

Intended for
BAM Construction

Document Reference:
NMC-RAM-ZZ-XX-RP-Y-07001

Date
March 2023

Project Number
1620014943

GLAN CLWYD HOSPITAL, NUCLEAR MEDICINE CONSOLIDATION PROJECT CONTAMINATED LAND AND GEOTECHNICAL ASSESSMENT

CONTAMINATED LAND AND GEOTECHNICAL ASSESSMENT GLAN CLWYD HOSPITAL, NUCLEAR MEDICINE CONSOLIDATION PROJECT

Project No. **1620014943**
Issue No. **P01**
Date **15 March 2023**
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Version Control Log

Revision	Date	Made by	Checked by	Approved by	Description
01	15/03/2023	CC/TC	VG	HC	First Issue

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1. INTRODUCTION

1.1 Background

This report presents the objectives, scope, findings and conclusions of a Contaminated Land and Geotechnical Assessment undertaken at Glan Clwyd Hospital, Nuclear Medicine Consolidation Project (the "site"). The review was undertaken in connection with the proposed development at the site.

This report was prepared by Ramboll UK Limited ("Ramboll") on behalf of BAM Construction (the "client").

This assessment has been undertaken assuming the site will be redeveloped based on the proposals outlined in Section 1.4 of this report.

1.2 Objectives

The objectives of this assessment are:

1. to assess the potential for significant soil or groundwater contamination, both at and in the immediate vicinity of the site, and its likely implications to the client for the proposed redevelopment scenario. No sampling or analysis of soils, waters or other materials was undertaken as part of the assessment. Review of compliance with environmental legislation is outside the scope of this assessment; and
2. to identify any significant geotechnical risks associated with the proposed development and to inform subsequent ground investigation.

1.3 Scope of Works

The scope of the Phase I Contaminated Land and Geotechnical Assessment has included the following:

- Review of historic, recent and current Ordnance Survey plans to identify activities which might have led to contamination of soil or groundwater (for example, from manufacturing processes, from storage activities or waste disposal practices) both on the subject site and on adjacent sites;
- Review of published records and plans on the shallow and deep geology and hydrogeology of the site to assess the vulnerability and sensitivity of groundwater and surface water resources to contamination, if present, and the possible direction of movement off site, if mobile;
- Review of the Groundsure environmental database report for environmental permits, records and incidents at the site and surrounding area;
- Review of published or publicly accessible geological / geotechnical information;
- Provide an initial contaminated land conceptual site model and preliminary risk assessment; and
- Provide initial advice relating to geotechnical constraints for the development.

1.3.1 Scope of Works Notable Exceptions and Restrictions

No sampling or analysis of soils, waters or other materials has been carried out as part of the Phase I Environmental Site Assessment.

In accordance with the scope of works, no contact with the regulatory authorities was made. Consequently, no information that may be held by the authorities and listed on the Register of Contaminated Sites was obtained.

The assessment specifically excluded a detailed assessment as to the presence and condition of asbestos or asbestiform containing materials at the site.

1.4 The Proposed Development

The development is to comprise a two-storey building with an enclosed plant room on the upper floor. The development will include facilities to house two gamma cameras and a static PET CT scanner along with their associated ancillary uses. The detailed proposed development plan is yet to be finalised at the time of writing this report.

1.5 General Limitations and Reliance

This report has been prepared by Ramboll exclusively for the intended use by the client in accordance with the agreement between Ramboll and the client defining, among others, the purpose, the scope and the terms and conditions for the services.

No other warranty, expressed or implied, is made as to the professional advice included in this report or in respect of any matters outside the agreed scope of the services or the purpose for which the report and the associated agreed scope were intended or any other services provided by Ramboll.

In preparation of the report and performance of any other services, Ramboll has relied upon publicly available information, information provided by the client and information provided by third parties. Accordingly, the conclusions in this report are valid only to the extent that the information provided to Ramboll was accurate, complete and available to Ramboll within the reporting schedule.

Ramboll's services are not intended as legal advice, nor an exhaustive review of site conditions and / or compliance. This report and accompanying documents are initial and intended solely for the use and benefit of the client for this purpose only and may not be used by or disclosed to, in whole or in part, any other person without the express written consent of Ramboll. Ramboll neither owes nor accepts any duty to any third party, unless formally agreed by Ramboll through that party entering into, at Ramboll's sole discretion, a written reliance agreement.

This assessment has been based on the proposed redevelopments as described in Section 1.4 of this report.

Ramboll's scope of services for this assignment did not include collecting samples of any environmental media. Ramboll cannot rule out the existence of conditions, including, but not limited to, contamination not identified and defined by the data and information available to and / or obtained by Ramboll. Specifically, this assessment must not be considered as an asbestos survey (whether in built structures, waste, soils, etc.), even though the subject of asbestos-containing materials may have been discussed in the report. Any reference to flood risk does not constitute a flood risk assessment.

2. SITE DESCRIPTION

Figures showing the location of the site, site boundary and key features on site are presented in Appendix 1.

2.1 Site Setting

The site is located within the grounds of the Glan Clwyd Hospital in Bodelwyddan, approximately 6 km south of Rhyl Town Centre, at National Grid Reference 300252, 375934. Access to the hospital site is via Rhuddlan Road to the east.

Figures showing the location of the site and site boundary are presented in Appendix 1.

Adjacent and surrounding land uses are detailed in Table 2.1 below.

Table 2-1: Adjacent and Surrounding Land Uses

Direction	Occupant
North	Main area of the Glan Clwyd Hospital with agricultural fields beyond.
South	Car Parking with the Ablet Unit (hospital buildings), car parking and residential properties beyond.
East	North Wales Cardiac Centre with car park and agricultural fields beyond.
West	Car parking and entrance to the Emergency Department with grassland beyond.

2.2 Site Layout and Activities

The site is located immediately south of the main buildings associated with the Glan Clwyd Hospital. The site is approximately 0.3 Ha and is roughly rectangular in shape.

The site comprises a soft landscaped area in the south of the site (approximately 0.1 Ha) with picnic bench and mature trees. A drain is noted cross cutting the site from east to south-west which is surrounded on its northern and southern banks by shrubs. The drain appears to be culverted further to the east beneath existing hospital buildings. A small, mounded area was noted in the far south-western area of the site which appears to be immediately south of the drain. A low wooden fence was noted along the southern band of the drain in this area.

The northern area of the site (approximately 0.22 Ha) is currently used as a contractor's compound with various shipping containers for storage of materials, general waste skips and offices. Tarmacadam and concrete hardstanding were noted in the majority of the northern area (which appeared to be patched from previous service excavations) with very small areas of grass surrounding the footpaths. No visual or olfactory evidence of contamination was noted by Ramboll during a brief site visit. There are also two mobile scanning units along the northern site boundary.

3. HISTORICAL & REGULATORY INFORMATION

3.1 Map History

Ramboll has undertaken a review of historical mapping and aerial imagery (where available) obtained from a Groundsure Environmental Database report which is summarised below and presented in Appendix 2.

The historical development of the site and the surrounding area is detailed in Table 3.1 below.

Table 3-1: Site History

Date & Scale	Features On-Site	Features Off-Site
1871 1:2,500 1:10,560	The site is shown as a wooded area in the north with agricultural land in the south.	The surrounding area is predominantly woodland and agricultural land, with a pond approximately 100 m west of the site.
1899 1:2,500 1900 1:10,560	No significant changes noted on-site.	No significant changes in the vicinity noted. Two 'Old Lead shafts' noted 680 m to 740 m south of the site.
1912 1:2,500 1911 - 1914 1:10,560	A ditch is marked towards the southern boundary of the woodland area, with a west-east orientation. No other significant development is observed on site.	No significant changes in the vicinity noted.
1949 1:10,560	No significant changes noted on-site.	A Sports Ground is shown approximately 250m south-west of the site. A Sewage Works is located 400m west of the site.
1959-1964 1:10,560 1961 - 1962 1:2,500	No significant changes noted on-site. The ditch is shown as a Drain.	The onsite Drain flows off-site to the south-east and into a larger connection (orientated north to south) approximately 150m east.
1970 1:2,500	No significant changes noted on-site.	Additional housing has been built approximately 250m south-east and south of the site.
1977-1980 1:2,500 1982 1:10,000	The north of the site is no longer woodland but remains undeveloped.	The main Clwyd District General Hospital building has been constructed north of the site. Many small buildings have been constructed approximately 50m south-east of the site, which appear to be associated with the hospital. Old Lead Shafts are no longer labelled on the map.
1988-1991 1:2,50	No significant changes noted on-site.	No significant changes in the vicinity noted. An electrical sub-station was noted approximately 50m south-east associated with the hospital buildings.
1988-1993 1:2,500 1990-1994 1:10,000	No significant changes noted on-site.	Various extension and additions to the hospital have been undertaken 250m north-west of the site.

Date & Scale	Features On-Site	Features Off-Site
1990 - 1995 1:2,500	No significant changes noted on-site.	Additional buildings have been constructed 75m south of the site.
2000 Aerial Photo	The northern area of the site appears to be in use as a car park.	Car parking is noted immediately south of the site and extends beyond the east and west of the site boundaries.
2001 1:10,000	No significant changes noted on-site.	The sewage works approximately 400m west is no longer shown.
2003 1:1,250	No significant changes noted on-site.	Car parking has been constructed in the vicinity of the site to the south, east and north-east. An electrical sub-station is noted approximately 50m west of the site.
2009 Aerial Photo	A roadway has been constructed along the northern site boundary with entrance to the site in the north-eastern corner of the site.	A new structure is noted immediately east of the site, where car parking had been previously.
2010 1:10,000	No significant changes noted on-site.	Housing approximately 250m south-west has been developed.
2016 Aerial Photo	The northern area of the site has been developed with a large square structure in the north-west of the site and several small structures in the centre of the site. It appears that buildings along the northern site boundary have been extended to encroach along the north-east area of the site.	A new building has been constructed (Emergency Department) immediately north-west of the site with associated parking and entranceway.
2023 1:10,000	No significant changes noted on-site.	Additional development of hospital buildings is noted approximately 250m north-west of the site.

3.2 Environmental Database Records

The following information has been obtained from a review of a Groundsure environmental database (dated February 2023)¹ relating to the site and surrounding land:

Table 3-2: Summary of Key Environmental Database Information

Data Type	Distance			Relevant records within 250m of the site
	On Site	<250m	250m-500m	
Contaminated Land Register enquiries	0	0	0	None within 250m

¹ Groundsure Enviro+Geo Insight Report, Reference: RMBL-9335428, Dated: 3rd February 2023.

Data Type	Distance			Relevant records within 250m of the site
	On Site	<250m	250m-500m	
Pollution incidents	0	2	8	November 2013 – 210 m west, Crude sewage pollutant. Category 3 (Minor) impact to land. No information regarding water impact. February 2009 – 210 m south-east Tyres pollutant causing a Category 2 (Significant) impact to land. Impact to air and water were noted as Category 4 (No Impact).
Recorded landfill sites	0	0	0	None within 250m
Licensed waste management facilities	0	0	0	None within 250m
Part A(1) Environmental Permits	0	0	0	None within 250m
Part A(2) Environmental Permits	0	0	0	None within 250m
Part B Environmental Permits	0	0	0	None within 250m
Control of Major Accident Hazards Sites (COMAH)	0	0	0	None within 250m
Fuel stations	0	0	0	None within 250m
Registered radioactive substances	0	3	0	All records relate to the use, storage and disposal of radioactive materials associated with the Glan Clwyd Hospital.
NRW discharge consents	0	1	4	Nearest entry is 210 m south for storm overflow into an unnamed tributary of the River Gele.
Radon affected area (Y / N)	N	N / A	N / A	Lower probability radon area. See note below.

According to the Groundsure report the site does not lie in a “Radon Affected Area” as less than 1% of residential properties are projected to contain radon above the residential action threshold).

Under Health and Safety legislation, employers have a duty to manage workplace risks including the potential for radon exposure. Health and Safety Executive guidance recommends radon monitoring for workplaces located in radon Affected Areas. If the workplace radon threshold is exceeded, the Ionising Radiations Regulations 1999 require employers to take action to reduce risks.

According to BRE Report BR211 (2015) Radon: Protective Measures for New Buildings, radon protection measures are not required under building regulations for new buildings at this location.

The LinesearchbeforeUdig database, which lists pipelines distributing crude oil and refined hydrocarbon products owned and / or operated by a number of UK pipeline operators indicates that there are no records of underground oil or refined hydrocarbon product pipelines on the site or within 250m.

The site has a low risk from Unexploded Ordnance (UXO), using online information from Zetica UXO database². A low-risk area is indicated as having a bombing density of less than 15 bombs per 1,000 acres.

3.3 Historical Potential for Ground Contamination

3.3.1 The Site

Potential contaminative activities on-site include:

- Use as a car park;
- Contractors compound with waste storage areas; and
- Made Ground to build site levels and provide an engineered fill for the screening units.

Potential Contaminants include ground gases from any made ground and buried organic material and a variety of contaminants depending upon the Made Ground and car parking activities including fuels, oils, volatile organic compounds (VOCs), heavy metals, polyaromatic hydrocarbons (PAHs) and asbestos.

3.3.2 The Surrounding Area

The following potentially contaminative activities have been identified as having taken place in the surrounding area:

- Old Lead Shafts are noted between 680 m and 740 m south of the site associated with former lead mining in the area. However, these were noted to be old by 1900 and so unlikely to have been in operation at that time.
- A Sewage Works was noted 400m west of the site between 1949 and 2001. Potential contamination such as heavy metals, organics, treatment chemicals, microorganisms, methane, carbon dioxide and hydrogen sulphide could be associated with this development.
- The wider Gland Clywd Hospital site, immediately surrounding the site. There is potential for made ground in the vicinity, with contaminants from boiler rooms, asbestos within older buildings and fuel leaks at car parks. Potential contamination could include including fuels, oils, VOCs, heavy metals, PAHs and asbestos.

The above activities represent potential off-site sources of contamination that (if present) could potentially migrate beneath the site.

The potential for off-site contamination (if present) to migrate beneath the site would be dependent on the underlying geological conditions, which are discussed in Section 4.

3.3.3 Potential for Radiological Contamination

Taking into account that the site forms part of Glan Clwyd Hospital (which was built in the 1980s with various additional developments and extensions to present day) consideration should be given to the potential of presence of radiological contamination (deriving from fume cupboards,

² Zetica UXO Risk Maps, 2023, Available at: <https://zeticauxo.com/downloads-and-resources/risk-maps/>
Accessed 1st March 2023

radium needles, radioactive wastes etc.). The Groundsure report has indicated that a Radioactive Consent pertaining to disposal of radioactive waste is present within the hospital grounds.

Historically, the site has not undergone any significant redevelopment, and no hospital structures were present on site. As such, it is considered unlikely for radiological contaminants to be present within the ground of the subject site.

It is also considered unlikely for Glan Clywd Hospital in the vicinity of the subject site to pose an off-site risk to the subject site due to the presence of extensive hardstanding, and the provisions of a set of conditions on handling and storing radioactive waste as per UK legislation³.

³ UK Government Legislation, 2023. Atomic Energy and Radioactive Substances. The Radioactive Substances (Hospitals) Exemption Order 1990. <https://www.legislation.gov.uk/uksi/1990/2512/made> Accessed: March 2023.

4. ENVIRONMENTAL SETTING

Desk-based research of the local geology, hydrogeology and hydrology was carried out in order to establish the potential for migration of contamination onto or away from the site, and to assess the sensitivity and vulnerability of the site's setting with respect to surface water, groundwater and ecological resources.

Information was obtained from a number of sources, including:

- examination of published geological maps produced by the British Geological Survey (BGS);
- review of publicly available BGS borehole logs for the site or near vicinity;
- Groundsure environmental Database report procured by Ramboll;
- Regulatory Authority websites including the Natural Resources Wales (NRW);
- Geotechnics Ltd, May 1996: Ground Investigation (Reference:96-1098);
- Ramboll, July 2021: Glan Clwyd Hospital Contaminated Land and Geotechnical Desk Study (Reference: 1620007255); and,
- Ramboll, December 2022: Adult and Older Persons Mental Health Unit- Glan Clwyd Hospital Phase II Environmental Site Investigation (Reference: 1620007255-RP-CE-00002).

4.1 Geology and Hydrogeology

According to BGS 1:50,000 mapping of the area, Geology of Britain Viewer and an off-site ground investigation undertaken for the Ramboll 2022 Phase II assessment (200m north-west of the site) and Geotechnics (150m north-west and 150m north-east of the site) the site geology and hydrogeology is presented in Table 4.1 below.

Table 4.1: Summary of Geology and Hydrogeology

Formation	Description	Thickness (m)	EA Aquifer Designation	Hydrogeological Significance
Made Ground	Reworked natural material with fragments of brick, wood and occasional metal pipe.	Up to 2.60 m*	-	-
Superficial Deposits Glacial Till, Devensian	Clay, silt, sand and gravel	Up to 15.45 m*	Secondary (Undifferentiated)	Variable permeability formation with potential to support small or localised abstractions.
Bedrock Warwickshire Group (Mudstone, Siltstone and Sandstone)	-	Not encountered	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale.
*Proven in 1996 intrusive investigation				

Localised groundwater strikes encountered near surface in the made ground (between 1.80 m bgl and 2.40 m bgl) and Glacial Till as 'seepages' or 'wet' in boreholes or 'slow inflow' or 'seepages' in trial pits. From the 2022 Ground Investigation it appears that groundwater is perched at the top of the Glacial Till, or within sandier bands within the Glacial Till.

The NRW currently classifies groundwater at the site (Clwyd Permo-Triassic Sandstone aquifer) as being of 'good' chemical quality and of 'good' quantitative status under the Water Framework Directive classification scheme.

According to NRW information provided by Groundsure, there are no active licensed groundwater abstractions within a 2km radius of the site.

The site is not situated within an NRW designated groundwater Source Protection Zone.

There may also be private (unlicensed) abstractions (that are generally of smaller scale) which have not been provided within the Groundsure report.

4.2 Mining

According to the Coal Authority, the site is not located in a Coal Mining Reporting Area.

The Groundsure report identifies two records of non-coal mining activities within 250 m of the site, for a vein mineral. A mine cavity is noted 830 m south of the site at Bodelwyddan for a lead mine. Several old lead shafts are noted between 680 m south and 870 m south of the site, ranging in date from 1871 to 1960 which appear to relate to lead mining.

A review of the Coal Authority Interactive Map Viewer⁴ shows there are abandoned mine plans in this area relating to the lead mining.

4.3 Hydrology

The nearest identified surface water body is the Drain on-site, described by Groundsure as an inland river not influenced by normal tidal action. The nearest identified Water Framework Directive Surface water body is The River Gele which is located over 2km north of the site.

NRW classifies the River Gele as 'moderate' ecological rating and 'good' chemical rating under the Water Framework Directive classification scheme.

According to Groundsure, there are no licensed surface water abstractions within a 2km radius of the site.

4.4 Regulatory Flood Designations

Regulatory flood maps have been developed by regulatory agencies to be used in strategic planning and are not intended to provide site-specific information. However, the mapping can provide a useful indication of whether further consideration or assessment of flood risks to a site may be required.

4.4.1 Fluvial and Tidal Flooding

According to NRW's Flood Risk Assessment Wales Map Viewer for the rivers and the sea flooding⁵, which takes into account the effect of any flood defences, the site is located in an area defined as Very Low risk, meaning that each year, this area has a chance of flooding of less than 1 in 1000 (0.1%).

⁴ Coal Authority Interactive Map Viewer Interactive Map Viewer | Coal Authority (bgs.ac.uk) Accessed 22nd February 2023

⁵ National Resources Wales Flood Risk Map Viewer <https://maps.cyfoethnaturiolcymru.gov.uk> accessed 1st March 2023.

The Flood Risk Assessment Wales maps do take into account flood defences which reduce, but do not completely stop the chance of flooding and they can be overtopped or fail.

4.4.2 Surface Water Flooding

According to the NRW's Flood Map for Surface Water which presents the theoretical potential for flooding from pluvial sources (i.e. flooding caused by rainwater exceeding capacity of drainage systems), the site is located in an area of High flooding probability. This zone comprises land assessed as having a 1 in 30 or greater annual probability of pluvial flooding (>3.3% in any year). This is approximately 10% of the site area which is a result of the on-site Drain.

Surface water drainage networks are typically designed to accommodate only a 1 in 30 (3.3%) annual probability rainfall event. Older drainage networks may have a lower capacity, especially if they have not been maintained adequately. Although not true of every situation, surface water flooding is typically relatively shallow and would be expected to subside following the storm event assuming drainage assets are maintained in an appropriate condition.

4.5 Designated Ecological Sites

The Groundsure report indicates the site is not located within designated Green Belt, nor within 2km of a SSSI or SAC. There are 20 areas of Designated Ancient Woodland within 2km of the site, of which five are between 500m and 1km.

4.6 Environmental Sensitivity and Vulnerability

The site is considered to be situated in an area of low to moderate sensitivity with respect to groundwater resources due to the underlying Secondary Undifferentiated Aquifer of the Glacial Till which is underlain by the Secondary A Aquifer in relation to the Warwickshire Group (Mudstone, Siltstone and Sandstone). There are no active licensed groundwater abstractions within 2km of the site; the NRW classified the groundwater quantitative quality as 'Good' under the Water Framework Directive along with the chemical status.

The vulnerability of the groundwater receptor in the vicinity of the site is considered to be low to moderate as the southern area of the site is covered by soft landscaping. However, the northern area of the site is covered by hardstanding.

The sensitivity of the hydrological receptor can be considered as moderate as there is a water course onsite which is connected to other small drains / ditches in the local area. It is part of the Gele waterbody catchment area, however the River Gele is over 2km north of the site. There are no licensed surface water abstractions within 2km of the site.

The site is considered to be in an area of moderate vulnerability with respect to surface water resources as the nearest surface water course is onsite.

There are no statutory designated ecologically sensitive areas within 2km apart from 20 Designated Ancient Woodland sites, the closest being 710m east of the site.

5. QUALITATIVE RISK ASSESSMENT

5.1 Legislative Framework

The regime for contaminated land was set out in Part 2A (ss.78A-78YC) of the Environmental Protection Act 1990 (EPA), as inserted by S.57 of The Environment Act 1995 and came into effect in Wales on 1st July 2001 as The Contaminated Land (Wales) Regulations 2001 (WSI 2001/2197, W.157). These regulations were subsequently revoked with the provision of The Contaminated Land (Wales) Regulations 2006 (SI 2006/2989 W.278), which consolidated the previous regulations and amendments and added in provisions regarding radioactive contaminated land. These regulations came into force on 10th December 2006 and were accompanied by statutory guidance published by the Welsh Assembly Government in December 2006 ('the Guidance') for local authorities on how to implement the regime. The 2006 statutory guidance was replaced by the Contaminated Land Statutory Guidance - 2012 (WG19243), issued by the Welsh Government.

Under Part 2A of the EPA Section 78A(2), "contaminated land" is defined as "land which appears... to be in such a condition, by reason of substances in, on or under the land, that:

- a) significant harm is being caused or there is a significant possibility of such harm being caused; or
- b) pollution of controlled waters is being or is likely to be caused"⁶.

The pollution of controlled waters is defined in Section 78A(9) of the Act as "the entry into controlled waters of any poisonous, noxious or polluting matter or any solid waste matter".

5.2 Risk Assessment Framework

"Significant harm" or "significant pollution of controlled waters" is defined in the Guidance on risk-based criteria and must be the result of one or more relevant 'contaminant linkages' relating to the land.

The presence of a contaminant linkage relies on the Source-Pathway-Receptor concept, where all three factors must be present and potentially or actually linked for a potential risk to exist. For a risk of pollution or environmental harm to occur as a result of ground contamination, all of the following elements must be present:

- A source - a substance that is capable of causing pollution or harm;
- A receptor - something which could be adversely affected by the contaminant; and
- A pathway - a route by which the contaminant can reach the receptor.

If one of these elements is absent there can be no significant risk. If all are present then the magnitude of the risk is a function of the magnitude and mobility of the source, the sensitivity of the receptor and the nature of the migration pathway.

The potential severity of the risk and the probability of the risk occurring have been combined in accordance with the following matrix in order to give a level of risk for each potential hazard.

⁶ Section 86 of the Water Act 2003 remains only partially implemented in Wales.

Table 5-1: Classification of Risk (after NHBC / EA 2008)

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High Likelihood	Very high	High	Moderate	Low
	Likely	High	Moderate	Moderate / Low	Low
	Low Likelihood	Moderate	Moderate / Low	Low	Very low
	Unlikely	Moderate / Low	Low	Very low	Very low

The assessment has been based on the proposed construction of the new Nuclear Medicine Consolidation Unit as described in Section 1.4 of this report.

5.3 Preliminary Risk Assessment

A preliminary conceptual site model has been developed and qualitative risk assessment undertaken to identify and assess the potential risks associated with environmental conditions at and in the vicinity of the site based on the available information. This is presented in Table 5.2.

Table 5-2: Conceptual Site Model

Source	Pathway	Receptor	Potential Consequence	Probability of Risk	Risk of Contaminant Linkage
Onsite Current use of site as site compound with waste storage, skips, and mobile screening units in the north. Historical use as car parking in the northern area. Potential for made ground of unknown origin across the site. Potential contaminants include ground gases fuels, oils, VOCs, heavy metals, PAHs and asbestos.	Dermal Contact / ingestion	Site users	Medium	Low Likelihood	Moderate / Low. Potential for contaminants on-site from current and historical land uses. Proposed end uses comprise predominantly hard standing.
	Inhalation of gas / vapours	Site users	Medium	Low Likelihood	Moderate / Low. No significant sources of gas or vapours identified on-site. The northern area of the site is currently hardstanding with the proposed end use comprising predominantly hardstanding.
	Dermal Contact / ingestion	Construction or maintenance workers during ground works	Medium	Low Likelihood	Moderate / Low. Potential for contaminants on-site from current and historical land uses. Potential exists for workers to have greater exposure to soils during ground works such as excavations.
	Inhalation of gas / vapours	Construction or maintenance workers during ground works	Medium	Low Likelihood	Moderate / Low. No significant sources of gas or vapours identified in the site area. Potential risk if confined spaces, including deeper excavations are required.
	Leaching to Groundwater & Groundwater Flow	Groundwater in the Till deposits and underlying Sandstone, Mudstone, Siltstone Bedrock (Warwickshire Group)	Mild	Low Likelihood	Low. Potential for contaminants on-site from current and historical land uses. The cohesive Till would limit any potential for migration.
	Surface water run-off	Surface water as controlled water	Medium	Likely	Moderate. Potential for contaminants on-site from current and historical land uses. There is an onsite ditch / drain which is likely to be receive runoff from site.

Source	Pathway	Receptor	Potential Consequence	Probability of Risk	Risk of Contaminant Linkage
<p>Potential current and historical off-site contamination sources in the vicinity of the site include:</p> <ul style="list-style-type: none"> • Old Lead Shafts 700m south-east associated lead mining pre 1900; • Glan Clwyd Hospital Site immediately surrounding the site from the 1980s to present day. <p>Potential contaminants could include fuels, oils, VOCs, heavy metals, PAHs and asbestos.</p>	Leaching onto site in Groundwater & Groundwater Flow	Groundwater in the Glacial Till and underlying Sandstone, Mudstone, Siltstone Bedrock (Warwickshire Group)	Medium	Unlikely	Low. Potential presence of potential contamination sources from off-site activities. However, potential for migration considered low in Glacial Till.
	Vapours	Site buildings, users and neighbours	Medium	Unlikely	Low. No significant sources of gas or vapours identified within the surrounding area.

6. GEOTECHNICAL ENGINEERING CONSIDERATIONS

6.1 Existing Ground Investigation Information

Previous ground investigations have identified variable thicknesses of Made Ground across the site. It is a heterogeneous material comprising varying proportions of clay, sand, gravel and cobbles. Gravel and cobble size constituents comprise natural materials such as sandstone, mudstone, quartz, as well as anthropogenic materials such as plastic, metal, timber, ash, tile, brick etc.

The Made Ground is underlain by Glacial Till to a depth of approximately 13 m to 14 m comprising predominantly firm clay with varying proportions of sand and gravel. This is in turn underlain by medium dense to dense sand and gravel.

Groundwater was observed within the sands and gravels and appears to be sub-artesian, being recorded in one borehole as rising to 3.7 m bgl after a period of 20 minutes.

6.2 Material Properties

Based on previous investigation, material properties of the strata identified are summarised in Table 6-1 below:

Table 6-1: Material properties

Property	No. of tests	Maximum	Minimum	Mean
Glacial Till				
Moisture content (%)	33	29	13	20
Liquid limit (%)	7	48	24	36
Plastic limit (%)	7	20	14	18
Plasticity index	7	29	7	18
Bulk density (Mg / m ³)	23	2.28	1.65	2.12
Standard penetration test N-value	44	50	10	25
Undrained shear strength (kN / m ²)	23	281	36	107
Coefficient of volume compressibility (m ² / MN)	8	0.17	0.09	0.14

Sand and Gravel					
Standard penetration test N-value		9	50	25	37
Particle size distribution	Gravel (%)	5	37	27	30
	Sand (%)	5	45	22	30
	Fines (%)	5	50	28	39

6.3 Geotechnical Risk

A number of preliminary geotechnical risks have been identified and are summarised in Table 6-2.

Table 6-2: Geotechnical risk register

Reference	Geotechnical hazard description	Current risk rating	Description of current risks	Control measures proposed
1	Unknown and / or unexpected ground conditions – groundwater	Medium	Laterally variable ground conditions in terms of groundwater bearing granular horizons which may affect excavations and ground stability.	Ground investigation within development areas.
2	Unknown and / or unexpected ground conditions – material parameters	Medium	Excessive ground movements / settlements due to variability in the ground.	Ground investigation to define design parameters / ground model.
3	Aggressive chemical environment	Medium	Unknown ground chemistry in the development areas in terms of its aggressivity to buried concrete which may lead to premature deterioration of structures.	Ground investigation within development areas.

