

17 MARINE ARCHAEOLOGY

17.1 Introduction

17.1.1 This chapter of the Environmental Appraisal describes the baseline conditions in terms of the marine archaeological environment; describes the assessment methodology; identifies the potential pressures associated with the Proposed Marine Works on the receptors; and presents the findings of the environmental appraisal and any proposed mitigation measures where applicable.

17.1.2 The boundary of the Marine Environment Area which nominally follows mean high-water springs (MHWS) within the wider project Area of Search for Permanent and Temporary Works (see Figure 1.1), has been agreed in consultation with Natural Resources Wales (NRW). The Proposed Marine Works, which will only occur during the construction phase, are defined as the footprint of the Proposed Project that falls below MHWS and includes the following:

- Removal and dismantling of two pylons and their foundations (4ZC030R and 4ZC031) and the associated temporary access tracks to these locations; and
- Removal of the foundations of the previously dismantled pylon 4ZC030.

Installation of the tunnel and cables within the tunnel, although part of the Proposed Project lie at least 15m below Ordnance Datum Newlyn (ODN) and are therefore below the level that marine archaeology is encountered. These elements of the Proposed Project are therefore not assessed in this chapter.

17.2 Data Sources

17.2.1 This chapter has been informed by previous assessment works, which are included in the following Appendices:

- Appendix 17A: Marine archaeological desk-based assessment
- Appendix 17B: Archaeological review of marine geophysical survey data

17.2.2 The appendices should be consulted for detailed presentation of the full results of these surveys.

Technical surveys

Desk-based assessment (Appendix 17A)

17.2.3 A marine archaeological desk-based assessment was conducted (Cotswold Archaeology 2017)¹ to inform a Marine Licence for Ground Investigation works associated with the Proposed Project (Appendix 17A). The assessment was carried out in accordance with the *Standard and Guidance for Historic Environment Desk-Based Assessment* (Chartered Institute for Archaeologists 2014¹; Cadw's 2011²). The report aimed to assess the potential for, and significance of, below ground archaeological remains within the Marine Environment Area, utilising the following data sources:

- Gwynedd Archaeological Trust (GAT) historic environment record (HER);

¹ Chartered Institute for Archaeologists (2014), 'Standard and Guidance for Historic Environment Desk-Based Assessment', Reading: Chartered Institute for Archaeologists.

² Cadw (2011), 'Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment in Wales', Cardiff: Cadw.

- Cadw records of Scheduled Monuments, Listed Buildings, Registered Parks and Gardens and the Register of Landscapes of Outstanding Historic Interest in Wales;
- Records of wrecks and obstructions held by the UK Hydrographic Office (UKHO);
- National Monument Records for Wales (NMRW) records held by the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW);
- Aerial photographs held by the Welsh Assembly Government (WAG) and/or the RCAHMW including those acquired by the Royal Air Force (RAF) and Ordnance Survey (OS);
- Historic charts, records and sailing directions held by the UKHO;
- Specific sources dealing with the area including the Tremadog Bay and Dwyryd Estuary Marine Character Area 14 documents (Natural Resources Wales 2015)³; and
- British Geological Survey (BGS) GeoIndex Offshore for any previous geotechnical or geophysical surveys in the area.

17.2.4 The desk-based assessment provides the baseline assessment for this section of the Environmental Appraisal.

Geophysical survey (Appendix 17B)

17.2.5 A marine geophysical survey was undertaken in June 2017, within a survey corridor concentrated on the locations of proposed geotechnical investigations. This focussed on the Marine Area and was followed by a terrestrial geophysical survey in July 2017. The survey achieved limited coverage owing to the challenging environment, including shallow water depths and shoaling conditions. Archaeological review of the acquired data was undertaken and reported provided as Appendix 17B (Cotswold Archaeology 2017)⁴.

