## Archaeology Wales

### Glasffrwd, Strata Florida, Ceredigion

Archaeological Survey



By Philip Poucher

Report No. 1232



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#### Summary

A topographical survey of archaeological features was carried out on the route of a proposed hydro-scheme along the Glasffrwd Brook near Strata Florida Abbey, Ceredigion (NGR SN 76176 63958 to SN 74787 65333). The survey was carried out by Archaeology Wales Ltd at the request of Kevin Jones. The work was recommended by Dyfed Archaeological Trust Planning Services as a condition of the planning application.

The survey, which also included examination of Lidar data and historic mapping, recorded several archaeological features along the route of the hydro scheme. At the NW end of the route, in the area of a proposed powerhouse, evidence of possible medieval trackways with associated banks and ditches were recorded. Close-by, remains of a post-medieval leat, likely associated with mining activity, was also recorded. Midway along the route, further post-medieval mining activity was recorded in the form of mine adits and an associated wall and trackway. A former stone wall field boundary was also recorded in this area. At the SE end of the route, in the area of the intake weir, a stone-lined culvert and a possible enclosure were recorded, although the enclosure may be of natural origin.

The proposed location of the pipeline and powerhouse at the NW end should avoid upstanding remains of the trackways, although there is potential for disturbance of belowground remains in this area. Care should be taken in positioning the pipeline and powerhouse and in any related ground-disturbing activities. The proposed location of the pipeline and intake weir at the SE end may impact on the possible enclosure, although it is possible that this feature is of natural origin. Dependent on the area affected by the construction of the intake weir and the resultant water-levels, the culvert should remain unaffected. The route of the pipeline will probably have a minimal impact on the trackway associated with the post-medieval mining remains, although it will avoid the mine adits and the associated wall. It will, however, cut across the field boundary wall and the line of the post-medieval leat.

Care should be taken in the positioning of the various elements of the hydro-scheme, including access routes and site compounds, to avoid identified upstanding archaeological remains associated with the trackway at the NW end and the culvert at the SE end, and reduce the impact on the possible enclosure. Careful consideration should also be given to the movement of machinery and materials at the time of construction. An archaeological watching brief will be sufficient to record any potential below-ground archaeological remains, as long as sufficient time is allowed within the construction programme for detailed archaeological recording should features be uncovered, particularly in the area of the intake weir and powerhouse.

#### 1 Introduction

- 1.1 This report has been prepared by Archaeology Wales Ltd (AW), in response to a request by Kevin Jones, to provide a topographical survey of archaeological features along the route of a proposed hydro-scheme along the Glasffrwd brook, near Strata Florida, Ceredigion (Archaeology Wales Project Number 2170).
- 1.2 The development consists of a pipeline, *c*.2km long, which will be largely surface mounted, and positioned along the banks and valley side of the Glasffrwd Brook. At the upper, southeast, end water will enter the pipeline via a weir intake system, and at the lower, northwest, end the pipeline will run through a small powerhouse. The Glasffrwd Brook consists of a fast-flowing stream that runs through a thickly wooded valley to the southeast of Strata Florida Abbey. The pipeline will run from NGR SN 76176 63958 to SN 74787 65333, see figure 1. A planning application has been submitted (planning reference A130773).
- 1.3 A previous archaeological desk-based assessment (Smith 2012) of the development area was produced by AW (Smith 2013). Subsequently, however, additional information about the potential archaeological resource within the area of the development was provided by Professor David Austin of the Strata Florida Research Project. This additional information highlighted an enhanced archaeological potential along the route of the pipeline, and in particular in the area of the proposed weir intake and powerhouse.
- 1.4 As a result of this additional information, Dyfed Archaeological Trust Planning Services (DAT-PS), in its capacity as archaeological advisors to the local planning authority (Ceredigion County Council), recommended that a Section 23 Grampian Condition be attached to the planning permission, requiring the developer to implement a programme of archaeological work to protect the historic environment interests.
- 1.5 A Written Scheme of Investigation for the archaeological work was produced, and sent to DAT-PS for approval (see Appendix I). This work proposed a three-stage methodology - Stage one comprises a pre-commencement survey involving examination of Lidar data along with topographic survey of features along the route, followed by consultation and micro-adjustment of the planned works to avoid or reduce the impact on any identified archaeological remains. Stage two comprises an archaeological watching brief during groundworks associated with the planned works and stage three comprises the compilation of an illustrated report. This report details the results of Stage one.
- 1.6 A topographical survey of features along the pipeline route was undertaken in May 2014. The work was managed by Phil Poucher and carried out by Louis Stafford and Phil Poucher.
- 1.7 All work conformed to the IFA's Standards and Guidance for Archaeological Field Evaluation (IfA 1994, revised 2001 and 2008) and was undertaken by suitably qualified staff to the highest professional standards.

#### 2 Site description

2.1 The proposed route is located to the southeast of Strata Florida Abbey, Ceredigion (NGR SN 76176 63958 to SN 74787 65333), in the bottom of a reasonably thickly wooded, shallow sided, valley running north-west to south-east. The eastern end of the proposed route lies at 311m above Ordnance Datum whilst the western end, approximately 2km to the north east, is located at 204m above Ordnance Datum. The surrounding area is one of very sparse population, made up predominantly by woodland managed by the Forestry Commission.

