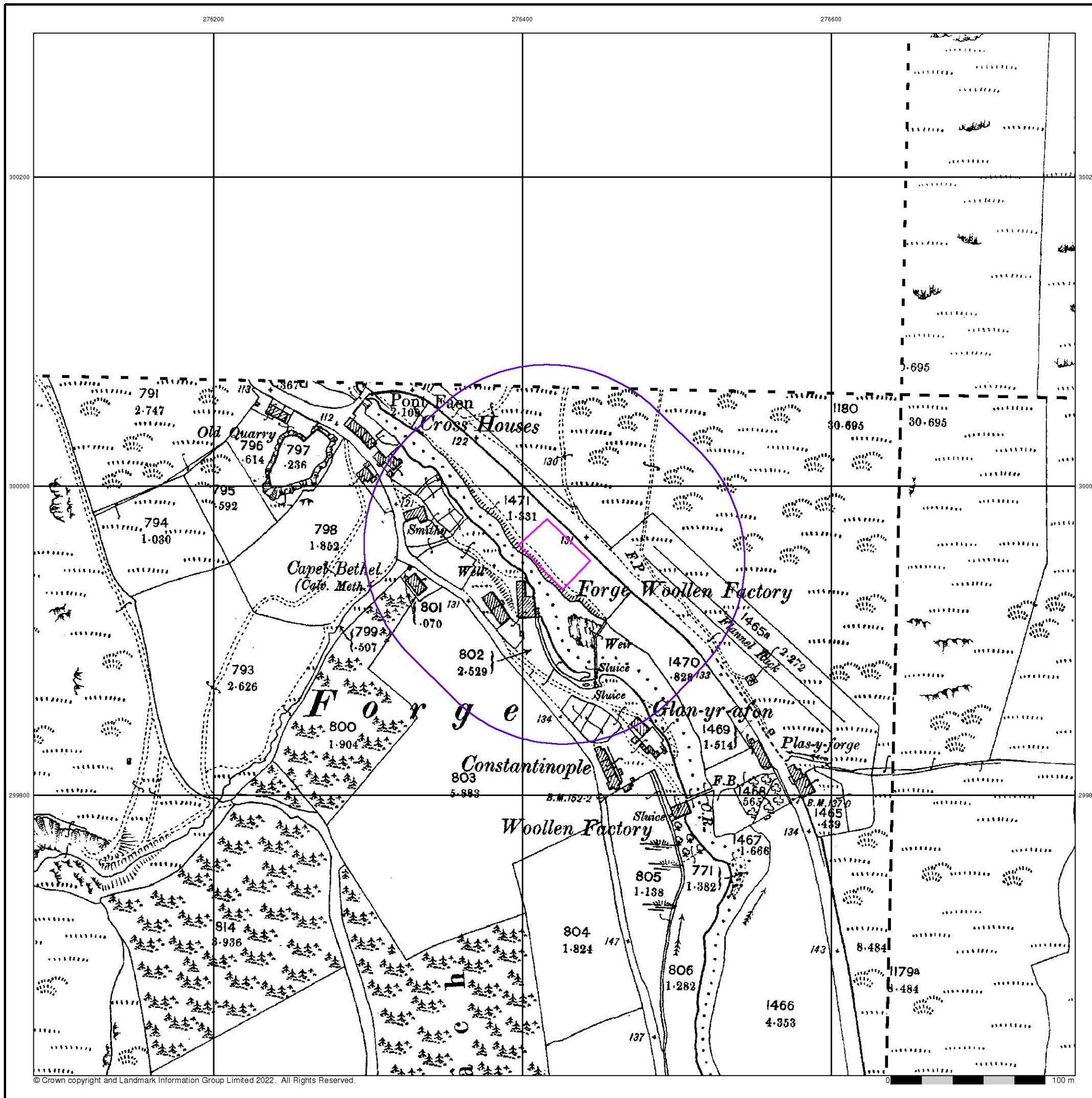


Order Details

Order Number: 290035929_1_1
Customer Ref: ES200122a
National Grid Reference: 276420, 299960
Slice: A
Site Area (Ha): 0.11
Search Buffer (m): 100

Site Details

Maes Y Wern, Forge, MACHYNLLETH, SY20 8RZ



Ordnance Survey Plan

Published 1975

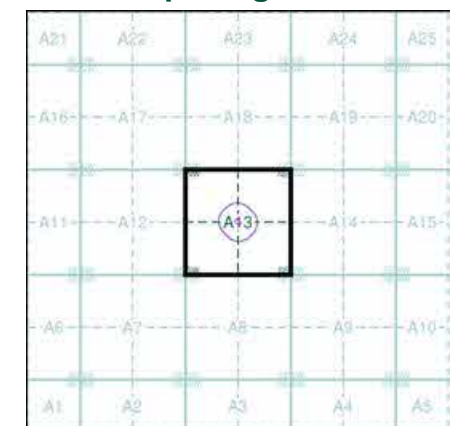
Source map scale - 1:2,500

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

Map Name(s) and Date(s)

SH7600	1975	1:2,500
SN7699	1975	1:2,500

Historical Map - Segment A13

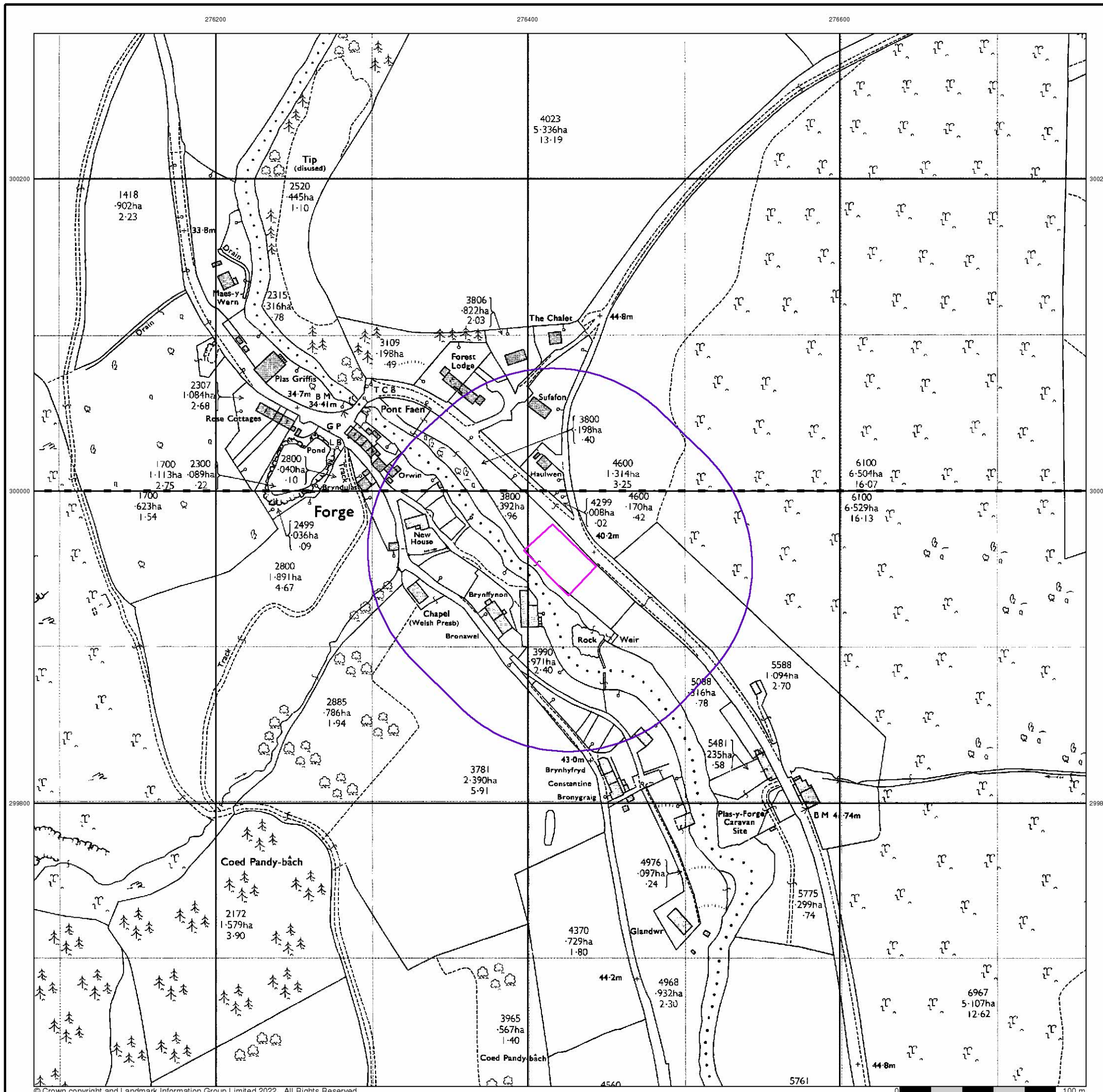


Order Details

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 National Grid Reference: 276420, 299960
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Site Details

Maes Y Wern, Forge, MACHYNLLETH, SY20 8RZ



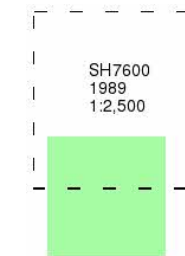
Additional SIMs

Published 1989

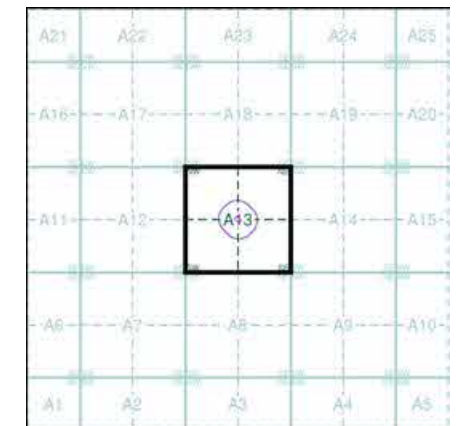
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13