17.3 Scope and Methodology

Scoping

17.3.1 This chapter of the Environmental Appraisal has been prepared in accordance with the VIP Snowdonia Screening and Scoping Report (National Grid 2018)⁵ and subsequent Screening Opinion (Ref: SC1815, 2019) issued by NRW (on 10 December 2018), which indicated that the approach set out for assessing marine archaeology was acceptable. The Scoping Report did not identify any cultural heritage issues to be scoped out of the Environmental Appraisal, however a full 'Assessment of the Significance of the Impact of the Development on the Historic Landscape' (ASIDOHL) assessment was scoped out.

³ Natural Resources Wales (2015), 'Marine Character Areas. MCA 14: Tremadog Bay & Dwyryd Estuary', s.l.: Natural Resources Wales.

⁴ Cotswold Archaeology (2017), 'Visual Impact Provision (VIP) Snowdonia Scheme. Archaeological review of marine geophysical survey data', CA Report 16542, Issue 1.

⁵ National Grid (2018), 'Visual Impact Provision Snowdonia National Park, Overhead Line 4ZC Screening and Scoping Report' October 2018.

Appraisal Methodology

17.3.2 The Environmental Appraisal has been undertaken by assessing the potential adverse and beneficial effects of the Proposed Marine Works on the marine archaeological environment. This has been achieved by applying the following steps:

- Characterisation of the existing baseline – a good understanding of the baseline conditions has been achieved through desk-based assessment and review of site-specific geophysical data (see Section 17.2).
- Establish potential pressures.
- Characterisation of sensitive receptors – when assessing the sensitivity of a receptor the evidential, historical, aesthetic and communal value of the receptor was considered in line with Cadw's 'Conservation Principles' (Cadw 2011)⁶.
- Assessment of adverse and / or beneficial effects – qualitative and where possible quantitative assessment based on the sensitivity of the receptor to the identified pressure and the magnitude of the change from the baseline conditions i.e. the spatial extent, scale and duration / frequency of change.
- If necessary, propose mitigation measures to avoid, reduce or offset the effect and repeat assessment to ascertain the residual effects.

The Study Area

17.3.3 The study area (or zone of influence) is the spatial extent over which the Proposed Marine Works are predicted to have an effect on the receiving environment. The main activities and their predicted zones of influence are as follows:

- Installation of temporary access tracks and watercourse crossings (ramp, bridges and culverts) may impact on previously undiscovered archaeological sites.
- Excavation activities during the partial removal of structures at sites 4ZC031 and 4ZC030R are predicted to directly affect saltmarsh sediments within the footprint of the excavation works.
- Excavation activities during the partial removal of the foundations at site 4ZC030 are predicted to directly affect estuary sediments within the footprint of the excavation works.
- Full or partial removal of the pylon structures at site 4ZC030R and 4ZC030 is predicted to affect the functioning of the estuary channel locally within approximately 200m of the foundations.

17.3.4 The assessment has been informed by the results of a marine archaeological desk-based assessment and a geophysical survey. These surveys have provided information regarding the archaeological potential within the Marine Environment Area; as archaeology is, however in principle, a buried resource a certain degree of uncertainty remains with regard to the presence / absence and potential impact on any as yet unidentified assets.

⁶ Cadw (2011), 'Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment in Wales', Cardiff: Cadw.

17.4 Consultation Undertaken

- 17.4.1 Consultation and stakeholder engagement have been integral to the design and development of the project. For full details of screening and scoping consultations undertaken in relation to the Proposed Project please refer to Sections 3.1 and 3.2 of Chapter 3 - Environmental Appraisal Process.
- 17.4.2 Gwynedd Archaeology Trust (GAT), who sit on both the VIP Snowdonia stakeholder advisory group (SAG) and stakeholder reference group (SRG) has been consulted throughout project design. With respect to the Proposed Marine Works, National Grid consulted GAT throughout the consenting process for the Dwyryd estuary marine geotechnical surveys (2017 and 2018); a requirement for tunnel alignment design. Initial archaeological assessment of the core sample logs identified palaeo-environmental potential in one of the cores. Consequently, further assessment of the core is required in the form of a palaeo-environment assessment and National Grid has worked closely with GAT to ensure the scope of this assessment meets their requirements. The first stage of this work is currently being undertaken.
- 17.4.3 Table 17.1 summarises consultation responses relevant to the marine archaeological environment.

