

Stage 1 Settings Assessment:

On Land North of Bronwylfa Road, Rhostyllen, Wrexham.

October 2023



Report No. 2234

By

John Davey



Stage 1 Settings Assessment:

On Land North of Bronwylfa Road, Rhostyllen, Wrexham.

October 2023

Innova Renewables Developments Limited

By

John Davey PhD MCIfA

Report No.2234

Version	Date	Sections Revised	Prepared/Revised by	Checked & Authorised by
1	10/10/2023	Original	John Davey PhD MCIfA	Rhiannon Philp PhD
2	11/11/2023	Minor alterations to text	John Davey PhD MCIfA	

Copyright Notice: Archaeology Wales Ltd. retain copyright of this report under the Copyright, Designs and Patents Act, 1988, and have granted a licence to Innova Renewables Developments Limited and their agents to use and reproduce the material contained within.

The Ordnance Survey has granted Archaeology Wales Ltd a Copyright Licence (No.100055111) to reproduce map information; Copyright remains otherwise with the Ordnance Survey.

Archaeology Wales Limited

Main Office, Unit D11.6 Treforest Industrial Estate

Pontypridd - CF37 5UR

Tel: +44 (0) 1686 440371

Email: admin@arch-wales.co.uk

Web: arch-wales.co.uk



Contents

1. Introduction	6
2. Legislation and Guidance	7
3. Methodology	7
4. The Development Proposals	8
5. Stage 1: Identifying Affected Historic Assets.....	11
6. Site Visit	20
7. Conclusions	25
8. Sources	30
Figures.....	31
Plates	44

Table 1. Designated Heritage Assets within 3km radius of the site

Table 2. Results of the Stage 1 Settings Assessment (potentially affected Heritage assets)

Figures

Figure 1: Location plan

Figure 2: Proposed Development plan

Figure 3: Proposed Development Layout Plan

Figure 4: Proposed Contour Plan (West)

Figure 5: Proposed Contour Plan (East)

Figure 6: Proposed Cut and Fill Plan (West)

Figure 7: Proposed Cut and Fill Plan (East).

Figure 8: Proposed Alpha Substation.

Figure 9: Proposed 132_33kV Compound

Figure 10: Proposed energy storage MV Skid

Figure 11: Designated Heritage Assets within 3km of the site

Figure 12: ZTV Analysis

Figure 13: Photo Location Plan

Plates

Plate 1: Field 1, view to west-southwest.

Plate 2: Field 1, east end, view to the west.

Plate 3: Field 1, east end view to south.

Plate 4: Field 1, west end, view to west.

Plate 5: Field 1, view towards Croesfoel Farmhouse (LB16571).

Plate 6: Field 2, view west southwest along northern field boundary (Rhos Railway Embankment).

Plate 7: Field 2, view north northwest along the eastern field boundary.

Plate 8: Field 2, view west across the large lynchet forming the western field boundary with Field 10.

Plate 9: Moated Site at Croes Foel (DE193), western moat, view to south southeast.

Plate 10: Moated Site at Croes Foel (DE193), remains of stone building on central platform, view to east northeast. 1m scale.

Plate 11: Moated Site at Croes Foel (DE193), western moat, additional stone structure, view to east northeast. 1m scale.

Plate 12: Moated Site at Croes Foel (DE193), dump of rubble, brick and corrugated sheeting, northwest corner of site. The proposed energy storage site lies behind the trees in the background, view to north.

Plate 6: View across the north edge of the Moated Site at Croes Foel (DE193), towards the proposed energy storage site which lies behind the trees in the background, view to northeast.

Plate 14: View southwest towards Croes Foel Round Barrow (DE048).

Plate 15: View north northeast towards the proposed energy storage Site from Croes Foel Round Barrow (DE048).

Plate 16: view east from Croes Foel Round Barrow (DE048) towards Croes Foel Farmhouse (LB 16571).

Plate 17: view north northwest from Croes Foel Farmhouse (LB 16571) towards the site.

Plate 18: view north northwest from the road outside Timber-framed building in yard at Croesfoel Farm (LB 16573) towards the site.

Plate 19: view north from the Gate Piers at Hafod-y-Bwch Hall (LB 16572) towards the site.

Plate 20: view south along Offa's Dyke: Section extending 120m from Railway to Bronwylfa Road, Legacy (DE194).

Plate 21: view south along recently re-cut ditch parallel to Offa's Dyke (DE194)

Plate 22: View east towards the site along possible southern Cable route across Offa's dyke (DE194).

Plate 23: View north along Offa's Dyke: Cadwgan Hall Section (DE132).

Plate 24: View east southeast across Offa's Dyke: Cadwgan Hall Section (DE132) towards the site.

Plate 25: Cadwgan Hall Mound (DE131), view to the east southeast across the monument towards the site.

Plate 26: view to the east southeast from the top of Cadwgan Hall Mound (DE131), towards the site.

Plate 27: view to the west northwest towards the site from DE137 Offa's Dyke Pentre-Bychan Hall Section, extending 540m S from Bron-Wylfa.

Plate 28: view to the northwest towards the site from DE174 Offa's Dyke: Section S of Bryn yr Owen Farm.

Plate 29: Scheduled Monument DE047 Hafod-y-Bwlch Round Barrow, view to the west.

Plate 30: View north towards the site from DE047 Hafod-y-Bwlch Round Barrow.

Plate 31: LB1715 Pentrebychan Hall Dovecote, view to the north northwest.

Plate 32: View north northeast towards the site from Pentrebychan Hall Dovecote.

Plate 33: Bersham Conservation Area showing 2-3 Mill Terrace (LB 16541, 16546) and Mill House Farmhouse (LB 16540), view to the west.

Plate 34: The scheduled Monument of Bersham Ironworks (DE189) including the grade II listed

Bersham Mill including cast-iron feed pipe (LB16538), view to the north.

Plate 35: Obstructed view towards the site from Bersham Conservation Area outside Bersham Ironworks, view to the south.

Plate 36: View south towards the site from the south end of Bersham Conservation Area. The tree-topped Rhos Branch Railway Embankment which forms the northern boundary of the site is visible on the near horizon.

Plate 37: Obstructed view west towards the site from the scheduled Monument of Erdigg Mound and Castle (DE017)

Plate 38: View west northwest towards the site from the grade I listed Building of Erddig (LB1533), listed as a significant view from Erddig RHPG. The site is obscured behind the right side of the rounded wooded hill in the centre, which is the spoil heap of the former Bersham Colliery.

Summary

Archaeology Wales (AW) was commissioned by Innova Renewables Developments Limited in September 2023 to carry out a Stage 1 Settings Assessment (SA) on the impact of a proposed new energy storage system and substation on Land north of Bronwylfa Road, Rhostyllen, Wrexham, on the setting of designated heritage assets within a 3km search radius of the site. The proposal is currently in the pre-application consultation phase. The Local Planning Authority is Wrexham County Borough Council (WCBC). Cadw have requested a Stage 1 Settings Assessment be undertaken in accordance with the methodology outlined in the Welsh Government's best practice guidance Setting of Historic Assets in Wales (2017).

The proposed development site comprises hedged agricultural fields. The proposed development area of the energy storage site is approximately 5.5ha and is centred on NGR SJ 30539 48599.

The stage 1 settings assessment has considered a total of 26 scheduled monuments, 147 listed buildings, 5 Conservation Areas and 2 Registered Historic Parks and Gardens. The sites were assessed through the initial use of ZTV analysis which assessed the theoretical visual impact of three separate elements of the proposed development: The GIS Hall and alpha substation, the 132/33kv transformers, and the energy storage units themselves. This theoretical impact highlighted key designated heritage assets for which a site visit would be necessary to confirm any potential impact. The results indicate that the vast majority of the designated heritage assets within a 3km radius of the site will have no, negligible, or minor impact on their settings arising from the proposals. It is considered that none of these heritage assets require any further assessment.

Nevertheless, it is considered that further settings assessment is required for the two closest scheduled monument to the site: the Moated Site at Croes Foel (DE193); and the Croes Foel Round Barrow (DE048). Further assessment may also be required for the southern part of the Bersham Conservation Area and the Hafod -y-Bwlch round barrow (DE047). The closest group of three listed buildings have been assessed via a Heritage Impact Assessment. The closest section of Offa's Dyke to the site may also require further assessment and Scheduled Monument Consent if the Southern Cable Route were to pass through it.

Crynodeb Annhechnegol

Comisiynwyd Archaeology Wales (AW) gan Innova Renewables Developments Cyfyngedig ym mis Medi 2023 i gynnal Asesiad Lleoliadau Cam 1 (SA) ar effaith cyfleuster ac is-orsaf System storio ynni newydd ar dir yn Rhostyllen ar leoliad asedau treftadaeth dynodedig o fewn radiws chwylio 3km o'r safle. Mae'r cynnig ar hyn o bryd yn y cyfnod ymgynghori cyn gwneud cais. Yr Awdurdod Cynllunio Lleol yw Cyngor Bwrdeistref Sirol Wrecsam (WCBC). Mae Cadw wedi gwneud cais i Asesiad Lleoliadau Cam 1 gael ei gynnal yn unol â'r fethodoleg a amlinellir yng nghanllaw arferion gorau Llywodraeth Cymru, Lleoliad Asedau Hanesyddol yng Nghymru (2017).

Mae safle'r datblygiad arfaethedig yn cynnwys caeau amaethyddol â chloddiau. Mae ardal datblygiad arfaethedig y safle storio ynni oddeutu 5.5ha ac mae ei ganolbwynt wedi'i leoli yn NGR SJ 30539 48599.

Mae'r asesiad lleoliadau cam 1 wedi ystyried cyfanswm o 26 o henebion cofrestredig, 147 o adeiladau rhestredig, 5 Ardal Gadwraeth a 2 Barc a Gardd Hanesyddol Cofrestredig. Aseswyd y safleoedd drwy'r defnydd cychwynnol o ddadansoddi ZTV, a asesodd effaith weledol ddamcaniaethol tair elfen unigol y datblygiad arfaethedig: Y Neuadd GIS a'r is-orsaf alffa, y trawsnewidwyr 132/33kv, a'r unedau storio ynni eu hunain. Amlygodd yr effaith ddamcaniaethol hon asedau treftadaeth dynodedig allweddol y byddai angen ymweliad â'r safle ar eu cyfer i gadarnhau unrhyw effaith bosibl. Mae'r canlyniadau'n dangos y bydd y cynigion hyn yn cael dim effaith, effaith ddibwys, neu effaith fach ar y mwyafrif helaeth o'r asedau treftadaeth dynodedig o fewn radiws 3km o'r safle. Ystyrir na fydd angen asesu unrhyw rai o'r asedau treftadaeth hyn ymhellach.

Fodd bynnag, ystyrir bod angen asesiad lleoliadau ychwanegol ar gyfer y ddwy heneb gofrestredig agosaf at y safle: y Safle Ffosedig yng Nghroes Foel (DE193); a Chrug Crwn Croes Foel (DE048). Mae'n bosibl y bydd angen asesiad pellach hefyd ar gyfer rhan ddeheuol Ardal Gadwraeth Bersham a chrug crwn Hafod-y-Bwlch (DE047). Mae'r grŵp agosaf o dri o adeiladau rhestredig wedi cael eu hasesu drwy'r Asesiad o'r Effaith ar Dreftadaeth. Mae'n bosibl y bydd angen asesu'r rhan agosaf o Glawdd Offa ymhellach hefyd a chael Caniatâd Heneb Gofrestredig pe bai'r Llwybr Cefl Deheuol yn mynd drwyddo.

1. Introduction

1.1. Background

1.1.1. In September 2023 Archaeology Wales (henceforth – AW) was commissioned by Innova Renewables Developments Limited to carry out a Settings Assessment in relation to the proposed construction of a proposed new energy storage system and substation on Land north of Bronwylfa Road, Rhostyllen, Wrexham. The site is centred on NGR SJ 30539 48599, Lat Long 53.030237 / -3.0371404 (Figures 1 - 3). The development is in the pre-application planning phase.

1.1.2. Numerous designated historical assets are located within a 3km search radius of the proposed development. Consultation with Cadw, dated 15th December 2022, stated that:

In regard to the historic environment desk-based assessment, the impact of the proposed development on the setting of the above designated heritage assets (which are located inside 3km of the proposed development should be carried out in accordance with the Welsh Government guidance given in the document “The Setting of Historic Assets in Wales”. It is expected that a stage 1 assessment to be carried out for all of the above designated heritage assets, which will determine the need, if necessary, for stages 2 to 4 to be carried out for specific heritage assets.