Reference	Geotechnical hazard description	Current risk rating	Description of current risks	Control measures proposed
4	Inadequate or incomplete ground investigation information	Medium	Currently available ground investigation information does not encompass the entire site area, and may not extend deep enough if piled foundations are required.	Ensure any GI extends deep enough to comply with Eurocode recommendations for GI extents in relation to anticipated foundation depths.

6.4 Engineering Considerations

Excavations

No specialist plant will be required for excavations once existing areas of hardstanding are broken out.

Excavations within areas of Made Ground will require battering back to a safe angle or will require mechanical support.

Vertically sided shallow excavations above the water table within the Glacial Till are likely to remain stable for a short period of time. However, if deeper excavations are required, or if excavations are required to remain open for longer periods then some form of support will be required.

If water-bearing layers of sand and gravel are present these may cause instability if they are penetrated by excavations.

Foundations

Based on the historical ground investigation information it is anticipated that for shallow spread foundations bearing on the Glacial Till an allowable bearing resistance in the order of 150 to 200kN / m² would be achievable. This would limit settlements to less than 25mm. However, given the possible depth of the overlying made ground, foundations bearing on the Glacial Till may not be feasible. A project specific ground investigation is recommended to be carried out to define the ground model across the development area.

If greater loads are proposed, or if settlement criteria are more stringent, deep foundations would be required.

Ground conditions and material properties within the site area will require investigation to allow a suitable foundation solution to be developed.

Pavements and hardstanding

Based on soil descriptions and laboratory analysis an equilibrium CBR value for the Glacial Till of 3% to 4% is anticipated.

However, it is likely that Made Ground will be present at proposed pavement level, therefore ground conditions within the development area should be investigated to ascertain site specific information to enable design of pavements and hardstanding.

Ground chemistry

In order to ensure ground chemistry is not aggressive to buried concrete the soils and groundwater should be investigated in accordance with the requirements of BRE Special Digest 1 – Concrete in Aggressive Ground (BRE, 2005).

Drainage

Based on the anticipated stratigraphy it is unlikely that soakaway drains will be feasible, however it is recommended that this should be confirmed.

7. CONCLUSIONS AND RECOMMENDATIONS

Historical maps show the site to be undeveloped until circa 2000s when structures associated with the Glan Clwyd Hospital was constructed in the northern area of the site. The main hospital site was constructed in the early 1980s which was extended over time to encompass the site. The southern area of the site appears to have never been developed with a drain cross cutting the site east-west.

Potentially contaminating land uses identified onsite comprise car parking, site compound area including waste skips and likely Made Ground. Off-site potentially contaminating land uses have been identified in the surrounding area including:

- Old Lead Shafts associated with lead mining in the area approximately 680 m to 740m south of the site circa 1900; and,
- Wider Glan Clywd Hospital immediately surrounding the site from 1980s.

The risk to future site users and construction or maintenance workers been assessed as Moderate / Low. As there is a Drain on-site the risk to controlled waters has been assessed as Moderate. However, the underlying cohesive Till would limit any potential for migration to the underlying Groundwater within the Secondary A Aquifer. There is a Low risk from off-site potential contamination sources.

A previous Ground Investigation for the AOPMHU and multi-story car park was provided and reviewed. No significant areas of contamination were identified.

Based on the information obtained to date, the risk to the development from contamination is considered low to moderate.

It is recommended that a ground investigation should be undertaken to confirm the ground conditions and risks from contamination and to inform construction of the proposed Nuclear Medicine Consolidation Unit. Information would also be obtained to inform the waste classification for excavated soils should these need to be disposed offsite. The investigation will also need to obtain information to inform the geotechnical design.

The scope of the ground investigation will be confirmed within a ground investigation specification, however, it is anticipated this will comprise:

- Boreholes to obtain information on shallow and deeper soils along with groundwater conditions
- Trial pitting using a mechanical excavator to obtain information on shallow soils
- In-situ testing within boreholes and trial pits
- Installation of combined gas and groundwater monitoring wells into boreholes
- Obtaining soil and groundwater samples for laboratory analysis
- Subsequent monitoring of groundwater levels and ground gas

The information obtained from the ground investigation will be assessed within an interpretative report and used to provide an update to the preliminary Conceptual Site Model and risks identified within the desk study from contamination.

It is recommended that any ground investigation contractor should visit the site to identify any access constraints, prior to providing their proposal.

It will also be necessary to obtain up to date services records to enable any ground investigation works to be undertaken safely.

APPENDIX 1

FIGURES

Figure 1: Site Location

Figure 2: Site Boundary and Layout



Figure Title
Figure 1: Site Location Plan

Project Name
Nuclear Medicine Consolidation

Date
February 2023

Scale
As shown

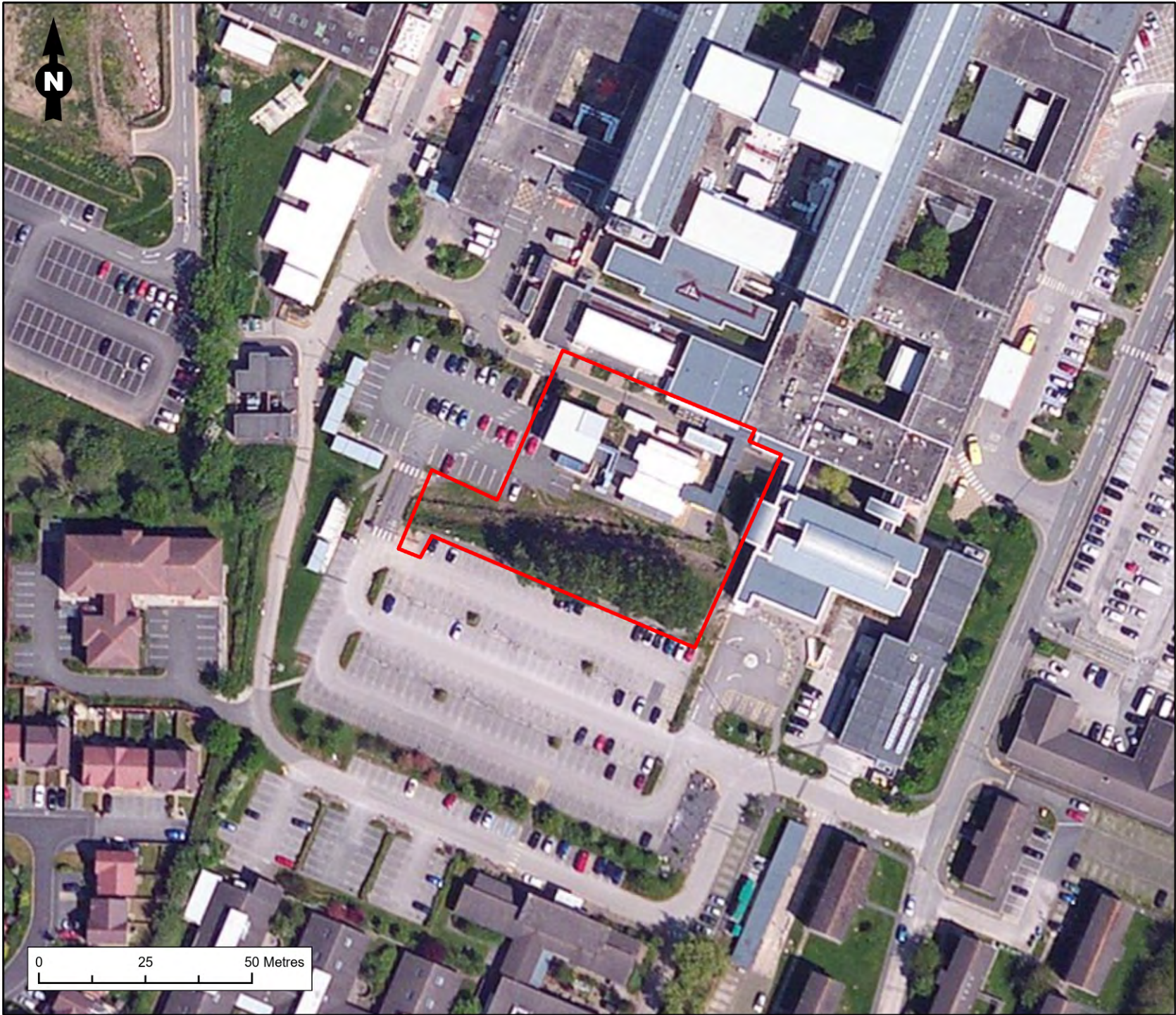
Project Number
1620014943

Client
BAM Construction Ltd

Issue
1

Prepared By
NJ





Legend

 Site Boundary

Figure Title
Figure 2: Site Layout Plan

Project Name
Nuclear Medicine Consolidation

Project Number 1620014943	Figure No. 2
Date February 2023	Prepared By NJ
Scale 1:1,250 @A4	Issue 1

Client
BAM Construction Ltd



APPENDIX 2

GROUNDSURE ENVIRONMENTAL DATABASE

GLAN CLWYD HOSPITAL, RHUDDLAN ROAD, BODELWYDDAN, RHYL, LL18 5UJ

Order Details

Date: 03/02/2023
Your ref: PO_1620053301
Our Ref: RMBL-9335428

Site Details

Location: 300252 375934
Area: 0.32 ha
Authority: [Sir Ddinbych - Denbighshire County Council](#)



Summary of findings

p. 2

Aerial image

p. 8

OS MasterMap site plan

p.13

groundsure.com/insightuserguide

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
14	1.1	<u>Historical industrial land uses</u>	2	0	0	14	-
15	1.2	<u>Historical tanks</u>	0	0	0	9	-
16	1.3	<u>Historical energy features</u>	0	2	0	7	-
17	1.4	Historical petrol stations	0	0	0	0	-
17	1.5	Historical garages	0	0	0	0	-
17	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
18	2.1	<u>Historical industrial land uses</u>	2	0	0	18	-
19	2.2	<u>Historical tanks</u>	0	0	0	18	-
20	2.3	<u>Historical energy features</u>	0	3	0	8	-
21	2.4	Historical petrol stations	0	0	0	0	-
21	2.5	Historical garages	0	0	0	0	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
22	3.1	Active or recent landfill	0	0	0	0	-
22	3.2	Historical landfill (BGS records)	0	0	0	0	-
23	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
23	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
23	3.5	Historical waste sites	0	0	0	0	-
23	3.6	Licensed waste sites	0	0	0	0	-
23	3.7	<u>Waste exemptions</u>	0	0	7	0	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
25	4.1	<u>Recent industrial land uses</u>	0	2	7	-	-
26	4.2	Current or recent petrol stations	0	0	0	0	-
26	4.3	Electricity cables	0	0	0	0	-
26	4.4	Gas pipelines	0	0	0	0	-
27	4.5	Sites determined as Contaminated Land	0	0	0	0	-



27	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
27	4.7	Regulated explosive sites	0	0	0	0	-
27	4.8	Hazardous substance storage/usage	0	0	0	0	-
27	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
28	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
28	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
28	4.12	<u>Radioactive Substance Authorisations</u>	0	0	18	0	-
31	4.13	<u>Licensed Discharges to controlled waters</u>	0	0	1	4	-
32	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
32	4.15	Pollutant release to public sewer	0	0	0	0	-
32	4.16	List 1 Dangerous Substances	0	0	0	0	-
32	4.17	List 2 Dangerous Substances	0	0	0	0	-
32	4.18	<u>Pollution Incidents (EA/NRW)</u>	0	0	2	8	-
34	4.19	Pollution inventory substances	0	0	0	0	-
34	4.20	Pollution inventory waste transfers	0	0	0	0	-
34	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
35	5.1	<u>Superficial aquifer</u>	Identified (within 500m)				
37	5.2	<u>Bedrock aquifer</u>	Identified (within 500m)				
39	5.3	<u>Groundwater vulnerability</u>	Identified (within 50m)				
40	5.4	<u>Groundwater vulnerability- soluble rock risk</u>	Identified (within 0m)				
40	5.5	Groundwater vulnerability- local information	None (within 0m)				
41	5.6	<u>Groundwater abstractions</u>	0	0	0	0	2
42	5.7	Surface water abstractions	0	0	0	0	0
42	5.8	Potable abstractions	0	0	0	0	0
43	5.9	Source Protection Zones	0	0	0	0	-
43	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
44	6.1	<u>Water Network (OS MasterMap)</u>	1	0	7	-	-



45	6.2	<u>Surface water features</u>	1	0	6	-	-
45	6.3	<u>WFD Surface water body catchments</u>	1	-	-	-	-
46	6.4	<u>WFD Surface water bodies</u>	0	0	0	-	-
46	6.5	<u>WFD Groundwater bodies</u>	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
47	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
47	7.2	Historical Flood Events	0	0	0	-	-
47	7.3	Flood Defences	0	0	0	-	-
48	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
48	7.5	Flood Storage Areas	0	0	0	-	-
49	7.6	Flood Zone 2	None (within 50m)				
49	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
50	8.1	<u>Surface water flooding</u>	1 in 30 year, Greater than 1.0m (within 50m)				
Page	Section	Groundwater flooding					
52	9.1	<u>Groundwater flooding</u>	Low (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
53	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
54	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
54	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
54	10.4	Special Protection Areas (SPA)	0	0	0	0	0
54	10.5	National Nature Reserves (NNR)	0	0	0	0	0
55	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
55	10.7	<u>Designated Ancient Woodland</u>	0	0	0	0	20
56	10.8	Biosphere Reserves	0	0	0	0	0
56	10.9	Forest Parks	0	0	0	0	0
56	10.10	Marine Conservation Zones	0	0	0	0	0
56	10.11	Green Belt	0	0	0	0	0
57	10.12	Proposed Ramsar sites	0	0	0	0	0



57	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
57	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
57	10.15	Nitrate Sensitive Areas	0	0	0	0	0
58	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
59	10.17	SSSI Impact Risk Zones	0	-	-	-	-
59	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
60	11.1	World Heritage Sites	0	0	0	-	-
61	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
61	11.3	National Parks	0	0	0	-	-
61	11.4	Listed Buildings	0	0	6	-	-
62	11.5	Conservation Areas	0	0	1	-	-
62	11.6	Scheduled Ancient Monuments	0	0	0	-	-
63	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
64	12.1	Agricultural Land Classification	Grade 3b (within 250m)				
65	12.2	Open Access Land	0	0	0	-	-
65	12.3	Tree Felling Licences	0	0	0	-	-
65	12.4	Environmental Stewardship Schemes	0	0	0	-	-
65	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
66	13.1	Priority Habitat Inventory	0	0	0	-	-
66	13.2	Habitat Networks	0	0	0	-	-
66	13.3	Open Mosaic Habitat	0	0	0	-	-
66	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
67	14.1	10k Availability	Identified (within 500m)				
68	14.2	Artificial and made ground (10k)	0	0	0	0	-
69	14.3	Superficial geology (10k)	0	0	0	0	-

69	14.4	Landslip (10k)	0	0	0	0	-
70	14.5	Bedrock geology (10k)	0	0	0	0	-
70	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
71	15.1	<u>50k Availability</u>	Identified (within 500m)				
72	15.2	Artificial and made ground (50k)	0	0	0	0	-
72	15.3	Artificial ground permeability (50k)	0	0	-	-	-
73	15.4	<u>Superficial geology (50k)</u>	1	0	0	1	-
74	15.5	<u>Superficial permeability (50k)</u>	Identified (within 50m)				
74	15.6	Landslip (50k)	0	0	0	0	-
74	15.7	Landslip permeability (50k)	None (within 50m)				
75	15.8	<u>Bedrock geology (50k)</u>	1	0	1	3	-
76	15.9	<u>Bedrock permeability (50k)</u>	Identified (within 50m)				
76	15.10	<u>Bedrock faults and other linear features (50k)</u>	0	1	0	1	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
77	16.1	<u>BGS Boreholes</u>	1	6	7	-	-
Page	Section	Natural ground subsidence					
79	17.1	<u>Shrink swell clays</u>	Very low (within 50m)				
80	17.2	<u>Running sands</u>	Very low (within 50m)				
81	17.3	<u>Compressible deposits</u>	Negligible (within 50m)				
82	17.4	<u>Collapsible deposits</u>	Very low (within 50m)				
83	17.5	<u>Landslides</u>	Very low (within 50m)				
84	17.6	<u>Ground dissolution of soluble rocks</u>	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
85	18.1	Natural cavities	0	0	0	0	-
86	18.2	BritPits	0	0	0	0	-
86	18.3	Surface ground workings	0	0	0	-	-
86	18.4	<u>Underground workings</u>	0	0	0	0	7
87	18.5	Historical Mineral Planning Areas	0	0	0	0	-



87	18.6	<u>Non-coal mining</u>	0	0	2	0	8
88	18.7	<u>Mining cavities</u>	0	0	0	0	1
88	18.8	JPB mining areas	None (within 0m)				
89	18.9	Coal mining	None (within 0m)				
89	18.10	Brine areas	None (within 0m)				
89	18.11	Gypsum areas	None (within 0m)				
89	18.12	Tin mining	None (within 0m)				
89	18.13	Clay mining	None (within 0m)				
Page	Section	Radon					
90	19.1	<u>Radon</u>	Less than 1% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
92	20.1	<u>BGS Estimated Background Soil Chemistry</u>	1	2	-	-	-
92	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
92	20.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
93	21.1	Underground railways (London)	0	0	0	-	-
93	21.2	Underground railways (Non-London)	0	0	0	-	-
93	21.3	Railway tunnels	0	0	0	-	-
93	21.4	Historical railway and tunnel features	0	0	0	-	-
93	21.5	Royal Mail tunnels	0	0	0	-	-
94	21.6	Historical railways	0	0	0	-	-
94	21.7	Railways	0	0	0	-	-
94	21.8	Crossrail 1	0	0	0	0	-
94	21.9	Crossrail 2	0	0	0	0	-
94	21.10	HS2	0	0	0	0	-

