

## Wylfa Newydd Project

# Addendum to the Environmental Impact Assessment Scoping Report



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# WYLFA NEWYDD PROJECT

*DCO Scoping Report Addendum*

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# 1 Introduction

## 1.1 Background to the Project and Addendum

### 1.1.1 Changes to Scope as a Result of Design Optimisation and Associated Development

1. Horizon is proposing to submit an application under the Planning Act 2008 for an order granting development consent (DCO) for a new Nuclear Power Station at Wylfa Peninsula on Anglesey, Wales.
2. As part of the evolving design of the Wylfa Newydd Project, a review has been undertaken to optimise the development with respect to cost, schedule, safety and environmental impact. As a result, a number of changes have been made to the proposals which were presented in the Wylfa Newydd Generating Station Environmental Impact Assessment Scoping Report (herein referred to as the '2016 Scoping Report'), submitted as part of the DCO process, on 15 March 2016.
3. At the time of the submission of the 2016 Scoping Report, proposals for various Associated Development facilities were being prepared for submission as separate planning applications under the Town and County Planning Act 1990 (TCPA). However, the Wales Act 2017 now makes provision for Associated Development to be incorporated into applications for development order consent in Wales.
4. The purpose of this addendum is to update the 2016 Scoping Report to reflect the revised proposals arising from the optimisation programme, as well as to provide additional Environmental Impact Assessment (EIA) scoping information for the Associated Development now proposed to be included as part of the application for development consent.
5. This addendum highlights the changes in environmental assessment scope currently proposed compared to those previously proposed in the 2016 Scoping Report. It does not replace the 2016 Scoping Report and should be read in conjunction with it. The 2016 Scoping Report can be found at:

<https://infrastructure.planninginspectorate.gov.uk/projects/wales/wylfa-newydd-nuclear-power-station/?ipcsection=docs>.

### 1.1.2 Marine Works Environmental Impact Assessment Scoping Report

6. As part of the construction and operation of the Wylfa Newydd Power Station, certain marine works would be required. The works, which include construction of marine structures, dredging, and disposal of dredged material, will meet the definition of 'marine licensable activities' under the Marine and Coastal Access Act 2009 and so must be consented under a marine licence. Horizon will apply for a marine licence for marine construction works and for marine dredging and disposal. The licence is required because, unlike in England, marine licences cannot be incorporated into a DCO in Wales. The proposed scope of the EIA for the licensable marine works is set out in Appendix B to this addendum. It is referred to as the Marine Works Environmental Impact Assessment Scoping Report.
7. Whilst the mechanism for consenting of these works will be different, it is nevertheless proposed that the EIA for the Wylfa Newydd Project will consider project activities as a whole (see Chapter 7 of this Addendum) and therefore the EIA will inform the marine licence application as well as the development order consent application.
8. The content and presentation of this Addendum to the Scoping Report has been informed by needs of the two consenting processes. The scope for the marine licensable activities has been

provided as an appendix so that the issues to be assessed to satisfy the requirements of the marine licensing process can be clearly identified. The main text of the document sets out the full scope of the EIA to satisfy the combined requirements of both consenting processes. The findings of the EIA will be presented in one integrated ES.

## 1.2 Project overview

9. The optimisation process has resulted in design changes compared to those presented in the 2016 Scoping Report. Notable changes include:
  - a more compact site for the Wylfa Newydd Power Station;
  - a reduced construction schedule;
  - a reduction in the maximum number of workers required to construct the Project from 10,720 to 9,000;
  - a change in the location of the Temporary Workers' Accommodation from a number of off-site locations to one campus for up to 4,000 workers to be located close to the Power Station Site;
  - an optimised design for the marine facilities; and
  - consolidation of the Off-Site Power Station Facilities onto one site.
10. Further details are provided in chapter 3 of this addendum.
11. The Wales Act 2017 has allowed the DCO to now include the following Associated Development:
  - Logistics Centre at Parc Cybi – a facility to manage deliveries to the Power Station Site;
  - Park and Ride facility at Dalar Hir – a facility to transport construction workers to the Power Station Site;
  - A5025 Off-line Highway Improvements – works to improve traffic movement to the Power Station Site; and
  - provision of On-Site Campus accommodation.
12. Although the On-Site Campus facility is considered to be Associated Development, the co-location of the facility within the Power Station Site makes it appropriate to integrate the assessment of that facility with the assessment of other developments on the Power Station Site, in line with the geographical approach to the EIA set out in this addendum.
13. Consent for the A5025 On-line Highway Improvements will be sought through a separate TCPA application.
14. The construction phase of the Wylfa Newydd Project includes enabling works within the Wylfa Newydd Development Area. These enabling works are referred to as Site Preparation and Clearance (SPC). SPC is within the scope of the application for development consent. However, SPC is also the subject of a separate Town and Country Planning Application (TCPA) to the Isle of Anglesey County Council (IACC). The reason for this is that there would be programme benefits if the SPC works were to be granted planning permission in advance of the DCO being granted.
15. The Project now no longer includes Temporary Workers' Accommodation at Kingsland (Holyhead), Cae Glas (Holyhead) and Rhosgoch. Horizon is also now no longer pursuing Madyn Farm as a location for Temporary Workers' Accommodation, but is proposing that it be brought forward through a Housing Fund supported by Horizon, with TCPA consent applied for by an appropriate housing provider.

16. Horizon is now no longer proposing a Visitor Centre during the construction phase of the Project, as part of its application for development consent. There is the potential for a temporary solution, although Horizon has not yet decided on the form that this may take and will therefore apply for a separate consent for this later, if required. This is therefore not considered further in this addendum. Horizon do, however, still intend to develop a Visitor Centre as part of the operational phase of the Project and will apply for this separately through a TCPA application, once more detail is known about the precise nature and form of this facility.
17. Figure 1.1 shows the indicative location of the developments to be consented through the application for development consent and separate TCPA applications. This replaces Figure 1.1 in the 2016 Scoping Report.

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**LEGEND**

- Wylfa Newydd Development Area
- Proposed Off-line Highway Improvements
- Settlements
- Rivers/Lakes
- "A" Roads
- "B" Roads
- Railway Stations
- Railway Lines
- Airports
- Visitor Centre
- Logistics Centre
- MEEG and AECC/ESL
- Park and Ride Facility

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18. The marine licensable activities associated with the Wylfa Newydd Project would be located in two spatially distinct locations; the Wylfa Newydd Development Area and the Holyhead Deep Disposal Site.
19. Marine licensable activities at the Wylfa Newydd Development Area include:
- Cooling Water System (CWS) – excavation and construction of a cooling water intake and outfall, together with two marine breakwaters to maintain a favourable wave climate at the intake; maintenance of the CWS and removal of debris from the CWS during operation, as well as a cooling water outfall structure to return cooling water to the sea.
  - Marine Off Loading Facility (MOLF) – construction of a bulk quay and a Roll-on, Roll-off (Ro-Ro) berthing facility and navigational dredging to deepen berths and channels; maintenance dredging and maintenance of structures and buoy movements during operation.
20. Marine licensable activities at Holyhead Deep Disposal Site include:
- Disposal of rock and soft sediment generated through construction of the CWS and MOLF and disposal of maintenance dredge arisings.
21. A Marine License application was submitted for the Minesto Deep Green Holyhead Deep Project (Minesto, 2016), a low-velocity tidal energy project in the southern half of the Holyhead Deep Disposal Site. Whilst not constructed yet, it is assumed that the presence of the Minesto Project precludes disposal of material from the Wylfa Newydd Project within this area. The disposal site for the Wylfa Newydd Project is, therefore, defined as the northern part of the Holyhead Deep Disposal Site.
22. The disposal of excess marine materials and dredge arisings at Holyhead Deep does not form part of the application for development consent since marine licence activities cannot be consented through the DCO process in Wales. However, it is proposed that the EIA for the Wylfa Newydd project shall inform the marine licence application as well as the development order consent application.

## 1.3 Report Aims and Purpose

23. The aims of this Scoping Report addendum are as follows:
- To provide a brief description of the changes to the Project and describe the Associated Development to be included in the application for development consent.
  - To outline the strategic background for the addendum to the 2016 Scoping Report, highlighting any additional legislation, planning guidance and consents not already identified in the 2016 Scoping Report.
  - To identify alternatives considered for any changes to the Power Station Site, Associated Development and the marine licensable activities.
  - To identify new, or any changes to, existing environmental constraints and sensitivities.
  - To identify any changes to the potential significant effects as a result of design changes at the Power Station Site, and identify potential significant effects from the Associated Development and marine licensable activities, both beneficial and adverse.
  - To identify preliminary opportunities for mitigation and enhancement of Associated Development and marine works, and highlight any changes to those already considered in the 2016 Scoping Report for the Power Station Site.

- To identify where it is proposed that receptors are to be scoped out of requiring further assessment and the reasons for this.
- To provide an outline of any changes proposed to the existing scope or the methodologies provided in the 2016 Scoping Report as a result of design changes and the full scope for the assessment of the Associated Development and marine works.
- To identify gaps in information and proposed further surveys.
- To identify further stages required of the EIA and the consultation process.
- To provide an outline of the proposed approach for the cumulative effects assessment taking into consideration the Associated Development and marine licensable activities and design changes to the Power Station Site and third party projects.
- To identify other assessments required to support the other licence applications (e.g. marine licence).
- To incorporate into the scope any changes identified through the consultation on the 2016 Scoping Report.

24. This report is set out according to the following structure:

- Chapter 2 - regulatory and policy background;
- Chapter 3 - project description;
- Chapter 4 - consideration of alternatives;
- Chapter 5 - consultation;
- Chapter 6 - scoping;
- Chapter 7 - approach to EIA;
- Chapter 8 - air quality;
- Chapter 9 - noise and vibration;
- Chapter 10 - landscape and visual;
- Chapter 11 - terrestrial and freshwater ecology;
- Chapter 12 - radiological issues;
- Chapter 13 - soils and geology;
- Chapter 14 - surface water and groundwater;
- Chapter 15 - coastal processes and coastal geomorphology;
- Chapter 16 - the marine environment;
- Chapter 17 - cultural heritage;
- Chapter 18 - socio-economics;
- Chapter 19 - public access and recreation;
- Chapter 20 - traffic and transport;
- Chapter 21 - waste and materials management; and
- Chapter 22 - cumulative effects;.

25. Marine licensable activities are considered in Appendix A of this addendum.

26. Responses from the 2016 Scoping Report Consultation covered in this Appendix are provided in Appendix B.

## 1.4 Structure of Environmental Statement

27. The ES will be composed of ten volumes. It will be presented in a 'development-based' structure with the assessments for each component development making up the Wylfa Newydd Project presented in a separate volume. Each of these development volumes will be subdivided into environmental topics. Each development volume will include a section on 'combined topic effects' (i.e. intra-development effects). This structure ensures appropriate focus can be given to the off-site component developments as well as the Power Station Main Site, whilst also allowing for Cumulative and Project wide effects to be considered.

28. The Environmental Statement will be set out according to the following structure:

- Non-Technical Summary – a summary description of the Wylfa Newydd Project and its likely significant residual effects on the environment.
- Volume A: Introduction to the Wylfa Newydd Project and to the Environmental Statement – an introduction to the ES and an overview of the development to which it relates.
- Volume B: Introduction to the environmental assessments – sets out the technical approach to the EIA and includes a discussion on how the assessments have regard for proposed mitigation and how the significance of likely effects of the Project is determined.
- Volume C: Project-wide effects – reports the assessment of those effects that are more appropriately considered at a project-wide level rather than for each component development in turn (e.g. effects relating to traffic and transport).
- Volume D: Power Station Main Site – reports the assessment of effects resulting from the activities on the Wylfa Newydd Development Area, including On-Site Accommodation, but excluding other Associated Development and Off-site Power Station Facilities.
- Volume E: Off-site Power Station Facilities: AECC, ESL and MEEG – reports the assessment of the effects resulting from the co-located Alternative Emergency Control Centre (AECC), Environmental Survey Laboratory (ESL) and Mobile Emergency Equipment Garage (MEEG).
- Volume F: Dalar Hir Park and Ride Facility – reports the assessment of the effects resulting from the Park and Ride facility.
- Volume G: A5025 Off-line Highway Improvements – reports the assessment of the effects resulting from the A5025 Off-line Highways Improvements.
- Volume H: Parc Cybi Logistics Centre – reports the assessment of the effects resulting from the Logistics Centre.
- Volume I: Cumulative effects – brings together an assessment of cumulative effects of the different developments within the Wylfa Newydd Project (described in Volumes C - H, above) and the cumulative effects of the Wylfa Newydd Project together with Reasonably Foreseeable Future Projects.
- Volume J: Summary of residual effects – provides quick reference summary information on the environmental commitments as well as the overall significant residual effects for the Wylfa Newydd Project as a whole.

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## 2 Regulatory and Policy Background

### 2.1 Legislation, Policy and Guidance

1. A range of international, national and local legislation, policies and guidance are of relevance to the Wylfa Newydd Project. This section details any legislation, policy and guidance that is either additional to, no longer relevant or has changed since the publication of the 2016 Scoping Report.

#### 2.1.1 Wales Act 2017

2. The Wales Act 2017 provides for Associated Development to be incorporated into applications for development consent.

#### 2.1.2 EIA Legislation

3. The revised EIA Directive (2014/52/EU) came into force on 15 May 2014, with the UK legally having to apply the new rules from 16 May 2017. The 2016 Scoping Report contained a commitment to adopt the requirements of this Directive.
4. The key requirements of the new legislation relevant to the 2016 Scoping Report and this addendum are set out below.

##### **Article 3(1)**

5. Article 3(1) states the following:
  - The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:
    - (a) population and human health;
    - (b) biodiversity, with particular attention to species and habitats protected under the Habitats Directive and the Birds Directive;
    - (c) land, soil, water, air and climate;
    - (d) material assets, cultural heritage and the landscape;
    - (e) the interaction between the factors referred to in points (a) to (d).
6. It is proposed that population and human health effects will be covered in a Health Impact Assessment, a Welsh Language Impact Assessment and an Equality Impact Assessment, presented as stand-alone documents which shall accompany the ES. This is in line with the approach outlined in the 2016 Scoping Report.

##### **Article 3(2)**

7. Article 3(2) states the following:
  - The effects referred to in paragraph 1 (Article 3(1)) on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned.
8. The Radiological Effects chapter will consider potential effects from major accidents as part of the EIA. This is an addition to the scope proposed in the 2016 Scoping Report.

### **Article 8a(4)**

9. Article 8a(4) is a new article inserted into the 2014 Directive, which sets out the following:

- In accordance with the requirements referred to in paragraph 1(b), Member States shall ensure that the features of the project and/or measures envisaged to avoid, prevent or reduce and, if possible, offset significant adverse effects on the environment are implemented by the developer, and shall determine the procedures regarding the monitoring of significant adverse effects on the environment.
- The type of parameters to be monitored and the duration of the monitoring shall be proportionate to the nature, location and size of the project and the significance of its effects on the environment.
- Existing monitoring arrangements resulting from Union legislation other than this Directive and from national legislation may be used if appropriate, with a view to avoiding duplication of monitoring.

10. The 2016 Scoping Report already stated the requirement to include comprehensive environmental mitigation and monitoring proposals along with a management plan to ensure that they are implemented and so already addressed these requirements.

### **Climate Change**

11. The Directive sets out a requirement to assess the impact of projects on climate and their vulnerability to climate change. The 2016 Scoping Report already stated that climate change would be assessed (Section 14.4 of the 2016 Scoping Report) in line with requirements set out in NPS EN-6. The effects of sea level rise is considered as part of Chapter 15 of the 2016 scoping report.

## **2.2 Policy Relevant to the Power Station Site**

### **2.2.1 National and Local Planning Policy and Guidance**

12. The EIA will have regard for how the Wylfa Newydd Project aligns with national and local planning policies.

#### **Planning Policy Wales (PPW) 9**

13. The 2016 Scoping Report omitted to mention Technical Advice Note (TAN) 14: Coastal Planning, which aims to ensure development takes into account the coastal environment and setting within plans. This is relevant to the Power Station Site. TAN14 will be taken into account for the purposes of the EIA.

## **2.3 Policy Relevant to Associated Development**

### **2.3.1 National and Local Planning Policy and Guidance**

14. As a result of the inclusion of Associated Development facilities within the application for development consent, additional legislation and policy relevant to these facilities is being taken into account for the purposes of the EIA. The policies and guidance described below sit outside of the National Policy Statement (NPS).

#### **PPW 9**

15. The chapters of PPW 9 of particular relevance to understanding the possible environmental effects of the Associated Development proposals include:

- 4: Planning for Sustainability;
  - 5: Conserving and Improving Natural Heritage and the Coast;
  - 6: The Historic Environment;
  - 8: Transport;
  - 12: Infrastructure and Services; and
  - 13: Minimising and Managing Environmental Risks and Pollution.
16. The following TAN have also been considered with regard to the potential environmental effects of the Associated Development:
- TAN 5: Nature Conservation and Planning;
  - TAN 11: Noise;
  - TAN 15: Development and Flood Risk;
  - TAN 18: Transport;
  - TAN 20: Planning and the Welsh Language; and
  - TAN 21: Waste.

### ***Design Manual for Roads and Bridges (DMRB)***

#### ***A5025 Off-line Highway Improvements***

17. The A5025 Off-line Highway Improvements would be constructed to be compliant with Design Manual for Roads and Bridges (DMRB) standards.
18. DMRB – Volume 11: Environmental Assessment, Section 3 Environmental Assessment Techniques, provides a framework for a range of environmental topic areas for consideration in the EIA of highways projects.
19. In addition, Highways Agency Interim Advice Notes provide supplementary guidance to that contained in DMRB Volume 11.
20. Adoption of these methods is appropriate for assessing effects associated with A5025 Off-line Highway Improvements; the reporting of the effects, however, requires some degree of adjustment to achieve consistency with other elements of the Wylfa Newydd Project EIA. These are described in chapter 7 and also chapters 8-22 of this addendum, as appropriate.

### ***New Nuclear Build at Wylfa: Supplementary Planning Guidance (Wylfa SPG) (Isle of Anglesey County Council (IACC), 2014)***

#### ***Logistics Centre at Parc Cybi***

21. A Logistics Centre at Parc Cybi is required to further reduce vehicle movements along the A5025 by consolidating loads and controlling traffic flows. Guiding principle 14 (GP14) of the *Wylfa SPG* requires consideration to be given to the requirement for facilities, including those for freight consolidation, to reduce the volume of road traffic that would utilise parts of the road network where congestion and/or environmental effects may occur.

#### ***Park and Ride Facility at Dalar Hir***

22. The IACC's vision and objectives for a new nuclear development are set out in section 2.1.3 Local Planning Policy of the 2016 Scoping Report. GP14 states that the project promoter should consider "...the requirement for, and locations of, facilities including Park and Ride.....to minimise



*the volume of road traffic that will utilise parts of the road network where congestion and/or environmental impacts may occur”.*

23. The planning guidance also outlines the particular considerations and constraints relating to Anglesey’s largest settlements and key transport corridors and also includes general guidance on a number of environmental topics, including:

- GP14: Transport;
- GP16: Managing Waste Sustainably;
- GP18: Mitigating Climate Change;
- GP19: Adapting to Climate Change;
- GP20: Conserving and Enhancing the Natural Environment;
- GP21: Conserving the Water Environment; and
- GP22: Conserving and Enhancing the Historic Environment.

## 2.4 Marine Licence

24. Policy relating the licensable marine works is detailed in appendix A of this addendum.

### 3 Project Description

1. The project design has continued to evolve through a process of optimisation and the scope of the application for development consent has been increased to include the Associated Development.
2. This section outlines design changes to the Project since the 2016 Scoping Report.

#### 3.1 Power Station Site

3. The following changes have been made to the proposed design of Power Station Site since the submission of the 2016 Scoping Report.

**Table 3.1 Changes to Power Station Site**

Building/plant	2016 Scoping Reference	Change to the design
Main plant		
Main plant	3.2.1	Land added to the Wylfa Newydd Development Area to facilitate better landscape design using surplus excavation material. The area would be returned to agricultural use following operation of the Wylfa Newydd Power Station.
		Power island relocated to the north-west of the site, with ancillary buildings relocated south of the power island.
		Change in level around the power island to +18m Above Ordnance Datum (AOD).
		Change in level around the south of the backup building to +21m AOD.
		Two backup buildings realigned adjacent to each other.
		New compound provided for five additional transformers.
Reactor Building and Main Stack	3.2.1.1	Redesign from a twin cruciform to a single power island comprising two Reactor Buildings, two Turbine Buildings, two Control Buildings, one Service Building and one Radioactive Waste Building.
MOLF	3.2.3.6	Change in level around the circulating water intakes and MOLF to +6.6m Above Ordnance Datum (AOD).
Radioactive waste storage buildings	3.2.4.4	Change in level of Spent Fuel and Intermediate Level Waste Stores to +21m AOD.

Building/plant	2016 Scoping Reference	Change to the design
Radioactive waste storage buildings	3.2.4.4	Merger of High Level Waste Decay Storage Facility with the Spent Fuel Storage Facility to create a single Spent Fuel Storage Facility.
Cooling water system and breakwaters	3.2.5	Change in size of dredging area and internal configuration within the intake structure e.g. area of screens and number of drum screens per unit.
General	3.7.2	Increase in the site platform level from 14m to 17m.

4. The EIA will have regard for the need to make use of a 'Rochdale Envelope' approach consistent with PINS advice note 9 to provide for a robust assessment whilst accommodating the need for flexibility in final design.
5. Figure 3.1 illustrates the indicative proposals for the Power Station Site. This replaces figure 3.1 in the 2016 Scoping Report.
6. All other plant and facilities remain as described in the 2016 Scoping Report.

## 3.2 Off-Site Power Station Facilities

7. Optimisation of the design has allowed the co-location of the three Off-Site Power Station Facilities: the MEEG, AECC and ESL, at Llanfaethlu approximately 6km south of the Power Station Site. The purpose and operation of the facilities would be as described in the 2016 Scoping Report. The AECC and ESL will be designed to fit inside the site boundary for the MEEG presented in the 2016 Scoping Report.
8. Figure 3.2 provides an indicative location of the Off-Site Power Station Facilities. The Llanfaethlu site is approximately 1ha in size and is located adjacent to the A5025. This replaces Figure 3.5 in the 2016 Scoping Report.