This Stage 1 assessment has been undertaken in line with relevant legislation and in accordance with the guidance set out in *Managing Heritage Impact Assessment in Wales* (Cadw 2017).

1.2. Site Description

1.2.1. The Site is broadly triangular in shape, comprises a single agricultural field parcel and extends to approximately 5.5 ha in area. The site’s boundaries feature a broad tree belt to the north and east, with hedgerows to the south and west. A former railway line runs along the northern boundary (set at a higher level and bounded by the mature vegetation) whilst the A483 lies to the east which is also elevated and bounded by mature established vegetation. The B5097 (Bronwylfa Road) forms the southern boundary, from which there is a single gated access in the site, with an unnamed single-track road separating the western boundary of the site with the neighbouring field and Bersham Cricket Club.

1.2.2. Agricultural land and uses form the site’s predominant surroundings to the north, south and west with pockets of residential properties dispersed throughout. To the east of the site (approx. 500m), on the opposite side of the A483, is the village of Rhostyllen. The Legacy National Grid Substation, which the proposals will connect to, is located approximately 750m west of the site.

1.2.3. Wrexham City Centre is located approximately 3km north-east.

- 1.2.4. The underlying bedrock geology of the proposed energy storage site is classified as Pennine Lower Coal Measures Formation, which comprises of Mudstone, siltstone and sandstone, and Pennine Middle Coal Measures Formation which comprises of Sedimentary bedrock formed between 319 and 309.5 million years ago during the Carboniferous period (BGS, Geology Viewer – accessed 25/09/2023).
- 1.2.5. The superficial geology of the eastern area of the proposed development site comprises of Devensian Till – Diamicton, which is a sedimentary superficial deposit formed between 116 and 11.8 thousand years ago during the Quaternary period. The superficial geology of the western area of the proposed development site comprises of Devensian Glaciofluvial Deposits which comprises of sand and gravel formed between 116 and 11.8 thousand years ago during the Quaternary period (BGS, Geology Viewer – accessed 25/09/2023).

2. Legislation and Guidance

- 2.1.1. This assessment has been undertaken in line with the relevant legislation and guidance relating to the historic environment, which is outlined below.
- 2.1.2. National planning guidance, concerning the treatment of archaeological remains, listed buildings, conservation areas and the wider historic built environment in Wales, is detailed in Chapter 6 of Planning Policy Wales (PPW), Edition 11 (February 2021). Chapter 6 of the PPW outlines the policy relating to Distinctive and Natural Places which includes the Historic Environment. Paragraph 6.1.7 states that:

“It is important that the planning system looks to protect, conserve and enhance the significance of historic assets. This will include consideration of the setting of an historic asset which might extend beyond its curtilage. Any change that impacts on an historic asset or its setting should be managed in a sensitive and sustainable way.”

- 2.1.3. Archaeology Wales works to the standards and guidance published by the Chartered Institute for Archaeologists and *The Setting of Historic Assets in Wales* guidance issued by Cadw.
- 2.1.4. The Chartered Institute for Archaeologists has also recently published guidelines on how to conduct a cultural heritage impact assessment and these have also been consulted during the preparation of this report (CIfA 2021).

3. Methodology

- 3.1.1. The primary objective of this assessment is to assess which designated heritage assets within a 3km radius of the site are likely to have their settings impacted by the development proposals. This assessment will be primarily achieved through ZTV analysis corroborated through a site visit. This will help determine the need, if necessary, for stages 2 to 4 to be carried out for specific identified heritage assets.
- 3.1.2. This report provides information of sufficient detail to allow informed planning

decisions to be made which can safeguard the archaeological resource.

3.1.3. The production of this report follows the guidance set out in *Setting of Historic Assets in Wales* (Cadw 2017). This details a four-stage approach, only stage 1, however, will be addressed through this report:

- 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.

4. The Development Proposals (Figures 2-10)

- 4.1.1. The proposed development is for the installation and operation of an Energy Storage System (ESS) including energy storage units, substation, site access, cable connection, landscaping and ancillary infrastructure. (Figures 2-3).
- 4.1.2. The proposed ESS will be based upon the latest energy storage technology. It will import and export large amounts of electricity with no time lag, storing surplus electricity from the grid and then providing a means of additional electricity supply at times of peak demand.
- 4.1.3. The UK has a legally binding target to achieve Net Zero by 2050 and has committed to fully decarbonising the electricity network by 2035. As a result, many low carbon and renewable energy generation is needed across the UK. Renewable energy generation is however intermittent, and Energy Storage Systems are therefore required to provide a balancing service to the National Grid, facilitating the transition to renewable energy sources. These projects are therefore a crucial component of achieving Net Zero.
- 4.1.4. The Energy Storage units will be laid out in rows with intervening access areas. The units will sit on concrete slabs or supporting feet. Internal access tracks will comprise crushed stone and the access road for the abnormal load will be asphalt. The Energy Storage units will use LFP (Lithium Iron Phosphate) technology and measure approximately 2.9m in height. The GIS building in the substation area will measure approximately 14m in height and is therefore the tallest piece of equipment.
- 4.1.5. The associated MV skids are sited alongside the Energy Storage units and connect in groups to 33kV transformer bays distributed evenly throughout the site. The substation compound is proposed to be located on the north-western corner of the site.

- 4.1.6. Remaining areas within the main site, outside of the fence line will be landscaped to create and enhance ecological habitat and enhance the visual quality of the area. Woodland planting will be provided on the western and southern boundaries and adjacent to the existing PRoW to help screen the proposals from the surroundings, as well as bunding along western/southern/eastern boundaries. An attenuation basin is included on the eastern part of the main site for sustainable drainage.
- 4.1.7. Primary access to the main development site during construction and operation will be from the existing B5097 access. A new secondary access is proposed from Cadwgan Lane at the main site's western boundary.
- 4.1.8. A road for abnormal loads is proposed to intersect the southern part of the neighbouring field (to the west of Cadwgan Lane) from the B5097 / Bronwylfa Lane. This will connect to the main site's new western access to provide access for abnormal load vehicles. A temporary construction compound is proposed on the northern part of this field.
- 4.1.9. In summary, the proposed ESS development comprises:
- 400kV Substation with Gas Insulated Switchgear (GIS) building & Transformers;
 - Energy storage containers;
 - 33kV transformer bays;
 - Medium Voltage (MV) Skid – Inverters & Transformers;
 - Control buildings;
 - Access from the adopted highway;
 - Internal access road and crushed stone tracks;
 - Drainage infrastructure, landscape, and ecological planting; and
 - Security fencing and CCTV.
- 4.1.10. For the purpose of determining the visual impact the proposals may have on the settings of designated heritage assets, it is necessary to provide the following detail on the heights of the individual units of the proposed energy storage site derived from Figures 3-10. The proposed development will comprise energy storage containers, each measuring 7m long x 2.5m wide x 2.9m high (Figure 10). Each pair will be associated with a single MV Skid measuring 6.5m long x 3m wide x 3m high. In addition, there will be 33kV Compounds interspersed amongst the energy storage units. These each comprise a 132/33kV transformer measuring 14.8m long x 9.5m wide x 6m high; and a 33kv substation each measuring 10.4m long x 5.8m wide x 7.3m high (Figure 9). A further major component of the development will be the Alpha Substation covering a 2.1ha area located in the northwestern corner of the site. This will comprise three Filters measuring 16.2 x 5.3 x 12.5m high; a GIS Hall measuring 56.8 x 28.8 x 14m high; two Transformers measuring 22 x 14 x 9.0m high;

a Substation measuring 3 x 3 x 2.5m high; a Fire Wall surrounding each transformer measuring 15 x 1 x 10.5m high; and a perimeter fence surrounding the whole measuring 2.4m high (Figure 7).

- 4.1.11. There will also be a network of internal roads linking every element described above measuring between 5m and 8m wide. The primary access during construction will be from B5097, during operation will be from the Cadwgan lane on western boundary. The complex of structures will be surrounded by a perimeter fence which will in turn be surrounded by a modern landform bund measuring up to 3m high in the southwest corner of the site. A 0.3m deep attenuation pond will also be excavated at the eastern end of the site (Figure 3).
- 4.1.12. In order to transmit power to and from the site it will be necessary to construct a subsurface cable linking the site to the neighbouring Legacy Substation to the west. The route of this cable is yet to be determined, although it may be necessary for it to pass through the line of Offa's Dyke Scheduled Monument (Figure 3). Schedule Monument Consent will be obtained prior to any works within the scheduled area.
- 4.1.13. It is understood that a number of mitigation measures have been designed into the proposals with the intention of lessening the visual impact of the proposed development on the landscape and the historic landscape. This will include the lowering of the ground level in the northwest corner of the site effectively reducing the height of the tallest elements: the Alpha Substation, from approximately 14m to 12.5m. Furthermore, a bund will be raised around the western and southern sides of the site varying in height from approximately 1m to 3m in the southwest corner (Figures 4-7). Green infrastructure enhancements will include a line of trees along the western boundary, screening the lower parts of the Alpha Substation and hedges will also be enhanced around the site (see also Landscape Masterplan submitted as part of the application). Ecological mitigation will also be undertaken within a field to the west of the site. Finally, a disused railway embankment already screens the site to the north so that only the highest elements of the Alpha Substation will be visible to the north and northwest of the site (Figure 3).
- 4.1.14. It is possible that construction may also involve any of the following activities:
- Construction of infrastructure;
 - Service installation;
 - Installation of access road, hard standing and car parking; and,
 - Site Access tracks for the construction and operational phases.
 - The site construction compound will be located to the west of the site, screened from view to the north by the pre-existing railway embankment (Figure 3).

The proposed development has the potential to generate negative impacts on neighbouring archaeological sites, such as altering the visual setting or tranquillity of the sites and landscapes.

5. Stage 1: Identifying Affected Historic Assets (Figures 11-12)

- 5.1.1. Initial scoping was conducted using GIS software to determine which designated heritage assets lie within 3km of the proposed development and therefore need to be considered as part of the Stage 1 settings assessment. Table 1 shows a full list of designated heritage assets that fall within the 3km search radius. These assets are also shown on Figure 11.
- 5.1.2. ZTV analysis was then undertaken in order to establish which of the assets within 3km of the site would theoretically be visually impacted by the proposed development (Figure 12). A ZTV, as use of the term theoretical implies, is not an absolute indication of the extent of visibility but rather a computer-generated aid that utilises available relative data to indicate areas of inter-visibility and screening in relation to a specific modelled object. Imperfections in data are such that it must only be seen as an aid to understanding. This limitation needs to be recognised when interpreting the ZTV. A site visit was undertaken over two separate occasions by Dan Moore (MA) of Archaeology Wales on the 26th and 27th of January 2023 and Dr Susan Stratton (AW) on October 4th-10th 2023 to confirm the theoretical results.
- 5.1.3. The ZTV was undertaken in three separate stages to reflect the theoretical visibility of the different elements of the development, each of which will be constructed to a different height and within a different area of the site. These elements have been broken down into the following:
 - 5.1.4. The proposed GIS Hall, which represents the largest and tallest element of the proposed development measuring 56.8m long x 28.8m x 14m high within the Alpha Substation located in the northwest corner of the site. However, the ground in the area of the Alpha Substation will be reduced in height by approximately 1.5m. For this reason 7 viewpoints were created at the corners of the GIS Hall set at a height of 12.5m above current ground level. For the avoidance of any doubt, the ZTV does not include the presence of any proposed new planting or landforms to the west of the Alpha Substation which will form part of the Proposed Development. As such, it illustrates a worst-case scenario of theoretical visibility. Equally the digital surface model used in the analysis was the Environment Agency's Lidar 1m DSM data. This does take into account trees currently occupying the railway embankment to the north of the Alpha Substation, but not any new green infrastructure, such as hedgerow enhancement that will form part of the proposed development.
 - 5.1.5. The second element of the ZTV analysis comprises three of the four 132/33kV transformers measuring 14.8m long x 9.5m wide x 6m high; and a 33kv substation each measuring 10.4m long x 5.8m wide x 7.3m high. The substation adjacent to the GIS Hall was not included in the analysis as it will be effectively obscured by the adjacent GIS Hall. The ground upon which the remaining three transformers will be located will be variously raised or reduced by relatively small amounts. The height of

the three viewpoints were there set at 7.5m above current ground level and positioned on the locations of the 33kv substations.