Recent aerial photograph

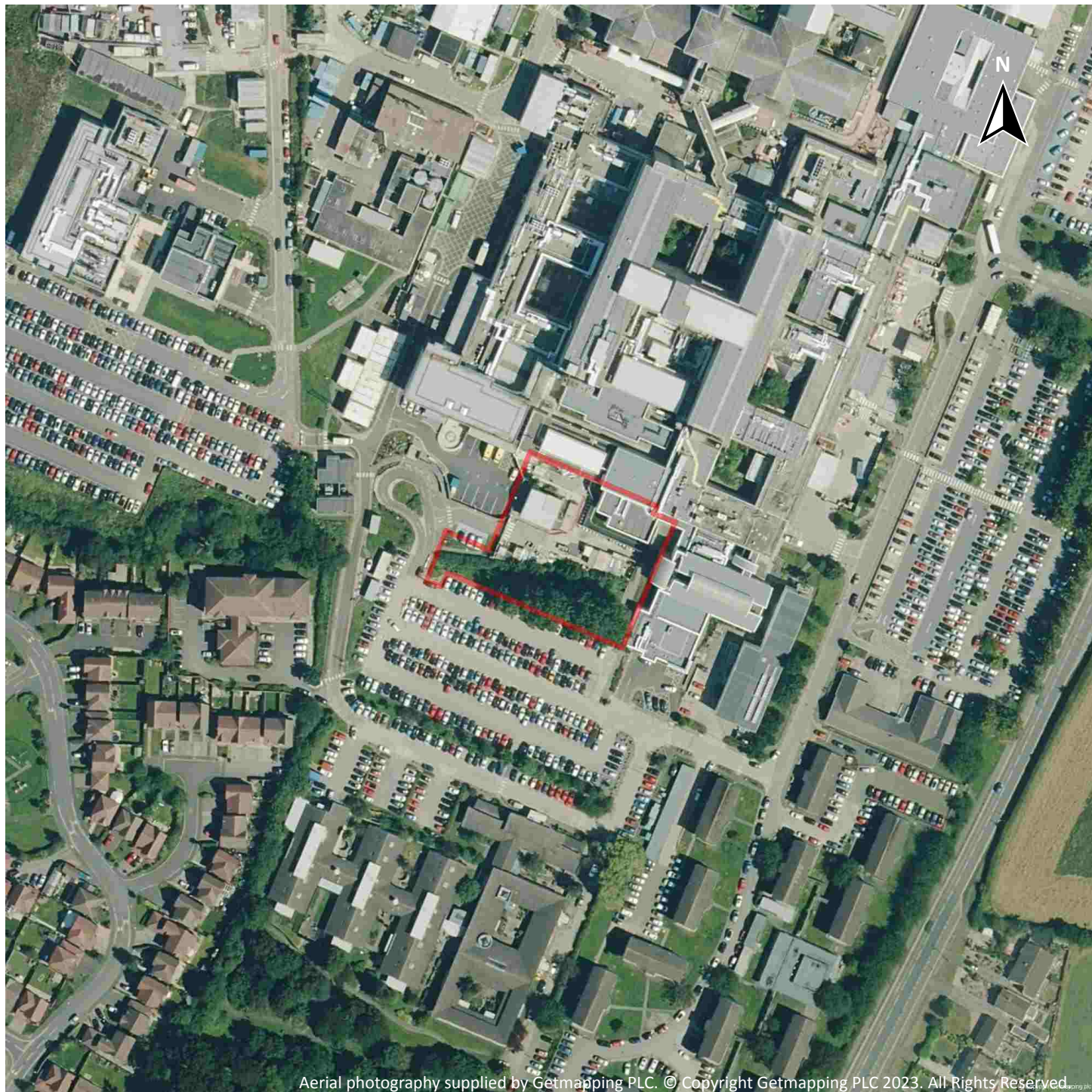


Capture Date: 06/05/2020

Site Area: 0.32ha



Recent site history - 2016 aerial photograph



Capture Date: 04/07/2016

Site Area: 0.32ha



Recent site history - 2009 aerial photograph

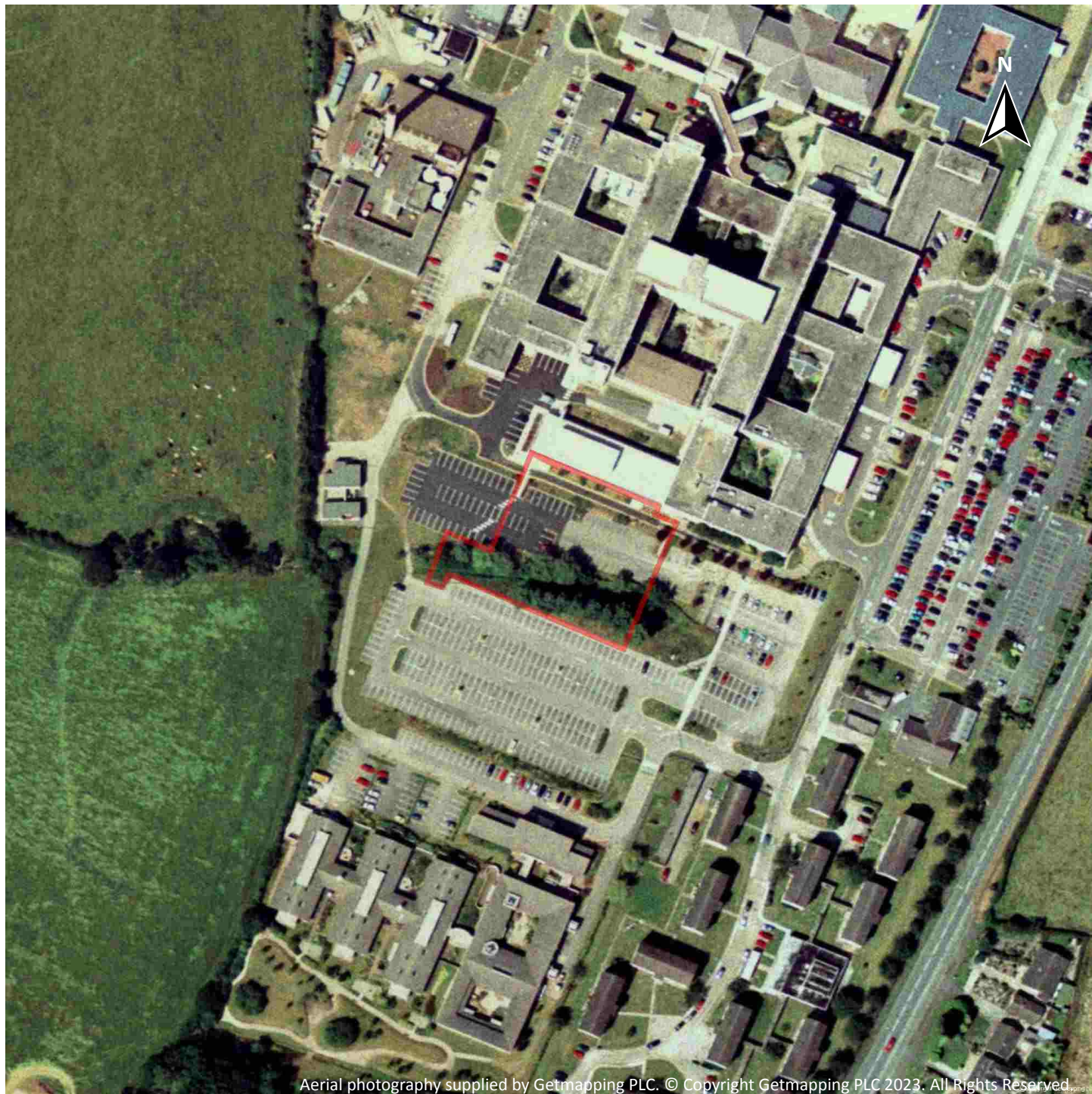


Capture Date: 01/06/2009

Site Area: 0.32ha



Recent site history - 2003 aerial photograph

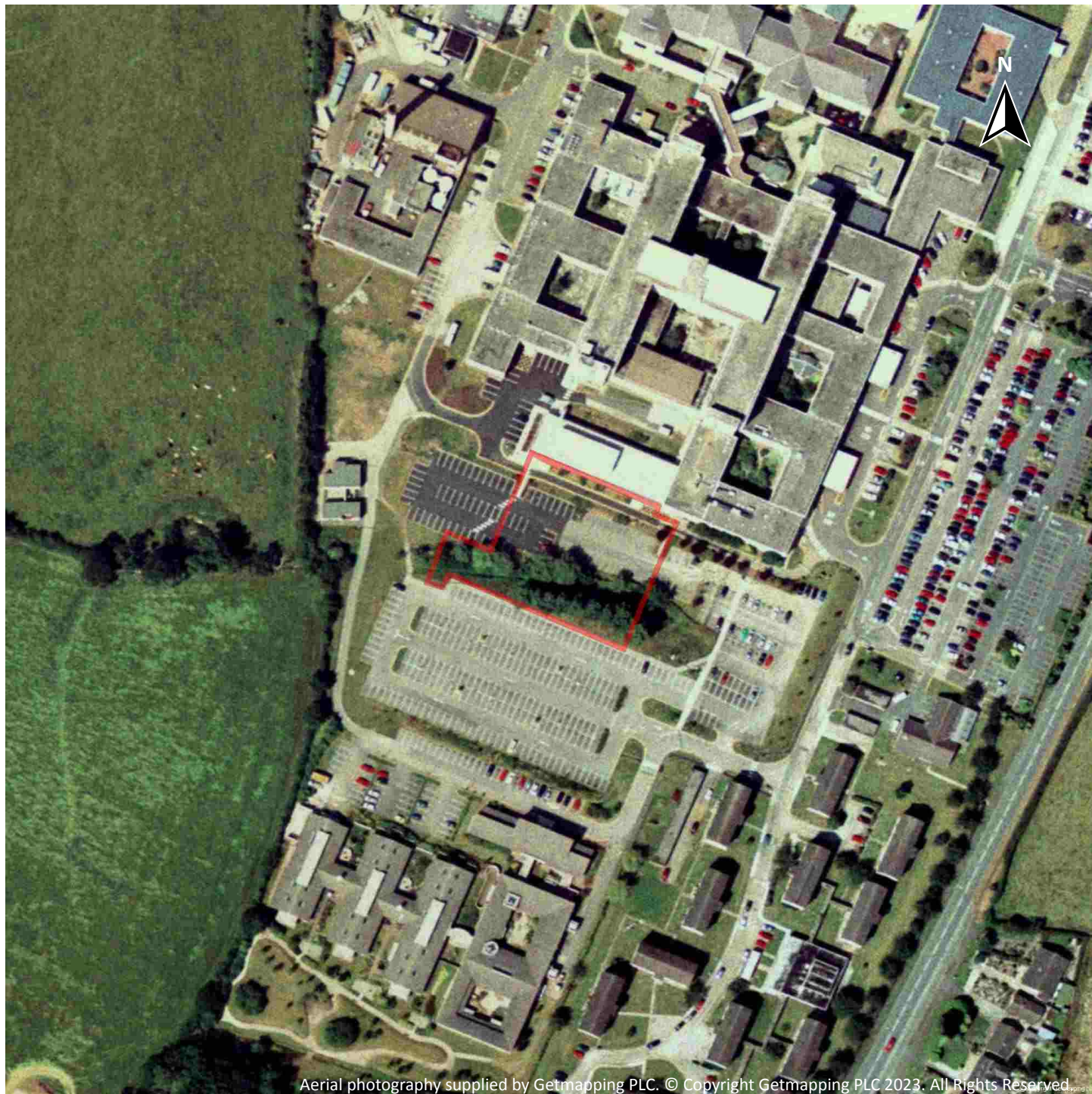


Capture Date: 31/07/2003

Site Area: 0.32ha



Recent site history - 2000 aerial photograph

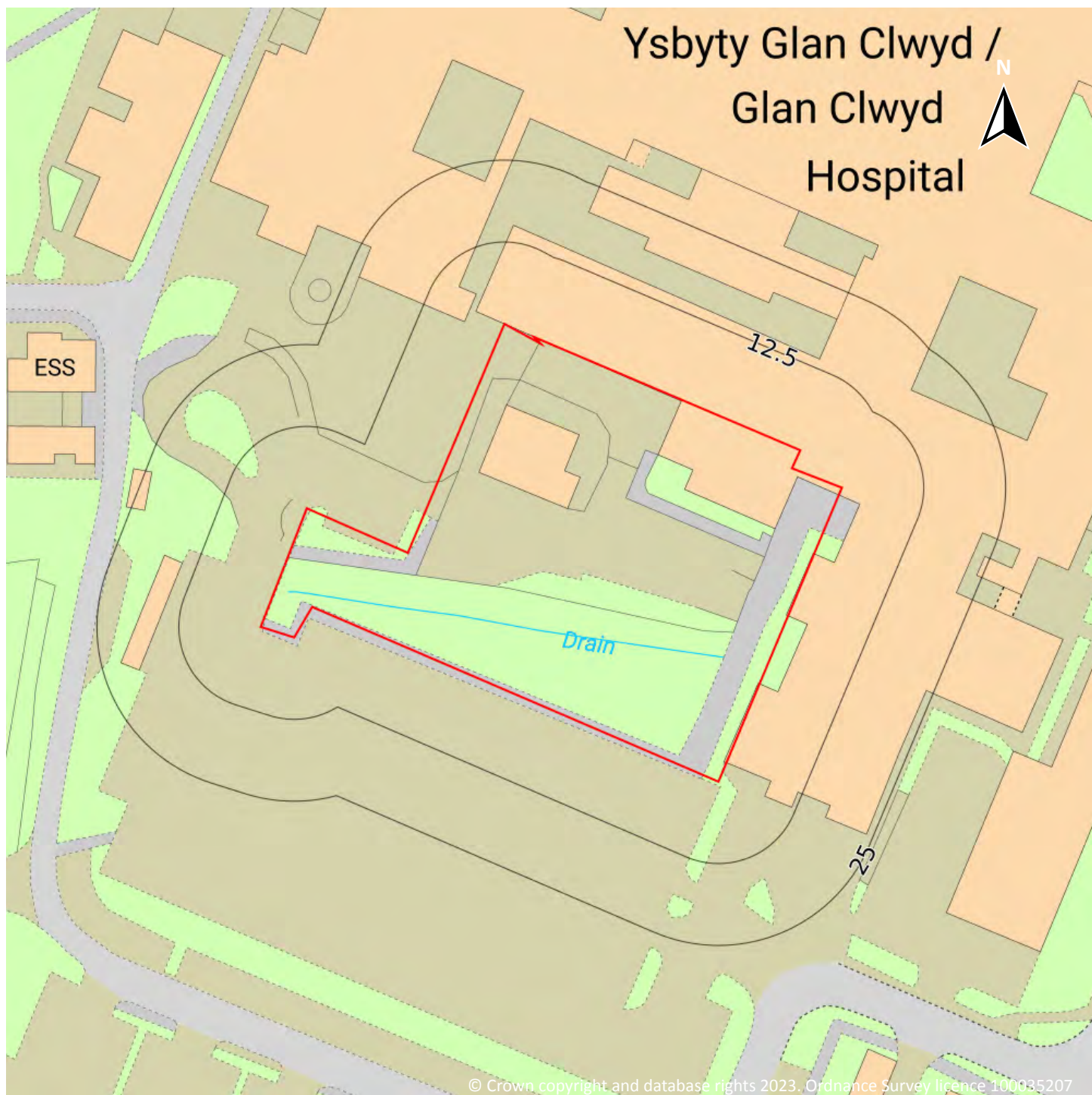


Capture Date: 22/07/2000

Site Area: 0.32ha



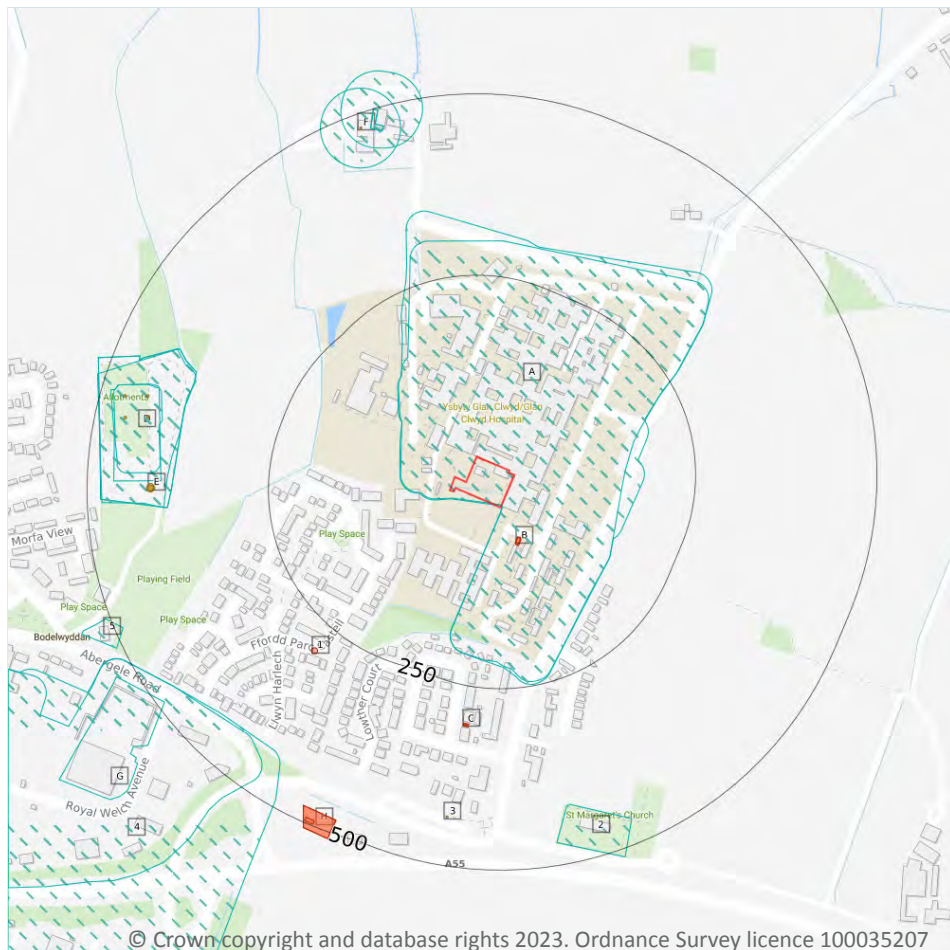
OS MasterMap site plan



Site Area: 0.32ha



1 Past land use



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

1.1 Historical industrial land uses

Records within 500m

16

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
A	On site	General Hospital	1982	798109



ID	Location	Land use	Dates present	Group ID
A	On site	Hospital	1994	834365
D	379m W	Unspecified Works	1964	211640
D	379m W	Sewage Works	1980 - 1990	225147
D	380m W	Sewage Works	1949	245062
D	398m W	Unspecified Tanks	1949 - 1964	233868
D	401m W	Sewage Tanks	1980 - 1990	235970
2	420m S	Grave Yard	1871	817227
F	425m N	Unspecified Tank	1949	849599
4	432m SW	Industrial Estate	1980 - 1990	235062
G	437m SW	Unspecified Factory	1990	211439
F	442m N	Unspecified Tank	1960	852345
F	468m N	Unspecified Tank	1949	964238
F	468m N	Unspecified Tank	1914	950338
5	489m W	Police Station	1990	218967
G	490m SW	Unspecified Depot	1980 - 1990	224831

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m

9

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
E	406m W	Unspecified Tank	1988 - 1990	32569
E	408m W	Unspecified Tank	1991	32010
E	408m W	Unspecified Tank	1970 - 1996	32484



ID	Location	Land use	Dates present	Group ID
D	426m W	Unspecified Tank	1960	30595
3	432m S	Unspecified Tank	1899 - 1912	137329
D	434m W	Unspecified Tank	1960	30547
D	457m W	Unspecified Tank	1960	30594
D	464m W	Unspecified Tank	1960	30548
F	478m N	Unspecified Tank	1912	111991

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m

9

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
B	47m SE	Electricity Substation	1988 - 1999	73301
B	48m SE	Electricity Substation	1989	72866
1	285m SW	Electricity Substation	1999	60853
C	302m S	Electricity Substation	1989	82946
C	302m S	Electricity Substation	1978 - 1988	79850
C	302m S	Electricity Substation	1999	77750
H	479m SW	Gas Governor	1989	303167
H	479m SW	Gas Governor	1988	303128
H	492m SW	Gas Governor	1999	69269

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**0**

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'.

This data is sourced from Ordnance Survey / Groundsure.

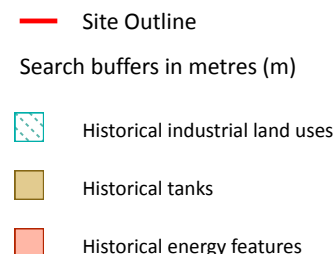
1.6 Historical military land

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



2.1 Historical industrial land uses

20

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 ungrouped 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 18**

ID	Location	Land Use	Date	Group ID
A	On site	General Hospital	1982	798109
A	On site	Hospital	1994	834365
D	379m W	Unspecified Works	1964	211640

ID	Location	Land Use	Date	Group ID
D	379m W	Sewage Works	1980	225147
D	379m W	Sewage Works	1990	225147
D	380m W	Sewage Works	1949	245062
D	398m W	Unspecified Tanks	1949	233868
D	401m W	Unspecified Tanks	1964	233868
D	401m W	Sewage Tanks	1980	235970
D	408m W	Sewage Tanks	1990	235970
2	420m S	Grave Yard	1871	817227
F	425m N	Unspecified Tank	1949	849599
3	432m SW	Industrial Estate	1980	235062
H	437m SW	Unspecified Factory	1990	211439
F	442m N	Unspecified Tank	1960	852345
F	468m N	Unspecified Tank	1949	964238
F	468m N	Unspecified Tank	1914	950338
4	489m W	Police Station	1990	218967
H	490m SW	Unspecified Depot	1980	224831
H	490m SW	Unspecified Depot	1990	224831

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m

18

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 18**

ID	Location	Land Use	Date	Group ID
E	406m W	Unspecified Tank	1988	32569
E	406m W	Unspecified Tank	1988	32569
E	406m W	Unspecified Tank	1989	32569



ID	Location	Land Use	Date	Group ID
E	406m W	Unspecified Tank	1989	32569
E	408m W	Unspecified Tank	1991	32010
E	408m W	Unspecified Tank	1995	32484
E	408m W	Unspecified Tank	1996	32484
E	409m W	Unspecified Tank	1983	32484
E	409m W	Unspecified Tank	1970	32484
E	411m W	Unspecified Tank	1990	32569
E	411m W	Unspecified Tank	1990	32569
D	426m W	Unspecified Tank	1960	30595
G	432m S	Unspecified Tank	1899	137329
G	432m S	Unspecified Tank	1912	137329
D	434m W	Unspecified Tank	1960	30547
D	457m W	Unspecified Tank	1960	30594
D	464m W	Unspecified Tank	1960	30548
F	478m N	Unspecified Tank	1912	111991

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m

11

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 18**

ID	Location	Land Use	Date	Group ID
B	47m SE	Electricity Substation	1988	73301
B	48m SE	Electricity Substation	1989	72866
B	50m SE	Electricity Substation	1999	73301
1	285m SW	Electricity Substation	1999	60853
C	302m S	Electricity Substation	1989	82946



ID	Location	Land Use	Date	Group ID
C	302m S	Electricity Substation	1978	79850
C	302m S	Electricity Substation	1988	79850
C	302m S	Electricity Substation	1999	77750
I	479m SW	Gas Governor	1989	303167
I	480m SW	Gas Governor	1988	303128
I	492m SW	Gas Governor	1999	69269

This data is sourced from Ordnance Survey / Groundsure.

2.4 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. 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

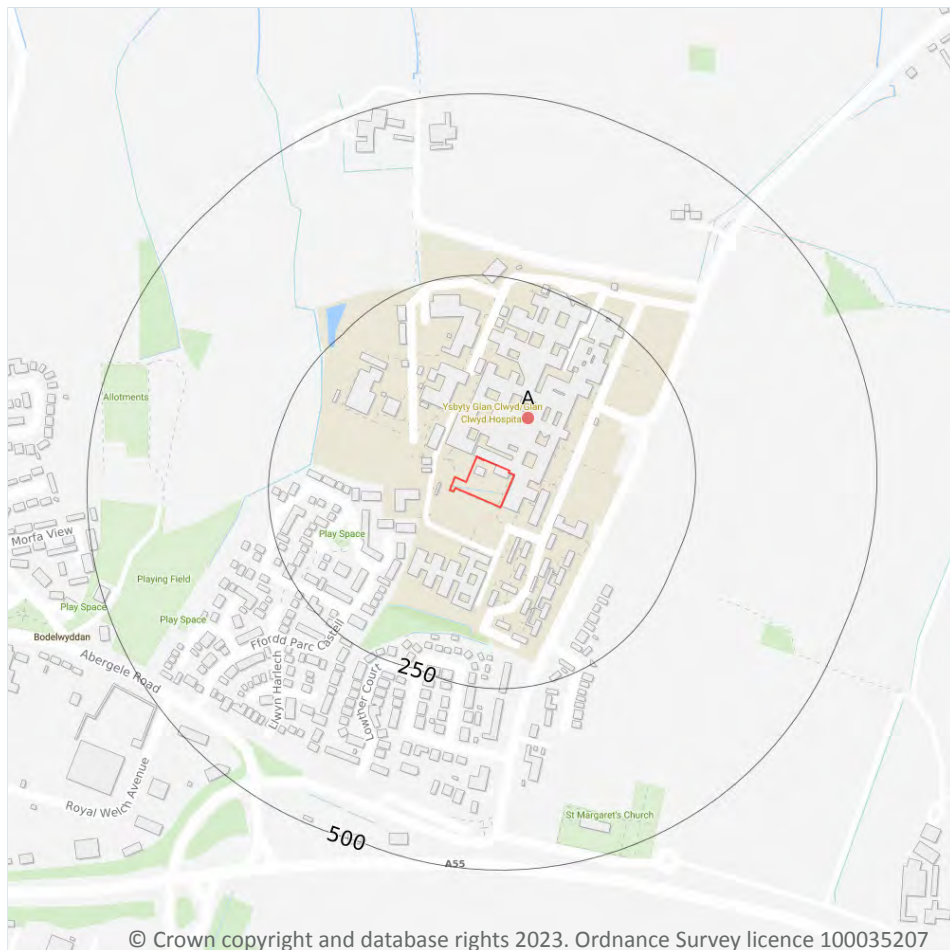
Records within 500m

0

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'.

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill



— Site Outline
Search buffers in metres (m)
● Waste exemptions

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**7**

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.

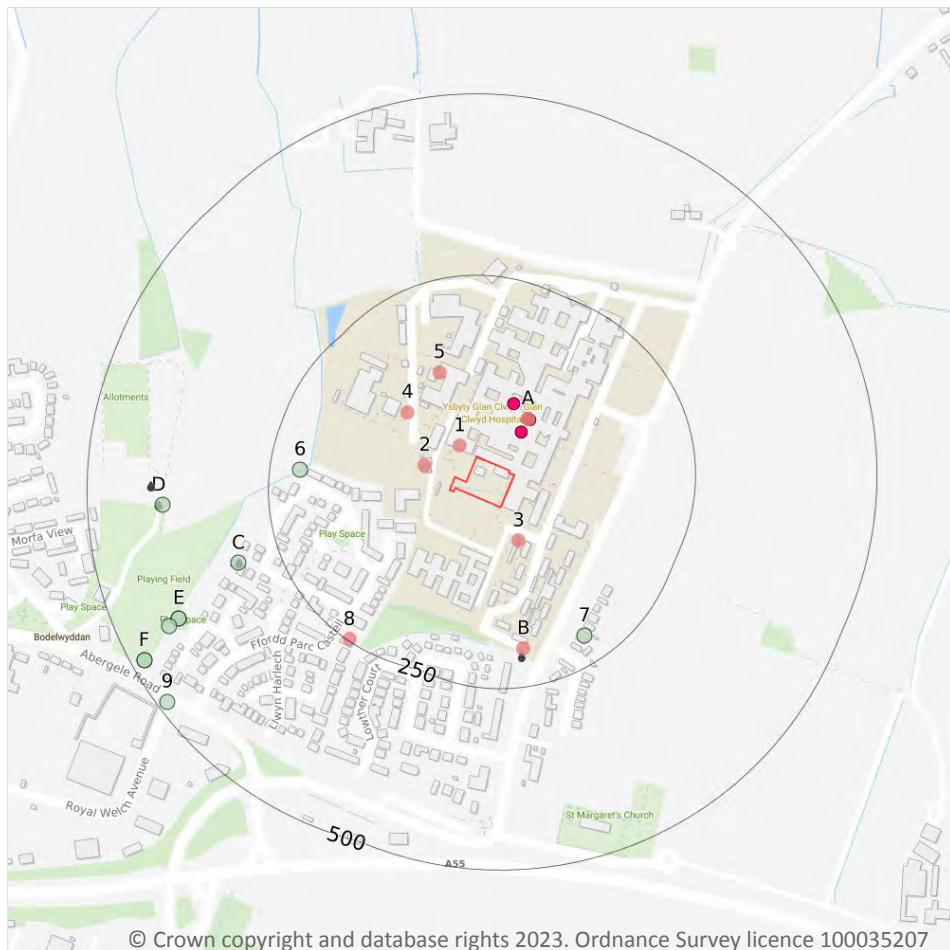
Features are displayed on the Waste and landfill map on **page 22**

ID	Location	Site	Reference	Category	Sub-Category	Description
A	76m NE	BAM Construction Ltd, SURNICC Site Offices, Glan Clwyd Hospital, Rhuddlan Road, Bodelwyddan, Rhyl, Denbighshire, LL185UJ	NRW-WME021206	Using waste exemption	Not on a farm	Use of waste in construction
A	76m NE	Betsi Cadwaladr University Health Board, Glan Clwyd Hospital, Rhuddlan Road, Bodelwyddan, Rhyl, Denbighshire, LL185UJ	NRW-WME022186	Treating waste exemption	Not on a farm	Preparatory treatments (baling, sorting, shredding etc)
A	76m NE	Betsi Cadwaladr University Health Board, Glan Clwyd Hospital, Rhuddlan Road, Bodelwyddan, Rhyl, Denbighshire, LL185UJ	NRW-WME022186	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal
A	76m NE	Betsi Cadwaladr University Health Board, Glan Clwyd Hospital, Rhuddlan Road, Bodelwyddan, Rhyl, Denbighshire, LL185UJ	NRW-WME022186	Storing waste exemption	Not on a farm	Storage of waste in a secure place
A	76m NE	Laing O'Rourke, Glan Clwyd Hospital, Rhuddlan Road, Rhyl, Rhyl, Denbighshire, LL185UJ	NRW-WME032728	Treating waste exemption	Not on a farm	Treatment of waste aerosol cans
A	76m NE	Glan Clwyd Hospital, Rhuddlan Road, Rhyl, Denbighshire, LL18 5UJ	NRW-WME001917	Using waste exemption	Waste Exemption - Non-Agricultural	Pig and poultry ash
A	76m NE	Glan Clwyd Hospital, Rhuddlan Road, Rhyl, Denbighshire, LL18 5UJ	NRW-WME001917	Treating waste exemption	Waste Exemption - Non-Agricultural	Treatment of waste aerosol cans

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
- Radioactive Substance Authorisations
- Licensed Discharges to controlled waters
- Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m

9

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 25**

ID	Location	Company	Address	Activity	Category
1	28m NW	Glan Clwyd Hospital	Rhuddlan Road, Bodelwyddan, Rhyl, Clwyd, LL18 5UJ	Accident and Emergency Hospitals	Health Practitioners and Establishments
2	45m W	Electricity Sub Station	Clwyd, LL18	Electrical Features	Infrastructure and Facilities
3	52m SE	Electricity Sub Station	Clwyd, LL18	Electrical Features	Infrastructure and Facilities



ID	Location	Company	Address	Activity	Category
A	76m NE	Glan Clwyd Hospital	Rhuddlan Road, Bodelwyddan, Rhyl, Clwyd, LL18 5UJ	Hospitals	Health Practitioners and Establishments
A	76m NE	Disability Resource Centre	Rhuddlan Road, Bodelwyddan, Rhyl, Clwyd, LL18 5UJ	Disability and Mobility Equipment	Consumer Products
4	111m NW	Electricity Sub Station	Clwyd, LL18	Electrical Features	Infrastructure and Facilities
5	127m NW	Chimney	Clwyd, LL18	Chimneys	Industrial Features
B	197m S	Pumping Station	Clwyd, LL18	Water Pumping Stations	Industrial Features
8	248m SW	Pumping Station	Clwyd, LL18	Water Pumping Stations	Industrial Features

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m

0

Open, closed, under development and obsolete petrol stations.

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m

0

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m

0

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.



4.5 Sites determined as Contaminated Land

Records within 500m**0**

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**

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

18

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

Features are displayed on the Current industrial land use map on **page 25**

ID	Location	Address	Details	
A	54m NE	Wrexham Maelor Hospital Nhs Trust, Ysbyty Glan Clwyd, Bodelwyddan, Rhyl, Clwyd, LL18 5UJ	Operator: Wrexham Maelor Hospital Nhs Trust Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: AG2081 Date of approval: 31/03/1991	Effective from: 31/03/1991 Last date of update: 01/01/2015 Status: Revoked/cancelled
A	54m NE	North Wales Nhs Trust, Ysbyty Glan Clwyd, Bodelwyddan, Rhyl, Clwyd, LL18 5UJ	Operator: North Wales Nhs Trust Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: AI3810 Date of approval: 31/03/1991	Effective from: 31/03/1991 Last date of update: 01/01/2015 Status: Superseded By Variation
A	54m NE	North Wales Nhs Trust, Ysbyty Glan Clwyd, Bodelwyddan, Rhyl, Clwyd, LL18 5UJ	Operator: North Wales Nhs Trust Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: AI3810 Date of approval: 07/02/1994	Effective from: 09/03/1994 Last date of update: 01/01/2015 Status: Superseded By Variation

ID	Location	Address	Details	
A	54m NE	North Wales Nhs Trust, Ysbyty Glan Clwyd, Bodelwyddan, Rhyl, Clwyd, LL18 5UJ	Operator: North Wales Nhs Trust Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: AI3810 Date of approval: 12/07/1995	Effective from: 12/07/1995 Last date of update: 01/01/2015 Status: Superseded By Variation
A	54m NE	North Wales Nhs Trust, Ysbyty Glan Clwyd, Bodelwyddan, Rhyl, Clwyd, LL18 5UJ	Operator: North Wales Nhs Trust Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: AI3810 Date of approval: 03/01/1997	Effective from: 03/01/1997 Last date of update: 01/01/2015 Status: Revoked/cancelled
A	54m NE	North Wales Nhs Trust, Ysbyty Glan Clwyd, Bodelwyddan, Rhyl, Clwyd, LL18 5UJ	Operator: North Wales Nhs Trust Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: BF4024 Date of approval: 31/03/1999	Effective from: 01/04/1999 Last date of update: 01/01/2015 Status: Superseded By Variation
A	54m NE	North Wales Nhs Trust, Ysbyty Glan Clwyd, Bodelwyddan, Rhyl, Clwyd, LL18 5UJ	Operator: North Wales Nhs Trust Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: BF4024 Date of approval: 21/06/2000	Effective from: 19/07/2000 Last date of update: 01/01/2015 Status: Superseded By Variation
A	54m NE	North Wales Nhs Trust, Ysbyty Glan Clwyd, Bodelwyddan, Rhyl, Clwyd, LL18 5UJ	Operator: North Wales Nhs Trust Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: BF4024 Date of approval: 15/08/2001	Effective from: 12/09/2001 Last date of update: 01/01/2015 Status: Superseded By Variation
A	54m NE	North Wales Nhs Trust, Ysbyty Glan Clwyd, Bodelwyddan, Rhyl, Clwyd, LL18 5UJ	Operator: North Wales Nhs Trust Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: BF4024 Date of approval: 01/12/2003	Effective from: 01/01/2004 Last date of update: 01/01/2015 Status: Superseded By Variation
A	54m NE	North Wales Nhs Trust, Ysbyty Glan Clwyd, Bodelwyddan, Rhyl, Clwyd, LL18 5UJ	Operator: North Wales Nhs Trust Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: BF4024 Date of approval: 05/07/2007	Effective from: 02/08/2007 Last date of update: 01/01/2015 Status: Superseded By Variation
A	54m NE	North Wales Nhs Trust, Ysbyty Glan Clwyd, Bodelwyddan, Rhyl, Clwyd, LL18 5UJ	Operator: North Wales Nhs Trust Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: BF4024 Date of approval: 06/08/2008	Effective from: 06/08/2008 Last date of update: 01/01/2015 Status: Revoked/cancelled



ID	Location	Address	Details	
A	54m NE	Betsi Cadwaladr University Local Health Board, Glan Clwyd Hospital, Bodelwyddan, Rhyl, Clwyd, LL18 5UJ	Operator: Betsi Cadwaladr University Local Health Board Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: CE0214 Date of approval: 15/03/2010	Effective from: 15/03/2010 Last date of update: 01/01/2015 Status: Effective
A	54m NE	Betsi Cadwaladr University Local Health Board, Glan Clwyd Hospital, Bodelwyddan, Rhyl, Clwyd, LL18 5UJ	Operator: Betsi Cadwaladr University Local Health Board Type: Keeping And Use Of Radioactive Materials (was Rsa60 Section 1). Permission number: CE0222 Date of approval: 15/03/2010	Effective from: 15/03/2010 Last date of update: 01/01/2015 Status: Effective
A	54m NE	Conwy And Denbighshire Nhs Trust, Ysbyty Glan Clwyd, Rhyl, Clwyd, LL18 5UJ	Operator: Conwy And Denbighshire Nhs Trust Type: Keeping And Use Of Radioactive Materials (was Rsa60 Section 1). Permission number: AI4077 Date of approval: 15/07/1993	Effective from: 15/07/1993 Last date of update: 06/01/2005 Status: Superseded By Variation
A	74m NE	Conwy And Denbighshire Nhs Trust, Glan Clwyd Hospital, Rhyl, Clwyd, LL18 5UJ	Operator: Conwy And Denbighshire Nhs Trust Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: BF4024 Date of approval: -	Effective from: - Last date of update: 06/01/2005 Status: Valid
A	87m N	North Wales Nhs Trust, Glan Clwyd Hospital, Rhyl, Clwyd, LL18 5UJ	Operator: North Wales Nhs Trust Type: Keeping And Use Of Radioactive Materials (was Rsa60 Section 1). Permission number: BF4008 Date of approval: 12/01/2000	Effective from: 13/01/2000 Last date of update: 01/01/2015 Status: Superseded By Variation
A	87m N	North Wales Nhs Trust, Glan Clwyd Hospital, Rhyl, Clwyd, LL18 5UJ	Operator: North Wales Nhs Trust Type: Keeping And Use Of Radioactive Materials (was Rsa60 Section 1). Permission number: BF4008 Date of approval: 14/04/2005	Effective from: 14/04/2005 Last date of update: 01/01/2015 Status: Superseded By Variation
A	87m N	North Wales Nhs Trust, Glan Clwyd Hospital, Rhyl, Clwyd, LL18 5UJ	Operator: North Wales Nhs Trust Type: Keeping And Use Of Radioactive Materials (was Rsa60 Section 1). Permission number: BF4008 Date of approval: 06/08/2008	Effective from: 06/08/2008 Last date of update: 01/01/2015 Status: Revoked/cancelled

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



4.13 Licensed Discharges to controlled waters

Records within 500m

5

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 25**

ID	Location	Address	Details	
B	208m S	THE VILLAGE BODELWYDDAN PS	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: CG0326301 Permit Version: 2 Receiving Water: UNNAMED TRIB. OF RIVER GELE	Status: Effective Issue date: 14/02/1995 Effective Date: 14/02/1995 Revocation Date: -
C	308m W	REDROW HOMES DEVELOPMENT PARC CASTE, REDROW HOMES DEVELOPMENT PARC CA, PARC CASTELL BODELWYDDAN, BODELWYDDAN	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: CG0371501 Permit Version: 1 Receiving Water: A TRIBUTARY OF BODELWYDDAN DRA	Status: Effective Issue date: 01/04/1997 Effective Date: 01/04/1997 Revocation Date: -
D	401m W	BODELWYDDAN MAIN PS	Effluent Type: SEWAGE DISCHARGES - PUMPING STATION - WATER COMPANY Permit Number: CG0186801 Permit Version: 2 Receiving Water: BODELWYDDAN DRAIN	Status: Effective Issue date: 08/09/2010 Effective Date: 08/09/2010 Revocation Date: -
D	412m W	BODELWYDDAN MAIN SPS, Nr 10 Morfa View, Bodelwyddan, Rhyl, LL18 5TT	Effluent Type: SEWAGE DISCHARGES - PUMPING STATION - WATER COMPANY Permit Number: CG0186801 Permit Version: 3 Receiving Water: BODELWYDDAN DRAIN	Status: Effective Issue date: 06/02/2020 Effective Date: 06/02/2020 Revocation Date: -
D	412m W	BODELWYDDAN MAIN SPS, Nr 10 Morfa View, Bodelwyddan, Rhyl, LL18 5TT	Effluent Type: SEWAGE DISCHARGES - PUMPING STATION - WATER COMPANY Permit Number: CG0186801 Permit Version: 3 Receiving Water: BODELWYDDAN DRAIN	Status: Effective Issue date: 06/02/2020 Effective Date: 06/02/2020 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**10**

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 25**

ID	Location	Details	
6	208m W	Incident Date: 28/11/2013 Incident Identification: 1179378 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: - Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
7	211m SE	Incident Date: 11/02/2009 Incident Identification: 652971 Pollutant: Specific Waste Materials Pollutant Description: Tyres	Water Impact: Category 4 (No Impact) Land Impact: Category 2 (Significant) Air Impact: Category 4 (No Impact)
C	307m W	Incident Date: 15/11/2014 Incident Identification: 1294790 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: - Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)
D	396m W	Incident Date: 06/07/2009 Incident Identification: 695332 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: Category 2 (Significant) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
E	412m SW	Incident Date: 14/04/2003 Incident Identification: 150982 Pollutant: Sewage Materials Pollutant Description: Other Sewage Material	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
E	412m SW	Incident Date: 14/04/2003 Incident Identification: 150982 Pollutant: Sewage Materials Pollutant Description: Other Sewage Material	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
E	429m SW	Incident Date: 03/04/2003 Incident Identification: 148346 Pollutant: Sewage Materials Pollutant Description: Process Effluent	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
F	482m SW	Incident Date: 19/05/2017 Incident Identification: 1702649 Pollutant: - Pollutant Description: -	Water Impact: Category 3 (Minor) Land Impact: No Details Air Impact: No Details
F	482m SW	Incident Date: 19/05/2017 Incident Identification: 1702649 Pollutant: Sewage Material Pollutant Description: Crude Sewage	Water Impact: Category 3 (Minor) Land Impact: No Details Air Impact: No Details
9	486m SW	Incident Date: 03/07/2014 Incident Identification: 1252297 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: - Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)

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.