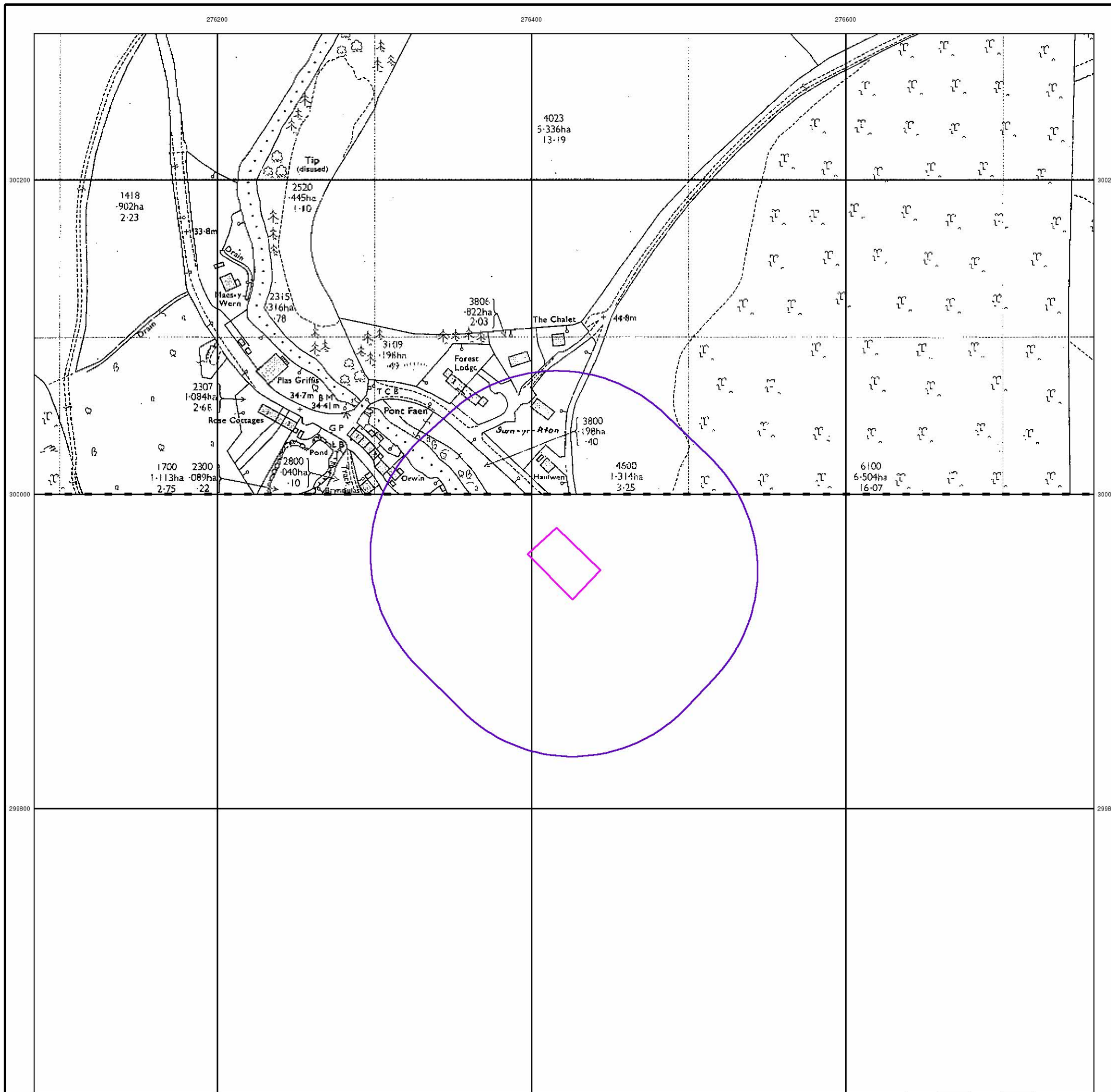


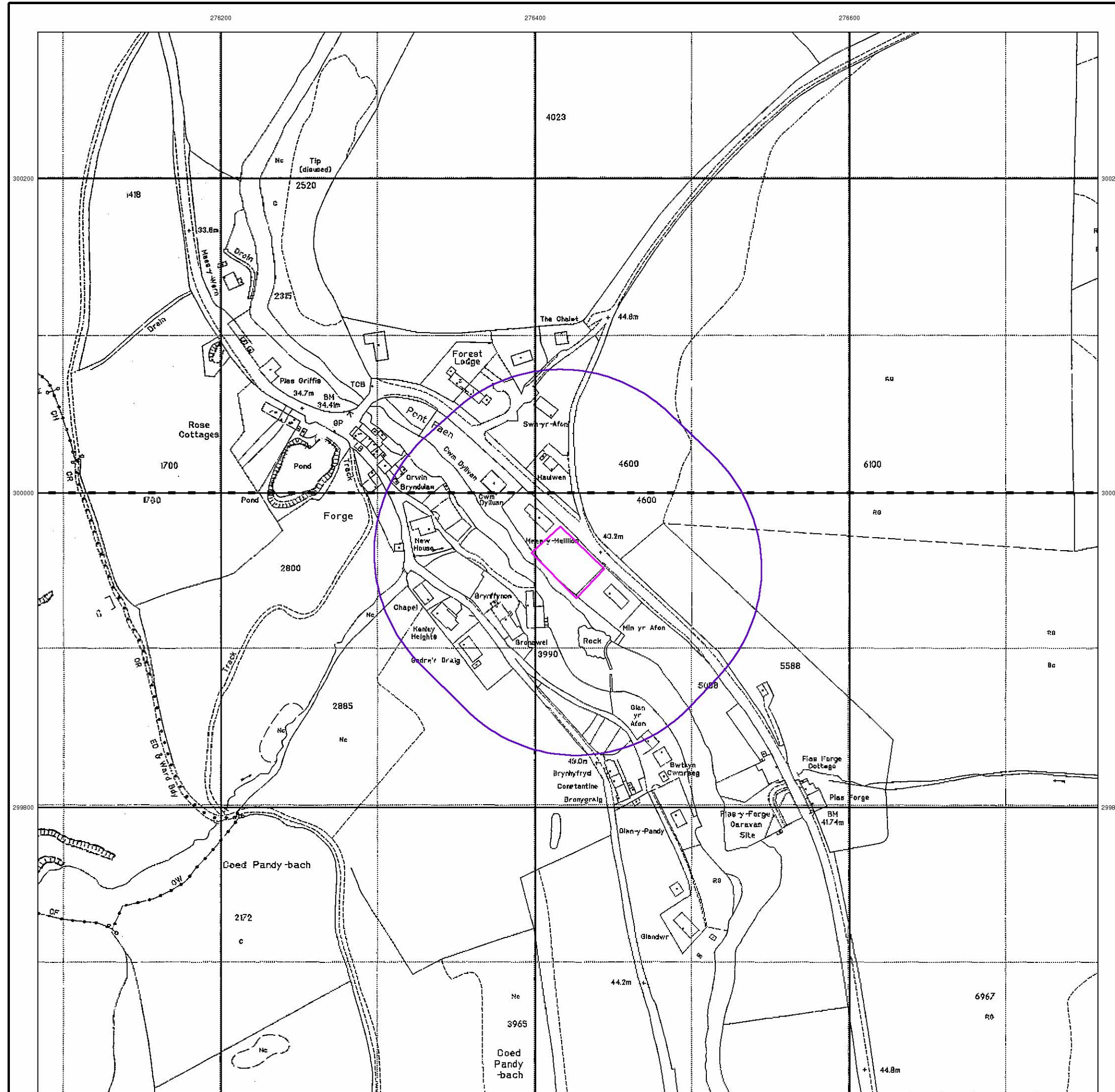
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 National Grid Reference: 276420, 299960
 Slice: A
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 Search Buffer (m): 100

Site Details

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Large-Scale National Grid Data

Published 1995

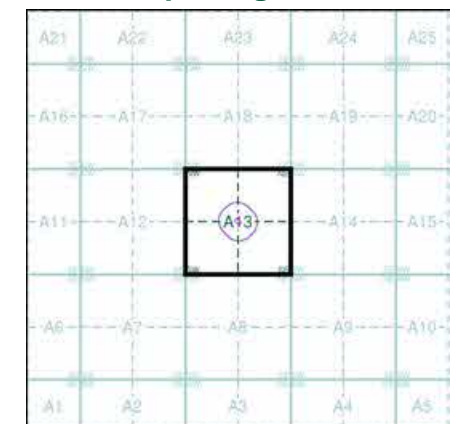
Source map scale - 1:2,500

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

Map Name(s) and Date(s)

SH7600	1995	1:2,500
SN7699	1995	1:2,500

Historical Map - Segment A13



Order Details

Order Number: 290035929_1_1
 Customer Ref: ES200122a
 National Grid Reference: 276420, 299960
 Slice: A
 Site Area (Ha): 0.11
 Search Buffer (m): 100

Site Details

Maes Y Wern, Forge, MACHYNLLETH, SY20 8RZ

Historical Mapping Legends

Ordnance Survey County Series 1:10,560

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

Ordnance Survey Plan 1:10,000

	Chalk Pit, Clay Pit or Quarry		Gravel Pit
	Sand Pit		Disused Pit or Quarry
	Refuse or Slag Heap		Lake, Loch or Pond
	Dunes		Boulders
	Coniferous Trees		Non-Coniferous Trees
	Orchard		Scrub
	Coppice		Heath
	Rough Grassland		Marsh
	Reeds		Saltings
	Building		Glasshouse
	Sloping Masonry		Pylon
	Electricity Transmission Line		Pole
	Cutting		Embankment
	Standard Gauge Multiple Track		Standard Gauge Single Track
	Siding, Tramway or Mineral Line		Narrow Gauge
	Geographical County		
	Administrative County, County Borough or County of City		
	Municipal Borough, Urban or Rural District, Burgh or District Council		
	Borough, Burgh or County Constituency Shown only when not coincident with other boundaries		
	Civil Parish Shown alternately when coincidence of boundaries occurs		
	BP, BS Boundary Post or Stone		Pol Sta Police Station
	Ch Church		PO Post Office
	CH Club House		PC Public Convenience
	F E Sta Fire Engine Station		PH Public House
	FB Foot Bridge		SB Signal Box
	Fn Fountain		Spr Spring
	GP Guide Post		TCB Telephone Call Box
	MP Mile Post		TCP Telephone Call Post
	MS Mile Stone		W Well