- 5.1.6. The third element of the ZTV analysis comprises the 123 pairs of energy storage containers, each measuring 7m long x 2.5m wide x 2.9m high and the associated MV Skids measuring 6.5m long x 3m wide x 3m high. Again, the ground upon which the storage containers and MV Skids will be located will be variously raised or reduced by relatively small amounts. The height of the viewpoints were therefore set at 3m above current ground level and positioned on the locations of twelve of the MV skids, equally distributed across the site (Figure 12).
- 5.1.7. The ZTV was produced using publicly available Environment Agency 1m LiDAR Digital Surface Model (DSM). This is derived from data captured from the National LiDAR Programme in 2021 and does take account of screening features (e.g. vegetation, buildings and other structures). The DSM is based upon a 1m grid spacing.
- 5.1.8. The ZTV was calculated and created using QGIS opensource software. The ZTV calculation process takes account of the curvature of the earth's surface and light refraction. This treats vegetation as a solid feature, when in reality partially obscured views can sometimes be available through leaves and branches especially in winter. The height of the receptor in the computer model was set at ground level.
- 5.1.9. Additionally, the DSM does not distinguish between the ground surface and the surface of structures and vegetation. As a consequence, the ZTV output may indicate visibility from areas known to be occupied by woodland and buildings. Whilst in theory it may be possible for people to experience the views from such locations (by climbing onto roofs, or into the tops of trees), this is not representative of typical day to day visibility, and as such there is the potential to overstate the actual visibility of the Proposed Development.
- 5.1.10. The output, covering a 3km radius around the site, is shown in Figure 12, overlaid with spatial data for designated assets within 3km of the site. The ZTV model is not definitive, but it does provide a worst-case scenario for the visual impacts of the development. Table 1 provides a summary of the theoretical visual impacts of the proposed development on the designated Heritage assets within 3km of the site.

Table 1. Designated Heritage Assets within 3km radius of the site

Scheduled Monuments (Count = 26 Monuments)

Record No	SAM No	Name	Theoretical Impact
311	DE165	Wat's Dyke : Section South of Ruthin Road	Negligible
600	DE191	Wat's Dyke: Section SSW of Wrexham Station, 130m Long	None
1015	DE199	Bersham Colliery: No 2 Winding Gear	None
1019	DE131	Cadwgan Hall Mound	Minor

1021	DE137	Offa's Dyke: Pentre-Bychan Hall Section, extending 540m S from Bron-Wylfa	Moderate
2306	DE047	Hafod-y-Bwlch Round Barrow	Moderate
2325	DE179	Offa's Dyke: Sections N & S of Bryn yr Owen Colliery	Minor
2326	DE180	Offa's Dyke: Section in Plas Power Park	Negligible
2922	DE017	Erddig Mound & Bailey Castle	Minor
2953	DE139	Offa's Dyke: Plas Power Section	Moderate
3125	DE173	Wat's Dyke: Sections N & S of the Court	Minor
3129	DE181	Offa's Dyke: South Section at Coedpoeth	Negligible
3130	DE182	Offa's Dyke: North Section at Coedpoeth	None
3434	DE178	Offa's Dyke: Section S of Aberderfyn Road	None
3560	DE193	Moated Site near Groesfoel Farm, Rhostyllen	Moderate
3590	DE048	Croes-Foel Round Barrow	Moderate
3670	DE174	Offa's Dyke: Section S of Bryn yr Owen Farm	Minor
3671	DE153	Wat's Dyke: Section extending from Middle Sontley to Black Brook Bridge	Negligible
3726	DE163	Fairy Oak Round Barrow	Negligible
3730	DE164	Hillbury Round Barrow	None
3792	DE152	Wat's Dyke: Section extending from Erddig Park to Middle Sontley	Minor
3794	DE189	Bersham Ironworks	Minor
3801	DE194	Offa's Dyke: Section extending 120m from Railway to Bronwylfa Road, Legacy	Minor
3809	DE237	Nant Mill Wood Shaft Mounds	None
3816	DE132	Offa's Dyke: Cadwgan Hall Section, extending from River Clywedog to the Railway	Minor
4028	DE290	Gatewen Hall round barrow	None

Registered Historic Parks and Gardens (Count = 2)

reference_	site_name_	site_name0	Theoretical Impact
PGW(C)67(WRE)	Wrexham Cemetery	Mynwent Wrecsam	Minor
PGW(C)62(WRE)	Erddig	Erddig	Minor

Conservation Areas (Count = 5)

localplann	inspireid	sitename	Theoretical Impact
WREXHAM	WAL/WREX/	Bersham	Minor
WREXHAM	WAL/WREX/	Fairy Road	Negligible
WREXHAM	WAL/WREX/	Grosvenor Road, Wrexham.	None
WREXHAM	WAL/WREX/	Salisbury Park	None
WREXHAM	WAL/WREX/	Wrexham Town	None

Listed Buildings (Count = 147)

Record No	Name	Grade	Theoretical Impact
1533	Erddig	I	Minor
1534	Esclusham Hall	II*	Minor
1560	Squires Cottage	II	None
1562	Tyn-y-Coed	II	Minor
1566	Berse Drelincourt Church	II	Minor
1567	Berse Vicarage with Flanking Walls to Garden	II*	Minor
1568	Orphanage	II	Minor
1570	Millward House	II	Negligible
1584	Stable Courtyard Range	II*	Minor
1585	Tan-y-Llan	II	Negligible
1586	Octagonal Building at Bersham Ironworks Site	II*	Negligible
1587	Hafod-y-Bwch Hall	II*	None
1588	Hafod House	II	None
1589	Hafod House Farmhouse	II	None
1590	Esless Hall	II*	Negligible
1621	Llannerchrugog Hall	II	Negligible
1715	Pentrebychan Hall Dovecote	II	Minor
1721	Miners' Institute	II*	Negligible

1737	Game Larder at Plas Power	II	Negligible
1738	Dairy at Plas Power	II	Negligible
1739	Ice-House at Plas Power	II	Negligible
1740	Rhosberse Lodge at Entrance to West drive at Plas Power	II	Negligible
1760	The Cross Foxes Public House	II	None
1761	The Old Swan Public House	II	None
1762	Lower Berse Farmhouse	II*	None
1763	Former Island Green Brewery including Former Malthouse	II	None
1764	Burton Buildings	II	None
1765	Offices and Lodge to Wrexham Lager Brewery	II	None
1766	NO.1 CHAPEL STREET (N SIDE),,,,,CLWYD,	II	None
1767	Pen-y-Bryn Welsh Baptist Chapel	II	None
1768	4 Chapel Street	II	None
1773	2 Chest Tombs adjacent to W Boundary of Churchyard	II	Negligible
1777	The Commercial Public House	II	None
1778	The Cambrian Vaults Public House	II	None
1779	Bridge over River Clywedog	II	None
1780	,5,Fairy Road,,Wrexham,CLWYD,LL13 7PT	II	Negligible
1781	NO.9 FAIRY ROAD (N SIDE),,,,,CLWYD,	II	Negligible
1782	Stafford House	II	None
1796	Poplar House	II	None
1798	Statue of Queen Victoria	II	Negligible
1799	The Bowling Green Public House	II	None
1800	Former County Buildings	II	None
1801	Roman Catholic Cathedral of St Mary	II	None
1802	Boundry Wall and Gates to Roman Catholic Cathedral	II	None
1803	Presbytery at roman Catholic Cathedral	II	None
1804	Former Wrexham Infirmary	II	None
1805	Adult Education Centre, University College of North Wales	II	None

1806	Croesnewydd Hall	II*	Negligible
1807	Cemetey Chapels	II	Negligible
1808	Lodge to Cemetary	II	Negligible
1809	Gate Piers to Cemetary	II	Negligible
1810	NO 1, SALISBURY ROAD (NE SIDE),,,,,CLWYD,	II	None
1811	Gate Piers and Boundary Wall to No.1	II	None
1812	Oteley House	II	None
1813	The Bishops House	II	None
1814	Sontley Bridge	II	None
1820	Former Crossing Keeper's Cottage at Croesnewydd North Fork	II	None
1821	The Old Three Tuns Public House	II	None
1830	NO.1 GROSVENOR ROAD (NW SIDE),,,,,CLWYD,	II	None
1831	NO.2 GROSVENOR ROAD (SE SIDE),,,,,CLWYD,	II	None
1846	Nos.1,3 & 5, with Nos. 56, 58 & 60 Regent Street, King Street (W side)	II	None
1855	Wrexham General Station: Entrance Building	II	None
3176	Gatewen Hall	II	None
9355	The Vicarage	II	None
15825	Bersham Colliery Winding Engine House	II	None
15826	Former Bersham Colliery Baths, Canteen and Offices	II	None
16452	Stable Block at Plas Power	II	Negligible
16453	Bath House in Plas Power Park	II	Negligible
16454	Railings and Gates to West Entrance Drive at Plas Power	II	Negligible
16455	Wall to Plas Power Park including Park Cottage	II	Negligible
16456	Wall to Plas Power Park SW of Rhosberse Lodge	II	Negligible
16457	Higher Berse Farmhouse	II	Negligible
16480	,7,Fairy Road,,Wrexham,CLWYD,LL13 7PT	II	Negligible
16485	Gates to Cemetary	II	Negligible
16486	Railing to Cemetary	II	Negligible
16487	NO 3, SALISBURY ROAD (NE SIDE),,,,,CLWYD,	II	None

16488	NO 5, SALISBURY ROAD (NE SIDE),,,,,CLWYD,	II	None
16489	Gate Piers and Boundary wall to No 5	II	None
16490	Gate Piers and Boundary Wall to No 5	II	None
16538	Bersham Mill including cast-iron feed pipe	II	None
16539	Single Storeyed Building to SE of Octagonal Building at Bersham Ironworks Site.	II*	None
16540	Mill House Farmhouse	II	None
16541	,2,Mill Terrace,Bersham,,,	II	None
16546	,3,Mill Terrace,Bersham,,,	II	None
16547	,4,Mill Terrace,Bersham,,,	II	None
16549	,6,Mill Terrace,Bersham,,,	II	None
16550	,5,Mill Terrace,Bersham,,,	II	None
16552	East Weir on River Clywedog	II	None
16553	Church of Saint Mary	II*	None
16554	Caeau Bridge	II	None
16555	Caeau Weir	II	None
16556	Bersham Lodge	II	None
16557	Bridge, Gates and Railings at Bersham Lodge	II	None
16558	Western Weir on the River Clywedog	II	None
16559	Nant Bridge	II	None
16560	Bridge Cottages	II	None
16561	The White House	II	None
16563	,1-3,Laurel Grove,Bersham,,,	II	Negligible
16564	Hafod-y-bwch Bridge	II	None
16565	Plas Grono Lodge	II	None
16567	Bersham Colliery No 2 Headframe	II*	None
16569	Timber-framed Barn in Yard at Hafod-y-Bwch Hall	II	Minor
16571	Croesfoel Farmhouse	II	Moderate
16572	Gate Piers at Hafod-y-Bwch Hall	II	Moderate

16573	Timber-framed building in yard at Croesfoel Farm	II	Moderate
16574	Barn Range at Esclusham Hall	II	Minor
16845	Capel Mawr (Jerusalem Welsh Presbyterian Chapel) with attached school room	II	Negligible
17089	Church of Saint John Evangelist	II	None
17090	Bethlehem Independent Chapel	II	Negligible
17091	Penuel Baptist Chapel	II	Negligible
17092	War Memorial	II	None
17093	Eddystone House	II	Negligible
17094	War Memorial	II	Negligible
17850	Kitchen and attached laundries, bakehouse and scullery at Erddig	II*	Minor
17851	Cupola to SE of the house	II	Negligible
17852	Former Haybarn to Outer Yard	II	Minor
17853	Sawmill	II	Minor
17854	Dog Yard Range	II	None
17855	Gardener's House including Bothies, walls and shed to W	II	Negligible
17856	N Garden Pavilion including attached walls, alcove gatepiers and gates immediately to E of the house	II	None
17857	S Garden Pavilion including attached walls, alcove gatepiers and gates immediately to E of house	II	None
17858	Garden walls to N side of formal garden including gatepiers, gates and alcove	II	None
17859	Screen and gates closing the formal garden at Erddig	II*	None
17860	Garden walls to S side of formal garden including gate piers, gates and alcove	II	None
17861	Sundial on main axis of the formal garden	II	None
17862	Pair of pinnacles in the formal garden at Erddig	II	None
17863	Sundial near the N end of the formal garden	II	None
17864	Dovecote	II	Negligible
17865	Coachman's House	II	None
17866	Gatepiers and gates to the forecourt at Erddig	II	None
17867	Gatepiers and attached gates and railings on N drive	II	None