#### 3 Historical Background

- 3.1 There is extensive evidence of prehistoric activity in the wider landscape, although only one site, a possible Bronze Age standing stone (PRN 8608), lies within 250m of the pipeline route. To the northwest lies the former Cistercian monastic house of Strata Florida, re-established at its present site in 1184. Although Strata Florida lies beyond the 250m search area around pipeline route that was examined as part of the desk-based assessment, like other medieval monastic sites its impact would have been felt across the wide landscape, so it is possible associated features extend into the site area. The south-eastern extent of the Abbey's former precinct, which consists of a wall and trackway, extends close to the area around the north-western end of the pipeline and the powerhouse. In this area, on the northern side of the river, are extensive remains of a water management system that served the needs of the Abbey, with possible associated remains extending to the south of the river, again in the area of the pipeline and powerhouse locations.
- 3.2 Other medieval remains are noted along the course of the pipeline. To the southeast, lies the site of a Holy Well, now a protected Scheduled Ancient Monument (CD183), and also within 250m of the pipeline route lies a medieval farmstead (PRN 36705) and a deserted rural settlement (PRN 41058), as well as two shelters (PRNs36490 & 41062) and a stone-walled enclosure (PRN 36723) of uncertain date, but possibly medieval in origin. These sites, however, will remain largely unaffected by the hydro scheme. A potential, previously unrecorded, walled enclosure of uncertain date lies in the area of the intake weir at the south-eastern end of the pipeline route, and therefore may also be affected by the planned works. Midway along the route lies a series of metal-mining remains (PRNs 26622 & 36720) listed within the HER as post-medieval in date, although their exact date is uncertain.
- 3.3 To the north of the pipeline route lies the post-medieval farmstead of Pantyfedwen, which includes three Grade II listed buildings, all of which will remain unaffected by the planned works. A series of former post-medieval field boundaries has also been identified, some of which potentially cross the route of the proposed pipeline.

#### 4 Methodology

4.1 Prior to the work taking place, a Written Scheme of Investigation was produced detailing the methodology for the archaeological investigation. A copy is included in Appendix I.

- 4.2 Lidar data, at 2m and 1m resolution (the best available for the area Figure 7), was studied and analysed for the area of the pipeline route. As the site runs through wooded areas a Digital Terrain Model (DTM) was used to produce a bare-earth model, removing vegetation and standing buildings. Features identified by the analysis of the Lidar data where then plotted on maps of the pipeline route (Figures 2 4).
- 4.3 Further information was collated from more detailed historic map sources and recent survey work undertaken in the area by Louise Barker of the RCAHMW.
- 4.4 The route of the pipeline was re-walked (it was initially walked during the production of the Desk-Based Assessment) and archaeological features identified along the route were surveyed using Topcon GRS1 survey equipment. These features were then plotted on to maps showing the pipeline corridor (Figures 2 6). They are described and discussed in the current report.
- 4.5 The report, in consultation with DAT-PS, is intended to help develop appropriate measures to mitigate the impact of the development on the potential archaeological resource.

#### 5 Results

#### 5.1 Earthworks at the NW end (Figures 2 & 5, Photos 1 – 3)

- 5.1.1 A series of earthworks, comprising linear banks and ditches, was recorded close to the NW end of the pipeline route, in the area of the proposed powerhouse location. Five ditches, or linear hollows, were recorded, labelled 1 5 from west to east.
- 5.1.2 **No.1** consisted of a 2.3m wide, slightly concave, linear ditch or hollow running in a roughly N S to NE SW direction. The feature is faintly visible *c*. 6m from the south bank of the Glasffrwd. As the ground begins to rise *c*. 10m further to the south, the ditch or hollow becomes more pronounced. From this point the western side is formed by a vertical cut into the rising ground, 1m deep. The eastern side is formed by a shallower slope, cutting 1.1m into the rising ground. Large stones are visible in the rising ground on this eastern side, although it is uncertain if they are naturally occurring river boulders or deliberately piled stones. This feature was traced a total of 24m to the south, before the route became too choked with undergrowth to continue surveying. However, the route is visible on Lidar imagery (Figure 7).
- 5.1.3 **No.2** lay 6m to the east, and appears to be associated with adjacent feature, No.3. No.2 comprises a relatively narrow ditch, 1.4m wide, the base of which, now vegetation covered, still drains water towards the Glasffrwd. The ditch is 1.6m deep, with a steep western edge, and an almost vertical eastern edge. It is visible *c*.20m from the south bank of the Glasffrwd as the ground begins to rise. The water that drains out of this ditch meanders across the low-lying ground before draining into the Glasffrwd.
- 5.1.4 **No.3** lay 3.5m to the east of No.2, the two separated by a 1.6m to *c*.2m high bank, which has a vertical drop to No.2 on its western side, and a gentler slope down to No.3 on its east. The bank is vegetation covered, but appears to be a stone and earth bank rather than the remains of a collapsed wall. No.3 itself comprises a 2m wide ditch or hollow running in a north south direction in a relatively straight line, with a high bank on its western side and rising ground to the east. This ditch/hollow is first visible *c*.19.5m from the south bank of the Glasffrwd, its line lost on the low ground edging the river. As the ground begins to rise the ditch/hollow can be traced for *c*.28m, with slight kinks in the line, possibly due to bank collapse or fallen trees. Beyond this point, the ditch/hollow becomes shallower and begins to fade into the thick undergrowth, although the route is visible on Lidar imagery (Figure 7).
- 5.1.5 **No.4** lay 7.3m to the east and comprised a 1.7m wide slightly concave linear ditch or hollow running in a north to south direction. The ditch/hollow is flanked by gentle sloping land that rises onto the surrounding higher ground. It first becomes apparent as the natural ground begins to rise *c*.20m to the south of the line of the Glasffrwd, but only extends a few metres into the rising ground before fading out.
- 5.1.6 **No.5** meets No.4 at the point where the two become visible in the natural rising ground. It runs in a slightly more SSE direction than No.4 and extends further before fading out on higher ground where there is a pine plantation. This ditch/hollow is formed by a flat-bottomed ditch, 1.7m wide, with relatively steep, slightly convex, edges.