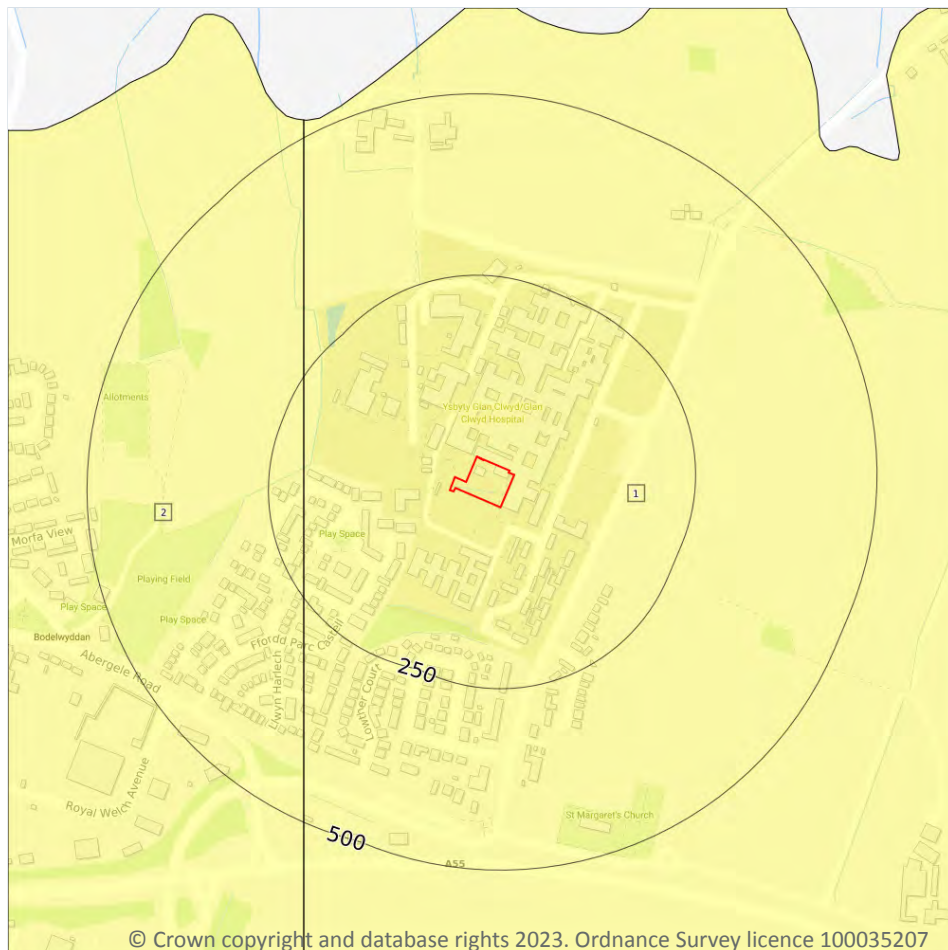
4.21 Pollution inventory radioactive waste

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

2

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 35**

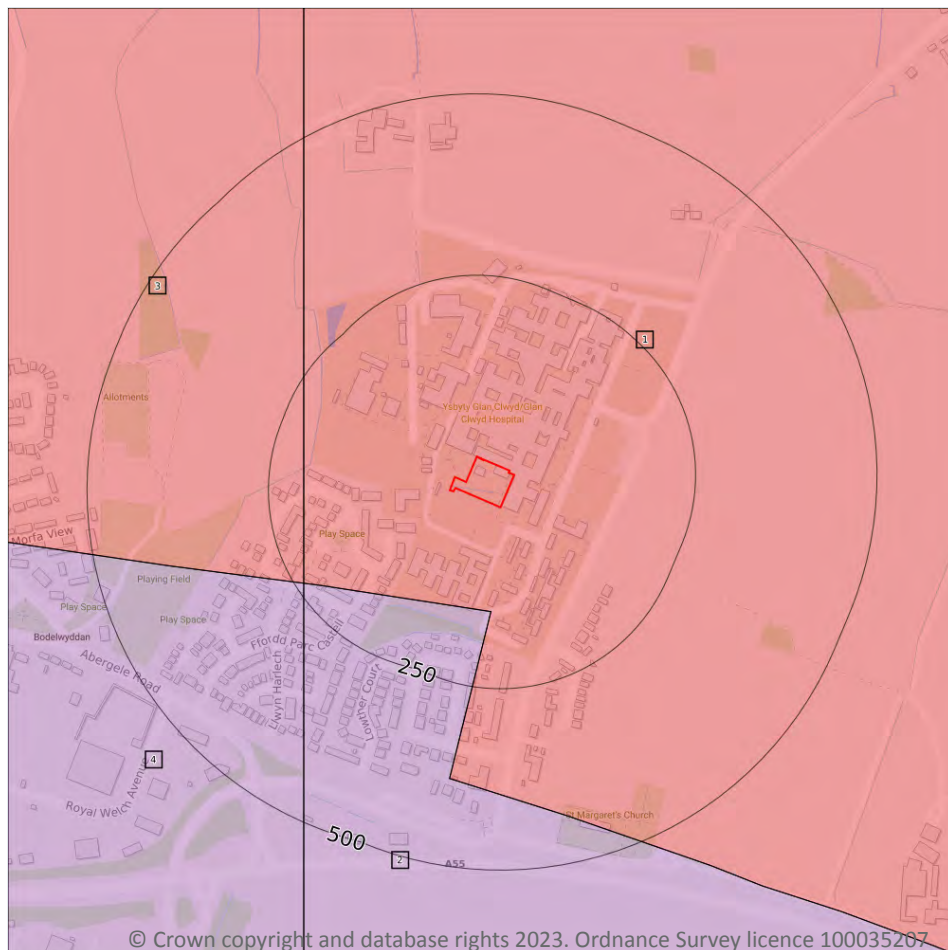
ID	Location	Designation	Description
1	On site	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
2	201m W	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



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 37**

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	144m S	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers

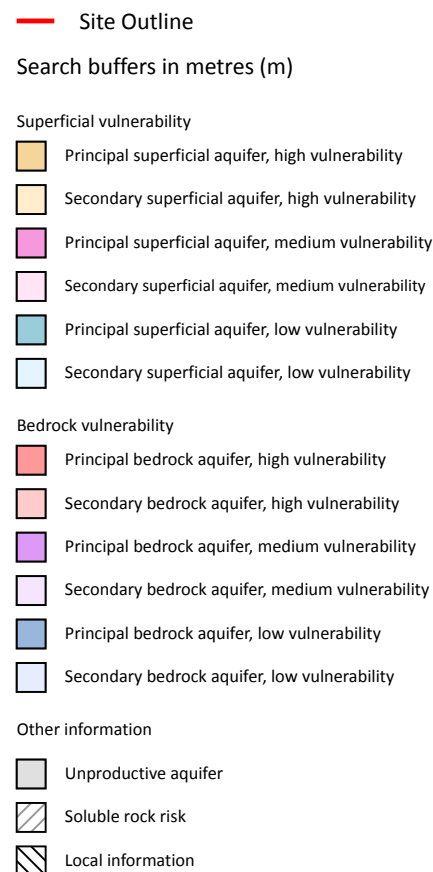
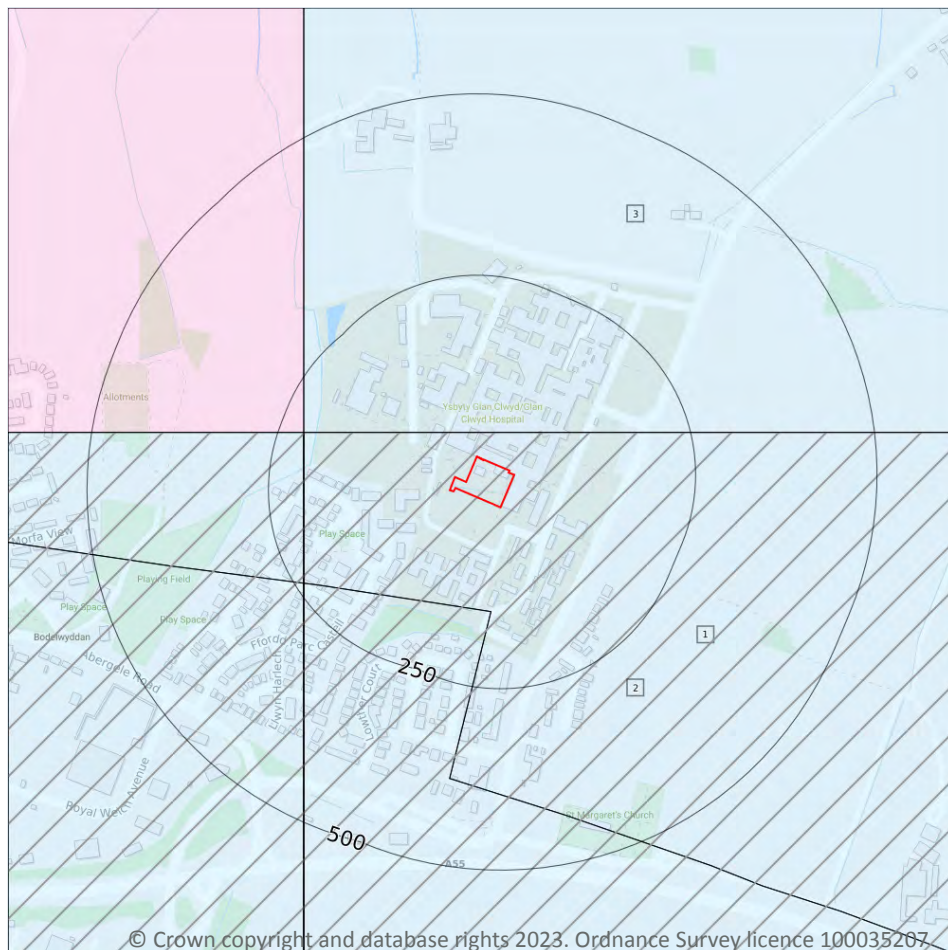


ID	Location	Designation	Description
3	201m W	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
4	239m SW	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major 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

2

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 39**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary superficial aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: 300-550mm/year	Vulnerability: Low Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: Medium	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
3	33m N	Summary Classification: Secondary superficial aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: 300-550mm/year	Vulnerability: Low Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: Medium	Vulnerability: Low 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	1
------------------------	----------

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

ID	Maximum soluble risk category	Percentage of grid square covered by maximum risk
2	Very significant soluble rocks are likely to be present with a moderate possibility of localised natural subsidence or dissolution-related degradation of bedrock, especially in adverse conditions such as concentrated surface or subsurface water flow.	3.0%

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

5.5 Groundwater vulnerability- local information

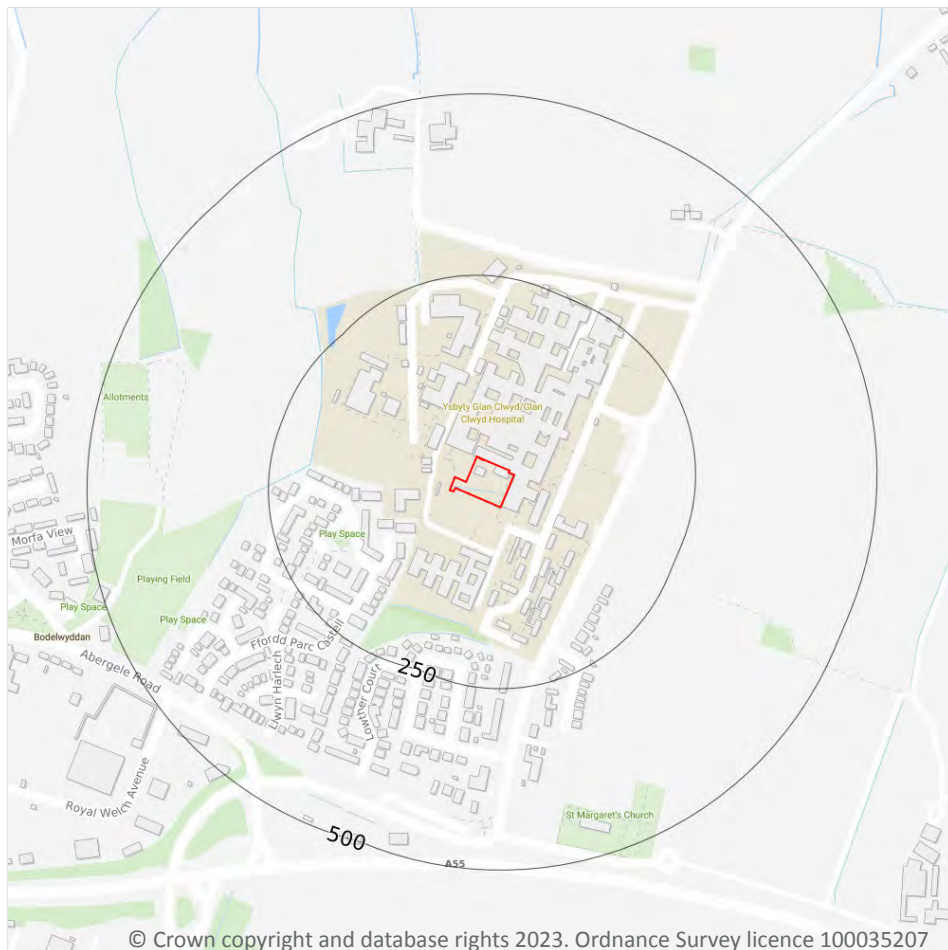
Records on site	0
------------------------	----------

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
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

2

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 41**

ID	Location	Details	
-	840m S	Status: Historical Licence No: 24/66/7/0016 Details: General Farming & Domestic Direct Source: EAW Groundwater Point: MINE ADIT Data Type: Point Name: Schools Trust Ltd Easting: 300470 Northing: 375080	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 29/03/1966 Expiry Date: - Issue No: 100 Version Start Date: 29/03/1966 Version End Date: -
-	1885m N	Status: Historical Licence No: 24/66/7/0018 Details: General Farming & Domestic Direct Source: EAW Groundwater Point: BOREHOLE Data Type: Point Name: Hughes Easting: 300680 Northing: 377800	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 24/02/1967 Expiry Date: - Issue No: 100 Version Start Date: 24/02/1967 Version End Date: -

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

5.7 Surface water abstractions

Records within 2000m	0
-----------------------------	----------

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.

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

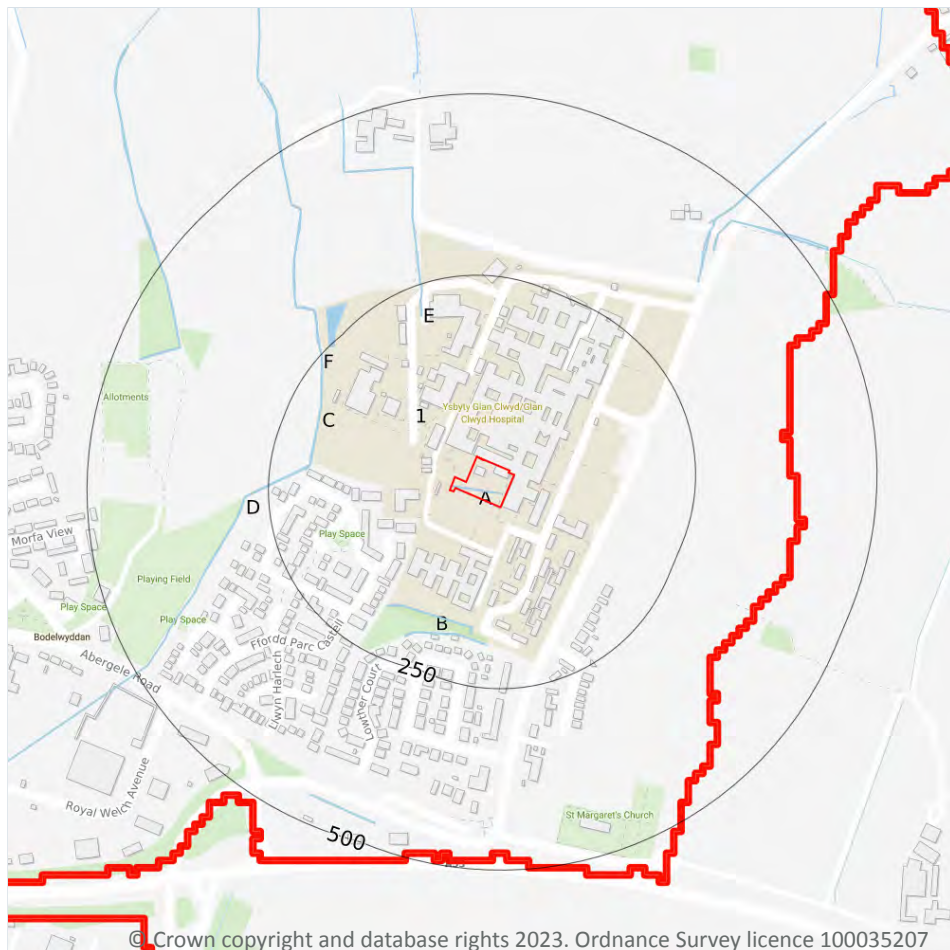
0

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

8

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 44**

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)	-



ID	Location	Type of water feature	Ground level	Permanence	Name
B	169m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	184m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	195m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	195m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	207m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	231m N	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
F	247m NW	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m

7

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 44**

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site

1

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 44**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	On site	River WB catchment	Gele	GB110066059980	Gele	Clwyd

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

6.4 WFD Surface water bodies

Records identified	1
---------------------------	----------

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 44**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	2665m N	River	Gele	GB110066059980	Moderate	Good	Moderate	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 44**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
A	On site	Clwyd Permo-Triassic Sandstone	GB41001G202100	Good	Good	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

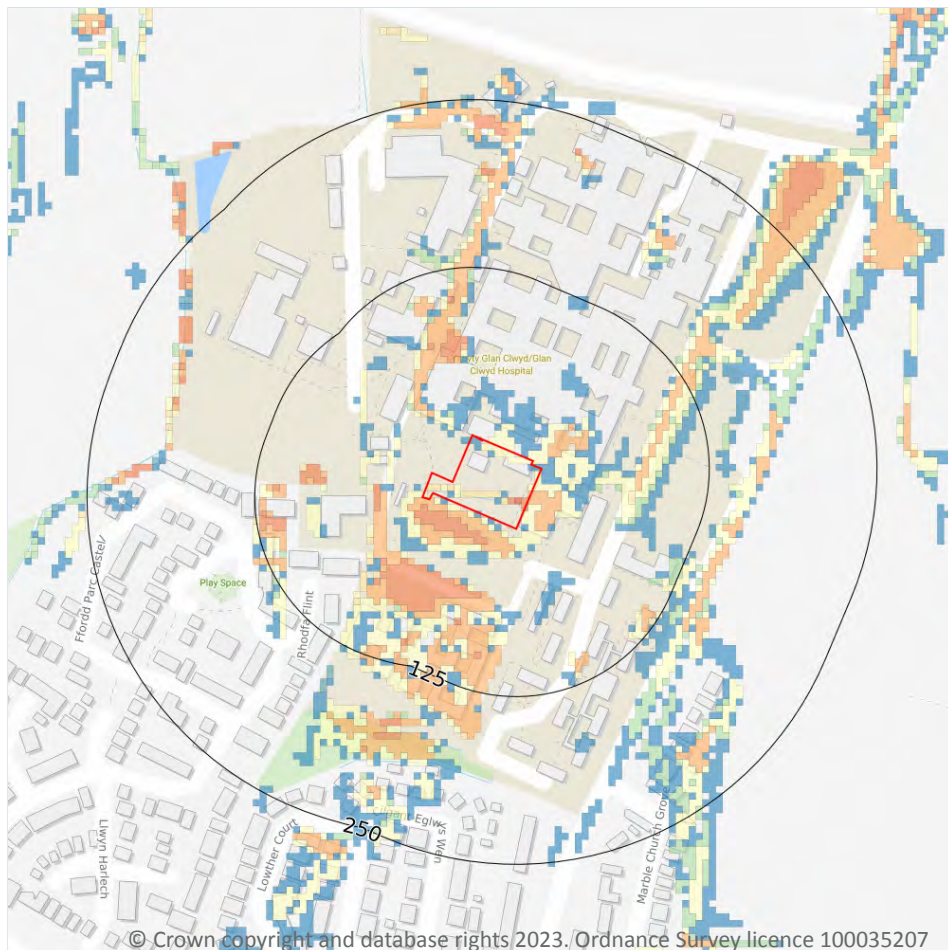
Records within 50m

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



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 50**

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.

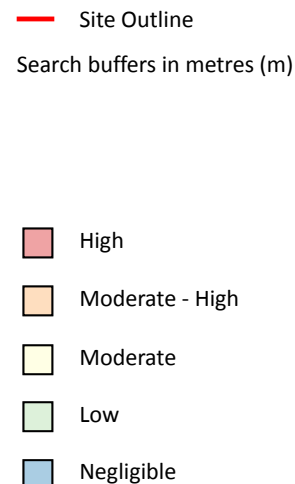
The table below shows the maximum flood depths for a range of return periods for the site.

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



9.1 Groundwater flooding

Highest risk on site

Low

Highest risk within 50m

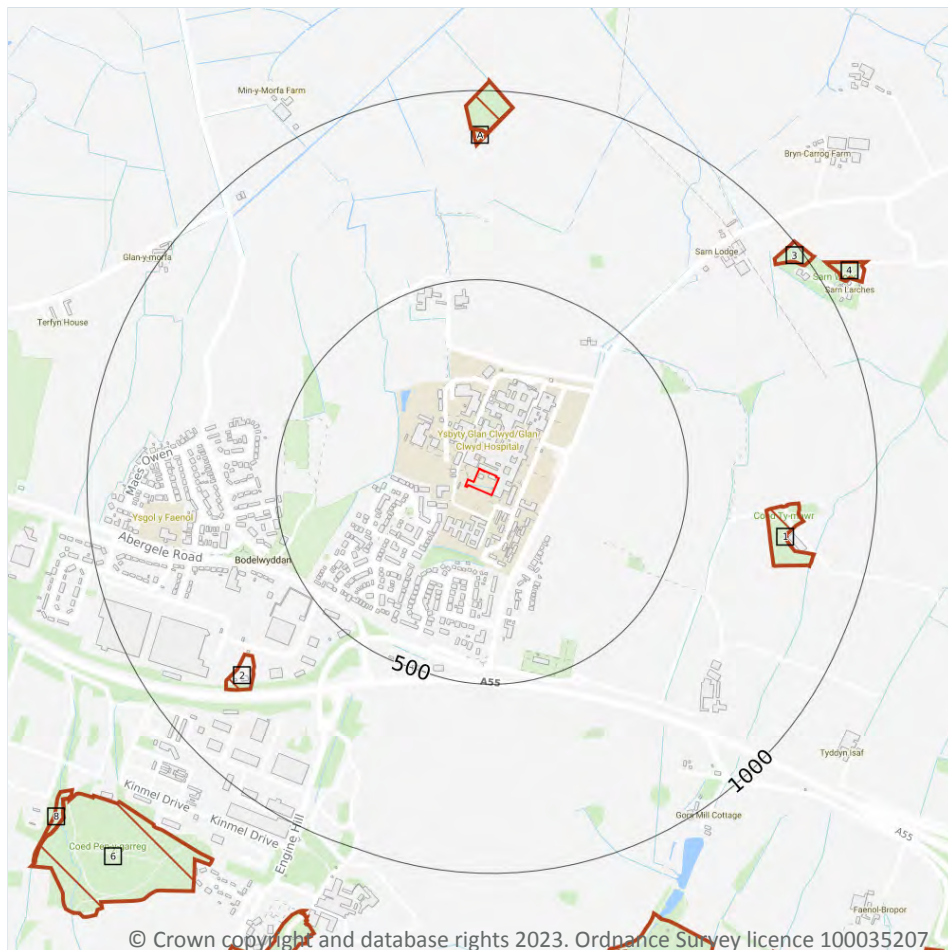
Low

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 52**

This data is sourced from Ambiantal Risk Analytics.

10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- Designated Ancient Woodland

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

0

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.

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

0

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.

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

10.7 Designated Ancient Woodland

Records within 2000m

20

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 53**

ID	Location	Name	Woodland Type
1	713m E	Unknown	Restored Ancient Woodland Site
2	720m SW	Unknown	Ancient Semi Natural Woodland
A	856m N	Unknown	Ancient Woodland Site of Unknown Category
A	888m N	Unknown	Restored Ancient Woodland Site
3	925m NE	Unknown	Restored Ancient Woodland Site
4	1036m NE	Unknown	Restored Ancient Woodland Site
5	1186m S	Unknown	Restored Ancient Woodland Site
6	1191m SW	Unknown	Ancient Semi Natural Woodland
7	1200m SW	Unknown	Ancient Semi Natural Woodland
8	1314m SW	Unknown	Ancient Semi Natural Woodland
9	1418m SE	Unknown	Restored Ancient Woodland Site
-	1549m NE	Unknown	Ancient Semi Natural Woodland
-	1650m SW	Unknown	Restored Ancient Woodland Site
12	1661m SE	Unknown	Ancient Woodland Site of Unknown Category
-	1689m W	Unknown	Plantation on Ancient Woodland Site
-	1763m SW	Unknown	Restored Ancient Woodland Site



ID	Location	Name	Woodland Type
-	1819m SW	Unknown	Restored Ancient Woodland Site
-	1893m W	Unknown	Restored Ancient Woodland Site
-	1927m SW	Unknown	Restored Ancient Woodland Site
-	1932m E	Unknown	Ancient Semi Natural Woodland

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

6

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 60**

ID	Location	Name	Grade	Reference Number	Listed date
A	218m S	1, The Village, To the W side of the street of Bodelwyddan Village, opposite the Vicarage, in 2 terraces; shared front access paths behind low stone wall; shared rear paths.	II	80714	06/12/2002
A	224m S	2, The Village, To the W side of the street of Bodelwyddan Village, opposite the Vicarage, in 2 terraces; shared front access paths behind low stone wall; shared rear paths.	II	80725	06/12/2002

ID	Location	Name	Grade	Reference Number	Listed date
A	229m S	3, The Village, To the W side of the street of Bodelwyddan Village, opposite the Vicarage, in 2 terraces; shared front access paths behind low stone wall; shared rear paths.	II	80726	06/12/2002
A	236m S	4, The Village, To the W side of the street of Bodelwyddan Village, opposite the Vicarage, in 2 terraces; shared front access paths behind low stone wall; shared rear paths.	II	80728	06/12/2002
A	241m S	5, The Village, To the W side of the street of Bodelwyddan Village, opposite the Vicarage, in 2 terraces; shared front access paths behind low stone wall; shared rear paths.	II	80729	06/12/2002
A	245m S	6, The Village, To the W side of the street of Bodelwyddan Village, opposite the Vicarage, in 2 terraces; shared front access paths behind low stone wall; shared rear paths.	II	80731	06/12/2002

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

11.5 Conservation Areas

Records within 250m

1

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.

Features are displayed on the Visual and cultural designations map on **page 60**

ID	Location	Name	District	Date of designation
1	205m S	Bodelwyddan	DENBIGHSHIRE	1971-01-01

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

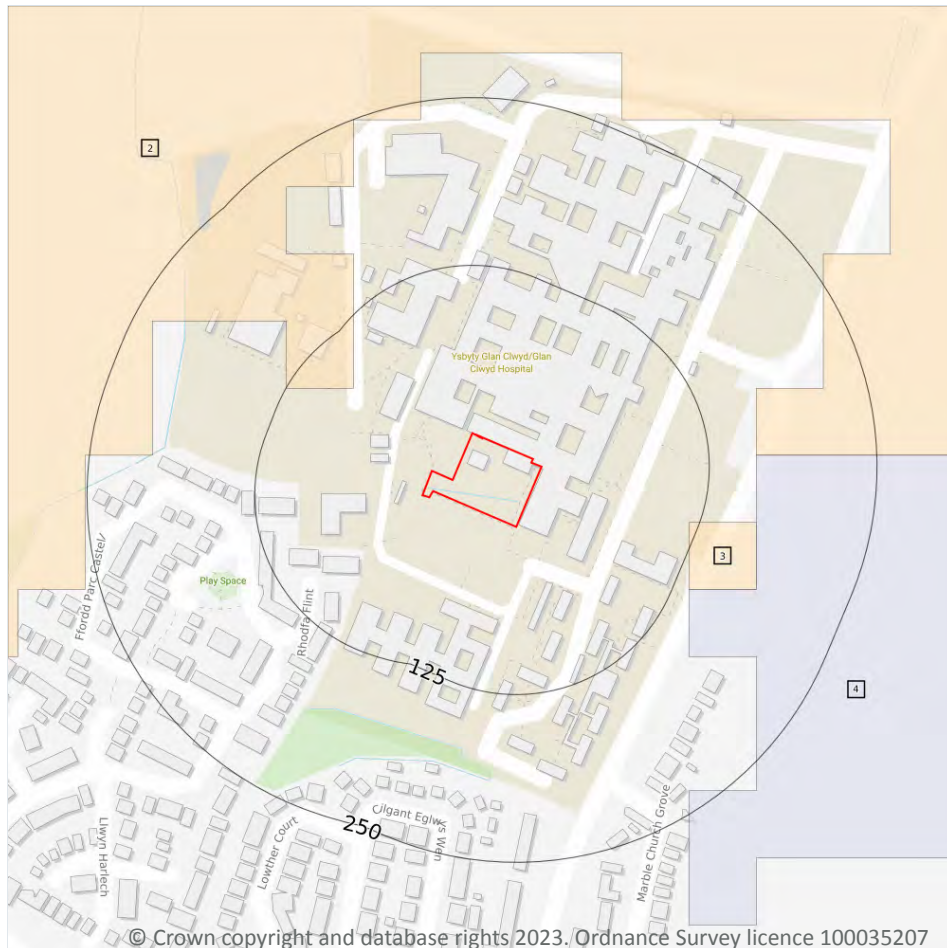
0

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

3

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 64**

ID	Location	Classification	Description
2	85m NW	Grade 3a	Good to moderate quality agricultural land
3	118m E	Grade 3a	Good to moderate quality agricultural land
4	137m SE	Grade 3b	Moderate quality agricultural land

This data is sourced from Natural Resources Wales.

