



**ARCHAEOLOGICAL
DESK-BASED
ASSESSMENT**

**ST CYRES SCHOOL
DINAS POWYS
VALE OF GLAMORGAN**

JULY 2017

**Planning Authority:
Vale of Glamorgan Council**

**Site centred at:
NGR 316308, 170795**

**Author:
Nathan Thomas BSc (Hons), MSc,
ACIfA**

Philip Bethell BA (Hons), MCIfA

**Original Approved by:
Cathy Patrick BA, DipArchaeol,
MPhil, MCIfA**

**Revised/updated by Philip
Bethell**

**Report Status:
REVISION July 2017**

**Issue Date:
JULY 2017**

**CgMs Ref:
PB/NT/19631**

© CgMs Limited

No part of this report is to be copied in any way without prior written consent.

Every effort is made to provide detailed and accurate information, however, CgMs Limited cannot be held responsible for errors or inaccuracies within this report.

© Ordnance Survey maps reproduced with the sanction of the controller of HM Stationery Office.
Licence No: AL 100014723

CONTENTS

	Executive Summary
1.0	Introduction and Scope of Study
2.0	Planning Background and Development Plan Framework
3.0	Geology and Topography
4.0	Archaeological and Historical Background, including Assessment of Significance
5.0	Site Conditions, the Proposed Development and Impact on Archaeological Assets
6.0	Summary and Conclusions
	Sources Consulted

LIST OF ILLUSTRATIONS

Fig. 1	Site Location
Fig. 2	1791 William Hurst Estate Map
Fig. 3	1840 St Andrew's Major Tithe Map
Fig. 4	1878-1881 Ordnance Survey Map
Fig. 5	1900 Ordnance Survey Map
Fig. 6	1918 Sales Particulars Map
Fig. 7	1919-1920 Ordnance Survey Map
Fig. 8	1942 Ordnance Survey Map
Fig. 9	1969-1971 Ordnance Survey Map
Fig. 10	1977-1987 Ordnance Survey Map
Fig. 11	1992 Ordnance Survey Map

LIST OF PLATES

- Plate 1 Looking south-east from the north-eastern edge of the study site
- Plate 2 Looking east from the south-eastern part of the study site
- Plate 3 Looking west from the crest of the topographic ridge towards Dinas Powys Common
- Plate 4 Looking west towards Dinas Powys Common from the north-western part of the study site
- Plate 5 Looking east towards the study site from Dinas Powys Common
- Plate 6 Looking north-west from the north-western part of the study site
- Plate 7 Looking south-east from within Dinas Powys Castle
- Plate 8 Looking south-east from within Dinas Powys Castle
- Plate 9 Looking north-west across the south-eastern part of the study site
- Plate 10 Looking north across the area of the former school
- Plate 11 Looking south-east across the former school playing field from the north-west
- Plate 12 Looking north-east across the former school playing field from the south-west
- Plate 13 Looking west across the western part of the study site
- Plate 14 Looking east from the western limit of the study site
- Plate 15 Looking south across the south-western corner of the study site
- Plate 16 Looking north-west from the north-western part of the study site

APPENDICES

- Appendix 1:** Glamorgan-Gwent Archaeological Trust Historic Environment Record and National Monument Record (Wales) data plots
- Appendix 2:** Gazetteer of aerial photographs held by CRAPW
- Appendix 3:** LiDAR data plots
- Appendix 4:** Geophysical Survey Report

Executive Summary

This archaeological desk-based assessment considers c.12.05 hectares of land at the former St Cyres School, Dinas, Powys, Vale of Glamorgan.

There are no designated archaeological assets (Scheduled Monuments, Registered Battlefields or Historic Parks and Gardens) within the study site. Three Scheduled Monuments are located within a 1km radius of the study site; however, this assessment has determined that the proposed development would not harm the setting or significance of these monuments. This assessment addresses archaeological assets only.

The non-designated site of Stonylands Farm (NMR 19996) is recorded within the study site. The Glamorgan Gwent Archaeological Trust (GGAT) has suggested that the farm may date to the Medieval period; however, this is unproven. The earliest reference to a "Stony Land Farm" in the Dinas Powys area occurs in the late 18th century; this accords with the National Monument Record's (NMR) dating of the farm. Historic mapping demonstrates that the farm was in existence in the early 19th century and that many of the ancillary farm buildings date to the 20th century. The farmstead was demolished when St Cyres School was constructed in the late 1970s. Truncated remains of the farm and associated features shown on historic mapping, for example foundation deposits and backfilled ponds, may survive within the study site. However, the farm is well documented and such evidence (if present) is considered to be of no more than local significance.

Based on current evidence, this assessment has identified that the study site has a moderate theoretical potential for previously undiscovered Roman evidence comprising truncated settlement remains and unstratified finds. This is based on its similar topographic position to the two other Roman settlement sites at Pop Hill and Dinas Powys Common recorded within the wider 1km study area. Any Prehistoric, Medieval and Post-Medieval evidence is expected to be limited to former field boundaries (both extant and buried), traces of cultivation and unstratified finds only. Such assets are considered to be of no more than local significance.

Groundworks associated with the proposed development could impact on any archaeological assets that survive within the study site. However, it is considered that the cumulative negative impacts of past agriculture, landscaping and groundworks associated with the construction of St Cyres School in the eastern part of the study site, will have led to the truncation and, in places, the complete removal of any archaeological evidence that may have once been present.

Given the prospect for development impact on truncated assets of no more than local significance, it is considered unlikely that archaeology would constrain or preclude the proposed development. However, in order to address the modest archaeological interest of the study site, GGAT have stated in their allocation consultation response that further archaeological evaluation of the study site would need to be undertaken.

GGAT has also indicated that the Medieval field boundaries in the western part of the study site should be preserved in the layout of any future development as far as reasonably possible.

The results of LiDAR and geophysical survey suggest that any remains of Stonylands Farm have been removed by the construction of the school playing field. These survey results have recorded no other possible archaeological features which do not relate to the current and former agricultural use of the study site, and consequently suggest the overall archaeological potential of the study site is low.

GGAT have informally indicated that a sufficient level of archaeological investigation has taken place, and that as a result it is likely that no further archaeological work will be required on the study site. This is largely due to the complete lack of evidence for any survival of archaeological features relating to Stonylands Farm which GGAT identified as forming the focus of archaeological interest within the study site.

1.0 INTRODUCTION AND SCOPE OF STUDY

- 1.1 This archaeological desk-based assessment has been researched and prepared by CgMs Consulting for Barratt Homes South Wales.
- 1.2 The assessment considers c.12.05 hectares (ha) of land at the former St Cyres School, Dinas Powys, Vale of Glamorgan (referred to as the study site) which is being proposed for development. The study site is centred at National Grid Reference (NGR) 316308, 170795 and excludes a small area (0.35 ha) in the north-east which has recently been developed as a medical centre (Fig. 1).
- 1.3 In accordance with government policy (Planning Policy Wales and Welsh Office Circular 60/96 'Planning and the Historic Environment: Archaeology'), and local planning policy, this assessment draws together the available archaeological, topographic and land-use information in order to clarify the significance of any archaeological assets on the study site and to establish the archaeological potential of the study site.
- 1.4 Additionally, in accordance with the Standard and Guidance for Historic Environment Desk-Based Assessments (Chartered Institute for Archaeologists (CIfA) 2014), the assessment includes the results of a site inspection, an examination of published and unpublished records and charts historic land-use through a map regression exercise.
- 1.5 As a result, the assessment enables relevant parties to assess the significance of archaeological assets on the study site and assesses the potential for previously undiscovered archaeological evidence, thus enabling potential impacts on the significance of any assets to be identified along with the need for design, engineering or archaeological mitigation.

2.0 PLANNING BACKGROUND AND DEVELOPMENT PLAN FRAMEWORK

2.1 Legislation

i) Ancient Monuments & Archaeological Areas Act 1979

2.1.1 The Ancient Monuments & Archaeological Areas Act 1979 (as amended) protects the fabric of Scheduled Monuments, but does not afford statutory protection to their settings. Relevant policies relating to the protection of the setting of scheduled monuments are contained within national and local development plan policy.

ii) Well-being of Future Generations (Wales) Act 2015

2.1.2 This Act places duties on public bodies requiring them to act in accordance with the 'sustainable development principle'. The Act also establishes well-being goals which include achieving 'a Wales of vibrant culture and Welsh language', described as 'a society that promotes and protects culture, heritage and the Welsh language'. The Act lays down the principle that a properly protected, conserved and enhanced historic environment can improve the quality of life and well-being for everyone.

iii) Historic Environment (Wales) Act 2016

2.1.3 The Historic Environment (Wales) Act was given Royal Assent in March 2016. This Act provides the legislative framework for managing the historic environment in Wales. Accompanying the Act is new policy and guidance in the form of a Technical Advice Note (TAN) specific to the Historic Environment (TAN24, see below), and changes to Planning Policy Wales (PPW) Chapter 6 – Conserving the Historic Environment. This legislation and guidance supersedes the previous Welsh Office Circulars which formed the basis of historic environment policy in Wales.

2.2 Planning Policy Wales

2.2.1 The Welsh Government has published Planning Policy Wales (PPW), currently updated to Version 9 from November 2016 (PPW9). This sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs). Procedural advice is given in circulars and policy clarification letters.

2.2.2 Chapter 6 of PPW9, entitled 'Conserving the Historic Environment', provides policy for planning authorities, property owners, developers and others on the conservation and

investigation of heritage assets. Overall, the objectives of Chapter 6 in relation to archaeology can be summarised as seeking to:

- conserve and enhance the historic environment, which is a finite and non-renewable resource and a vital and integral part of the historical and cultural identity of Wales;
- recognise its contribution to economic vitality and culture, civic pride, local distinctiveness and the quality of Welsh life, and its importance as a resource to be maintained for future generations;
- base decisions on an understanding of the significance of Wales' historic assets;
- contribute to the knowledge and understanding of the past by making an appropriate record when parts of a historic asset are affected by a proposed change, and ensuring that this record or the results of any investigation are securely archived and made publicly available; and specifically to
- conserve archaeological remains, both for their own sake and for their role in education, leisure and the economy.

2.2.3 Chapter 6 of PPW9 describes the historic environment as being made up of individual historic features, archaeological sites, historic buildings and historic parks, gardens, townscapes and landscapes, collectively known as historic assets.

2.2.4 Welsh planning legislation and policy guidance outlines that the conservation of archaeological remains and their setting is a material consideration in the determination of a planning application (Planning Policy Wales 9, Chapter 6, Para. 6.5.5). Guidance on understanding and assessing the impact on the settings of historic assets has been published by Cadw in 2017 (Setting of Historic Assets in Wales).

2.2.5 In order to take into account archaeological considerations and deal with them from the beginning of the development control process Local Planning Authorities in Wales need to be fully informed about the nature and importance of archaeological remains, and their setting, and the likely impact of any proposed development upon them.

2.2.6 Paragraphs 6.5.6 to 6.5.8 of PPW9 Chapter 6 set out the staged process of investigations which may be required to provide the relevant information to inform decisions. This means that Local Planning Authorities can request an applicant to provide further information on archaeological matters in the form of desk-based

assessment, field evaluation, and detailed Written Schemes of Investigation to outline mitigation proposals.

2.3 **Local Policy**

2.3.1 The Vale of Glamorgan Council adopted the Vale of Glamorgan Local Development Plan (LDP) 2011-2026 on 28th June 2017. This supersedes the Vale of Glamorgan Adopted Unitary Development Plan (UDP) 1996-2011 (adopted April 2005) and replaces previously saved policies in the UDP.

2.3.2 The LDP contains the following objectives and policies, which relate to the historic environment:

OBJECTIVE 4: TO PROTECT AND ENHANCE THE VALE OF GLAMORGAN'S HISTORIC, BUILT AND NATURAL ENVIRONMENT.

POLICY SP10 – BUILT AND NATURAL ENVIRONMENT

DEVELOPMENT PROPOSALS MUST PRESERVE AND WHERE APPROPRIATE ENHANCE THE RICH AND DIVERSE BUILT AND NATURAL ENVIRONMENT AND HERITAGE OF THE VALE OF GLAMORGAN INCLUDING:

- 1. THE ARCHITECTURAL AND / OR HISTORIC QUALITIES OF INDIVIDUAL BUILDINGS OR CONSERVATION AREAS;**
- 2. HISTORIC LANDSCAPES, PARKS AND GARDENS;**
- 3. SPECIAL LANDSCAPE AREAS;**
- 4. THE GLAMORGAN HERITAGE COAST;**
- 5. SITES DESIGNATED FOR THEIR LOCAL, NATIONAL AND EUROPEAN NATURE CONSERVATION IMPORTANCE; AND**
- 6. IMPORTANT ARCHAEOLOGICAL AND GEOLOGICAL FEATURES.**

POLICY MD8 – HISTORIC ENVIRONMENT

DEVELOPMENT PROPOSALS MUST PROTECT THE QUALITIES OF THE BUILT AND HISTORIC ENVIRONMENT OF THE VALE OF GLAMORGAN, SPECIFICALLY:

- 1. WITHIN CONSERVATION AREAS, DEVELOPMENT PROPOSALS MUST PRESERVE OR ENHANCE THE CHARACTER OR APPEARANCE OF THE AREA;**
- 2. FOR LISTED AND LOCALLY LISTED BUILDINGS, DEVELOPMENT PROPOSALS MUST PRESERVE OR ENHANCE THE BUILDING, ITS SETTING AND ANY FEATURES OF SIGNIFICANCE IT POSSESSES;**
- 3. WITHIN DESIGNED LANDSCAPES, HISTORIC PARKS AND GARDENS, AND BATTLEFIELDS, DEVELOPMENT PROPOSALS MUST RESPECT THE SPECIAL HISTORIC CHARACTER AND QUALITY OF THESE AREAS, THEIR SETTINGS OR HISTORIC VIEWS OR VISTAS.**

4. FOR SITES OF ARCHAEOLOGICAL INTEREST, DEVELOPMENT PROPOSALS MUST PRESERVE OR ENHANCE ARCHAEOLOGICAL REMAINS AND WHERE APPROPRIATE THEIR SETTINGS.

2.3.3 The study site has been allocated for a mixed use residential and community development within the LDP (Policy MG 2: 26). Preliminary comments with regards to archaeological issues are provided in Appendix 5 of the Deposit Plan Written Statement (November 2013):

"The Glamorgan Gwent Archaeological Trust has advised that an archaeological evaluation of the site will be required and that some parts of the site may need to be retained to protect archaeological features."

2.3.4 This is further qualified in the Planning and Highways Context Statement (August 2014) with the following:

"The site includes an area that previously accommodated a mediaeval farm called Stonylands. Consideration will need to be given by the developer to possibly providing open space in this part of the site subject to the outcome of their archaeological evaluation. In addition, there is evidence of mediaeval field layouts, which should be incorporated in to development proposals as far as reasonably possible."

2.4 **Definitions and Guidance**

2.4.1 The 'Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment in Wales' published by Cadw in March 2011 provides the basic principles under which all subsequent guidance has evolved. The six principles expressed are:

- Historic assets will be managed to sustain their values.
- Understanding the significance of historic assets is vital.
- The historic environment is a shared resource.
- Everyone will be able to participate in sustaining the historic environment.
- Decisions about change must be reasonable, transparent and consistent.
- Documenting and learning from decisions is essential.

Definition of the historic environment

2.4.2 The historic environment is defined in TAN 24 (at para. 1.7) as:

“All aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and deliberately planted or managed.”

Definition of Heritage assets

2.4.3 A historic asset is defined in TAN 24 (at para. 1.7) as:

“An identifiable component of the historic environment. It may consist of or be a combination of an archaeological site, an historic building, or a parcel of historic landscape. Nationally important historic assets will normally be designated.”

2.4.4 A useful additional definition is contained within the National Planning Policy Framework for England (2012), which defines ‘Archaeological Interest’ as a heritage asset which holds or potentially could hold, evidence of past human activity worthy of expert investigation at some point. Heritage assets with archaeological interest are the primary source of evidence about the substance and evolution of places, and of the people and cultures that made them.

2.4.5 A Designated Heritage Asset is considered to be a: World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area. In Wales areas of landscape have been designated and included in the non-statutory Register of Landscapes of Historic Interest in Wales.

Significance

2.4.6 Significance in relation to heritage policy considerations is defined as:

- The sum of the cultural heritage values (Cadw 2011).

2.4.7 The ‘*Guide to Good Practice on Using the Register of Landscapes of Historic Interest in Wales in the Planning and Development Process, (Revised Edition 2007)*’ outlines Categories A – U which are used to place historic environment assets in order of relative importance.

Setting

- 2.4.8 Welsh policy makes it clear that setting must be considered in any assessment of the historic environment (PPW9 6.4.2, 6.5.1). The Welsh Government has published '*Setting of Historic Assets in Wales*' in 2017, and this provides guidance on what setting is, how it contributes to the significance of a historic asset and why it is important.
- 2.4.9 Setting of a historic asset is defined as 'the surroundings in which it is understood, experienced, and appreciated embracing present and past relationships to the surrounding landscape. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to that significance or may be neutral. Setting is not a historic asset in its own right but has value derived from how different elements may contribute to the significance of a historic asset' (WG 2017).
- 2.4.10 Draft TAN 24 also makes the point that setting always forms part of the aesthetic value of a historic asset and can contribute to the other heritage values, and that setting is primarily a visual amenity. Consideration needs to be given to how the proposed development will appear in views out of and looking towards the historic asset, and in views where the proposed development and the historic asset are juxtaposed (WG 2015).
- 2.4.11 *Setting of Historic Assets in Wales* sets out a four-stage process for assessing the impact of proposed developments within the settings of historic assets as follows:
- Stage 1:** Identify the historic assets that might be affected by a proposed change or development.
 - Stage 2:** Define and analyse the settings to understand how they contribute to the significance of the historic assets and, in particular, the ways in which the assets are understood, appreciated and experienced.
 - Stage 3:** Evaluate the potential impact of a proposed change or development on that significance.
 - Stage 4:** If necessary, consider options to mitigate or improve the potential impact of a proposed change or development on that significance.
- 2.4.12 The final decision about the acceptability of proposals will depend on the range of circumstances that apply to a heritage asset and the relative sensitivity to change. Decisions are therefore made on a case by case basis, recognising that all heritage

assets are not of equal importance and the contribution made by their setting to their significance also varies.

2.5 **General**

2.5.1 In considering any planning application for development, the planning authority will be mindful of the framework set by Welsh Government policy, by current local planning policy and by other material considerations.

3.0 GEOLOGY AND TOPOGRAPHY

3.1 Geology

3.1.1 The solid geology of the study site comprises interbedded Limestone and Mudstone of the Mary's Well Bay Member and Penarth Group. A small area of Made Ground is also recorded within the study site at the southern end of the former school playing field. This is adjacent to a larger area of Made Ground identified to the south-west of the study site which reflects historic quarrying. No superficial deposits are recorded (British Geological Survey online 2017).

3.1.2 Soils within the study site are identified as '*Slightly acid loamy and clayey soils with impeded drainage*' (Cranfield University Soilscales online 2017).

3.1.3 No site specific geotechnical investigations were available at the time of writing this section (February 2017).

3.2 Topography

3.2.1 The study site occupies part of a north-east to south-west oriented ridge which forms part of the southern side of the valley of the River Cadoxton. The eastern part of the study site, including the former school playing field, lies on the south-eastern side of this ridge and grades down gently from c.42m AOD in the north-west to c.34m AOD in the south-east. The western part of the study site mostly lies on the north-western side of the ridge and grades down more sharply towards Dinas Powys from c.45m AOD on its crest to c.38m AOD in the west.

3.2.2 The nearest watercourse to the study site is the East Brook c.360m to the north-west. This feeds into the River Cadoxton which flows south to join the Bristol Channel at Barry. A small stream is also present c.370m to the east of the study site. This drains south through Old Cogan Hall Farm and joins the Sully Brook c.1.5km to the south-east.