#### Interpretation

- 5.1.7 No.1 appears to represent a trackway that crosses the Glasffrwd via a ford, which is marked on the 1889 Ordnance Survey map, and continues northwards to meet the current road along the north side of the Glasffrwd. This route can be traced on Lidar imagery (Figure 7) extending in a south-westerly direction for some distance. On the north side of the Glasffrwd, the track appears to run along the front of the medieval Abbey precinct wall, and may therefore have been established by the Abbey to provide access to its extensive estates.
- 5.1.8 Similarly, given its comparative width, No.3 also appears to represent a trackway. It appears to be flanked by a bank, with a well-constructed drainage ditch cut along its western side (No.2). It is also visible on the 1<sup>st</sup> edition Ordnance Survey map and the Lidar image. The Lidar image shows the feature continuing for some distance to the south (Figure 7). The Ordnance Survey map, however, does not mark a trackway, instead it depicts a field boundary following the same route. Clearly this feature was used as a boundary during the later post-medieval period, although the possibility remains that it was used as both a trackway and a boundary during the medieval period. Its location, and the considerable resources clearly expended in creating it (which would be unusual for a simple post-medieval field boundary), gives a strong indication that it was monastic and origin and formed part of the Abbey's extensive estates.
- 5.1.9 Although slightly smaller and more indistinct Nos.4 & 5 may also be remnants of trackways leading onto the higher ground on the eastern side of the main trackway / boundary represented by No.3. The Lidar image appears to pick up the line of No.5 running for a short distance into the woodland. The woodland comprises a 20<sup>th</sup> century pine plantation, and modern ridges and drainage channels associated with it are clearly visible on the ground in the area. This raises the possibility that these smaller trackways may be associated with later woodland management activity.

#### 5.2 Leat (Figure 2 & 5, Photos 4 - 7)

- 5.2.1 A short distance to the southeast, as the ground rises sharply *c*.30m to the south of the Glasffrwd, a leat is visible cutting into the contours of the rising ground. The leat itself is *c*.2m wide and visible as a slightly concave, near level, depression cut into the hillslope, which is now covered in vegetation. The line of the leat is traceable to the point where it is fed by the Glasffrwd to the southeast, up to an area close to the earthworks described above. At this point the line of the leat was lost amongst the various drainage features associated with the pine plantation, however a recent survey undertaken by the RCAHMW, commissioned by the Strata Florida Research Project, was able to identify and trace the line of this leat continuing in a westerly direction, its line taking it further away from the banks of the Glasffrwd.
- 5.2.2 At the point where it is fed by the Glasffrwd, the leat is visible as a squared, rock-cut, feature with straight vertical edges and a flat base, 0.9m wide. It is flanked on its northern side by a 2.4m wide bank fronted by a dry-stone built wall that faces the river, 0.7m high. This wall runs along the edge of a rectangular bay cut into the south-western bank of the Glasffrwd, measuring 4m long, and 2.8m wide, cutting back into

the south-western bank. The water pools in this bay, opposite which, on the northeastern side of the river, a channel is cut into the rising ground, end in what appears to be a partially in-filled mine adit. Immediately to the southeast of this point the banks of the valley close in and the Glasffrwd cuts through a rocky gorge.

#### Interpretation

5.2.3 Although the leat is not marked on late 19<sup>th</sup> or 20<sup>th</sup> century mapping for the area, on consideration, it is most likely to have been built in association with 19<sup>th</sup> century mining activity.

#### 5.3 <u>Mining remains (Figure 3, Photos 8 – 11)</u>

- 5.3.1 Roughly halfway along the route of pipeline, the Glasffrwd can be crossed via a bridge giving trackway access to Crofftau. At this point the Glasffrwd cuts relatively deeply into the bedrock, forming a small gorge in places. Roughly 60m to the south of the bridge, two opposing former mine adits are cut into the bedrock, close to the base of the gorge. These adits are recorded on the HER (PRNs 26622 & 36720), described as a minor post-medieval metal mine, comprising a level, with both entrances now infilled with stone. Due to their location at the base of the gorge it was not possible to record these adits in any detail, however, on the east bank of the Glasffrwd, above the area of the adits, a series of stone walls and trackway is visible.
- 5.3.2 Running along the top of the eastern bank, behind the eastern mine adit is a trackway *c*.2m wide, cut into the rising ground. The track is now vegetation covered but a stretch *c*.15m long is clearly visible behind the mine adit. It appears to continue in sections along the banks of the Glasffrwd for a greater distance. It is flanked on its western, river, side by a stone wall, 0.9m high, built of unworked local stone bedded in clay and soil, partly tumbled in places.
- 5.3.3 A further *c*.80m to the south of the initial mine adits two further possible adits are cut into the base of the gorge. These, however, are more uncertain. There is a recess into the bedrock in the side of the gorge at this point, but stone fall and vegetation has obscured them both and no clear adit is visible.
- 5.3.4 Another 20m beyond this point, a dry-stone built wall is visible, running east to west from the current road to the edge of the Glasffrwd. This wall is 1.1m high, 0.5m wide, and built of large blocks of unworked local stone. It continues the line of the field boundary visible on the opposite side of the road to the east.