Table 17.1: Consultation responses

Stakeholder	Summary of consultation response	How response has been addressed
Cadw	Cadw concur with the decision in the submitted scoping report that an ASIDOHL assessment is not required to determine the impact on the registered historic landscape. The assessment should concentrate on the impact of the development on undesignated heritage assets and the possibility that unrecorded archaeological features are present.	Assessment presented in this section focuses on impacts on undesignated heritage assets and unrecorded archaeological features.
Welsh Archaeology Trust	The Welsh Archaeology Trust concur that the assessment should consider impact on undesignated historic assets. In particular, there is a potential for buried archaeological remains and submerged palaeo-environmental estuarine deposits or wrecks to be affected by the proposed work. These effects need to be properly assessed and any impacts mitigated as part of the works.	Assessment presented in this section considers the potential for buried archaeological remains and submerged palaeo-environmental estuarine deposits to be affected by the Proposed Marine Works.

Stakeholder	Summary of consultation response	How response has been addressed
National Trust	National Trust welcome further information on the proposed Protocol for Archaeological discoveries particularly in relation to trackways across National Trust land.	A written scheme of investigation and protocol for archaeological discoveries (PAD) for the Proposed Marine Works on the estuary will be submitted with the marine licence application. No known or potential archaeological sites or features were identified in proximity to the proposed trackways. The PAD will set out the processes to be adopted in the event that unexpected archaeological discoveries are made during the laying, use and dismantling of the trackways. A temporary exclusion zone (TEZ) will be imposed in the area of any discovery and work teams will move elsewhere until the advice of the archaeological consultant has been sought.

17.5 Statutory and Planning Context

National Legislation

17.5.1 The primary legislation in relation to the marine environment is set out by the Marine and Coastal Access Act 2009. This is supplemented by statutory controls related to archaeological material in the marine and intertidal zones, which includes:

- The Protection of Wrecks Act 1973;
- The Ancient Monuments and Archaeological Areas Act 1979;
- The Protection of Military Remains Act 1986;
- The Merchant Shipping Act 1995; and
- The Treasure Act 1996.

National Policy and Relevant Sector Guidance

- 17.5.2 National legislation is further supported by the UK Marine Policy Statement (HM Government 2011)⁷ and Welsh National Marine Plan (Welsh Government 2019)⁸. In addition, the primary guidance/policy on archaeology for Wales is contained in:
- Planning Policy Wales (Welsh Government)⁹;
 - Technical Advice Note (TAN) 24 (Welsh Government 2017)¹⁰: The Historic Environment
- 17.5.3 A strategic assessment of the Irish Sea¹¹ was also carried out which includes an assessment of archaeology.

Local Planning Policy

- 17.5.4 Key policies in the Eryi Local Development Plan 2016-2031 (Snowdonia National Park 2019)¹² plan relating to archaeology and heritage include:
- Strategic Policy A: National Park Purposes and Sustainable Development (A);
 - Strategic Policy B: Major Development (B);
 - Development Policy 1: General Development Principles (1); and
 - Development Policy 8: Protection of Non Designated Sites (8).

17.6 Existing Environment

Introduction

- 17.6.1 This section provides a summary of the known and potential marine archaeological resource within the area of the Proposed Marine Works and its environs. Further detail is provided in the marine archaeological desk-based assessment which forms Appendix 17A of this Environmental Appraisal.
- 17.6.2 Owing to coastal morphology it is difficult to determine what activities may have been undertaken in proximity to the area of the Proposed Marine Works at different historical periods. It is likely that these would have included a combination of marine, intertidal and terrestrial elements ranging from fishing to land management. Peat deposits in nearby Penrhyndeudraeth suggest that sea levels were at one point higher than at present; but with limited information currently available it is unclear how this might have affected habitation patterns. It is likely that buried deposits could also be present within the area of the Proposed Marine Works.