1:10,000 Raster Mapping

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

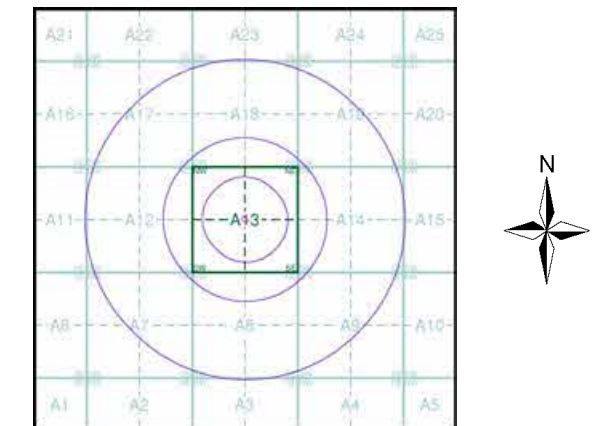
Envirocheck

LANDMARK INFORMATION GROUP

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Montgomeryshire	1:10,560	1886 - 1887	2
Merionethshire	1:10,560	1902	3
Montgomeryshire	1:10,560	1903	4
Merionethshire	1:10,560	1938	5
Montgomeryshire	1:10,560	1953	6
Merionethshire	1:10,560	1953	7
Ordnance Survey Plan	1:10,000	1964	8
Ordnance Survey Plan	1:10,000	1979	9
Ordnance Survey Plan	1:10,000	1980	10
10K Raster Mapping	1:10,000	2000	11
Street View	Variable		12

Historical Map - Slice A



Order Details

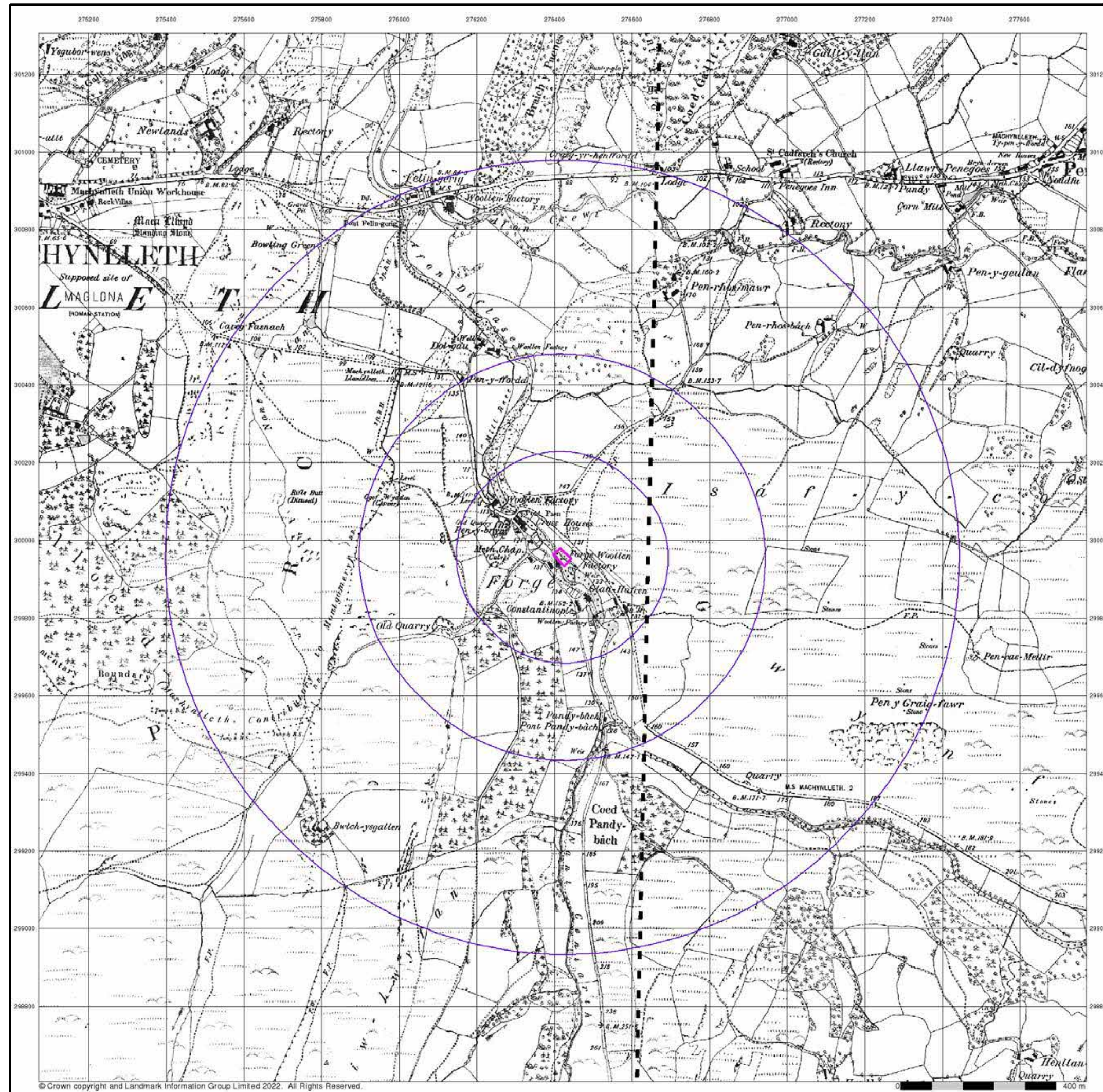
Order Number: 290035929_1_1
 Customer Ref: ES200122a
 National Grid Reference: 276420, 299960
 Slice: A
 Site Area (Ha): 0.11
 Search Buffer (m): 1000

Site Details

Maes Y Wern, Forge, MACHYNLLETH, SY20 8RZ

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 INFORMATION GROUP

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



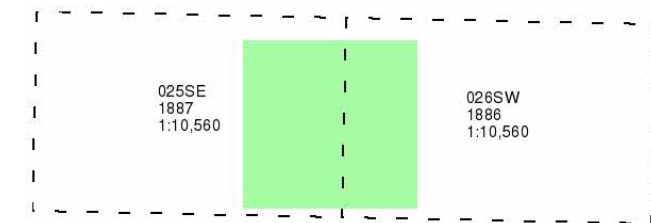
Montgomeryshire

Published 1886 - 1887

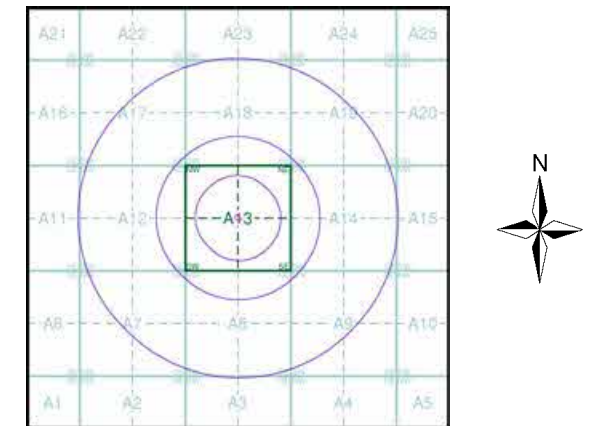
Source map scale - 1:10,560

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

Map Name(s) and Date(s)



Historical Map - Slice A

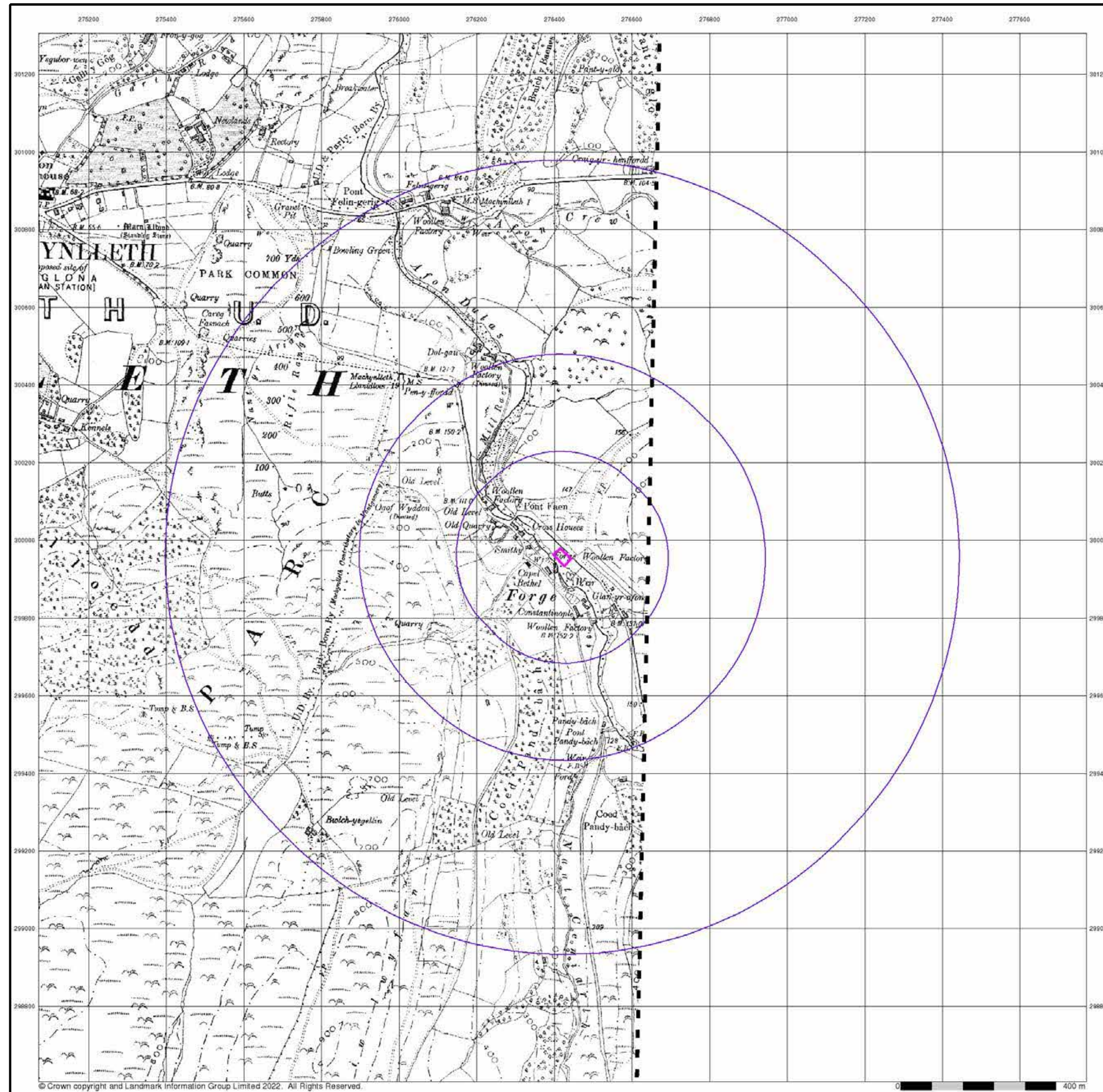


Order Details

Order Number: 290035929_1_1
 Customer Ref: ES200122a
 National Grid Reference: 276420, 299960
 Slice: A
 Site Area (Ha): 0.11
 Search Buffer (m): 1000