#### Interpretation

5.3.5 Due to its location adjacent to the visible mine adits, the trackway, with its associated boundary wall, appears to be related to the use of the mine. It is difficult to say whether such remains represent a simple access route, or are part of a more extensive processing operation that would have been located above the mine. The 1889 Ordnance Survey map marks a footbridge at the point of the northern mine adits. Although neither the adits themselves nor the trackway is marked, the presence of the footbridge indicates that the trackway was still in use at that time. The trackway and adits, therefore, are likely to be later post-medieval in date, although a precise date is unknown.

5.3.6 The dry-stone wall to the south appears to be remnants of a post-medieval field boundary, and is shown on the tithe map of the 1840s and the 1889 Ordnance Survey map.

#### 5.4 Possible enclosure and culvert at SE end (Figure 4 & 6, Photos 12 - 18)

- 5.4.1 A large walled enclosure and old stone culvert were identified by Professor Austin at the southeast end of the pipeline route, at the point where the proposed intake weir is located.
- 5.4.2 The site of the enclosure consists of an area of raised ground occupying the southern end of a low-lying river bank set within a curve in the steep eastern valley side of the Glasffrwd. This raised ground measures roughly 12m SE – NW by 17m SW – NE with an occasional large boulder visible on the ground amongst a covering of low vegetation. The north-western end of the area is defined by a 0.4m to 0.6m high bank of riverwashed stone. The height of the bank is measured from the lower lying ground to the northwest; the ground to the southeast is roughly level. The bank follows a curvilinear route. As it curves round to the southwest, close to the current banks of the Glasffrwd, a pile of large river-washed boulders is visible along its line. This pile measured 4.5m long, 3.4m wide, and is 1.1m high on its southwest (river-side) edge and 0.4m high on its northeast edge.
- 5.4.3 On the opposite banks of the Glasffrwd, at this point, are the remains of an apparent stone-lined culvert. The culvert consist of two very large, relatively flat, stones laid vertically, with a similarly sized capstone, enclosing an area *c*.0.5m square just above the current waterline. The culvert runs back into the riverbank, but the interior is blocked with collapsed stone.

#### Interpretation

- 5.4.4 Although identified as a walled enclosure, its location within an area where the valleyside has been scoured out, taken in consideration with the presence of river-washed boulders along the curvilinear line of the bank, particularly along its north-western edge, gives the impression that this is a naturally occurring landform created by highenergy fluvial activity. There is little indication from any of the exposed stones of regularity or deliberate construction, although given its location adjacent to the river, and incidentally a short distance downstream from a confluence of the Glasffrwd with another large stream, any structural remains in this area are likely to have been badly affected by fluvial activity.
- 5.4.5 The conduit is more obvious as a deliberately built structure, although the date of its construction and information on how it would have functioned in this location is unclear. Stepping stones across the Glasffrwd *c*.15m to the south demonstrate a degree of investment in a footpath through the area, but it is difficult to see the conduit being associated with this. It is of note that a medieval well (PRN 36494), renowned and visited for its medicinal qualities, which lies on higher ground *c*.170m to the west, is fed along a slate cistern and may therefore drain through a stone-lined culvert.

#### 5.5 PRNs 36723 & 41058

- 5.5.1 Within the original desk-based assessment (Smith 2013) two known sites were identified as lying close to the proposed route of the pipeline and potentially therefore affected by the groundworks. These sites were PRN 36723, Bwlch-y-graig enclosure, and PRN 41058, a deserted rural settlement.
- 5.5.2 PRN 36723, although lying close to the line of the pipeline, lies within woodland at a small but significantly higher level and therefore will not be affected by it.
- 5.5.3 No clear evidence of PRN 41058 was uncovered at the given location (SN75056516), although the area was covered in vegetation. However, it is probably of note that a building platform and enclosure have been recorded by the RCAHMW within their survey on the north side of the Glasffrwd at this point. It is likely therefore that the site referred to as PRN 41058 is in fact the site on the north side, and so will be unaffected by the proposed works.

#### 6 Impact Assessment

- 6.1 Of particular (but not exclusive) concern for the proposed development were the positions of the intake weir at the SE end of the route and the powerhouse at the NW end, and the potential archaeological remains in their vicinities.
- 6.2 At the NW end, clear evidence of trackways with associated banks and drainage ditches, that may be medieval in origin, have been identified and surveyed. The development plans available indicate the powerhouse, along with the pipeline, is to be located on the line of these trackways, but on the lower-lying, level, ground located between the upstanding remains of the features and the bank of the Glasffrwd, at a point where there are no clear above-ground remains. Therefore, although it appears the upstanding remains will be avoided, the proximity of the powerhouse still has the potential to disturb some of these remains, and below-ground remains of the trackway may be uncovered by ground disturbing works associated with the construction of the powerhouse. Any ground-breaking activity that results from associated work, such as site compounds and the movement and storage of materials and machinery, also has the potential to disturb archaeological features in this area.
- 6.3 At the SE end, a possible enclosure may be disturbed by the positioning of the intake weir and pipeline. The route of the pipeline was marked out with stakes along the north-western edge of this possible enclosure. There is, therefore, a potential for any works associated with the laying and positioning of the pipe to affect this bank. Similarly, the weir intake will lie close to the edge of the possible enclosure, although it is unlikely to be located directly on top of features associated with it. What is unknown, at present, is the extent of the area that may be affected by ground disturbance associated with the construction of the weir intake. Any ground-breaking activity that results from associated work, such as site compounds and the movement and storage of materials and machinery, also has the potential to disturb archaeological features in this area. It should be noted, however, that it is not clear if the possible enclosure is of archaeological origin; the surveyors, for example, considered it a natural feature.
- 6.4 The stone culvert lies on the opposite side of the Glasffrwd and therefore should not be directly affected by the proposed works, although this will depend on the extent of the area to be disturbed during the construction of the weir intake.
- 6.5 Changes in water level around the area of the intake weir are also unknown at this point. Any significant rises in the water level may affect the possible enclosure and culvert, although from the construction details available this would appear unlikely.
- 6.6 Along the route of the planned pipeline, construction work may impact on two further identified sites, that of the mining remains (PRNs 26622 & 36720) and the newly-identified leat towards the NW end of the route. In the area of the mining remains, the planned pipeline route will not affect the site of the mine adits, nor will it affect the line of the boundary wall that runs along the river-side. It may, however, intersect with the line of the trackway associated with the mining remains, although given the intention to surface-mount the pipeline, or run it along a shallow narrow cutting, the impact on the trackway is likely to be minimal. The presence of these features does, however, highlight the potential for further archaeological remains