⁷ HM Government (2011), 'UK Marine Policy Statement', London: The Stationary Office Limited.

⁸ Welsh Government (2019), 'Welsh National Marine Plan', Cardiff: Welsh Government.

⁹ Welsh Government (2018), 'Planning Policy Wales. Edition 10'. S.I.: Welsh Government.

¹⁰ Welsh Government (2017), 'Technical Advice Note 24: The Historic Environment', May 2017.

¹¹ British Geological Survey (2005), 'DTI Strategic Environmental Assessment Area 6: Irish Sea (SEA 6)'

¹² Snowdonia National Park Authority (2019), 'Eryi Local Development Plan 2016 – 2031'. Written Statement., Pre-publication version. Penrhyndeudraeth: Snowdonia National Park Authority.

Landscape context

- 17.6.3 The superficial geology of the area of the Proposed Marine Works is comprised of tidal flat deposits composed of clay, silt and sand. These overlie bedrock geology of the Ffestiniog Flags Formation, composed of mudstone, siltstone and sandstone (BGS 2016)¹³.
- 17.6.4 The Proposed Marine Works lies within the Tremadog Bay and Dwyrdd Estuary Marine Character Area (MCA) 14 (NRW 2015)¹⁴. This characterises the Dwyrdd Estuary as an extensive intertidal area with a meandering channel running through it which continues inland. There are also extensive saltmarshes, sand flats, mud and dune systems, with the tidal island of Ynys Giffan forming a prominent feature (NRW 2015)¹⁵.

Designated heritage assets within the Marine Environment Area

- 17.6.5 There are no World Heritage Sites, Scheduled Monuments, Protected Wreck Sites, Registered Parks and Gardens, Registered Battlefields or Conservation Areas within the Marine Environment Area.
- 17.6.6 The estuary marks the boundary between the Ardudwy Landscape of Outstanding Historic Interest to the east, and the Aberglaslyn Landscape of Outstanding Historic Interest to the west.
- 17.6.7 The Pont Briwet railway bridge is listed twice as a Grade II Listed Building on either side of the Dwyrdd at Penrhyndeudraeth and at Talsarnau. This is located on the northern limit of the Marine Area, c. 380m east of Pylon 4ZCO30R.

Previous archaeological investigations

- 17.6.8 The Dwyrdd Estuary was included in the Coastal Erosion Survey: Aberdaron to Aberdyfi (Gwynedd Archaeological Trust 1996)¹⁶ which assessed the effects of coastal erosion on heritage assets. In the case of the area of Traeth Mawr, Traeth Bach and Talsarnau it was noted that, largely owing to modern development of the coastline, very little coastal archaeology predating the 19th century was observed.
- 17.6.9 The existing overhead line (OHL) overlaps the southern extent of the A487 assessment and excavation project which terminates in Minffordd (Hyder Consulting 2013)¹⁷. This report identified evidence of Bronze Age, Roman and medieval activity along the route of the A487.
- 17.6.10 In preparation for the Proposed Project a marine geophysical survey was undertaken in June 2017. This focussed on the Marine Area and was followed by a terrestrial geophysical survey in July 2017. The survey achieved limited

¹³ British Geological Survey (2016), 'Geology of Britain Viewer' [Online] Available at: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html> [Accessed 14 August 2018]

¹⁴ Natural Resources Wales (2015), 'Marine Character Areas. MCA 14: Tremadog Bay & Dwyrdd Estuary', s.l.: Natural Resources Wales.

¹⁵ *Ibid.*

¹⁶ Gwynedd Archaeological Trust (1996), 'Coastal Erosion Survey: Aberdaron to Aberdyfi'. Report 198, s.l.: Gwynedd Archaeological Trust.