Figure .3.1 Indicative layout of Power Station Site

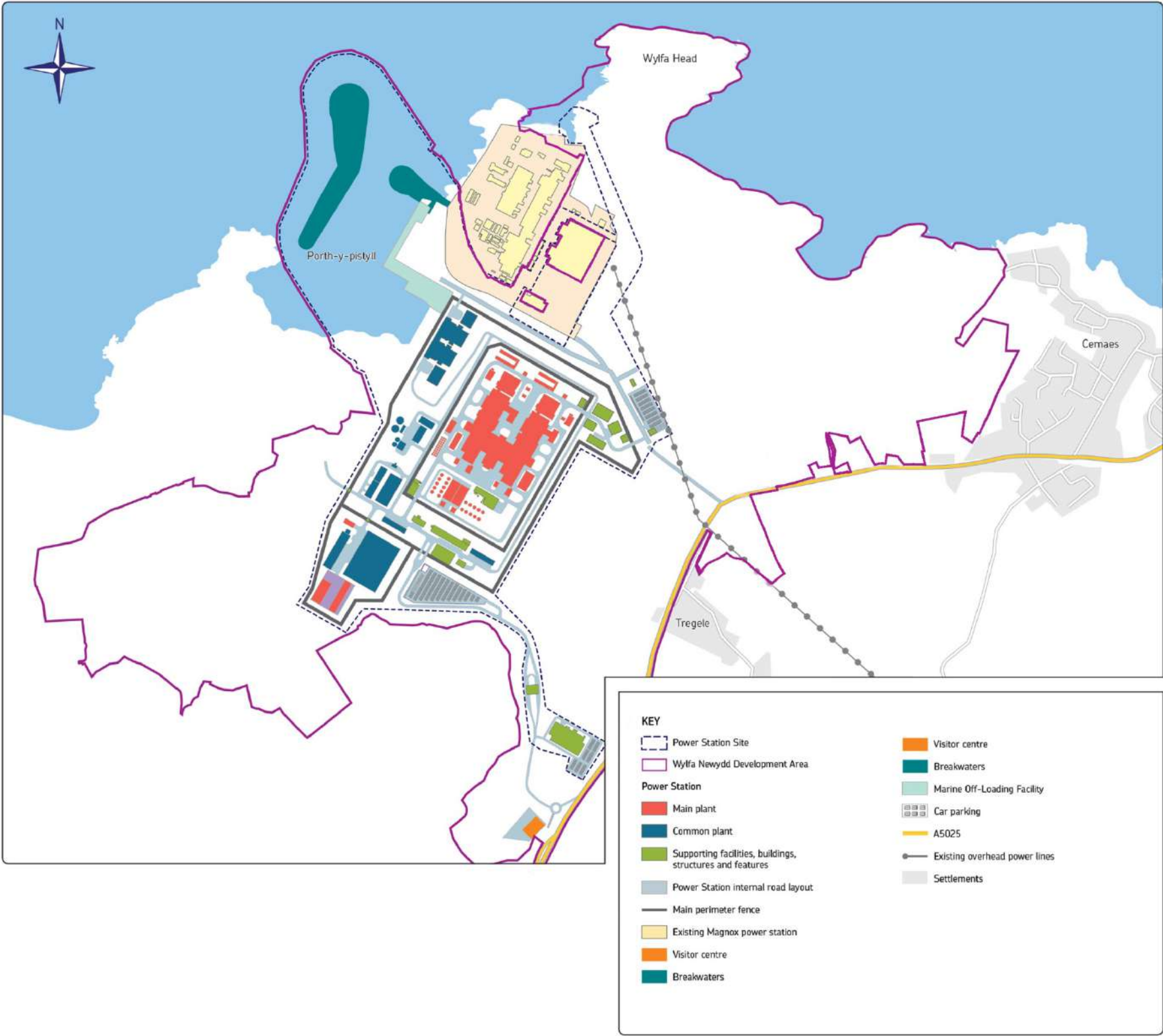
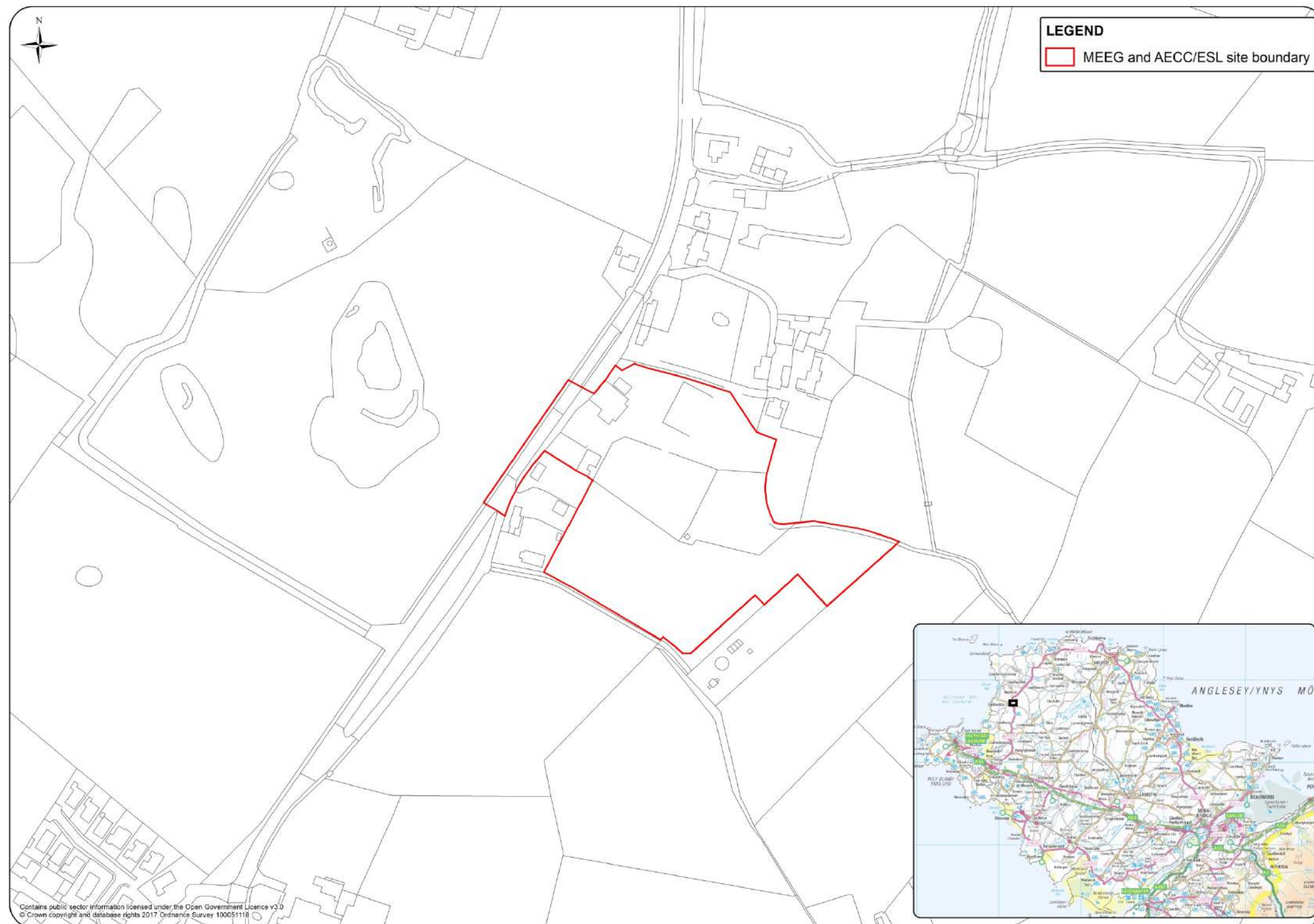


Figure 3.2 Indicative location of the Off-Site Power Station Facilities





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## 3.3 Associated Development

### 3.3.1 On-Site Campus

9. Temporary Workers' Accommodation is required as part of a comprehensive strategy to house the construction workers required throughout the construction phase of the Wylfa Newydd Power Station. A maximum peak workforce of 9,000 has been predicted.
10. Temporary accommodation would be provided for those construction workers that do not already live within a commutable distance (within 1.5hrs of the Wylfa Newydd Power Station) through a combination of:
  - use of existing capacity in the private rented and tourist sectors including caravans and camping accommodation;
  - stimulation of new (latent) capacity;
  - re-use of empty homes; and
  - an On-Site Campus.

#### ***Site description***

11. As the On-Site Campus would be located within the Wylfa Newydd Development Area. The construction of the facility would be phased, working up to the potential full capacity of up to 4,000 workers. The facility would accommodate parking for up to 1,100 vehicles on site, as well as 800 car share parking spaces. When construction of the Wylfa Newydd Power Station is complete, the accommodation would be decommissioned and the area developed in accordance with the Landscape Environmental Management Plan (LEMP).
12. The site would be accessed via a new Power Station Access Junction which would connect the existing A5025 to the Power Station Site.

#### ***Environmental context of the site and surrounding area***

13. As the On-Site Campus would be located within the Wylfa Newydd Development Area, the environmental context of the site is as set out in chapters 8 to 22 of the 2016 Scoping Report.

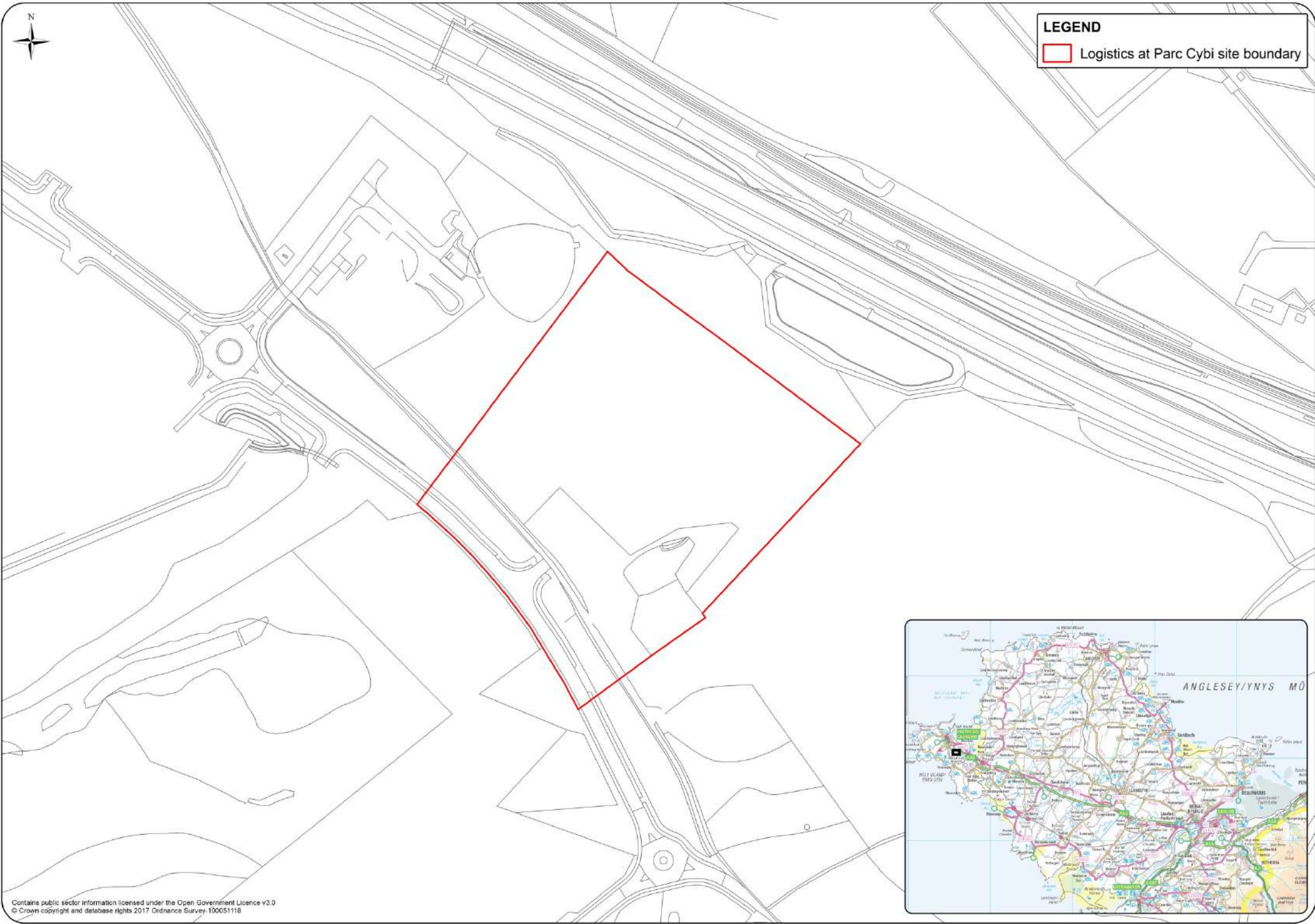
### 3.3.2 Logistics Centre

#### ***Site description***

14. The Logistics Centre would be a temporary secure facility for construction of the main Power Station Site only, from which deliveries to the Power Station Site would be managed to reduce traffic and associated effects on the local road network. Vehicles would be despatched to control the flow of traffic to the Wylfa Newydd Development Area. Robust logistics management would ensure that convoys of delivery vehicles travelling along the A5025 could be avoided and queues of vehicles entering the Power Station Site reduced.
15. The facility would be located at Parc Cybi, to the south-east of Holyhead - Caergybi (see figure 3.3).
16. The facility is intended to manage deliveries to the Power Station Site to reduce impacts on the local road network, in particular the A5025. It would be used to control the timing and flow of traffic to the Power Station Site.

17. The design would include an office/welfare building, security kiosks, inspection bays, parking zones for Heavy Goods Vehicles (HGV) and staff vehicles and security features. The external layout will be designed to support a clear and swift flow of vehicles through the site.
18. HGV deliveries would be allocated a time slot and associated delivery period when they should arrive at the Logistics Centre. The turnover delivery period would be  $\leq 65$  minutes. This is the time from when the vehicle arrives at the Logistics Centre until its eventual arrival at the Power Station Site. The sequence of activities during this delivery period is as follows:
- Vehicle arrives at the site and queues up on the access road within the footprint but before the security kiosk (design would cater for up to eight HGVs to queue at any time).
  - Delivery documentation is checked and authorised, vehicle drives through security and arrives at the inspection bay and is inspected as required ( $\leq 15$  minutes typical; a thorough search would take longer).
  - Vehicle is accepted and driver is issued delivery documents, a departure time and is allocated holding bay number, holding bay waiting time and if required directed to the inspection area.
  - Vehicle leaves the Logistics Centre and drives directly to the Power Station Site.
19. Logistics management would involve the following activities, including but not limited to:
- Provision of a core team of staff to include, security, inspectors and logistics controllers.
  - Provision of full time plant (owned or hired) to remain in permanent operational readiness if vehicles need to be inspected, to include forklift trucks and general sundries like pallets, tarpaulin and rope.
  - Day-to-day management of traffic movements, via a real-time management system.

Figure 3.3 Indicative location of the Logistics Centre





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### ***Environmental context of the site and surrounding area***

20. The logistics centre site is near the A55, outside of Holyhead town, near existing industrial and retail developments. The site is bounded by the A55 to the north, an existing B-road to the south and open countryside to the east and west. The proposed development footprint covers an area of approximately 3.7 hectares.
21. Environmental/heritage features in the vicinity of the site are a pond (100m x 20m) sandwiched between the north-east site boundary and A55 road and the Trefignath Burial Chambers ancient heritage monument which is approximately 20m from the southern boundary of the site. An access track is to be provided down the eastern boundary of the site to the pond.
22. Residential areas of Kingsland and Holyhead are situated to the north of the Parc Cybi site. The site is located close to national and international transport links, with the Port of Holyhead and train station nearby. A local cycle route connects Parc Cybi and Holyhead and provides a car-free route through Parc Cybi.

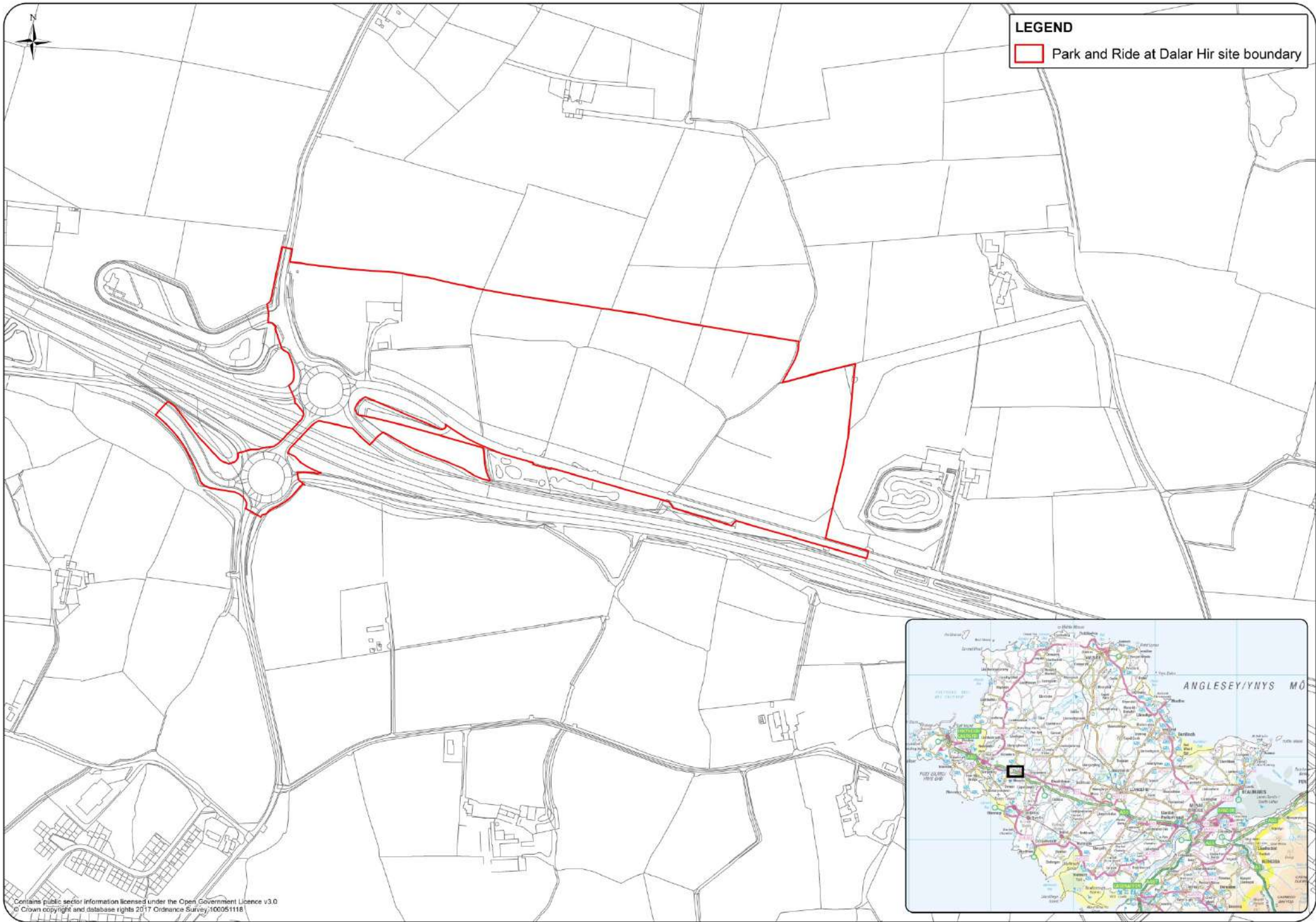
### **3.3.3 Park and Ride Facility**

#### ***Site description***

23. A Park and Ride facility would be constructed and utilised as a hub for the transfer of construction workers from private vehicles onto shuttle buses, to then be transported to the Power Station Site. The facility is intended to reduce congestion along local roads during the construction phase of the Wylfa Newydd Power Station. The indicative location of the facility is shown on figure 3.4.
24. The site would be constructed at Dalar Hir, adjacent to Junction 4 of the A55, and cover an area of approximately 19.4ha. Access to the Park and Ride facility would be via a number of new dedicated vehicle and pedestrian entrances and exits. Access to the facility for buses and workers' vehicles is intended via a proposed new roundabout located in close proximity to the existing A55-A5 junction and associated roundabouts at the western tip of the site. Workers' vehicles would exit to the A5 from the south-east of the site. Buses would exit via the new roundabout.
25. The Park and Ride facility at Dalar Hir is expected to be operational from 2019 to approximately 2026, supporting the movement of workers constructing the Wylfa Newydd Power Station. During peak operation, the total number of bus journeys would be approximately 112 per day. The facility would be temporary and would be dismantled once it is no longer required. It is anticipated that dedicated Park and Ride buses would transport workers to the Power Station Site for two shift patterns, including night shifts, throughout the duration of the construction of the Wylfa Newydd Power Station.
26. The development would include a bus transport facility building located in the centre of the site, with vehicle parking areas organised around the facility. The facility would include up to 1,900 parking spaces (including disabled, mini-bus, motorcycle and bicycle spaces). The facility would act as an arrivals, waiting, and departure terminal for workers, and would contain management, administration, security offices, welfare facilities and a drivers' canteen. If required, the facility could operate to a maximum of 24 hours a day, seven days a week during peak construction.

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Figure 3.4 Indicative location of the Park and Ride facility



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### ***Environmental context of the site and surrounding area***

27. The site and surrounding area is rural in nature, comprising pastoral farmland. A number of isolated farm properties exist nearby, including two farmsteads, one vacant and one occupied.
28. The site is not located within a flood risk zone according to Technical Advice Note (TAN) 15 Development Advice Map (Welsh Government, 2004), however a number of small watercourses are located within and surrounding the site.
29. The Llynnau y Fali – Valley Lakes Site of Special Scientific Interest (SSSI) is located approximately 1.2km south-west of Dalar Hir. This SSSI consists of a series of small shallow lakes, supporting a variety of aquatic flora and fauna; the northernmost of these (Llyn Dinam) is a designated Special Area of Conservation (SAC). Llyn Traffwll SSSI, located approximately 900m south, is a shallow lake designated for its wildfowl. A number of protected species have been recorded within the Dalar Hir site and its immediate environs. (See chapter 11 of this addendum)
30. The southern boundary of the Park and Ride facility at Dalar Hir would incorporate tree and shrub planting to reduce visual impacts from the A5, whilst the northern, western and eastern boundaries would be planted with species-rich grass. There would be additional screen planting, outside of the main site next to the A5 Holyhead Road.
31. In terms of cultural heritage the Dalar Hir site can very broadly be divided into improved fields and associated drainage channels around the late 19<sup>th</sup> century Bryn Goleu farmhouse, and semi-improved fields and relict field boundaries around the early 19th century Dalar Hir farmhouse. Heritage assets within the Dalar Hir site include post-medieval field boundaries, post-medieval farmsteads and a boundary wall built for the A5 Telford Road.