12.2 Open Access Land

Records within 250m

0

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.

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

0

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



— Site Outline
Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

14.1 10k Availability

Records within 500m

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 67**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	No coverage	No coverage	No coverage	NoCov
2	201m W	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

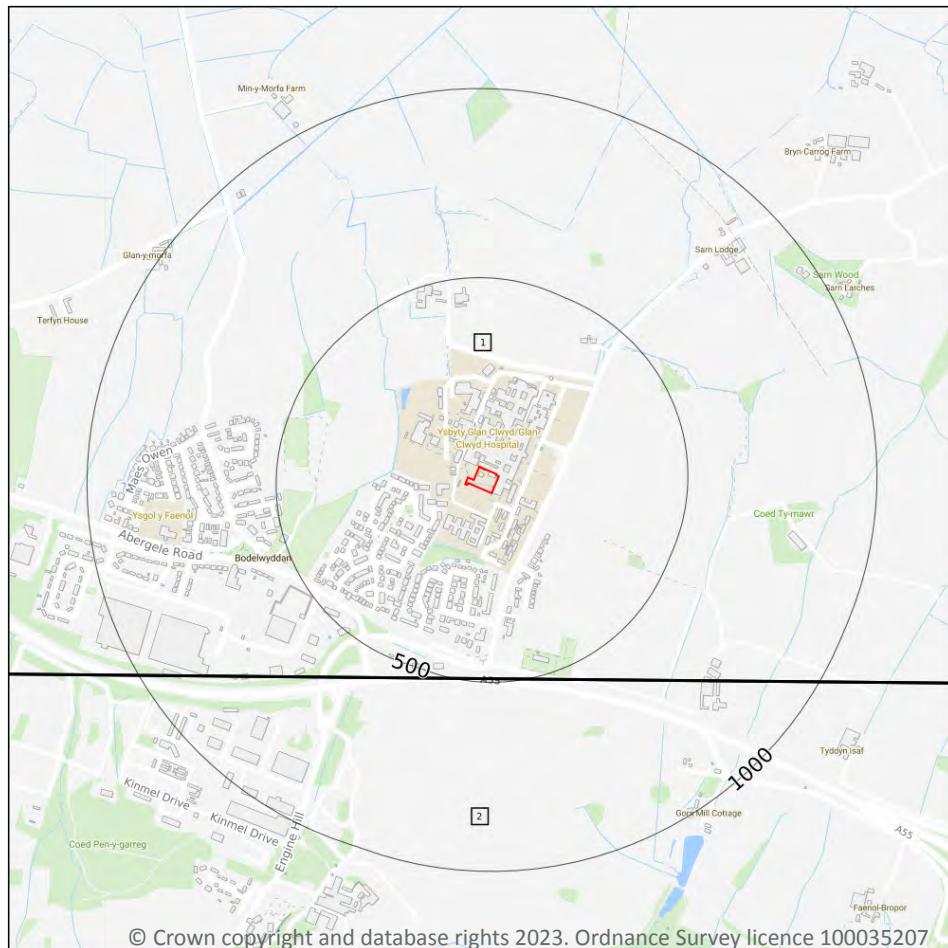
0

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

2

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 71**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	Full	EW095_rhyl_v4
2	491m S	No coverage	Full	Full	Full	EW107_denbigh_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

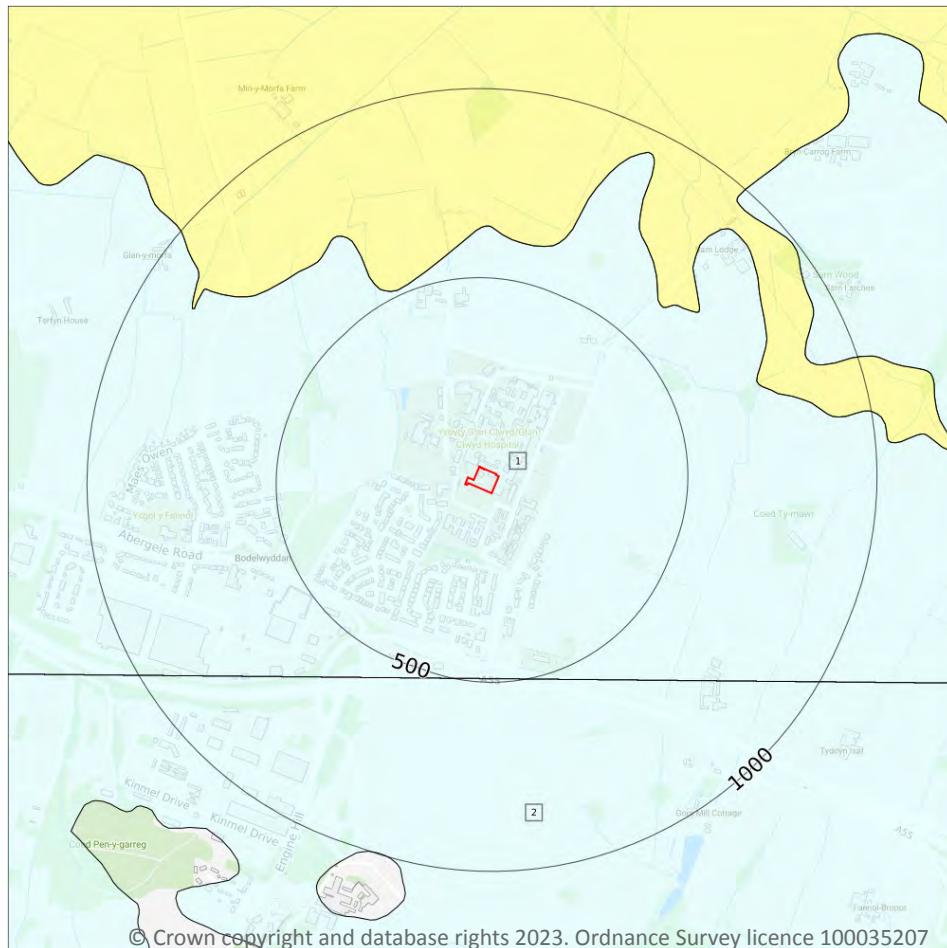
0

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

2

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 73**

ID	Location	LEX Code	Description	Rock description
1	On site	TILLD-DMTN	TILL, DEVANSIAN	DIAMICTON
2	491m S	TILLD-DMTN	TILL, DEVANSIAN	DIAMICTON

This data is sourced from the British Geological Survey.



15.5 Superficial 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 superficial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Mixed	High	Low

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m

0

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.

This data is sourced from the British Geological Survey.

15.7 Landslip 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 landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.



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15.8 Bedrock geology (50k)

5

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 75**

ID	Location	LEX Code	Description	Rock age
1	On site	WAWK-MDSS	WARWICKSHIRE GROUP - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
3	144m S	CLWYD-LMST	CLWYD LIMESTONE GROUP - LIMESTONE	WISEAN

ID	Location	LEX Code	Description	Rock age
4	380m S	CLWYD-LMST	CLWYD LIMESTONE GROUP - LIMESTONE	WISEAN
5	491m S	CLWYD-LMST	CLWYD LIMESTONE GROUP - LIMESTONE	WISEAN
6	500m S	CLWYD-LMST	CLWYD LIMESTONE GROUP - LIMESTONE	WISEAN

This data is sourced from the British Geological Survey.

15.9 Bedrock 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 bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Fracture	Moderate	Low

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m

2

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.

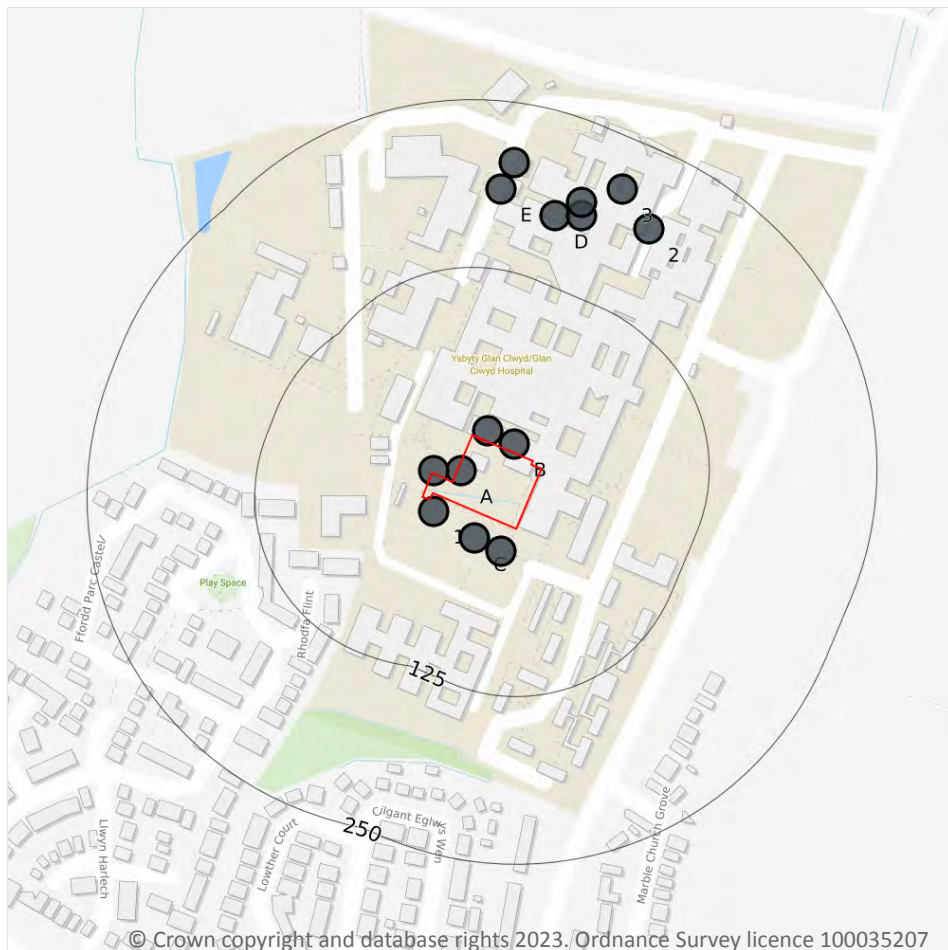
Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 75**

ID	Location	Category	Description
2	24m E	FAULT	Fault, inferred
7	500m S	FAULT	Fault, inferred, displacement unknown

This data is sourced from the British Geological Survey.



16 Boreholes



— Site Outline
Search buffers in metres (m)

- Confidential
- 0 - 10m
- 10 - 30m
- 30m+
- Unknown

16.1 BGS Boreholes

Records within 250m

14

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.

Features are displayed on the Boreholes map on **page 77**

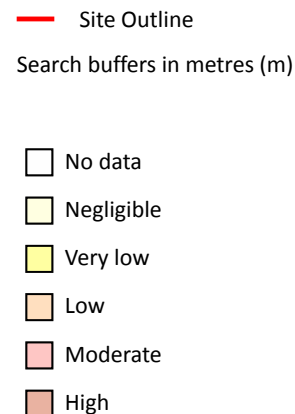
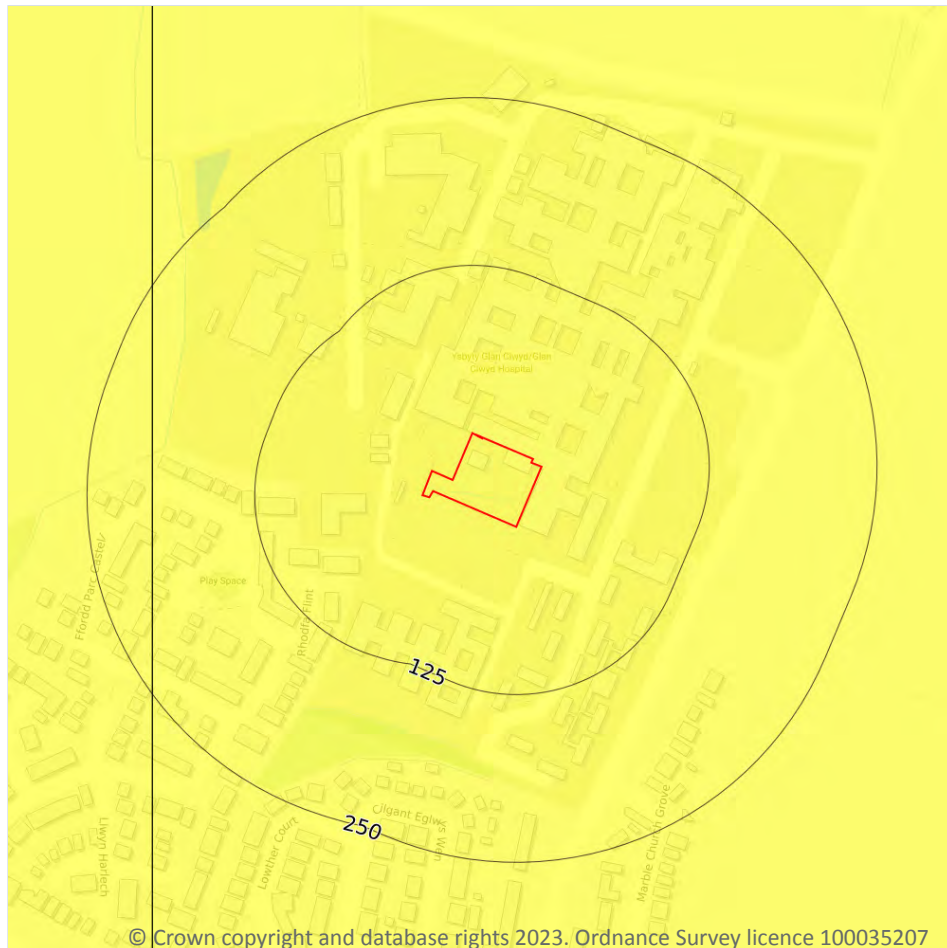
ID	Location	Grid reference	Name	Length	Confidential	Web link
A	On site	300230 375940	GLAN CLWYD HOSPITAL BODELWYDDAN TP4	-	Y	N/A
A	2m W	300210 375940	GLAN CLWYD HOSPITAL BODELWYDDAN TP3	-	Y	N/A
B	6m NE	300270 375960	GLAN CLWYD HOSPITAL BODELWYDDAN 7	-	Y	N/A

ID	Location	Grid reference	Name	Length	Confidential	Web link
B	8m N	300250 375970	GLAN CLWYD HOSPITAL BODELWYDDAN 8	-	Y	N/A
1	9m SW	300210 375910	GLAN CLWYD HOSPITAL BODELWYDDAN TP5	-	Y	N/A
C	19m S	300240 375890	GLAN CLWYD HOSPITAL BODELWYDDAN TP6	-	Y	N/A
C	20m S	300260 375880	GLAN CLWYD HOSPITAL BODELWYDDAN TP7	-	Y	N/A
D	175m N	300300 376130	GLAN CLWYD HOSPITAL BODELWYDDAN WS2	-	Y	N/A
D	182m N	300320 376130	GLAN CLWYD HOSPITAL BODELWYDDAN WS1	-	Y	N/A
E	185m N	300260 376150	GLAN CLWYD HOSPITAL BODELWYDDAN WS3	-	Y	N/A
D	192m N	300320 376140	GLAN CLWYD HOSPITAL BODELWYDDAN 2	-	Y	N/A
2	193m NE	300370 376120	GLAN CLWYD HOSPITAL BODELWYDDAN 5	-	Y	N/A
E	206m N	300270 376170	GLAN CLWYD HOSPITAL BODELWYDDAN 1	-	Y	N/A
3	213m NE	300350 376150	GLAN CLWYD HOSPITAL BODELWYDDAN 4	-	Y	N/A

This data is sourced from the British Geological Survey.



17 Natural ground subsidence - Shrink swell clays



17.1 Shrink swell clays

Records within 50m

1

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).

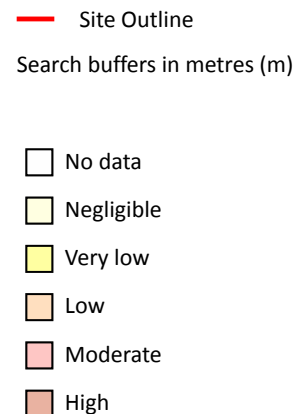
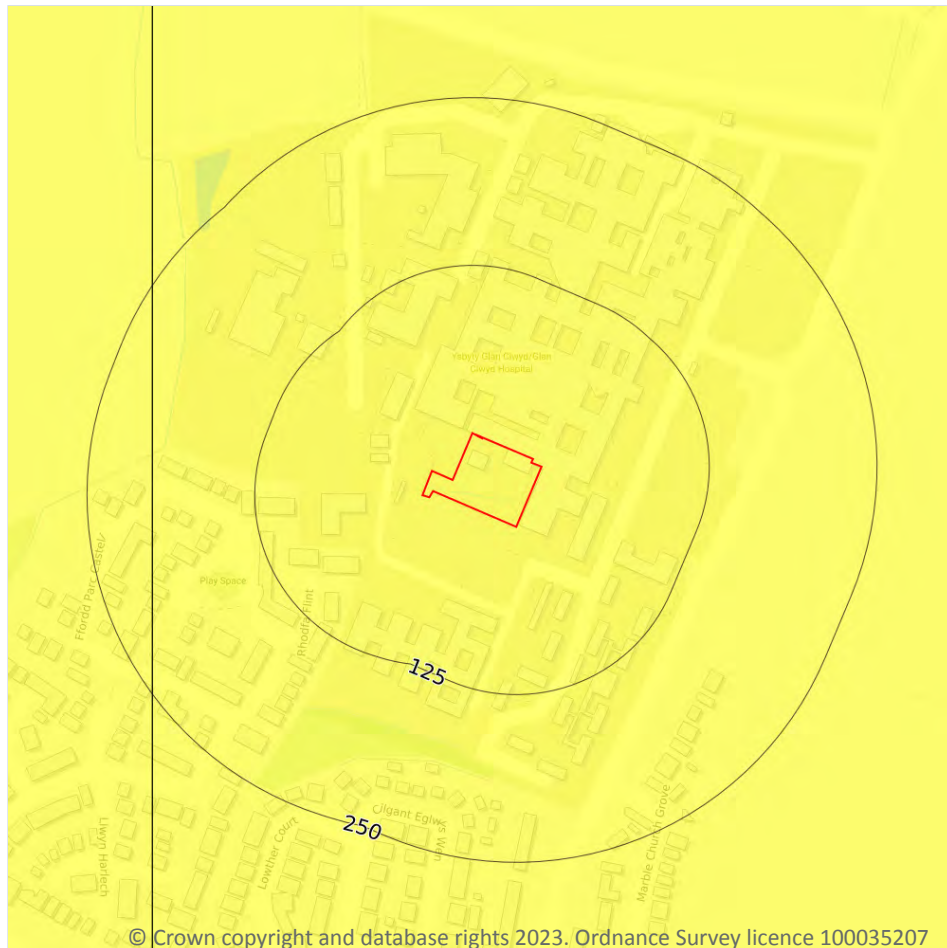
Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 79**

Location	Hazard rating	Details
On site	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.

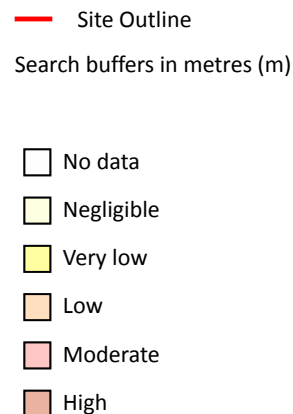
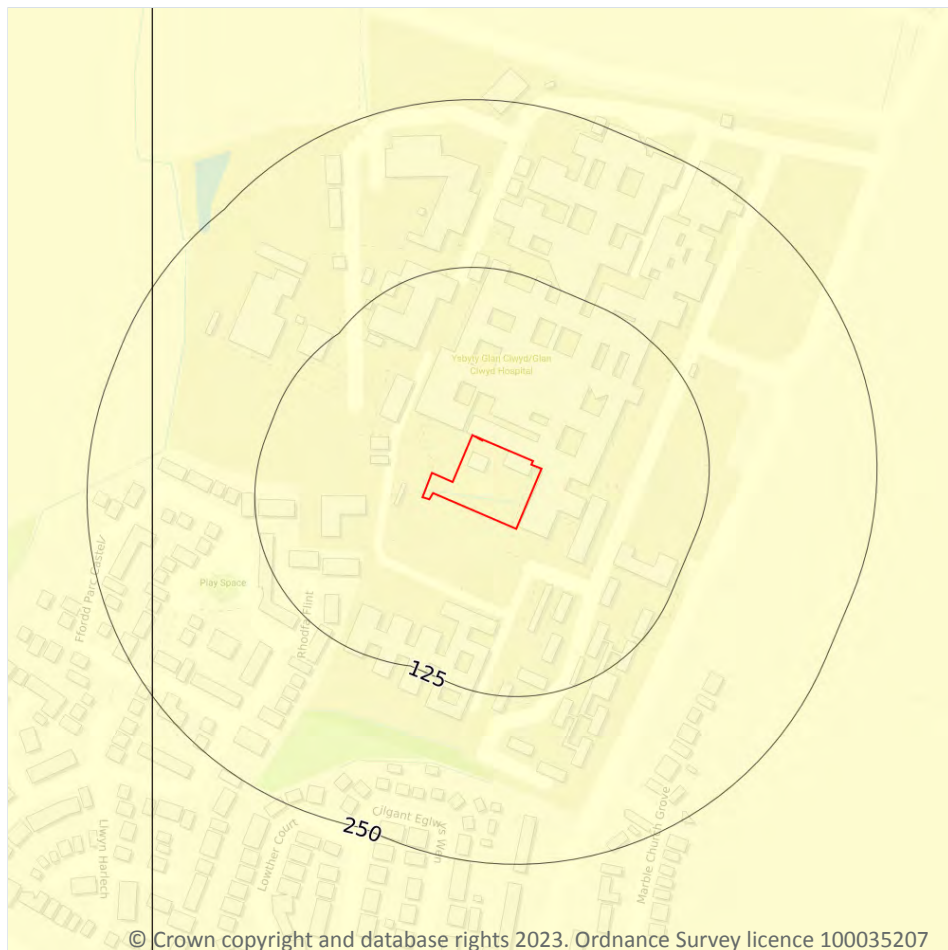
Features are displayed on the Natural ground subsidence - Running sands map on **page 80**

Location	Hazard rating	Details
On site	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.

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.

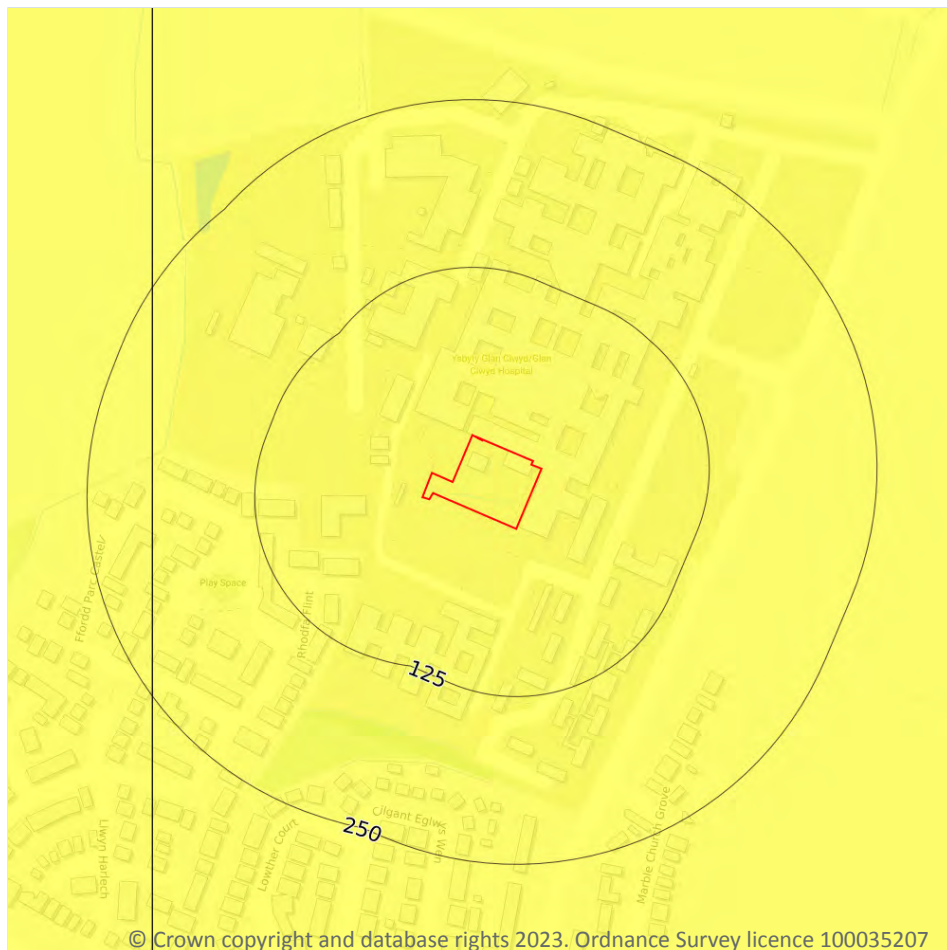
Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 81**

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

This data is sourced from the British Geological Survey.



Natural ground subsidence - Landslides



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☒ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.5 Landslides

Records within 50m

1

The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

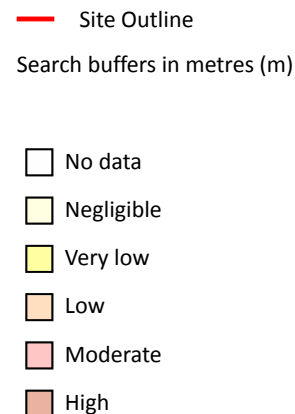
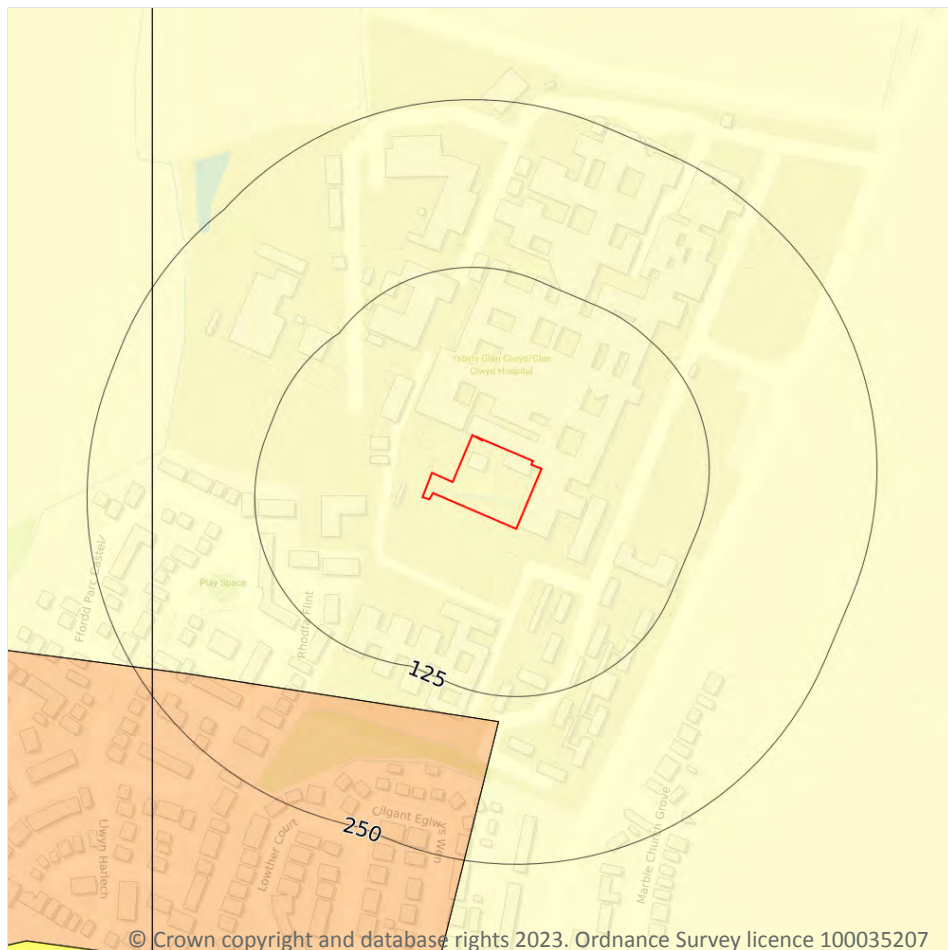
Features are displayed on the Natural ground subsidence - Landslides map on **page 83**

Location	Hazard rating	Details
On site	Very low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.

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.