¹⁷ Hyder Consulting (2013), 'Balfour Beatty Jones Brothers Joint Venture A487 Porthmadog, Minffordd and Tremadog Bypass: Report on archaeological mitigation' (GAT report 1065), Warrington: Hyder Consulting (UK) Ltd.

coverage owing to the challenging environment, including shallow water depths and shoaling conditions. The archaeological assessment of survey data concluded that there were no archaeological features in this area.

- 17.6.11 No previous marine surveys or walkover assessments of the Traeth Bach area of the Dwyryd Estuary were identified.

Archaeological context

- 17.6.12 There is limited direct evidence for prehistoric activity in the environs of the Proposed Marine Works. The identification of intertidal peats to the north of Tremadog Bay at Afon Dwyfor and Afon Wen (NRW 2015)¹⁸ may suggest a higher potential for finding similar deposits in the Afon Dwyryd. Terrestrial archaeological remains have been identified in the wider landscape. It has also been suggested that the distribution of Mesolithic flint scatters in the wider area of Tremadog Bay indicates the exploitation of coastal resources (Gwynedd Archaeological Trust)¹⁹.
- 17.6.13 The peats noted above date to the 2nd to 3rd millennium calibrated (cal) Before Christ (BC), and pollen samples suggest Bronze Age landscape development (Hyder Consulting 2013)²⁰. Bog oak was also identified within the peat, however no tool marks or signs of working were observed. There is additional evidence for Bronze Age activity in the surrounding area in the form of find spots in Penrhyndeudraeth.
- 17.6.14 In the wider context of North Wales there is evidence for Roman maritime trade, including the discovery of a Graeco-Italic anchor from the 3rd or 2nd century BC at Porth Felen, Aberdaron (Gwynedd Archaeological Trust 1996)²¹. In the immediate environs of the estuary, Roman activity is most clearly expressed by Roman roads which run east-west through Penrhyndeudraeth. There is another road recorded as crossing the Dwyryd Estuary at Portmeirion to the west that also crosses north-east of the OHL at the Vale of Ffestiniog. There is additional direct evidence for Roman activity in the environs in the form of three silver coins found at Penrhyndeudraeth, c. 2.1km west of Pylon 4ZCO31.
- 17.6.15 Following the Roman departure, the Kingdom of Gwynedd developed in this part of North Wales, although there is limited archaeological evidence for this and many accounts appear to be based in myth (NRW 2014)²².
- 17.6.16 There is archaeological evidence of marine activity in the wider environs of the Marine Area during the medieval period, including a ferry embarkation point which may have been canalised in the Middle Ages to improve access to the wharf by ships at Ty Gwyn y Gamlas, south of the Marine Area (Lewis 1849)²³. The

¹⁸ Natural Resources Wales (2015), 'Marine Character Areas. MCA 14: Tremadog Bay & Dwyryd Estuary', s.l.: Natural Resources Wales.

¹⁹ Gwynedd Archaeological Trust (1996), 'Coastal Erosion Survey: Aberdaron to Aberdyfi'. Report 198, s.l.: Gwynedd Archaeological Trust.

²⁰ Hyder Consulting (2013), 'Balfour Beatty Jones Brothers Joint Venture A487 Porthmadog, Minfordd and Tremadog Bypass: Report on archaeological mitigation' (GAT report 1065), Warrington: Hyder Consulting (UK) Ltd.

²¹ Gwynedd Archaeological Trust (1996), 'Coastal Erosion Survey: Aberdaron to Aberdyfi'. Report 198, s.l.: Gwynedd Archaeological Trust.