## **3.3.4 A5025 Off-line Highway Improvements**

### ***Site description***

32. The construction of off-line sections of highway is required along the A5025 to improve access and safety to the Power Station Site as a result of increased traffic during construction and operational phases. Improvements along the A5/A5025 would be made at the following locations:
  - Section 1 - A5/A5025 Valley junction improvements, covering an area of approximately 13.9ha;
  - Section 3 - Llanfachraeth bypass, covering an area of approximately 20.4ha;
  - Section 5 - Llanfaethlu road straightening, covering an area of approximately 10.9ha; and
  - Section 7 - Llanrhuuddlad to Cefn Coch improvements, covering an area of approximately 10ha.
33. The indicative locations of the off-line sections are shown on figure 3.5 a-d below.

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Figure 3.5a Indicative Off-line A5025 Highway Improvements – Section 1

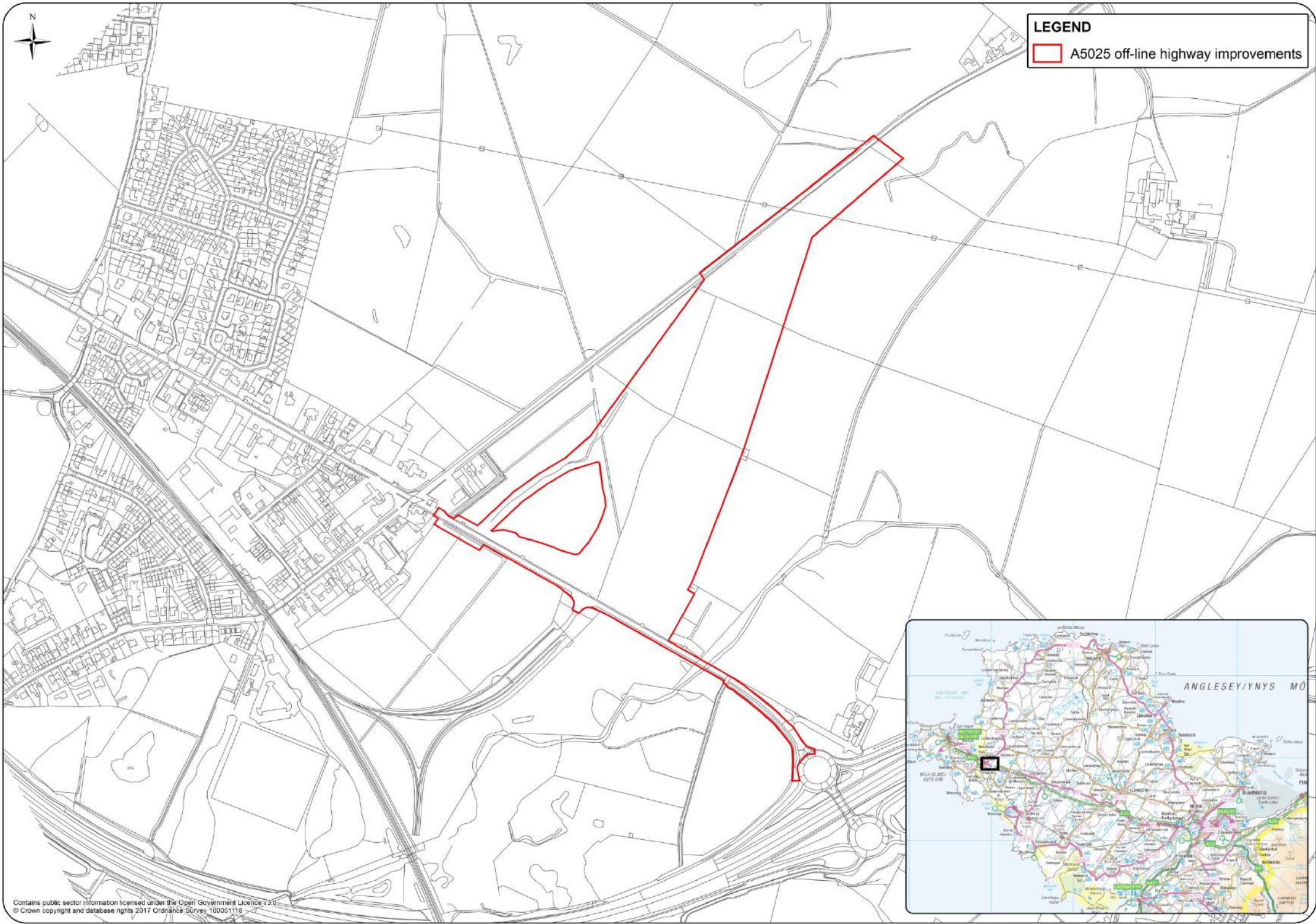




Figure 3.5b Indicative Off-line A5025 Highway Improvements – Section 3

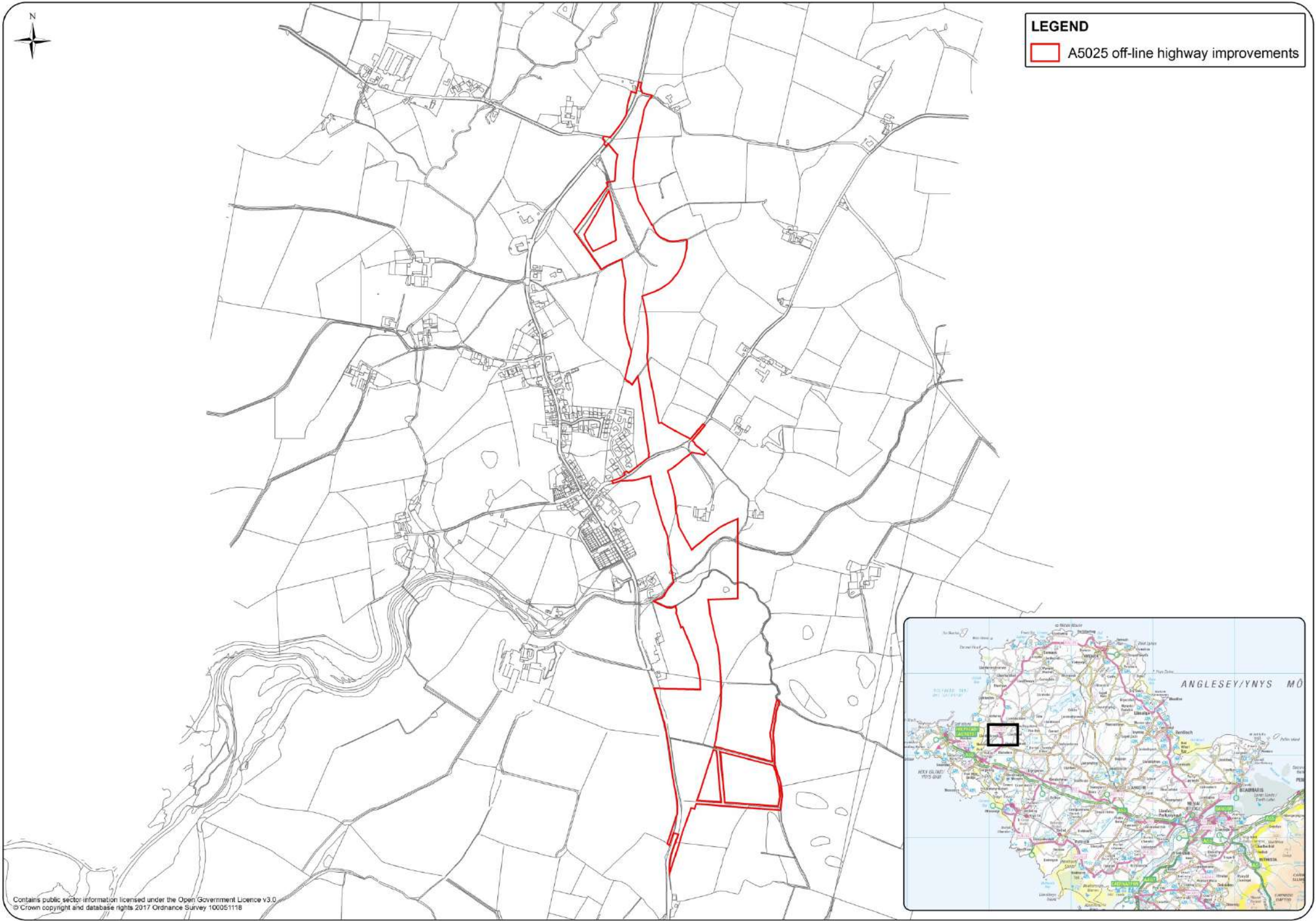




Figure 3.5c Indicative Off-line A5025 Highway Improvements – Section 5

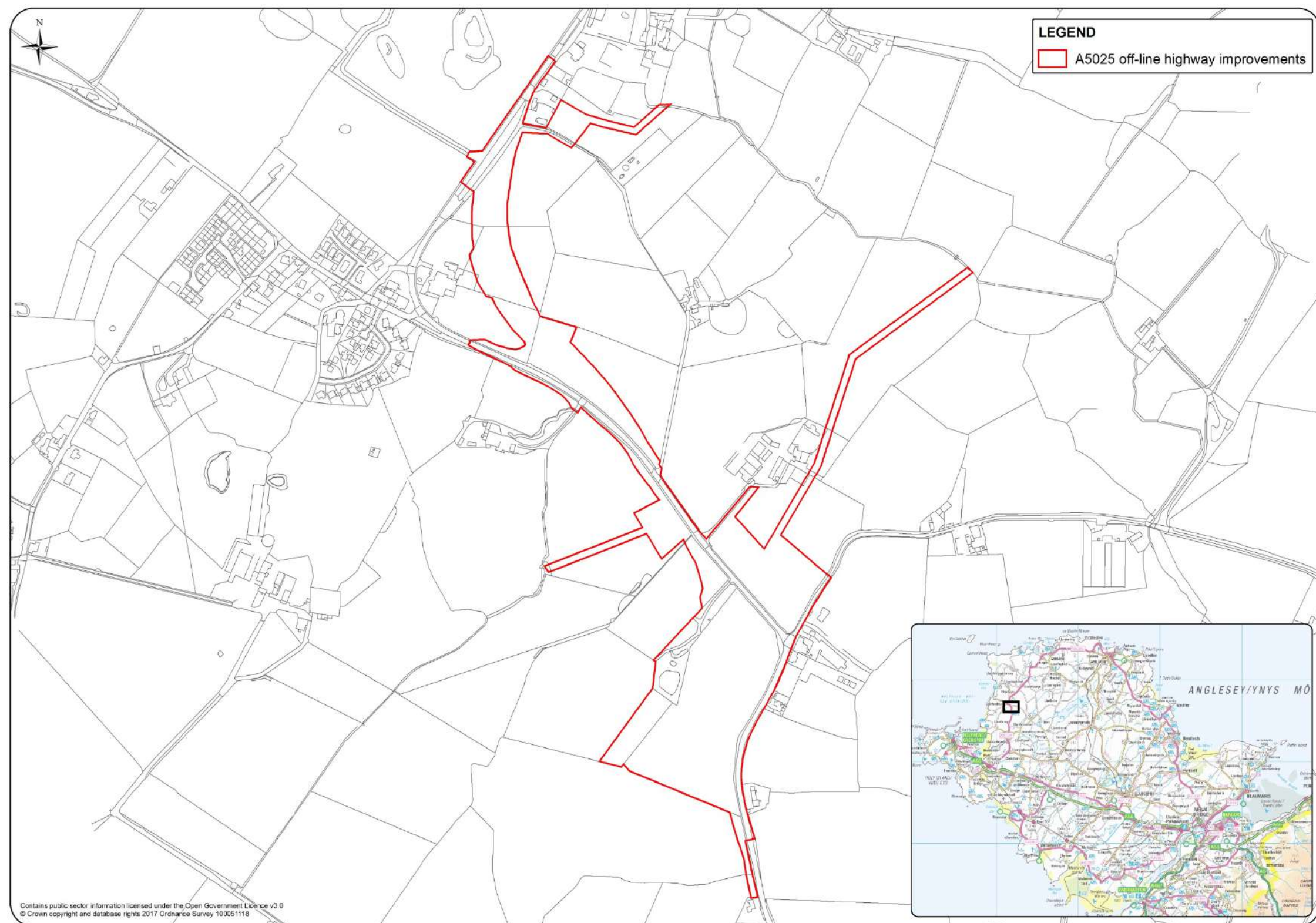
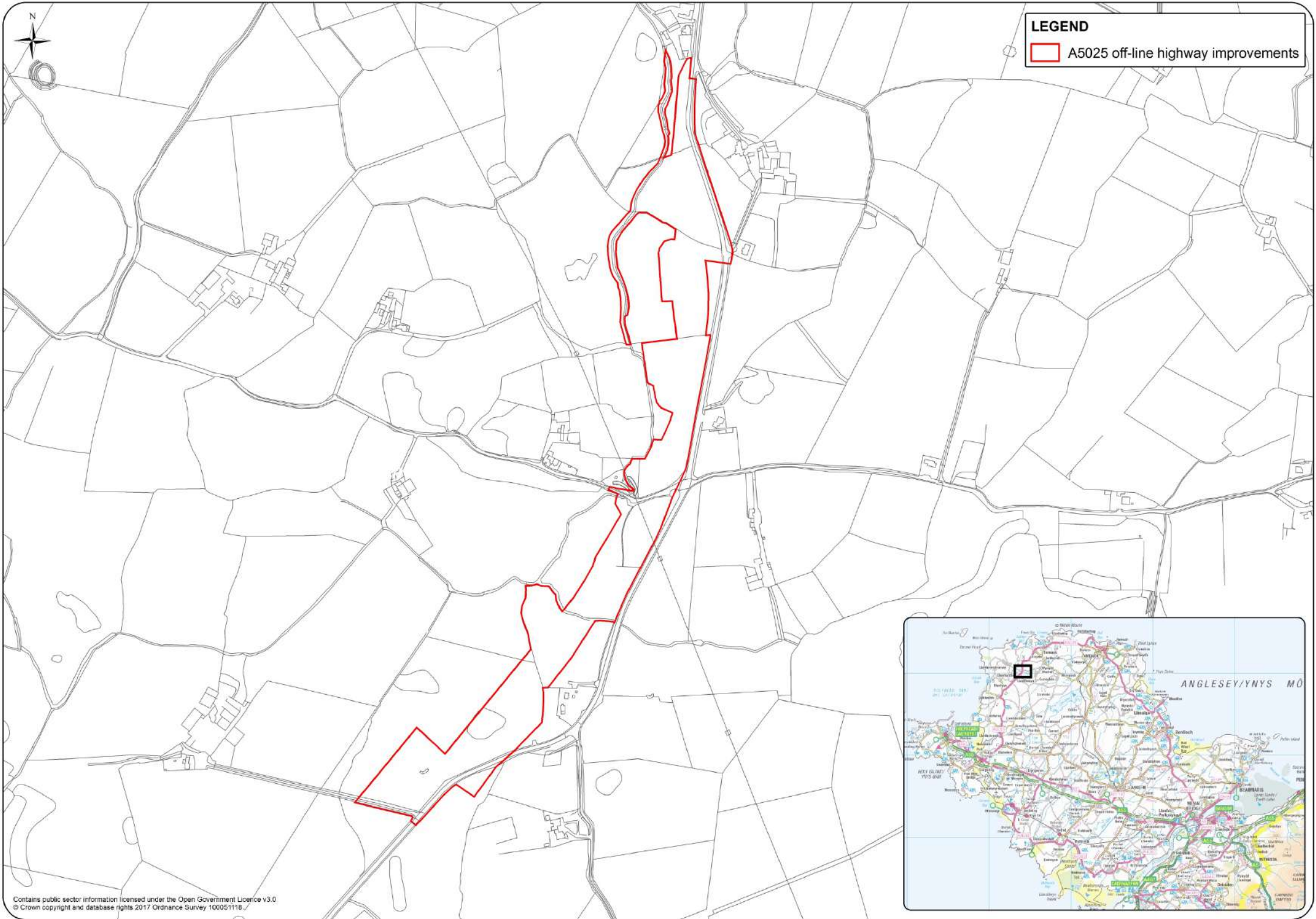




Figure 3.5d Indicative Off-line A5025 Highway Improvements – Section 7



34. The A5025 Off-line Highway Improvements would include the construction of new sections of carriageway and junctions. The improvements are required to bypass existing settlements or unsuitable sections of the existing A5/A5025 to reduce the impact of the Wylfa Newydd Project. Key objectives of the A5025 proposals are to:

- upgrade the route, both in terms of standard of construction and road geometry, such that it can support the increased level of construction related traffic, improve safety, and improve accessibility to the Power Station Site;
- ensure that all relevant abnormal loads can pass along the full length of the road;
- reduce any potential increase in road accident risk;
- reduce any adverse impacts on local communities;
- reduce any adverse impacts on the environment; and
- seek opportunities where possible to achieve improvements for local communities and the environment through road design measures.

### ***Environmental context of the site and surrounding area***

35. Direct vehicular access from east (mainland along the north Wales coast to the national motorway network) or west (Port of Holyhead) is via the A55. At Junction 3 of the A55 access is thereafter via a short section of the A5 and then following the crossroads at Valley – Y Fali along the A5025 to the Power Station Site. Along the route the road passes through or adjacent to the communities of Llanfachraeth, Llanfaethlu, Llanrhuuddlad and Treglele. The section of carriageway associated with the application for development consent comprises 18km of road from the A5 at Valley – Y Fali along the 5025 to the Power Station Site adjacent to Treglele. To the east, the A5025 connects the Power Station Site to Cemaes and a number of other settlements on the northern and eastern coast of Anglesey.

36. Although National Cycle Route 566 crosses the A5025 at Treglele and National Cycle Route 5 crosses at Llanyngghenedl, no formal cycle provision is found along the stretches of road. A number of public rights of way are crossed by the A5025. Local watercourses and drains pass under the carriageway within culvert structures. The off-line sections would traverse agricultural land. In places the Anglesey Area of Outstanding Natural Beauty (AONB) boundary is defined by the existing A5025.

### **3.3.5 Marine Off-loading Facility and Works.**

37. The operational requirements of a nuclear power station mean that a significant amount of marine works are required for its construction and operation. For the Power Station Site, the following permanent marine works are required:

- Marine Off Loading Facility (MOLF);
- a cooling water intake and outfall system and pump house; and
- two breakwater structures, navigational dredging to deepen berths and channels and maintenance dredging, disposal of dredged material and shore protection works.

38. These works were described in the 2016 Scoping Report but there have been a number of design changes since then. The key parameters of the MOLF and breakwater design are now as follows:

- East breakwater crest length of 151.5m (an envelope of 131.5 – 151.5m); and
- West breakwater:
  - Crest length of 500m (an envelope of 400 – 500m);

- The knuckle / change in direction of the breakwater shifted 20m to the west from the design presented in the 2016 Scoping Report; and
- The northern section of the breakwater shifted 20m to the west from the design presented in the 2016 Scoping Report.

39. In addition to the above changes, the following temporary works are now required and will be factored into the assessment:

- the construction and subsequent removal of the intake cofferdam, outfall cofferdam, semi-dry cofferdam, temporary barge berth, temporary pontoon.

40. As a result of the above works and maintenance dredging at the MOLF, there would be excess materials that would need to be disposed of. Material arising from the dredging works associated with the CW intake channel and the CW intake breakwaters would be re-used onsite (e.g. for core material in the CW intake breakwaters) or offsite where practicable. It is likely that the soft sediment would be disposed of at sea and the fractured bedrock would be re-used and/or disposed of at sea, and the remaining material would be disposed of at sea.

41. The disposal of materials will not form part of the development order consent, but will be consented through a Marine Licence. Please refer to the Marine Works Environmental Impact Assessment Scoping Report at Appendix B for further details on the scope of the EIA for the licensable marine activities.

## 4 Consideration of Alternatives

1. The EIA Regulations require an Environmental Statement to include an outline of the main alternatives studied and an indication of the main reasons for the choice made, taking into account the environmental effects. This chapter summarises Horizon's approach to the consideration of alternatives.

### 4.1 Main Site and Off-Site Power Station Facilities

2. The designs of the facilities described in chapter 3 of this addendum have recently been reviewed as part of an optimisation process commencing in late 2016. The objectives of the optimisation process were to:
  - Eliminate any duplication or redundant areas within the design.
  - Reduce footprint of the design thereby reducing impacts to the surrounding areas.
  - Ensure the Associated Development including Temporary Workers' Accommodation is aligned with the current need for the construction and operation of the Project.
  - Ensure the design is cost-effective.
  - • Continue to incorporate further sustainability measures into the design (e.g. through reduction in embedded carbon).
  - Consider responses received from the Stage Two Pre-Application Consultation and other consultations.
3. The principal change to the provision of Temporary Workers' Accommodation has been to move from a number of individual sites, located out with the Power Station Site, to one with a single On-Site Campus. The reasons for this will be set out in the ES and include the aim of reducing daily traffic movements to the site as much as possible; delivering worker accommodation that is fit for purpose and meets the needs of workers; as well as providing cost efficiency for the construction phase.
4. Main alternatives to the design were considered using multi-criteria analysis, which included environmental assessment criteria, to determine the preferred options. This process will be described in in the Environmental Statement.
5. Following the submission of this addendum to the Planning Inspectorate, a third stage of statutory pre-application consultation on the proposed changes to the Project will be undertaken in May 2017.
6. This section is additional to and does not replace the process described in chapter 4 of the 2016 Scoping Report in determining the need for and alternatives to the Wylfa Newydd Newydd Project, technological alternatives, or operational alternatives.

### 4.2 Associated Development

7. The Associated Development for the Project was identified through strategic, locational and design criteria. A summary of the selection process is provided below. Full details of the consideration of alternatives will be described in the ES. In addition, a Site Selection and Alternatives report will be submitted as part of the application for development consent.