Site Details

Maes Y Wern, Forge, MACHYNLLETH, SY20 8RZ

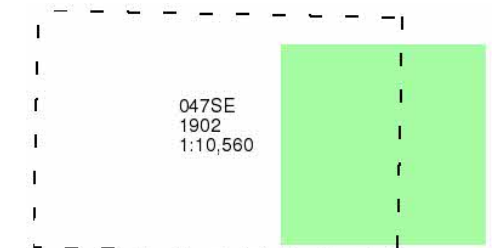


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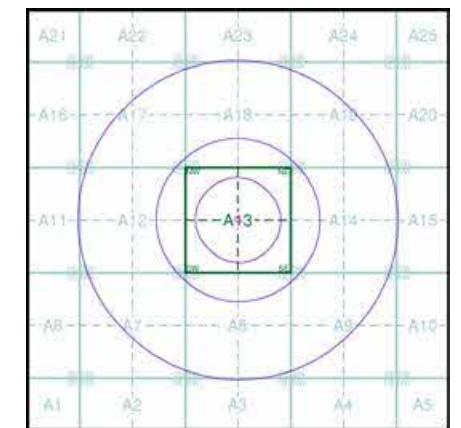
0 400 m

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

Map Name(s) and Date(s)



Historical Map - Slice A

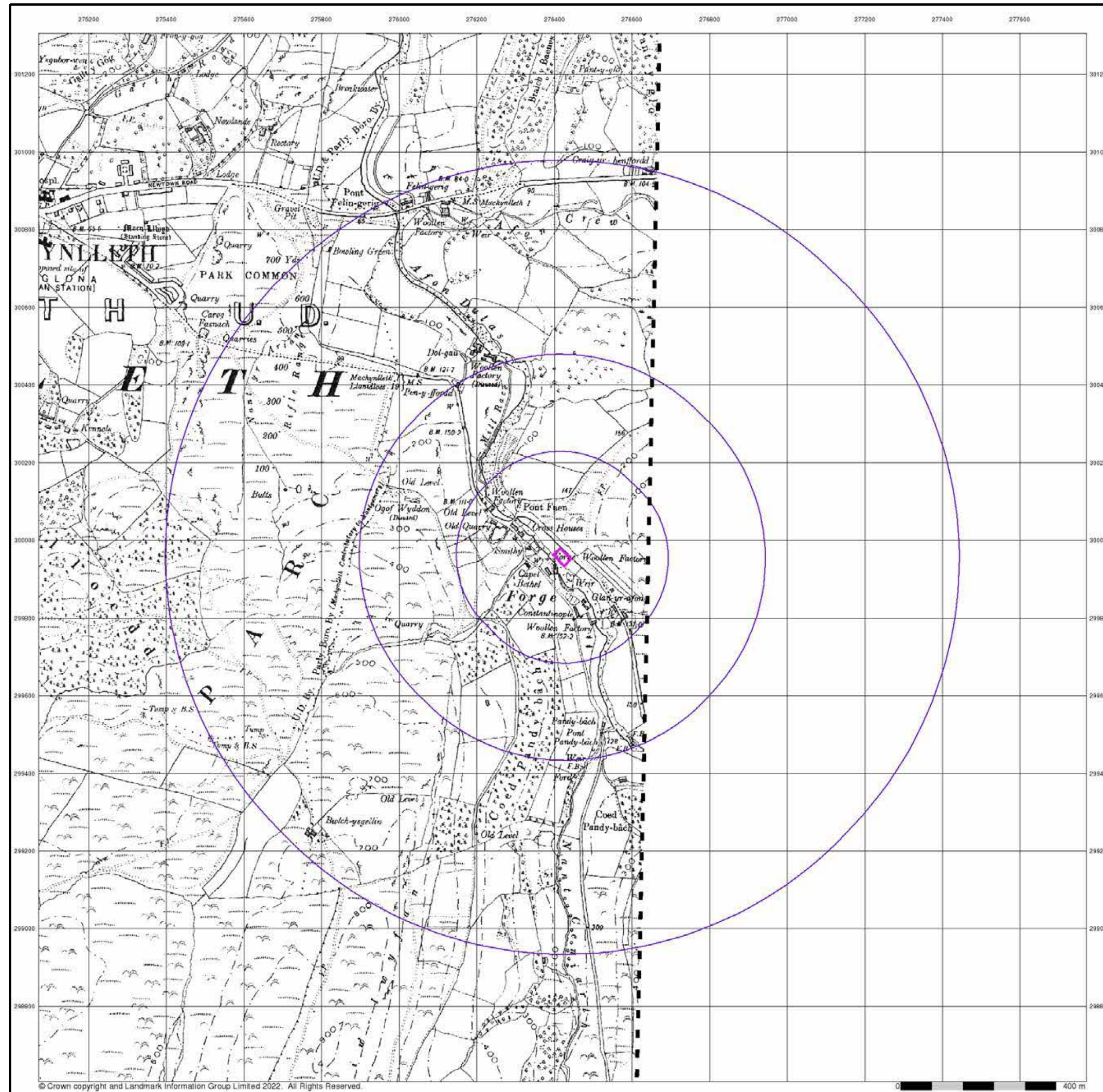


Order Details

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 National Grid Reference: 276420, 299960
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Site Details

Maes Y Wern, Forge, MACHYNLLETH, SY20 8RZ



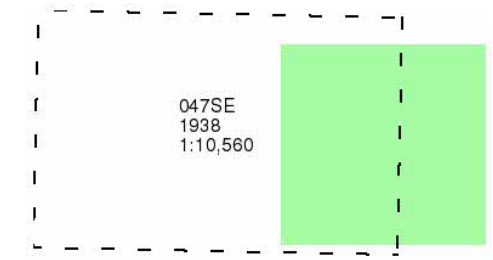
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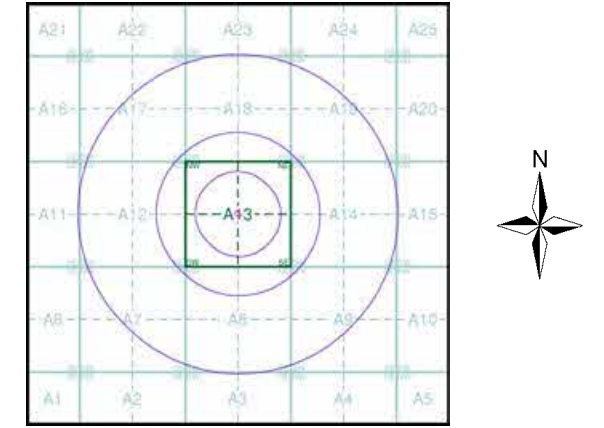
Merionethshire
Published 1938
Source map scale - 1:10,560

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

Map Name(s) and Date(s)