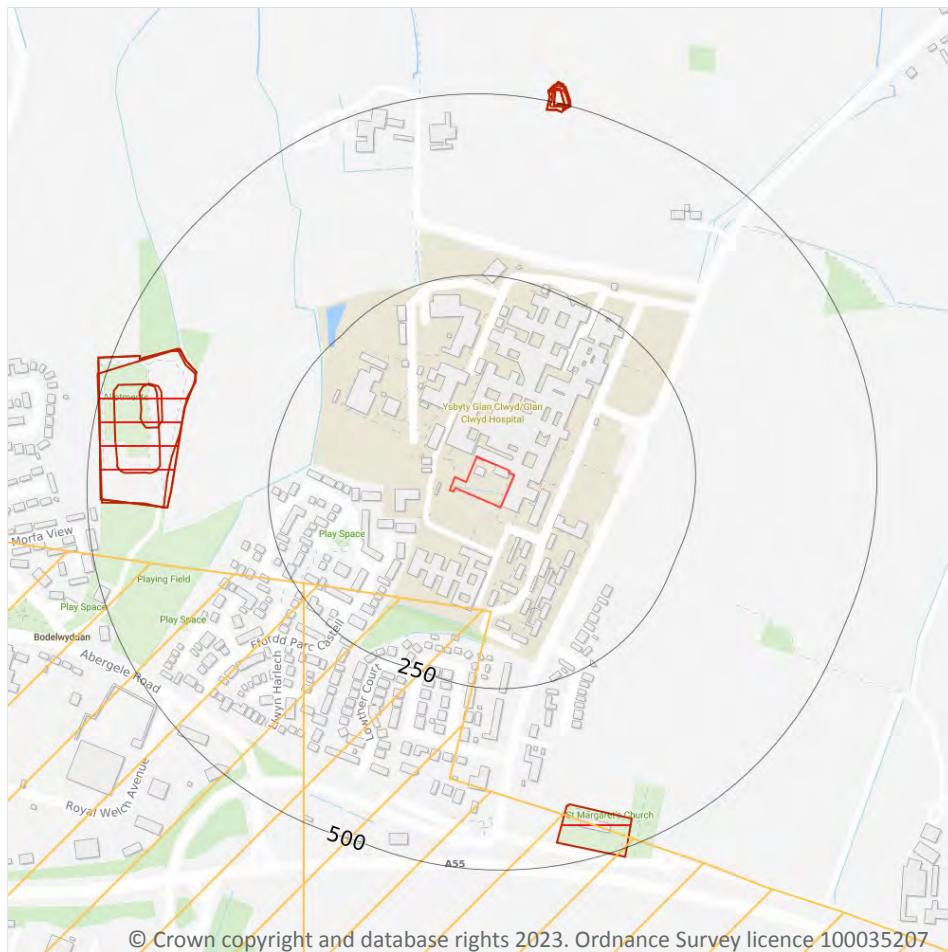
Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 84**

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, ground workings and natural cavities



- Site Outline
- Search buffers in metres (m)
- Natural cavities (Area)
- Natural cavities (Point)
- BritPits
- Surface ground workings
- Underground workings
- Historical Mineral Planning Areas
- Mining Cavities
- 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 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.

18.2 BritPits

Records within 500m

0

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.

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m

0

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.

This data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m

7

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, ground workings and natural cavities map on **page 85**

ID	Location	Land Use	Year of mapping	Mapping scale
-	677m S	Old Lead Shaft	1900	1:10560
-	680m S	Old Lead Shaft	1949	1:10560
-	682m S	Unspecified Old Shaft	1960	1:10560
-	737m S	Old Lead Shaft	1900	1:10560
-	744m S	Old Lead Shaft	1949	1:10560
-	745m S	Unspecified Old Shaft	1960	1:10560
-	867m S	Lead Level	1871	1:10560

This data is sourced from Ordnance Survey/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

10

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, ground workings and natural cavities map on **page 85**

ID	Location	Name	Commodity	Class	Likelihood
1	144m S	Not available	Vein Mineral	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
2	239m SW	Not available	Vein Mineral	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
-	801m S	Not available	Vein Mineral	D	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
-	825m S	Not available	Vein Mineral	D	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
-	897m S	Not available	Vein Mineral	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
-	897m S	Not available	Vein Mineral	D	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered



ID	Location	Name	Commodity	Class	Likelihood
-	901m S	Not available	Vein Mineral	E	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
-	910m S	Not available	Vein Mineral	E	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
-	920m S	Not available	Vein Mineral	E	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
-	937m S	Not available	Vein Mineral	E	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered

This data is sourced from the British Geological Survey.

18.7 Mining cavities

Records within 1000m

1

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.

Features are displayed on the Mining, ground workings and natural cavities map on **page 85**

ID	Location	Mine Address	Mineral	Data source	Publisher
-	829m S	Bodelwyddan, Clwyd	Lead	THE GEOLOGY OF THE COUNTRY AROUND RHYL AND DENBIGH	HMSO

This data is sourced from Stantec UK Ltd.

18.8 JPB mining areas

Records on site

0

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

This data is sourced from Johnson Poole and Bloomer.



18.9 Coal mining

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

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

This data is sourced from the Coal Authority.

18.10 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.

18.11 Gypsum areas

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

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.12 Tin mining

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

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

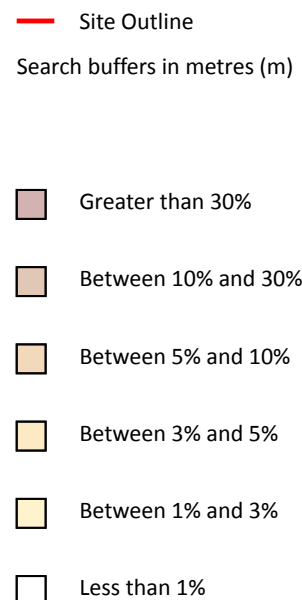
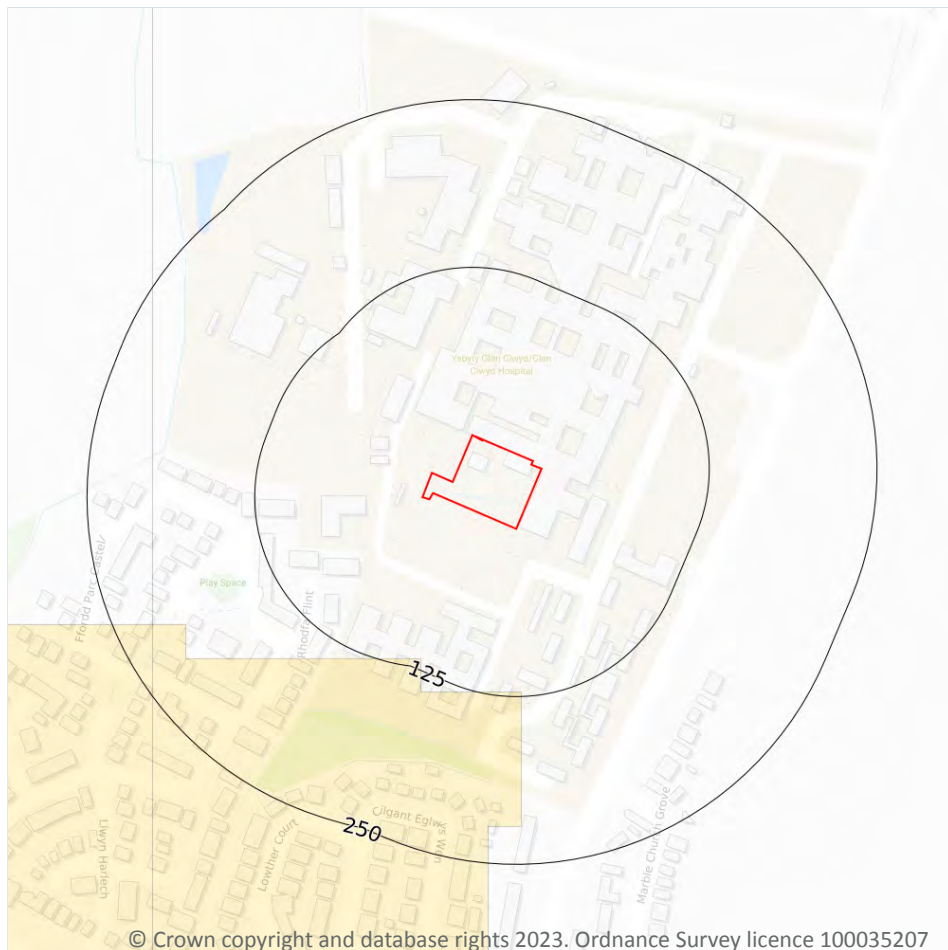
18.13 Clay mining

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 Radon



19.1 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 90**

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None



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



20 Soil chemistry

20.1 BGS Estimated Background Soil Chemistry

Records within 50m

3

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 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
33m N	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
33m N	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.

20.2 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.

20.3 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.



21 Railway infrastructure and projects

21.1 Underground railways (London)

Records within 250m

0

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

21.2 Underground railways (Non-London)

Records within 250m

0

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

This data is sourced from publicly available information by Groundsure.

21.3 Railway tunnels

Records within 250m

0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m

0

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.

This data is sourced from Ordnance Survey/Groundsure.

21.5 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.

21.6 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.

21.7 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.

21.8 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.

21.9 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.

21.10 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

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Map Name: County Series

Map date: 1871

Scale: 1:2,500

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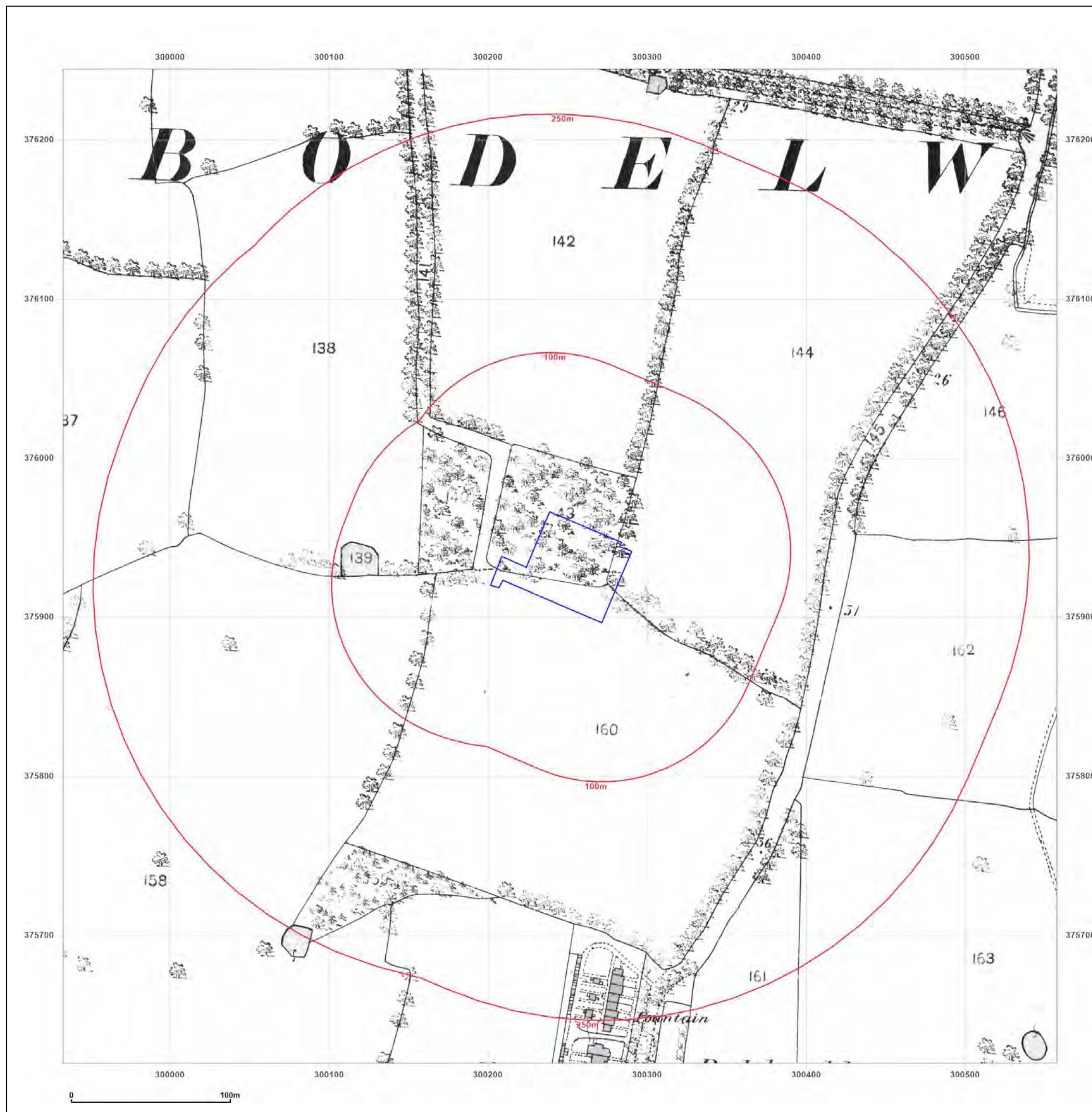


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Map Name: County Series

Map date: 1899

Scale: 1:2,500

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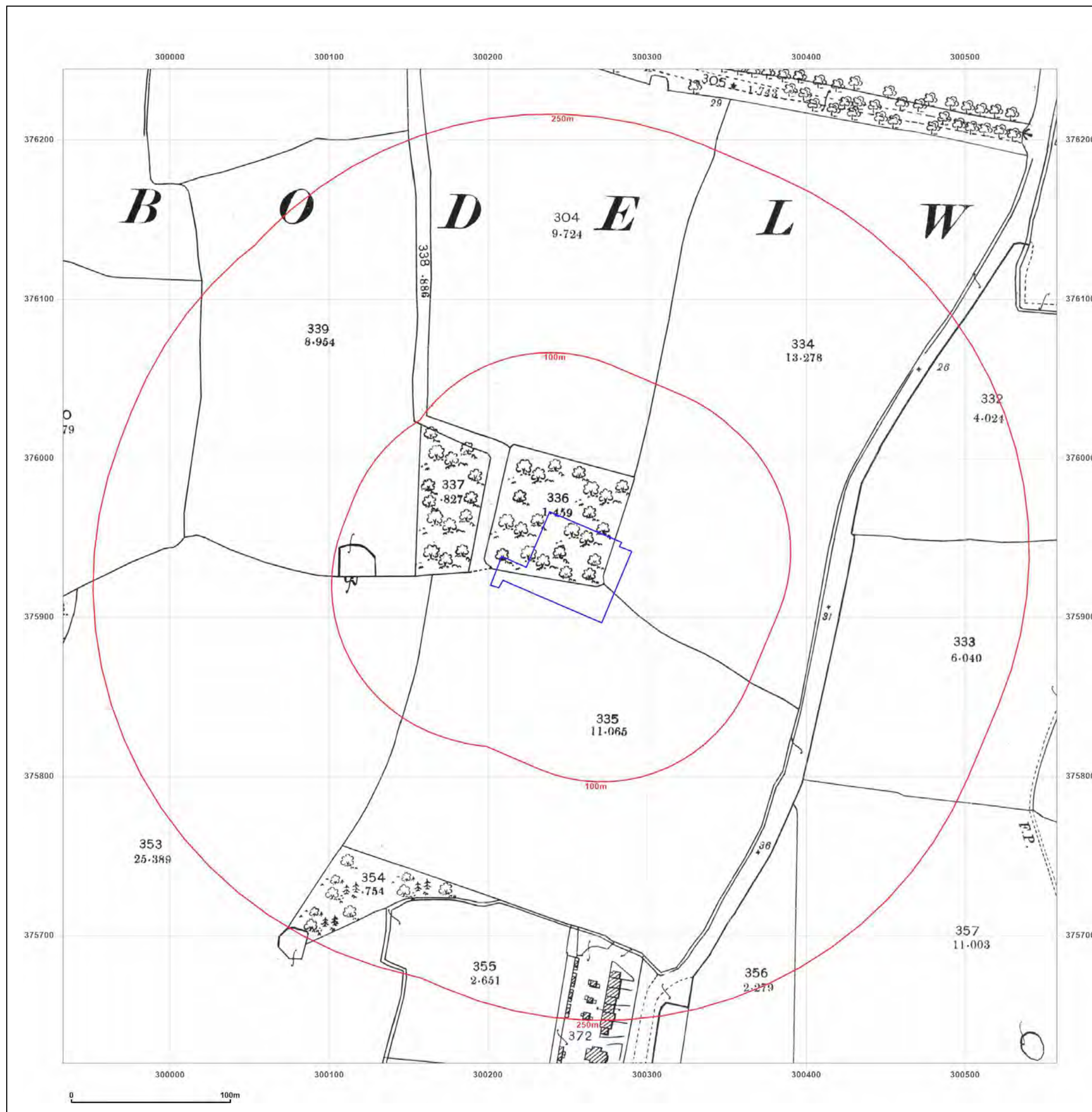


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Map Name: County Series

Map date: 1912

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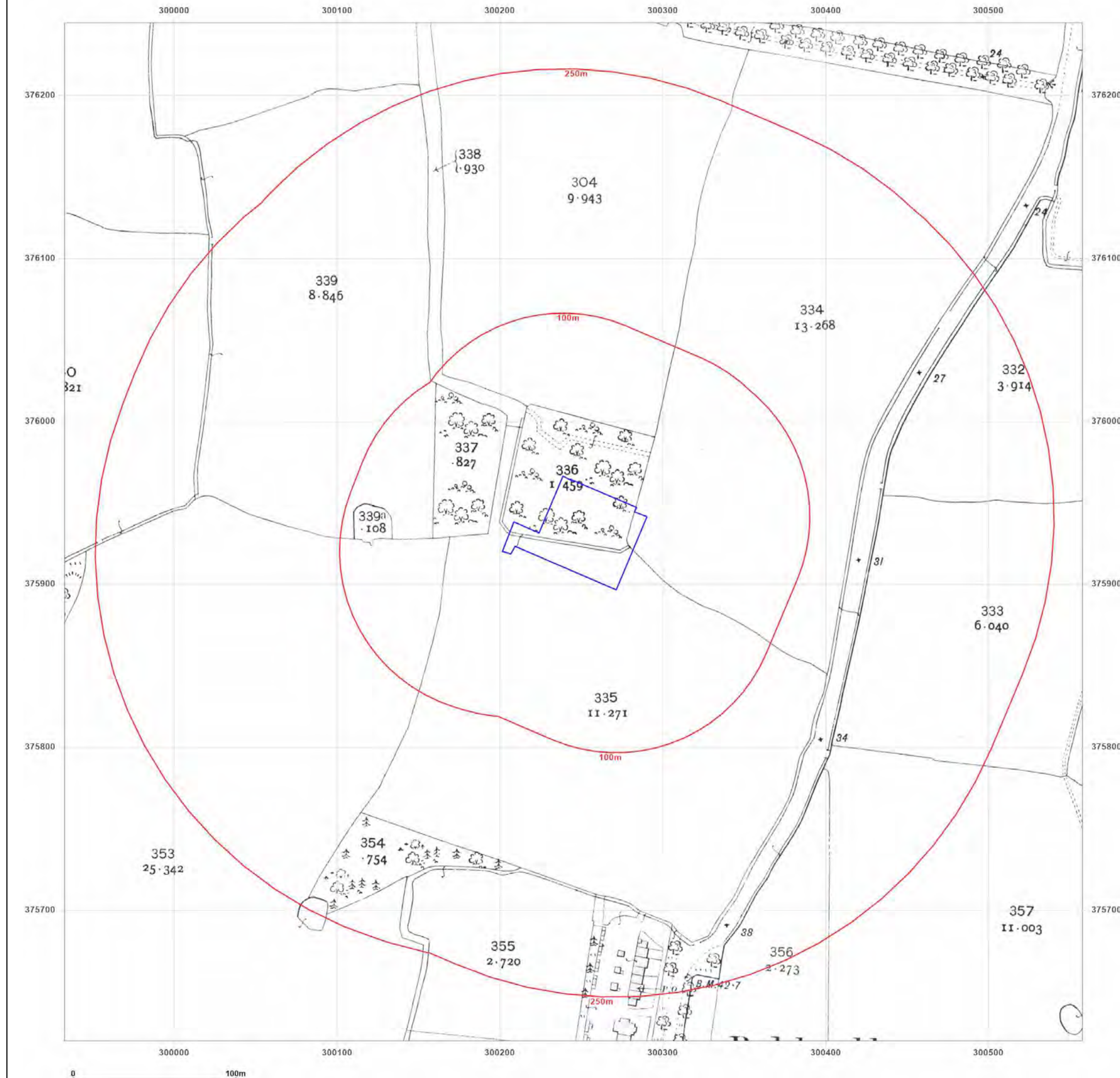


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Map Name: National Grid

Map date: 1961-1962

Scale: 1:2,500

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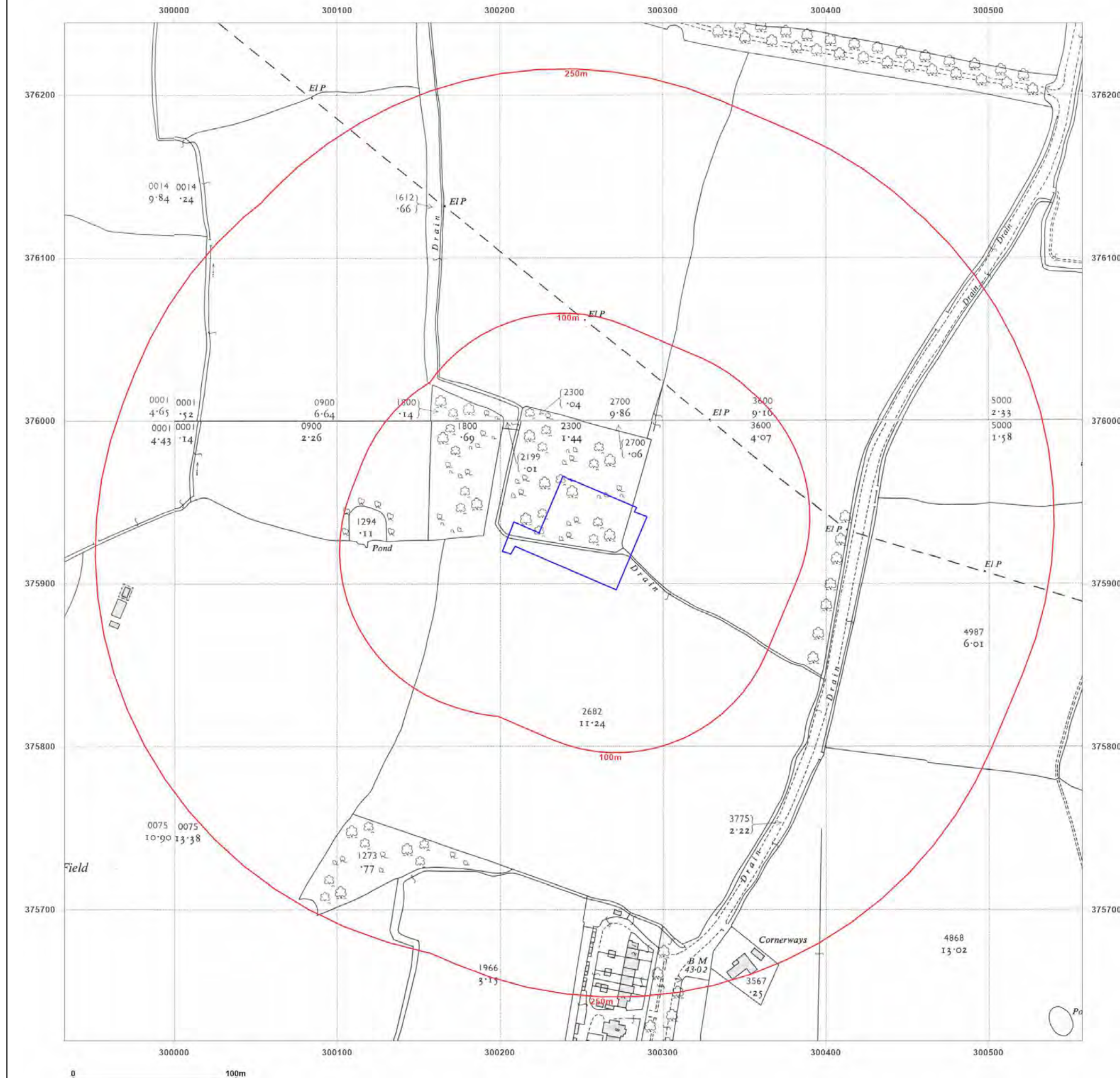
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Map Name: National Grid

Map date: 1962

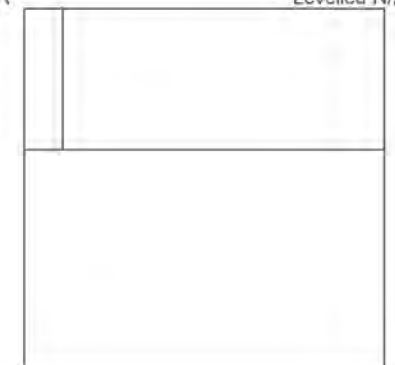
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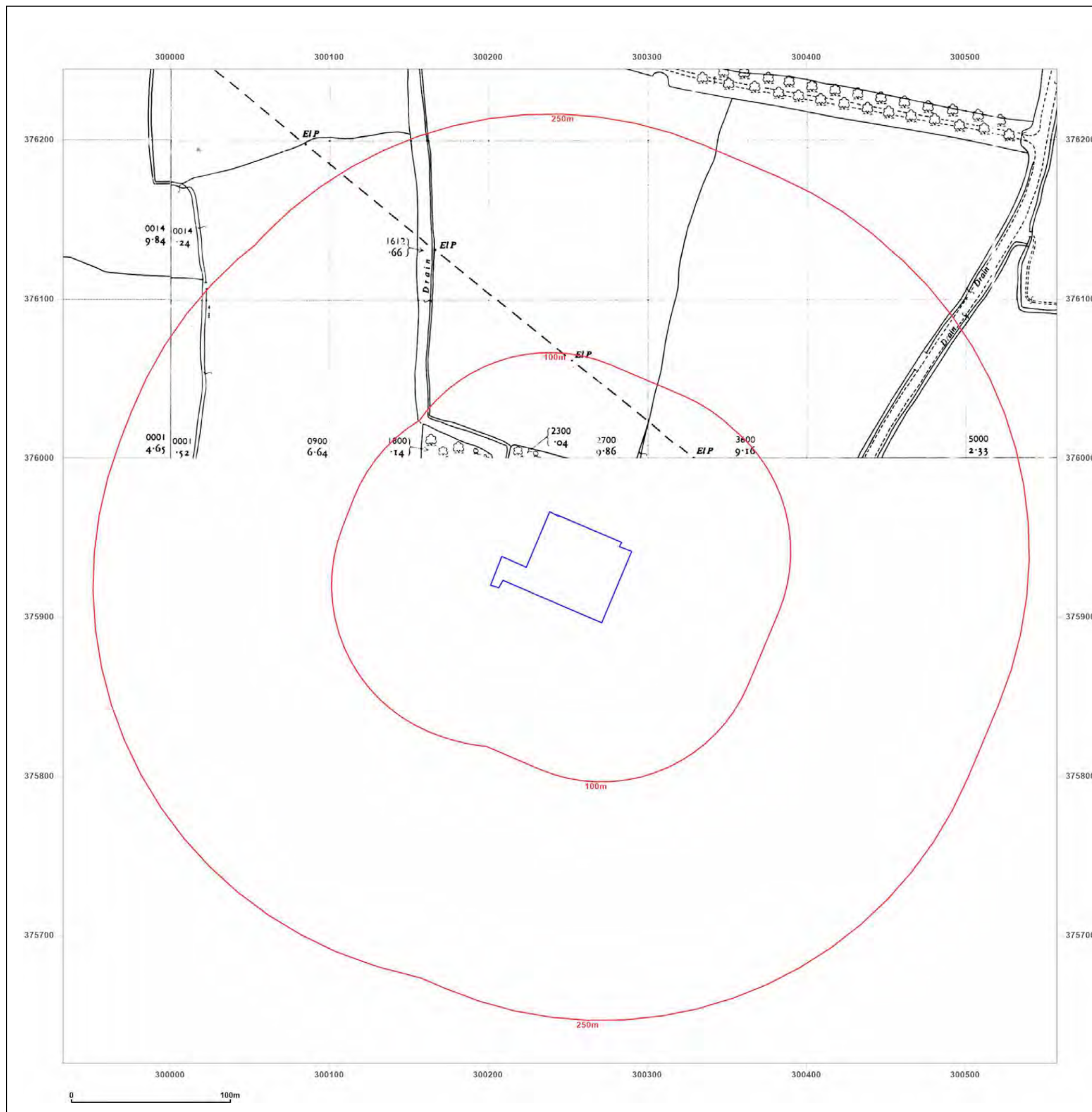