### 4.2.1 Logistics Centre

8. The approach to the identification of the preferred location for the Logistics Centre identified eight sites that were considered potentially suitable for development, namely:
  - Parc Cybi (S1), within the Parc Cybi industrial estate, accessed from Junction 2 of the A55;
  - land adjacent to Dalar Hir (SP301), accessed from Junction 4 of the A55;
  - Tir Ty Mawr Land (SP48), south of Valley;
  - land off Station Road and Part of Bryn Hyfryd (SP307; SP537), accessed from minor road, not close to an A55 junction;
  - Yr Ogof (SP202), to the north of Holyhead leisure centre;
  - land near Ynys Wen (SP755), south-east of Valley;
  - land adjacent to Tyddyn Uchaf (SP368), within the Parc Cybi industrial estate; and
  - land adjacent to Zealand Park (SP324), south of Caergeiliog.
9. From these eight short-listed sites, the Parc Cybi site was identified as the preferred option for the location of the Logistics Centre. Parc Cybi is allocated in the Development Plan for employment purposes, including B8 (storage and distribution) use and is therefore preferable in planning terms to unallocated sites outside of the settlement boundaries.

### 4.2.2 Park and Ride Facility

10. An identification, screening and assessment process was undertaken by Horizon to identify potentially suitable sites for the Park and Ride facility. The approach to the identification of the preferred location for the Park and Ride facility identified four potential sites for consideration:
  - land adjacent to Dalar Hir;
  - Tir Ty Mawr land;
  - land off Station Road and Part of Bryn Hyfryd; and
  - land near Ynys Wen.
11. The final selection of the preferred option then involved consideration of a number of finer-grained criteria, including a set of planning and environmental considerations, to enable them to be compared and contrasted consistently.
12. The Dalar Hir site was chosen from the short list due its accessibility, land availability and reduced flood risk compared to the other options.

### 4.2.3 A5025 Off-line Highway Improvements

13. A Scoping Report was developed for the A5025 Highway Improvements which was consulted on by stakeholders in preparation for previously proposed TCPA applications.
14. A summary of the consideration of alternatives for this addendum is provided below.
15. The following independent transport studies commissioned by both IACC and Horizon have led to the development of a transport strategy designed to minimise the burden placed by the Wylfa Newydd Project through increased traffic on the highway network, and in particular the A5025.

- Strategic Transport Study for Major Developments: Final Report (Revision C) (2011), produced by Grontmij.
  - Heavy Route and MOLF Strategy Study (2010), produced by Halcrow.
  - Wylfa Transport Strategy Overview (2011), produced by RPS.
  - Strategic Transport Study for Major Developments: Wylfa B Highways Review and Recommendations (2011), produced by Grontmij.
16. Although the overall strategy includes the construction of a new MOLF at the Power Station Site to enable direct deliveries by sea, the strategic studies identified a need to investigate improvements to the highway network in response to highways and transportation issues associated with the movement of freight and people during construction of the Wylfa Newydd Power Station.
17. The studies identified a number of mitigation measures focused on improving sections of carriageway along the A5025 between Valley and the Power Station Site. These were developed into a series of preliminary designs which were then subjected to further appraisal and refinement as part of a staged review and assessment process.
18. In accordance with the staged approach to highways development presented in TD37/93 of the Design Manual for Roads and Bridges (1993 - 2015), a series of conceptual design options for off-line sections of the A5025 carriageway between Valley and Treglele were developed by Horizon during 2011 and subjected to a Stage 1 level of assessment and evaluation to determine their relative engineering, traffic and environmental merits and implications.
19. These conceptual designs responded to the existing physical constraints associated with the A5025 corridor, and took into account the minimum highways design standards and current/predicted levels of vehicle use. Consideration was also given to existing environmental interests and sensitivities along and in proximity to the A5025 which could influence the development of off-line options.
20. Design work undertaken during 2011 identified a number of distinct sections of the A5025 as requiring improvement, several of which would require off-line improvement due to the existing highway corridor offering limited potential to accommodate an appropriate design solution due to limited space availability, geometric constraints and/or proximity to residential dwellings within settlements.
21. The development of options to the current design position has been informed by continued consultation with IACC, discussions with landowners along and adjacent to the A5025, land availability, and relationships to environmental interests.
22. Specific environmental considerations which have influenced the design-development of the options to date have centred on the following design-related measures and solutions:
- Modification and refinement of off-line horizontal alignments to avoid sensitive environmental interests and achieve an appropriate fit with existing land contours, where achievable.
  - Minimisation of the physical footprint to reduce landtake.
  - Sensitive siting of prominent engineering features or vertical structures (e.g. embankments) to reduce visual intrusion within local landscapes, and on the setting of the built heritage.
  - Retention of existing features to improve environmental integration.
  - Use of available highways land to accommodate design features and improvements.

- Inclusion of facilities to ensure continued accessibility to existing rights of way, private means of access and landholdings.
  - Inclusion of engineering solutions to retain existing hydrological features and mitigate potential effects on drainage regimes from landtake and road runoff.
  - Optimise protection for nearby private dwellings through the use of existing features, earthwork cutting slopes and/or range.
23. The 18km stretch of the A5025 requiring improvement was split into eight distinct sections; this was undertaken both to clearly segregate the carriageway into areas for off-line or on-line improvement, and to enable the reporting of the environmental, traffic and engineering assessments on a sectional basis.
24. Information acquired and used as part of the design-development process has included: topographical data; drainage and pavement surveys; mining, utilities and accident records; local planning information; and data derived from preliminary traffic and environmental surveys.
25. The full consideration of alternatives to the preferred options will be described in detail in the DCO ES, included in the application for development consent.

## 5 Consultation

### 5.1 Introduction

1. The purpose of this chapter is to provide an update on consultation activities since the 2016 Scoping Report. Activities relating to Pre-Application Consultation Stage One (PAC1), including interim consultation responses, remain as described in chapter 5 of the 2016 Scoping Report. The following sections provide an update on Stage Two Pre-Application Consultation (PAC2), a description of Stage Three Pre-Application Consultation (PAC3), consultation undertaken for the Associated Development, and an update on formal consultation relating to the Scoping Report. Consultation relating to the marine licensable activities is described separately in Appendix A – Marine Works Environmental Impact Assessment Scoping Report.

### 5.2 Stage Two Pre-Application Consultation

2. Horizon completed its second stage of pre-application consultation (PAC2) in October 2016. The aim of the consultation was to provide information, and encourage feedback, on a range of aspects on the Wylfa Newydd Project. This included aspects such as the approach and preferred sites for the On-Site Campus; the layout, appearance and landscaping of Associated Development and Off-Site Power Station Facilities; and the effects of the Project on the environment.
3. PAC2 was the formal pre-application consultation in terms of satisfying both section 42 and section 47 of the Planning Act 2008, and formed the second statutory stage of consultation for the Wylfa Newydd Project. The consultation conformed to the commitments established in Horizon's Statement of Community Consultation (SOCC), and met with the objectives of Horizon's Maximising Inclusion Strategy, which applies to all stages of consultation.
4. PAC2 materials consisted of seven technical documents and five non-technical documents, as detailed below:
  - Main Consultation Document – presented Horizon's proposals for the Wylfa Newydd Project and a description of how they had evolved since the previous consultations. Provided a description of how previous feedback was considered and a series of questions inviting responses on the latest proposals.
  - Preliminary Environmental Information Report – set out the preliminary environmental information relating to the Wylfa Newydd Project as part of the EIA process.
  - Consultation Summary Report – outlined the approach that Horizon followed for PAC1 on the Wylfa Newydd Project.
  - Welsh Language Impact Assessment Interim Report – described the findings of specialist assessment work undertaken to date in relation to the predicted effects of the Wylfa Newydd Project on Welsh language and culture.
  - Health Impact Assessment Interim Report – provided an update on the specialist assessment work examining the links between health and well-being, and the potential effects that may arise as a result of the Wylfa Newydd Project.
  - Habitats Regulations Assessment Interim Report – set out the progress of the work undertaken to date relating to the assessment of the potential effects of the Wylfa Newydd Project on European Designated Sites.

- Equality Impact Assessment Interim Report – presented an interim assessment of the predicted effects of the Wylfa Newydd Project on people with protected characteristics (as defined by the Equality Act 2010).

Non-technical documents included:

- Consultation Overview Document – provided a non-technical overview and summary of the Wylfa Newydd Project in its entirety.
- Summary of Project Update January 2016 Consultation Feedback – provided a summary of the responses received to the January Project Update Consultation and described the informal non-statutory consultation and engagement which is ongoing as part of the Project evolution.
- Non-Technical summaries for the Preliminary Environmental Information, Welsh Language Impact Assessment, and Health Impact Assessment.

### 5.3 Stage Three Pre-Application Consultation

5. As a result of project design changes and the inclusion of Associated Development in the application for development consent following the introduction of the Wales Act 2017, a further round of pre-application consultation, PAC3, will commence in May 2017. As with PAC1 and PAC2, the consultation will be widely advertised across Anglesey as well as on Horizon's website to satisfy the requirements of the *Planning Act 2008*.
6. PAC3 will build on Horizon's previous engagement activities and explain the way in which the Wylfa Newydd Project has evolved, the environmental implications, and the reasons for the changes. The focus of PAC3 will be on design changes since PAC2, and will include descriptions of where environmental effects are expected to be different. It will identify the likely environmental effects and how we are proposing to mitigate them. The contents of PAC3 will satisfy a number of requirements of the Preliminary Environmental Information (PEI) report.
7. An updated SOCC has also been issued to the IACC.

### 5.4 Associated Development Pre-Application Consultation

8. Given the interrelated nature of the proposed Associated Development and other elements of the Wylfa Newydd Project, consultation on the Associated Development has been undertaken as part of the wider statutory consultation for the application, including as part of PAC1 and PAC2. Feedback received on the Associated Development from PAC1 and PAC2 informed the development of the 2016 Scoping Report and this Scoping Report addendum.

### 5.5 Other Consultation

9. Consultation has been undertaken with stakeholders to discuss the scope and methodology of the environmental assessments for the Associated Development. The DCO Environmental Statement will summarise how stakeholder feedback has influenced the final scope of assessment. In addition, the Planning Inspectorate has consulted on the Transboundary Impacts of the Wylfa Newydd Project, in particular with the Republic of Ireland and France. It is understood that the appropriate bodies in France have declared that there will be no further need to consult with them on these impacts. Consultation with the Republic of Ireland will, however, continue.

## 5.6 Scoping Report

10. As part of the formal scoping process the Planning Inspectorate administered consultation with a number of statutory stakeholders on the contents of the 2016 Scoping Report. Key issues and recommendations raised by stakeholders from this consultation were formally communicated by the Secretary of State in a Scoping Opinion issued to Horizon in April 2016.
11. Consultee comments provided to Horizon alongside the Scoping Opinion have been considered, and where appropriate, will be addressed within the scope of the EIA. To aid the Secretary of State in determining how consultation feedback has influenced the EIA, an appendix to the ES will be prepared which will list stakeholder comments and Horizon's responses. Additionally, the ES will include a discussion on how key points arising in consultation have guided the topic specific assessment work.
12. A Scoping Report was also produced and consulted on for the A5025 Highway Improvements in July 2015. Stakeholder comments were compiled in a Scoping Opinion issued by the IACC in December 2015. Since then the decision was made to include the A5025 Off-line Highway Improvements within the application for development consent, with online improvements to be consented under a separate TCPA application. Comments raised during the consultation relevant to the A5025 Off-line Highway Improvements will be taken into account in the EIA to support the application for development consent. No formal Scoping Opinion was sought for the Dalar Hir Park and Ride or Parc Cybi Logistics Centre.
13. All stakeholder comments will be taken into account in the EIA. Comments on the 2016 Scoping Report have been incorporated into this Addendum Scoping Report where relevant. Appendix A - Responses to 2016 Scoping Opinion includes these comments, and provides signposts to the relevant sections in this report where they have been considered. Horizon will also submit a Consultation Report as part of the application for development consent.



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## 6 Scoping

### 6.1 Scoping Approach to the Addendum

1. The approach to scoping for the Wylfa Newydd Project remains as described in chapter 6 of the 2016 Scoping Report. The purpose of this chapter is to set out the changes in scope for the Power Station Site since the 2016 Scoping Report, as well as the scoping process for the Associated Development and marine licence which are to be considered within the ES that will accompany the application for development consent.
2. Each environmental topic chapter (chapters 8 to 22 of this addendum) sets out the proposed scope for the following aspects of the Wylfa Newydd Project environmental assessment:
  - Change in scope for the Power Station Site and Offsite Power Station Facilities as a result of design changes. This is an update to the scope set out in the 2016 Scoping Report.
  - Proposed scope for the Associated Development. This relates to additional scoping on matters not considered within the 2016 Scoping Report. The proposed scope will cover the following proposed developments:
    - Park and Ride facility at Dalar Hir;
    - Logistics Centre at Parc Cybi;
    - A5025 Off-line Highway Improvements.
3. The On-Site Campus is considered to be Associated Development, however, it would be co-located with the Power Station Site and within the Wylfa Newydd Development Area. The assessment for the On-Site Campus will therefore be integrated with the assessment for the Power Station Site.
4. Given the need for NRW to consult on the scope of EIA required specifically to support the application for a marine licence, a separate appendix dedicated to this has been produced. This can be found in Appendix A – Marine Works Environmental Impact Assessment Scoping Report. However, it should be noted that the assessment work will be subsumed into wider the project EIA described in this addendum and reported in one integrated Environmental Statement for the project as a whole to support both the application for development consent and for the marine license.

### 6.2 Scoping Process

#### 6.2.1 Power Station Site

5. The 2016 Scoping Report proposed to scope out the following issues:
  - ozone;
  - odour;
  - insect infestation;
  - accidental radiological releases;
  - seismic activity; and
  - civil and military aviation and defence interests.

6. The 2016 Scoping Opinion received from the Planning Inspectorate considered each of these issues (see Appendix B), and table 6.1 reports their proposed status in the DCO Environmental Statement.

**Table 6.1 Proposed issues to be scoped out/in based on feedback in the 2016 Scoping Opinion**

Issue	Consideration	Status
Ozone	The 2016 Scoping Opinion agreed that ozone be scoped out of the EIA.	Scoped out
Odour	Odour has now been scoped in and is discussed further in chapter 8 of this addendum.	Scoped in
Insect infestation	The conclusions of the Pre-Construction Safety Report will cross-reference with the ES, and on that basis, the 2016 Scoping Opinion agreed that insect infestation be scoped out of the EIA.	Scoped out
Accidental radiological releases	Accidental radiological release has now been scoped in and is discussed further in chapter 12 of this addendum.	Scoped in
Seismic activity	Seismic activity has now been scoped in and is discussed further in chapter 13 of this addendum.	Scoped in
Civil and military aviation and defence interests	The 2016 Scoping Opinion agreed that impacts to aviation and defence interests can be scoped out of the EIA.	Scoped out

7. The overall approach adopted in the EIA for most topics will be to assess the potential effects from the Power Station Site, the Offsite Power Station Facilities and geographically distinct Associated Development in turn. However, some effects are more appropriately assessed at a project-wide level. These are traffic-related effects which are assessed by means of a project wide traffic model (including both the effects on traffic and transport per se, and the effects of changes in traffic on air quality, on noise and on public access and recreation), as well as waste and materials management and some aspects of socio-economics which consider effects at regional spatial scales. As explained in chapter 1 of this addendum, these will be reported in a separate volume on project-wide effects rather than within the assessment of the Power Station Site as previously anticipated in the 2016 Scoping Report.
8. All other environmental topics remain scoped into the environmental assessment for the Power Station Site as per the 2016 Scoping Report. Where there has been a change in scope for the individual topics, this is described in chapters 8 to 22 of this addendum.

## 6.2.2 Associated Development

### *Environmental topic areas considered*

9. The scoping process for the Associated Development has considered the same environmental topic areas that are included in the scope of assessment for the Wylfa Newydd Power Station. This will facilitate the assessment of cumulative effects for the Wylfa Newydd Project as a whole that will be reported in the Environmental Statement for the DCO.

10. Following a review of environmental topic areas, a simple tabular matrix has been developed (table 6.2) to show the topics proposed to be considered in the EIA for the Associated Development at Dalar Hir, Parc Cybi, and the A5025.

**Table 6.2 Scoping matrix for the proposed Associated Development (y= scoped in, n= scoped out)**

Development	EIA topics												
	Air quality	Noise and vibration	Landscape and visual	Terrestrial and freshwater ecology	Radiological Issues	Soils and geology	Water environment	Coastal processes and coastal geomorphology	The marine environment	Archaeology and cultural heritage	Socio-economics	Public access and recreation	Traffic and transport
Park and Ride facility at Dalar Hir	y	y	y	y	n	y	y	n	n	y	y	n	y
Logistics centre at Parc Cybi	y	y	y	y	n	y	y	n	n	y	y	y	y
A5025 Off-line Highway Improvements	y	y	y	y	n	y	y	n	n	y	y	y	y

11. The scope for individual environmental topics to be considered in the EIA for the Associated Development is set out in chapters 8 to 21 of this addendum. Each topic chapter records:

- the extent and availability of existing environmental information;
- key sensitivities and interests within the receiving environment;
- study area extents;
- data collection and survey requirements;
- the scope and level of assessment detail to be progressed; and
- methodologies, guidance and criteria to be followed.

### ***A5025 Off-line Highway Improvements***

12. The methodologies set out in the *Design Manual for Roads and Bridges* (DMRB) Volume 11 (Highways Agency, 1993) are prescriptive in relation to the content of the methodology and the terminology used for the assessment of highways projects. Although adoption of these methods is appropriate for assessing effects associated with A5025 Off-line Highway Improvements, the reporting of the effects will be adjusted to achieve consistency with the criteria set out in section 7 of the 2016 scoping report the Wylfa Newydd Project EIA.
13. Several environmental topics presented in DMRB Volume 11, and updated in Interim Advice Note (IAN) 125/15 (Highways England, 2015), are bespoke to highways developments (e.g. materials); therefore these topics require assimilation into the standard environmental topic reporting framework being utilised by the Wylfa Newydd Project EIA. As such the following reporting

modifications have been made for the A5025 Off-line Highways Improvements assessment topics which will form Volume G of the ES:

- Traffic and transport - this topic will detail the DMRB aspects relating to driver stress, normally reported within the 'People and Communities' aspect, and relevant parts of the DMRB 'Materials' aspect (e.g. the transportation of materials and waste associated with the A5025 proposals). The 'People and Communities' aspect of DMRB formally comprised the 'Effects on all Travellers' and 'Community and Private Assets' aspects of DMRB. This was updated in IAN 125/15.
- Public access and recreation - this topic will detail the DMRB aspects relating to views from the road; also pedestrians, cyclists, equestrians and community effects, which are normally reported within the 'People and Communities' aspect.
- Socio-economics - this topic will detail land-based interests normally reported in the DMRB through the 'People and Communities' aspect, and will also consider the potential for construction-related disruption.

### ***Environmental topic areas scoped out***

#### ***Common to all Associated Development***

14. As indicated in table 6.2, there are a number of environmental topics which are not likely to have an interaction with activities associated with any of the Associated Development. It is therefore proposed to scope out the following environmental topics from further consideration for the developments at Dalar Hir, Parc Cybi and the A5025:

- Coastal processes and geomorphology – there are no marine activities associated with the proposals, and due to the distance of the proposed developments from the sea, there would not be any significant effects on coastal processes and geomorphology.
- Marine environment – there would not be any effects on marine water quality, or other marine ecology receptors, including: phyto and zooplankton, subtidal and intertidal habitats and communities, fish, marine mammals and seabirds.
- Radiological effects – the scope and extent of the proposed works contains no activities which would have a bearing on radiological issues. Accordingly there are no significant effects associated with radiological issues.

15. Effects associated with the above environmental topics will be addressed in the EIA for the Power Station Site.

#### ***Park and Ride facility at Dalar Hir***

16. In addition to the environmental topics scoped out across all three Associated Development, the following topic is proposed to be scoped out for the Park and Ride facility at Dalar Hir:

- Public access and recreation – there are no public rights of way within, or bordering, the proposed site footprint. The nearest footpath (13/013/1) is located approximately 300m north of the site in Dalar-bach. There would therefore be no direct impacts on any recreational activities.

### ***Welsh Language Impact Assessment***

17. A Welsh Language Impact Assessment (WLIA) will be provided for the Wylfa Newydd Project as a whole, focussing on the potential effects from an influx of construction workers. The WLIA will be undertaken according to the approach set out in section 7.3.2 of the 2016 Scoping Report.

## 7 Approach to EIA

1. This section sets out the changes in approach to EIA from those set out in the 2016 Scoping Report.

### 7.1 EIA Regulatory Context

2. This addendum has been produced in accordance with EIA Directive (2014/52/EU), with any changes since the 2016 Scoping Report incorporated to ensure the assessment process is robust. Updates required to the 2016 Scoping Report as a result of new or amended legislation are detailed in sections 2.1.2 and 2.1.3 of chapter 2 of this scoping addendum.

### 7.2 EIA Methodology

3. The additional assessments required for this addendum have been completed in accordance with legislative requirements set out in the *Infrastructure Planning (Environmental Impact Assessment) Regulations 2009* (as amended). This is the same legislation followed in the 2016 Scoping Report. The process of environmental assessment is the same as those set out in section 7.2.3 of the 2016 Scoping Report.
4. All additional potential impacts identified in this Scoping Report addendum will also be incorporated into the ongoing assessment for potential cumulative effects.
5. The study areas for each environmental topic are the same as those set out in the 2016 Scoping Report, in terms of the distances from Wylfa Newydd Development Area.
6. Study areas for the Associated Development are described in chapters 8 to 21 of this addendum.

### 7.3 EIA Significance Criteria

7. The same principles for assessing EIA significance set out in section 7.2.3 of the 2016 Scoping Report shall be used to assign the significance of effects.

### 7.4 Design Iteration and Mitigation Proposals

8. In addition to design iteration and mitigation proposals set out in the 2016 Scoping Report, the Institute of Environmental Management and Assessment's (IEMA) *Environmental Impact Assessment Guide to: Delivering Quality Development 2016* (IEMA, July 2016), has been used as guidance in the consideration of mitigation. The document sets out three types of EIA mitigation measures which have been implemented: primary (referred to as 'embedded' in the EIA), secondary (referred to as 'additional' in the EIA) and tertiary (referred to as 'good practice' in the EIA).
9. Mitigation would be applied throughout the Wylfa Newydd Project according to 'Good Practice' measures. Measures would be set out in Code of Construction Practices (CoCP) and a Code of Operation Practice (CoOP), with location-specific measures identified in relevant sub-CoCP. The CoCPs and sub-CoCPs will provide the general and topic-specific standards and measures to provide effective planning, management and control of all construction activities with the aim of controlling potential impacts upon people, businesses and the natural and historic environment. This updated section 7.2.3 of the 2016 scoping report.