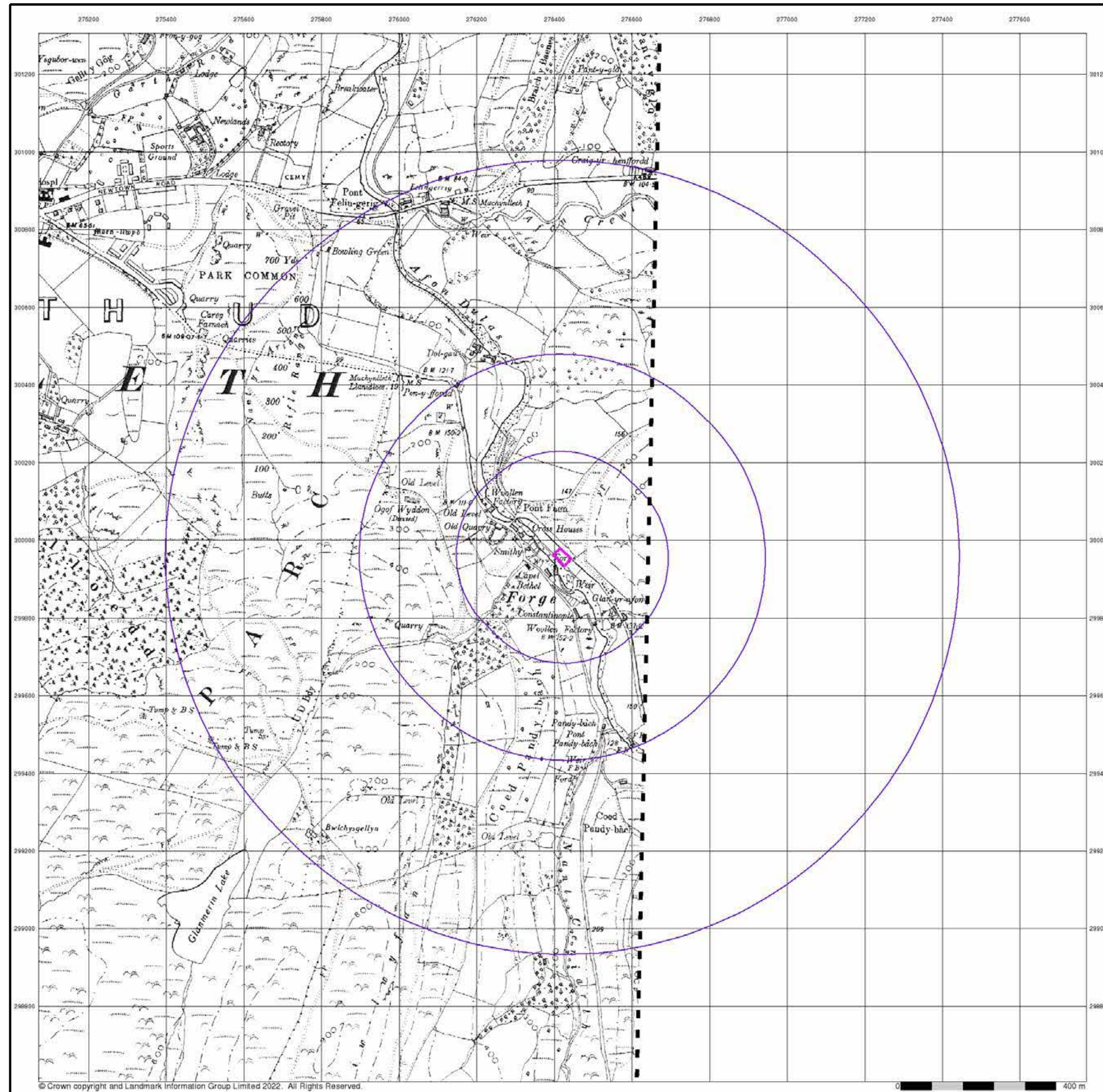


Historical Map - Slice A



Order Details
 Order Number: 290035929_1_1
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 National Grid Reference: 276420, 299960
 Slice: A
 Site Area (Ha): 0.11
 Search Buffer (m): 1000

Site Details
 Maes Y Wern, Forge, MACHYNLETH, SY20 8RZ



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Merionethshire

Published 1953

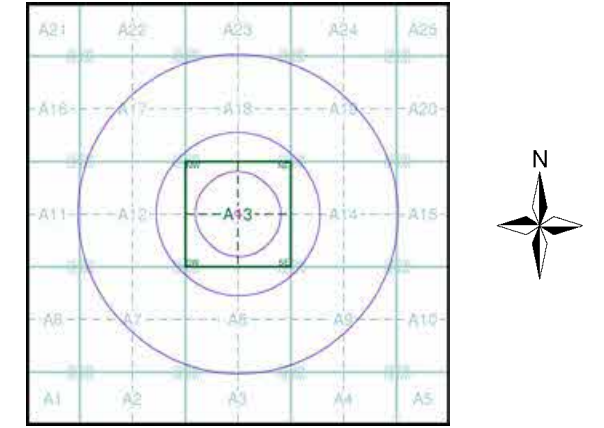
Source map scale - 1:10,560

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

Map Name(s) and Date(s)



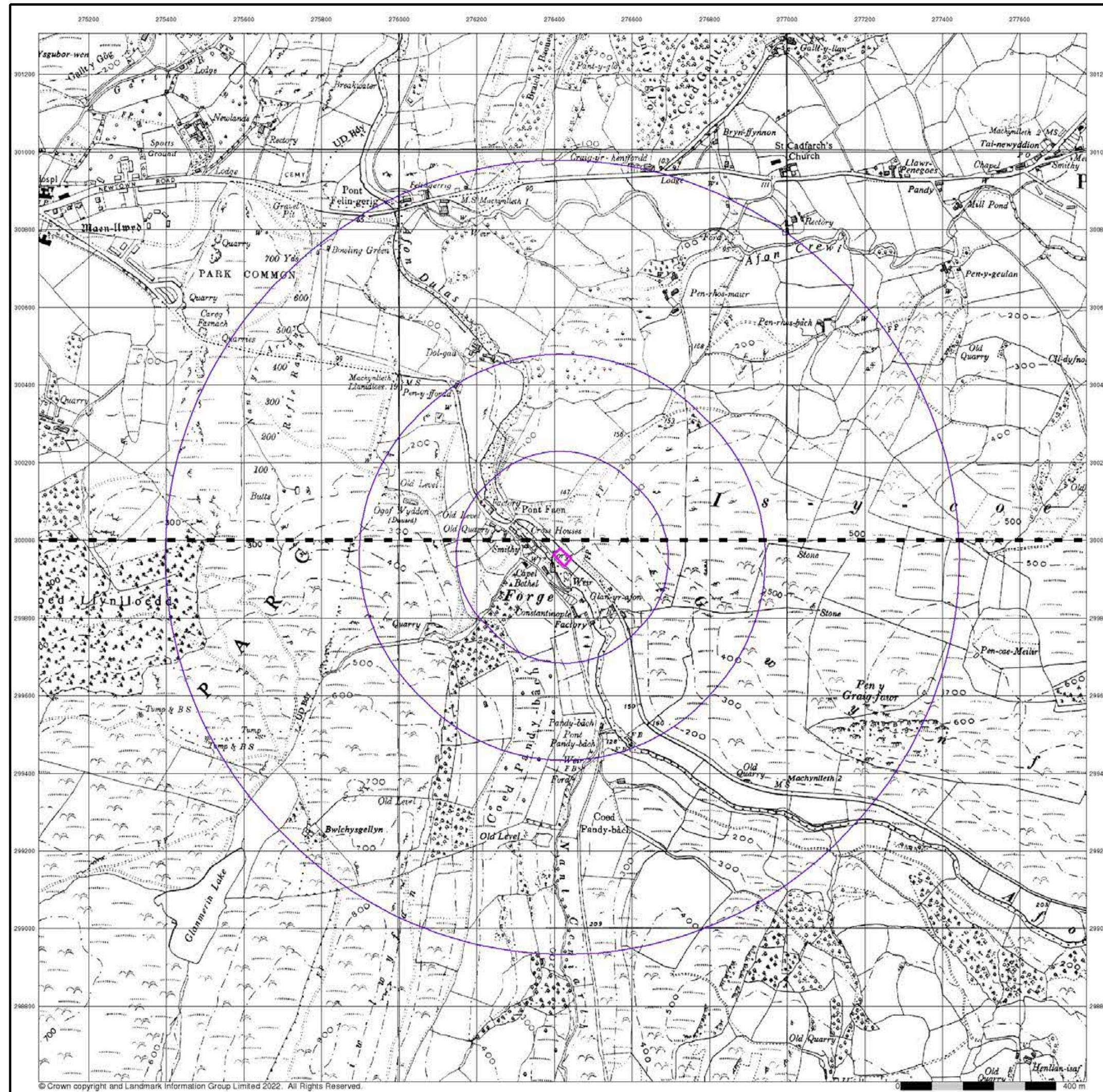
Historical Map - Slice A



Order Details

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Site Details
 Maes Y Wern, Forge, MACHYNLLETH, SY20 8RZ



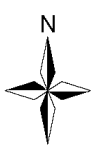
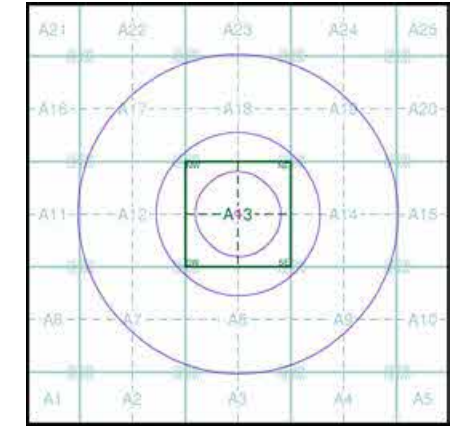
Ordnance Survey Plan Published 1964 Source map scale - 1:10,000

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

Map Name(s) and Date(s)

SH70SE	1964	1:10,560
SN79NE	1964	1:10,560

Historical Map - Slice A



Order Details

Order Number: 290035929_1_1
 Customer Ref: ES200122a
 National Grid Reference: 276420, 299960
 Slice: A
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 Search Buffer (m): 1000

Site Details

Maes Y Wern, Forge, MACHYNLLETH, SY20 8RZ

10k Raster Mapping

Published 2000

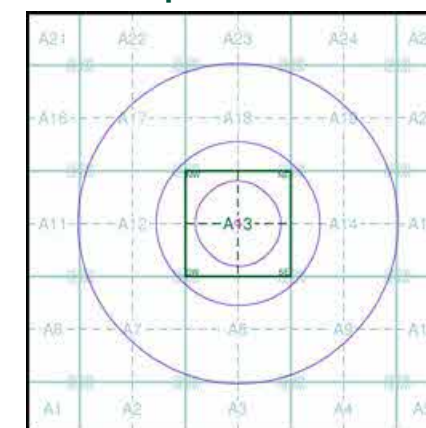
Source map scale - 1:10,000

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

Map Name(s) and Date(s)