²² *Ibid.*

²³ Lewis 1849 Llanvihangel – Llanvillo. In: 'A Topographical Dictionary of Wales'. London: s.n., pp. 129-147

- evidence of activity in the immediate environs of the Proposed Marine Works, however, is limited and relates to terrestrial activity, including the re-use of one of the Roman roads as a pre-turnpike road.
- 17.6.17 In the wider context of Tremadog Bay, the fishing industry appears to have played an important role in the region from the medieval period onwards. During the post-medieval period the Dwyryd Estuary became a focal point for fishing and ship-building. The HER indicates that Penrhyndeudraeth and Talsarnau developed considerably during the post-medieval period. This includes evidence of managed waterways such as the channelled stream at Talsarnau, and a notable increase in quarrying activities around Penrhyndeudraeth. There is also evidence of maritime infrastructure related to quarrying in the form of a quay for the transportation of the slate at Cei Newydd, north-east of the OHL.
- 17.6.18 There is also a record of attempts to reclaim the area of Traeth Bach in the 18th century, which had been designated previously as waste land. It is unclear how this parcel of land correlates with modern maps, or how it was used. In 1806 an Act of Parliament was obtained to inclose [*sic*] common and waste ground adjoining the parish of Llandanwg, including marshes in the intertidal area of Traeth Bach (Gwynedd Archaeological Trust 1996)²⁴. This led to the construction of sea-walls and defences at Talsarnau between 1809 and 1810 (NRW 2014)²⁵, elements of which are still visible. On the northern side of the Penrhyndeudraeth peninsula more extensive efforts were made to reclaim Traeth Mawr for agricultural land with William Maddocks' construction of the Great Embankment, commonly referred to as the Cob, which was completed in 1811 (Hyder Consulting 2013)²⁶. This was a large construction project and there are indications that there was a ship or boat-building capacity in Traeth Bach evidenced by the hiring of boats from there to build the Cob.
- 17.6.19 Throughout the modern period there was an increase in boat-building and coastal trade, primarily linked to slate-quarrying. This can be seen in the slate quay c. 1.2km to the east of Pylon 4ZCO30R and the wreck site of a slate boat c. 1.8km south-west of pylon 4ZCO30R. There are also references to ferries operating in Traeth Bach, one of which is reported to have sunk in the area (Gewefan gymunedol 2018)²⁷. It may be that there are more small vessels similar to the slate-carrying boat, or their cargoes, buried in the sands of Traeth Bach.
- 17.6.20 There was a shift away from marine transport of slate following the arrival of the railway in the 1860s. This led to the construction of the Traeth Bach road and railway bridge, Pont Briwet Grade II Listed Building. Coastal shipping associated with the slate trade appears to have ended with the advent of World War I, and

²⁴ Gwynedd Archaeological Trust (1996), 'Coastal Erosion Survey: Aberdaron to Aberdyfi'. Report 198, s.l.: Gwynedd Archaeological Trust.

²⁵ *Ibid.*

²⁶ Hyder Consulting (2013), 'Balfour Beatty Jones Brothers Joint Venture A487 Porthmadog, Minffordd and Tremadog Bypass: Report on archaeological mitigation' (GAT report 1065), Warrington: Hyder Consulting (UK) Ltd.

²⁷ Gewefan gymunedol: Talsarnau, n.d. 'Discovering the slate carrying boat' [Online] Available at: <http://www.talsarnau.com/index.php/en/history/discovering-slate-carrying-boat> [Accessed 14 August 2018]

- the prohibition on export to the considerable German market (Gwynedd Archaeological Trust)²⁸.
- 17.6.21 Evidence from historic mapping and aerial photographs indicates that the areas of saltmarsh were in use, as evidenced by the depiction of channels and trackways. The use of the saltmarshes appears to have continued into the modern period. Assessment of Royal Air Force (RAF) (1946, frames 4015 and 4016) and Ordnance Survey (OS) (1971, 266) aerial photographs covering Traeth Bach also appear to show possible tracks or channels across the saltmarshes on both the north and south sides of the channel.
- 17.6.22 More recently, the National Monuments Record for Wales (NMRW) records the wreck of an amphibious vehicle in the immediate environs of the OHL. No additional information is provided on the wreck indicating details of its construction or date of loss. Assessment of RAF (1946, frames 4125 -4127) and OS (1971, frames 202, 256 and 257) aerial photographs covering its location show no signs of the amphibious vehicle. The aerial photographs from 1946 do however indicate a spread of possible debris south of Pylon 4ZCO30R, to the east of the landing craft. The resolution of the photographs is insufficient to identify what these objects are, and it is possible that they are natural features, but they seem to be spread in an east-west alignment over c. 240m. No similar objects are visible in the 1971 OS aerial photographs or modern coverage of the area, viewable in Google Earth, suggesting they have either been removed or buried by sand.