4.0 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND, INCLUDING ASSESSMENT OF SIGNIFICANCE

The timescales used in this report are as follows:

Prehistoric

Palaeolithic	800,000	-	12,000	BC
Mesolithic	12,000	-	4,000	BC
Neolithic	4,000	-	1,800	BC
Bronze Age	1,800	-	600	BC
Iron Age	600	-	AD 43	

Historic

Roman	AD	43	-	410
Early-Medieval	AD	410	-	1066
Medieval	AD	1066	-	1485
Post-Medieval	AD	1486	-	1800
Modern	AD	1800	-	Present

4.1 Introduction

- 4.1.1 This assessment is based on a consideration of evidence in the Glamorgan-Gwent Historic Environment Record (HER – search reference number 5427) and the National Monuments Record of Wales (NMR – licence number RCPL2/3/64/005) for the study site and a zone 1km around it (hereafter ‘the wider study area’). Glamorgan Archives was also visited in order to examine historic maps relating to the study site.
- 4.1.2 This chapter reviews existing archaeological evidence for the study site and the archaeological/historical background of the general area, and, in accordance with Welsh Planning Policy, considers the potential for any previously undiscovered archaeological evidence within the study site.
- 4.1.3 Archaeological data from a 1km radius area around the study site has been reviewed to produce a predictive model of the study site’s archaeological potential. Archaeological assets are considered in the relevant sections below and are identified as either HER or NMR depending on the data source followed by the unique reference number. Plans showing the location of data mentioned in the text can be found in Appendix 1.

4.1.4 Aerial photographs held at the Central Register of Aerial Photographs Wales (CRAPW, Appendix 2) and Natural Resources Wales Light Detection And Ranging data (LiDAR, Appendix 3) were also reviewed as part of this assessment and are discussed, where relevant, in the sections below.

4.1.5 Chapter 5 subsequently considers the study site conditions and whether the theoretical potential identified in this chapter is likely to survive.

4.2 **Designated Heritage Assets**

4.2.1 There are no designated archaeological assets (Scheduled Monuments, Registered Battlefields or Historic Parks and Gardens) within the study site.

4.2.2 In the wider 1km study area, three Scheduled Monuments are recorded. These are: Cogan Deserted Medieval Settlement (GM535) c.300m to the east; a Romano-British farmstead on Dinas Powys Common (GM431) c.800m to the west; and Dinas Powys Castle (GM021) which partly lies on the fringe of the wider 1km study area to the north-west. These assets will be considered further below:

Cogan Deserted Medieval Settlement

4.2.3 This monument (GM535, HER 00818s, NMR 15272) comprises the earthwork and buried remains of a Medieval village including: trackways (HER 01297.0s, 01305.0s, 04145.0s); crofts (HER 01298s-01300s, 01304s, 01306s, 01307s, 04142s-04144s); boundaries (HER 01443.0s, 01448.0s, 01525.0s); a field system (HER 02820s); and a possible mill site with associated leat to the south (HER 00819S, 01295s, 01296s, 04146S, NMR 22001). The village was first documented in the 12th century at which time St Peter's Church (HER 00070s, NMR 301276) was founded. The village was largely depopulated by the 17th century (HER E003326, Doyle 1991).

4.2.4 Cadw record the reason for designation of this monument as follows:

"The monument is of national importance for its potential to enhance our knowledge of medieval settlement. The monument forms an important element within the wider medieval context and the scheduled area may be expected to contain a wide range of archaeological information, including chronological detail and evidence in regard to construction techniques and agricultural methods. The scheduled area comprises the remains described and areas around them within which related evidence may be expected to survive."

- 4.2.5 The primary significance of this monument derives from its historic and evidential value.
- 4.2.6 The setting of the monument comprises its secluded position to the north, east and south of Old Cogan Hall Farm (HER 01660s) set within a shallow, north to south oriented, stream valley along which the village developed. To the east are the modern suburbs of Penarth and to the north, west and south are low-lying fields, housing and dispersed farmsteads. There is no intervisibility between the study site and the monument due to intervening vegetation and buildings (Plates 1 and 2). The eastern part of the monument is completely enclosed by dense woodland. In addition, the boundaries to the north and west of the monument, including along the course of the stream to the south, consist of mature trees which provide substantial screening from the wider landscape which is further reinforced by its low-lying topography.
- 4.2.7 Aspects of the setting that contribute towards the significance of the monument include: its position on the north to south oriented stream along which it developed; the sense of seclusion within the monument, particularly in the east; and the inter-relationship and experience of the extant earthworks with St Peter's Church (HER 00070s) and the other remaining upstanding elements at Old Cogan Hall Farm (HER 01660s, 02189s).
- 4.2.8 Given the distance of the study site from the monument, the identified lack of intervisibility, and in the absence of any historical associations, it is considered that the proposed development of the study site would not impact the setting or significance of this monument.

Romano-British farmstead on Dinas Powys Common

- 4.2.9 This monument (GM431, HER 00770s) comprises a series of small quadrangular and rectangular enclosures defined by low stony banks and scarps. A central enclosure has also been identified to contain two possible huts. Excavation work at the site has yielded pottery of 2nd – 4th century date (HER 001657, Evans 2001).
- 4.2.10 Cadw record the reason for designation of this monument as follows:

"The monument is of national importance for its potential to enhance our knowledge of Roman settlement and agricultural practices. It retains significant archaeological potential, with a strong probability of the presence of associated archaeological features and deposits. A field system may be part of a larger cluster of monuments

and their importance can further enhanced by their group value. The scheduled area comprises the remains described and areas around them within which related evidence may be expected to survive."

- 4.2.11 The primary significance of this monument derives from its evidential value.
- 4.2.12 The setting of the monument comprises its open position on the topographically elevated western side of the valley of the River Cadoxton. To the north, east and south are the modern suburbs of Dinas Powys. To the west are agricultural fields and the village of Westra. The elevated position of the monument, in combination with its open aspect, enables a degree of intervisibility between the crest of the topographic ridge in the western limit of the study site and the monument (Plates 3 to 5). However, given the distance between the two, there are no clear views of the enclosure banks.
- 4.2.13 While it is acknowledged that the study site may fall within the wider landscape setting of this monument, taking into account the reason for designation stated above, it is considered that this wider setting does not contribute to the monument's significance.
- 4.2.14 The proposed development would result in a very minor change to the wider landscape setting of the Scheduled Monument. Only the western edge of the study site would be visible, and any new development within this area would blend seamlessly into the existing urban form of Dinas Powys. Therefore it is concluded that there would be no impact on the significance of the monument by the proposed development of the study site.

Dinas Powys Castle

- 4.2.15 This monument (GM021, HER 00068s) comprises the remains of an early Norman castle dating to the 12th century. Only the curtain-wall remains standing and Cadw note that "much of this is ruinous". The curtain-wall defines a roughly rectangular area and contains the remains of the north-western half of the early keep. The castle formed the centre of the Norman lordship of Dinas Powys and was occupied by the de Sumeri family until the early-14th century when the last male heir died. It is also suggested that the castle keep may have suffered at the hands of Owain Glyndwr at the start of the 15th century (Vale of Glamorgan Council (VOGC) 2009). The built remains of the castle are also a Grade II Listed Building (13624)
- 4.2.16 Cadw record the reason for designation of this monument as follows:

“The monument is of national importance for its potential to enhance our knowledge of medieval defensive and domestic practices. The monument is well-preserved and an important relic of the medieval landscape. It retains significant archaeological potential, with a strong probability of the presence of both structural evidence and intact associated deposits. The scheduled area comprises the remains described and areas around them within which related evidence may be expected to survive.”

- 4.2.17 The primary significance of this monument derives from its historic and evidential value.
- 4.2.18 The setting of the monument comprises its position on the north-western end of a steep sided narrow topographic ridge. The ridge is covered with dense trees and scrub and is bordered by modern residential housing to the south and west, the River Cadoxton to the east, and undulating wooded hills to the north. There is some intervisibility between the study site and the general area of the monument from the north-western limit of the study site only (Plates 6 and 7). However, there are no views of the upstanding castle elements (curtain wall and keep) due to the dense surrounding vegetation and intervening distance.
- 4.2.19 Aspects of the setting that contribute towards the significance of the monument include: its topographic position; its relationship with the scheduled Early-Medieval defensive earthworks (Tyn y Coed (GM024, HER 00014s)) to the north-west; and the sense of seclusion within the monument, which is enhanced by the dense surrounding vegetation (Plate 8).
- 4.2.20 Given the distance of the study site from the monument, the limited intervisibility, and in the absence of any historical associations, it is considered that the proposed development of the study site would not impact the setting or significance of this monument.

Dinas Powys Conservation Area and Listed Buildings

- 4.2.21 It is noted that the Dinas Powys Conservation Area lies c.600m to the north-west of the study site at its nearest. In addition, 12 Listed Buildings are recorded within the wider 1km study area, including six at Little Orchard to the immediate north of the study site.
- 4.2.22 This this report addresses archaeological assets only.

4.3 **Previous Archaeological Investigations**

- 4.3.1 No previous invasive archaeological investigations of the study site have been undertaken. It is also noted that no archaeological work was conducted ahead of, or during, the groundworks for the new medical centre in the north-east of the study site (2014/00178/FUL).
- 4.3.2 A non-intrusive geophysical survey was undertaken in April 2017 (Tigergeo 2017, Appendix 4). This survey revealed little of archaeological significance.
- 4.3.3 In the wider study area, a number of interventions are recorded (Appendix 1). The majority of these relate to investigative work undertaken within and surrounding the scheduled remains of Cogan Deserted Medieval Settlement (GM535, HER 00818s, NMR 15272), c.300m to the east, which have recorded evidence of Medieval and later date.
- 4.3.4 Excavation work at Pop Hill (HER E000772), c.750m to the south-west, identified evidence of a Roman building of 2nd to 4th century date.
- 4.3.5 A watching brief (HER E004321) during the construction of the Cosmeston to Cog Moors Pumping Main, c.850m to the south, did not record any archaeological evidence. A Medieval house platform identified during the monitoring has been discredited (Williams 1995).
- 4.3.6 Where relevant, the results of the above investigations will be discussed in the sections below.

4.4 **Prehistoric (Palaeolithic – Iron Age)**

- 4.4.1 There is no Prehistoric evidence recorded within the study site by the HER or NMR.
- 4.4.2 In the wider study area, Prehistoric evidence is limited to a number of unstratified finds including: a barbed and tanged arrowhead (HER 01685S) found c.400m to the north; two flints flakes recovered during a watching brief (HER E004626) c.650m to the south-east (Sell 2003); and a polished flint axe head (HER 01440s) found c.670m to the north-east.
- 4.4.3 Given the paucity of Prehistoric evidence from the wider study area, and in the absence of any recorded cropmarks or topographic features that would suggest Prehistoric occupation within, or in close proximity to, the study site, a low theoretical

potential for previously undiscovered Prehistoric evidence is identified. While it is acknowledged that the landscape surrounding the study site would have been settled and utilised during the Prehistoric period, and that its elevated topographic position may have been a favourable position for past settlement, any Prehistoric evidence (if present) is expected to comprise unstratified finds only.

4.5 **Roman**

4.5.1 There is no Roman evidence recorded within the study site by the HER or NMR.

4.5.2 In the wider study area, the site of a possible Roman villa (HER 00584S) was identified on Pop Hill, c.750m to the south-west, during excavation work in 1957 (HER E000772). The recorded remains included traces of a building associated with pottery of 2nd to 4th century date. The building was located on the north-eastern side of a gently rounded summit which lies at c.39m AOD.

4.5.3 The only other Roman evidence recorded within the wider study area comprises the above noted (paragraphs 4.2.9 to 4.2.14) scheduled Roman farmstead on Dinas Powys Common (GM431, HER 00770s) c.800m to the west. This again dates to the 2nd to 4th centuries and occupies a raised topographic position at c.38m AOD.

4.5.4 There are no cropmarks or localised topographic features within the study site that would suggest the presence of Roman activity. However, the topographic siting and geology of the study site are similar to that of the two known settlement sites within the wider study area. Therefore a moderate theoretical potential for previously undiscovered Roman evidence is identified. Such evidence (if present) could comprise truncated settlement remains and unstratified finds.

4.6 **Early-Medieval**

4.6.1 There is no Early-Medieval evidence recorded within the study site or wider study area by the HER or NMR.

4.6.2 Given the paucity of Early-Medieval evidence from the wider study area, and taking into account the distance of the study site from the only known Early-Medieval settlement focus within Dinas Powys c.1.6km to the north-west (Alcock 1963), a low/nil theoretical potential for previously undiscovered Early-Medieval evidence within the study site is identified.

4.7 **Medieval**

- 4.7.1 There is no Medieval evidence recorded within the study site by the HER or NMR.
- 4.7.2 In the wider study area, Medieval evidence includes: the scheduled remains of Cogan Medieval Village (HER 00818s, NMR 15272) with associated church (HER 00070s, NMR 301276) c.300m to the east (see paragraphs 4.2.3 to 4.2.8); the site of a possible Medieval house platform (HER 04994) identified during a watching brief (HER E004626) c.650m to the south-east and subsequently discredited (Williams 1995); and a small part of the scheduled area of Dinas Powys Castle (GM021, HER 00068s) c.1km to the north-west.
- 4.7.3 The only other Medieval evidence present within the wider study area is relict elements of the Medieval agricultural landscape. These elements are represented by the curving field boundaries to the north-east, south (HER 02820s, 03955s) and south-west (HER 00842s) of the study site which reflect former strips within the open fields that surrounded both Dinas Powys and Cogan village. The western part of the study site comprises part of three linear fields the mature boundaries of which may date from the Medieval period. GGAT has suggested that the layout of these boundaries should be incorporated into any proposed development of the study site "as far as reasonably possible" (see paragraph 2.3.4).
- 4.7.4 The study site is located away from the known Medieval settlement foci in an area that would have been used for agricultural purposes. The LiDAR data indicates the presence of slight linear earthworks in the west of the study site (Appendix 3) that suggest Medieval, or later, cultivation. Given the above, any previously undiscovered Medieval evidence within the study site is therefore expected to be limited to further traces of cultivation, former boundaries (both extant and buried) and unstratified finds derived from manuring practices.

4.8 **Post-Medieval and Modern**

- 4.8.1 The site of Stonylands Farm (NMR 19996) is recorded within the study site. The NMR contains the following description of the farm building:

"A house of possible C18 date of rubble stone construction with slate roof and brick chimneys. The house was of two unit plan with a central doorway in a symmetrical facade. Inside, the main room featured a large fireplace, winding stone stair, and stop-chamfered beams."

- 4.8.2 GGAT has suggested that the farm may date to the Medieval period; however, this is unproven. The earliest recorded reference to the place name "Stonylands" occurs in the late 17th century in rentals and surveys of the manor of Dinas Powys. However, these references refer to fields which are of poor quality. The earliest reference to a "Stony Land Farm" was recorded in the late 18th century (Pierce 1968). The farmstead was demolished when St Cyres School was constructed in the late 1970s (see below).
- 4.8.3 In the wider study area, the HER and NMR record further buildings and industrial features. This evidence adds little to the understanding of the archaeological potential of the study site. The locations of the above features are shown in Appendix 1 and are discussed, where relevant, below.
- 4.8.4 In the later Post-Medieval period, understanding of settlement, land-use and the utilisation of the landscape is enhanced by cartographic and documentary sources which can give additional detail to data contained within the HER and NMR.
- 4.8.5 The 1791 William Hurst Estate Map (Fig. 2) is the earliest available map of the Dinas Powys/St Andrew's Major area (Thomas 1992). However, the area of the study site is not mapped in detail. In the wider study area, the surrounding landscape consists of remnant strip fields, for example to the north and south-west of the area of the study site, and more regular enclosures.
- 4.8.6 The 1840 St Andrew's Major Tithe Map (Fig. 3) shows the area of the study site to comprise part of 16 fields which are documented as arable (653, 661, 666, 667, 683-685 and 694-696), pasture (654) and woodland (697 and 699). Stonylands Farm is depicted as comprising the main north-west to south-east oriented farm house with two square ancillary buildings to the north and north-east. The three enclosures that encompass the farm buildings are recorded as an orchard (662), homestead and yard (663) and garden (664). In the wider study area, the landscape is shown to comprise undeveloped agricultural land.
- 4.8.7 The 1878-1881 Ordnance Survey Map (Fig. 4) shows limited change to the area of the study site. A north-west to south-east oriented field boundary in the north-west is recorded to have been removed (formerly part of field 661 in the above Tithe Map). In the area of Stonylands Farm, two ponds are depicted to the east of the farm in addition to further ancillary structures and a trackway leading to Murch in the north-west. In the wider study area, the landscape is shown to remain undeveloped agricultural land.

4.8.8 The 1900 Ordnance Survey Map (Fig. 5) shows limited change to the area of the study site. An additional east to west oriented building is shown to the north of Stonylands Farm. A slight re-arrangement of the boundaries adjoining the farm to the north and east and the presence of a trackway to the south-east are also depicted. In the wider study area, a limestone quarry is mapped to the south-west.

4.8.9 A map of Stonylands Farm is provided in a sales particulars dating to 1918 (Fig. 6). The fields surrounding the farm are recorded as arable (283 and 286) and pasture (196, 276, 285, 287, 289 and 290). The farm is described as comprising:

“ The Farm House which is built of stone, with a pantile roof, comprises the following accommodation: Parlour, Sitting Room, and Kitchen, Good Lean-to Larder, all with stone floors; and three bedrooms. There is a good Kitchen Garden with a Pump and a small Front Garden. The Wooden Sheds in the Kitchen Garden are the property of the Tenant.

The Farm Buildings include: Stone Barn with pantile roof; Range of stone buildings with pantile roof, comprising: Trap House, Three Stall Stable, fitted with Mangers and Racks; Cowhouse to tie seven with Feeding Walk. Two stone and slate Pigs’ Cots.

The lean-to wooden Fowl House adjoining the Barn; lean-to wooden Cow-Shed, with corrugated iron roof adjoining the Trap House; the wooden Fowl House and the Gearing in the Trap House are the property of the Tenant.”

4.8.10 The 1919-1920 Ordnance Survey Map (Fig. 7) shows the two ponds to the east of Stonylands Farm to have been replaced with a larger pond. Further ancillary buildings and boundaries are also depicted to the north-east of the farm in addition to a north-east to south-west oriented track extending to Sully Road in the east. In the wider study area, expansion of the quarry to the south-west and some residential housing to the north are also mapped.

4.8.11 The 1942 Ordnance Survey Map (Fig. 8) shows further development of the ancillary buildings to the north-east and west of Stonylands Farm. The remainder of the study site is depicted to remain mostly unchanged. In the wider study area, further expansion of the quarry to the south-west and residential dwellings to the north are recorded.

4.8.12 The 1969-1971 Ordnance Survey Map (Fig. 9) shows limited change to the area of the study site. Again slight changes to the ancillary buildings and boundaries in the

immediate vicinity of Stonylands Farm are mapped. In the wider study area, significant residential development surrounding Dinas Powys is recorded to the north and west of the study site.