17868	Hydraulic Ram	II	None
17869	Cup and Saucer	II*	None
17870	Bridge over the Black Brook	II	None
17871	Bridge over the River Clywedog	II	None
17872	The Lodge	II	None
17873	Bryn Goleu	II	None
17874	Gatepiers, Railings and Gates at Forest Lodge entrance	II	None
17875	Sontley Bridge	II	None
17876	New Sontley Farmhouse	II	Negligible
17877	Former Stables at New Sontley Farm	II	Negligible
17878	Combined Pigsties and Hen House at New Sontley Farm	II	Negligible
19725	Church of St Andrew	II	Negligible
19728	Wern Farm	II	None
87572	Church of The Holy Trinity	II	Minor
87623	The Former Mines Rescue Centre	II	None
87790	Mortuary at Wrexham Cemetery	II	None

5.1.11. Of the 26 Scheduled Monuments recorded within a 3km radius of the site, 12 are considered, from the results of the ZTV analysis to have no or negligible impact on their settings arising from the proposed development. This is because either the proposed development will not be visible from the monument (in the case of no impact), or the distance between the monument and proposed development is such that any minor partial visibility will not be noticeable in the field of view from the monument (in the case of negligible impact). Nine of the Scheduled Monuments within a 3km radius of the site are considered to have the potential for a minor theoretical impact on their settings arising from the proposed development. This theoretical impact will be considered further in the site visit section below. The remaining five scheduled monuments have the potential for a moderate impact on their setting. These include DE137 (Offa's Dyke: Pentre-Bychan Hall Section, extending 540m S from Bron-Wylfa); DE047 (Hafod-y-Bwlch Round Barrow); DE048 (Croes-Foel Round Barrow); DE193 (Moated Site near Groesfoel Farm, Rhostyllen); and DE139 (Offa's Dyke: Plas Power Section). These will also be considered in the site visit section below and may require a further, more detailed, settings assessment.

- 5.1.12. Of the two Registered Historic Parks and Gardens recorded within a 3km radius of the site: Wrexham Cemetery and Erddig, both are considered, from the results of the ZTV analysis to have the potential for a minor impact on their settings arising from the proposed development. This theoretical impact is likely to be lower in reality for Wrexham Cemetery, which is already surrounded by modern development. Erddig will be considered in the site visit.
- 5.1.13. Of the five Conservation Areas recorded within a 3km radius of the site, only one: Bersham, is considered, from the results of the ZTV analysis to have the potential for a minor impact on its setting arising from the proposed development. Although this Conservation Area is relatively close to the site (approximately 200m to the north at the closest point). It is largely obscured from view of the development by the intervening Rhos Branch railway embankment and by dense woodland which surrounds the designated heritage assets within the conservation area.
- 5.1.14. Of the 147 Listed Buildings recorded within a 3km radius of the site, 128 are considered, from the results of the ZTV analysis to have no or negligible impact on their settings arising from the proposed development. This is because, either the proposed development will not be visible from the monument (in the case of no impact), or the distance between the monument and proposed development is such that any minor partial visibility will not be noticeable in the field of view from the monument (in the case of negligible impact). 15 of the Listed Buildings within a 3km radius of the site are considered to have the potential for a minor theoretical impact on their settings arising from the proposed development. This theoretical impact will be considered further in the site visit section below. The remaining three listed buildings have the potential for a moderate impact on their setting. These include LB16571 (Croesfoel Farmhouse); LB16572 (Gate Piers at Hafod-y-Bwch Hall) and LB16573 (Timber-framed building in yard at Croesfoel Farm). The Conservation Officer at WCBC has requested that a Heritage Impact Assessment be conducted on the potential impact of the proposed development on this group of listed buildings.
- 5.1.15. No other designated assets will be impacted by the proposed development.

6. Site Visit (Figure 13; Plates 1-38)

- 6.1.1. A site visit was undertaken over two separate occasions: the first on the 26th and 27th of January 2023 by Dan Moore (MA) of Archaeology Wales. Conditions were dry with light cloud and good visibility. The second by Dr Susan Straton of Archaeology Wales on the 4th and 5th October 2023 when conditions were variable but with good visibility.
- 6.1.2. The site comprises two fields that may be subject to varying levels of impact from different elements of the proposed development. Figure 3 shows these different parts of the site. The part of the site subject to the greatest impact is likely to be that of the proposed energy storage area which comprises Field 1. The field to the west may be required for an access road and a temporary construction compound.

Further fields may be impacted by a sub-surface cable route and proposed green infrastructure. The temporary site compound and the cable route are not considered to be likely to have a potential impact on the setting of any designated heritage assets, although any direct impact due to the proposed cable on sub-surface archaeological deposits associated with Offa's Dyke will be the subject of a Scheduled Monument Consent Application in due course. These impacts are also considered in an archaeological desk-based assessment conducted by Archaeology Wales in support of the application (Davey & Muller 2023).

- 6.1.3. The main proposed energy storage site (Field 1) is roughly triangular in plan with maximum dimensions of approximately 500m by 200m. It lies east of the A483 Wrexham By-pass and west of the Legacy electrical substation; between the Pentre Bychan Road in the south and the former Rhos Branch Railway Embankment to the north.
- 6.1.4. Field 1 comprises a recently drilled improved pasture field gently sloping from west to east (Plate 1). It is bounded by the large, wooded embankment of the disused railway to the north (Plate 2), the A483 Wrexham By-pass to the east (Plate 3), the B5097 Bronwylfa Road to the south and a minor road to the west. No archaeological features other than the current field boundaries were observed. Historic maps indicate that a former field boundary existed at the east end of the field but no sign of it was discernible, either on LiDAR, or on the ground, apparently removed by modern ploughing. The current field boundaries to the northeast and southeast are modern, arising after the construction of the railway in c. 1900 and the Wrexham By-pass in the late 20th century. The railway embankment, topped by mature trees, provides an effective screen for this field when viewed from the north. The current field boundaries along the southwest and west sides follow the line of field boundaries shown on the Tithe map of 1844 but appear to currently comprise relatively modern clipped hedges of holly and hazel with modern wooden fences. A single section at the north end of the western boundary hedge has been allowed to grow to full height and comprises largely grown out hazel (Plate 4). None of these hedges meet the historic criteria for an 'important' hedgerow as outlined in Schedule II of the Hedgerow Removal Act 1997. None of the designated heritage assets within a 3km radius of the site are visible from ground level in Field 1, other than the grade II listed building of LB16571: Croesfoel Farm (Plate 5).
- 6.1.5. Field 2 is located north and east of the Bersham Cricket Ground on the north side of the B5097 Bronwylfa Road. The southern part of this field is proposed to be developed as an access track to the main energy storage site (Field 1) and the northern part is proposed to be the temporary construction site compound. A geophysical survey was undertaken in this field during 2023 and no anomalies considered to be of archaeological significance were recorded (Muller 2023). Field 2 is approximately 'L' shaped in plan with maximum dimensions of 220m by 150m. It comprises an improved pasture field gently sloping from west to east (Plate 6). The tithe map indicates that this field was subdivided into two fields in 1844 but also extended further north prior to the construction of the Rhos branch railway c. 1900.

The railway embankment now forms the northern boundary of this field (plate 7). The Cricket field was not established until c.1954 – 1964. It is interesting to note that the tithe field to the southeast was called Pant or hollow. This may refer to the lane running along the east side of the field which is in a slight Holloway. The proposed cable route may pass through the eastern hedge at the northern end, run across the northern end of the field (Plate 6) and pass across a pronounced lynchet which forms the western field boundary. The scale of this lynchet indicates that it may pre-date modern ploughing (Plate 8).

- 6.1.6. The closest scheduled monument to the site is the Moated Site at Croes Foel (DE193) which lies approximately 200m south of the site. ZTV analysis indicates a theoretical moderate impact from the proposed development on the setting of this monument. A small fenced and wooded enclosure contains the scheduled remains. The monument is approximately sub-rectangular in plan with maximum dimensions of 40m by 45m. It comprises a sub-rectangular ditched enclosure around the east, south, west and part of the north side, with a gap in the moat to the northeast, which marks the former causewayed entrance to the site as shown on historic OS maps. This entrance contains traces of masonry. The moat is up to 1.5m deep (Plate 9) and contains water in the northeast corner. Within the moated enclosure are the remains of a stone building shown as still standing on OS county series maps as late as 1954 but had been removed by 1964. This now equates to remains on the ground comprising masonry foundations of a building measuring 5m by 6.5m (Plate 10) with a small rectangular addition of 3m square (Plate 11). There is also a modern tip of hardcore, including brick and corrugated roofing material along the western edge of moat (Plate 12). This might suggest that one or more of the buildings functioned as an outbuilding with corrugated roof or may represent imported dumped material. A brake of trees immediately north of the monument provides an effective screen between the monument and the proposed development. The monument itself is also densely wooded (plate 8). There are currently no clear views towards the site from this monument, although the taller elements of the development are likely to be prominent in the background of views across the monument towards the site from the southwest (plate 13). Furthermore, the moated site is publicly accessible along a footpath from Pentre Bychan Road. This footpath leaves the road at a point approximately 130m south of the proposed main site entrance.
- 6.1.7. The scheduled monument of Croes Foel Round Barrow (DE048) is located towards the northeast end of a ploughed field approximately 450m south southeast of the site (Plate 14). This monument appears to be under threat from ploughing. There are partial views towards the site from this monument at ground level (Plate 15), although the taller elements of the development are likely to be more prominent in these views creating a potential moderate impact on the setting of this monument.
- 6.1.8. The eastern end of the field containing Croes Foel Round Barrow (DE048) is marked by LB 16571: Croes Foel Farmhouse (Plates 16-17). This grade II listed building forms a group with LB16573 Timber-framed building in yard at Croesfoel Farm (plate 18) and LB 16572 Gate Piers at Hafod-y-Bwch Hall Timber-framed building in yard at

Croesfoel Farm (plate 19). Together these represent the closest listed buildings to the site at between 430m and 520m to the south southeast. Croes Foel Farmhouse and the Timber-framed building in yard at Croesfoel Farm will be subject of a separate Heritage Impact Assessment (Stratton forthcoming). It was not possible to access the privately owned Hafod-y-Bwch Hall (LB1587) and Timber-framed Barn in Yard at Hafod-y-Bwch Hall (LB 16569), although ZTV analysis indicates that impact on the settings of these two listed buildings will be minor due to intervening mature tree cover.

- 6.1.9. The scheduled monument of Offa's Dyke (Offa's Dyke: Section extending 120m from Railway to Bronwylfa Road, Legacy – DE194) runs approximately N-S 550m west of the site (Plate 20), being, together with DE132, the closest section of Offa's dyke to the proposed development. It is topped with trees and has no clear views towards the site. The proposed southern cable route is projected to run along the southern side the railway embankment and then potentially cutting across or burrowing under this section of Offa's Dyke (Plate 21-22). The setting of this monument has already been affected by the cutting of a new modern ditch alongside it (plate 21) and the cutting of a modern gated field entrance through it (plate 22). Whilst the theoretical impact of the proposed development on this monument was considered to be minor following the initial ZTV analysis, the site visit indicates that this could potentially be reduced to negligible.
- 6.1.10. The scheduled Monument of Offa's Dyke: Cadwgan Hall Section (DE132) runs approximately N-S 500m west and west northwest of the site (Plate 23). There are currently no clear views towards the site from this section of Offa's Dyke, which is hidden behind the Rhos Branch Railway Embankment (plate 24). Nevertheless, ZTV analysis indicates that the taller elements of the development, including the top of the GIS Hall and potentially one or two of the transformers are likely to be just visible above the railway embankment in the background of views across the monument. It should be noted that at this point the scheduled monument has already been slighted by the creation of the gate and is at risk from the movement of farm machinery and the overall impact on the setting of this monument is considered to be minor.
- 6.1.11. The scheduled monument of Cadwgan Hall Mound (DE131) lies adjacent to this section of Offa's Dyke approximately 470m to the northwest of the site (Plate 25). This site is obscured behind modern farm buildings associated with Cadwgan Hall and there are no clear views towards the site (plate 26). ZTV analysis indicates that the very top of part of the proposed GIS Hall may be visible above these buildings, although this is likely to blend in behind the modern farm buildings which will be much more prominent in these views. The impact of the proposed development on this monument is considered to be negligible.
- 6.1.12. Offa's Dyke: Pentre-Bychan Hall Section, extending 540m S from Bron-Wylfa (DE137) lies approximately 560m east southeast of the site at its nearest point. Views towards the site are obscured by mature trees (plate 27), although ZTV analysis indicates that

the tops of the tallest elements of the proposed development may be visible above the trees. Nevertheless, enhanced green infrastructure is built into the development proposals between this monument and the site and it is expected that the impact on its setting will be minor.