SH70SE	2000	1:10,000
SN79NE	2000	1:10,000

Historical Map - Slice A

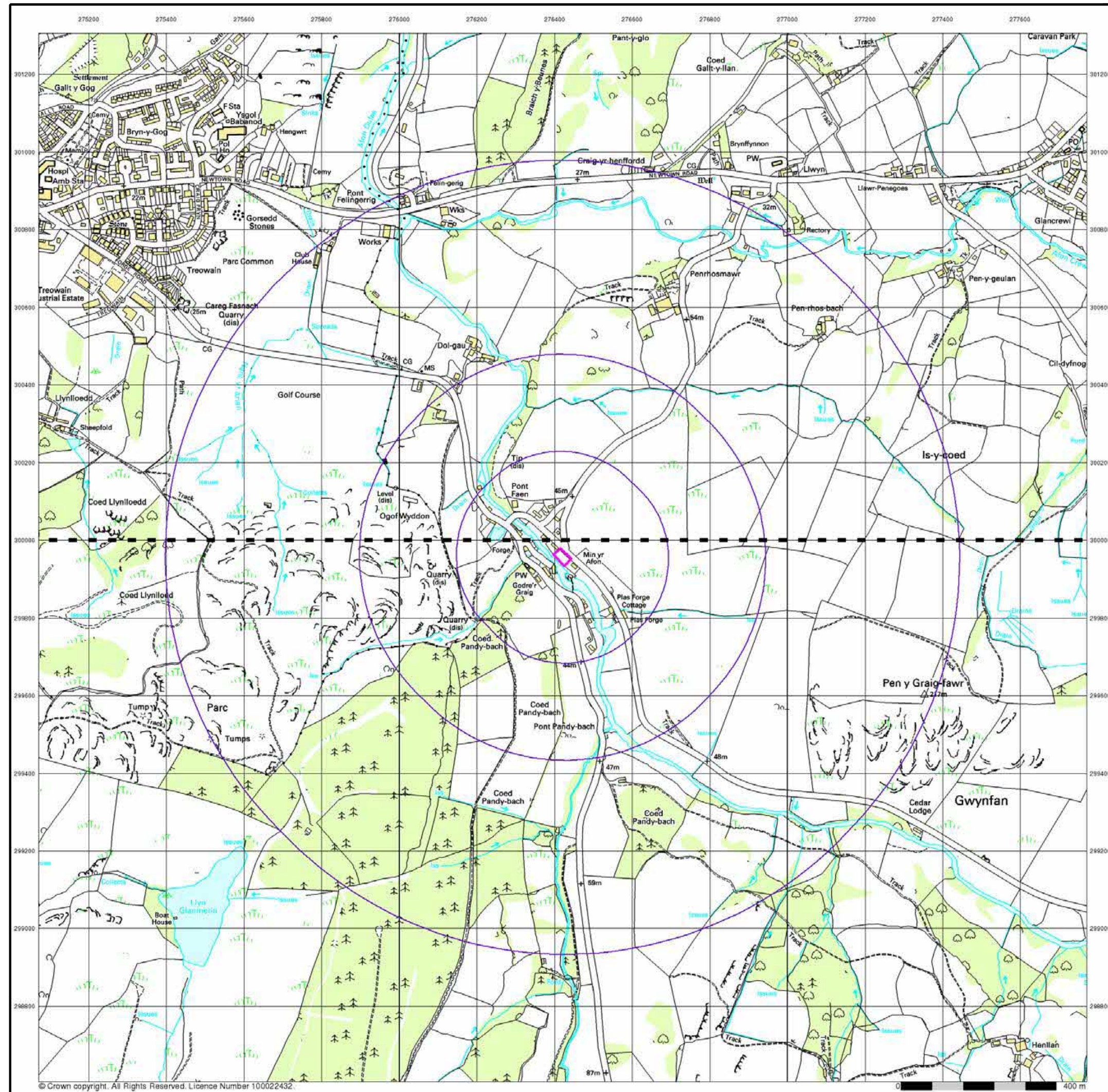


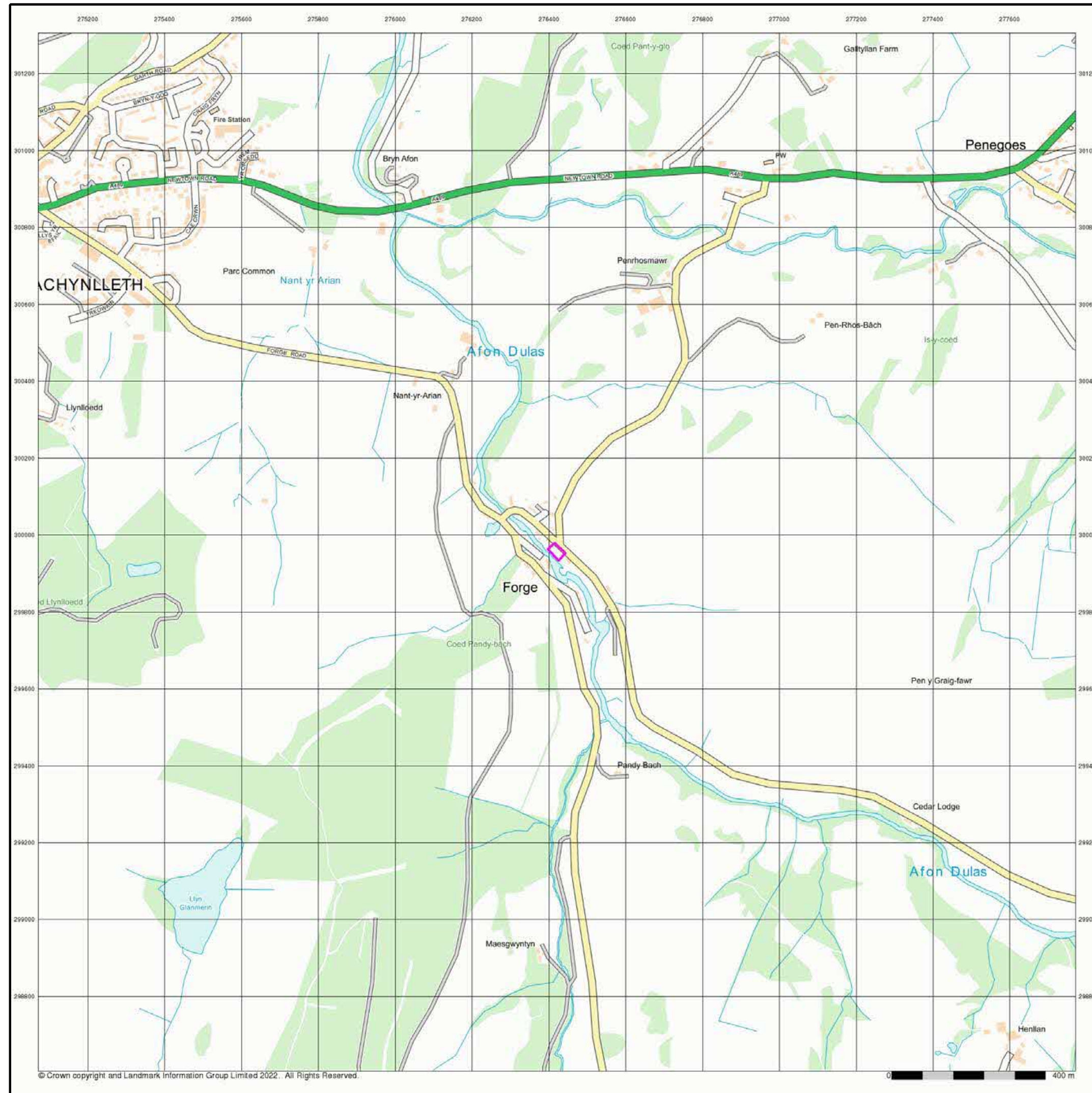
Order Details

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 Site Area (Ha): 0.11
 Search Buffer (m): 1000

Site Details

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Street View

Published 2022

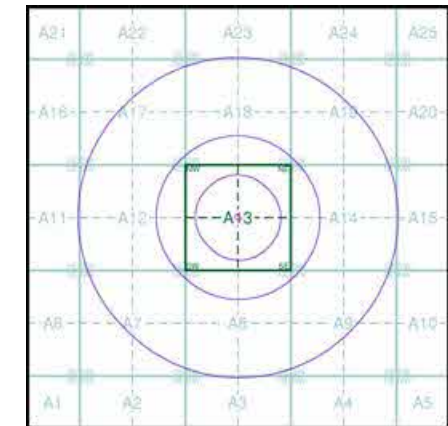
Source map scale - 1:10,000

Street View is a street-level map for the whole of Great Britain produced by the Ordnance Survey. These maps are provided at a nominal scale of 1:10,000

Map Name(s) and Date(s)



Street View Map - Slice A



Order Details

Order Number: 290035929_1_1
 Customer Ref: ES200122a
 National Grid Reference: 276420, 299960
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 Site Area (Ha): 0.11
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Site Details

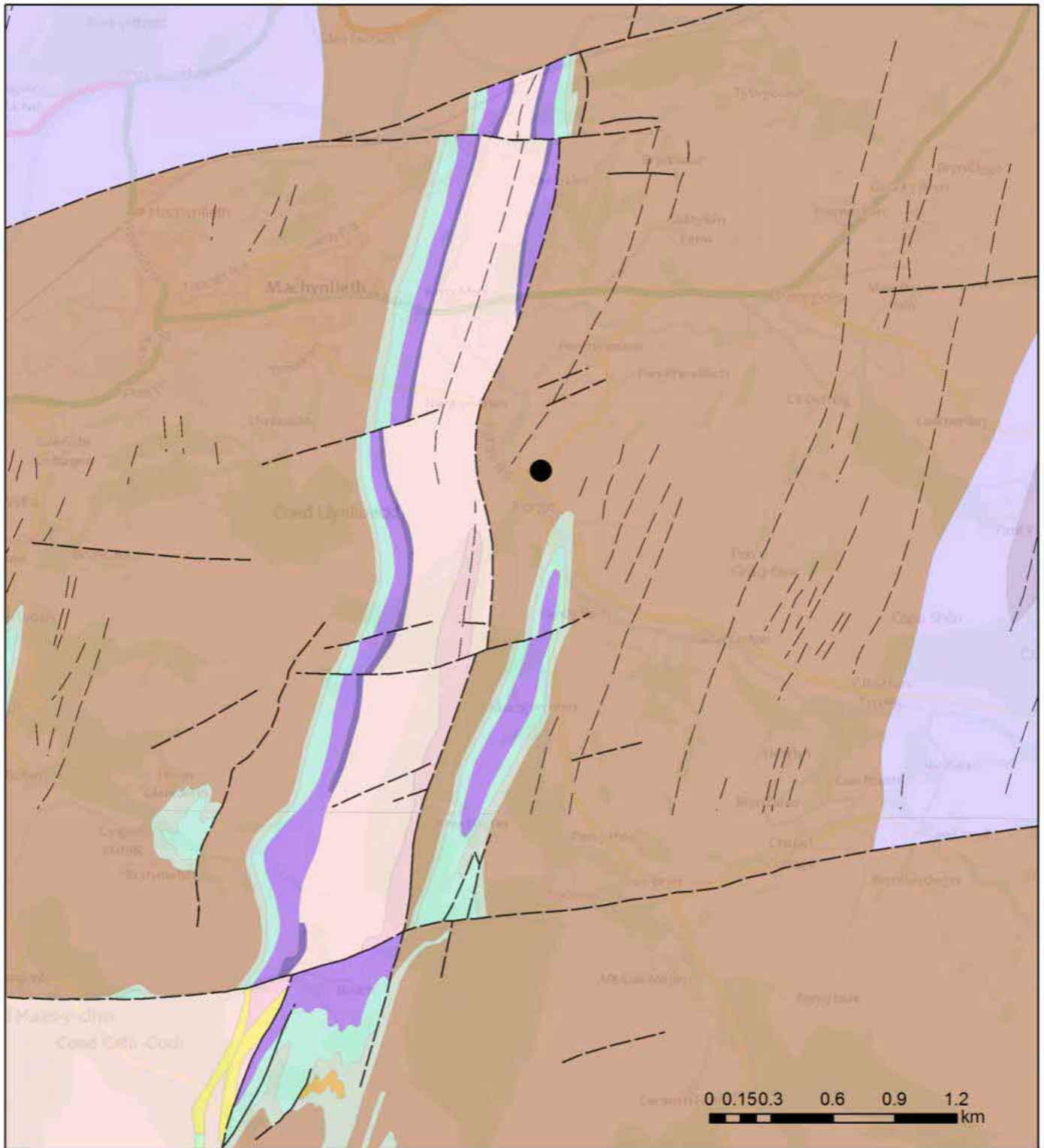
Maes Y Wern, Forge, MACHYNLLETH, SY20 8RZ