- 4.8.13 The 1977-1987 Ordnance Survey Map (Fig. 10) shows St Cyres School to have been constructed within the eastern part of the study site with associated playing field to the west. Stonylands Farm and its associated ponds, trackway and ancillary buildings are depicted to have been completely demolished and ponds infilled. In addition, a number of the field boundaries in the eastern part of the study site are mapped to have been removed. In the wider study area, further residential development to the north of the study site is shown.
- 4.8.14 The 1992 Ordnance Survey Map (Fig. 11) shows no further changes to the area of the study site.
- 4.8.15 St Cyres School was closed in 2012 and the school buildings and caretaker's house were demolished in 2014. There are no further significant changes to the area of the study site in the subsequent Ordnance Survey mapping. As noted above, the Dinas Powys Medical Centre was constructed in the north-east of the study site in the area of the former school tennis courts during 2014/2015.
- 4.8.16 Historic aerial photographs held at the CRAPW and dating from the mid-20th century onwards show the area of the study site in use under a mixture of pasture and arable regimes. No cropmarks or earthworks features were noted.
- 4.8.17 The LiDAR data (Appendix 3) does not indicate the presence of any earthwork features within the study site apart from some slight linear trends in the west which are interpreted to reflect former cultivation. There are no traces of Stonylands Farm or the former field boundaries which were shown on historic mapping.
- 4.8.18 The non-designated site of Stonylands Farm (NMR 19996) is recorded within the study site. GGAT has suggested that the farm may date to the Medieval period; however, this is unproven. The earliest reference to a "Stony Land Farm" in the Dinas Powys area occurs in the late 18th century; this accords with the NMR's dating of the farm. Historic mapping demonstrates that the farm was in existence in the early 19th century and that many of the ancillary farm buildings date to the 20th century. The farmstead was demolished when St Cyres School was constructed in the late 1970s and there is no evidence for any surviving above-ground structures within the study site (see site inspection below). The remainder of the study site is likely to have remained as

agricultural fields prior to the development of the school. Given the above, any Post-Medieval evidence is expected to be limited to the truncated remains of Stonylands Farm, for example foundation deposits and backfilled ponds, and evidence of past agriculture.

4.8.19 The geophysical survey (Appendix 4) did not reveal any magnetic anomalies which could relate to remains of Stonylands Farm. The possible archaeological features identified were interpreted as reflecting the agricultural use of the land.

4.8.20 Based on the available evidence from LiDAR and geophysical survey, it is concluded that remains of Stonylands Farm have been thoroughly removed during the preparation and laying out of the school playing field, and that consequently the theoretical archaeological potential for remains of the Farm to be present has been reduced to very low.

4.9 **Historic Landscape Characterisation**

4.9.1 The study site lies across two Landmap Aspect Areas. In the east, the former St Cyres School and its playing field form part of VLFGLHL013 (Penarth and Dinas Powys Urban). In the west, the remainder of the study site falls within VLFGLHL011 (Cogan and Pop Hill). Landmap is a Wales-wide landscape characterisation tool developed by the Countryside Council for Wales (now part of Natural Resources Wales). The two Aspect Areas are described as follows:

Penarth and Dinas Powys Urban (VLFGLHL013)

"This aspect area is defined as the extent of the urban development of Penarth and Dinas-Powys. Penarth developed in the second half of the 19th century, the docks were established in 1865 and an extension was completed by 1884 to take the overflow traffic from the docks at Cardiff. A total of fourteen coal staiths were in operation at this time, handling more than 3,000,000 tons per year. The dock peaked in the second decade of the 20th century, in 1912 it handled coal and coke exports totalling 4,179,506 tons. Penarth established itself as a retirement town for wealthy landowners, merchants and colliery owners. Large 19th villas were erected in the town, most with views of the sea, for the wealthy and were in contrast to the cheaper terracing built for the dockworkers. The esplanade was constructed during 1883-4 and the pier ten years later. Elaborate gardens were laid out for both the wealthy and the lower classes (VOGHL14, 15, 16 and 18). In 1871, the population reached 3,104 and ten years later it was 6,228, over the next decade the number of inhabitants doubled, taking the figure to 12,424. Penarth Church is known to be at least 12th century in

date and Llandough was an important Early-medieval monastic centre from the mid-7th century to the end of the 11th century. the monastic sites were located in the vicinity of St Dochdwy church; the early-medieval Irbici cross-shaft (SAMGm209) stands to the southwest of church. To the north of the church, on the site of the former Great House Farm, an excavation carried out by the Cotswold Archaeological Trust revealed an Early-medieval cemetery of over 800 inhumations. There were also a number of Iron Age and Roman burials, which may indicate a continuity of settlement at the Llandough Farm villa site 150m to the south."

4.9.2 The value given to the historic landscape in the Landmap assessment is 'Moderate', and is justified for the following reasons:

"The late 19th-20th century urban sprawl of Penarth, with outlying suburbs at Llandough to the N and Dinas Powys to the W, has largely obscured earlier fieldscapes and patterns of settlement. However, an older focus of settlement remains at Llandough, centred on the church of St Dochdwy where excavations have revealed evidence of a large early medieval cemetery standing in close proximity to the site of a Roman villa and early medieval monastery."

Cogan and Pop Hill (VLFGLHL011)

"This aspect area represents the survival of a possible medieval landscape of small-elongated rectangular strip fields on Pop Hill and north of Old Cogan Hall Farm. Much of the landscape still exhibits the form of closely regimented fields. However during the last century many of these small strip fields have been amalgamated into larger enclosures. The modern settlement of Dinas-Powys (VOGHL13) has encroached into this medieval landscape, which extended as far north as Eastbrook (VOGHL19), east to the medieval settlement of Cogan and Dinas-Powys Moors to the west. Cross Common is a small unenclosed area on Pop Hill, large irregular fields dominate the landscape on top of the hill and it is possible this represents some enclosure of an earlier common of much greater size. The 12th century medieval settlement at Cogan consisted of several house platforms, two roads, a mill and leat, all centred on St Peter's Church. A castle or fortified manor house is suggested at the site of the 19th century Old Cogan Hall farmhouse. The parish and manor of Cogan were held in the 12th century by the de Cogan family. By the 16th century the manor had passed to the Herbert family where it remained until being purchased by Lord Bute in 1793 (RCAHMW 2000, 472-4). St Peter's Church, which served the deserted medieval village of Cogan, dates to the 12th century but with later 15th and 16th century remodelling. The church fell into disuse by the 18th century but was later restored in 1888-1894 by W Frame, architect to the Bute Estates. The Third Marquess of Bute

also provided a bronze reredos in memory of James A Corbett, a kinsman (died 1890) who had instigated the restoration of the church."

4.9.3 The value given to the historic landscape in the Landmap assessment is 'High', and is justified for the following reasons:

"This area has been evaluated as of high importance, based on the largely intact survival of a medieval fieldscape of elongated strip fields on Pop Hill and N of Old Cogan Farm, together with the extensive and well-preserved earthworks of a medieval deserted settlement in the vicinity of St Peter's Church and Old Cogan Hall."

4.9.4 The implication of this assessment is that the western part of the study site retains evidence of the Medieval agricultural landscape attested by the surviving field boundaries.

4.10 **Assessment of Significance**

4.10.1 There are no designated archaeological assets (Scheduled Monuments, Registered Battlefields or Historic Parks and Gardens) within the study site.

4.10.2 In the wider 1km study area, three Scheduled Monuments are recorded. These are: Cogan Deserted Medieval Settlement (GM535) c.300m to the east; a Romano-British farmstead on Dinas Powys Common (GM431) c.800m to the west; and Dinas Powys Castle (GM021) which partly lies on the fringe of the wider 1km study area to the north-west. These assets are of national significance.

4.10.3 The non-designated site of Stonylands Farm (NMR 19996) is recorded within the study site. GGAT has suggested that the farm may date to the Medieval period; however, this is unproven. The farm was probably in existence in the 18th century and was demolished when St Cyres School was constructed in the late 1970s. Truncated remains of the farm and associated features shown on historic mapping, for example foundation deposits and backfilled ponds, may survive within the study site, but the results of LiDAR and geophysical survey suggest the Farm remains have been removed by the construction of the school playing field. However, the farm is well documented and any archaeological evidence (if present) is considered to be of no more than local significance (Category D, Cadw 2007).

4.10.4 Based on current evidence, this assessment has identified that the study site has a moderate theoretical potential for previously undiscovered Roman evidence. This is

based on its similar topographic position to the two other Roman settlement sites at Pop Hill and Dinas Powys Common recorded within the wider 1km study area. Any Prehistoric, Medieval and Post-Medieval evidence is expected to be limited to former field boundaries (both extant and buried), traces of cultivation and unstratified finds only. The LiDAR and geophysical survey results revealed no indication of buried features which might belong to these periods, and suggest that the Modern agricultural use of the site has removed or heavily truncated any of such evidence.

4.10.5 When considered in the context of the Welsh Assembly Government's non-statutory criteria for Scheduled Monuments (Cadw 2002) such assets (if present) are considered to be of no more than local significance (Category D, Cadw 2007).

5.0 SITE CONDITIONS, THE PROPOSED DEVELOPMENT AND IMPACT ON ARCHAEOLOGICAL ASSETS

5.1 Site Conditions

5.1.1 A site inspection was conducted on the 26th January 2017 (Plates 9-16).

5.1.2 The eastern part of the study site consisted of: an area of undeveloped pasture in the south-east (Plate 9); the demolished remains of St Cyres School with associated access roads and areas of hardstanding (Plate 10); the former school playing field (Plates 11 and 12); and the new medical centre in the north-east. No surviving above-ground evidence of Stonylands Farm was identified. The former school playing field was noted to be level and was likely to have involved a significant degree of landscaping at the time of construction. There is a pronounced change in level along the playing field's eastern boundary with the field to the south-east. This suggested that the playing field had had been built-up in this area to account for the drop in the natural topography present. Areas of wood/scrub bordered the playing field to the north and south.

5.1.3 The western part of the study site consisted of part of six fields with additional small areas of woodland (Plates 13 – 16). All of these fields were under short grass and were partitioned by mature trees and hedges. The topography of the study site drops off sharply to the north-west in this area.

5.1.4 No other archaeological finds or features were noted during the site inspection.

5.2 The Proposed Development

5.2.1 The proposed development is for a mixed use scheme (residential and employment) with associated access, landscaping and infrastructure.

5.3 Impacts on Archaeological Assets

5.3.1 There are no designated archaeological assets within the study site. In the wider 1km study area, three Scheduled Monuments are recorded. However, this assessment has identified that the proposed development of the study site would not harm the setting or significance of these monuments.

- 5.3.2 Groundworks associated with the proposed development could impact on any archaeological assets within the study site. However, it is considered that the cumulative negative impacts of past agriculture, landscaping and groundworks associated with the construction of St Cyres School in the eastern part of the study site, will have led to the truncation and, in places, the complete removal of any archaeological evidence that may have once been present.
- 5.3.3 Following the completion of the geophysical survey, informal correspondence with Rob Dunning, Planning Archaeologist at GGAT, has indicated that a sufficient level of investigation has taken place, and that as a result it is likely that no further archaeological work will be required on the study site. This is largely due to the complete lack of evidence for any survival of archaeological features relating to Stonylands Farm which GGAT identified as forming the focus of archaeological interest within the study site.

6.0 SUMMARY AND CONCLUSIONS

- 6.1 This archaeological desk-based assessment considers c.12.05 hectares of land at the former St Cyres School, Dinas, Powys, Vale of Glamorgan.
- 6.2 There are no designated archaeological assets (Scheduled Monuments, Registered Battlefields or Historic Parks and Gardens) within the study site. Three Scheduled Monuments are located within a 1km radius of the study site; however, this assessment has determined that the proposed development would not harm the setting or significance of these monuments. Built heritage assets are addressed in a separate statement (CgMs 2017).
- 6.3 The non-designated site of Stonylands Farm (NMR 19996) is recorded within the study site. GGAT has suggested that the farm may date to the Medieval period; however, this is unproven. The earliest reference to a "Stony Land Farm" in the Dinas Powys area occurs in the late 18th century; this accords with the NMR's dating of the farm. Historic mapping demonstrates that the farm was in existence in the early 19th century and that many of the ancillary farm buildings date to the 20th century. The farmstead was demolished when St Cyres School was constructed in the late 1970s. Truncated remains of the farm and associated features shown on historic mapping, for example foundation deposits and backfilled ponds, may survive within the study site. However, the farm is well documented and such evidence (if present) is considered to be of no more than local significance.
- 6.4 Based on current evidence, this assessment has identified that the study site has a moderate theoretical potential for previously undiscovered Roman evidence comprising truncated settlement remains and unstratified finds. This is based on its similar topographic position to the two other Roman settlement sites at Pop Hill and Dinas Powys Common recorded within the wider 1km study area. Any Prehistoric, Medieval and Post-Medieval evidence is expected to be limited to former field boundaries (both extant and buried), traces of cultivation and unstratified finds only. Such assets are considered to be of no more than local significance.
- 6.5 Groundworks associated with the proposed development could impact on any archaeological assets that survive within the study site. However, it is considered that the cumulative negative impacts of past agriculture, landscaping and groundworks associated with the construction of St Cyres School in the eastern part of the study site, will have led to the truncation and, in places, the complete removal of any archaeological evidence that may have once been present.

- 6.6 Given the prospect for development impact on truncated assets of no more than local significance, it is considered unlikely that archaeology would constrain or preclude the proposed development. However, in order to address the modest archaeological interest of the study site, GGAT stated in their allocation consultation response that further archaeological evaluation of the study site would need to be undertaken.
- 6.7 GGAT has also indicated that the Medieval field boundaries in the western part of the study site should be preserved in the layout of any future development as far as reasonably possible.
- 6.8 The results of LiDAR and geophysical survey suggest that any remains of Stonylands Farm have been removed by the construction of the school playing field. The results of LiDAR and geophysical survey suggest that any remains of Stonylands Farm have been removed by the construction of the school playing field. These survey results have recorded no other possible archaeological features which do not relate to the current and former agricultural use of the study site, and consequently suggest the overall archaeological potential of the study site is low.
- 6.9 GGAT have informally indicated that a sufficient level of archaeological investigation has taken place, and that as a result it is likely that no further archaeological work will be required on the study site. This is largely due to the complete lack of evidence for any survival of archaeological features relating to Stonylands Farm which GGAT identified as forming the focus of archaeological interest within the study site.

SOURCES CONSULTED

General

British Geological Survey
British Library
Central Repository for Aerial Photography Wales
Cranfield University Soilscales (online)
Glamorgan Archives
Glamorgan-Gwent Historic Environment Record
National Library of Wales

Bibliographic and Documentary

Alcock, L.	1963	Dinas Powys; an Iron Age, Dark Age and Early Medieval Settlement in Glamorgan
Cadw	2002	What is Scheduling?
Cadw	2007	Guide to good practice on using the register of landscapes of historic interest in Wales in the planning and development process
CgMs	2017	St Cyres School – Heritage Statement
Cadw	2011	Conservation Principles for the sustainable management of the historic environment in Wales
ClfA	2014	Standard and Guidance for Historic Environment Desk-Based Assessments
Doyle, J.	1991	Archaeological Desk Top Survey, Old Cogan Hall Farm, Penarth
English Heritage	2011	The Setting of Heritage Assets
Evans, E. M.	2001	Romano-British southeast Wales settlement survey: Final Report
Pierce, G. O.	1968	The Place-Names of Dinas Powys Hundred
Sell, S. H.	2003	Old Cogan Hall Farm, Penarth, South Glamorgan: archaeological watching brief

Thomas, H. M.	1992	A Catalogue of Glamorgan Estate Maps
Tigergeo	2017	St Cyre's School Site, Dinas Powys, Vale of Glamorgan – Geophysical Survey Report
VOGC	2009	Dinas Powys Conservation Area: Appraisal and Management Plan
Williams, D. N.	1995	Cosmeston to Cog Moors Pumping Station: Archaeological Watching Brief Report

Cartographic Sources Consulted

1791 William Hurst Estate Map (DXGL/9)

1840 St Andrew's Major Tithe Map

1918 Sales Particulars Map (BB/C/206)

Ordnance Survey, 1878-1881 1: 2500

Ordnance Survey, 1900 1: 2500

Ordnance Survey, 1919-1920 1: 2500

Ordnance Survey, 1942 1: 2500

Ordnance Survey, 1969-1971 1: 2500

Ordnance Survey, 1977-1987 1: 2500

Ordnance Survey, 1992 1: 2500

Ordnance Survey, 1885 1:10560

Ordnance Survey, 1901 1:10560

Ordnance Survey, 1922 1:10560

Ordnance Survey, 1938-1947 1:10560

Ordnance Survey, 1964-65 1:10000

Ordnance Survey, 1972-1975 1:10000

Ordnance Survey, 1984-1989 1:10000

Ordnance Survey, 1991-1996 1:10000

Ordnance Survey, 2006 1:10000

Ordnance Survey, 2016 1:10000

Websites

British Library – www.bl.uk

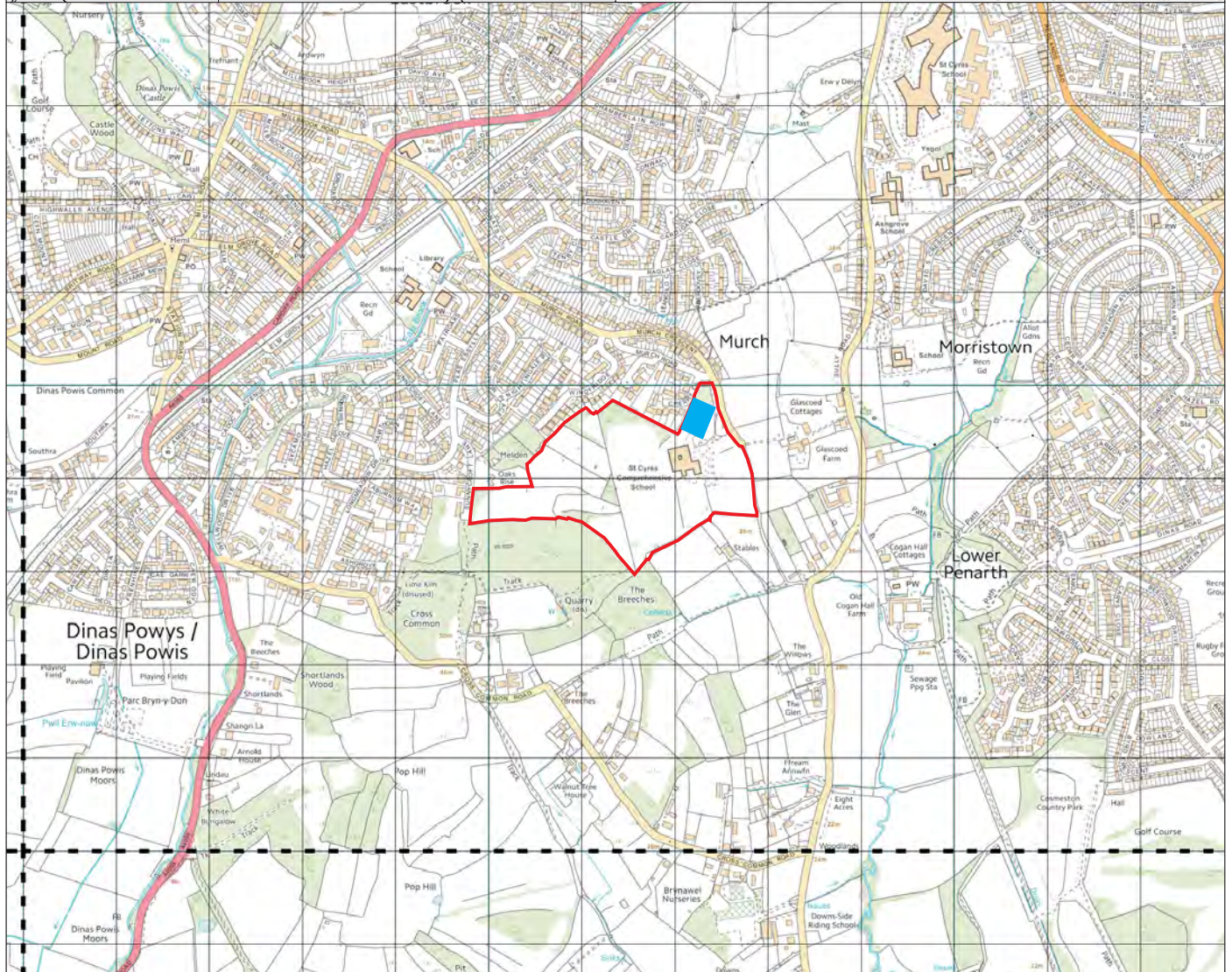
British Geological Survey - <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