- 6.1.13. Offa's Dyke: Section S of Bryn yr Owen Farm (DE174) lies further to the south approximately 700m southwest of the site at its nearest point. At this point the monument has been seriously compromised by the construction of Bryn yr Owen Farm, which also restricts views towards the site (plate 28). ZTV analysis indicates that the site will be visible from the top of the dyke, although from this direction the proposed development is likely to be in character with pre-existing modern development at Rhostyllen meaning that any residual impact on the setting of this monument will be minor.
- 6.1.14. Offa's Dyke: Plas Power Section (DE139) and Offa's Dyke: Sections N & S of Bryn yr Owen Colliery (DE179) both lie at just over 1km distance the site at their nearest points, to the northwest and southwest respectively. Again, ZTV analysis indicates that the site will be visible from their tops, although from these directions and distance, the proposed development is likely to be in character with pre-existing modern development at Rhostyllen and Wrexham behind meaning that any residual impact on the setting of this monument will be negligible.
- 6.1.15. DE047 Hafod-y-Bwlch Round Barrow (plate 29) lies approximately 850m south of the site at its closest point. Whilst the site will be partially visible from the north side of the monument, its closer setting has already been compromised by modern high voltage electricity pylons, road development and lighting and modern development at Pentre Bychan (plate 30). The impact from the proposed development, lying nearly 1km distant, will be minor in comparison.
- 6.1.16. Apart from the group of listed buildings at Croes Foel Farmhouse, the closest Listed Building to the site is the grade II listed Pentrebychan Hall Dovecote (LB1715) which lies nearly 700m southwest of the site (plate 31). Views towards the site are obscured by intervening mature trees any impact from the proposed development on the setting of this building is likely to be negligible.
- 6.1.17. Bersham Conservation Area (plate 33) lies 200m north of the site at its closest point and contains a group of 18 listed buildings and a scheduled monument: DE189 Bersham Ironworks (plate 34). There are no views towards the site from the core of the conservation area, or the scheduled Monument (Plate 35). The Conservation Area is generally densely wooded and long-distance views out severely restricted. However, at the southern limit of the Conservation Area only a single field separates it from the Rhos Branch Railway Embankment which forms the northern boundary of the site (Plate 36). Only the tallest elements of the proposed development will be visible from this point, the lower parts of the site obscured by the embankment. Whilst the impact on the setting of this part of the Conservation will be moderate. The impact on the Conservation Area as a whole, including all of its listed buildings and scheduled monument, will be low.

- 6.1.18. The Registered Historic Park and Garden of Erddig lies approximately 1.4km east of the site at the nearest point and contains a group of 26 listed buildings and three Scheduled Monuments: Erddig Mound & Bailey Castle (DE017); Wat's Dyke: Sections N & S of the Court (DE173); and Wat's Dyke: Section extending from Erddig Park to Middle Sontley (DE152). All three scheduled monuments are located in mature woodland and only severely restricted views of the site may be glimpsed through the trees (plate 37). This combined with the distance from the site (generally 1.8km from all three scheduled monuments) indicates that the impact on the settings of these monuments arising from the development proposals will be negligible.
- 6.1.19. Similarly, the site will not be visible from the vast majority of the listed buildings within Erddig, largely due to intervening mature tree cover. Nevertheless, a small group of key listed buildings and significant views form an important part of the design of the Registered Historic Park and Garden. There is a designed break in the tree cover co-inciding with the west front of grade I listed country house that forms the focal point of the estate (LB1533). The house has late 17th century origins and phases of early and late 18th century work including well-preserved interior schemes and the ashlar faced west front. The formal garden east of the house dates from the early 18th century and landscaped park from the late 18th century. The designed views from the west front of the house generally look to the landscape immediately to the south of the proposed development site. The site itself is obscured in a dip behind the wooded artificial hill formed from the spoil heap of the former Bersham Colliery (plate 38). ZTV analysis indicates that the top of the GIS Hall only may be visible in this view and, due the distance between the two sites (2.2km to the GIS Hall). The impact on the setting of the Listed Building and RHPG of Erddig is expected to be negligible.

7 Conclusions

- 7.1.1 The stage 1 settings assessment has considered the potential impact of the proposed development of a new energy storage system and substation on land at Rhostyllen on the setting of designated heritage assets within a 3km search radius of the site. In total 26 scheduled monuments, 147 listed buildings, 5 Conservation Areas and 2 Registered Historic Parks and Gardens have been considered as part of the assessment. The sites were assessed through the initial use of ZTV analysis which assessed the theoretical visual impact of three separate elements of the proposed development; The GIS Hall and alpha substation, the 132/33kv transformers, and the energy storage units themselves. This theoretical impact highlighted key designated heritage assets for which a site visit would be necessary to confirm any potential impact.
- 7.1.2 The assessment has also taken into account design elements of the proposed new energy storage system. These include landscaping within the site itself which will effectively lower the overall height above current ground level of the tallest elements of the proposals. The landscaping of the site will also create modern landforms or bunds around the south and west sides of the site, shielding the majority of the lower

elements of the site from view. It is also proposed that the existing hedgerows will be enhanced as well as the planting of new trees and a larger area of ecological mitigation to the west of the site. These proposed landscape design features are not built in to the ZTV analysis, which consequently represents a worst-case scenario.

- 7.1.3 The assessment has also summarily taken into account other factors that may influence the impact of any proposed development on the setting of a designated heritage asset. These include the distance between the asset and the proposed development. ZTV analysis does not take distance into account and an asset located 3km distant from the site is shown to have the same visual impact as an asset located within 500m of the site, assuming the line of sight is unbroken. This is clearly not the case in reality and assets between 2km and 3km distant from the site have generally been shown to have at most, a negligible potential impact on their settings.
- 7.1.4 The assessment has also taken into account the existing backdrop to the site when viewed from the designated heritage asset. For example, a large number of listed buildings located to the higher ground to the west of the site can be considered to only have a negligible impact arising from the proposed development due to the proximity of the site to the urban area of Wrexham and the modern industrial and commercial estates at Rhostyllen, which will form the backdrop the site when viewed from the west.
- 7.1.5 The results of the ZTV analysis and site visit determined that the settings of several designated heritage assets will be impacted by the proposed development. The results are set out in Table 2.

Table 2. Results of the Stage 1 Settings Assessment (potentially affected Heritage assets)

Scheduled Monuments

Record No	SAM No	Name	Potential Impact	Further Assessment Required
1019	DE131	Cadwgan Hall Mound	Negligible	No
1021	DE137	Offa's Dyke: Pentre-Bychan Hall Section, extending 540m S from Bron-Wylfa	Minor	Potential
2306	DE047	Hafod-y-Bwlch Round Barrow	Minor	Potential
2325	DE179	Offa's Dyke: Sections N & S of Bryn yr Owen Colliery	Negligible	No
2922	DE017	Erddig Mound & Bailey Castle	Negligible	No
2953	DE139	Offa's Dyke: Plas Power Section	Negligible	No
3125	DE173	Wat's Dyke: Sections N & S of the Court	Negligible	No
3560	DE193	Moated Site near Groesfoel Farm, Rhostyllen	Moderate	Yes

3590	DE048	Croes-Foel Round Barrow	Moderate	Yes
3670	DE174	Offa's Dyke: Section S of Bryn yr Owen Farm	Minor	No
3792	DE152	Wat's Dyke: Section extending from Erddig Park to Middle Sontley	Negligible	No
3794	DE189	Bersham Ironworks	Minor	No
3801	DE194	Offa's Dyke: Section extending 120m from Railway to Bronwylfa Road, Legacy	Minor	No
3816	DE132	Offa's Dyke: Cadwgan Hall Section, extending from River Clywedog to the Railway	Minor	No

Registered Historic Parks and Gardens

reference_	site_name_	site_name0	Potential Impact	Further Assessment Required
PGW(C)67(WRE)	Wrexham Cemetery	Mynwent Wreccsam	Negligible	No
PGW(C)62(WRE)	Erddig	Erddig	Negligible	No

Conservation Areas

localplann	inspireid	sitename	Potential Impact	Further Assessment Required
WREXHAM	WAL/WREX/	Bersham	Minor to Moderate	Potential

Listed Buildings

Record No	Name	Grade	Potential Impact	Further Assessment Required
1533	Erddig	I	Minor	No
1534	Esclusham Hall	II*	Negligible	No
1562	Tyn-y-Coed	II	Negligible	No
1566	Berse Drelincourt Church	II	Negligible	No
1567	Berse Vicarage with Flanking Walls to Garden	II*	Negligible	No

1568	Orphanage	II	Negligible	No
1584	Stable Courtyard Range	II*	Minor	No
1715	Pentrebychan Hall Dovecote	II	Negligible	No
16571	Croesfoel Farmhouse	II	Moderate	HIA
16572	Gate Piers at Hafod-y-Bwch Hall	II	Moderate	HIA
16573	Timber-framed building in yard at Croesfoel Farm	II	Moderate	HIA
16574	Barn Range at Esclusham Hall	II	Minor	No
17850	Kitchen and attached laundries, bakehouse and scullery at Erddig	II*	Negligible	No
17852	Former Haybarn to Outer Yard	II	Negligible	No
17853	Sawmill	II	Negligible	No

7.1.6 The results of the stage 1 assessment indicate that the impact on the vast majority of the designated heritage assets within a 3km radius of the site will have no, negligible or minor impact on their settings arising from the proposals. It is considered that none of these heritage assets require any further assessment.

7.1.7 The closest scheduled monument to the site is the Moated Site at Croes Foel (DE193) which lies approximately 200m south of the site. The monument itself is densely wooded (plate 8) and there are currently no clear views towards the site from this monument, although the taller elements of the development are likely to be prominent in the background of views across the monument towards the site from the southwest (plate 13). Furthermore, the moated site is publicly accessible from a point approximately 130m south of the proposed main site entrance. The impact of the proposed development on the setting of this monument is currently assessed as moderate although a full settings assessment would be required to confirm this.

7.1.8 The scheduled monument of Croes Foel Round Barrow (DE048) is located approximately 450m south southeast of the site (Plate 14). This monument is already under threat from ploughing. There are partial views towards the site from this monument at ground level (Plate 15), although the taller elements of the development are likely to be more prominent in these views creating a potential moderate impact on the setting of this monument. Again, a full settings assessment would be required to confirm this.

7.1.9 A group of three grade II listed buildings; LB16571: Croesfoel Farmhouse; LB16572: Gate Piers at Hafod-y-Bwch Hall; and LB16573: Timber-framed building in yard at Croesfoel Farm; all lie approximately 500m south of the site and approximately 60m west of the Rhostyllen Services junction on the Wrexham By-pass. As such their setting has already been severely impacted by modern development. A Heritage Impact

Assessment has been requested by the Conservation Officer at Wrexham CBC to assess the impact of the proposed development on these listed buildings and a full settings assessment may not be required in this case.