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Map Name: National Grid

Map date: 1970-1971

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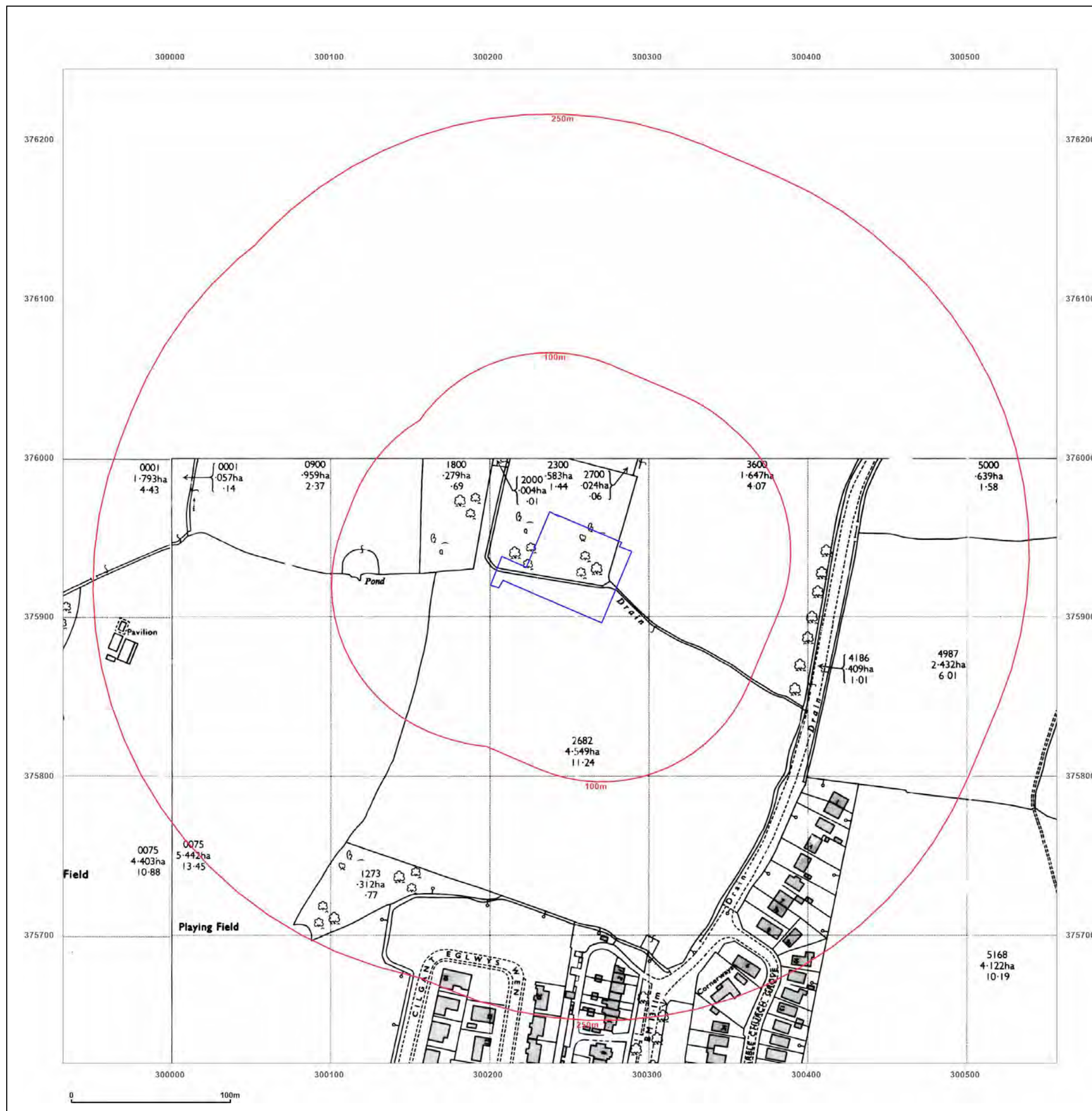


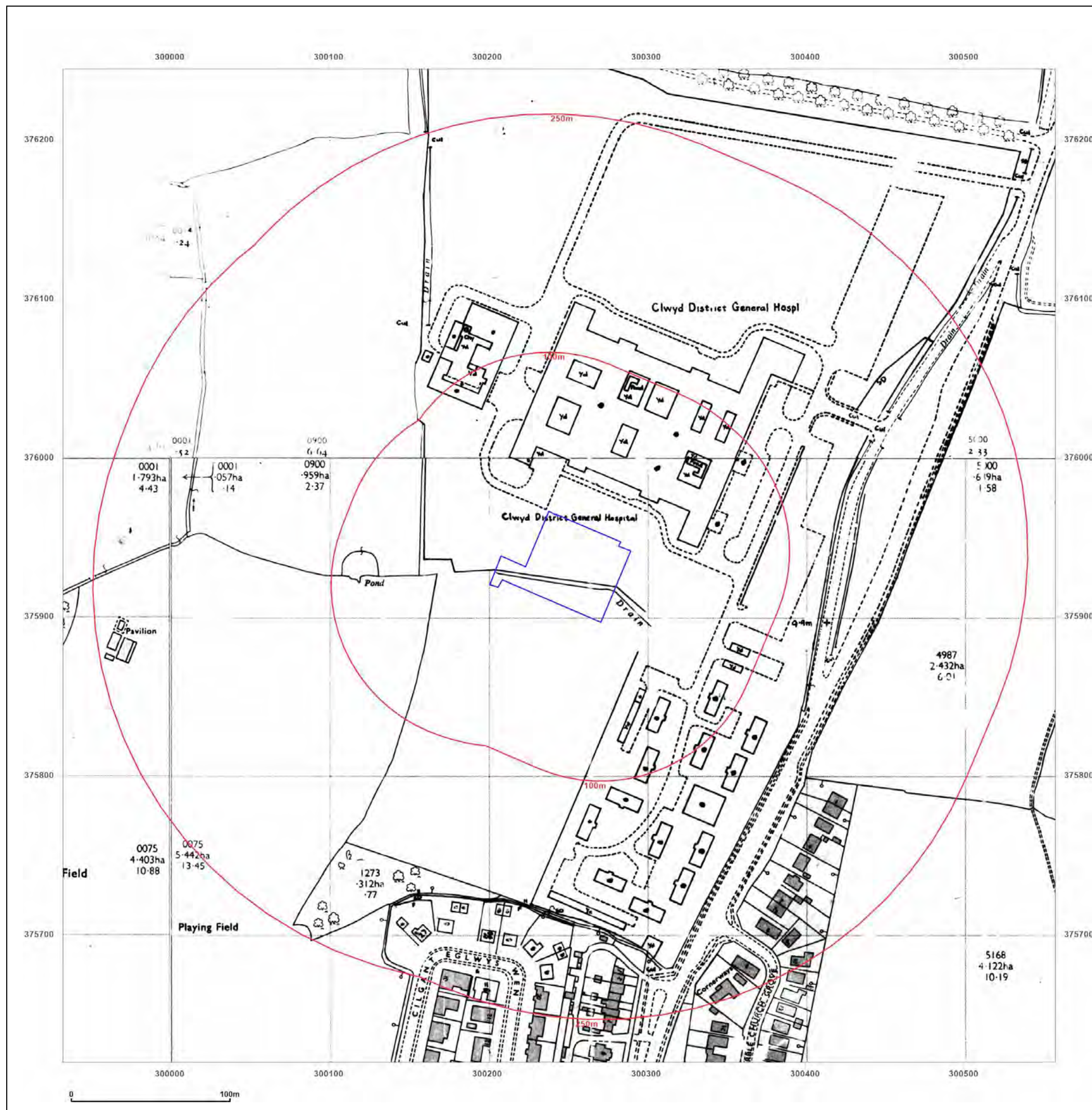
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Map Name: National Grid

Map date: 1978-1981

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Map Name: National Grid

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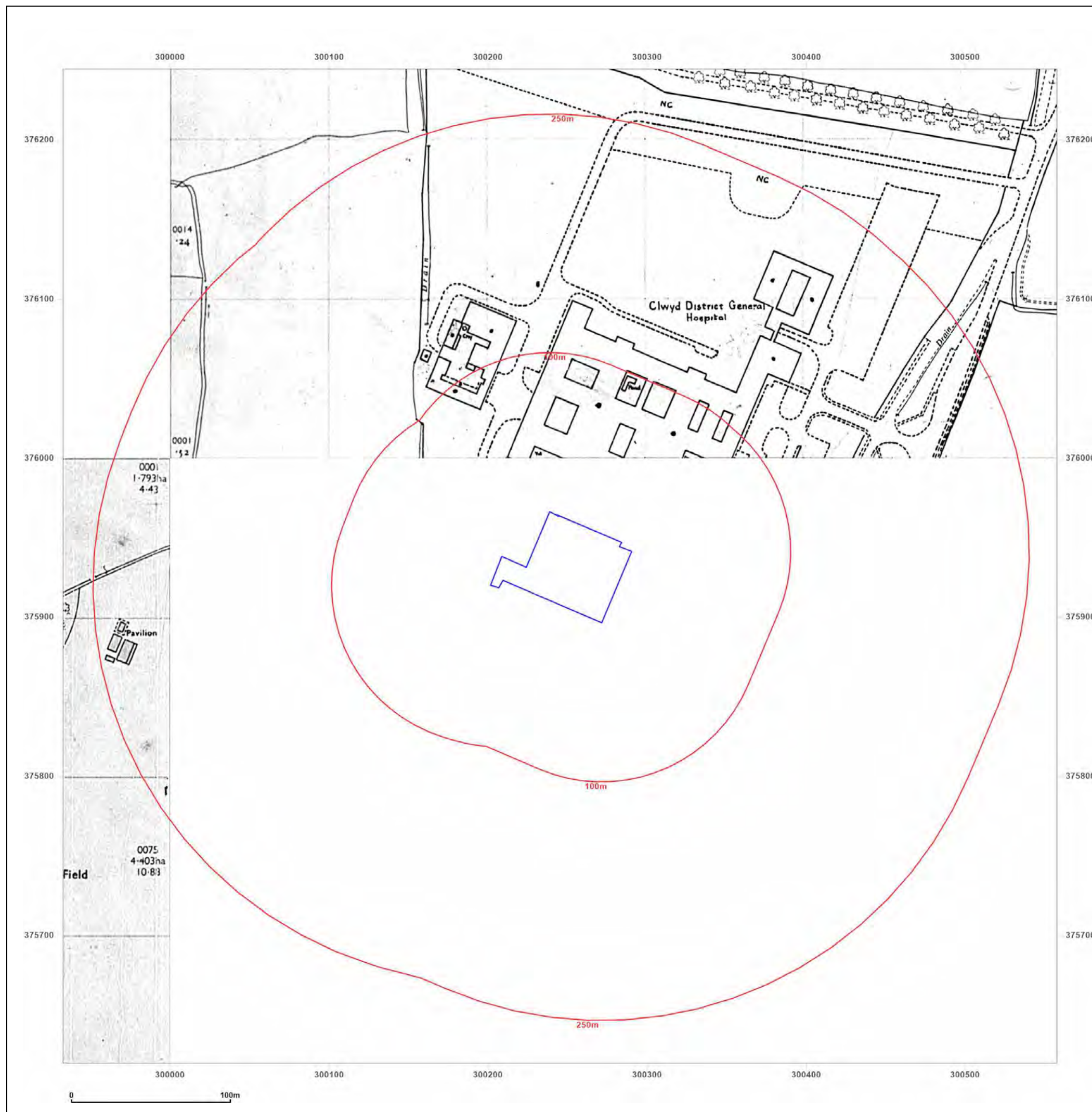


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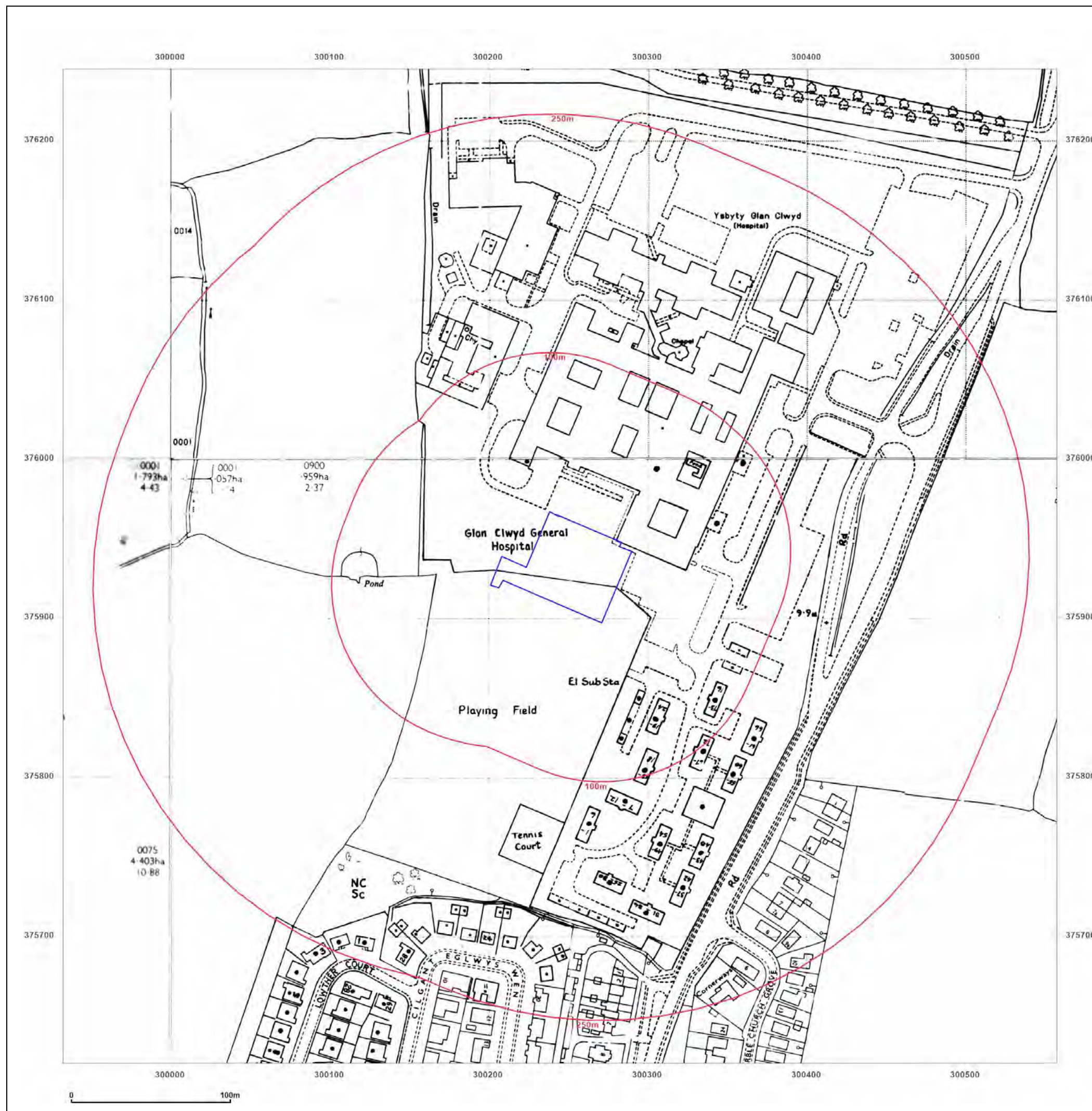


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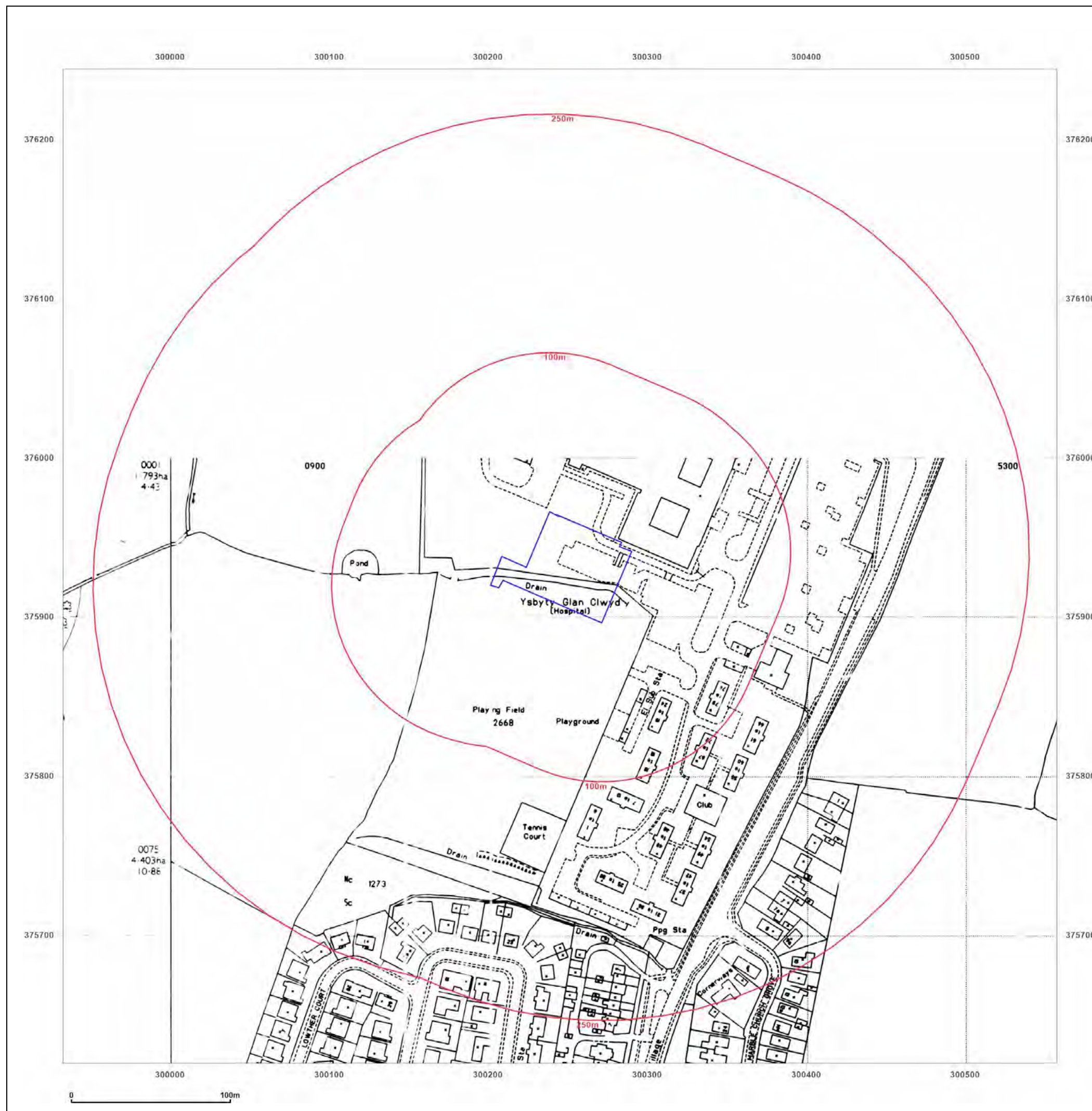


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Map Name: National Grid

Map date: 1989-1994

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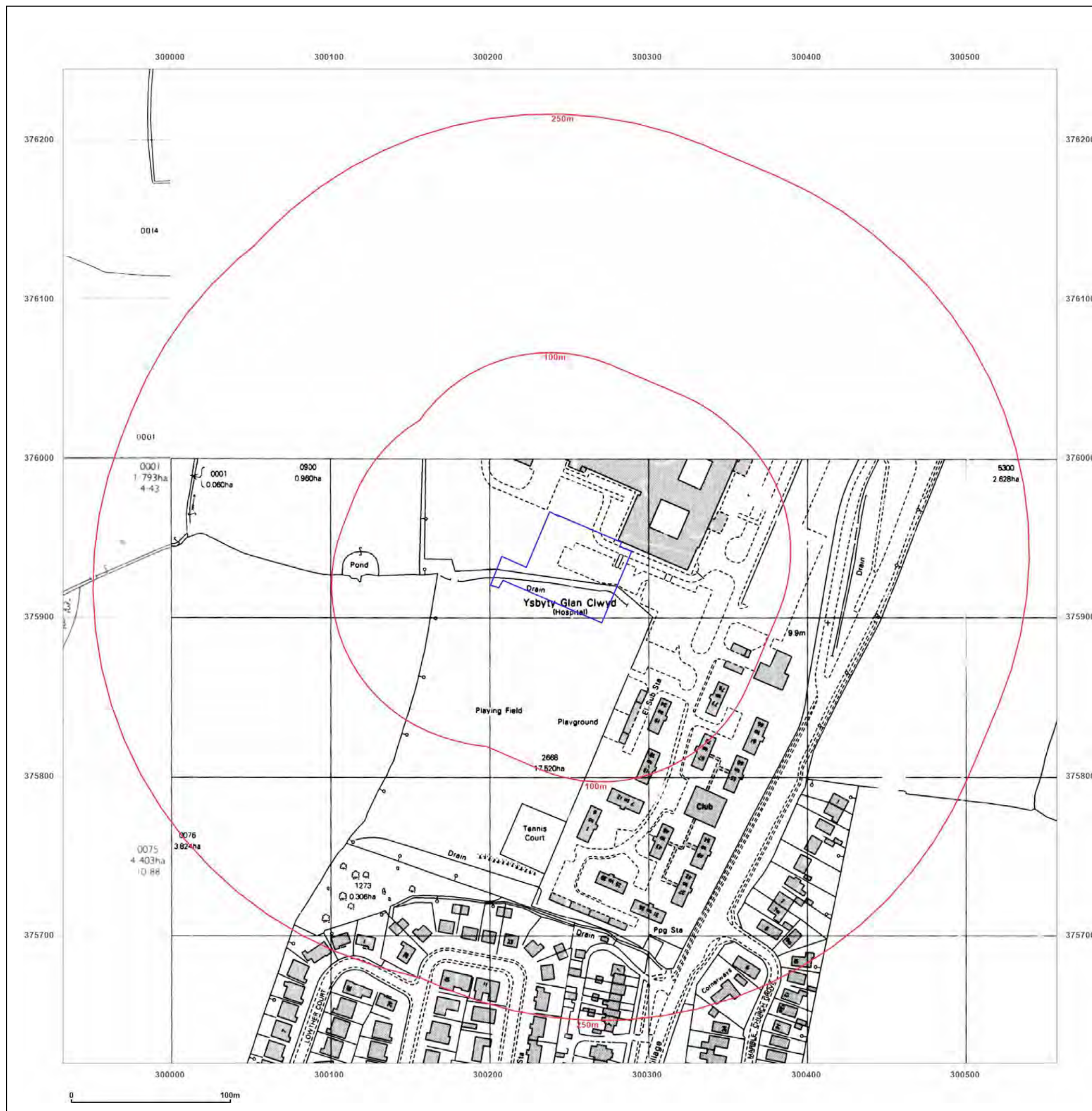


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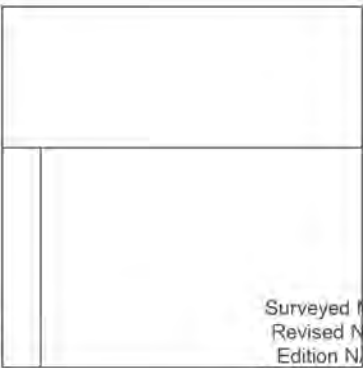
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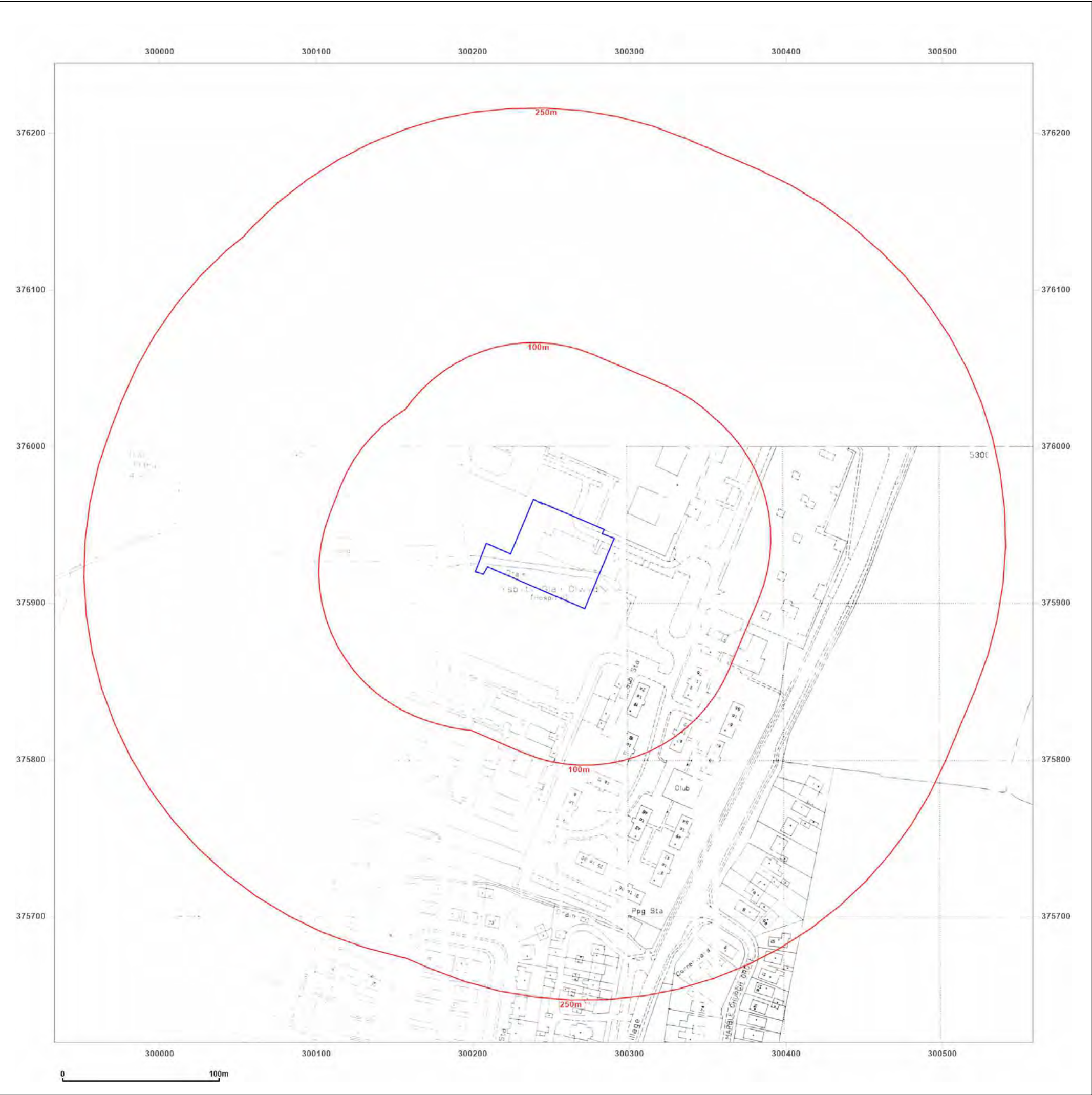


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Report Ref: RMBL-9335427
Grid Ref: 300245, 375932

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250

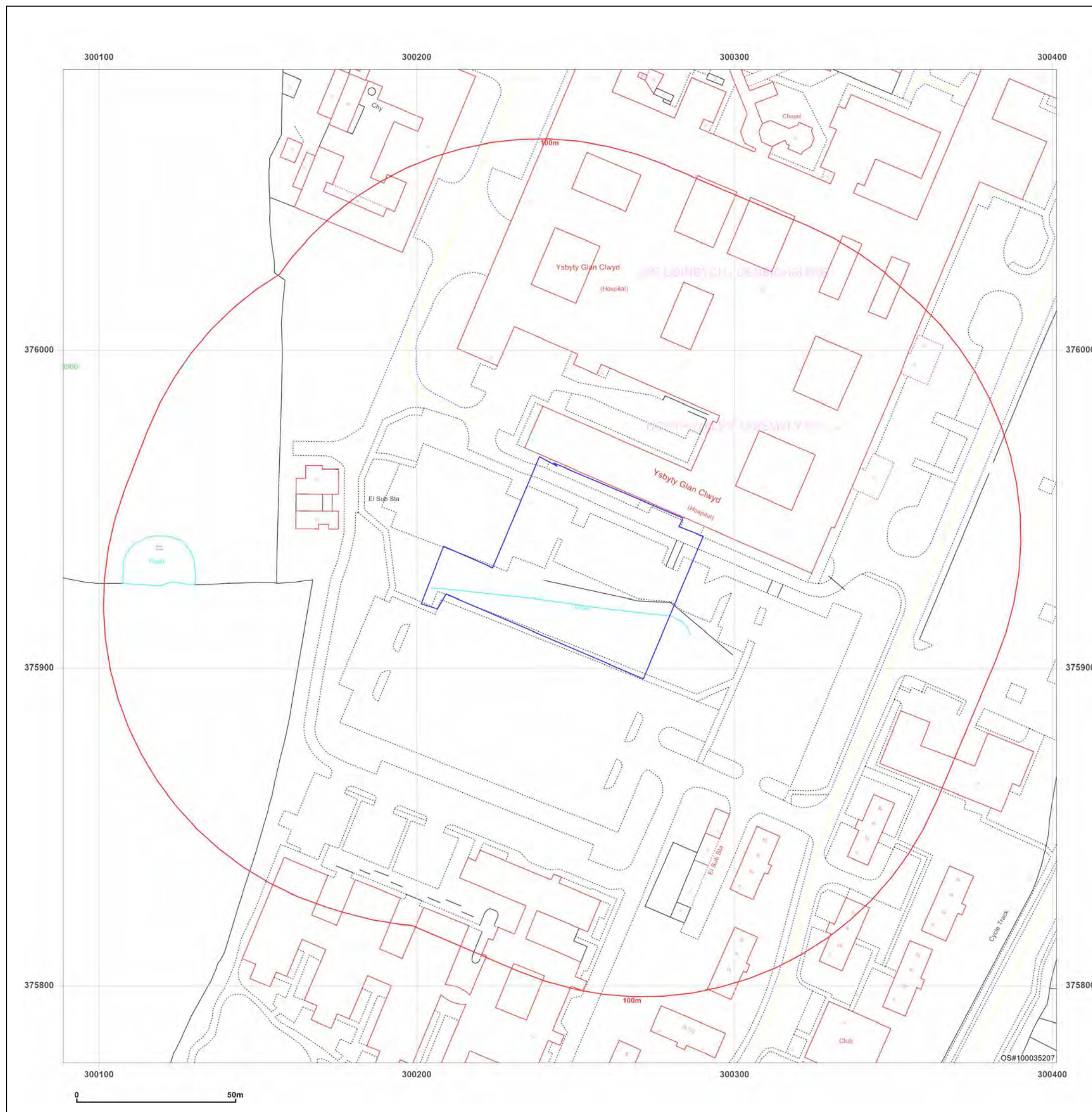


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Site Details:

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RHUDDLAN ROAD,
BODELWYDDAN, RHYL, LL18
5UJ

Client Ref: PO_1620053301
Report Ref: RMBL-9335427
Grid Ref: 300245, 375932

Map Name: County Series

Map date: 1900

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1870
Revised 1900
Edition N/A
Copyright N/A
Levelled N/A

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



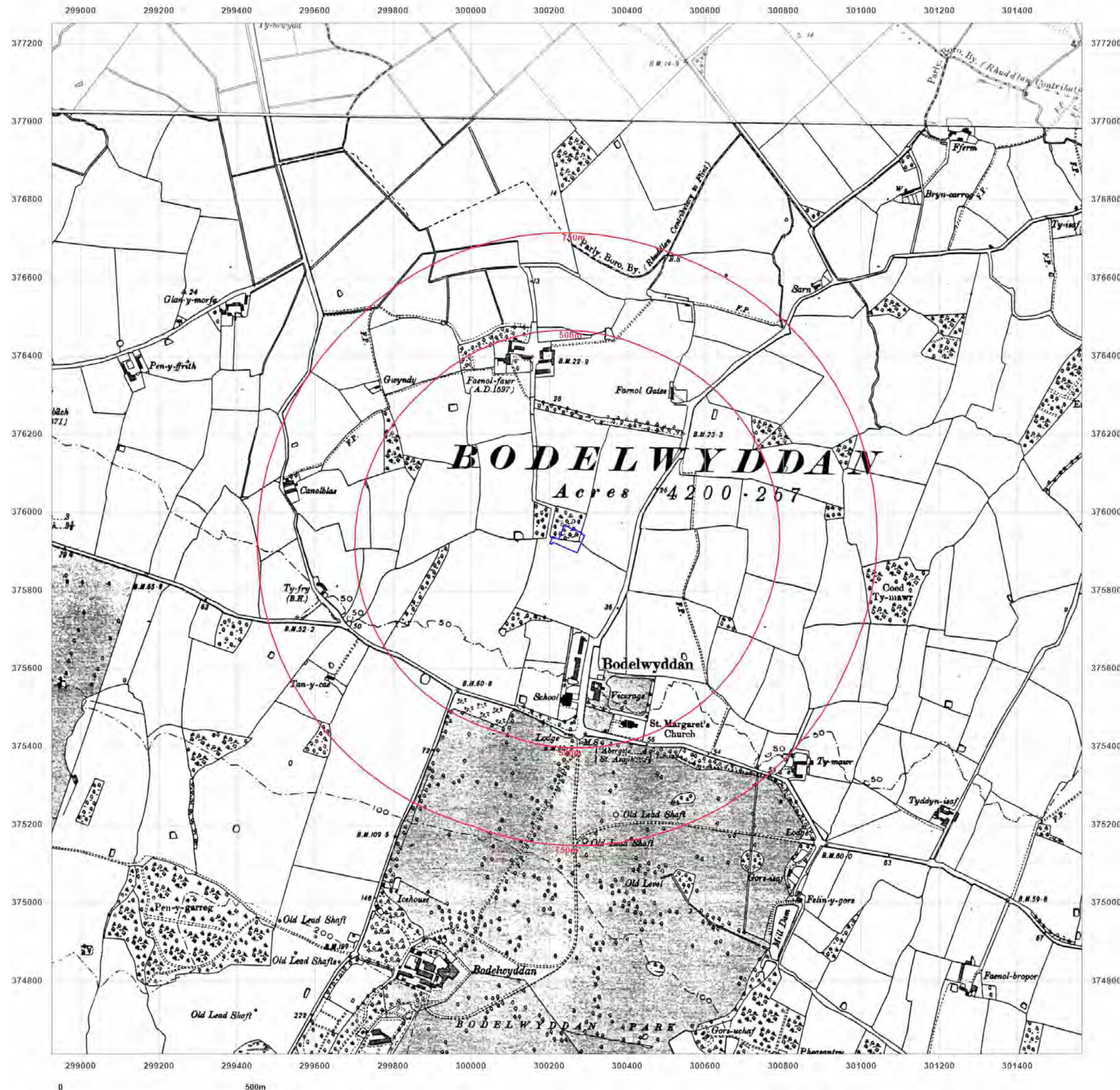
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5UJ

Client Ref: PO_1620053301
Report Ref: RMBL-9335427
Grid Ref: 300245, 375932

Map Name: County Series

Map date: 1900

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1871
Revised 1900
Edition N/A
Copyright N/A
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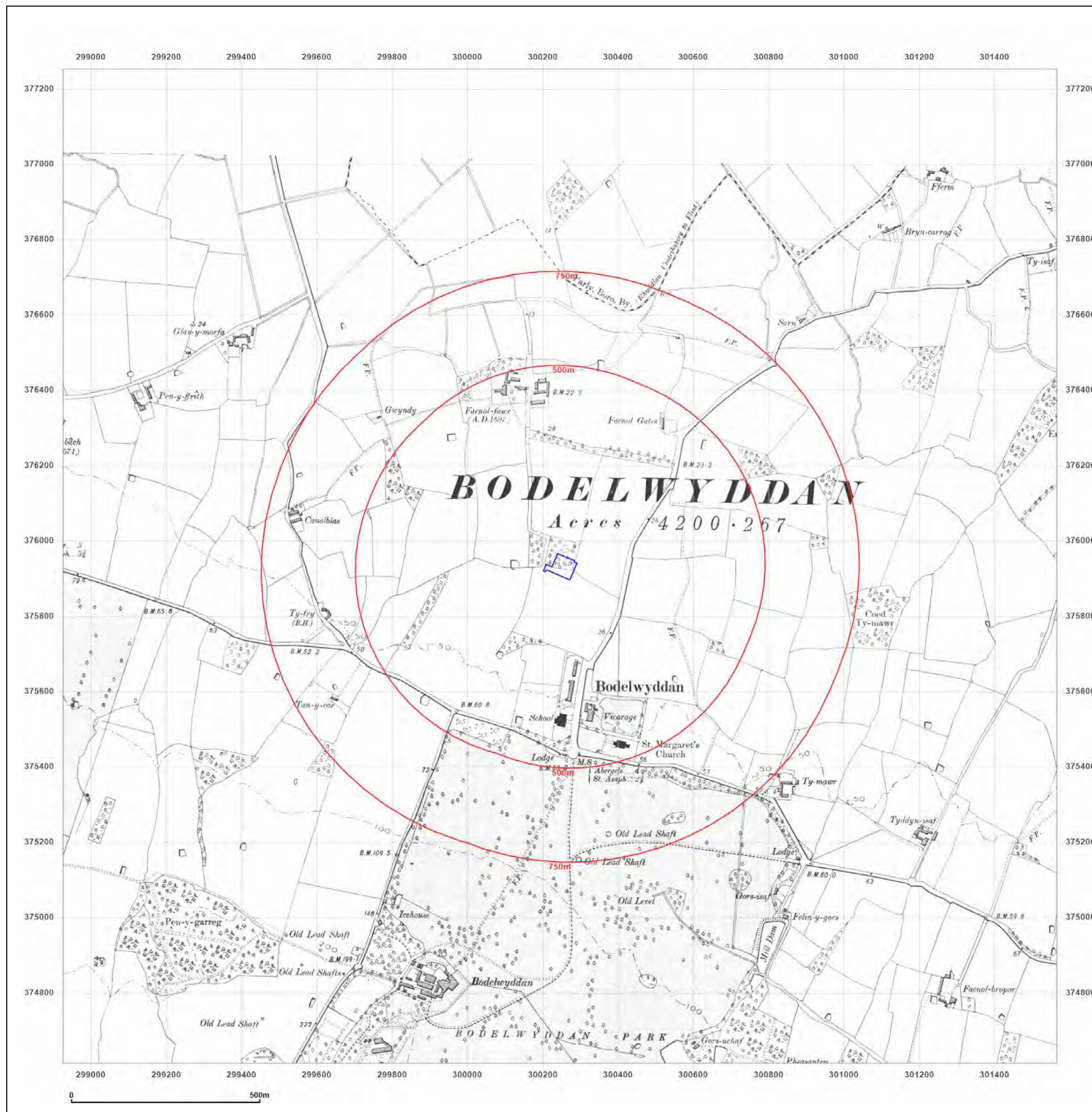
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Client Ref: PO_1620053301
Report Ref: RMBL-9335427
Grid Ref: 300245, 375932

Map Name: County Series

Map date: 1911-1914

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1870
Revised 1911
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1872
Revised 1914
Edition 1914
Copyright N/A
Levelled N/A



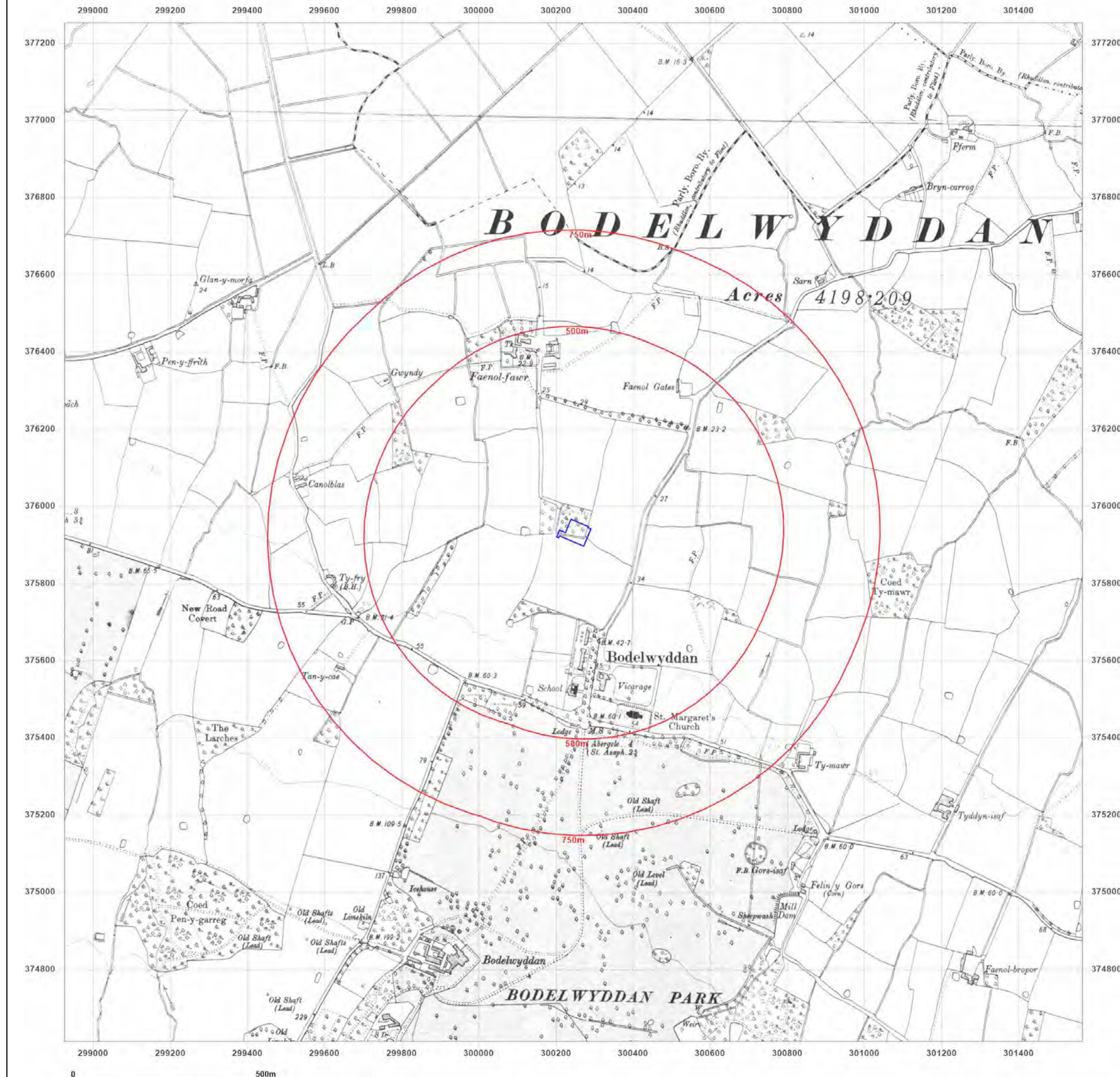
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Client Ref: PO_1620053301
Report Ref: RMBL-9335427
Grid Ref: 300245, 375932

Map Name: Provisional

Map date: 1959-1964

Scale: 1:10,560

Printed at: 1:10,560



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Surveyed 1960
Revised 1960
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1959
Revised 1959
Edition N/A
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Levelled N/A

Surveyed 1959
Revised 1959
Edition N/A
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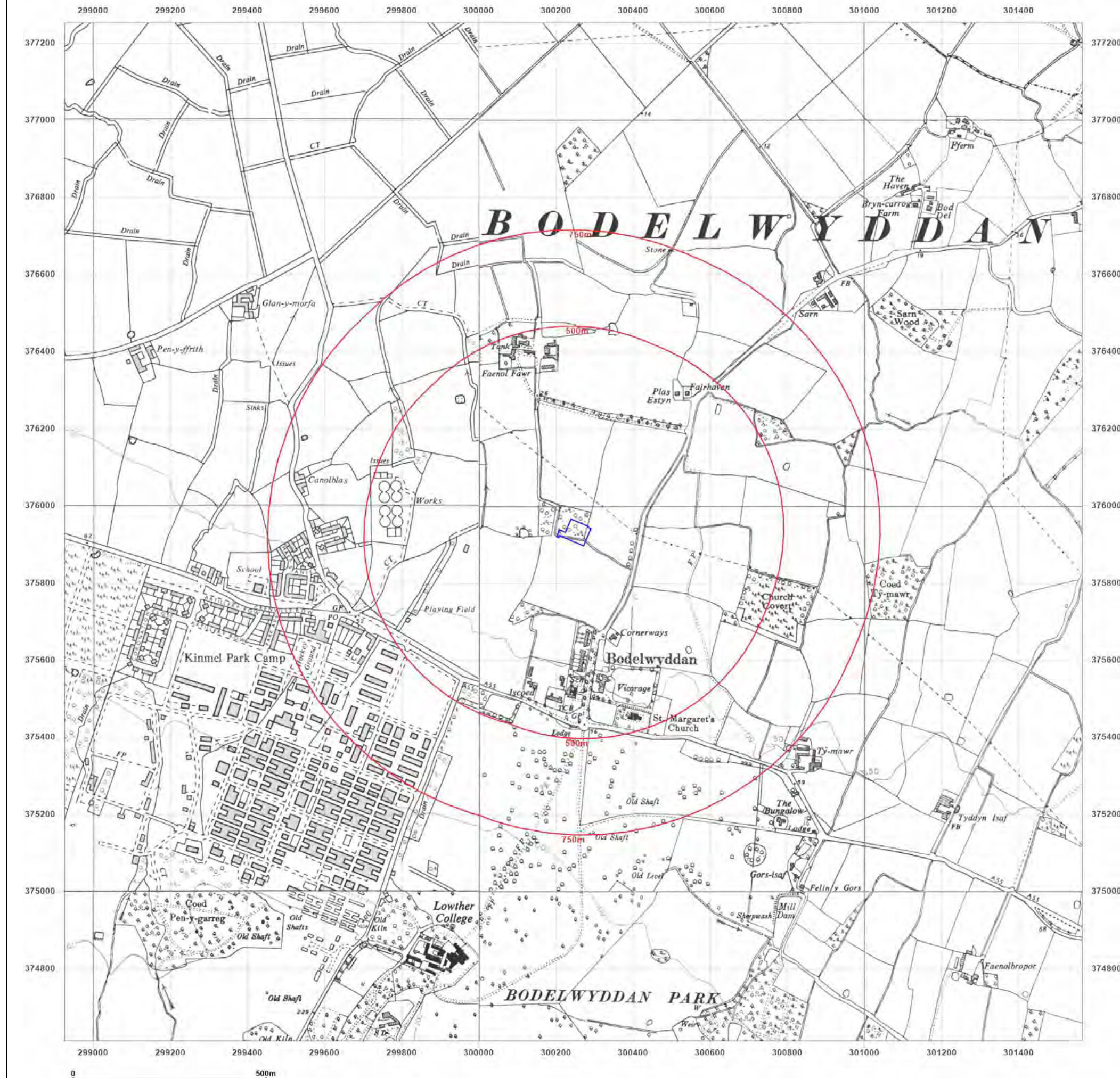
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Client Ref: PO_1620053301
Report Ref: RMBL-9335427
Grid Ref: 300245, 375932

Map Name: Provisional

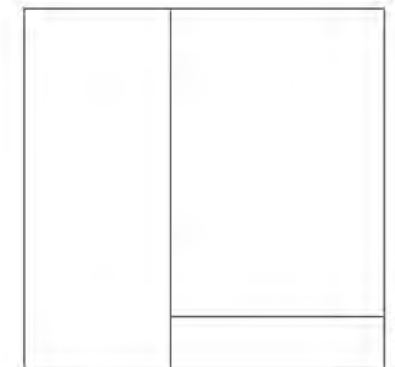
Map date: 1966-1968

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1968
Revised 1968
Edition N/A
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Levelled N/A



Surveyed 1966
Revised 1966
Edition N/A
Copyright N/A
Levelled N/A

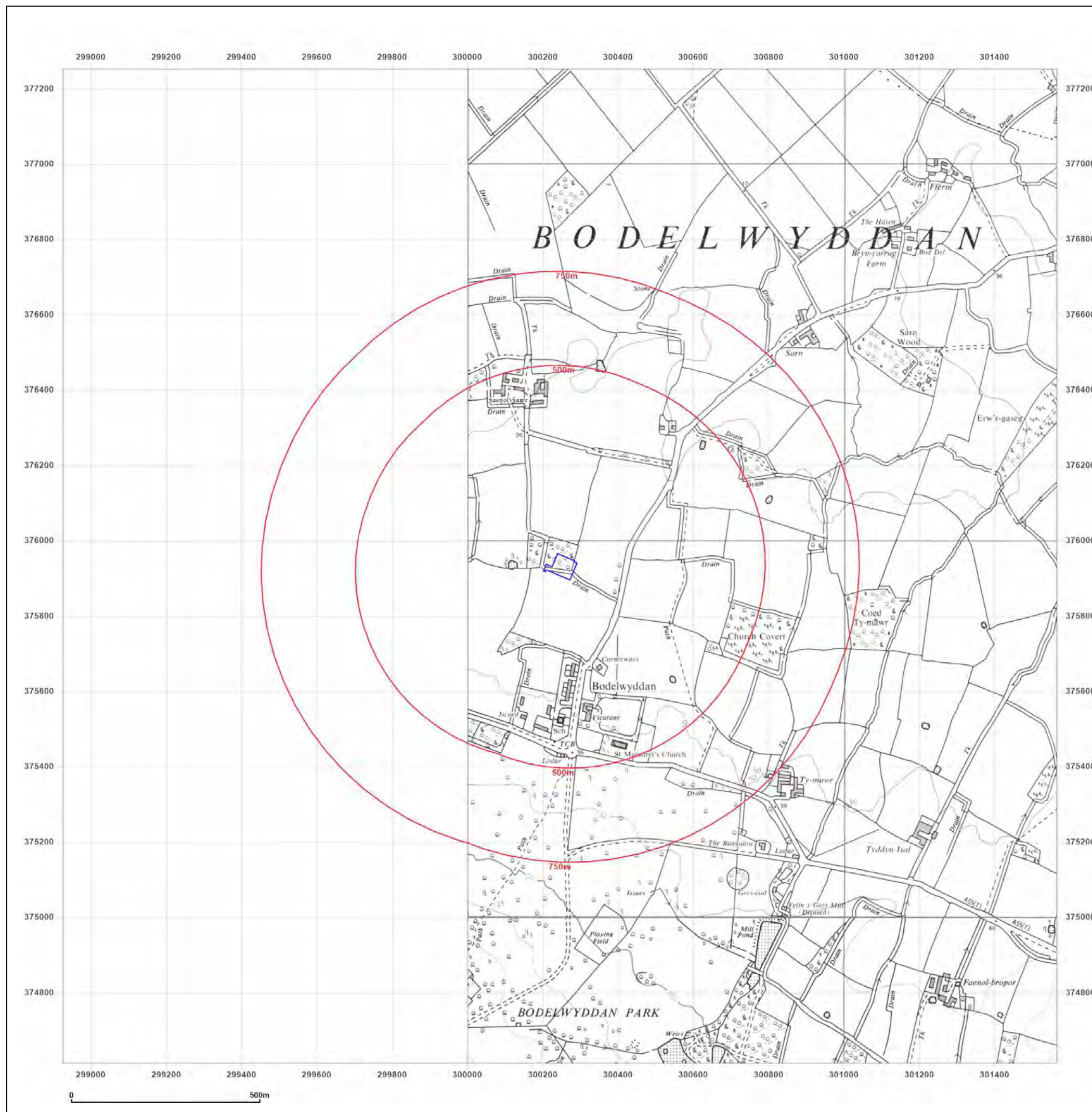


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Client Ref: PO_1620053301
Report Ref: RMBL-9335427
Grid Ref: 300245, 375932

Map Name: National Grid

Map date: 1978-1982

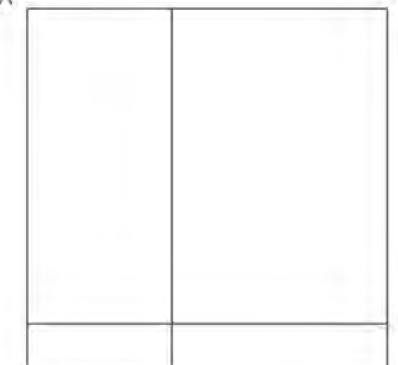
Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1977
Revised 1980
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1976
Revised 1982
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1973
Revised 1978
Edition N/A
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Client Ref: PO_1620053301
Report Ref: RMBL-9335427
Grid Ref: 300245, 375932

Map Name: National Grid

Map date: 2001

Scale: 1:10,000

Printed at: 1:10,000

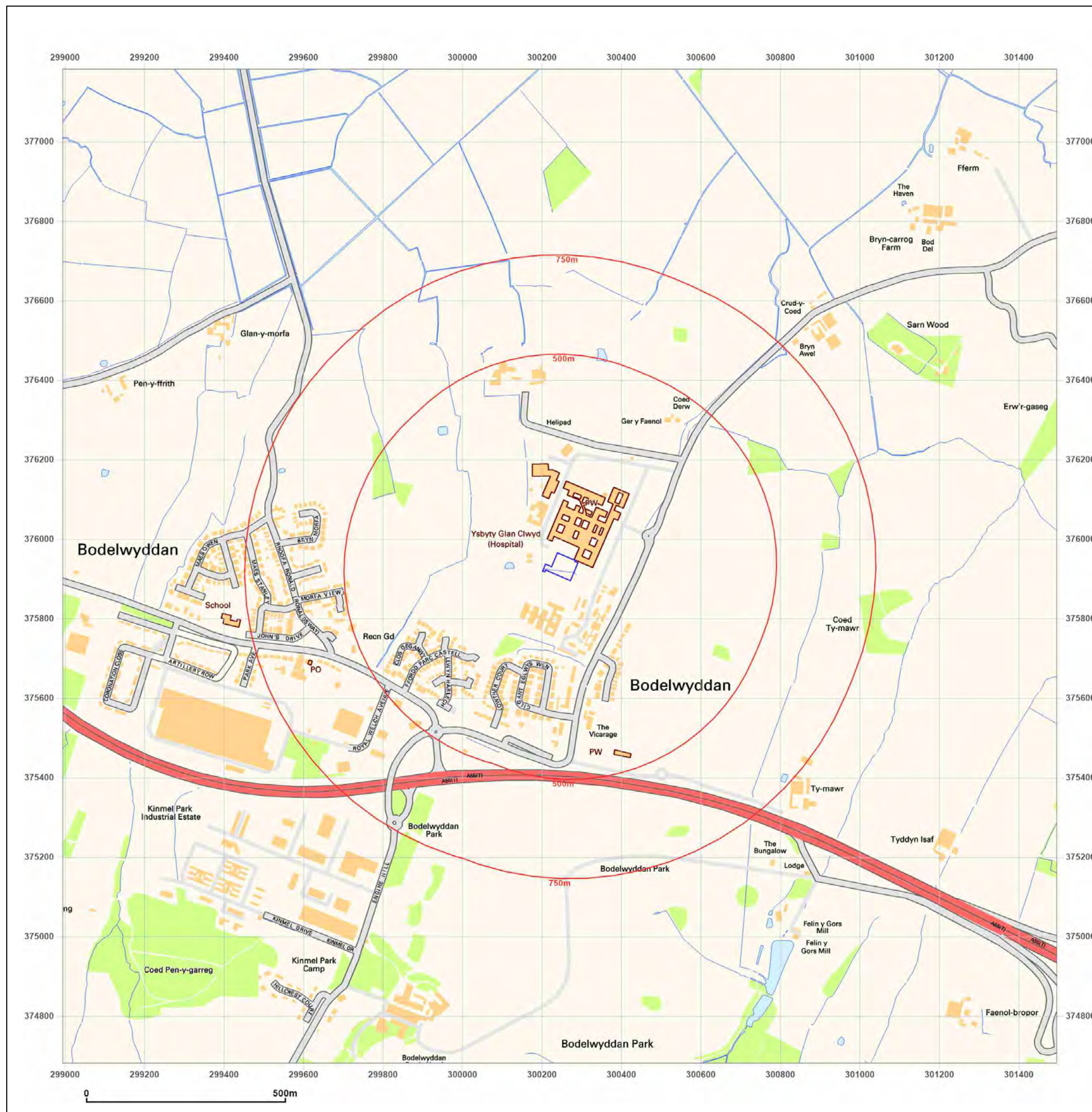


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Client Ref: PO_1620053301
Report Ref: RMBL-9335427
Grid Ref: 300245, 375932

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000

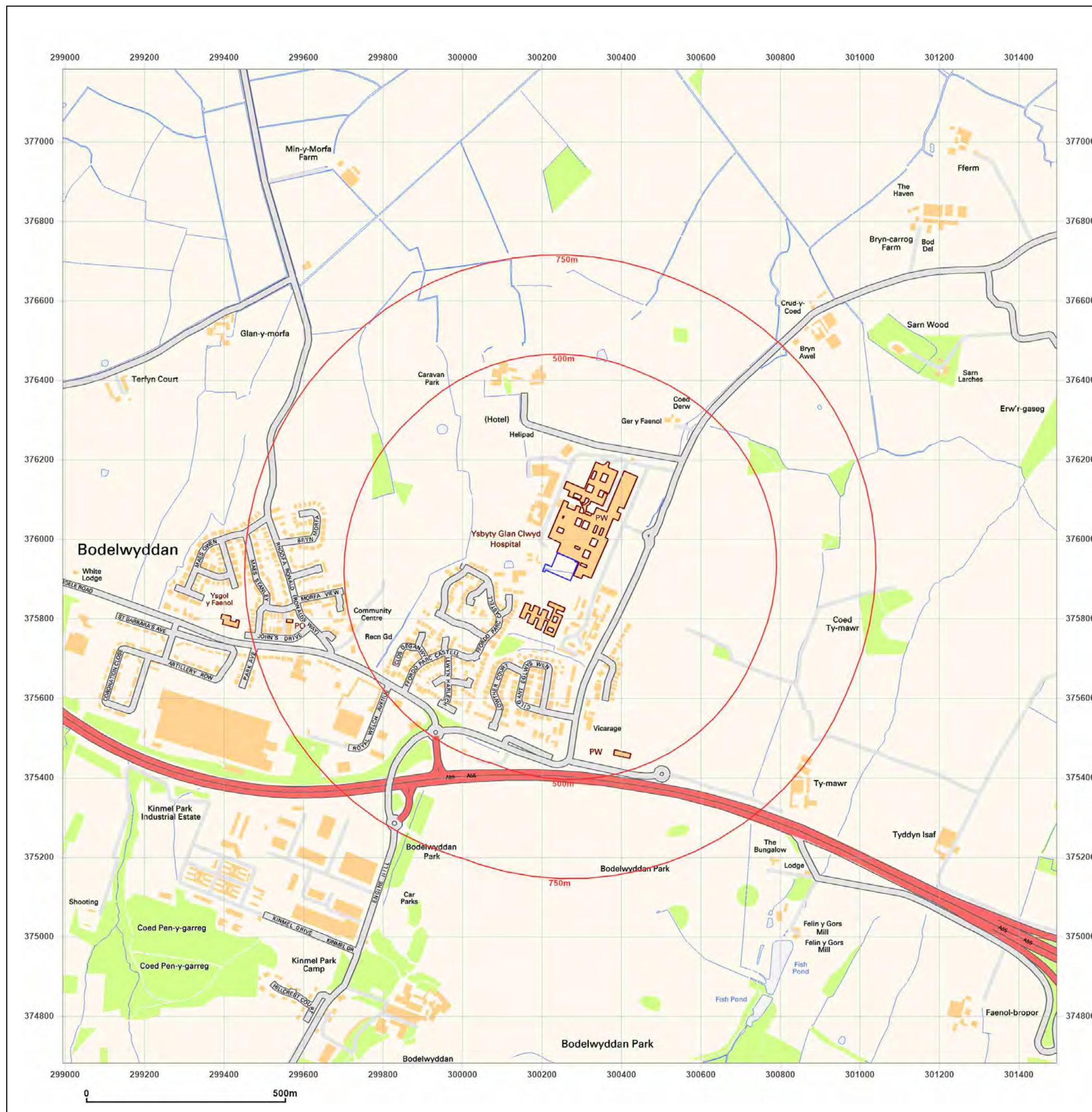


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5UJ

Client Ref: PO_1620053301
Report Ref: RMBL-9335427
Grid Ref: 300245, 375932

Map Name: National Grid

Map date: 2023

Scale: 1:10,000

Printed at: 1:10,000



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