Cranfield University Soilscales - <http://www.landis.org.uk/soilscales/>

Google Earth - <https://earth.google.co.uk>

Internet Archive - <https://archive.org/index.php>

National Library of Wales - <https://www.llgc.org.uk/>



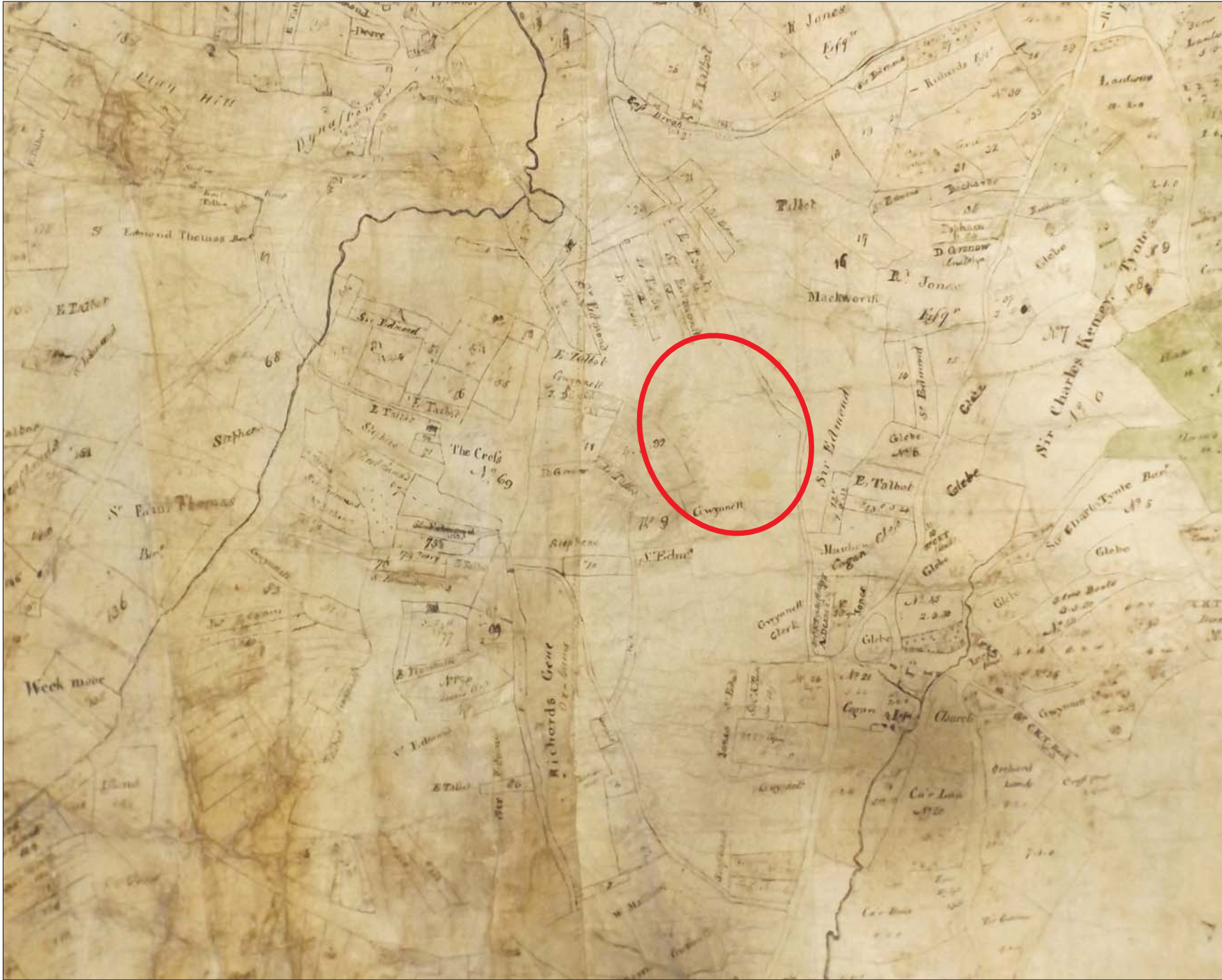
Legend

- Site Location
- New Medical Centre



Not to Scale:
Illustrative Only

Figure 1:
Site Location



Planning • Heritage
www.cgms.co.uk

Legend

— Approximate Site Location



Not to Scale:
Illustrative Only

Figure 2:
1791 William Hurst
Estate Map



Planning • Heritage
www.cgms.co.uk

Legend

— Approximate Site Boundary

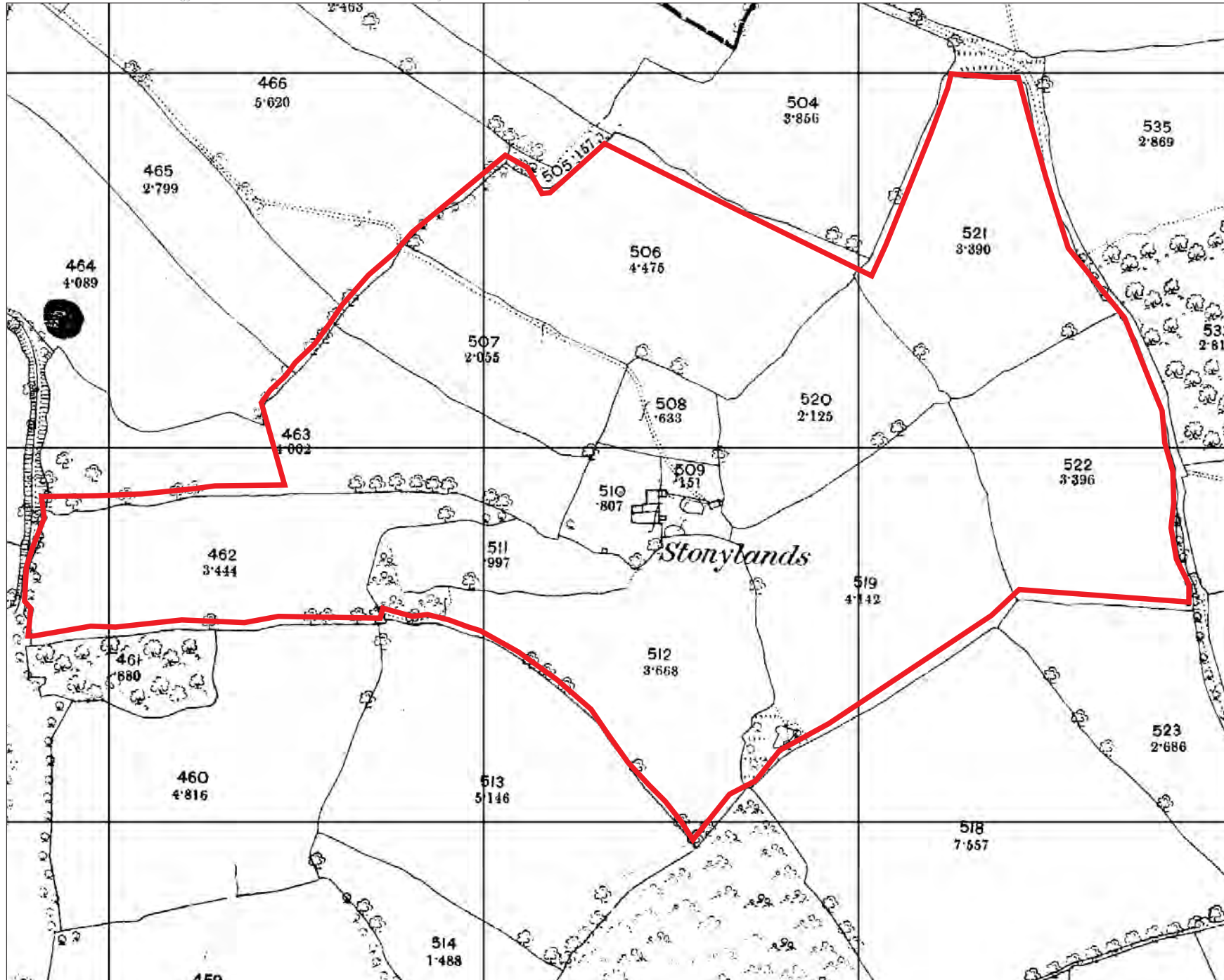


Not to Scale:
Illustrative Only

Figure 3:
1840 St Andrew's
Major Tithe Map



Planning • Heritage
www.cgms.co.uk



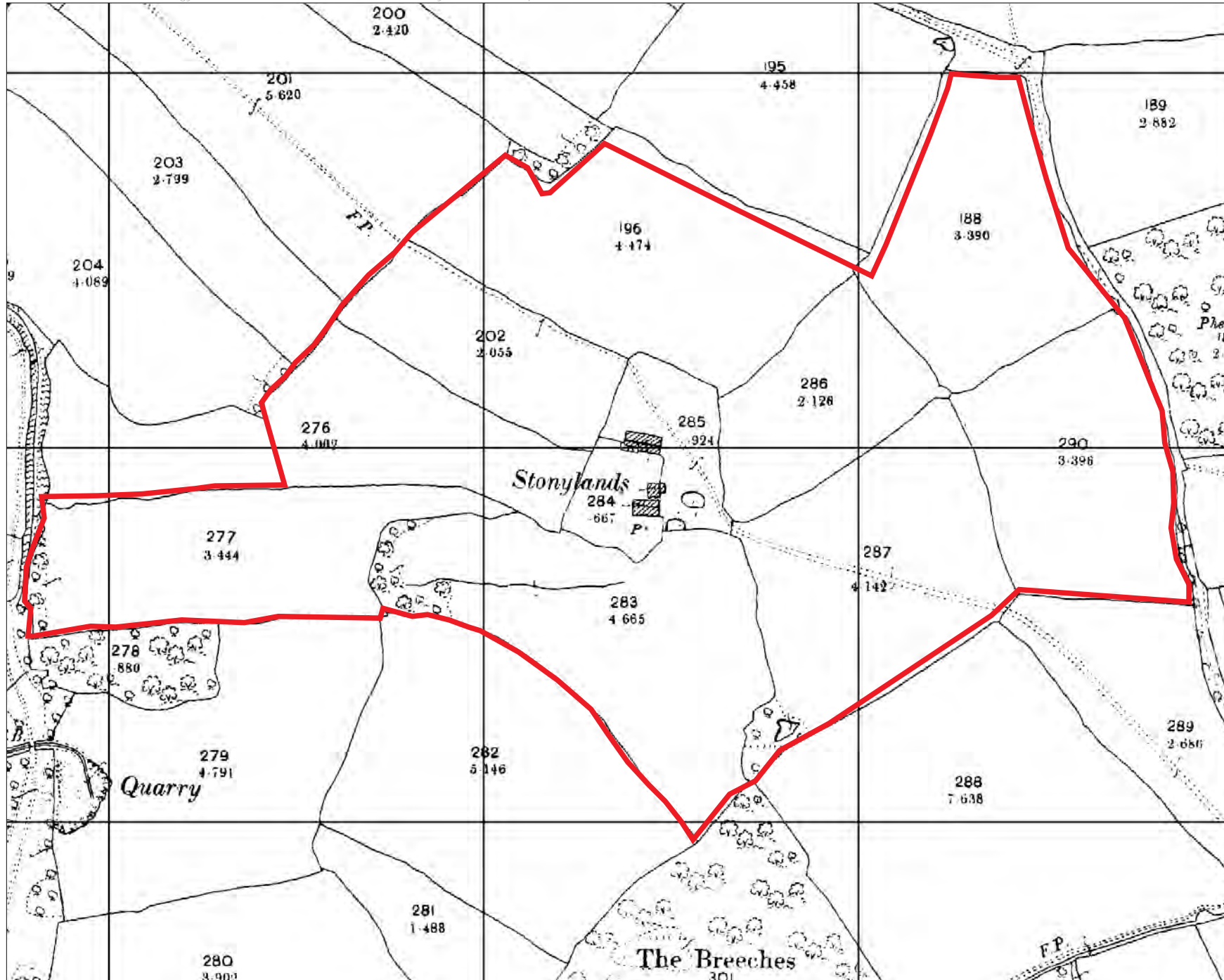
Legend

Site Boundary



Not to Scale:
Illustrative Only

Figure 4:
1878-1881 Ordnance
Survey Map



Planning • Heritage
www.cgms.co.uk

Legend
— Site Boundary



Not to Scale:
Illustrative Only

Figure 5:
1900 Ordnance
Survey Map

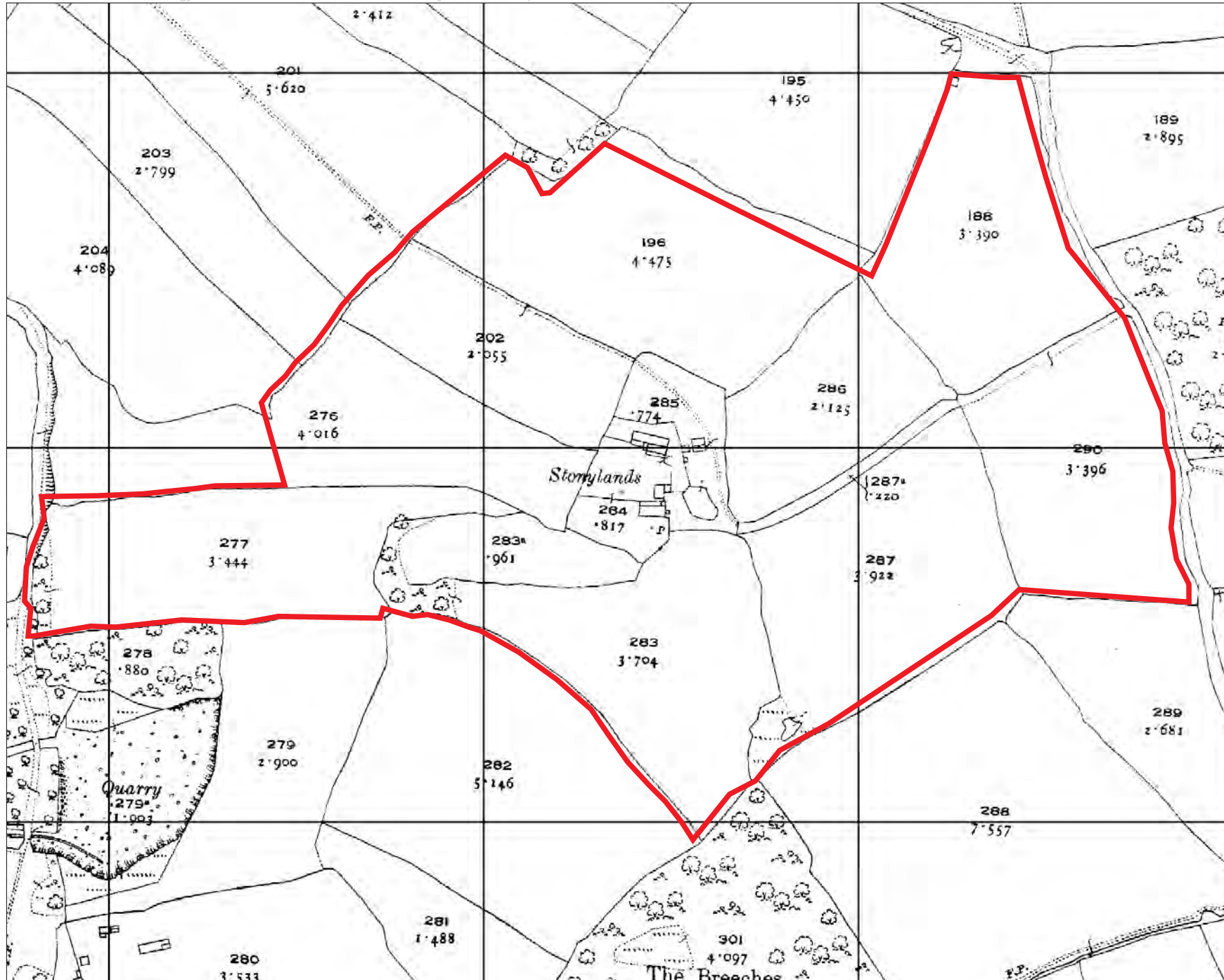


Legend

— Site Boundary

Not to Scale:
Illustrative Only

Figure 6:
1918 Sales Particulars
Map



Planning • Heritage
www.cgms.co.uk

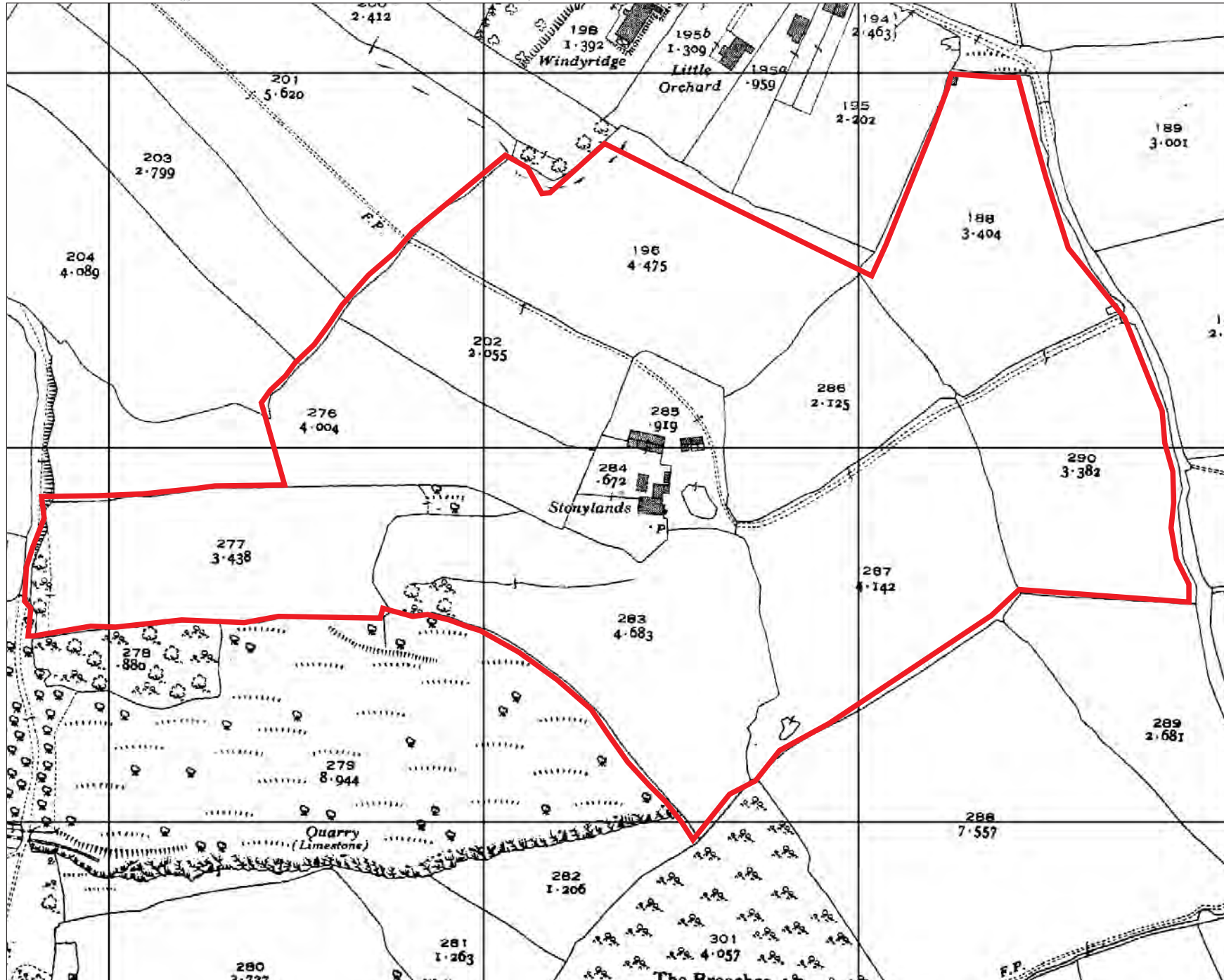
Legend

- Site Boundary



Not to Scale:
Illustrative Only

Figure 7:
1919-1920 Ordnance
Survey Map



Planning • Heritage
www.cgms.co.uk

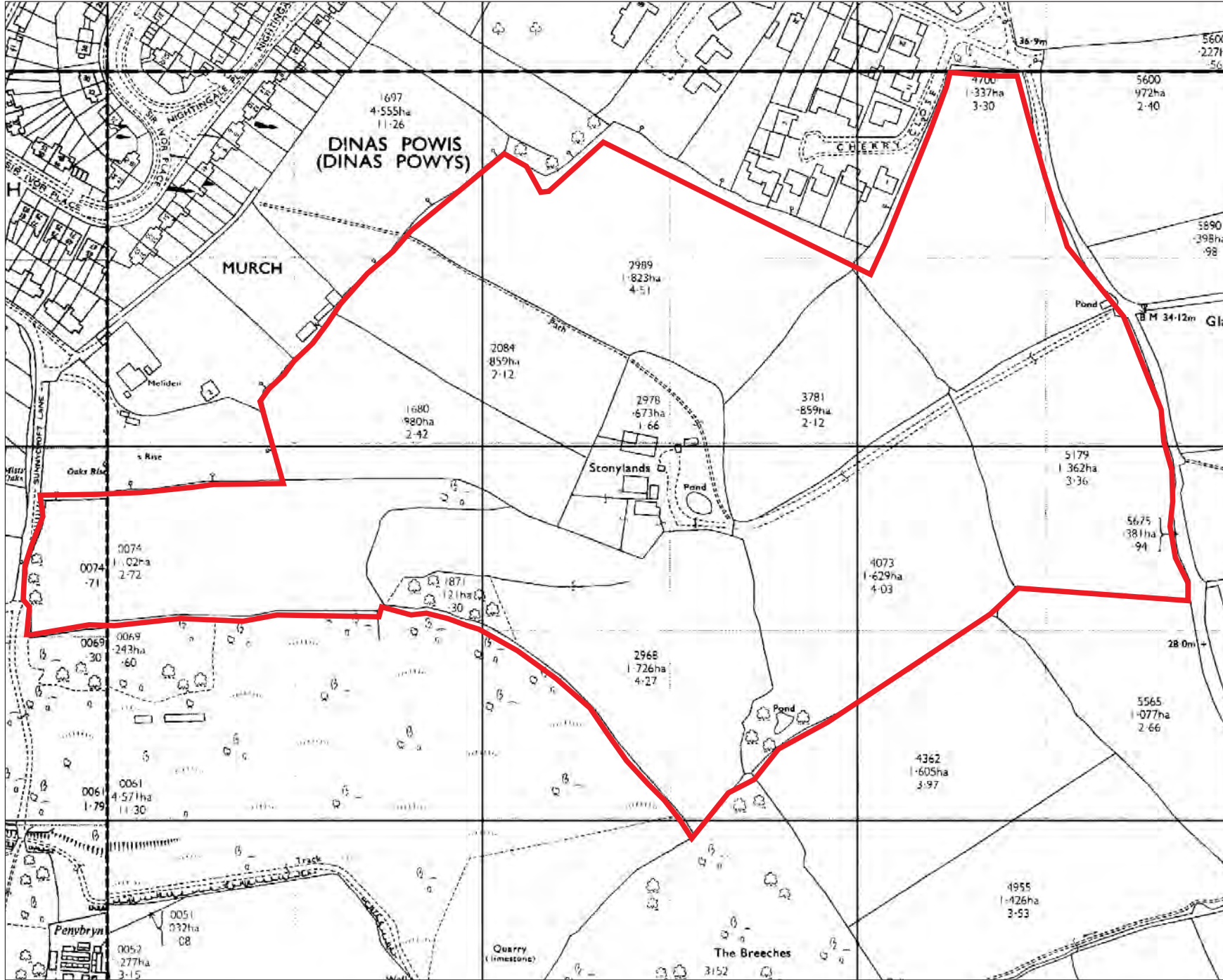
Legend

— Site Boundary



Not to Scale:
Illustrative Only

Figure 8:
1942 Ordnance
Survey Map



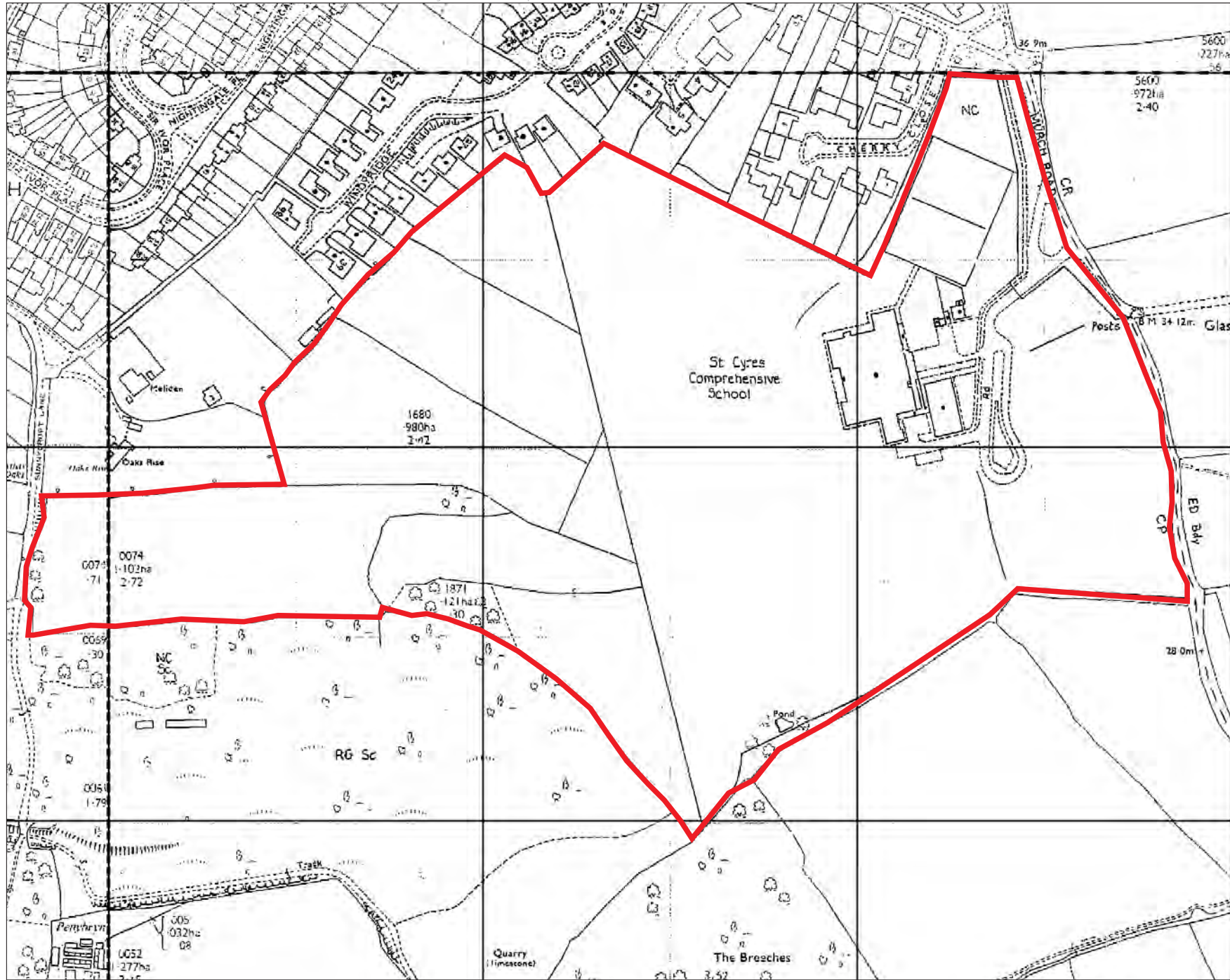
Legend

— Site Boundary

N

Not to Scale:
Illustrative Only

Figure 9:
1969-1971 Ordnance
Survey Map



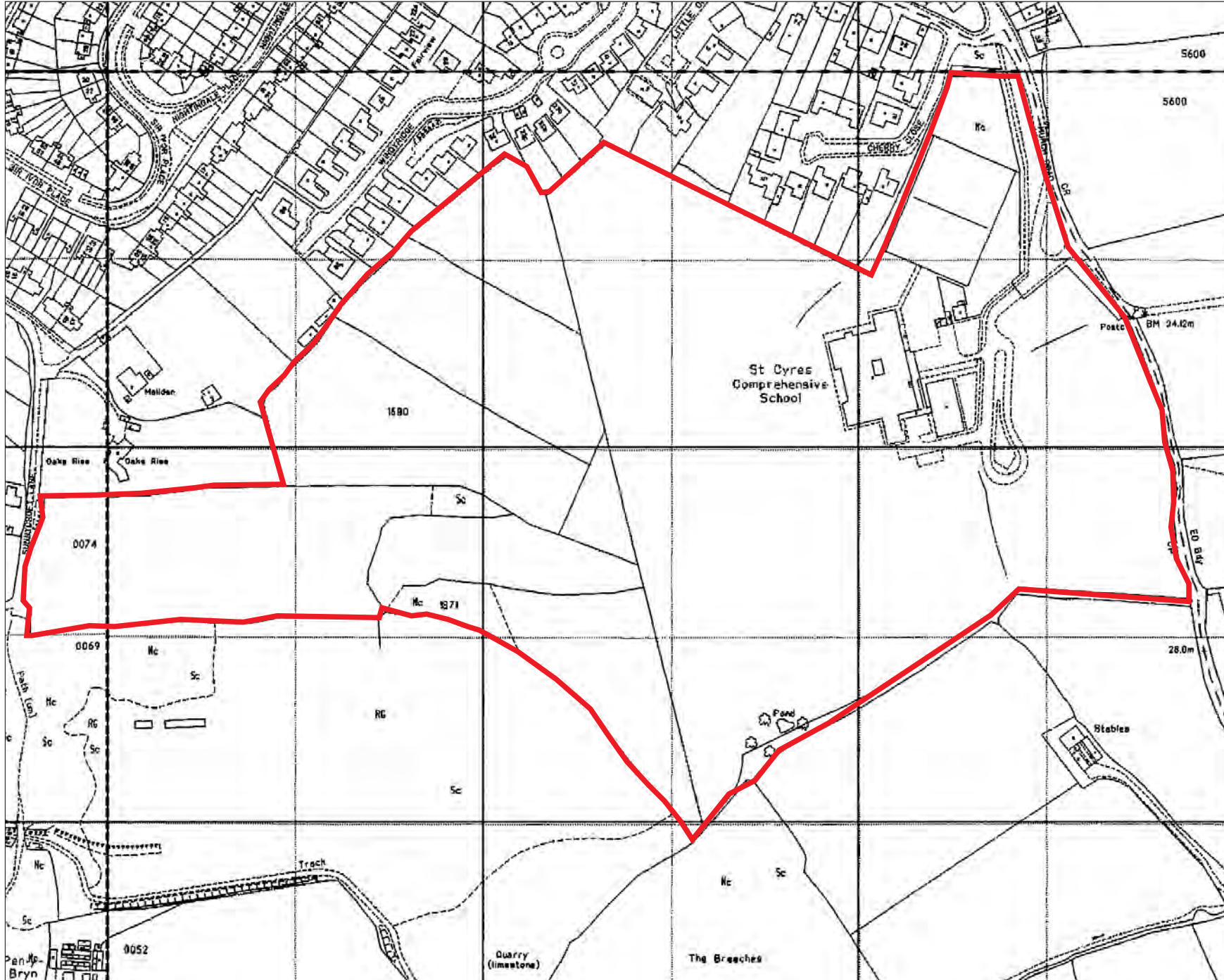
Planning • Heritage
www.cgms.co.uk

Legend