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Appendix D – Geological Maps

Bedrock Geology



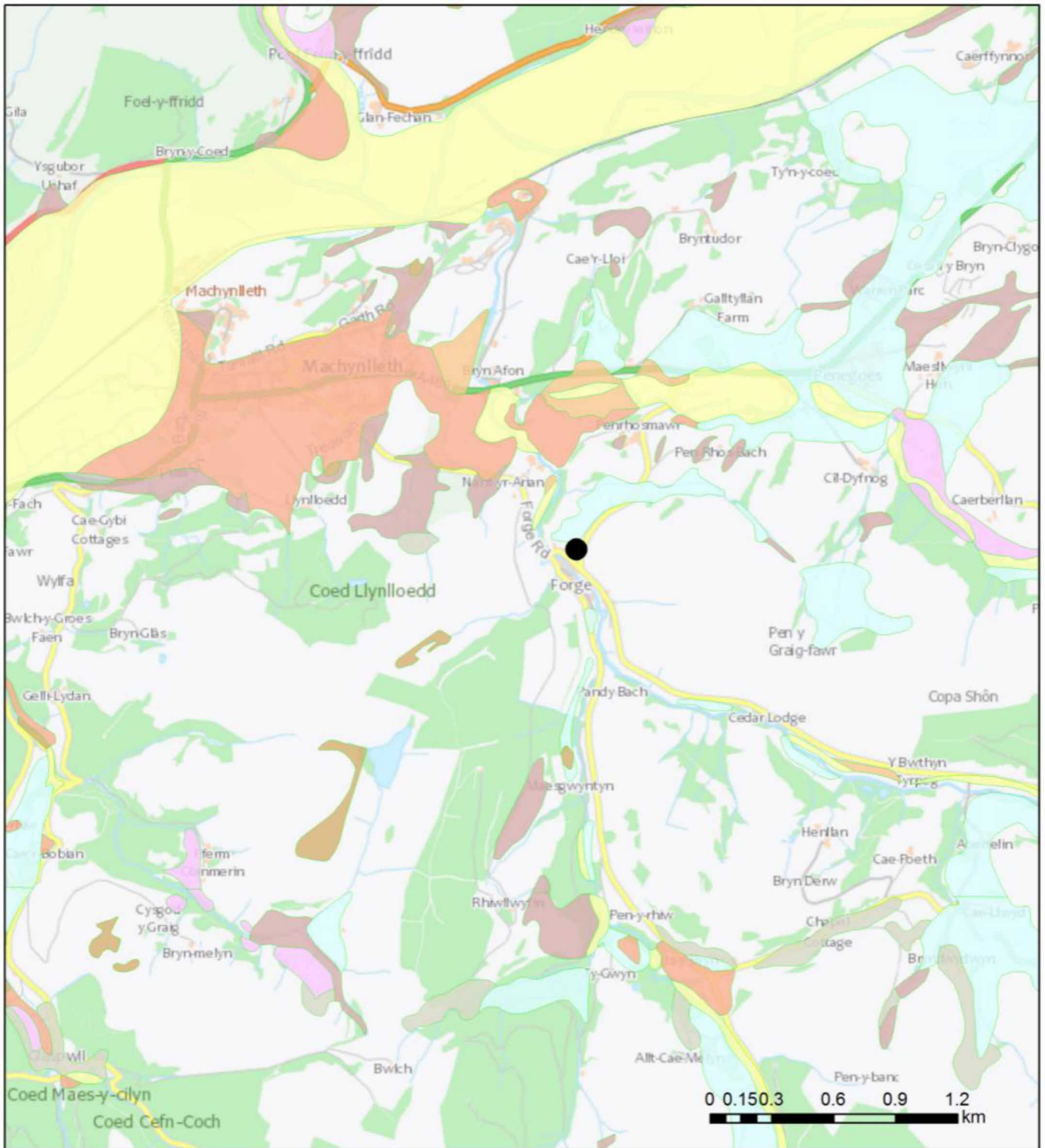
Linear features 1:50,000 scale

- Fold_Anticline
- Fold_Syncline
- ←← Glacial_overflow_channel_Centre

Bedrock geology 1:50,000 scale

-  [RHUDDNANT GRITS FORMATION - MUDSTONE AND SANDSTONE](#)
-  [BORTH MUDSTONES FORMATION - MUDSTONE](#)
-  [FOEL FADIAN FORMATION - MUDSTONE AND SANDSTONE, INTERBEDDED](#)
-  [CWMERE FORMATION - MUDSTONE](#)
-  [BRYN-GLAS FORMATION - SLUMPED MUDSTONE, SLUMPED SILTSTONE AND SLUMPED SANDSTONE](#)
-  [DROSGOL FORMATION - MUDSTONE, SLUMPED](#)
-  [BLAEN MYHERIN MUDSTONES FORMATION - MUDSTONE](#)
-  [DERWENLAS FORMATION - MUDSTONE](#)
-  [PENCERRIGTEWION MEMBER - MUDSTONE](#)
-  [PENCERRIGTEWION MEMBER - SLUMPED MUDSTONE, SLUMPED SILTSTONE AND SLUMPED SANDSTONE](#)
-  [RHAYADER MUDSTONES FORMATION - MUDSTONE](#)
-  [MOTTLED MUDSTONE MEMBER, LLANDOVERY AGE - MUDSTONE](#)
-  [BRYN-GLAS FORMATION - SANDSTONE](#)
-  [PENCERRIGTEWION MEMBER - MUDSTONE, SILTSTONE AND SANDSTONE](#)
-  [DEVIL'S BRIDGE FORMATION - MUDSTONE AND SANDSTONE, INTERBEDDED](#)
-  [PENCERRIGTEWION MEMBER - MUDSTONE, SLUMPED](#)
-  [RHAYADER MUDSTONES FORMATION - SANDSTONE AND MUDSTONE](#)
-  [PENCERRIGTEWION MEMBER - SANDSTONE](#)