Summary of baseline conditions

- 17.6.23 There are limited known archaeological remains within a 500m radius of the pylons in the Proposed Marine Works. The majority of these archaeological remains are terrestrial and would be unaffected by the removal of the pylons. It should also be noted that the potential to encounter buried archaeological material in the footprint of the pylons is expected to be negligible due to previous impacts as a result of the pylon installation.
- 17.6.24 Limited information is currently available regarding the recorded wreck of the amphibious vehicle recorded c. 560m west of Pylon 4ZC030R. Should the amphibious vehicle still be present, it would likely be of evidential value due to its potential to provide information relating to its construction and use. The wreck may also hold historical and communal values depending on the circumstances of its loss and whether its loss has entered into local tradition, although no evidence for this has yet been identified. If it is a military craft then it may inform our understanding of the history of Traeth Bach at the time of its loss.
- 17.6.25 Based on the above summary of the historical and archaeological context of the Marine Environment Area, there is some potential for as yet unidentified archaeological remains to be present in the area of the Proposed Marine Works. This potential relates in particular to remains of post-medieval or modern date, which would hold evidential value associated with the history and use of the estuary and its environs in these periods.
- 17.6.26 There is also considered to be a low potential for remains of prehistoric or Roman date to be encountered within the area of the Proposed Marine Works. If present, such remains would most likely be associated with coastal activity, in artefactual form.

²⁸ Gwynedd Archaeological Trust (1996), 'Coastal Erosion Survey: Aberdaron to Aberdyfi'. Report 198, s.l.: Gwynedd Archaeological Trust.

- 17.6.27 No submerged prehistory or palaeo-landscapes have been identified in the immediate environs of the pylons. Remains have been noted, however, in the wider landscape with a potential for deposits associated with the formation of the palaeo-landscape in the Dwyryd Estuary. The most likely deposits of archaeological interest to be encountered are buried peats which could be used to inform our understanding of the palaeo or prehistoric environment at the time of the deposition. Based on the information discussed above, it has been determined that the potential for encountering such material is limited.

17.7 Key Parameters for Appraisal

- 17.7.1 The impact of the Proposed Marine Works upon the marine archaeological resource would result primarily from any disturbance of the ground immediately adjacent to the pylons which was not previously subject to disturbance during their installation. These impacts would be very localised, but due to the nature of the archaeological resource would be of a permanent nature.

There are additional potential impacts from machinery movements in the immediate vicinity of the pylon bases and in the wider environs of the pylons, including the laying of:

- temporary access routes;
- a ramp with culvert for access to 4ZC031;
- surface laid bridges/culverts to cross watercourses (4ZC030, 4ZC030R & 4ZC031);
- temporary working areas (4ZC030R & 4ZC031); and
- a temporary working platform (4ZC030).