associated with mining activity in this area that may be revealed through ground disturbance associated with the proposed development.

6.7 The line of the pipeline will, at some point, cross the line of the leat at the NW end of the route. This will only disturb a small section of the overall leat, while the best preserved remains, at its intake from the Glasffrwd, will remain undisturbed by the proposed works.

#### 7 Proposed Mitigation

- 7.1 In the areas around the archaeological features highlighted within this report, care should be taken to minimise any impact from the movement and storage of machinery and equipment, as well as the positioning of any ancillary works such as access routes and site compounds.
- 7.2 An archaeological watching brief should be sufficient to record archaeology features and deposits should they be present and uncovered by any groundworks associated with the development. Adequate time should be available within the construction programme to allow for more detailed archaeological recording should features or deposits of particular interest be uncovered.
- 7.3 From the plans currently available, there is no need to reposition the locations of the intake weir, powerhouse or pipeline, although care should be taken when their locations are accurately plotted on the ground to ensure they do not impact on the upstanding remains of the banks and ditches in the area of the powerhouse at the NW end of the pipeline route.

#### 8 Bibliography

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- Regional Historic Environment Record (HER), held and maintained by Glamorgan-Gwent Archaeological Trust
- Coflein, the online database for the National Monuments Record of Wales (NMRW), held and maintained by the Royal Commission on the Ancient and Historical Monuments of Wales



Fig 1: Map showing location of assessment area











Stream Ivert -1 Steep Rock Face River Crossing/ Stepping Stones 263920.000 276020.000 50 m Scale: 1:10000





Figure 6: The possible enclosure or natural feature and stone culvert identied at the southeast point of the proposed pipeline.

Scale: 1:10000





Photo 1: View south down a possible medieval trackway (No.1) at the NW end of the pipeline route. 1m scales.



Photo 2: View south down remains of one of the trackways (No.3) at the NW end of the pipeline route. 1m scales.



Photo 3: View south down a trackway (No.5) at the NW end of the pipeline route. 1m scale.



Photo 4: View SE along the post-medieval leat towards the NW end of the pipeline route. 1m scales.



Photo 5: View SW at the post-medieval leat, at the point its intake point from the Glasffrwd. 1m scales.



Photo 6: View NW showing the leat intake on the left, with the scales lying on the dry-stone wall revetted bank between the leat and the Glasffrwd.



Photo 7: View NW across the square bay cut into the western bank of the Glasffrwd next to the postmedieval leat intake.



Photo 8: View west of the mine adit (PRN 36720) in the eastern bank of the Glasffrwd.



Photo 9: View south along the trackway associated with the mining remains. 1m scale.



Photo 10: View west of a section of the wall between the trackway and the Glasffrwd. 1m scales.



Photo 11: View SE of the field boundary wall to the south of the mining remains. 1m scale.



Photo 12: View NNW across the interior of the possible enclosure at the SE end of the pipeline route. 1m scales.



Photo 13: View NW across the pile of larger stones on the line of the possible enclosure boundary at the SE end of the pipeline route. 1m scales.



Photo 14: As above, taken in the opposite direction. 1m scales.



Photo 15: View NE along the NW edge of the possible enclosure, represented by the raised ground on the right. The wooden stakes mark the line of the pipeline. 1m scale.



Photo 16: As above, looking east. 1m scale.



Photo 17: View SW at the stone-lined culvert close to the SE end of the pipeline route. 1m scale.



Photo 18: As above, showing the culvert in its setting.

Archaeology Wales

### **APPENDIX I:** Written Scheme of Investigation

## Archaeology Wales

#### WRITTEN SCHEME OF INVESTIGATION

## FOR A PRE-COMMENCEMENT SURVEY AND ARCHAEOLOGICAL WATCHING BRIEF

ON

#### **Glasffrwd Hyrdo Scheme, Strata Florida, Ceredigion**

Prepared for:

Kevin Jones

9<sup>th</sup> May 2014 Amended 28<sup>th</sup> July 2014

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#### NON TECHNICAL SUMMARY

This Written Scheme of Investigation (WSI) details the proposal for a precommencement survey before groundworks and potential archaeological excavation and an archaeological Watching Brief during groundworks associated with the construction of a hydro scheme between Blaen-Glasffrrwd and Pantyfedwen, Strata The proposed scheme of works involves a three stage Florida, Ceredigion. methodology. Stage one comprises a pre-commencement survey involving examination of Lidar data along with topographic survey of features along the route, followed by consultation and micro-adjustment of the planned works to avoid or reduce the impact on any identified archaeological remains. Stage two comprises an archaeological watching brief during groundworks associated with the planned works - adequate time will be allowed to provide the supervising archaeologist time to clean and identify the extent and nature of any archaeological features and for excavation and recording to take place. Stage three comprises the compilation of an illustrated report. It has been prepared by Archaeology Wales Limited for their client, Mr Kevin Jones.