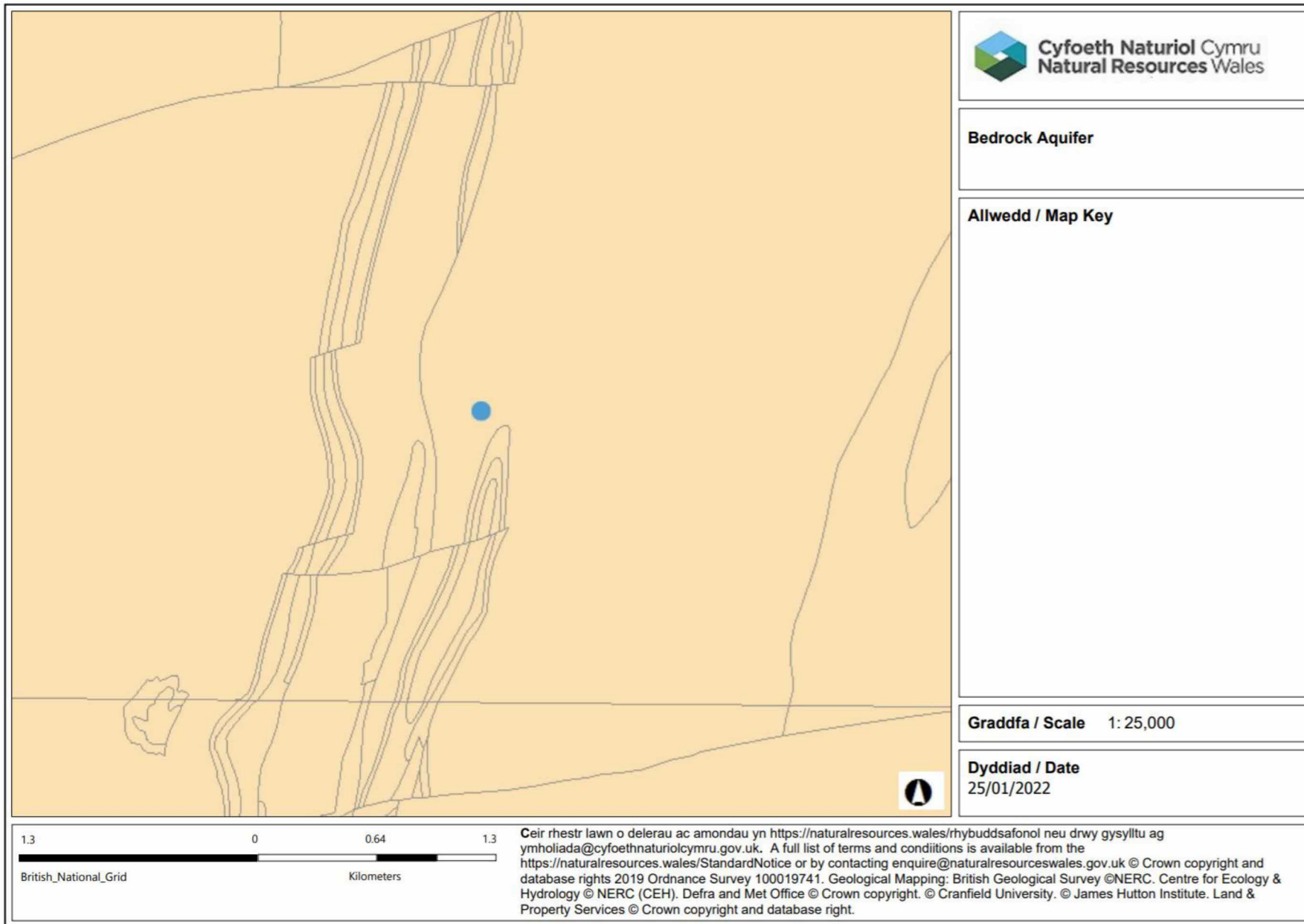
Superficial Geology

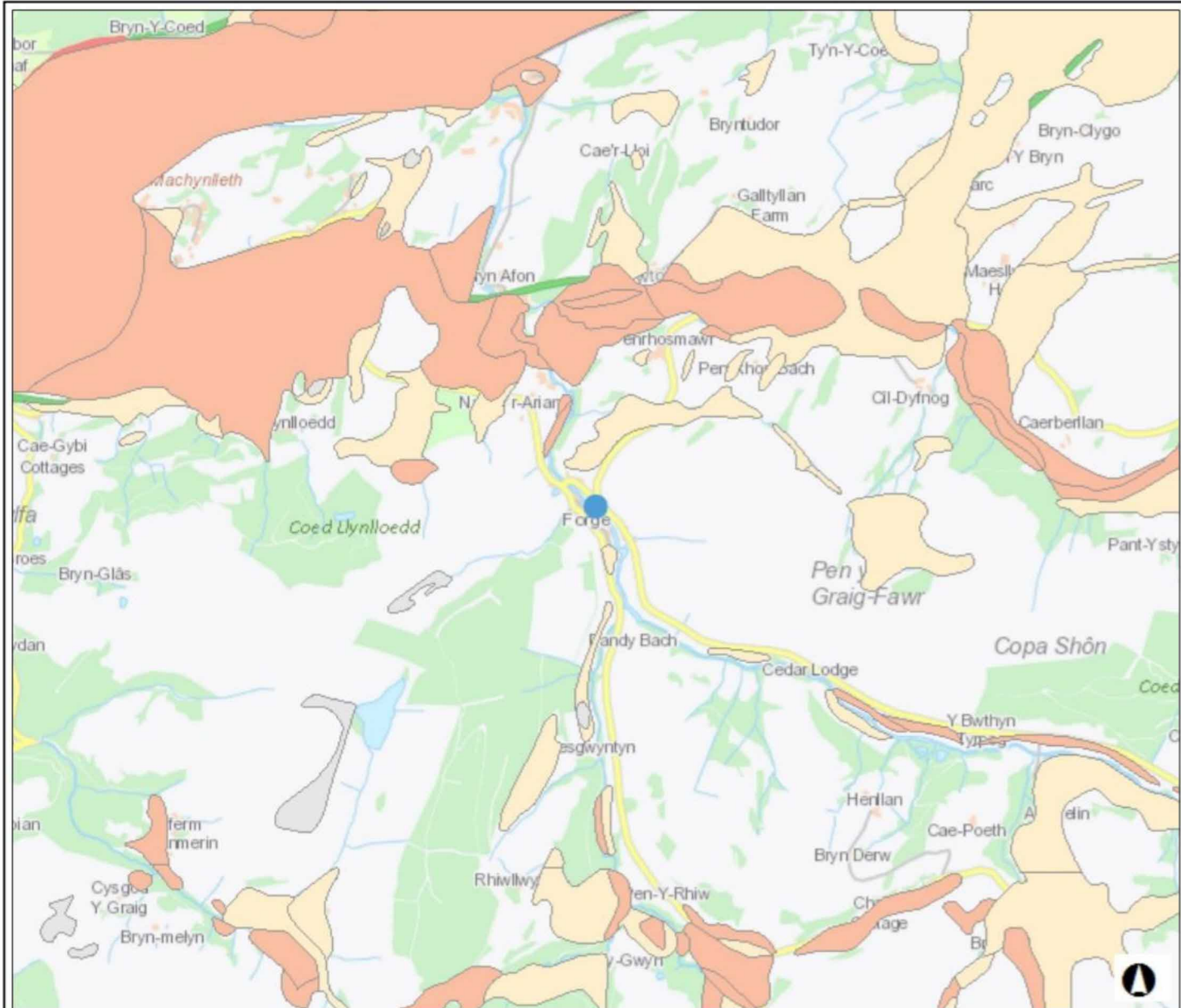


Superficial deposits 1:50,000 scale

- GLACIOFLUVIAL DEPOSITS, DEVENSIAN - SAND AND GRAVEL
- TILL, DEVENSIAN - DIAMICTON
- TALUS - ROCK FRAGMENTS, ANGULAR, UNDIFFERENTIATED SOURCE ROCK
- ALLUVIUM - CLAY, SILT, SAND AND GRAVEL
- HEAD - CLAY, SILT, SAND AND GRAVEL
- RIVER TERRACE DEPOSITS (UNDIFFERENTIATED) - SAND AND GRAVEL
- ALLUVIAL FAN DEPOSITS - GRAVEL
- TIDAL FLAT DEPOSITS - CLAY, SILT AND SAND
- PEAT - PEAT
- SUPERFICIAL THEME NOT MAPPED [FOR DIGITAL MAP USE ONLY] - UNKNOWN/UNCLASSIFIED ENTRY

Appendix E – Hydrogeological Maps





Cyfoeth Naturiol Cymru
Natural Resources Wales

Superficial Aquifer

Allwedd / Map Key

Graddfa / Scale 1: 25,000

Dyddiad / Date
25/01/2022



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Groundwater Vulnerability

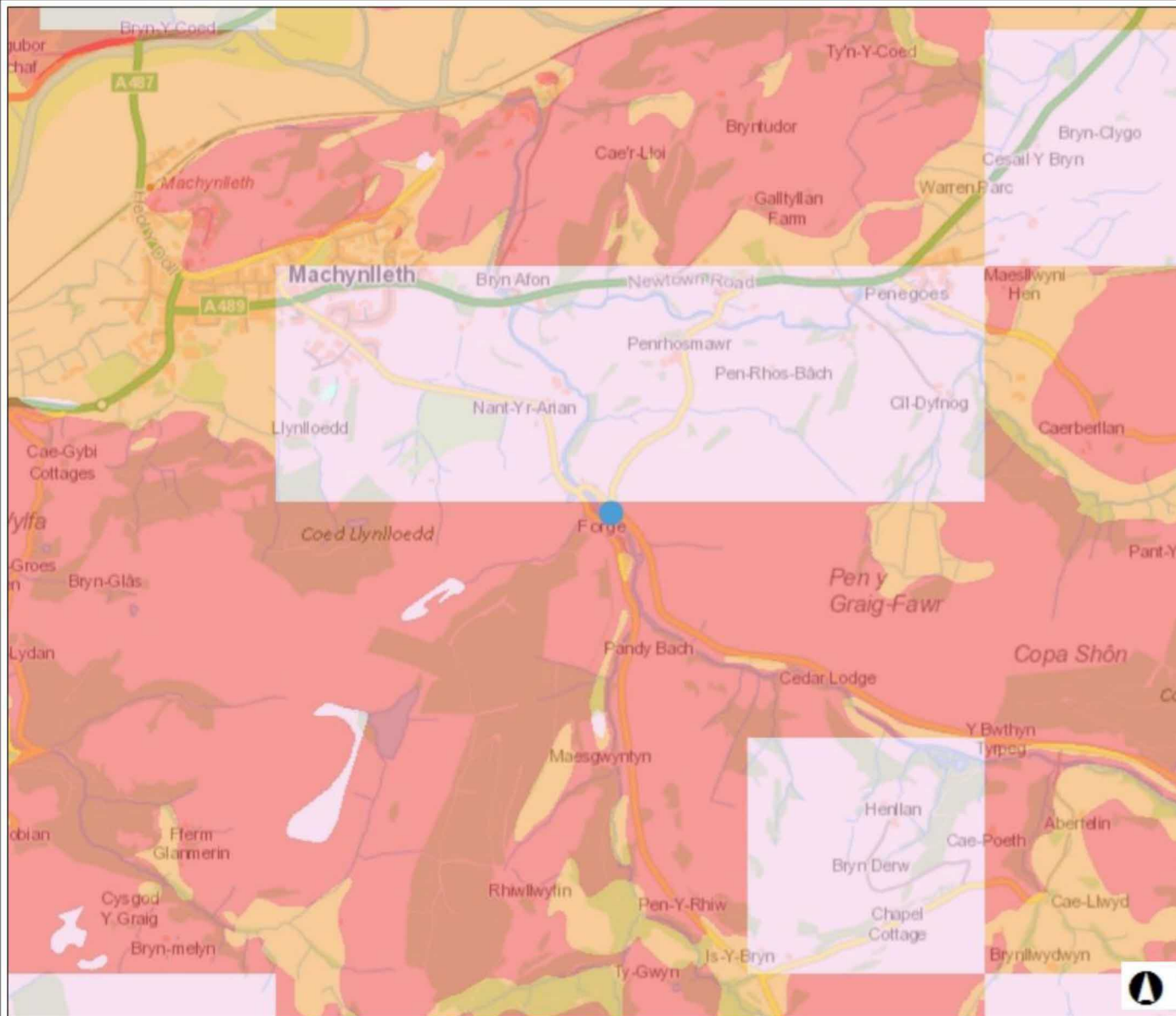
Allwedd / Map Key

Simplified Groundwater vulnerability

- High
- Medium - High
- Medium
- Medium - Low
- Low
- Unproductive

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Appendix F – Historic Landfill Map