— Site Boundary



Not to Scale:
Illustrative Only

Figure 10:
1977-1987 Ordnance
Survey Map



Planning • Heritage
www.cgms.co.uk

Legend

— Site Boundary



Not to Scale:
Illustrative Only

Figure 11:
1992 Ordnance
Survey Map



Plate 1: Looking south-east from the north-eastern edge of the study site



Plate 2: Looking east from the south-eastern part of the study site



Plate 3: Looking west from the crest of the topographic ridge towards Dinas Powys Common



Plate 4: Looking west towards Dinas Powys Common from the north-western part of the study site



Plate 5: Looking east towards the study site from Dinas Powys Common



Plate 6: Looking north-west from the north-western part of the study site



Plate 7: Looking south-east from within Dinas Powys Castle



Plate 8: Looking south-east from within Dinas Powys Castle



Plate 9: Looking north-west across the south-eastern part of the study site



Plate 10: Looking north across the area of the former school



Plate 11: Looking south-east across the former school playing field from the north-west



Plate 12: Looking north-east across the former school playing field from the south-west



Plate 13: Looking west across the western part of the study site



Plate 14: Looking east from the western limit of the study site



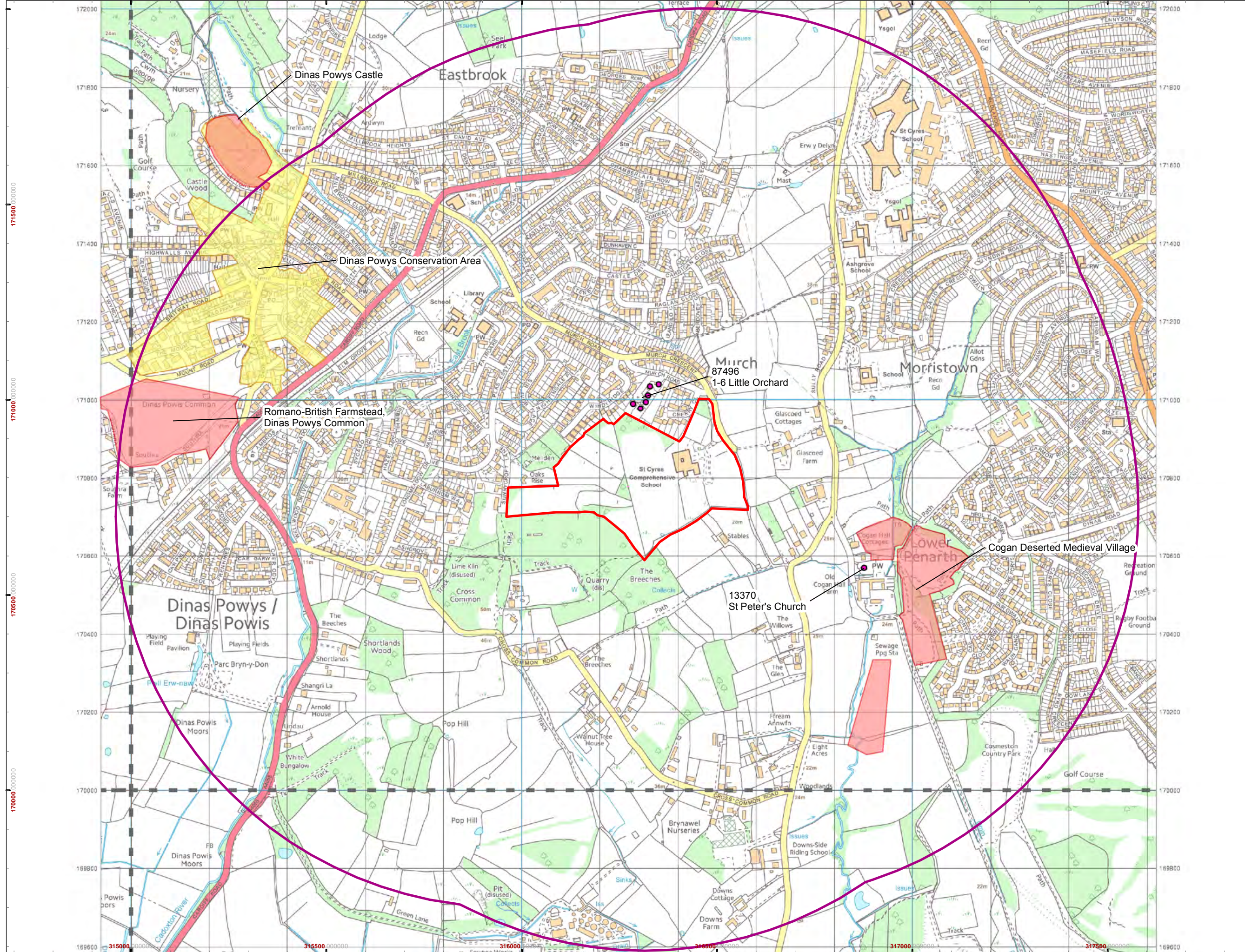
Plate 15: Looking south across the south-western corner of the study site



Plate 16: Looking north-west from the north-western part of the study site

Appendix 1

Glamorgan-Gwent Archaeological Trust Historic Environment Record
and National Monument Record (Wales) data plots

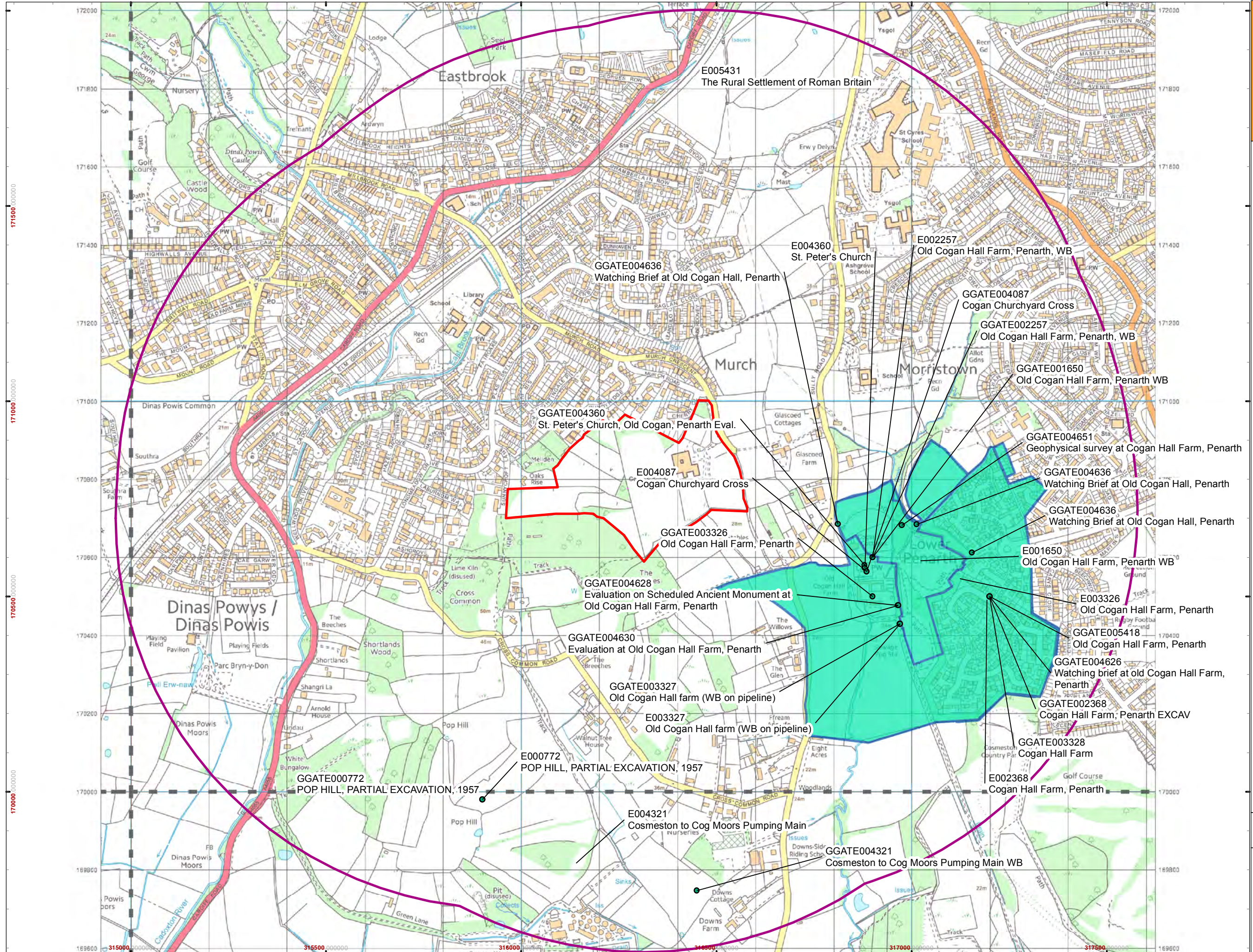


- Legend**
- Site Boundary
 - 1km Search Radius
 - SAMs
 - Conservation Area
 - Listed Buildings