#### 1. Introduction and archaeological background

The scope of the construction work to be undertaken at the site (NGR SN 76176 63958 to SN 74787 65333, Figures 1 & 2) includes the installation of an energy generating hydro scheme parallel with the course of the Glasffrwd Brook. A weir intake to the west of Blaen Glasffrwd will divert water from the brook into a 400mm diameter pipe. The pipe will run for approximately 2km to the north-west where it will enter a powerhouse structure before being discharged back into the brook. The pipe will be largely surface mounted, though where the gradient of the land dictates it necessary, i.e.to prevent the pipe rolling, it will be sat within a 600mm wide by 300mm deep cut (partially buried). One 40m section parallel with the road will see the pipe buried 1m deep (in bedrock) within a 600mm wide trench. The planning application number is A130773 and the planning authority is Ceredigion County Council.

This WSI has been prepared by Philip Poucher, Project Manager, Archaeology Wales Ltd (henceforth - AW) at the request of Kevin Jones. It provides information on the methodology that will be employed by AW during a pre-commencement survey and archaeological watching brief at the site.

The methodology set out in this WSI will be agreed with the planning services division of the Dyfed Archaeological Trust (henceforth - DAT-HM) prior to the commencement of groundworks due to be carried out on the site. A previous desk-based assessment for the scheme has been produced, subsequently however, additional information about the potential archaeological resource within the area of the development was provided, on the basis of which DAT-HM recommended a Section 23 Grampian or pre-commencement condition, as recommended in Welsh Office Circular 60/96, which states:

No development shall take place until the applicant, or their agents or successors in title, has secured the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted by the applicant and approved in writing by the local planning authority'.

*Reason: to protect historic environment interests whilst enabling development* 

All work will be undertaken in accordance with the standards and guidelines of the Institute for Archaeologists (2011).

#### 2. Site description and historic background

The proposed route is located to the south east of Strata Florida Abbey, Ceredigion (NGR SN 76176 63958 to SN 74787 65333), in the bottom of a reasonably thickly wooded, shallow sided, valley running north-west to south-east. The eastern end of the proposed route lies at 311m above Ordnance Datum whilst the western end, approximately 2km to the north east, is located at 204m above Ordnance Datum. The surrounding area is one of very sparse population, made up predominantly by woodland managed by the Forestry Commission.

A desk-based assessment (Smith 2013) has been produced, which examines the historic background to the site. Subsequent to this Professor David Austin of the Strata Florida Project has highlighted some further archaeological potential within the site area.

There is extensive evidence of prehistoric activity in the wider landscape although only one site, a possible Bronze Age standing stone (PRN 8608), lies within 250m of the pipeline route. To the northwest lies the former Cistercian monastic house of Strata Florida, re-established at its present site in 1184. Although Strata Florida lies beyond the 250m search area around pipeline route, examined during the desk-based assessment, monastic sites such as this had an impact over wide landscape areas during the medieval period, and it is possible features associated with Strata Florida extend into the site area. The south-eastern extent of the Abbey's former precinct, which consists of a wall and trackway, extends into the area around the north-western end of the pipeline and powerhouse location. On the northern side of the river in this area are extensive remains of a water management system that served the needs of the Abbey, with some associated remains extending to the south of the river, again in the area of the pipeline and powerhouse locations.

Other medieval remains are noted along the course of the pipeline. To the southeast lies the site of a Holy Well, now a protected Scheduled Ancient Monument (CD183), and also within 250m of the pipeline route lies a medieval farmstead (PRN 36705), a deserted rural settlement (PRN 41058) as well as two shelters (PRNs36490 & 41062) and a stone-walled enclosure (PRN 36723) of uncertain date, but possibly medieval in origin. These sites however will remain largely unaffected by the hydro scheme, with the possible exception of the stone-walled enclosure (PRN 36723) which lies close to the proposed route of the pipeline. A further, previously unrecorded, walled enclosure of uncertain date lies in the area of the intake weir at the south-eastern end of the pipeline route, and therefore may also be affected by the planned works. Midway along the route lies a series of metal-mining remains (PRNs 26622 & 36720) listed within the HER as post-medieval in date, although their exact date is uncertain.

To the north of the pipeline route lies the post-medieval farmstead of Pantyfedwen, which includes three Grade II listed buildings, all of which will remain unaffected by the planned works. A series of former post-medieval field boundaries have also been identified potentially crossing the route of the proposed pipeline.