## 7.5 Reporting

10. The information that the ES must contain has been revised in response to the 2016 Scoping Opinion. A number of issues have been scoped in or out. These are set out in table 6.1.

## 7.6 Rochdale Envelope

11. Following the 2016 Scoping Report, the design details and parameters of the Power Station have evolved. Where Project design details have not been finalised, the EIA will be based on a reasonable 'worst case' in accordance with the Rochdale Envelope approach and requirements of PINS Advice Note Nine. The same approach will be taken for the Associated Development. The details of the approach to assessment will be explained in the ES.

## 7.7 Transboundary Effects

12. The 2016 Scoping Report outlined that the project has the potential to give rise to significant transboundary effects on birds and marine mammals in the Republic of Ireland. In addition to this, there is also the potential for the project to affect birds and marine mammals in France. Consultation with France on these effects has been undertaken by the Planning Inspectorate, and it is understood that the relevant bodies in France have declared there is no further need to consult with them on Transboundary Impacts.

## 7.8 Other Impact Assessments

13. Having regard for the revised EIA Directive (2014/52/EU), and as already proposed in the 2016 Scoping Report, reports on a Health Impact Assessment and Welsh Language Impact Assessment will be prepared in support of the ES. In addition, an Equality Impact Assessment will be undertaken and will support the ES as part of the application for development consent.

## 8 Air Quality

1. This chapter outlines the changes in scope in relation to air quality since submission of the 2016 Scoping Report. Section 8.1 addresses the potential change in the scope of the original assessment as a result of the updated Power Station and Off-Site Facilities designs, and section 8.2 considers the potential effects of the Associated Development now being included in the application for development consent.
2. This chapter should be read in conjunction with Chapter 8 of the 2016 Scoping Report.

### 8.1 Changes to Existing Scope

3. Chapter 8 of the 2016 Scoping Report set out the scope, methodology and criteria for assessing potential air quality impacts in the vicinity of the Wylfa Newydd Development Area (WNDA).
4. Key changes to the Wylfa Newydd Project described in chapter 3 of this addendum that could affect air quality include the following:
  - Changes to footprints, plant lists, programme and working areas across the site for construction as a result of design optimisation.
  - Changes to the combustion plant in terms of size and number
  - Changes to the layout to create a single power island.
  - The co-location of three Off-Site Power Station Facilities at Llanfaethlu (and avoidance of effects at the former AECC site).
  - Expansion of the On-Site Campus (Temporary Workers' Accommodation) within the Wylfa Newydd Development Area.
5. Whilst changes have occurred on the Power Station Site, the scope as defined in the 2016 Scoping Report is considered appropriate to assess the impacts for the ES. The On-Site Campus lies within the WND A, and any additional effects due to its expansion shall be addressed as part of the WNDA assessment.
6. Off-site Facilities were also considered in the 2016 scoping report. The merger onto a single site will avoid potential effects on the former AECC site. In addition, the footprint at Llanfaethlu will remain unchanged. The exact layout and activities may alter, however, this is unlikely to require a change in study area or assessment methodology. Therefore, the scope remains the same as described in the 2016 Scoping Report.
7. A number of additional points are noted from the Scoping Opinion provided by the Secretary of State in response to the 2016 Scoping Report. These include the following, which make reference to comments included in Appendix B, Responses to 2016 Scoping Opinion:
  - The Scoping Opinion (Appendix B ref. 8) recommended that potential sources of odour resulting from construction activities should be added to the scope of the air quality assessment set out in the 2016 Scoping Report (this had been previously scoped out as part of the 2016 Scoping Report). The scope of the assessment will therefore now include potential odour emissions from the proposed temporary package sewage treatment plant and the existing sewage treatment works at Wylfa Head and odour associated with remediation activities relating to a number of potential contamination areas within the Power Station Site. Earthworks, including tunnel excavations to construct the cooling water intake system, in non-contaminated areas would not be expected to generate offensive odours. The method and scope to be used for the odour assessment is described in Section 8.1.1 below.

- The approach to the assessment, including the establishment of the baseline environment, the identification of sensitive human and ecological receptors, the proposed assessment methodology and any mitigation measures have been discussed and agreed through ongoing consultation with the Isle of Anglesey County Council (IACC) and Natural Resources Wales (NRW), including the EIA Progress Report submitted to the IACC and NRW (Appendix B ref.16). Further consultation is anticipated in relation to establishing the baseline environment and the approach to specifying the background concentrations of pollutants at all receptors. Consultation is also ongoing with regard to further refinement of the assessment methodologies and mitigation measures.
- Changes in guidance since the publication of the 2016 Scoping Report has resulted in the changes in air quality from road traffic emissions now being described in accordance with 'Land-Use planning & Development Control: Planning for Air Quality' version 1.2 dated January 2017' (Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM), 2017), rather than 'Development Control: Planning for Air Quality' (EPUK, 2010) or earlier versions of the 2017 EPUK/IAQM guidance (Appendix B ref.17).
- The study area for road traffic emissions will be discussed and agreed with the IACC and NRW once the designs are finalised and the final traffic flows have been developed. Consultation on how the study areas for assessing road traffic emissions and all other sources would be defined has been undertaken with the IACC, NRW and other councils on mainland Wales. The ES will define all the input data, parameters and assumptions used for the dispersion modelling of combustion emissions. The modelling scenarios will be defined to assess the 'worst case' where appropriate, including consideration of short and long term effects (Appendix B ref.18).
- For the avoidance of doubt, emissions of air pollutants from marine vessels at the Wylfa Newydd Development Area will be considered in conjunction with the emissions from construction plant during the construction phase (Appendix B ref. 19). These would be combined with the emissions of pollutants from road traffic where the receptors are close to the road network and in the vicinity of the Wylfa Newydd Development Area. The ES will include an assessment of these emissions.

### 8.1.1 Proposed Scope, Methodology and Criteria

8. In response to consultation that has taken place since submission of the 2016 Scoping Report, odour will now be considered as part of the air quality assessment, as described below.
9. There are three elements of odour emissions that will be considered for the construction works at the Wylfa Newydd Development Area:
  - Excavation / remediation of odorous contamination;
  - The effect of the existing sewage treatment works on the proposed On-Site TWA; and
  - Operation of the temporary package sewage treatment works.
10. A risk-based qualitative assessment will be undertaken to consider the potential for odour effects to occur based on the scale of the odorous emissions, distance to nearby sensitive areas or receptors, the prevailing weather conditions and the embedded mitigation or good practice mitigation which would prevent or reduce odour emissions at source. Where relevant, this will draw on the assessment approach set out in the 'Guidance on the assessment of odour for planning' (IAQM, 2014)

## 8.2 Associated Development

### 8.2.1 Existing Environment

11. The Wylfa Newydd Project and its Associated Development are located within the jurisdiction of the IACC. As part of the Local Air Quality Management (LAQM) process, the IACC undertakes an annual review of air quality in its area, to determine whether the Air Quality Objectives (AQOs) for a number of key air pollutants will be achieved. Defra and the devolved administrations also carry out air quality modelling across the UK; this includes emissions from main roads, industrial processes, domestic sources and background/regional sources. A review of modelled data for Anglesey indicates air quality concentrations are all very low at most locations across Anglesey, and in the vicinity of the A5025.
12. The main pollutants associated with the construction and operation of the Associated Development relate to vehicle emissions and dust during construction. Pollutants most associated with effects on human health are nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), sulphur dioxide (SO<sub>2</sub>) and fine particulates (referred to as PM<sub>10</sub> and PM<sub>2.5</sub>).
13. Measurements of air quality carried out by the IACC as part of the LAQM process (IACC, 2010; 2011; 2012; 2013; 2014; 2015, 2017); and background mapping of air quality produced by Defra and the devolved administrations (Defra, 2014) were reviewed in order to determine the existing background concentrations of pollutants in the vicinity of the Associated Development.
14. In reviewing air quality as part of the LAQM process or as part of informing its response to consultation on the application for development consent, the IACC has undertaken measurements of NO<sub>2</sub> and PM<sub>10</sub>/PM<sub>2.5</sub> around the Wylfa Newydd Development Area, and measurements of NO<sub>2</sub> in the vicinity of some of the Associated Development sites, including adjacent to the A5025 and the wider road network.
15. The 2015 Updating and Screening Assessment Report concluded that currently there is no risk of the AQOs being exceeded on Anglesey. Air quality on Anglesey is therefore considered to be good and background concentrations at locations away from pollution sources such as busy roads or other transport or industrial sources are relatively low and well below the AQOs. The AQOs relevant to the proposed Associated Development are those associated with the main pollutants described above, the limit values for which are laid down in the Air Quality Standards (Wales) Regulations 2010.
16. The IACC has also carried out dust deposition monitoring at the Existing Power Station and at several locations in the vicinity of the Wylfa Newydd Development Area and nearby A5025. The resulting data will be used to inform the assessment of dust from construction activities and to set the baseline for any future monitoring undertaken during construction activities associated with the proposed Associated Development. The results of the survey were indicative of the dust deposition levels for open country and are assumed to be representative of the existing dust deposition levels at locations adjacent to the A5025 which is located in a predominantly rural area for much of its length, and the other Associated Development.
17. Consideration of receptors will be undertaken as described in section 8.2.1 of the 2016 Scoping Report, and the air quality assessment will consider the following types of sensitive receptors:
  - human receptors such as residential properties, schools, hospitals, care homes, recreational areas and footpaths; and
  - ecological receptors including habitats and ecosystems which are sensitive to air pollution or dust deposition. These include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) which are protected at a European level, SSSIs, National Nature Reserves (NNR) and Local Nature Reserves (LNR), which are

generally protected by national legislation, and non-statutory sites such as local wildlife sites and ancient woodland.

18. A summary of the baseline information is presented in table 8.1, and an environmental constraints plan is included in Appendix C. A detailed report on the baseline conditions and the determination of background concentrations for the assessments of each element of the Wylfa Newydd Project will be submitted to the IACC, NRW and other councils for discussion and agreement in May 2017.

**Table 8.1 Summary of baseline information**

Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
<p>With regard to human receptors, the Dalar Hir site and surrounding area is relatively rural in nature, with a small number of isolated farm properties nearby, including the Bryn Goleu farmhouse located approximately 200m to the east of the eastern boundary of the Park and Ride facility. The nearest settlements to the Dalar Hir site are Llanfihangel-yn-Nhywyn, located 400m to the south and Caergeiliog approximately 900m to the south-west. There is a residential care home located approximately 250m north-east and a go-karting centre is located within 50m east of the Dalar Hir site's eastern boundary. The A5 road runs along the southern boundary of the Dalar Hir site, and the A55 is further to the south, also running east-west.</p> <p>A desk based study of ecological receptors has also been carried out. There are three designated ecological sites within 2km of the Dalar Hir site boundary; Llyn Dinam SAC, Llynau Y Fali - Valley Lakes SSSI and Llyn Traffwll SSSI.</p> <p>There are also a number of candidate Wildlife Sites (cWSs) on Anglesey and some of these are in the vicinity of the Dalar Hir site. These would be considered in the assessment.</p> <p>Based on available data and recent measurements undertaken by the IACC in 2016, the background concentrations of pollutants in the vicinity of the proposed Dalar Hir Park and Ride facility are within the applicable annual mean AQOs. The annual mean concentration of NO<sub>2</sub> recorded immediately to the south of the Dalar Hir site was 11.1µg/m<sup>3</sup>.</p>	<p>The site is currently open farmland located to the immediate south-east of the Holyhead community limits and bounded to the north-east by the major trunk route of the A55 and a main railway line. Approximately 600m to the north-west there is a line of residential properties.</p> <p>The southern edge of Kingsland, including the Kingsland School is approximately 800m to the north-west.</p> <p>Residential properties in the northern edge of Trearddur Bay are approximately 500m to the south-west and an isolated property is over 400m to the south-south-east.</p> <p>No measurement data are available for pollutants in the vicinity of the Logistic Centre site. Based on the available measurement data from the IACC diffusion tube monitoring and the Defra background mapping, concentrations of pollutants at the receptors identified above would be expected to be well within the relevant AQOs.</p>	<p>A desk based review of the sensitive receptors within the vicinity of the proposed A5025 Off-line Highway Improvements has been undertaken. There are a large number of human receptors such as residential properties located close to the A5025 within villages, settlements and at sections of the A5025 in between villages. There is an ancient woodland site close to the A5025 and the Beddmanarch-Cymyran SSSI is within 70m of the A5025 near Llanfachraeth.</p> <p>Over the last five years, the IACC has undertaken measurements of NO<sub>2</sub> at several different locations adjacent to the A5025. The results showed that the measured annual mean NO<sub>2</sub> concentrations were relatively low, ranging from 7.1µg/m<sup>3</sup> to 15.4µg/m<sup>3</sup>. The measured concentrations are well within the annual mean AQO of 40 µg/m<sup>3</sup>.</p> <p>There are no measurements of PM<sub>10</sub> or PM<sub>2.5</sub> adjacent to the A5025. 2013 and 2016 measurements of PM<sub>10</sub> and PM<sub>2.5</sub> undertaken by the IACC at or close to the Wylfa Newydd Development Area indicate that concentrations would be well within the relevant annual mean AQOs. The annual mean concentrations of PM<sub>10</sub> were approximately 15µg/m<sup>3</sup> and PM<sub>2.5</sub> concentrations were approximately 8µg/m<sup>3</sup>.</p>



## 8.2.2 Potential Environmental Effects and Mitigation

### *Park and Ride facility at Dalar Hir and the Logistics Centre*

19. The potential air quality and dust effects associated with the construction, operation and decommissioning phases at the Park and Ride facility at Dalar Hir and the Logistics Centre are expected to be similar and include the following:
- There is a risk of dust emissions during construction, including any demolition, site clearance and earthworks activities. These could lead to annoyance or health effects at nearby sensitive locations, some of which are in close proximity to the proposed sites. Dust deposition can also affect nearby vegetation and ecosystems.
  - Emissions from plant and machinery during the construction phase could lead to increases in pollutants (NO<sub>2</sub>, SO<sub>2</sub>, CO and particulates (PM<sub>10</sub>/PM<sub>2.5</sub>)), where human and ecological receptors are in close proximity to the proposed developments.
  - During construction and operation of the Park and Ride facility at Dalar Hir and the Logistics Centre, there are likely to be associated potential effects on air quality with road traffic emissions (NO<sub>2</sub> and particulates (PM<sub>10</sub>/PM<sub>2.5</sub>)), due to the additional vehicle movements on the local road network. As well as vehicle emissions from the road network, the vehicle emissions from the car park area of the Dalar Hir Park and Ride Facility itself could also lead to increases of these pollutants at receptors close to the site.
  - Effects associated with the decommissioning of the Park and Ride facility at Dalar Hir and the Logistics Centre are likely to be similar to (but of less magnitude than) the potential effects described for the construction phase.
20. Appropriate mitigation would be identified to prevent or reduce dust emissions at their source during construction, including good practice dust control techniques such as water sprays and suppression, reducing the height of material being dropped from loading shovels, dampening down and cleaning of haul roads. These, and other measures, would be incorporated into the Code of Construction Practice and would be discussed with the IACC and NRW. Good practice measures would be used to reduce emissions of pollutants from plant and machinery including appropriate selection of plant, use of mains electricity where possible and no idling of engines. These would also be incorporated into the Code of Construction Practice.
21. A Travel Plan would be developed for the Wylfa Newydd Project, promoting a range of sustainable transport options for staff and visitors to mitigate the potential for effects upon air quality that may otherwise arise from road transport.
22. The same mitigation measures would apply for any such potential effects during decommissioning activities at the sites.

### *A5025 Off-line Highway Improvements*

23. In relation to construction effects, there is potential for air quality to be affected as a result of the construction and operation of the A5025 Off-line Highway Improvements through similar activities described for construction of the Park and Ride facility at Dalar Hir and the Logistics Centre described above.
24. Post-construction, changes to the alignment of the A5025 could alter vehicle speeds and the distance between the road and nearby sensitive receptors, affecting the concentrations of NO<sub>2</sub> and PM<sub>10</sub>/PM<sub>2.5</sub> at these locations.

25. The A5025 Off-line Highway Improvements are likely to result in a decrease in pollutant concentrations within bypassed villages and communities, and where traffic would be moved further from properties currently adjacent to the existing road. Conversely, the A5025 Off-line Highway Improvements could result in an increase in pollutant concentrations where the change in alignment of the A5025 moves the road closer to receptors.
26. Mitigation measures for the construction-related effects would be similar to those discussed above for the Dalar Hir Park and Ride and the Logistics Centre.

### 8.2.3 Proposed Scope, Methodology and Criteria

27. Details of the assessment methodology for the Associated Development in relation to dust and combustion emissions is summarised in table 8.1 of the 2016 Scoping Report. Due to the relatively small scale of the construction activities carried out for the Associated Development, it is anticipated that emissions from plant and machinery during the construction of the Associated Development would not need to be assessed using dispersion modelling. These emissions will be assessed qualitatively based on the source-pathway-receptor concept, and taking into account the IAQM guidance on dust emissions which states that in the vast majority of cases, emissions from plant and machinery would not need to be quantitatively assessed.
28. More information is supplied below in regard to the assessment of road traffic emissions for the A5025 Off-line Highway Improvements and on the wider road network and the assessment criteria.

#### ***Road traffic emissions and the Offline Highway Improvements***

29. The assessment of road traffic emissions is proposed to be undertaken for two aspects as follows:
- The effect of the Wylfa Newydd Project on road traffic flows on the road network on Anglesey and on mainland Wales. This includes road traffic travelling to and from the Wylfa Newydd Development Area, Off-Site Power Station Facilities and all Associated Development sites; and
  - The effect of the change to the alignment of the A5025 brought about by the A5025 Off-line Highway Improvements.
30. As specified in the 2016 Scoping Report, for the assessment of road traffic emissions, human and ecological receptors within 200m of the affected routes will be considered. The 'affected' route will be identified where changes in traffic flows on road links exceed the relevant thresholds set out in the Environmental Protection UK and Institute of Air Quality Management guidance document (EPUK/IAQM, 2017). The relevant EPUK/IAQM criteria are:
- the annual average daily traffic (AADT) flow of cars and light goods vehicles would change by 500 or more; or
  - heavy goods vehicle flows would change by 100 AADT or more.
31. As discussed above, once the designs are finalised and the final traffic flows have been developed, the full road traffic emissions study area will be determined. This will be confirmed with the IACC, NRW and other councils on mainland Wales, as appropriate.
32. The assessment of road traffic emissions on the Isle of Anglesey will be undertaken using dispersion modelling as described in Table 8.1 of the 2016 Scoping Report. The method for assessing emissions on mainland Wales will be based on the DMRB screening assessment methodology (DMRB, 2007). The assessment criteria for the assessment of road traffic emissions

(and all other pollutant emission sources) are the relevant AQOs and other non-statutory air quality standards such as those specified by the Environment Agency and adopted by NRW (Environment Agency, 2016).

33. The modelled pollutant concentrations from road traffic emissions and other emission sources would be compared to the relevant AQOs and other non-statutory air quality standards. The classification of the magnitude of effects (known as impact descriptors) and the judgement of overall significance of the air quality effects will be undertaken in line with the approach set out in the EPUK/IAQM guidance (EPUK/IAQM, 2017). This is consistent with the approach in the Draft IACC guidance (2014) , which recommends use of the EPUK impact magnitude and air quality impact descriptors, albeit based on the 2006 EPUK guidance which was superseded by the current guidance. The approach differs from the approach adopted for the majority of other topics as air quality effects are categorised as 'significant' or 'not significant'. The significance of effects on ecological receptors will be determined in line with the Environment Agency guidance adopted by NRW (Environment Agency, 2016).
34. The performance of the dispersion model will be verified against the roadside measurements of NO<sub>2</sub> recorded by the IACC and the councils on mainland Wales next to the A5025 and A55. The PM<sub>10</sub> / PM<sub>2.5</sub> concentrations will be calculated using the adjustment factor calculated for NO<sub>2</sub>.
35. Appropriate assessment year scenarios would be considered to determine the potential effects at key points during the Wylfa Newydd Project. These are likely to include a recent year (for verification) and up to three other assessment years during construction and operation of the Power Station and Associated Development representing peaks in traffic flows. The assessment will also consider the effect of the A5025 Off-line Highway Improvements.
36. An appropriate method would be adopted to ensure predicted concentrations of NO<sub>2</sub> in future years are in better alignment with long-term trends and account for the uncertainty in road vehicle emissions (for example, the Highways Agency Interim Advice Note IAN 170/12 v3 or another appropriate method such as the CURED approach (Calculator Using Realistic Emissions for Diesels, version 2A) released by Air Quality Consultants (Air Quality Consultants, 2016b). The specific approach would be discussed and agreed with the IACC, NRW and other mainland councils.

## 9 Noise and Vibration

1. This chapter outlines the changes in scope in relation to the noise and vibration assessment since submission of the 2016 Scoping Report. Section 9.1 addresses the potential change in the scope of the original assessment as a result of the updated Wylfa Newydd Power Station and Off-Site Power Station Facilities designs, and section 9.2 considers the potential effects of the Associated Development now being included in the application for development consent.
2. This chapter should be read in conjunction with Chapter 9 of the 2016 Scoping Report.