- 7.1.10 Two further scheduled monuments are assessed as having a Minor to Moderate impact. These are DE137: Offa's Dyke: Pentre-Bychan Hall Section, extending 540m S from Bron-Wylfa; and DE047: Hafod-y-Bwlch Round Barrow. Whilst the aforementioned section of Offa's Dyke is only likely to have a minor visual impact on its setting arising from the proposed development, it may be necessary to take the proposed sub-surface cable route through this section of the monument. Hafod -y-Bwlch round barrow has clear views towards the site, although it is slightly further away (850m south of the site). Its more immediate setting has already been significantly impacted by modern development including main roads, high voltage electricity pylons and modern buildings at nearby Pentre Bychan.
- 7.1.11 One further designated heritage asset is assessed as having a Minor to Moderate impact arising from the development proposals, the Bersham Conservation Area. All of the listed buildings and scheduled monument within this CA will suffer only negligible or minor impacts. This is due to the CA being characterised by dense mature woodlands, shielding the development from view. However, the southern extremity of the CA lies just a single field north of the proposed development. The majority of the site will be screened from view to the north due to the presence of the Rhos Branch railway embankment which rises to a height of 5-6m above the site and is topped with mature trees. Nevertheless, the tallest elements of the proposed development will be visible above it and will loom large on the horizon when viewed from the southern part of the CA only.
- 7.1.12 Any residual impact of the proposed development on the setting of the monuments could potentially be mitigated through the use of traditional local materials as cladding for the rooves and walls of the GIS Hall. No details of construction materials have been provided at this stage, although it is assumed that the functionality of the site will be the prime determinant of materials used.
- 7.1.13 In conclusion, this Stage 1 Settings Assessment considers that further settings assessment is required for the two closest scheduled monument to the site: the Moated Site at Croes Foel (DE193); and the Croes Foel Round Barrow (DE048). Further assessment may also be required for the southern part of the Bersham Conservation Area and the Hafod -y-Bwlch round barrow (DE047). The closest group of three listed buildings have been assessed via a Heritage Impact Assessment. The closest section of Offa's Dyke to the site may also require further assessment and Scheduled Monument Consent if the Southern Cable Route were to pass through it.

8 Sources

BGS, 2023. British Geological Survey: Geology viewer. Accessed online: <https://geologyviewer.bgs.ac.uk/> [Accessed 25/09/23].

Cadw. Date unknown. Scheduled Monuments – Full description: Croes-Foel Round Barrow. Accessed online: <https://cadwpublic-api.azurewebsites.net/reports/sam/FullReport?lang=en&id=3590> – accessed September 2023

Cadw. 2011. *Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment in Wales*.

Cadw. 2017. *Heritage Impact Assessment in Wales*.

CADW. 2023. Online Records. Accessed online: <https://cadw.gov.wales/advice-support/cof-cymru/search-cadw-records> accessed [Accessed 09/23].

Chartered Institute for Archaeologists, 2020. *Standards and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials*.

Chartered Institute for Archaeologists, 2020. *Principles of Cultural Heritage Impact Assessment in the UK*.

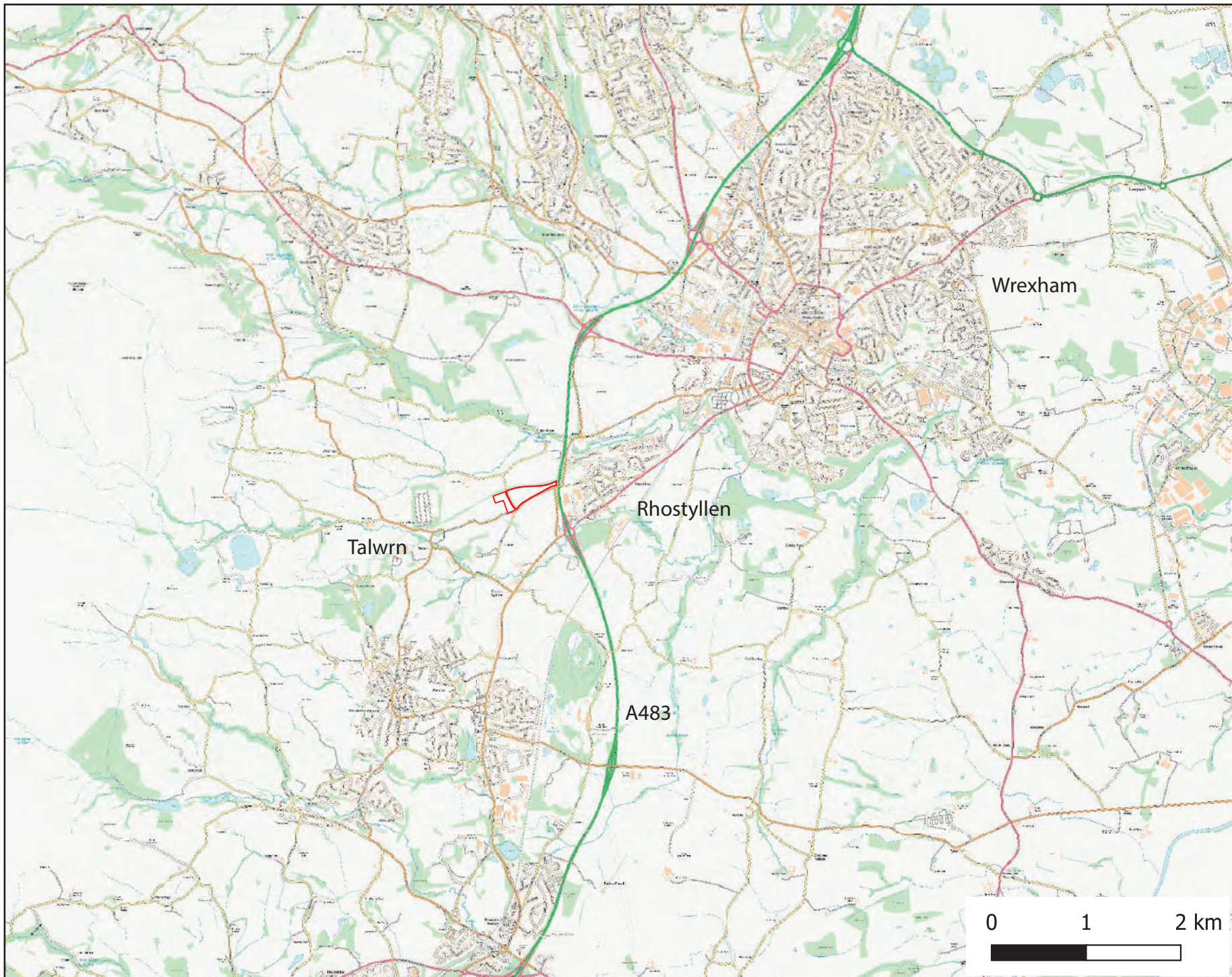
Davey, J. & Muller, J. 2023. Archaeological Desk Based Assessment: On Land at Rhostyllen, Wrexham. Archaeology Wales Report No. 2162

Muller, J. 2023. Geophysical Survey Report on Land at Rhostyllen, Wrexham. Archaeology Wales Report No. 2195

National Library of Scotland (NLS). 2023. Maps. Accessed online: <https://maps.nls.uk/> [Accessed 09/2023].

Welsh Government. 2017. *Technical Advice Note 24 The Historic Environment*.

Welsh Government. 2021. *Planning Policy Wales, Edition 11*.



 Site location

Figure 1: Location Plan

The Ordnance Survey has granted Archaeology Wales Ltd a Copyright Licence (No. 100055111) to reproduce map information; Copyright remains otherwise with the Ordnance Survey



Figure 2: Proposed Development Plan

The Ordnance Survey has granted Archaeology Wales Ltd a Copyright Licence (No. 100055111) to reproduce map information; Copyright remains otherwise with the Ordnance Survey

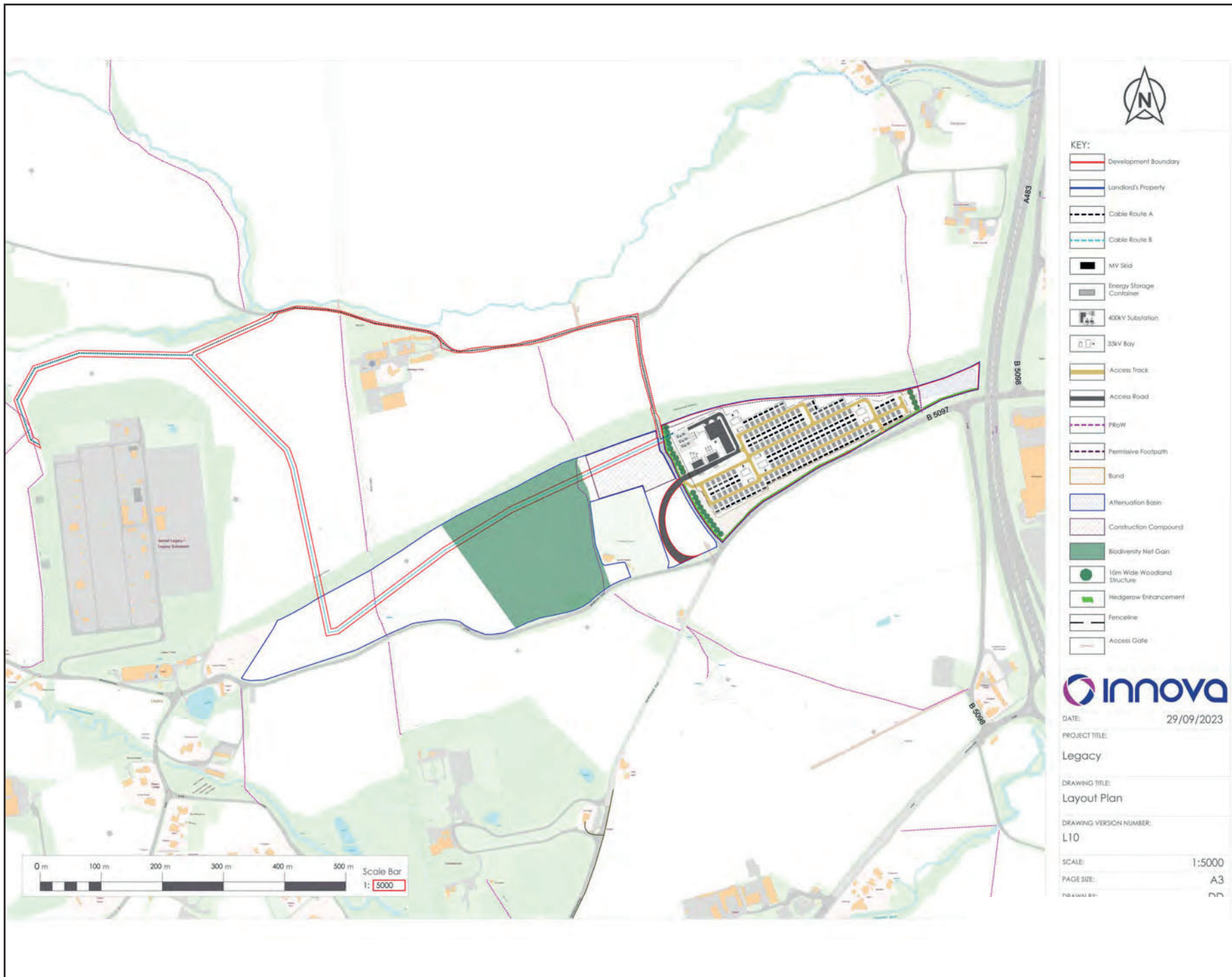


Figure 3: Proposed Development Layout Plan

The Ordnance Survey has granted Archaeology Wales Ltd a Copyright Licence (No. 100055111) to reproduce map information; Copyright remains otherwise with the Ordnance Survey