Scale at A3: 1:9,000
 0 250 m

Appendix 1:
 Designated Heritage Assets

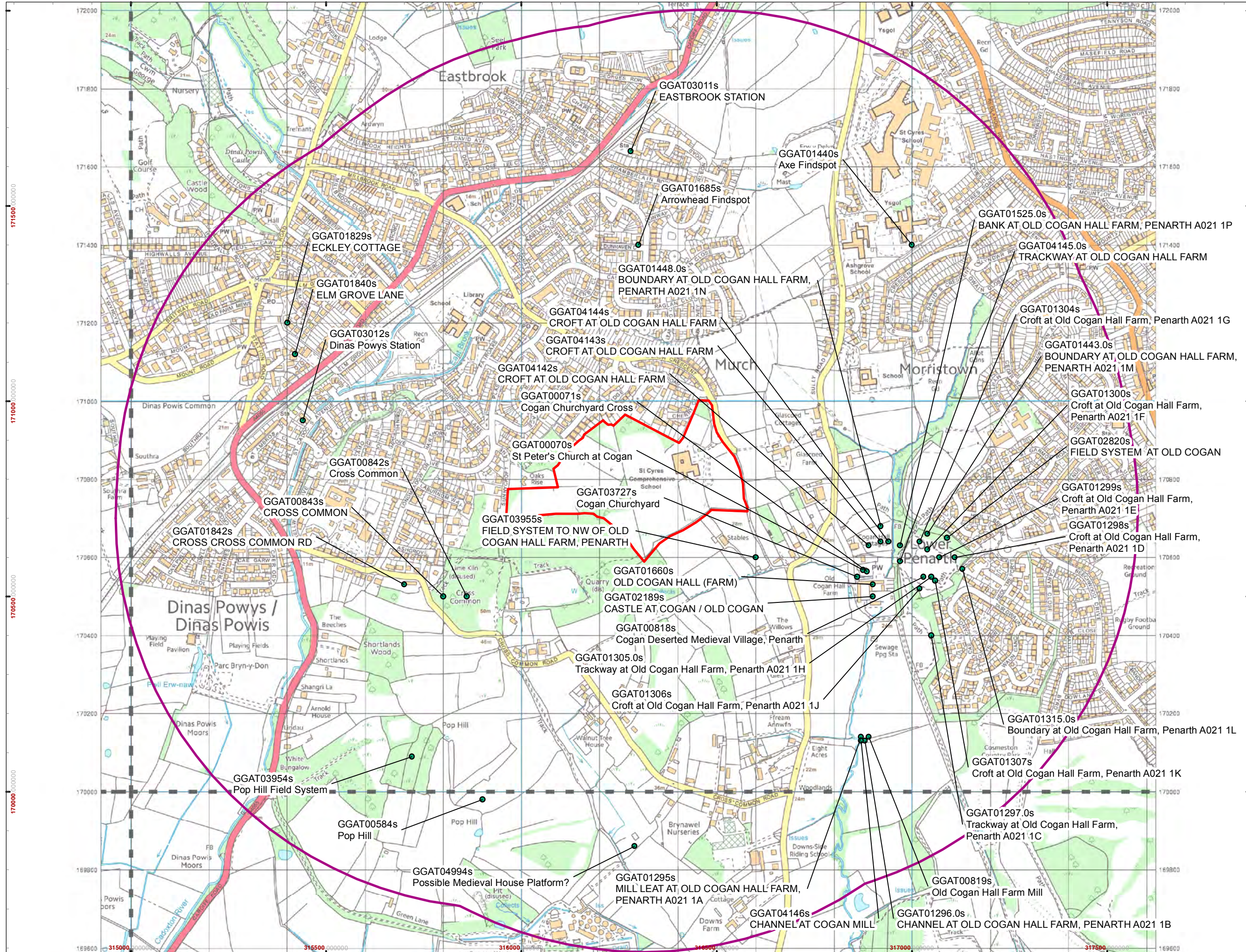


- Legend**
- Site Boundary
 - Search radius
 - HER Events
 - HER Events Region

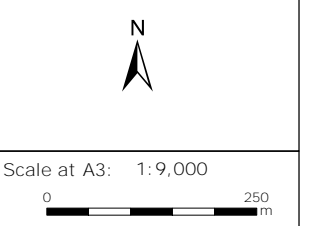
Scale at A3: 1:9,000

N

Appendix 1:
HER Events



- Legend**
- Site Boundary
 - Search radius
 - HER Monuments

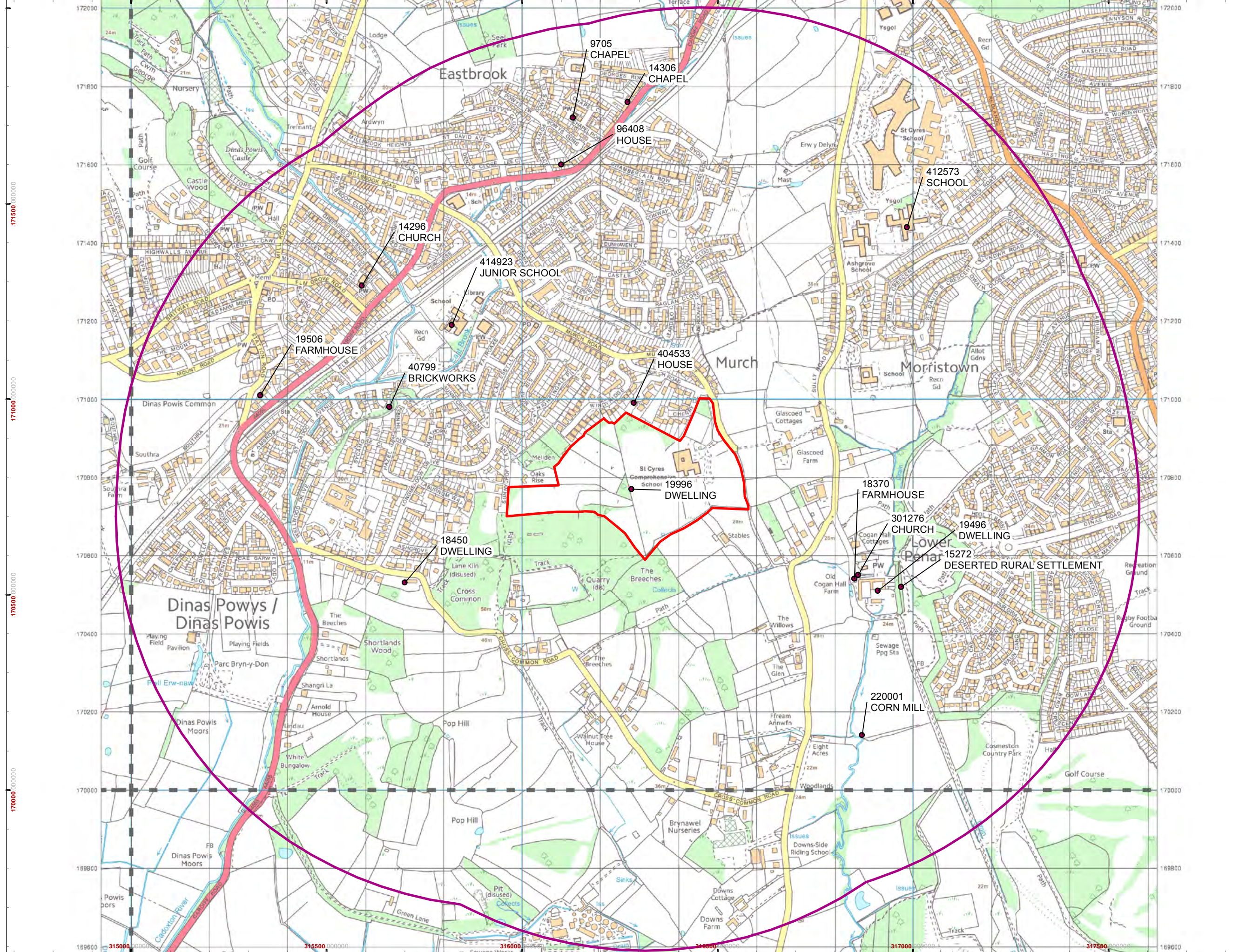


Appendix 1:
HER Monuments Data



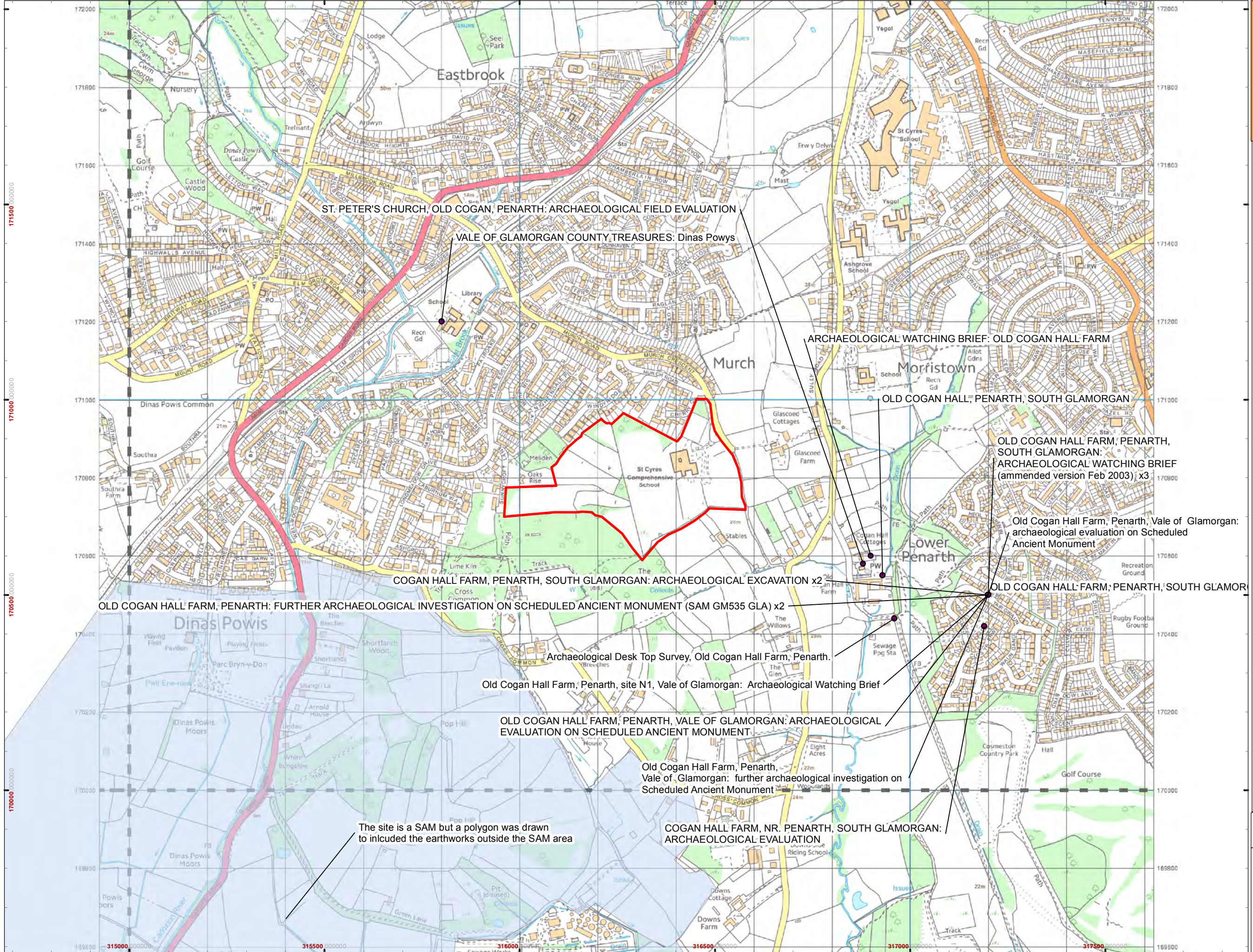
Legend

- 1km Search radius
- Site Boundary
- NMR Data



Scale at A3: 1:9,000
 0 250 m

Appendix 1:
NMR Data



- Legend**
- Site Boundary
 - Search radius
 - Report Archive Point
 - Report Archive Region



Scale at A3: 1:9,000

Appendix 1:
Report Archive Data

Appendix 2

Gazetteer of aerial photographs held by CRAPW

CENTRAL REGISTER OF AERIAL PHOTOGRAPHY FOR WALES

Welsh Government, Room G073a, Cathays Park, Cardiff CF10 3NQ Tel. 029 2082 3819
Aerialphotoofficer@wales.gsi.gov.uk

(This form is available in larger print on request)

Name Nathan Thomas, Address CGMS Consulting, Burlington House, Lypiatt Rd, Cheltenham, Glos. Postcode GL50 2SY Telephone 01242 259 833	Location St Cyres, Penarth Date of photos required All to view Note:- NPH = No Prints Held	National Grid Ref 316200/170700
	200029; 200601; 200901; 201401 6852 F44: # 31, 7846 # 2 - 3	signed <i>Vivien Davies</i> Your ref.

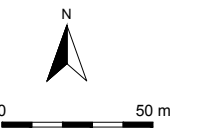
VIEWING BY APPOINTMENT ONLY

WO Lib No:	Old Lib No:	Sortie Number:	Date Flown:	Scale:	Air Survey Org:	Photo Type:	Film Loc:	Prints Available to View:
4220	M 3112	FNO / 17	25/06/1942		Medmenham	B & W		6.22
4714	642	CPE UK 2081	19/05/1947	1:9800	RAF	B & W	10/4	3419 - 20
5018		58 RAF 473	03/06/1950	1:3420	RAF	B & W	7/6	5246 - 48
5211	1246	58 RAF 863	25/04/1952	1:5000	RAF	B & W	9/7	5010 - 11
6007	1975	543 RAF 950	10/06/1960	1:10000	RAF	B & W	25/1	F43: 66 - 67
6209	2086 a & b	58 RAF 5098	02/05/1962	1:10000	RAF	B & W	4/3 x2	F22: 41 - 42
6211	2090	58 RAF 5154	01/06/1962	Various	RAF	B & W	6/7 x3	F21/22: 392 - 393
6310		OS 63 074	31/05/1963	1:24000	Ordnance Survey	B & W	1/2	78
6630		OS 66 200	16/08/1966	1:7500	Ordnance Survey	B & W	1/7	176 - 177
7156	2312	39 RAF 3764	07/09/1971	Various	RAF	B & W	10/4	F44: 18
7941		OS 79 130	22/09/1979	1:24400	Ordnance Survey	B & W	18/4	110
8101		J A Story 8669	29/06/1981	1:5000	JAStory(NRSC)	B & W	NRSC	208 - 209
9019		OS 90 160	13/07/1990	1:8200	Ordnance Survey	B & W	RCAHMW	210
9138			01/07/1991	1:5000	Geonex(NRSC)	Colour	NRSC	133 91: 65
9388		OS 93 108	02/05/1993	1:5200	Ordnance Survey	B & W	RCAHMW	008
9599		OS 95 155	15/06/1995	1:5200	Ordnance Survey	B & W	RCAHMW	50
9943		OS 99 349	09/09/1999	1:5000	Ordnance Survey	B&W	RCAHMW	80 - 81

Appendix 3:
LiDAR data plots



Site Boundary



Scale @ A3:
1:2500

Appendix 3:
LiDAR Data
Direction of sun: SE



Site Boundary



0 50 m

Scale @ A3:
1:2500

Appendix 3:
LiDAR Data
Direction of sun: SW

Appendix 4:
Geophysical Survey Report



St Cyres School Site, Dinas Powys, Vale of Glamorgan

Geophysical Survey Report
(Caesium Vapour Magnetic - Archaeology)

Project code: DPG171

Produced for:

CgMs Consulting

Authors:

MJ Roseveare, Senior Geophysicist
BSc(Hons) MSc MEAGE FGS MCIfA

D Lewis, Archaeological Consultant
BA(Hons) MA ACIfA



13th April 2017



St Cyres School, Dinas Powys, Vale of Glamorgan

Digital data

Item	Sent to	Sent date
CAD – Vector Elements	Philip Bethell	13 th April 2017

Audit

Version	Author	Checked	Date
Interim			
Draft Final	MJ Roseveare, D Lewis	ACK Roseveare	13 th April 2017
Final		ACK Roseveare	23 rd May 2017
Revision			
OASIS Form Completion			

Project metadata

Project Name	St Cyres School, Dinas Powys, Vale of Glamorgan
Project Code	DPG171
Client	CgMs Consulting
Fieldwork Dates	3 rd - 4 th April, 2017
Field Personnel	K Cunningham, T Collins
Data Processing Personnel	ACK Roseveare, T Collins
Reporting Personnel	MJ Roseveare, D Lewis
Draft Report Date	13 th April 2017
Final Report Date	23 rd May 2017

TigerGeo Limited

TigerGeo Limited - Registered in England & Wales 09895326 - D-U-N-S 22-127-7456
Registered Office: 2 Wyevale Business Park, Kings Acre, Hereford, Herefordshire HR4 7BS UK
+44 (0) 1989 730 564 – www.tigergeo.com - @TigerGeoUK – also on LinkedIn & Facebook



Non-Technical Summary

A magnetic survey was commissioned by CgMs Consulting to prospect land at St Cyres School Site, Dinas Powys, Vale of Glamorgan for buried structures of archaeological interest.

Survey was undertaken using an ATV-towed GNSS-tracked array of caesium vapour magnetometers within a number of small pasture fields surrounding the site of Stonylands farm.

Nothing of obvious archaeological interest was seen within the data, although a number of land drains plus buried debris is testimony to generally wet ground across the eastern parts.



Table of Contents

1 Introduction.....	1
2 Context.....	1
2.1 Background information.....	1
2.2 Environment.....	1
3 Discussion.....	3
3.1 Introduction.....	3
3.2 Principles.....	3
3.2.1 Instrumentation.....	3
3.3 Character & principal results.....	4
3.3.1 Data.....	4
3.3.2 Geology.....	4
3.3.3 Land use.....	4
3.3.4 Archaeology.....	5
3.4 Conclusions.....	5
3.5 Caveats.....	5
4 Methodology.....	6
4.1 Survey.....	6
4.1.1 Technical equipment.....	6
4.1.2 Monitoring & quality assessment.....	6
4.2 Data processing.....	6
4.2.1 Procedure.....	6
4.3 Interpretation	6
4.3.1 Introduction.....	6
4.3.2 Geological sources – magnetic character.....	7
4.3.3 Agricultural sources - magnetic character.....	7
4.3.4 Archaeological sources – magnetic character.....	7
4.4 Bibliography & selected reference.....	8
4.5 Archiving and dissemination.....	8
5 Supporting information.....	9
5.1 Standards and quality (archaeology).....	9
5.2 Key personnel	10

1 Introduction

Land at St Cyres School Site, Dinas Powys, Vale of Glamorgan, was magnetically surveyed to prospect for buried features of potential archaeological interest.

Approximately 6.2 hectares was surveyed across seven pasture fields with two small additional areas not being available for survey, one having an overgrown access and the other closed off by Heras mesh steel fencing.