### 9.1 Changes to Existing Scope

3. Chapter 9 of the 2016 Scoping Report set out the scope, methodology and criteria for assessing potential noise and vibration impacts at sensitive noise and vibration receptors in the vicinity of the Wylfa Newydd Development Area and associated transportation routes.
4. Key changes to the Wylfa Newydd Power Station described in chapter 3 of this addendum that could affect noise and vibration include:
  - changes to construction plant lists, working areas, platform levels, excavation methods and volumes, construction programme and traffic flows as a result of design optimisation;
  - changes to the site layout, use of a single power island building, and equipment specification as a result of design optimisation;
  - the co-location of three Off-Site Power Station Facilities at Llanfaethlu (and avoidance of effects at the former AECC site); and
  - expansion of the On-Site Campus (Temporary Workers' Accommodation) within the Wylfa Newydd Development Area.
5. Whilst changes have occurred on the Power Station Site, the scope as defined in the 2016 Scoping Report was developed for the Wylfa Newydd Development Area and is considered appropriate to assess effects for the ES. The On-Site Campus lies within the Wylfa Newydd Development Area, and any additional effects due to its expansion will be addressed as part of the assessment of activities on the Power Station Site.
6. Off-Site Power Station Facilities were considered in the 2016 scoping report. The proposed merger of these facilities onto a single site will avoid potential effects on the former AECC site. The footprint at Llanfaethlu will remain unchanged. The exact layout and activities may alter. However, this is unlikely to require a change in study area or assessment methodology. Therefore, the scope remains the same as described in the 2016 Scoping Report
7. A number of additional points are noted from the Scoping Opinion provided by the Secretary of State in response to the 2016 Scoping Report. These include the following, which make reference to comments included in Appendix B, Responses to 2016 Scoping Opinion:
  - Consultation has taken place with Isle of Anglesey County Council (IACC) with regard to the noise and vibration assessment, and they have both approved the selection of monitoring locations and agreed that no vibration baseline monitoring is required (Appendix B ref.20).
  - All mitigation (embedded and additional) will be detailed in the Environmental Statement noise and vibration assessment chapter, and any earth bunds being used in the design as embedded mitigation will be shown on the relevant ES figures and

considered within the noise modelling. Receptor locations will also be clearly presented on the ES figures, and their sensitivities presented in tables within the chapter (Appendix B ref. 21).

- The Technical Note detailed in Appendix D of the 2016 Scoping Report will be updated and included as an appendix to the ES (Appendix B ref.22). Consultation is currently underway with IACC and Natural Resources Wales, and the updated baseline reports will also be included in the ES as appendices.
- A construction plant list will be provided along with a brief description of construction methods relevant to the noise and vibration assessment (Appendix B ref.23). A detailed description of the construction process will be provided in the Project Description chapter of the ES.
- A Noise Management Plan will be produced by the contractor that will contain complaint response protocols (including recording and monitoring complaints) (Appendix B ref.24). This will form part of the Code of Construction Practice (CoCP).
- Given that certain construction activities are proposed to take place within the marine environment and that the Project would introduce new vessel movements to the area during both construction and operation, the potential noise and vibration impacts on marine ecological receptors will be assessed within the Marine Environment chapter of the ES (Appendix B ref.25).
- The assessment of construction and operational impacts of noise and vibration on ecological receptors and on the special qualities of the Anglesey Area of Outstanding Natural Beauty (AONB) will also be addressed and cross-referenced within the Ecology, Marine Environment, Landscape and Visual, and Public Access and Recreation chapters of the ES (Appendix B ref.26).

## 9.2 Associated Development

8. The Associated Development was described within the PEIR as part of the PAC2 consultation. In addition, the scope of the A5025 Off-line Highway Improvements assessment was consulted on separately in 2015. The baseline presented below provides a summary of this information to support this addendum to the 2016 Scoping Report.

### 9.2.1 Existing Environment

#### *Noise and vibration receptors*

9. Noise and vibration can have an effect on the environment and on the quality of life enjoyed by individuals and communities. The proposed scope of the noise and vibration assessments for each component of the Associated Development of the Wylfa Newydd Project has been informed by a desk-based review of information concerning the sites, their surrounding environment, and the development proposals. Ordnance Survey mapping information has been used in conjunction with guidance to identify the receptor types within the proposed study area.
10. The noise and vibration assessments will include consideration of the following sensitive receptors in the vicinity of the Associated Development and associated transportation routes:
  - human receptors – when present at noise-sensitive locations;
  - ecological receptors – within land-based areas designated for protected species (fauna only); and

- infrastructure receptors – historic, such as Listed Buildings and Registered Parks and Gardens; and contemporary, such as the Existing Power Station and statutory or other underground services.

11. A list of noise and vibration receptors for each of the Associated Development is included in table 9.1 below, and an environmental constraints plan is included in Appendix C.

**Table 9.1 Noise and Vibration Receptors**

Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
<p>The nearest settlements to the Dalar Hir site are Llanfihangel-yn-Nhowyn, and Caergeiliog approximately to the south-west.</p> <p>The closest residential dwellings to the site are:</p> <ul style="list-style-type: none"> <li>• Dalar Hir farmhouse (which would be demolished in order to develop the site);</li> <li>• Bryn Goleu farmhouse, approximately 200m east of the site (also the location of the Cartio Môn outdoor Go-Karting centre);</li> <li>• Penmynydd Farmhouse, approximately 500m west of the site; and</li> <li>• Residential Properties (1 and 2 Cefn Rhosydd), approximately 300m north of the site.</li> </ul> <p>Caergeliog Foundation School is located 1km to the south-west of the site. Taking into account this distance and the intervening A55, it is considered that significant effects are not likely at this location.</p> <p>The Gwyddfor Residential Home is located approximately 250m north-east of the site.</p>	<p>The nearest noise receptors would be users of the Lon Trefignath cycle path passing across the entrance to the Logistics Centre. The Holyhead Retail Park, Penrhos Business Park and Anglesey Aluminium industrial complex are located 300-350m to the north and east, beyond the A55 (see figure H3.1). Outline planning consent has been granted for the industrial estate at Parc Cybi, but only one plot and the new access road from the A55 have been constructed, along with improvements to the local road and cycle path; no further development of this site has been carried out.</p> <p>Residential and recreational facilities within Kingsland and Trearddur Bay are located 700m away to the north, west and south.</p> <p>Traffic on the A55 and parallel Bangor to Holyhead railway line, to the east of the site, would be the main existing sources of noise in the area.</p>	<p>The following groups of noise-sensitive receptors were identified during the scoping process:</p> <ul style="list-style-type: none"> <li>• Valley;</li> <li>• Llanynghenedl;</li> <li>• Llanfachraeth;</li> <li>• Llanfaethlu;</li> <li>• Llanrhuddlad;</li> <li>• Llanrhwydrus/Cefn Coch; and</li> <li>• Tregele.</li> </ul> <p>Short and long-term monitoring locations within these communities, and at individual receptor locations along the A5025, have been identified and agreed with an IACC Environmental Health Officer following desk-based review.</p>



### **Baseline noise monitoring surveys**

12. Noise-sensitive receptors can include (but are not limited to) dwellings, hospitals, schools, community facilities, designated landscapes, ecological areas, and users of public rights of way. Monitoring locations and methodology for the Park and Ride facility at Dalar Hir and A5025 Off-line Highway Improvements surveys were agreed in advance with the Environmental Health Officer of the IACC, and monitoring was undertaken with due regard for relevant standards and guidance outlined in table 9.3 of the 2016 Scoping Report.
13. Noise levels at receptors in the vicinity of the A5025 Off-line Highway Improvements are likely to be dominated by traffic noise, with contributions from other local traffic, agricultural and environmental noise sources increasing with distance from the road corridor. The future influence of noise from the Power Station Site on the A5025 would decrease with distance, and is considered unlikely to make a significant contribution to noise currently experienced along the A5025.
14. A summary of the noise baseline for Associated Development of the Wylfa Newydd Project is presented below in table 9.2.

**Table 9.2 Summary of Baseline Information**

Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Highway Improvements
<p>The noise monitoring was undertaken close to a selection of nearby sensitive receptors and at locations within the footprint of, or close to, the site:</p> <ul style="list-style-type: none"> <li>• within the curtilage of a residential property to the north of the site, in Cefn Rhosydd;</li> <li>• within the site boundary approximately 100m from the A5 in the central area of the site;</li> <li>• within the curtilage of Gwyddfor Residential Home; and</li> <li>• at the boundary edge of the site, 10m from the A5.</li> </ul> <p>Short-term monitoring was used at the location adjacent to the A5, whilst long-term monitoring was undertaken at the other three locations.</p>	<p>Traffic on the A55 and parallel Bangor to Holyhead railway line, to the east of the site, would be the main existing sources of noise in the area.</p> <p>The nearest noise receptors would be users of the Lon Trefignath cycle path passing across the entrance to the Logistics Centre. The Holyhead Retail Park, Penrhos Business Park and Anglesey Aluminium industrial complex are located 300 - 350m to the north and east, beyond the A55</p> <p>Residential and recreational facilities within Kingsland and Trearddur Bay are located 700m away to the north, west and south.</p>	<p>The A5025 between Valley and the Power Station Site passes through settlements and agricultural areas.</p> <p>A baseline survey undertaken in 2010 included a measurement location in Treglele (Tyn Refail) located adjacent to the A5025 (with no significant screening).</p> <p>Further baseline monitoring has been undertaken in 2015 to further establish the existing noise climate.</p>

## 9.2.2 Potential Environmental Effects and Mitigation

15. Where potentially significant effects are considered likely to occur as a result of the construction, operation and decommissioning of the Associated Development, they will be assessed further and reported in the Environmental Statement. Where the potential effect is judged not likely to be significant, this will not be assessed further.

### ***Park and Ride facility at Dalar Hir***

16. Noise and vibration effects have the potential to occur during the construction, operation and decommissioning phases of the Park and Ride facility at Dalar Hir, and there is potential for these effects to occur during both day and night-time periods.
17. Construction and decommissioning activities have the potential to give rise to elevated levels of noise and vibration due to the use of heavy plant, and would vary depending on time and location. This would be dependent on the contractor's chosen method of working and on the timing and phasing of certain activities. Detailed construction and decommissioning programmes are not yet available, however, anticipated plant associated with the likely construction and decommissioning activities include excavators, dozers, dump trucks, compactors, piling rigs, road breakers and road surfacing equipment.
18. In addition, traffic movements associated with the transportation of materials and personnel to and from the site during the construction period would result in increased road traffic noise levels on the local road network. During operations, noise would be associated with the movements of both site staff and Power Station Site construction workers' cars and buses around the site, inadvertent activation of car alarms, slamming doors, the starting of vehicles, and the use of air brakes by buses. Noise emissions may also arise from fixed plant (heating, ventilation and air conditioning) associated with the operation of the bus transport facility building which is located close to the centre of the site.

### ***Logistics Centre***

19. There would be an increase in noise during construction from activities such as stockpiling of materials and earth moving. However, the effects are not likely to be significant due to the distance between the construction works and most receptors, whilst the existing background noise of the A55 traffic and railway line reduces effects on those briefly passing close to the site (e.g. cyclists). There would be no significant vibration effects due to the distance to any sensitive buildings or structures.
20. The operational movement of upwards of 60 to 70 goods vehicles around the Logistics Centre site, plus other site management activity, would create new noise emissions in the local area. However, effects are not likely to be significant due to a combination of the short duration of exposure by the transient cycle path users, distance to sensitive receptors and existing background noise sources. The site buildings would also act as noise barriers to mitigate any increase in off-site baseline noise emissions during operation.
21. It is noted that there are proposals for two hotels to be constructed relatively close to the site. This will be considered as part of the Environmental Statement.

### ***A5025 Off-line Highway Improvements***

22. There is potential for the construction and operation phases of the A5025 Off-line Highway Improvements to result in changes in noise and vibration experienced by noise-sensitive receptors.

23. Construction could potentially give rise to elevated levels of noise and vibration through the use of heavy plant, equipment and machinery, depending on the timing and location of activities. It is anticipated that plant would include excavators, dozers, dump trucks, soil compaction and road surfacing equipment. Where modification or removal of existing carriageway is required, the use of road breakers is likely to be necessary. All such equipment would emit elevated levels of noise and/or vibration which have the potential to adversely affect receptors. Due to the proximity of residential properties and other noise-sensitive receptors to the A5025 Off-line Highway Improvements, there will be a requirement to assess the potential for significant noise and vibration effects associated with construction works.
24. A review of potential operational effects identified scope for changes in traffic-sourced noise and vibration levels arising from alterations in traffic composition and/or through alterations to the location of the carriageway (or through introducing a new noise and vibration source in the form of new carriageway sections). Such changes in traffic noise and vibration have the potential to cause annoyance or nuisance to those experiencing it.
25. A review of the proposals identified that all four A5025 Off-line Highway Improvements areas would involve significant alteration to the existing carriageway alignment, with dwellings and other noise-sensitive receptors present within 1km of each of the current options.
26. A preliminary review of the A5025 Off-line Highway Improvement proposals against identified ecological interests recorded limited potential for noise/disturbance impacts on ecological species such as birds and bats; this conclusion will be reviewed in more detail following completion of all ongoing ecological surveys and baseline noise monitoring (described below).
27. The *Design Manual for Roads and Bridges* (DMRB) HD 213/11 (Highways Agency, 2011) suggests scoping criteria of changes in noise level of 1dB  $L_{A10}$ , 18hr in the short term and 3dB  $L_{A10}$ , 18hr in the long term. Insufficient data is available at the time of writing in order to confirm that the likely changes in noise levels associated with the A5025 Off-line Highway Improvements are below these thresholds. Accordingly, the potential for such effects will be considered in the assessment.
28. For vibration associated with road traffic, guidance within DMRB states that there are two effects which need to be considered:
- effects on buildings – DMRB reports that extensive research has found no evidence that traffic induced vibrations are a source of significant damage to buildings. Any significant ground-borne vibrations are associated with irregularities in the road surface, which should not be present in new roads, and can easily be rectified by maintenance in older roads; and
  - disturbance to occupiers – DMRB states that "...ground-borne vibration is much less likely to be the cause of disturbance than airborne vibration" and can be rectified as detailed above. Disturbance due to traffic-induced airborne vibration has been found to be closely correlated with the  $L_{A10}$  18hr noise index, and can hence be assessed using noise modelling, rather than vibration models.
29. Accordingly, vibration assessment for the Off-line Highways Improvements has been scoped out of the assessment
30. The principles of mitigation outlined in section 9.2.2 of the 2016 Scoping Report would be implemented to prevent or minimise potential nuisance in relation to the Associated Development. Construction best practice measures and controls will be followed, and the CoCP will include measures to reduce noise effects on general amenity.

### 9.2.3 Proposed Scope, Methodology and Criteria

#### Scope

31. Full details of the scope, methodologies and criteria that will be applied to the Wylfa Newydd Project and its Associated Development are outlined in Appendix D: Noise and Vibration Modelling and Assessment Methodology Wylfa Newydd Project of the 2016 Scoping Report.
32. In developing the assessment scope, due regard has been given to methodologies and criteria contained in DMRB and various British Standards related to noise and vibration prediction and assessment as outlined in table 9.3 of the 2016 Scoping Report.
33. More details concerning the proposed methodologies are presented in the document Noise and Vibration Modelling and Assessment Methodology Wylfa Newydd Project (2015), which was discussed and agreed with the IACC.

#### Study Area

34. The topic study areas will be based on a buffer zone approximately 600m from the site boundary and the affected route of all the Associated Development. This has been determined using professional judgement and DMRB which uses a distance of 600m to define a 'calculation area', as there is no current authoritative guidance on how far a noise study area should extend from construction activities, or operational noise sources. This is also consistent with the approach set out in the 2016 scoping report.
35. DMRB HD 213/11 recommends detailed calculations are undertaken within a specified calculation area that encompasses all residential dwellings and other noise-sensitive receptors within 600m of the 'scheme', and for those roads (within 1km of the 'scheme') on the existing road network that are predicted to be an 'affected route'. Roads are considered to be an affected route if there is the possibility of a change of 1dB LA10,18hr or more in the short term, or 3dB LA10,18hr or more in the long term (equivalent to a +25% or -20% change in total volume, or a significant change in the percentage of HGV traffic), usually within 15 years after opening.
36. Secondly, roads on the wider network (outside the calculation area) that would be subject to a 1dB increase or decrease in noise in the baseline year and/or a 3dB increase or decrease in the future assessment year are captured. Traffic data and forecasts will be used to establish the potential change in noise levels for roads on the wider network. As stated in the 2016 scoping report, it is acknowledged that DMRB states that a road in a rural area may have effects beyond 600m, so the study areas will be kept under review during the EIA process so all potentially significant road noise effects are identified.
37. The Draft IACC EIA guidance further suggests that the 'Zone of Influence' for noise effects should be 600m from the boundary of any Associated Development or other Project component location. The study area for the noise and vibration assessments for the Associated Development of the Wylfa Newydd Project will therefore be based on a buffer zone extending at least 600m from the development site boundary, the proposed extent of works for the development of access routes, and any other roads potentially affected by significant increases/decreases in road traffic noise.
38. Whilst construction, operational and decommissioning noise may be audible at distances in excess of 600m, this topic study area is large enough to encompass the nearest noise-sensitive receptors, which would be used to classify the maximum magnitude of change. Based on the noise impact assessment of receptors within 600m, consideration will be given to the likelihood of significant noise effects outside the topic study area, and the study area would be extended where relevant.

### ***Methodology***

39. The methodology will be the same as that described in the 2016 scoping report. In order to establish the existing noise climate, noise surveys have been undertaken at receptors representative of those most likely to be affected by the Associated Development proposals. Short and long-term monitoring stations were set up at individual receptor locations that were identified and agreed with an IACC Environmental Health Officer following desk-based review. Monitoring for the Logistics Centre is currently being developed and shall be detailed in full in the Environmental Statement
40. A full list of the calculation methodologies, parameters and relevant assessment guidance documents relevant to the Wylfa Newydd Project for both noise and vibration are summarised in table 9.3 of the 2016 Scoping Report.

### ***Assessment criteria***

41. The assessment criteria used for assigning sensitivity to the receptors and assessing magnitude and significance are derived from guidance documents summarised in table 9.3 and set out in appendix D of the 2016 Scoping Report.

## 10 Landscape and Visual

1. This chapter outlines the changes in scope in relation to the landscape and visual assessment since submission of the 2016 Scoping Report. Section 10.1 addresses the potential change in the scope of the original assessment as a result of the updated Wylfa Newydd Power Station and Off-Site Power Station Facilities designs. Section 10.2 considers the potential effects of the Associated Development now being included in the application for development consent.
2. This chapter should be read in conjunction with chapter 10 of the 2016 Scoping Report.

### 10.1 Changes to Existing Scope

3. Chapter 10 of the 2016 Scoping Report set out the scope, methodology and criteria for assessing potential landscape and visual impacts in the vicinity of the Wylfa Newydd Development Area.
4. Key changes to the Power Station Site described in chapter 3 of this addendum that could affect the landscape and visual assessment include the following:
  - The overall footprint of the Power Station has reduced in size, and there is likely to be some reduction in visual effects in views from the north and south, including views from the Wales Coast Path from the north-east and from the A5025 from the east and south.
  - The expansion of the On-Site Campus (Temporary Workers' Accommodation) within the Wylfa Newydd Development Area. These temporary structures would provide accommodation for up to 4,000 workers on-site and parking for up to 1,900 vehicles. Effects caused by the On-site Campus will be assessed as part of the assessment of the Power Station Site.
  - Building platform levels have been raised on the Power Station Site, however, the landscape mounding already incorporated in the design would still remain in scale with the surrounding drumlins.
  - The maximum height of the main Very Heavy Lifting crane during construction would be approximately +250m above ground level. This could theoretically be visible from the mainland (Snowdonia mountain range), although the visual impact would be negligible from this distance.
  - The Off-Site Power Station Facilities have been co-located at Llanfaethlu, approximately 6km south of the Power Station Site avoiding impacts at the former AECC Site.
5. The study area for the landscape and visual impact assessment (LVIA) was defined in the 2016 Scoping Report on the basis of computer modelling results. The overarching study area extended for 15km from the Wylfa Newydd Development Area and the detailed study area for 6km. The proposed layout within the Power Station Site has changed. This is likely to reduce potential effects in some areas and increase the potential for some effects in other areas. Nevertheless, the scope of the LVIA detailed in the 2016 Scoping Report for the Power Station Site and Off Site Power Station Facilities remains unchanged and is considered to be appropriate to address the changes identified. Receptors within closer proximity to the Wylfa Newydd Development Area, especially within 6km, would be most affected where visibility of the crane would be greater and lighting associated with it could add to the effects of other construction lighting on the surrounding area. The visual effects of the Very Heavy Lifting crane will therefore be considered within the existing 15km study area.
6. The Off-Site Power Station Facilities were considered as part of the 2016 scoping report. The proposed co-location of facilities at the Llanfaethlu would avoid landscape and visual effects at the former AECC site. In addition, whilst some configuration changes may occur at the off-site location, the footprint of the site remains as defined in the 2016 report. The scope of the assessment for the off-sites area therefore remains unchanged.



7. A number of additional points are noted from the Scoping Opinion provided by the Secretary of State in response to the 2016 Scoping Report. These include the following, which make reference to comments included in Appendix B Responses to 2016 Scoping Opinion:
- All five aspects of LANDMAP will be used to identify the key characteristics of the local landscape character (Appendix B ref.27). Reference will also be made to The Anglesey, Gwynedd and Snowdonia National Park Landscape Sensitivity and Capacity Assessment.
  - Where there is public access to cultural heritage sites then the potential for visual effects will be set out within the LVIA (Appendix B ref.28). Visual effects will be assessed from representative publicly accessible viewpoints identified from Parys Mountain (a Landscape of Historic Interest). Visual effects will also be assessed from Cestyll Garden (a Landscape and Garden of Special Historic Interest in Wales, occasionally opened to the public).
  - A draft of the Landscape and Environmental Masterplan (LEMP) will be provided within the Environmental Statement, which will provide details of the landscape mounding and woodland planting that is proposed to soften views of the Wylfa Newydd Development Area including, for example, the location, dimensions and details of how long planting would take to establish (Appendix B ref.29).
  - Landscape mounding forming part of the design for the Project will be shown on the relevant figures and considered within the LVIA. The assessment of both construction and operational impacts on the special qualities of the Anglesey Area of Outstanding Natural Beauty (AONB) will be addressed within the landscape and visual chapter and cross-referenced with other relevant chapters of the Environmental Statement, for example, the noise chapter (Appendix B ref.30).
  - The visual effect of emissions remains scoped out of the LVIA as it is understood that there would be no visible plumes from the main stacks. (Appendix B ref.31).
  - Potential landscape and visual implications of transmission infrastructure, and the decommissioning works at the Existing Power Station site will be considered in the cumulative landscape assessment (Appendix B ref.32).

## 10.2 Associated Development

8. The Associated Development has been described within the PEIR as part of the PAC2 consultation. In addition, the scope of the A5025 Off-line Highway Improvements has been consulted on in 2015. The baseline presented below provides a summary of this information to support the scope of this addendum to the 2016 Scoping Report.

### 10.2.1 Existing Environment

9. A desk study has been undertaken to identify landscape features and designations of acknowledged importance and/or value in the vicinity of the Associated Development.
10. Existing landscape character documents have been collated, including the IACC Landscape Strategy and the Natural Resources Wales LANDMAP Level 3 information. Existing views and potential visual receptors have been identified through site appraisal and from use of aerial photography and OS mapping, and key findings from the desk study are contained in table 10.1 for the Associated Development. Key receptors are also shown on the environmental constraints plan contained in Appendix C.