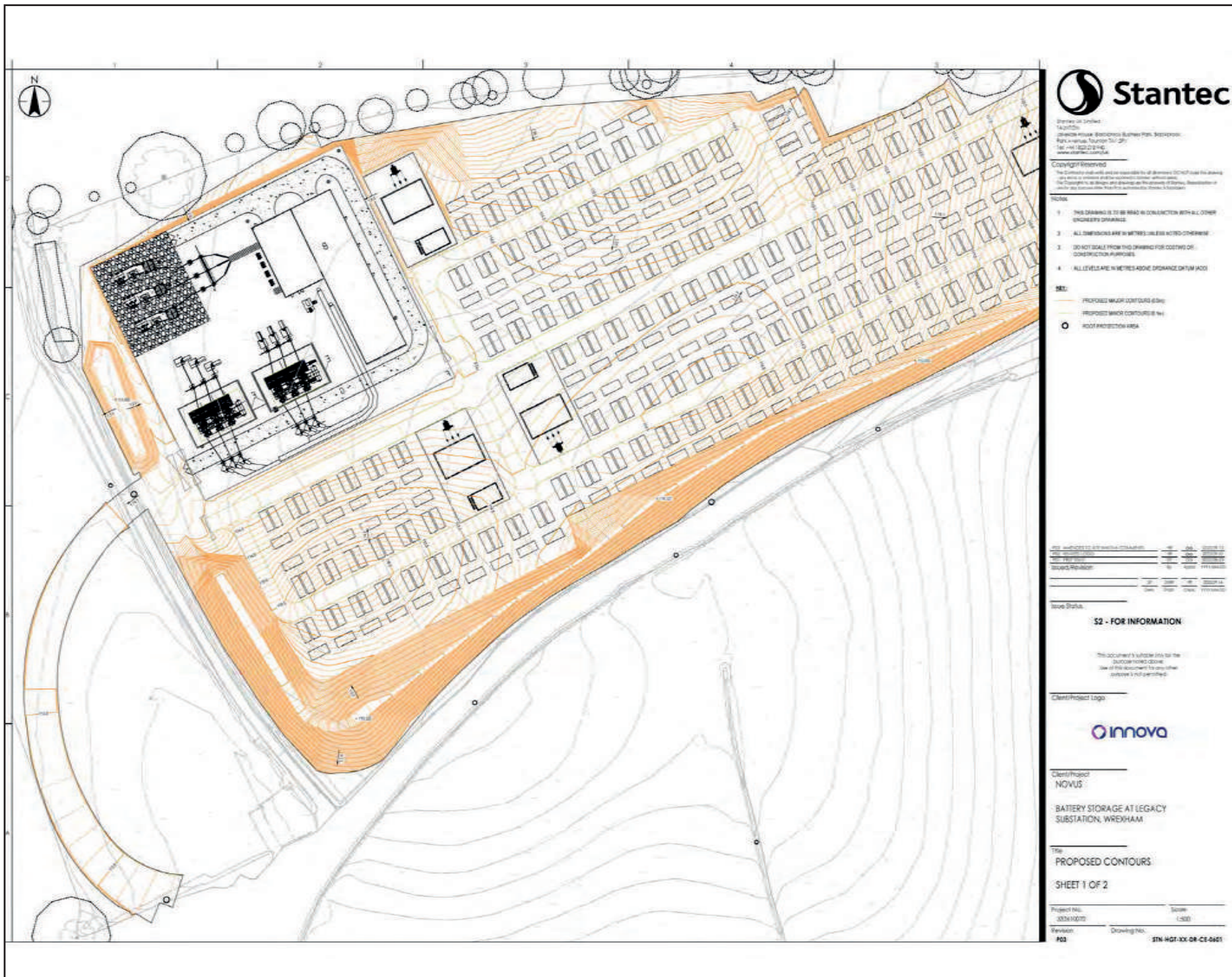
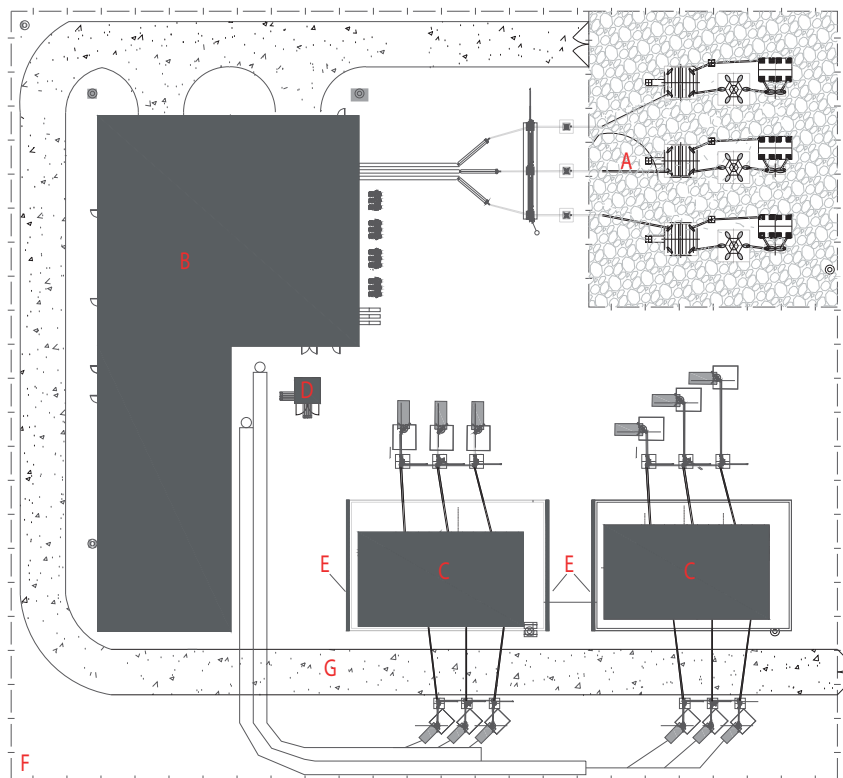


Figure 4: Proposed Contour Plan (West)

The Ordnance Survey has granted Archaeology Wales Ltd a Copyright Licence (No. 100055111) to reproduce map information; Copyright remains otherwise with the Ordnance Survey



KEY:

Dimensions (m) (l x w x h)

Alpha Substation	2.1 acres
A - Filter (x3)	16.2 x 5.3 X 12.5m
B - GIS Hall	56.8 x 28.8 x 14m
C - Transformer	22 x 14 x 9.0m
D - DNO Substation	3 x 3 x 2.5m
E - Fire Wall	15 x 1 x 10.5m
F - Fence (height)	2.4m
G - Internal Roads (width)	5m



DATE: 19/01/2023

PROJECT TITLE:

National Grid Substation
Layout

DRAWING TITLE:

Alpha Substation

DRAWING VERSION NUMBER:

1

SCALE: 1:500

PAGE SIZE: A3

DRAWN BY: DD

APPROVED BY: LT

Figure 8: Proposed
Alpha Substation



7 132/33kV Compound



Figure 9 132/33kV Compound

Equipment	Dimensions (m) (l x w x h)
132/33kV Compound	0.15 acres
132/33kV Transformer	14.8 x 9.5 x 6
33kV Substation	10.4 x 5.8 x 7.3
Internal Road	5m

Table 3 132/33kV Compound Dimensions

Figure 9: Proposed
132_33kV Compound



8.1 Battery and MV Layout

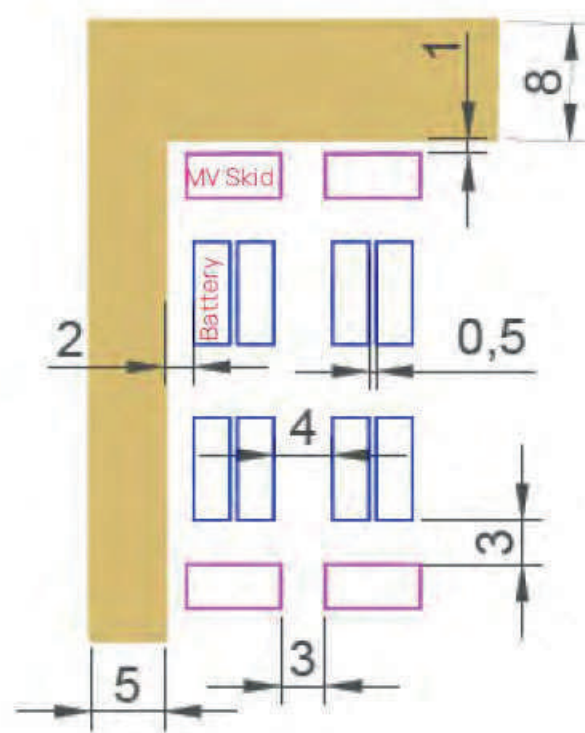


Figure 10 BESS and MV Layout

Equipment	Dimensions (m) (l x w x h)
Battery	7 x 2.5 x 2.9
MV Skid	6.5 x 3 x 3
Internal Road (MV Skid - MV Skid)	8m
Internal Road (Battery - Battery)	5m

Table 4 Battery and MV Skid Dimensions

[Link to PDF](#)

Figure 10: Proposed Battery MV Skid

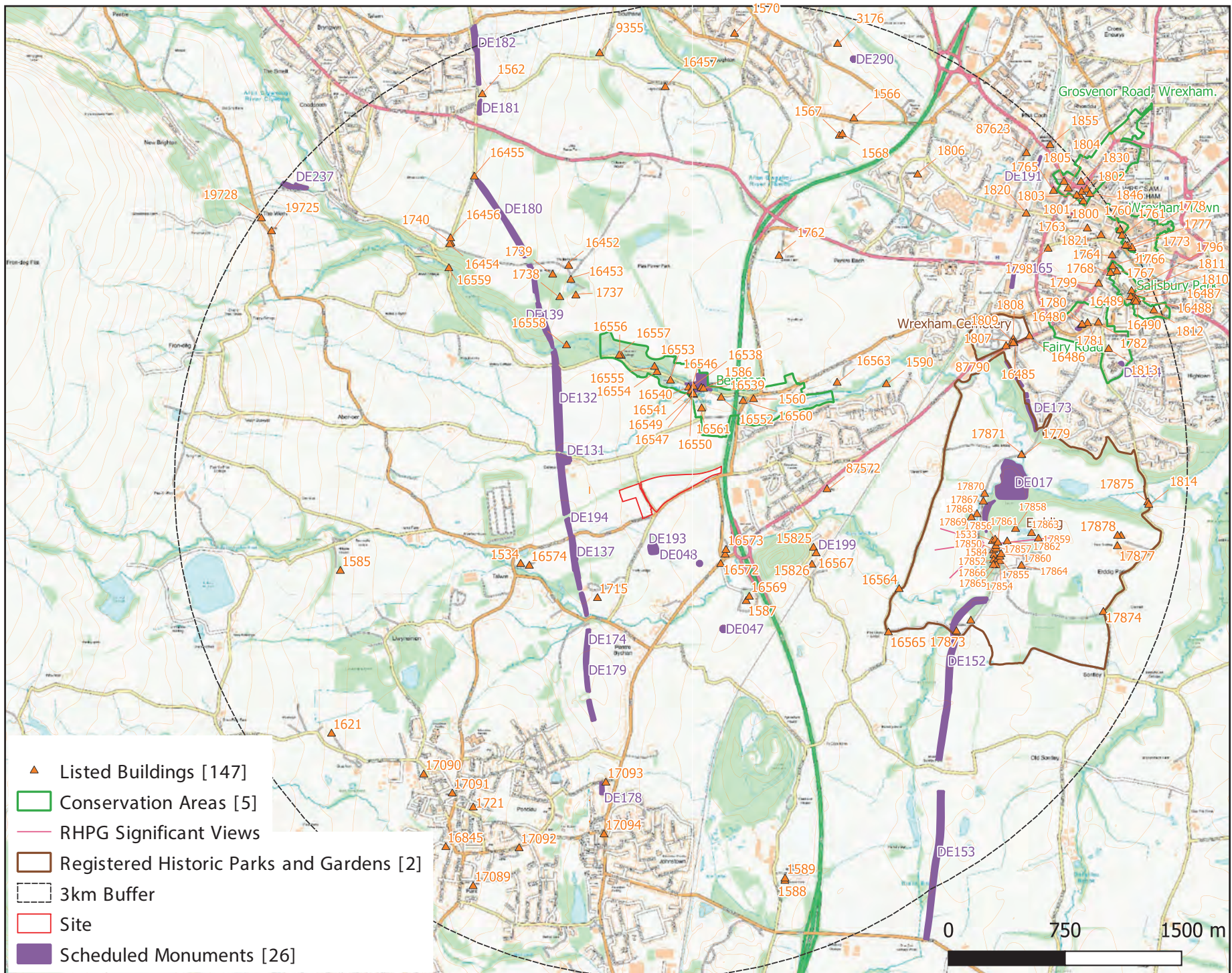


Figure 11: Designated Heritage Assets) Within 3km of the Site.