Country	Wales
County	Vale of Glamorgan – Bro Morgannwg
Nearest Settlement	Dinas Powys
Central Co-ordinates	316350, 170770

2 Context

2.1 Background information

An archaeological desk-based assessment has been produced for the site (CgMs, 2017). The summary of the report states that there are no designated heritage assets within the proposed survey area.

In regard to non-designated heritage assets it states:

"The non-designated site of Stonylands Farm (NMR 19996) is recorded within the study site. The Glamorgan Gwent Archaeological Trust (GGAT) has suggested that the farm may date to the Medieval period; however, this is unproven. The earliest reference to a "Stony Land Farm" in the Dinas Powys area occurs in the late 18th century; this accords with the National Monument Record's (NMR) dating of the farm. Historic mapping demonstrates that the farm was in existence in the early 19th century and that many of the ancillary farm buildings date to the 20th century. The farmstead was demolished when St Cyres School was constructed in the late 1970s. Truncated remains of the farm and associated features shown on historic mapping, for example foundation deposits and backfilled ponds, may survive within the study site. However, the farm is well documented and such evidence (if present) is considered to be of no more than local significance."

Based on current evidence, this assessment has identified that the study site has a moderate theoretical potential for previously undiscovered Roman evidence comprising truncated settlement remains and unstratified finds. This is based on its similar topographic position to the two other Roman settlement sites at Pop Hill and Dinas Powys Common recorded within the wider 1km study area. Any Prehistoric, Medieval and Post-Medieval evidence is expected to be limited to former field boundaries (both extant and buried), traces of cultivation and unstratified finds only. Such assets are considered to be of no more than local significance."

2.2 Environment

Soilscapes Classification	Slightly acid loamy and clayey soils with impeded drainage (8)
Superficial 1:50000 BGS	None recorded
Bedrock 1:50000 BGS	St Mary's Well Bay Member - Limestone And Mudstone, Interbedded (STM) Penarth Group - Mudstone And Limestone, Interbedded (PNG) Blue Anchor Formation – Mudstone (BAN)
Topography	Undulating
Hydrology	Natural
Current Land Use	Agricultural – pastoral
Historic Land Use	Agricultural – mixed
Vegetation Cover	Rough grass
Sources of Interference	Debris from the demolition of the former school, agricultural debris etc.



The response of magnetic survey is dependent upon the soil's ability to support magnetic susceptibility enhancement and therefore the parent material and land use. The magnetic contrast on soils derived from mudstone is often muted but satisfactory and will depend upon the overlying soils and local hydrology. Over limestone, the response is variable depending upon local conditions.

Magnetic survey should benefit from the potentially moderate to high magnetic susceptibility of the soil; the British Geological Survey 5km G-Base data states 3.4% soil iron which is slightly above the national average.

3 Discussion

3.1 Introduction

The sections below first discuss the geophysical context within which the results need to be considered and then specific features or anomalies of particular interest. Not all will be discussed here and the reader is advised to consult the graphical elements of this report.

3.2 Principles

Magnetic survey for any purpose relies upon the generation of a clear magnetic anomaly at the surface, i.e. strong enough to be detected by instrumentation and exhibiting sufficient contrast against background variation to permit diagnostic interpretation. The anomaly itself is dependent upon the chemical properties of a particular volume of ground, its magnetic susceptibility and hence induced magnetic field, the strength of any remanent magnetisation, the shape and orientation of the volume of interest and its depth of burial. Finally the choice and configuration of measurement instrumentation will affect anomaly size and shape.

Archaeological sites present a complex mixture of these factors and for some the causative affects are not known. However, depth of burial and size are usually fairly constrained and background susceptibility can be estimated (or measured). The degree of remanent magnetisation is harder to predict and depends on both the natural magnetic properties of the soil and any chemical processes to which it has been subjected. Fortunately heat will raise the susceptibility of most soils and topsoil tends to be more magnetic than subsoil, by volume.

It is hard to draw reliable conclusions about what sort of geology is supportive of magnetic survey as there are many factors involved and in any case magnetic response can vary across geological units as well as being dependent upon post-deposition and erosional processes. In general a relatively non-magnetic parent material contrasting with a magnetisable erosion product, i.e. one which contains iron in the form of oxides and hydroxides, will allow archaeological structures to exhibit strong magnetic contrast against their surroundings and especially if the soil has been heated or subjected to certain processes of fermentation. In the absence of either, magnetic enhancement becomes entirely reliant upon the geochemistry of the soil and enhancement will often be weaker and more variable.

The principal magnetic iron mineral is the oxide magnetite which sometimes occurs naturally but is more often formed during the heating of soil. Subsequent cooling yields a mixture of this, non-magnetic oxide haematite and another magnetic oxide, maghaemite. Away from sources of heat, other magnetic iron minerals include the sulphides pyrite and greigite while in damp soils complex chemistry involving the hydroxides goethite and lepidocrocite can create strong magnetic anomalies. There are thus a number of different geochemical reaction pathways that can both augment and reduce the magnetic susceptibility of a soil. In addition, this susceptibility may exhibit depositional patterns unrelated to visible stratigraphy.

Most structures of archaeological interest detected by magnetic survey are fills within negative or cut features. Not all fills are magnetic and they can be more magnetic or less magnetic than the surrounding ground. In addition, it is common for fills to exhibit variable magnetic properties through their volume, basal primary silt often being more magnetic than the material above it due to the increased proportion of topsoil within it. However, a fill containing burnt soil may be much more magnetic than this primary silt and sometimes a feature that has contained standing water can produce highly magnetic silts through mechanical depositional processes (depositional remanent magnetisation, DRM).

A third structural factor in the detection of buried structures is the depth of topsoil over the feature. As fills sink, the hollow above accumulates topsoil and hence a structure can be detected not through its own magnetisation but through the locally deeper topsoil above it. The volume of soil required depends upon the magnetic susceptibility of the soil but just a few centimetres are often sufficient. Such a thin deposit can, however, easily be lost through subsequent erosion by natural factors or ploughing.

3.2.1 Instrumentation

The use of the magnetic sensors in non-gradiometric (vertical) configuration avoids measurement

sensitisation to the shallowest region of the soil, allowing deeper structures, whether natural or otherwise to be imaged within the sensitivity of the instrumentation. However, this does remove suppression of ambient noise and temporal trends which have to be suppressed later during processing. When compared to vertical gradiometers in archaeological use, there is no significant reduction in lateral resolution when using non-gradiometric sensor arrays and the inability of gradiometers to detect laminar structures is completely avoided.

Caesium instrumentation has a greater sensitivity than fluxgate instruments, however, at the 10 Hz sampling rate used here this increase in sensitivity is limited to about one order of magnitude.

The array system is designed to be non-magnetic and to contribute virtually nothing to the magnetic measurement, whether through direct interference or through motion noise.

3.3 Character & principal results

The following paragraphs represent an interpretive summary of the survey. The numbers in square brackets refer to individual anomalies described in detail in the catalogue below and shown on DWG 03 onwards.

3.3.1 Data

Data quality is overall good with no significant defects of collection. Higher than normal noise from one sensor was successfully suppressed without unduly affecting the data or its interpretation. The background has a fairly uniform texture and magnetic contrast is fairly weak, more so than might be expected from the regional G-Base 3.4% soil iron but the presence of damp ground and pastoral context likely account for this. The strongest magnetic sources are those associated with imported materials and their remanent magnetisation, with natural variation from the soil no more than about 1.5 nT (0.5 nT/m). Survey-related noise is no more than about 0.1 nT while land drains contribute as much as 1.0 nT (0.4 nT/m) to the magnetic field. The significantly lower gradiometric anomaly strength reflects the depth to the magnetic source.

3.3.2 Geology

The mudstone geology is not especially evident except as a weak mottling [11] in the western parts that is indistinguishable from similar strength but likely soil-hosted variability. As already stated, the local environmental context of the site has resulted in lower magnetic contrast than might be expected from similar soils elsewhere.

3.3.3 Land use

There is likely significant modification of soils [12] within the central part of the site, with large amounts of imported debris throughout (e.g. [1 – 3], [5 – 7], etc.) likely to improve drainage plus materials spread from nearby demolished structures. There are land drains throughout the eastern parts, with variable magnetic contrast and hence not all may have been detected. Small areas of woodland adjacent to the fields are all modern, resulting from overgrowth of hedges and piecemeal colonisation. One of these, at (316260, 170770) is also the site of the buildings of Stonylands Farm.

Amongst the debris are discrete concentrations that may reflect former landscape features (not known from former Ordnance Survey map editions), e.g. [3] might be fill within a pond. More enigmatic are thin linear concentrations [1] and [2] but these might be former fence lines or similar transient features that have provided foci in the past.

A band [5] of debris broadly corresponds to a former field boundary and is perhaps in part debris within a former field ditch. The same might also apply to [7]. A larger quantity of debris [6] seems to be deliberate deposition and is apparently bounded along the east side by something aligned with a gap or change in the trees in the modern woodland immediately adjacent.

In the far west of the site, weak linear anomalies [8], [9] and [10] may reflect former agricultural enclosure although the anomalies could also have a natural origin.

There is nothing to suggest anything other than agricultural use of the land and latterly, predominantly



pastoral.

3.3.4 Archaeology

As the sole set of anomalies lacking a known or suspected origin, [4] is described here. In reality the interpretation is unclear and is limited to a straight line about 20 m long of discrete enhanced field anomalies up to 2 m across that are virtually indistinguishable from debris elsewhere, except for having a slightly different overall character. These could represent a fill or fills or perhaps debris within a former topographic feature but nevertheless, undiagnostic.

3.4 Conclusions

The magnetic survey has revealed little of obvious archaeological significance, within a landscape whose character is fairly modern due to colonisation (and perhaps some deliberate planting of) trees and the loss of its farm buildings. Magnetic contrast is fairly low which may be a factor in the result but natural variations are still evident and especially within the western parts.

3.5 Caveats

Geophysical survey is reliant upon the detection of anomalous values and patterns in physical properties of the ground, e.g. magnetic, electromagnetic, electrical, elastic, density and others. It does not directly detect underground features and structures and therefore the presence or absence of these within a geophysical interpretation is not a direct indicator of presence or absence in the ground. Specific points to consider are:

- some physical properties are time variant or mutually interdependent with others;
- for a buried feature to be detectable it must produce anomalous values of the physical property being measured;
- any anomaly is only as good as its contrast against background textures and noise within the data.

TigerGeo will always attempt to verify the accuracy and integrity of data it uses within a project but at all times its liability is by necessity limited to its own work and does not extend to third party data and information. Where work is undertaken to another party's specification any perceived failure of that specification to attain its objective remains the responsibility of the originator, TigerGeo meanwhile ensuring any possible shortcomings are addressed within the normal constraints upon resources.

4 Methodology

4.1 Survey

4.1.1 Technical equipment

Measured variable	Magnetic flux density / nT
Instrument	Array of Geometrics G858 Magmapper caesium magnetometers
Configuration	Non-gradiometric transverse array (4 sensors, ATV towed)
Sensitivity	0.03 nT @ 10 Hz (manufacturer's specification)
QA Procedure	Continuous observation
Spatial resolution	1.0m between lines, 0.25m mean along line interval

4.1.2 Monitoring & quality assessment

The system continuously displays all incoming data as well as line speed and spatial data resolution per acquisition channel during survey. Rest mode system noise is therefore easy to inspect simply by pausing during survey, and the continuous display makes monitoring for quality intrinsic to the process of undertaking a survey. Rest mode test results (static test) are available from the system.

4.2 Data processing

4.2.1 Procedure

All data processing is minimised and limited to what is essential for the class of data being collected, e.g. reduction of orientation effects, suppression of single point defects (drop-outs or spikes) etc. The processing stream for this data is as follows:

Process	Software	Parameters
Measurement & GNSS receiver data alignment	Proprietary	
Temporal reduction, regional field suppression	Proprietary	Bandpassed 0.3 – 10.0s
Gridding	Surfer	Kriging, 0.25m x 0.25m
Smoothing	Surfer	Gaussian lowpass 3x3 data
Imaging and presentation	Manifold GIS	

Potential field processing procedures are used where possible on gridded data from the above processing, allowing simulation of vertical gradient data, separation of deep and shallow magnetic sources, etc. The initial processing uses proprietary software developed in conjunction with the multisensor acquisition system. Gridded data is ported as data surfaces (not images) into Manifold GIS for final imaging and detailed analysis. Specialist analysis is undertaken using proprietary software.

4.3 Interpretation

4.3.1 Introduction

Numerous sources are used in the interpretive process, which takes into account shallow geological conditions, past and present land use, drainage, weather before and during survey, topography and any previous knowledge about the site and the surrounding area. Old Ordnance Survey mapping is consulted and also older sources if available. Geological information (for the UK) is sourced only from British Geological Survey resources and aerial imagery from online sources. LiDAR data is usually sourced from the Environment Agency or other national equivalents, SAR from NASA and other topographic data from original survey.

Information from nearby surveys is consulted to inform upon local data character, variations across soils and

near-surface geological contexts. Published data from other contractors may also be used if accompanied by adequate metadata.

4.3.2 Geological sources – magnetic character

On some sites, e.g. some gravels and alluvial contexts, there will be anomalies that can obscure those potentially of archaeological interest. They may have a strength equal to or greater than that associated with more relevant sources, e.g. ditch fills, but can normally be differentiated on the basis of anomaly form coupled with geological understanding. Where there is ambiguity, or relevance to the study, these anomalies will be included in this category.

Not all changes in geological context can be detected at the surface, directly or indirectly, but sometimes there will be a difference evident in the geophysical data that can be attributed to a change, e.g. from alluvium to tidal flat deposits, or bedrock to alluvium. In some cases the geophysical difference will not exactly coincide with the geological contact and this is especially the case across transitions in soil type.

Geophysical data varies in character across areas, due to a range of factors including soil chemistry, near surface geology, hydrology and land use past and present. These all contribute to the texture of the data, i.e. a background character against which all other anomalies are measured.

4.3.3 Agricultural sources - magnetic character

Coherent linear dipolar enhancement of magnetic field strength marking ditch fills, narrow bands of more variable magnetic field or changes in apparent magnetic susceptibility, are all included within the category of former field boundaries if they correlate with those depicted on the Tithe Map or early Ordnance Survey maps. If there is no correlation then these anomaly types are not categorised as a field boundaries.

Banded variations in apparent magnetic susceptibility caused by a variable thickness of topsoil, depositional remanent magnetisation of sediments in furrows or susceptibility enhancement through heating (a by product of burning organic matter like seaweed) tend to indicate past cultivation, whether ridge-based techniques, medieval ridge and furrow or post medieval 'lazy beds'. Modern cultivation, e.g. recent ploughing, is not included.

In some cases it is possible to identify drainage networks either as ditch-fill type anomalies (typically 'Roman' drains), noisy or repeating dipolar anomalies from terracotta pipes or reduced magnetic field strength anomalies from culverts, plastic or non-reinforced concrete pipes. In all cases identification of a herring bone pattern to these is sufficient for inclusion within this category.

4.3.4 Archaeological sources – magnetic character

Any linear or discrete enhancement of magnetic field strength, usually with a dipolar character of variable strength, that cannot be categorised as a field boundary, cultivation or as having a geological origin, is classified as a fill potentially being of archaeological interest. Fills are normally earthen and include an often invisible proportion of heated soil or topsoil that augments local magnetic field strength. Inverted anomalies are possible over non-earthen fills, e.g. those that comprise peat, sand or gravel within soil. This category is subject to the 'habitation effect' where, in the absence of other sources of magnetic material, anomaly strength will decrease away from sources of heated soil and sometimes to the extent of non-detectability.

Former enclosure ditches that contained standing water can promote enhanced volumetric magnetic susceptibility through depositional remanence and remain detectable regardless of the absence of other sources of magnetic enhancement.

Anything that cannot be interpreted as a fill tends to be a structure, or in archaeological terms, a feature. This category is secondary to fills and includes anomalies that by virtue of their character are likely to be of archaeological interest but cannot be adequately described as fills. Examples include strongly magnetic bodies lacking ferrous character that might indicate hearths or kilns. In some cases anomalies of ferrous character may be included.

On some sites the combination of plan form and anomaly character, e.g. rectilinear reduced magnetic field strength anomalies, might indicate the likely presence of masonry, robber trenches or rubble foundations.



Other types of structure are only included if the evidence is unequivocal, e.g. small ring ditches with doorways and hearths. In some circumstances a less definite category may be assigned to the individual anomalies instead.

It is sometimes possible to define different areas of activity on the basis of magnetic character, e.g. texture and anomaly strength. These might indicate the presence of middens or foci within larger complexes. This category does not indicate a presence or absence of discrete anomalies of archaeological interest.

4.4 Bibliography & selected reference

- Aspinall, A, *et al*, 2008, "Magnetometry for Archaeologists", Geophysical Methods for Archaeology, Altamira Press
- Blakely, R J, 1996, "Potential Theory in Gravity and Magnetic Applications", Cambridge University Press
- CgMs, 2017 "Archaeological Desk-Based Assessment: St Cyres School, Dinas Powys, Vale of Glamorgan" Unpublished
- Chartered Institute for Archaeologists, 2014 (Updated 2016), "Standard and guidance for archaeological geophysical survey" Reading
- David, A, *et al*, 2008, "Geophysical Survey in Archaeological Field Evaluation", English Heritage
- Gaffney, C, *et al*, 2002, "Technical Note 6: The use of geophysical techniques in archaeological evaluations", Institute for Archaeologists
- Milsom, J, 2003, "Field Geophysics", 3rd edition, The Geological Field Guide Series, Wiley
- Rawlins, B G *et al*, 2012, "The advanced soil geochemical atlas of England and Wales". British Geological Survey, Keyworth
- Schmidt, A, 2013, "Geophysical Data in Archaeology: A Guide to Good Practice", ADS
- Scollar, I, 1990, "Archaeological Prospecting and Remote Sensing", Topics in Remote Sensing 2, Cambridge University Press
- Tarling, D H, *et al*, (ed.), 1999, "Palaeomagnetism and Diagenesis in Sediments", Geological Society, London, Special Publications, 151
- Telford, W M, *et al*, 1990, "Applied Geophysics", 2nd Edition, Cambridge University Press
- TigerGeo, 2017, "Specification for Geophysical Survey: Caesium Vapour Magnetic – Archaeology" Unpublished, project code DPG171

4.5 Archiving and dissemination

An archive is maintained for all projects, access to which is permitted for research purposes. Copyright and intellectual property rights are retained by TigerGeo on all material it has produced, the client having full licence to use such material as benefits their project. Where required, digital data and a copy of the report can be archived in a suitable repository, e.g. the Archaeology Data Service, in addition to our own archive.

The archive contains all survey and project data, communications, field notes, reports and other related material including copies of third party data (e.g. CAD mapping, etc.) in digital form. Many are in proprietary formats while report components are available in PDF format.

The client will determine the distribution path for reporting, including to the end client, other contractors, local authority etc., and will determine the timetable for upload of the project report to the OASIS Grey Literature library or supply of report or data to other archiving services, taking into account end client confidentiality.

TigerGeo reserves the right to display data rendered anonymous and un-locatable on its website and in other marketing or research publications.



5 Supporting information

5.1 Standards and quality (archaeology)

TigerGeo meets with ease the requirements of English Heritage in their 2008 Guidance "Geophysical Survey in Archaeological Field Evaluation" section 2.8 entitled "Competence of survey personnel".

The management team at TigerGeo have over 30 years of combined experience of near surface geophysical project design, survey, interpretation and reporting, based across a wide range of shallow geological contexts. Added to this is the considerable experience of our lead geophysicists in a variety of commercial and academic roles. All geophysical staff have graduate and in many cases also post-graduate relevant qualifications pertaining to environmental geophysics from recognised centres of academic excellence.