**Table 10.1 Summary of baseline information**

Studies undertaken	Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
<p>Landscape Designated and Protected Features</p> <ul style="list-style-type: none"> <li>Desk-based study</li> </ul>	<p>Located within the Special Landscape Area (SLA) which covers the whole of Anglesey.</p> <p>Located on predominantly flat ground between 20m and 25m above ordnance datum (AOD). The land rises gently towards the A55 junction and Dalar Hir farmhouse.</p> <p>A small stream crosses the site from north to south and several ditches connect to this. There are also several ponds on site and a ditch near Dalar Hir farmhouse.</p> <p>Predominantly improved grassland used for grazing with some scrubby and marshy areas.</p> <p>Vegetation blocks include a shelterbelt at Dalar Hir farmhouse and a linear belt of planting along the A5 Holyhead Road. A strong hedgerow boundary marks the northern extent of the site.</p> <p>The site is crossed by several hedgerow field boundaries creating small to medium-sized fields, which are semi-regular in shape.</p> <p>The A5 Holyhead Road is an</p>	<p>The site is located at the south-eastern edge of Holyhead within the settlement boundary, immediately south of the A55 Trunk Road. The B4545 runs north-south to the west of the main Parc Cybi site, beyond which is the Trearddur Bay Golf Course over 700m west of the Logistics Centre site. The village of Trearddur Bay lies over 700m to the south of the Logistics Centre site, with agricultural land in between and to the south-east.</p> <p>The site comprises semi-improved grassland and bare ground with a small woodland area beside the western boundary and an area of scrub in its southern corner. A pond lies between the site's northern boundary and the A55 to the north. The topography of the site is low-lying and undulating, but the golf course and village of Trearddur lie on higher ground to the west and south, respectively.</p> <p>The Parc Cybi site is located within the Ynys Môn/Anglesey AONB, which covers the majority of Anglesey's coastline and areas of high ground that form the backdrop to the coast including Holyhead Mountain and Mynydd Bodafon. To the north of the A55, and within the AONB, lie the former Anglesey Aluminium works and an industrial or commercial estate. The stack on the aluminium works is visually prominent over a</p>	<p>The existing A5025 is located in proximity to the Anglesey AONB along its length and borders the AONB in some locations.</p> <p>Local planning policy designates all other land on Anglesey not within the AONB as an SLA, where development should have particular regard to the special character of its surroundings and not result in unacceptable harm. A recent study has proposed to localise the SLA into smaller areas of particular value, the nearest of which would be Mynydd Mechell close to Lake Llygeirian (see below).</p> <p>Landscape features such as hedgerows and stone walls are covered by local planning policy whereby features should be retained and protected and their loss not permitted unless acceptable mitigation proposals are provided. Landscape character is also covered by local planning policy whereby development should not cause significant harm to Landscape Character Areas.</p> <p>Carreglwyd Historic Park and Garden lies approximately 300m to the west of the A5025 near Llanfaethlu. Cestyll Garden, which is registered as a Historic Park and Garden lies approximately 1km to the north-west of the A5025 near Cemlyn Bay. The special historic interest and settings of these areas are protected</p>

Studies undertaken	Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
	important cultural heritage feature, considered as an historic roadway built by Thomas Telford.	<p>wide area.</p> <p>The site lies within the Holy Island LANDMAP Visual and Sensory Aspect Area, which has an overall evaluation of 'High' and reflects the fact that it is comprised mainly of the undeveloped part of Holy Island.</p>	<p>by local planning policy.</p> <p>Three long distance recreational routes, namely the Wales Coast Path, National Cycle Route 5 and National Cycle Route 566, run close to the A5025 at various points, with both National Cycle Routes crossing the A5025. These paths are important for their amenity and recreational value.</p>
<p>Landscape character</p> <ul style="list-style-type: none"> <li>Previous studies by third parties</li> </ul>	<p>Landscape Character Area (LCA) 5 North West Anglesey within the IACC Landscape Strategy: an extensive drumlin field resulting in a classic 'basket of eggs' description for the landscape. The hillocks run south-west to north-east and the majority have a land cover of improved grassland. There are also areas of marsh, scrub and rocky outcrops at Mynydd y Garn and Mynydd Mechell. Wind farms form a distinctive feature in the landscape.</p> <p>Close to the border of LCA17 West Central Anglesey within the IACC Landscape Strategy: the rural heartland of Anglesey with undulating topography and rock outcrops influenced by underlying geology. Land cover is predominantly improved grassland broken up by</p>	<p>Landscape character for the Logistics Centre will be described in the Environmental Statement.</p>	<p>The area around the A5025 corridor is covered by LCA5: North West Anglesey within the IACC Landscape Strategy. LCA 5 is described as having an extensive drumlin field resulting in a classic 'basket of eggs' description for the landscape. The hillocks run south-west to north-east and the majority have a land cover of improved grassland. There are also areas of marsh, scrub and rocky outcrops at Mynydd y Garn and Mynydd Mechell. Wind farms form a distinctive feature in the landscape.</p> <p>The area is also covered by several LANDMAP areas. The A5025 lies predominantly within the north-west Drumlins and Wylfa Power Station Visual and Sensory LANDMAP areas. The north-west Drumlins area is described as a 'basket of eggs' glacial landscape, tranquil and pleasant in nature, with smooth oval hillocks, damp hollows and a land cover of medium-sized, rolling to undulating pasture fields with hedgerow boundaries. The Existing Power Station area is</p>

Studies undertaken	Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
	<p>mires, trees, hedgerows and hedgebanks.</p> <p>LANDMAP Visual and Sensory Aspect Area North-west Drumlins: 'basket of eggs' glacial landscape of smooth oval hillocks with damp hollows. Land cover of medium sized, rolling to undulating, pasture fields with hedgerow boundaries. Small villages, hamlets and scattered farms linked by small roads. Settled character in an unremarkable but tranquil, pleasant landscape.</p> <p>Close to the border of LANDMAP Visual and Sensory Aspect Area A55 Corridor: the A55 dual-carriageway crosses Anglesey diagonally and has six interchanges, with intrusive raised roundabouts, signs and lighting. On the whole the corridor fits well into the gently undulating topography and is not particularly conspicuous. It has shallow cuttings and embankments, with mainly hedges alongside. From the road there are views across the pleasant countryside and more dramatic views of the coast towards Holyhead.</p>		<p>described as a nuclear power station made up of 'uncompromising cubes' of buildings which 'loom on the skyline, partially screened by bunds and woodland'. The area is 'unattractive', 'exposed', 'noisy' and 'threatening'.</p> <p>The topography around the A5025 corridor is dominated by drumlin features which create a varied, undulating landscape of enclosed, sheltered areas and more exposed areas with open views. Topography generally ranges in height from 0m to 90m AOD, with Mynydd Y Garn in the north-west forming a prominent landmark in the landscape at 170m AOD. The largest water body close to the existing A5025 is Llyn Llygeirian near Mynydd Mechell. The largest watercourse is Afon Alaw south of Llanfachraeth. Smaller ponds are scattered infrequently throughout the farmland adjacent to the A5025 and several other smaller streams and ditches are also present.</p> <p>The majority of the area around the existing A5025 consists of medium-sized, regular to semi-regular, pastoral fields bordered by a mixture of hedgerows, fences and stone walls. The A5025 forms a man-made linear feature across the farmland, emphasised by areas of residential development at villages such as Llanfachraeth, Llanfaethlu and Llanrhuwlad. Scattered farmsteads and houses are also dotted along the road and within farmland to either side.</p>

Studies undertaken	Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
			<p>The dominant vegetation type is native hedgerow along field boundaries and roads. Larger groups of trees and woodland blocks are less frequent, resulting in a relatively open and exposed landscape. Larger woodland blocks are found around the Existing Power Station, close to the A5025 at Cefn Coch, east of Llanrhuddlad, north-west of Llanfaethlu at Carreglwyd Historic Park and Garden, east of the A5025 at Gronant and Llyn Hall and around Llanfachraeth. Isolated areas of heath or marsh are interspersed amongst the pastoral farmland. Where hedgerows are not used as field boundaries, drystone walls are common.</p>
<p>Existing views</p> <ul style="list-style-type: none"> <li>• Desk-based study</li> </ul>	<p>Views towards the site are relatively well contained by drumlin features to the west and south. Views from the east and north are more open, although the flat nature of the landscape around the site enables filtering of views by hedgerows and scrub blocks.</p> <p>Views south out of the site are dominated by the A5 and A55 road corridors. Views out to the north, west and east are more rural in character, although detractors such as the DVSA site are present.</p>	<p>Existing views for the Logistics Centre will be detailed in the Environmental Statement.</p>	<p>The undulating nature of the landscape encloses some views but affords more open views elsewhere. Views towards the existing A5025 are possible from several residential properties and public rights of way. A high proportion of residential properties with views towards the A5025 are located in the villages of Valley, Llanfachraeth and Llanfaethlu. Away from these villages are numerous individual farmsteads dotted throughout the surrounding farmland, many of which have views towards the A5025. A number of public rights of way cross or are in close proximity to the A5025, including the Wales Coast Path and National Cycle Routes, the users of which form visual receptors.</p> <p>There are more long-distance views possible</p>

Studies undertaken	Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
			towards the A5025 from higher ground such as at Mynydd Y Garn, and where the road lies on higher topography in relation to its surroundings, such as at Llanfaethlu and Llanrhuddlad. There are several peaks of higher ground within the AONB to the west of the A5025, where there are views towards the existing road.



## 10.2.2 Potential Environmental Effects and Mitigation

### *Park and Ride facility at Dalar Hir*

11. The following potential visual receptors were identified through desk-based study:

- Users of the AONB landscape;
- Users of the SLA landscape;
- Residents at Dalar Hir farmhouse;
- Visitors to Bryn Goleu farmhouse and Cartio Môn Go-Karting centre;
- Residents at Gwyddfor Residential Home;
- Residents of property to the north including Dalar Bach and Castell;
- Users of public footpath near Dalar Bach;
- Residents of property to the west including Penymynydd;
- Residents of property to the south at Llanfihangel yn Nhowyn; and
- Users of National Cycle Route 8.

12. A number of potential environmental effects have been identified. These include changes in the special character of the SLA due to new buildings and associated infrastructure within a predominantly rural area.

13. There would also be changes in boundary features and the landscape pattern, as a result of the loss of several boundary features to accommodate the new buildings and associated infrastructure.

14. Effects on views from Bryn Goleu farmhouse, Gwyddfor Residential Home, Cartio Môn Go-Karting centre, and from properties to the north (including Dalar Bach and Castell) would be likely as a result of the new 6m high buildings in the landscape.

15. Similarly, there would be effects on views from the public footpath near Dalar Bach, from properties to the west (including Penymynydd), from the south (at Llanfihangel yn Nhowyn), and from the National Cycle Route 8, all as a result of the construction and operation of the new buildings on site.

16. The effect on views from the AONB would be partially mitigated by retaining the northern boundary hedgerow and views from Bryn Goleu farmhouse and Cartio Môn Go-Karting centre would be mitigated by retaining the eastern boundary hedgerow. The retention of these hedgerows would provide filtering of views. This would also mitigate effects on views from properties to the north including Dalar Bach and Castell, and from the east (Gwyddfor Residential Home).

17. Potential effects on views from properties to the south at Llanfihangel yn Nhowyn would be mitigated by retaining the linear belt of planting along A5 Holyhead Road, south of the site

18. Changes in the special character of the SLA, as well as changes due to loss of boundary features and field pattern would be mitigated by maintaining the existing field pattern and boundary features where not affected by building and associated infrastructure; in particular maintaining the existing strong boundary hedgerow to the north of site.

19. Good construction site management including temporary hoarding, and keeping the construction site tidy, would help to mitigate visual intrusion during construction.

### ***Logistics Centre***

20. The wider Parc Cybi site is low-lying and undulating, with rocky outcrops. Land cover is predominantly of pasture fields delineated by a mixture of fencing, stone walls and low, windswept hedgerows and tree belts. Due to the undeveloped nature of the site, the introduction of a new building has the potential for adverse effects on landscape and visual amenity.
21. However, the potential for effects should be considered in the context of a site with outline planning consent, close to the A55 and within the settlement boundary of Holyhead.
22. A range of potentially minor to moderate effects during construction has been identified and a brief summary of these is listed below:
- total or partial loss of existing landscape boundary features;
  - loss of small area of woodland;
  - temporary and short-term adverse effects on the Holyhead LANDMAP Visual and Sensory Aspect Area due to the influence of construction activity and the loss of boundary features and woodland;
  - temporary visual effects associated with plant, traffic and construction activities to the residential community of Trearddur to the south and travellers along the A55 and B4545;
  - effect on scenic quality and views of Anglesey AONB, which is likely to be minor in nature due to the existing context of the adjacent developed and industrial landscape; and
  - night-time views of lighting associated with site construction activities.
23. A range of potentially minor to moderate effects has been identified during the operation stage, and a brief summary of these is listed below:
- Effect on scenic quality and views on Anglesey AONB from the presence of the Logistics Centre and associated activities, but this is likely to be minor in nature due to the existing context of the adjacent developed and industrial landscape.
  - Visual effect of operational lighting, though the effect would be reduced by the context of the surrounding industrial development and A55 corridor.
  - Presence of the Logistics Centre and associated activities, during the construction of the Power Station, in views from the residential community of Trearddur to the south and to travellers along the B4545 and A55 corridor.
  - Effect on the Holyhead LANDMAP Visual and Sensory Aspect Area due to the presence of the Logistics Centre and associated activities.
24. Embedded design commitments would reduce operational effects associated with lighting. Lighting has been designed to reduce light pollution, which is in line with the Isle of Anglesey aim to achieve a Dark Sky Reserve Status (e.g. avoid lantern uplift to reduce light pollution and reduce light spill onto adjacent areas and environmentally sensitive zones).
25. New planting as part of the developer's wider proposals for the Parc Cybi industrial estate would mitigate the on-site vegetation loss. Within the Logistics Centre site there would be limited opportunities for landscape planting, but where possible, opportunities would be considered for landscape and biodiversity enhancement, such as scrub planting and using native grassland species.

### ***A5025 Off-line Highway Improvements***

26. Potential for effects on the existing landscape environment as a result of the construction and operation of the A5025 Off-line Highway Improvements include the following.

- The proposed A5025 Off-line Highway Improvements are located within the AONB at Llanfaethlu, which could result in the loss of protected land and a reduction in visual amenity.
  - The A5025 Off-line Highway Improvements would occur within the SLA, which would result in a reduction in visual amenity and tranquillity (particularly during construction), acknowledging that the majority of works would take place close to the A5025 corridor or close to more urban areas which would limit effects.
  - Construction of the A5025 Off-line Highway Improvements would introduce man-made earthwork features, although the undulating nature of the landscape would be able to accommodate these changes to a certain extent. The greatest potential for change would be at Llanfachraeth, Llanfaethlu and Cefn Coch.
  - Potential for effects on field patterns, reductions in field size and alteration to their shape. Hedgerows and stone walls would be partially lost along the A5025 where the A5025 Off-line Highway Improvements tie into the existing carriageway.
  - Partial loss of hedgerow field boundaries and stone walls at Llanfaethlu, where the A5025 Off-line Highway Improvements cross existing field patterns.
  - Vegetation loss (e.g. scrub and some individual trees at Cefn Coch).
27. Changes to landscape elements may result in adverse effects on the north-west Drumlins LANDMAP area, and there would be a reduction in visual amenity and tranquillity due to construction activity and operational traffic, most noticeable during construction. There would be minimal changes to the Wylfa Power Station LANDMAP area.
28. Temporary construction works such as site compounds, topsoil mounds and working areas may introduce additional adverse effects on the landscape through topsoil mounds on topography, and from the loss of agricultural land and hedgerows.
29. A seascape assessment will not be undertaken; the A5025 Off-line Highway Improvements would not have a significant effect on seascape character due to the scale of the improvements and their distance from the coast. This conclusion was drawn following a preliminary survey of coastal areas, which confirmed the limited extent of potential visibility of the A5025 Off-line Highway Improvements from these locations.
30. Mitigation measures will be incorporated into the overall designs to avoid, reduce or offset potential effects. Measures are likely to include tree and shrub planting and replacement hedgerows in areas such as Valley and Llanfachraeth, or scrub planting and hedgerows where the landscape is more open in character (e.g. at Llanfaethlu and Cefn Coch).
31. Establishment of mitigation vegetation would integrate new and improved sections of carriageway into the landscape and help restore vegetation cover and landscape pattern in the longer term. Notwithstanding this, scoping concluded there to be potential for adverse effects to remain on the SLA, topography, landscape character and landscape pattern.
32. Potential visual effects include the following:
- Visibility from the Anglesey AONB at several locations, in particular around Llanfaethlu, with close-range views available from Llanfachraeth and Llanfaethlu in which temporary construction works would potentially reduce visual amenity. Longer distance views would also be available.
  - Open, direct views from visual receptors during construction and operation phases. Construction works would be most visually intrusive due to the presence of temporary activity and works, the effects of which would be most noticeable from residential

properties and public rights of way on the eastern edge of Llanfachraeth, residential properties and public rights of way around Llanfaethlu, and isolated farms at Cefn Coch.

- The A5025 Off-line Highway Improvements would alter existing views through the formation of road embankments, vegetation loss and introduction of new bridge structures.
- During Operation, the A5025 Off-line Highway Improvements would be less visually intrusive and would appear as a wider road corridor or wider urban area when viewed in context with the existing A5025 and buildings in the villages.

33. Establishment of mitigation, incorporated into the final design of the proposals will reduce effects on views from the AONB as traffic and man-made earthwork features would become filtered or screened. Mitigation will also assist with visual integration and screening of development form and operational traffic; however it is likely that adverse effects would remain for many visual receptors to varying degrees.

### 10.2.3 Proposed Scope, Methodology and Criteria

#### **Scope**

34. The scope, methodology and criteria for assessing potential landscape and visual impacts are outlined in section 10.4 of the 2016 Scoping Report, and this will also apply to the Associated Development. The overarching study area for the Wylfa Newydd Development Area has been informed by a digitally produced Zone of Theoretical Visibility (ZTV) extending up to 15km from the boundary of the Wylfa Newydd Development Area, and a detailed study area extending up to 6km. The ZTVs for the Park and Ride Facility and the Logistics Centre will be developed using the computer modelling, and used to define the study area for the assessment of the Associated Development. This will be detailed within the Environmental Statement. The study area for the A5025 Off-line Highway Improvements has been defined using the ZTVs as up to 3km from the carriageway centre line of the preferred options. It is unlikely that any significant landscape or visual effects would occur beyond this distance.

35. A detailed level of assessment will be undertaken to identify effects on landscape and visual receptors, building on information collected as part of this scoping exercise.

#### **Methodology**

36. In order to inform the assessment of the likely magnitude of landscape and visual changes, photomontages will be prepared to illustrate the scale and massing of the main proposed buildings, structures and other features in the context of the existing landscape and representative views. Photographs will be taken in accordance with the Landscape Institute Advice Note 'Photography and Photomontage in Landscape and Visual Impact Assessment' (January 2011).

37. Two images will be prepared for each of the photomontage viewpoints. The first will illustrate the view on completion of construction. The second will illustrate the view approximately 15 years after proposed landscaping, when proposed planting would have begun to mature.

38. The LVIA will comprise the following steps:

- identification of the study area;
- baseline studies, leading to identification of landscape and visual receptors with the likely potential for significant effects and an assessment of their value;
- evaluation of the sensitivity of potential receptors by considering their susceptibility to change alongside the value of landscape and views;

- formulation of mitigation measures to address the likely adverse effects; and
- assessment of the magnitude and significance of effects after allowing for proposed mitigation.

### ***Assessment Criteria***

39. The assessment criteria for valuing the receptors and assessing magnitude and significance will be as described in the 2016 Scoping Report.

## 11 Terrestrial and Freshwater Ecology

1. This chapter outlines the changes in scope in relation to the terrestrial and freshwater ecology assessment since submission of the 2016 Scoping Report. Section 11.1 addresses the potential change in the scope of the original assessment as a result of the updated Power Station Site and Off-Site Power Station Facilities designs, and section 11.2 considers the potential effects of the Associated Development now being included in the application for development consent.
2. This chapter should be read in conjunction with Chapter 11 of the 2016 Scoping Report.

### 11.1 Changes to Existing Scope

3. Chapter 11 of the 2016 Scoping Report sets out the scope, methodology and criteria for assessing potential impacts on terrestrial and freshwater ecology in the vicinity of the Wylfa Newydd Development Area.
4. Key changes to the Wylfa Newydd Power Station described in chapter 3 of this addendum that could affect terrestrial and freshwater ecology include the following:
  - An area of land added to the Wylfa Newydd Development Area to facilitate better landscape design will result in a change to the boundary of the 500m study area.
  - The expansion of the On-Site Campus (Temporary Workers' Accommodation) within the Wylfa Newydd Development Area would have potential additional effects on terrestrial and freshwater ecology and protected habitats, notably Tre'r Gof SSSI.
  - The landscape bunding which would be placed around the raised building platform could have potential effects on the surrounding habitats and species.
  - The Off-Site Power Station Facilities have been co-located at Llanfaethlu avoiding impacts at the former AECC site.
5. The list of designated sites to be considered remains as described in table 11.1 of the 2016 Scoping Report. The study area was defined in the 2016 Scoping Report as the Wylfa Newydd Development Area plus a zone extending for a further 500m. Whilst the proposed layout of the Wylfa Newydd Development Area has changed with some proposed merger of facilities, expansion of the On-Site Campus and additional areas for landscape bunding, the study area as defined and the scope of the terrestrial and freshwater ecology assessment is considered to be appropriate given the changes identified.
6. The 2016 Scoping Report identified that a similar approach would be taken for the off-site facilities, which are now proposed to be co-located at Llanfaethlu.
7. The scope for the EIA of the Power Station Site and Off-Site Facilities therefore remains as described in the 2016 Scoping Report.
8. A number of additional points are noted from the Scoping Opinion provided by the Secretary of State in response to the 2016 Scoping Report. These include the following, which make reference to comments included in Appendix B Responses to 2016 Scoping Opinion:
  - The approach to the Habitats Regulations Assessment (HRA) for the Wylfa Newydd Project has been developed through the regular HRA Working Group meetings and discussions with the Planning Inspectorate. This liaison will continue until submission of the HRA and Environmental Statement. Baseline reports and technical summary reports will also be provided to NRW for review as and when they are prepared and ready for submission. Ramsar wetlands and sites in the process of designation as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) will be



assessed in the same way as sites already designated as SPAs and SACs, as required by Welsh Government Policy (Appendix B ref.33).