The Ordnance Survey has granted Archaeology Wales Ltd a Copyright Licence (No. 100055111) to reproduce map information; Copyright remains otherwise with the Ordnance Survey

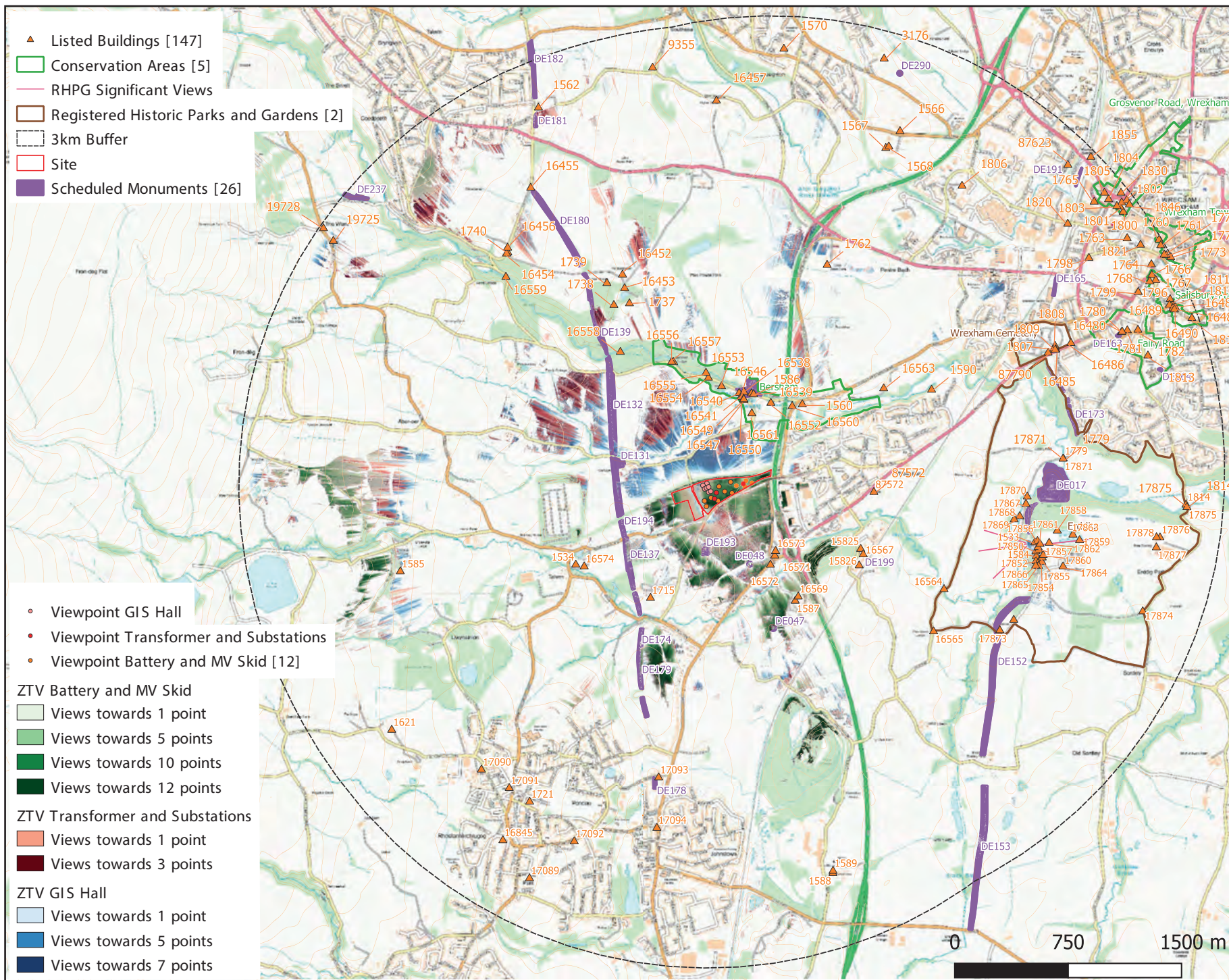


Figure 12: ZTV Analysis

The Ordnance Survey has granted Archaeology Wales Ltd a Copyright Licence (No. 100055111) to reproduce map information; Copyright remains otherwise with the Ordnance Survey

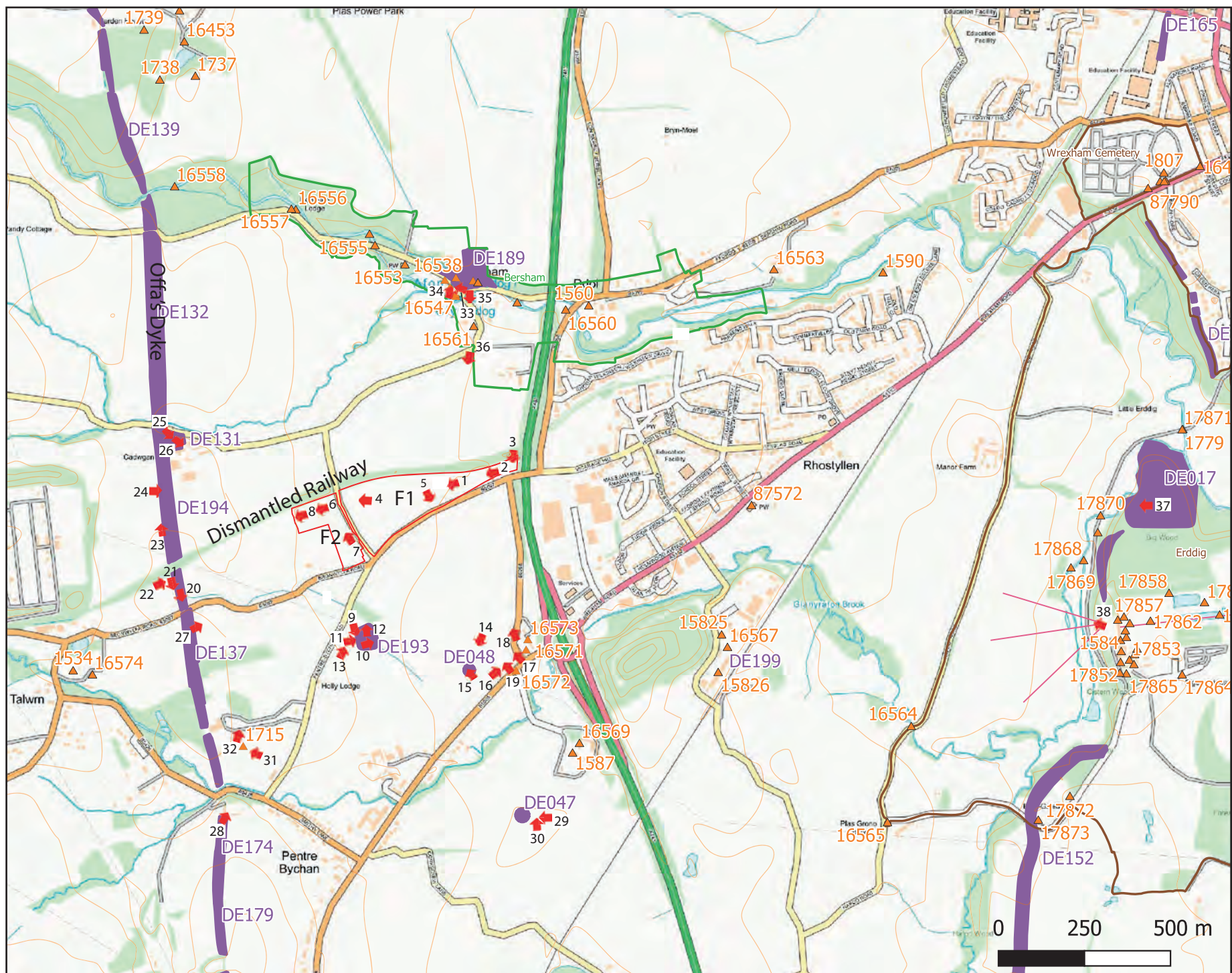


Figure 13: Photo Location Plan

The Ordnance Survey has granted Archaeology Wales Ltd a Copyright Licence (No. 100055111) to reproduce map information; Copyright remains otherwise with the Ordnance Survey



Plate 1: Field 1, view to west-southwest.



Plate 2: Field 1, east end, view to the west.



Plate 3: Field 1, east end view to south.



Plate 4: Field 1, west end, view to west.



Plate 5: Field 1, view towards Croesfoel Farmhouse (LB16571).



Plate 6: Field 2, view west southwest along northern field boundary (Rhos Railway Embankment).



Plate 7: Field 2, view north northwest along the eastern field boundary.



Plate 8: Field 2, view west across the large lynchet forming the western field boundary with Field 10.



Plate 9: Moated Site at Croes Foel (DE193), western moat, view to south southeast.



Plate 10: Moated Site at Croes Foel (DE193), remains of stone building on central platform, view to east northeast. 1m scale.



Plate 11: Moated Site at Croes Foel (DE193), western moat, additional stone structure, view to east northeast. 1m scale.



Plate 12: Moated Site at Croes Foel (DE193), dump of rubble, brick and corrugated sheeting, northwest corner of site. The proposed energy Storage site lies behind the trees in the background, view to north.



Plate 6: View across the north edge of the Moated Site at Croes Foel (DE193), towards the proposed energy Storage site which lies behind the trees in the background, view to northeast.



Plate 14: View southwest towards Croes Foel Round Barrow (DE048).



Plate 15: View north northeast towards the proposed Energy Storage Site from Croes Foel Round Barrow (DE048).



Plate 16: view east from Croes Foel Round Barrow (DE048) towards Croes Foel Farmhouse (LB 16571).



Plate 17: view north northwest from Croes Foel Farmhouse (LB 16571) towards the site.



Plate 18: view north northwest from the road outside Timber-framed building in yard at Croesfoel Farm (LB 16573) towards the site.



Plate 19: view north from the Gate Piers at Hafod-y-Bwch Hall (LB 16572) towards the site.



Plate 20: view south along Offa's Dyke: Section extending 120m from Railway to Bronwylfa Road, Legacy (DE194).



Plate 21: view south along recently re-cut ditch parallel to Offa's Dyke (DE194)



Plate 22: View east towards the site along possible southern Cable route across Offa's dyke (DE194).



Plate 23: View north along Offa's Dyke: Cadwgan Hall Section (DE132).



Plate 24: View east southeast across Offa's Dyke: Cadwgan Hall Section (DE132) towards the site.



Plate 25: Cadwgan Hall Mound (DE131), view to the east southeast across the monument towards the site.



Plate 26: view to the east southeast from the top of Cadwgan Hall Mound (DE131), towards the site.



Plate 27: view to the west northwest towards the site from DE137 Offa's Dyke Pentre-Bychan Hall Section, extending 540m S from Bron-Wylfa.



Plate 28: view to the northwest towards the site from DE174 Offa's Dyke: Section S of Bryn yr Owen

Farm.



Plate 29: Scheduled Monument DE047 Hafod-y-Bwlch Round Barrow, view to the west.



Plate 30: View north towards the site from DE047 Hafod-y-Bwlch Round Barrow.



Plate 31: LB1715 Pentrebychan Hall Dovecote, view to the north northwest.



Plate 32: View north northeast towards the site from Pentrebychan Hall Dovecote.



Plate 33: Bersham Conservation Area showing 2-3 Mill Terrace (LB 16541, 16546) and Mill House Farmhouse (LB 16540), view to the west.



Plate 34: The scheduled Monument of Bersham Ironworks (DE189) including the grade II listed Bersham Mill including cast-iron feed pipe (LB16538), view to the north.



Plate 35: Obstructed view towards the site from Bersham Conservation Area outside Bersham Ironworks, view to the south.



Plate 36: View south towards the site from the south end of Bersham Conservation Area. The tree-topped Rhos Branch Railway Embankment which forms the northern boundary of the site is visible on the near horizon.



Plate 37: Obstructed view west towards the site from the scheduled Monument of Erdigg Mound and Castle (DE017)



Plate 38: View west northwest towards the site from the grade I listed Building of Erddig (LB1533), listed as a significant view from Erddig RHPG. The site is obscured behind the right side of the rounded wooded hill in the centre, which is the spoil heap of the former Bersham Colliery.

Archaeology Wales Limited

Main Office, Unit D11.6 Treforest Industrial Estate

Pontypridd - CF37 5UR

Tel: +44 (0) 1686 440371

Email: admin@arch-wales.co.uk

Web: arch-wales.co.uk