A high standard of client-centred professionalism is maintained in accordance with the requirements of relevant professional bodies including the Geological Society of London (GeoSoc) and the Chartered Institute for Archaeologists (CIfA). Senior members of TigerGeo are professional members of the GeoSoc (FGS), CIfA (MCIfA & ACIfA grades) and other appropriate bodies, including the European Association of Geoscientists and Engineers (EAGE) Near Surface Division (MEAGE) and the Institute of Professional Soil Scientists (MISoilSci).

During fieldwork there is always a fully qualified (to graduate or post-graduate level) supervisory geophysicist leading a team of other geophysicists and geophysical technicians, all of whom are trained and competent with the equipment they are working with. Data processing and interpretation is carried out by a suitably qualified and experienced geophysicist under the direct supervision and guidance of the Senior Geophysicist. All work is monitored and reviewed throughout by the Senior Geophysicist who will appraise all stages of a project as it progresses.

Data processing and interpretation adheres to the scientific principles of objectiveness and logical consistency. A standard set of approved external sources of information, e.g. from the British Geological Survey, the Ordnance Survey and similar sources of data, in addition to previous TigerGeo projects, guide the interpretive process. Due attention is paid to the technical constraints of method, resolution, contrast and other geophysical factors.

There is a strong culture of internal peer-review within TigerGeo, for example, all reports pass through a process of authorship, technical review and finally proof-reading before release to the client. Technical queries resulting from TigerGeo's work are reviewed by the Senior Geophysicist to ensure uniformity of response prior to implementing any edits, etc.

All work is conducted in accordance with the following standards and guidance:

- David et al, "Geophysical Survey in Archaeological Field Evaluation", English Heritage, 2008;
- "Standard and guidance for Archaeological Geophysical survey", Chartered Institute for Archaeologists, 2014 (Updated 2016);

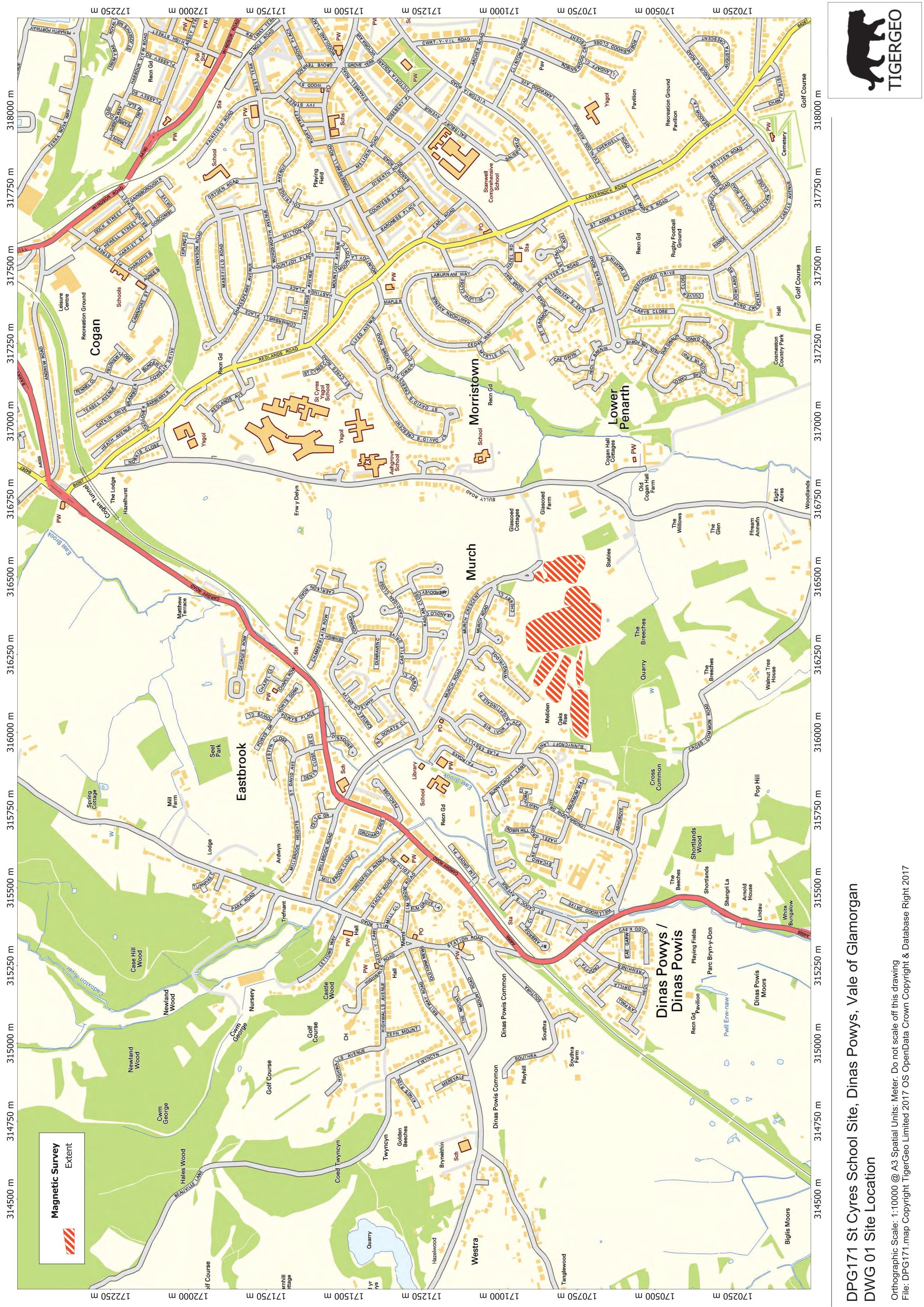
and undertaken in accordance with the high professional standards and technical competence expected by the Geological Society of London and the European Association of Geoscientists and Engineers.

TigerGeo is in the process of applying to the Chartered Institute for Archaeologists to become a Registered Organisation. ISO 9001 and 14001 accreditation is also sought.



5.2 Key personnel

Senior Geophysicist (Quality manager)	Martin Roseveare MSc BSc(Hons) MEAGE FGS MCIfA
<p>Martin specialised (MSc) in geophysical prospection for shallow applications and since 1997 has worked in commercial geophysics. Elected a GeolSoc Fellow in 2009 he is now working towards achieving CSci. A member of the European Association of Geoscientists & Engineers, he has served on the EuroGPR and CIfA GeoSIG committees and on the scientific committees of the 10th and 11th Archaeological Prospection conferences. He has reviewed papers for the EAGE Near Surface conference, was a technical reviewer of the Irish NRA geophysical guidance and is a founding member of the ISSGAP soils group. Professional interests include the application of geophysics to agriculture and the environment, e.g. groundwater and geohazards. He is also a software writer and equipment integrator with significant experience of embedded systems.</p>	
Operations Manager (Safety manager)	Anne Roseveare BEng(Hons) DIS MISoilSci
<p>On looking beyond engineering, Anne turned her attention to environmental monitoring and geophysics. She is a Member of the British Society of Soil Science (BSSS) and has specific areas of interest in soil physics & hydrology, agricultural applications and industrial sites. Amongst other contributions to the archaeological geophysics sector over the last 18 years, Anne was the founding Editor of the International Society for Archaeological Prospection (ISAP) and is a founding member of the ISSGAP soils group. Specifications, logistics, safety, data handling & analysis are integral parts of her work, though she is happily distracted by the possibilities of discovering lost cities, hillwalking and good food.</p>	
Archaeological Consultant	Daniel Lewis MA BA(Hons) ACIfA
<p>Daniel studied archaeology at the University of Nottingham and worked in field archaeology for many years, managing urban and rural fieldwork projects in and around Herefordshire. When the desk became more appealing he jumped into the world of consulting, working on small and large multi-discipline projects throughout England and Wales. At the same time, he returned to University, gaining an MA in Historic Environment Conservation. With over 15 years' experience in the heritage sector, Daniel has a diverse portfolio of skills. Here he ensures that geophysical work within the heritage sector is well grounded in the archaeology. His spare time includes much running up mountains.</p>	
Geophysicist	Kathryn Cunningham BSc(Hons) FGS
<p>Kathryn has been with TigerGeo for more than 18 months and has undertaken over 100 surveys comprising total field magnetometry, twin probe resistivity, electrical resistance tomography, ground penetrating radar and laser-scanning. Her particular role is to ensure all aspects of fieldwork run smoothly, including site-specific paperwork, liaison, internal auditing and risk assessment. In addition she has increasing responsibilities in data processing and interpretation. She graduated with a BSc (Hons) in Applied Geology in 2015 from the University of Plymouth, is a Fellow of the Geological Society and enjoys acrobatics and sunny days.</p>	
Geophysicist	Jack Wild BSc(Hons) FGS
<p>Down to earth and a recent Plymouth University graduate in geology (GeolSoc accredited degree) Jack entered the world of shallow geophysics with an Atkinson Leapfrog. Happiest when in the field he has undertaken geological projects Europe wide including in Sicily and the Spanish Pyrenees and closer to home has studied much of the Cornish and Devon coast. The mystery of what lies below drives his interest in the collection and interpretation of high quality data - be it from magnetometry or GPR he just cannot resist(ivity)!</p>	

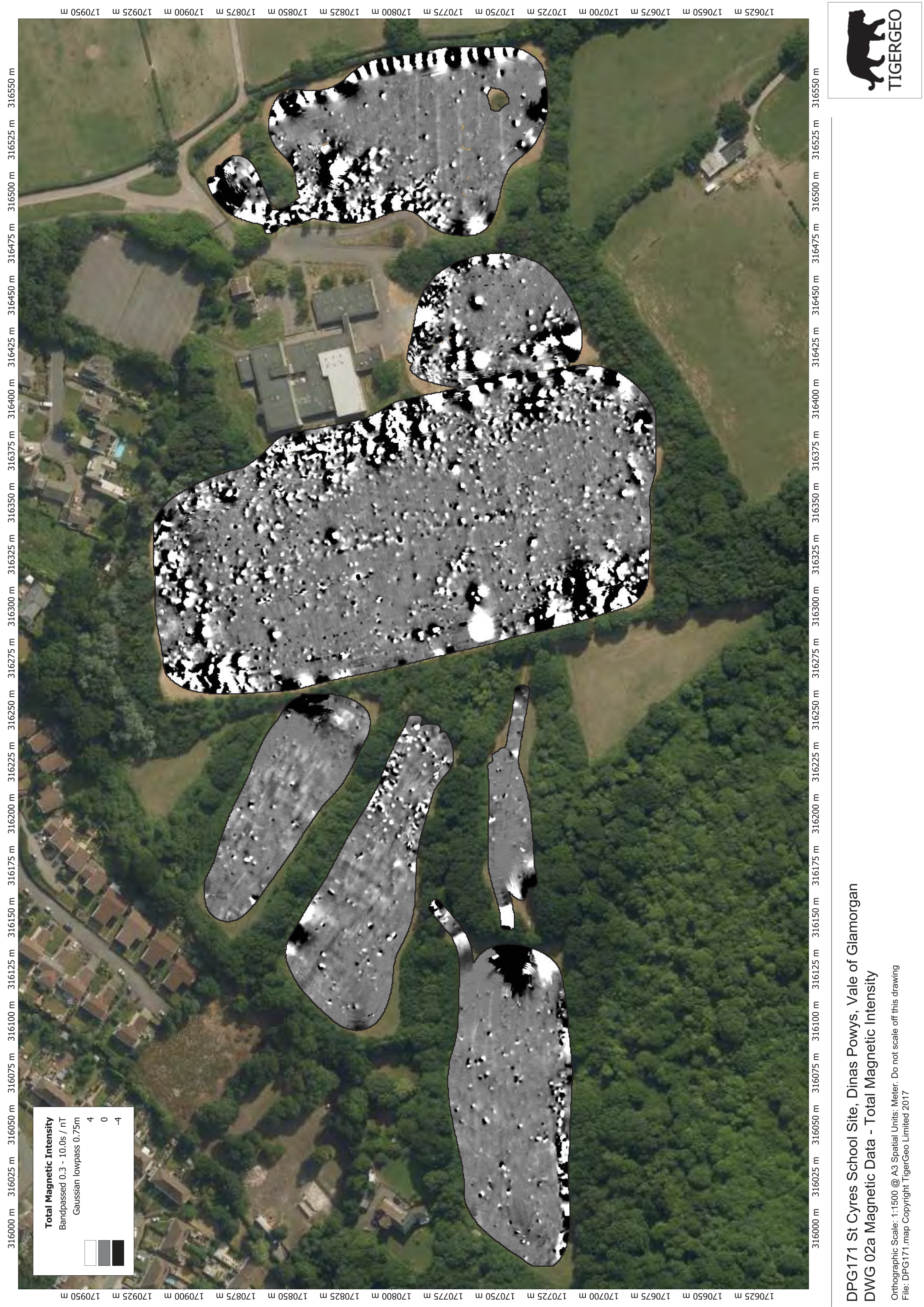


Magnetic Survey
Extent

DPG171 St Cyres School Site, Dinas Powys, Vale of Glamorgan
DWG 01 Site Location

Orthographic Scale: 1:10000 @ A3 Spatial Units: Meter. Do not scale off this drawing
File: DPG171.map Copyright TigerGeo Limited 2017 OS OpenData Crown Copyright & Database Right 2017





Total Magnetic Intensity
 Bandpassed 0.3 - 10.0s / nT
 Gaussian lowpass 0.75m

4
0
-4

DPG171 St Cyres School Site, Dinas Powys, Vale of Glamorgan
 DWG 02a Magnetic Data - Total Magnetic Intensity

Orthographic Scale: 1:1500 @ A3 Spatial Units: Meter. Do not scale off this drawing
 File: DPG171.map Copyright TigerGeo Limited 2017





DPG171 St Cyres School Site, Dinas Powys, Vale of Glamorgan
 DWG 02b Magnetic Data - Vertical 1m Pseudogradient

Orthographic Scale: 1:1500 @ A3 Spatial Units: Meter. Do not scale off this drawing
 File: DPG171.map Copyright TigerGeo Limited 2017





Magnetic Pseudogradient
 Bandpassed 0.3 - 10.0s / nT
 Gaussian lowpass 0.75m
 1m Pseudogradient nT/m

3	Labels
0	Underground services
-3	Probable land drains
> 50 nT/m	Possibly agricultural
> 20 nT/m	Highlighted anomalies
> 10 nT/m	
< -10 nT/m	
< -20 nT/m	
< -50 nT/m	

Interpretation

- Labels
- Underground services
- Probable land drains
- Possibly agricultural
- Highlighted anomalies

DPG171 St Cyres School Site, Dinas Powys, Vale of Glamorgan
 DWG 03 Interpretation

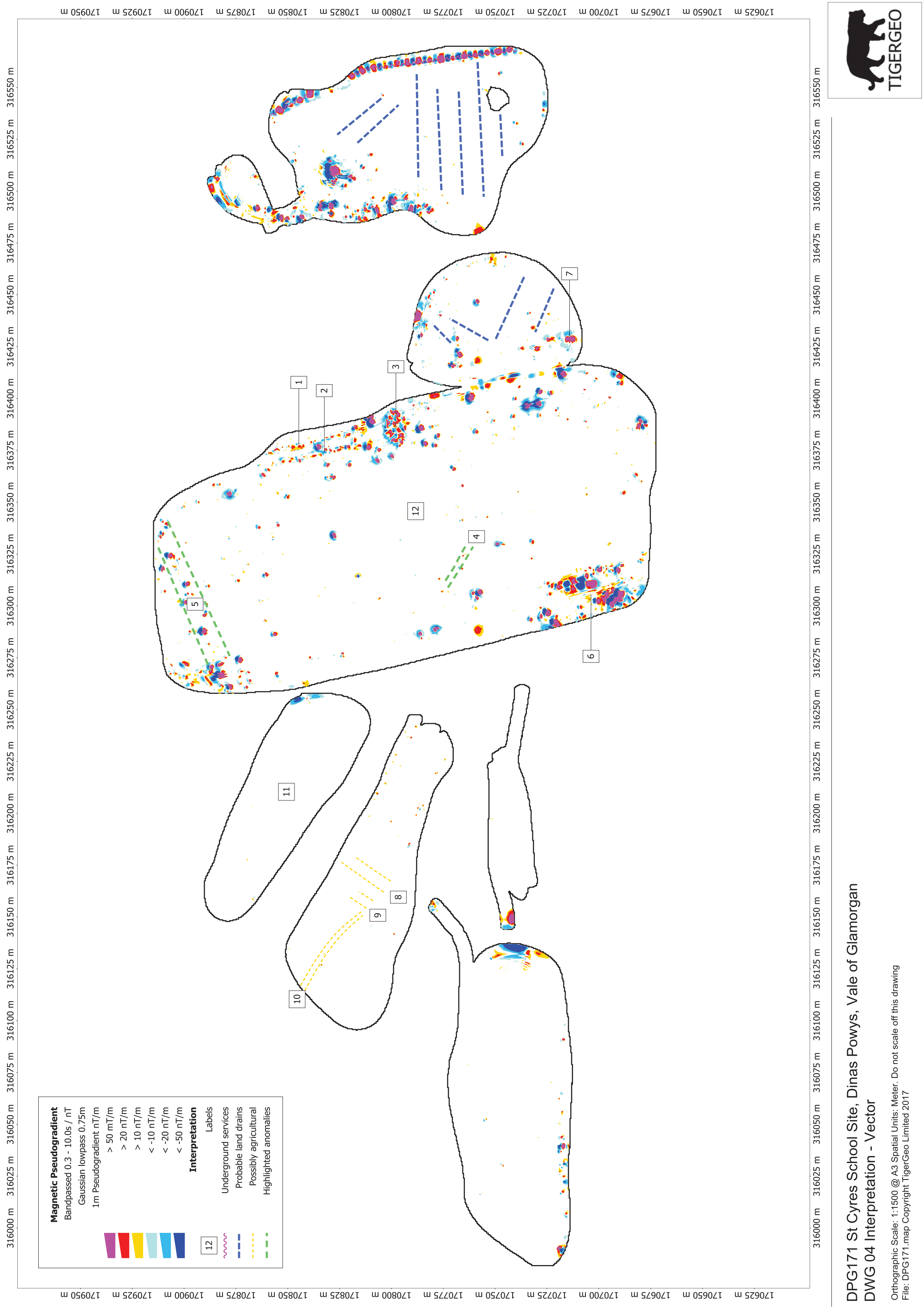
Orthographic Scale: 1:1500 @ A3 Spatial Units: Meter. Do not scale off this drawing
 File: DPG171.map Copyright TigerGeo Limited 2017



170625 m 170650 m 170675 m 170700 m 170725 m 170750 m 170775 m 170800 m 170825 m 170850 m 170875 m 170900 m 170925 m 170950 m

170625 m 170650 m 170675 m 170700 m 170725 m 170750 m 170775 m 170800 m 170825 m 170850 m 170875 m 170900 m 170925 m 170950 m

316000 m 316025 m 316050 m 316075 m 316100 m 316125 m 316150 m 316175 m 316200 m 316225 m 316250 m 316275 m 316300 m 316325 m 316350 m 316375 m 316400 m 316425 m 316450 m 316475 m 316500 m 316525 m 316550 m



Magnetic Pseudogradient
 Bandpassed 0.3 - 10.0s / nT
 Gaussian lowpass 0.75m
 1m Pseudogradient nT/m

[Purple]	> 50 mT/m
[Red]	> 20 nT/m
[Yellow]	> 10 nT/m
[Light Blue]	< -10 nT/m
[Dark Blue]	< -20 nT/m
[Dark Blue]	< -50 nT/m

Interpretation

[Box 12]	Labels
[Wavy line]	Underground services
[Blue dashed line]	Probable land drains
[Yellow dashed line]	Possibly agricultural
[Green dashed line]	Highlighted anomalies

DPG171 St Cyres School Site, Dinas Powys, Vale of Glamorgan
 DWG 04 Interpretation - Vector

Orthographic Scale: 1:1500 @ A3 Spatial Units: Meter. Do not scale off this drawing
 File: DPG171.map Copyright TigerGeo Limited 2017



Cgms

www.cgms.co.uk

Cgms