#### **3** Proposed archaeological work

The proposed archaeological work relates to the whole of the site, i.e. all of the application area. The primary objective will be to further assess and mitigate the impact of the development proposals on the historic environment through a staged approach. The aim of the work will be to establish and make available information about the archaeological resource revealed during a pre-commencement survey and archaeological watching brief during groundworks associated with the construction. This work will include the following elements:

- A pre-commencement survey including examination of existing survey data (including Lidar Digital Terrain Modelling), information held by 3<sup>rd</sup> parties along with a topographical survey of any identified archaeological features visible along the route of the pipeline. This will result in the production of an initial report illustrating the results of the survey work facilitating further consultation with DAT-HM to allow for any adjustments of the pipeline route to be undertaken (Stage 1). This consultation will take place prior to any development work requiring an archaeological watching brief taking place.
- An archaeological watching brief during groundworks associated with the development, adequate time will be allowed to provide the supervising archaeologist time to clean and identify the extent and nature of any archaeological features and for excavation and recording to take place.
- The production of an illustrated report and the deposition of the site archive (Stage 3)

#### 4 Pre-Commencement Survey Methodology (Stage 1)

#### <u>General</u>

Lidar data, at 2m and 1m resolution (the best available for the area), will be studied and analysed for the area of the pipeline route. Lidar data is particularly effective at locating ephemeral earthworks not visible to the naked eye. As the site runs through wooded areas a Digital Terrain Model (DTM) will be used which produces a bare-earth model, removing vegetation and standing buildings. Features identified by the analysis of Lidar data will be mapped in a GIS computer program.

Further research will include re-examining map data as well as locating and examining any further detailed historic and current map sources and aerial photographs for the area. Contact will also be attempted with both Professor David Austin of the Strata Florida Project and the RCAHMW who have undertaken survey work in the area to examine any additional information that they may hold.

The route of the pipeline will be re-walked (it was initially walked during the production of the Desk-Based Assessment) and any identified archaeological features identified along the route will be topographically surveyed using Topcon GRS1 survey equipment. All features will also be mapped in a GIS computer program and tied into the Ordnance Survey grid.

An initial brief illustrated report will be produced, combining the additional research and topographic surveys along the route of the pipeline.

This report will aim to illustrate and record the visible archaeological resource that may be affected by the planned scheme, allowing appropriate mitigation measures to be proposed in consultation with DAT-HM. Such mitigation measures may include the micro-adjustment of the pipeline route to avoid or reduce the impact on identified archaeological features. This consultation will take place prior to any development work requiring an archaeological watching brief taking place.

#### 5 Watching Brief Methodology (Stage 2)

#### **Objectives**

The aims of the watching brief, as defined by the IfA (2011) are:

- To allow a rapid investigation and recording of any archaeological features that are uncovered during the proposed groundworks within the application area.
- To provide the opportunity, if needed, for the watching archaeologist to signal to all interested parties, before the destruction of the material in question, that an archaeological find has been made for which the resources allocated to the watching brief are not sufficient to support the treatment to a satisfactory or proper standard.

#### <u>General</u>

The archaeological watching brief will be undertaken by AW staff using current best practice.

All work will be carried out by a suitably qualified archaeologist with relevant level membership of the Institute for Archaeologists (IfA) and will follow the IfA Standard and Guidance for an archaeological watching brief (2011).

The name of the attending archaeologist will be provided to DAT-HM prior to the watching brief taking place.

#### **Detailed**

The archaeological Watching Brief will not be undertaken until further consultation has been undertaken with DAT-HM following the Stage 1 Pre-Commencement Survey work in order to determine and agree the precise watching brief or other mitigation requirements. The Watching Brief will be carried out by a suitably qualified archaeologist during groundworks associated with the planned development that may disturb topsoil or subsoil deposits along the route of the pipeline and in the area of the intake weir and powerhouse. The mechanical excavation will be undertaken by a machine using a <u>toothless ditching bucket</u> wherever possible.

If archaeological features, finds or deposits are uncovered, work will be stopped in the area of the exposed feature in order that the supervising archaeologist can clean and identify the extent and nature of the feature and for excavation and recording to take place.

All archaeological deposits that are identified will be mapped, cleaned, recorded and sample excavated. The developer will provide a safe working area and sufficient time to record and excavate all features to the satisfaction of AW and DAT-HM. The excavation of identified features will not be compromised by the construction programme.

#### **Contingency Arrangements**

In the event of significant archaeological features being discovered all activities in this area of the site can be temporarily suspended. This will allow a period of consultation with DAT-HM and if required the opinion of specialists. Following such consultation, recommendations will be presented to the Developer and the Local Planning Authority.

The methodology and timescale of additional archaeological work to investigate such features will be presented and included in the Developers Programme; the feature will be fenced off and secured thus allowing the site programme to continue.

The Developer will be made aware of the additional cost and resources required should further archaeological excavation be required after consultation with DAT-HM and specialists, so such resources could be adequately accounted for.

#### Recording

Recording will be carried out using AW recording systems (pro-forma context sheets etc), using a continuous number sequence for all contexts.

Plans and sections will be drawn to a scale of 1:50, 1:20 and 1:10 as required and related to Ordnance Survey datum and published boundaries where appropriate.

All features identified will be tied in to the OS survey grid and fixed to local topographical boundaries. The location of all features will also be recorded using Topcon GRS1 survey equipment.

Photographs will be taken in digital format, using a 14MP camera with photographs stored in Tiff format. Should significant remains be identified that require excavation, photographs will also be taken in black and white and colour slide (35mm film).

The archaeologist undertaking the watching brief will have access to the AW metal detector and be trained in its use.

#### <u>Artefacts</u>

Archaeological artefacts recovered during the course of the excavation will be cleaned and labelled using an accession number, which will be obtained from the local museum. A single number sequence will be allocated to all finds. The artefacts will be stored appropriately until they are deposited with a suitable local museum.

All finds of gold and silver will be removed to a safe place and Natural Resources Wales, Cadw and the local coroner informed, within the guidelines of the Treasure Act 1996.