17.8 Predicted Impacts During Construction

- 17.8.1 Based on the recorded location of the amphibious vehicle wreck, this asset would not be affected by the removal of the pylon foundations or the laying of access roads. However, it is not clear how extensive the associated debris field is, and there is a potential that some disturbance may occur if debris is identified in the immediate environs of the pylons during their removal. This would represent a direct permanent impact of low magnitude resulting in a minor adverse effect.
- 17.8.2 No known archaeological remains are recorded within the footprint of the Marine Works. Should any as yet unidentified remains survive within these areas, these may be subject to direct, permanent impact during the removal of the pylon foundations. Such an impact would, however, be localised, of low magnitude and receptors will have low to medium sensitivity to the impact, resulting in a negligible to minor adverse effect.
- 17.8.3 Wherever possible, works vehicles will be moved via existing stone access tracks so potential impacts on known archaeology will be negligible. Some temporary routes, however, will need to be laid to pylons 4ZC030, 4ZC030R and 4ZC031. Use of these temporary access routes and watercourse crossings could result in potential truncation / compaction of known archaeological sites through surface stripping and vehicle tracking. Such an impact would, however, be localised, of low magnitude and receptors will have low to medium sensitivity to the impact, resulting in a negligible to minor adverse effect.

17.9 Predicted Impacts During Operation

- 17.9.1 No additional impacts on marine archaeology are predicted to occur during the operation phase of the Proposed Project.

17.10 Predicted Impacts During Decommissioning

- 17.10.1 No impacts on marine archaeology are anticipated during the decommissioning phase of the Proposed Project.

17.11 Mitigation and Summary of Residual Effects

During Construction

- 17.11.1 To mitigate any potential disturbance to the amphibious vehicle wreck, it is proposed that a 100m radius Archaeological Exclusion Zone (AEZ) is implemented centred on the recorded wreck location and its possible debris field. (see Figure 17.1). This illustrates that there is considerable distance between the location of the AEZ and the proposed works and the associated temporary tracks. With this proposed mitigation in place the effect on this historic asset has been assessed as negligible.
- 17.11.2 The potential to encounter, as yet unidentified, archaeological remains is considered low due to the sparsity of known sites within the Marine Environment Area. Potential impacts during the installation of the temporary access trackways, removal of the pylons and conductors and the excavation and removal of the pylon foundations will be mitigated through the provision and implementation of a Protocol for Archaeological Discoveries (PAD), which will accompany the written scheme of investigation (WSI) to be submitted with the Marine Licence Application. A PAD is intended to mitigate risks to potential unidentified marine archaeology and cultural heritage that may result from the ground disturbance works. In the unlikely event that debris from the amphibious wreck has settled as far as the Proposed Marine Works then the PAD will provide the process for mitigating affects i.e. stopping work in an area until an archaeological expert has been consulted. The PAD sets out best practice in the reporting of finds of archaeological interest based on the PAD implemented through the Crown Estate for offshore wind developments (The Crown Estate, 2014). With this proposed mitigation in place the effect on potential historic assets has been assessed as negligible.
- 17.11.3 The potential impact of vehicular access to the Marine Environment Area will be limited through the use, wherever possible, of existing stone tracks. Where this is impossible, the potential impacts of the installation, use and removal of temporary access routes, watercourse crossings and temporary working areas will be minimised through the strict observation of the AEZ, the use of terrafirma plastic panels to limit the impact of vehicles, and the implementation of a PAD. With this proposed mitigation in place the effect on potential historic assets has been assessed as negligible.

During Operation

- 17.11.4 No impacts are predicted therefore no mitigation is required.

During Decommissioning

- 17.11.5 No impacts are predicted therefore no mitigation is required.

17.12 Cumulative Effects

- 17.12.1 Gwynedd Council and Snowdonia National Park Authority have confirmed (2 September 2019) that there are no current or future developments to be assessed cumulatively with VIP Snowdonia. A search of applications on the NRW marine licensing portal for plans and projects within 10km of the Proposed Marine Works was undertaken in November 2019 however, no plans and projects within this area were found. Given the Proposed Marine Works are planned for 2026 it is unlikely that information on any projects which could overlap spatially and temporally with the Proposed Marine Works will be in the public domain yet. Should any future projects have the potential to overlap cumulatively with the Proposed Marine Works, they would need to consider the Snowdonia VIP project in their cumulative effect assessment.
- 17.12.2 Given the Proposed Marine Works are geographically separated from the terrestrial elements of the wider project and all predicted effects are confined to the marine environment, no intra-project effects on the marine archaeological environment are anticipated.