Any finds which are considered to be in need of immediate conservation will be referred to a UKIC qualified conservator (Phil Parkes at Cardiff University).

#### Human remains

In the event of burials or cremations being found all work will be halted in the area of the burials and their extent and nature established. The client, DAT–HM and the Ministry of Justice will be informed and a methodology of excavation agreed which will adhere to Ministry of Justice Guidelines.

#### Environmental and technological samples

Environmental samples will be taken where necessary when significant deposits are located. Technological samples will be taken where necessary when significant deposits are located.

#### **Specialists**

In the event of certain finds/features etc. being discovered, the site archaeologist may have to seek specialist opinion for assistance. Such specialists will be accessed either internally within AW itself or from an external source. A list of external specialists is given in the table below.

Туре	Name	Tel No.
Flint	Dr Amelia Pannett	02920 899509
Animal bone	Jen Kitch	07739 093712
CBM, heat affected clay, Daub etc.	Rachael Hall	01305 259751
Clay pipe	Hilary Major	01376 329316
Glass	Andy Richmond	01234 888800
Cremated and non-cremated human bone	Malin Holst	01759 368483
Metalwork	Kevin Leahy	01652 658261
Neo/BA pottery	Dr Alex Gibson	Bradford University
IA/Roman pottery	Jane Timby	01453 882851
Post Roman pottery	Mr Stephen Clarke	
Charcoal (wood ID)	John Carrot	01388 772167
Waterlogged wood	Nigel Nayling	University of Wales (Lampeter)
Molluscs and pollen	Dr James Rackham	01992 552256
Charred and waterlogged plant remains	Wendy Carruthers	01443 233466

#### Monitoring

Any changes to the specification that the contractor may wish to make after approval will be communicated to DAT–HM for approval on behalf of the Planning Authority.

Representatives of DAT–HM will be given access to the site so that they may monitor the progress of the all aspects of the fieldwork. DAT–HM will be kept regularly informed about developments, both during the site works and subsequently during any potential post-excavation.

#### 6 **Post-Fieldwork Programme (Stage 3)**

#### **Conservation**

After agreement with the client/landowner and DAT–HM arrangements will be made for the long term conservation and storage of all artefacts in an appropriate local or county museum.

#### Archive

The site archive will be prepared in accordance with MAP 2, Appendix 3 (English Heritage 1991). It will comprise all the data recovered during the fieldwork and shall be quantified, ordered and indexed and will be internally consistent. The archive will be deposited with the finds in a suitable local museum, contact will be made initially with Ceredigion County Museum, Aberystwyth to arrange the deposition of the archive. If no finds are present contact will be made with the County Archives Service in Aberystwyth to arrange deposition of the paper archive.

#### **Reporting**

The results of the watching brief will be submitted in an illustrated and bound report, which will include the following material:

- Non-technical summary
- Location plan showing the area/s covered by the watching brief, all artefacts, structures and features found
- Plan and section drawings with ground level, ordnance datum and vertical and horizontal scales.
- Written description and interpretation of all deposits identified, including their character, function, potential dating and relationship to adjacent features. Specialist descriptions and illustrations of all artefacts and soil samples will be included as appropriate.
- An indication of the potential of archaeological deposits which have not been disturbed by the development
- Statement of local, regional and national context of the remains
- A detailed archive list at the rear listing all contexts recorded, all samples finds and find types, drawings and photographs taken. This will include a statement of the intent to deposit, and location of deposition, of the archive.

A summary of the project results, excluding any confidential information, may be prepared for wider dissemination (e.g. Archaeology in Wales and special interest and period-specific journals).

#### Archive Format & Deposition

The full site archive will be deposited within one month of the completion of the client report.

The paper/drawing/digital archive will be deposited at the appropriate regional archival store (contact will be made with the County Archive Service in Aberystwyth) and the finds will be deposited with the appropriate local museum (contact will be made with the County Museum in Aberystwyth). AW will agree the location and timing of the deposition of the archive before the contract commences.

The archive will include all site notes, finds, documents, drawings, photographs, digital data and a copy of the final report and any prior draft versions. All of these items will be clearly quantified in tabular from in an 'archive deposition statement' located at the rear of the clients report, and their ultimate location and proposed date of deposition stated.

#### 7 Resources and timetable

#### **Standards**

The watching brief will be undertaken by AW staff using current best practice.

All work will be undertaken to the standards and guidelines of the IFA.

#### <u>Staff</u>

The survey work will be carried out by Louis Stafford and Philip Poucher. The archaeological watching brief will be undertaken by suitably qualified AW staff, the name of the attending archaeologist will be provided to DAT-HM in advance of the work being undertaken. Reporting will be undertaken by Philip Poucher.

#### Equipment

The project will use existing AW equipment.

#### Timetable of archaeological works

Once all mitigation measures have been agreed with DAT-HM the development will be undertaken at the convenience of the client and the archaeological watching brief will be undertaken intermittently on groundworks identified in consultation with DAT-HM that may affect the archaeological resource. DAT-HM will be informed in advance of the proposed development timetable.

#### <u>Insurance</u>

AW is an affiliated member of the CBA, and holds Insurance through the CBA insurance service. An insurance cover letter is attached to the rear.

#### Health and safety

All members of staff will adhere to the requirements of the *Health & Safety at Work Act*, 1974, and the Health and Safety Policy Statement of AW.



Fig 1: Map showing location of assessment area



Fig 2: Detailed location map showing exact route of proposed pipeline. Purple box defines extent of fully buried section whilst remainder will be surface mounted or partially buried as ground conditions permit.

# Archaeology Wales



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