- A number of terrestrial and aquatic Invasive Non-Native Species (INNS) are present on site and the proposed works have the potential to cause both the introduction and spread of INNS. Removal of INNS forms part of the Site Preparation and Clearance (SPC) works. A Biosecurity Risk Assessment (BRA) will therefore be included in the Environmental Statement, detailing measures that would be undertaken to control and eradicate INNS within the area of works. The BRA will outline the provisions which would be implemented during all phases of the Project, including construction and operation of the facility. This BRA will also be required to inform the HRA (Appendix B ref.34).
- The IACC has confirmed that Wylfa Head will not be designated as a Local Nature Reserve nor will be progressed as a County Wildlife Site (Appendix B ref.35).
- Mitigation measures will be provided in the Environmental Statement for avoiding and reducing impacts on all receptors scoped in to the assessment. Local Biodiversity Action Plan (LBAP) habitats will be referred to and effects assessed within the Environmental Statement (Appendix B ref.36). Technical summary reports will be appended to the Environmental Statement.
- A stand-alone Water Framework Directive (WFD) assessment will be provided as an appendix to the Environmental Statement (Appendix B ref.37).
- The potential impacts of lighting on ecological receptors during both construction and operation will be assessed and reported on within the Environmental Statement and cross-reference made to the landscape and visual impact assessment (Appendix B ref.38).
- The Environmental Statement will include provisions in regard to monitoring and ecological compliance audit requirements (Appendix B ref.39).

## 11.2 Associated Development

### 11.2.1 Existing Environment

9. The study area for terrestrial and freshwater ecology focusses on a 500m zone around each site. The study areas were determined by professional judgement with regard for the likely extent of potential effects on internationally and nationally designated sites, individual species, and species groups around the sites. This approach is in line with the definition of the study area defined in the 2016 Scoping Report for the Wylfa Newydd Development Area and the Off-Site Facilities.
10. A number of ecological surveys have been carried out to inform our understanding of the existing baseline. These include a desk-based study, extended Phase 1 habitat survey, and baseline surveys for protected species: bats, barn owls (*Tyto alba*), badgers (*Meles meles*), great crested newts (*Triturus cristatus*), water voles (*Arvicola amphibius*), and reptiles.
11. A summary of the surveys is presented in table 11.1 and the key findings in table 11.2. Key receptors are also shown on the environmental constraints plan contained in Appendix C.

**Table 11.1 Studies undertaken to inform baseline**

Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
<p>Extended Phase 1 habitat surveys and Great Crested Newt Habitat Assessment have been undertaken in 2014. Surveys included a walkover of key habitats (aquatic and freshwater), used to determine sampling locations for the freshwater baseline surveys. A number of other surveys were carried out:</p> <ul style="list-style-type: none"> <li>• Internal and external building assessment as reported in 'Dalar Hir Bats and Barn Owl Baseline Surveys'.</li> <li>• Assessments carried out on one building at Dalar Hir Farm and 11 buildings at the Cartio Môn Go-Karting centre.</li> <li>• Dalar Hir Badger Baseline Surveys. Survey of suitable habitat for supporting badger within the site, and a buffer zone of 30m from the site boundary to record signs of badgers.</li> <li>• Dalar Hir Water Vole Baseline Surveys carried out in March 2014 within the site and a 500m buffer zone of the site boundary. Suitable habitat was searched for evidence of water voles.</li> <li>• Great Crested Newt Baseline Surveys. Four presence/absence surveys on ponds within the study area (the site and a 500m buffer zone surrounding the site boundary).</li> <li>• Dalar Hir Reptiles Baseline Surveys. Suitable habitat identified. Seven survey visits between April and August 2014 in</li> </ul>	<p>An extended Phase 1 habitat survey of the two Parc Cybi sites was completed in 2015.</p>	<p>For the purposes of scoping, a study area was adopted focusing on a buffer 250m either side of the existing A5025 corridor and the A5025 Off-line Highway Improvements. A further study area extending outward to 2km was also adopted during scoping to identify sites of European and/or national importance and species records at distance from the A5025.</p> <p>Baseline surveys, covering key ecological species, were completed along the A5025 corridor. These focused on the off-line improvement sections in 2013 and 2014, and included:</p> <ul style="list-style-type: none"> <li>• A Phase 1 habitat survey carried out where access could be obtained, and included a buffer zone approximately 250m either side of the A5025.</li> <li>• Amphibian surveys within 500m of the A5025.</li> <li>• Bat buildings, trees and transect surveys within 250m of the A5025.</li> <li>• Badger surveys within 500m of the A5025.</li> <li>• Otter and water vole surveys within 500m of the off-line improvement sections and 250m of the on-line improvement sections.</li> <li>• Breeding and wintering bird surveys within 250m of the off-line improvement sections and 100m of the on-line improvement sections.</li> <li>• Reptile habitat suitability assessment within 250m of the A5025</li> <li>• Hedgerow surveys within 100m of the A5025.</li> </ul>

Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
optimal survey conditions.		<p><b>Freshwater Ecology Species and Habitats</b></p> <p>Baseline surveys, covering key ecological receptors, were completed in 2014 for the A50252 Off-line Highway Improvements extending to 250m beyond the A5025. The following surveys were undertaken:</p> <ul style="list-style-type: none"> <li>• Walkover survey and physical habitat assessment.</li> <li>• Phytobenthos (diatoms) surveys.</li> <li>• Water quality surveys.</li> <li>• Macroinvertebrate surveys.</li> <li>• Macrophyte surveys.</li> <li>• Fish surveys.</li> <li>• Pond surveys.</li> </ul> <p>During all surveys incidental sightings of non-native and invasive aquatic plant species were recorded.</p>

Table 11.2 Summary of baseline information

	Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
Protected Sites and Habitats Present. Invasive Non-native Species Information.	<p>Llyn Traffwll SSSI is approximately 900m south of the site and is hydrologically connected.</p> <p>Habitats recorded onsite were improved grassland, semi-improved neutral grassland, poor semi-improved grassland, marshy grassland, hedgerow, young plantation woodland, broadleaved semi-natural woodland, scattered scrub,</p>	<p>Areas of scrub, ditches and low lying wetland are present, including a pond on the north-east site boundary function as an attenuation basin for road run-off.</p>	<p>The results of the Phase 1 Habitat survey indicate that the area surrounding the A5025 is dominated by agricultural land, generally found to comprise improved and semi-improved grassland and arable land. The A5025 is generally bordered by hedgerows with walls, fences, ditches and streams.</p> <p>There are three European sites within 2km of the</p>

	Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
	<p>tall ruderal vegetation, ponds, ditches (wet and dry), bare ground and buildings.</p> <p>Japanese knotweed, <i>Montbretia</i> and Canadian pondweed recorded on site.</p>		<p>A5025:</p> <ul style="list-style-type: none"> <li>• Ynys Feurig, Cemlyn Bay and the Skerries Special Protection Area (SPA).</li> <li>• Cemlyn Bay Special Area of Conservation (SAC).</li> <li>• Llyn Dinam SAC.</li> </ul> <p>There are also a number of nationally designated sites within 2km of the A5025. The closest sites to the A5025 are:</p> <ul style="list-style-type: none"> <li>• Beddmanarch-Cymyran SSSI (approximately 50m west of the A5025).</li> <li>• Llyn Llygeirian SSSI (approximately 250m east of the A5025).</li> <li>• Cae Gwyn SSSI (approximately 250m west of the A5025).</li> <li>• Llyn Garreg-Lwyd SSSI (approximately 350m west of the A5025).</li> </ul> <p>Three main watercourses cross the A5025 with a number of smaller streams and field ditches running alongside the road. Several ponds were located within the study areas.</p>
Barn Owl	<p>No evidence of barn owl recorded on site.</p> <p>Habitats on site are suitable for foraging barn owls.</p>	N/A	N/A
Bats	No evidence of bats recorded on site.	N/A	<p>Low bat activity by widespread and common bat species was recorded across the survey areas: common pipistrelle bat; soprano pipistrelle bat; brown long-eared bat; noctule bat; and <i>Myotis</i></p>

	Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
			<p>bat species.</p> <p>55 trees recorded with the potential to support bats, with 27 considered to be of moderate or high potential.</p> <p>37 buildings with the potential to contain bat roosts were identified. Roosts were recorded at Fadog Frech, Bryn Maethlu Cae'r-bryniau, Pen yr orsedd, and Cefn Coch.</p> <p>Species recorded were soprano pipistrelle, brown long-eared, <i>Myotis</i> bat species, noctule, and common pipistrelle.</p> <p>Two lime kilns and an outside toilet were highlighted as having the potential to support hibernating bats. Survey work to date has not found any evidence for hibernating bats in them. The lime kiln near Fadog Frech has since collapsed.</p>
Badger	<p>One confirmed active outlier sett comprising a single hole.</p> <p>Two possible outlier setts comprising single holes (status unconfirmed).</p> <p>No evidence of foraging or latrines; and</p> <p>Concluded that low numbers of badgers had been using the site.</p>	N/A	<p>Very little evidence of badgers recorded during the survey work. A single live badger sighting was recorded near Cefn Coch farm during bat activity survey work.</p>
Water Vole	Evidence of water vole on three ditches and two ponds	Evidence of water vole was found in the 2015 surveys and follow-up surveys will be undertaken where necessary to establish the extent of usage of the site for impact assessment and legislative	Water vole have been recorded on six watercourses.

	Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
		compliance.	
Otter	N/A	N/A	Otter have been recorded on the Afon Alaw and five other watercourses.
Great Crested Newt	No great crested newt evidence was recorded within the site. Great crested newts were recorded in two ponds south of the site boundary.	Habitats with the potential to support Great Crested Newt were found. Further surveys will be undertaken where necessary.	Great crested newts recorded as present in six water bodies. Common frog, common toad, palmate and smooth newts were also recorded within 250m.
Reptiles	No evidence of reptiles recorded on site.	Habitats with the potential to support reptiles were found during the 2015 surveys. Further surveys will be undertaken where necessary.	Suitable habitat for reptiles has been identified within 250m and common lizard was recorded during Phase 1 habitat survey.
Birds	Sixteen bird species were observed on site of which nine are notable species. These include five amber list species of medium conservation concern. These were swallow, meadow pipit, kestrel, wheatear and dunnock. The dunnock is also listed on the United Kingdom Biodiversity Action Plan (UKBAP). The remaining four species are listed on both the UKBAP and red list of species of high conservation concern; these were linnet, starling, lapwing and house sparrow.	Habitats with the potential to support breeding birds were recorded during the 2015 surveys. No surveys have currently been undertaken for breeding birds	Breeding evidence was recorded for 39 species within 250m of the A5025 which included the following Section 42 list species: House Sparrow, Dunnock, Song Thrush, Lesser Redpoll, Linnet, Skylark, Grasshopper Warbler, Reed Bunting.  The wintering bird surveys observed many common species and included the following Section 42 list species: Black-headed Gull; Bullfinch; Curlew; Dunnock; Herring Gull; House Sparrow; Lapwing; Linnet; Reed Bunting; Skylark; Song Thrush; Starling



	Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
Hedgerows	N/A	N/A	Seven hedgerows within 100m were considered important as defined by the Hedgerow Survey Handbook <sup>1</sup> .
Freshwater Habitats and Quality.	There are a number of small watercourses within the site itself and in the immediate surrounds which are characteristic of a rural ditch system. Watercourses were typical of lowland setting and generally had low ecological value, although two rare aquatic plant species have been recorded outside the site boundary.	A large attenuation pond associated with the A55 was recorded immediately north of the site boundary.	<p>Five Water Framework Directive (WFD) surface waterbodies are present within 250m of the off-line improvement sections. Further consideration to the WFD waterbodies is given in Chapter 14 of this report, with explanation provided of designated ecological sites with hydrological connections.</p> <p>Water quality: Generally found to be moderate to good. There were incidences of elevated orthophosphates at some sites, which may be attributed to land use and periodic application of fertilizers. Additionally, copper, iron and zinc were elevated at a number of the sample sites.</p> <p>Pond Surveys: Three ponds were eligible for PSYM analysis. Based on the data available, there is evidence of nutrient enrichment relative to the low baseline expected from the west of Britain. The relatively uniform habitat and low water levels are not conducive to diverse invertebrate life which explains the low species diversity. The ponds visited were largely</p>

<sup>1</sup> Defra (2007) Hedgerow Survey Handbook. A standard procedure for local surveys in the UK. Defra, London. 2nd Edition

	Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
			ephemeral and heavily influenced by agriculture. Water quality was variable between ponds.
Macroinvertebrates	Macroinvertebrate communities present were generally species poor and indicative of slow flowing waterbodies. There were four species (two leeches and two snails) of local conservation importance found within the area	N/A	Macroinvertebrates: The majority of the sites were field drains with ditch-like habitat and flow types, which limited the macroinvertebrate communities. However there were a number of sites on the main watercourses and their tributaries which demonstrated a good diversity of habitat and flow types for macroinvertebrates and were classified under WFD metrics as of good quality
Macrophytes	N/A	N/A	Macrophytes: Analysis revealed that the overall number of truly aquatic groups across the study area was low because of seasonal drying of ditches and silted substrates within the ditch systems in the study area. The nationally scarce macrophyte, the three lobed water-crowfoot, was discovered (singleplant) in one watercourse
Phytobenthos	N/A	N/A	Phytobenthos (Diatoms): Most sites scored as medium to good quality.
Fish	European eel ( <i>Anguilla anguilla</i> ) were identified at two sites within the area (table F9.1). Fish fauna across the site was dominated by three spined stickleback ( <i>Gasterosteus aculeatus</i> ) and nine spined stickleback ( <i>Pungitius pungitius</i> ).		Of the four sites surveyed, two watercourses were found to have the greatest variety of species. Principal fish species found within the watercourses were 3 and 9 spined stickleback, brown trout, river lamprey and European eel. The presence of both juvenile and adult lamprey suggest that these watercourses are important spawning grounds, containing both suitable gravels for spawning and silt beds for juveniles.

## 11.2.2 Potential Environmental Effects and Mitigation

### ***Park and Ride facility at Dalar Hir***

12. Potential environmental effects from the Park and Ride facility at Dalar Hir are primarily associated with land take. They would be:
- loss of hedgerow habitat and subsequent bat commuting routes;
  - loss of ditch habitat used by water voles; and
  - loss, diversion or culverting of waterbodies (ditches and ponds) and possible terrestrial habitat during construction, with potential effects on great crested newt.
13. Other potential environmental effects would include disturbance to species through noise, vibration, and lighting. Lighting has the potential to disturb bat commuting corridors, whilst construction noise could disturb fish, and other species, within waterbodies.

### ***Logistics Centre***

14. Areas of scrub, ditches and low lying wetland are present at proposed site for the Logistics Centre at Parc Cybi, including a large attenuation pond on the north-east site boundary. There is the potential for effects on species including water voles, reptiles and great crested newt.

### ***A5025 Off-line Highway Improvements***

15. Potential effects on terrestrial ecology from the A5025 Off-line Highway Improvements would be:
- Land take resulting in habitat loss: likely to occur in areas within the construction footprint including temporary access routes and site compound areas.
  - Land take resulting in severance and fragmentation: potential to occur where natural movements of species are reduced which could result in a number of smaller areas of habitat which are of less ecological value and potentially insufficient to support viable populations of protected species.
  - Land take and/or changes in air and water quality resulting in habitat degradation: potential to occur in areas adjacent to the new road.
  - Direct mortality during construction: potential to occur as a direct result of the construction of the road, generally during the site clearance phase.
  - Direct mortality during operation: potential to occur as a result of collision with a vehicle or an acute pollution incident.
  - Noise, vibration and lighting resulting in disturbance: direct impact on faunal species reducing their ability to forage or breed.
16. A potential effect on freshwater ecology from the A5025 Off-line Highway Improvements would be land take resulting in habitat loss, however, this is anticipated to be minimal on off-line sections and of concern only in minor water courses or ditches.

### ***Potential Mitigation***

17. Mitigation measures for the Associated Development will be described in line with chapter 7 of this addendum. The potential to embed the following mitigation into the design proposals is being considered.
- Designing the footprint of the improvement works to avoid waterbodies on site.
  - Design of clear span bridges over some water courses and large culverts with mammal ledges elsewhere to maintain connectivity for species.

- Maintaining a buffer of at least 10m between the developments and waterbodies where possible. This would limit disturbance to species such as water vole as burrows are likely to extend 3m to 5m from the toe of the bank (Dean *et al*, 2016).
  - Retaining trees, hedgerows, ditches and stone walling where possible, together with space required for root protection zones (subject to results of tree surveys). A provisional buffer of 5m has been identified in the initial layout proposals but this will be reviewed when further survey work results are available for high value trees protected in accordance with BS 5837:2012.
  - Design and construction of appropriate foul and surface water drainage systems to collect and where appropriate attenuate the drainage prior to discharge.
  - Designing lighting to avoid hedgerows and watercourses. This would help to reduce effects on commuting corridors for bats. Lighting specification would be low-spill and directional.
18. Site constraints and requirements for buffer zones will be kept under review based on further survey work so that further sensitive areas can be avoided if required to mitigate potential effects upon ecology where possible.
19. Horizon Nuclear Power shall also comply with all Legal and licensing requirements (e.g obtaining European Protected Species licensing) relating to the potential presence of protected species, or the presence of non-native invasive species on site, will be met should survey work confirm that the species are present and that the proposals would be likely to breach the legislation protecting the respective species.
20. Good construction practices would be adopted including the following:
- Best practise pollution prevention and construction site management;
  - Demarcating and fencing-off working areas and haul routes to avoid sensitive ecological areas and root protection zones and to protect species from disturbance.
  - Completing any required vegetation clearance outside of the bird breeding season (March-August inclusive). If clearance is required within this period, this may be able to be carried out under ecological supervision.
  - Reduction of night-time construction lighting from affecting sensitive habitats such as hedgerows and watercourses. through measures such as directional lighting.

### 11.2.3 Proposed Scope, Methodology and Criteria

#### ***Park and Ride Facility at Dalar Hir***

21. Baseline data for the Park and Ride facility at Dalar has identified the need to consider the following ecological receptors:
- Water vole;
  - Bats;
  - Waterbodies (ditches and ponds).
22. Potential effects on these receptors would result from habitat loss, and disturbance from noise, vibration and lighting.
23. The potential effects on species of breeding birds which will be present on-site and in adjacent habitats are considered to be minimal once mitigation measures such as avoiding vegetation clearance during bird nesting season have been taken into account. They have therefore been scoped out of further consideration as part of the EIA process.

### ***Logistics Centre***

24. Given the habitats present on site, there is the potential for the following ecological receptors to be present on site and affected by the development:

- Amphibians (including great crested newts).
- Reptiles.
- Badger
- Water vole

### ***A5025 Off-line Highway Improvements***

25. Scoping has identified the need to further consider species, habitats and designated wildlife sites around the A5025 Off-line Highway Improvement sections. Potential impacts to the following species / groups will be considered as part of the assessment:

- Riparian mammals (otter and water vole).
- Bats.
- Amphibians (including great crested newts).
- Fish.

26. There are potential risks to birds, badgers, reptiles and other aquatic species associated with habitat loss and water pollution. Considering the small scale of the habitat loss and the mitigation measures (e.g. no site clearance during the bird breeding season) that would be implemented to ameliorate these impacts, this would result in minimal or no effects on these species / groups, therefore they have been scoped out of further consideration as part of the EIA process.

27. The A5025 Off-line Highway Improvements will be subject to a WFD assessment for those waterbodies scoped into the assessment (see Section 14), to ensure compliance with the aims of the WFD and the goals of the Western Wales River Basin Management Plan. The WFD assessment will be included as an appendix to the Environmental Statement.

### ***Methodology***

28. The assessment methodology for the Park and Ride facility at Dalar Hir and the Logistics Centre will be as described in section 11.4 of the 2016 Scoping Report.

29. The assessment methodology for the A5025 Off-line Highway Improvements will follow the Highways Agency Interim Advice Note (IAN) 130/10 'Ecology and Nature Conservation: Criteria for Impact Assessment (Highways Agency, 2010) and the Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment (DMRB, 2008) and Volume 10 Environmental Design (DMRB, 1992).

30. In parallel to the EIA process, a risk assessment document will be produced for the Park and Ride facility at Dalar Hir, the Logistics Centre and the A5025 Off-line Highway Improvements which details how the scheme will be delivered in compliance with all relevant legislation. These documents will be included in an appendix within the Environmental Statement.

### ***Assessment Criteria***

31. The assessment criteria for the Park and Ride Facility and the Logistics Centre will follow the generic assessment criteria set out in Chapter 7 of the 2016 Scoping Report and any

amendments contained within chapter 7 of this addendum. This incorporates elements of the Guidelines for Ecological Impact Assessment in the United Kingdom (2016).

32. The assessment of effects on ecology for the A5025 Off-line Highway Improvements will follow the assessment methodology set out in the DMRB Interim Advice Note 130/10 Ecology and Nature Conservation: Criteria for Impact Assessment, and will include discussion of the following:
- SI (Sign): Positive (beneficial (+ve)) or Negative (adverse (-ve)).
  - PO (Probability of Occurring): Certain, Probable, Unlikely.
  - CO (Complexity): Direct, Indirect, Cumulative.
  - EC (Extent): Area measures and percentage of total (e.g. area of habitat/ territory lost);
  - SZ (Size): Description of level of severity of influence (e.g. complete loss, number of animals affected).
  - RE (Reversibility): Reversible or Not Reversible (can the effect be reversed, whether or not this is planned).
  - DU (Duration): Permanent (P) or Temporary (T) in ecological terms. Where differing timescales are determined in relation to the life-cycle of the receptor, these should be defined.
  - TF (Timing and frequency): Important seasonal and/or life-cycle constraints and any relationship with frequency considered.
33. Where required, the criteria will be reviewed and expanded upon during the assessment process. In addition, where a given impact assessed might be considered to be a low probability event, such as a major spill or a pollution event associated with flooding, the significance of this will be qualitatively reduced. In such instances detailed justification for this decision will be provided.



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## 12 Radiological Issues

1. This chapter outlines the changes in scope in relation to the radiological issues assessment since submission of the 2016 Scoping Report. Section 12.1 addresses the potential change in the scope of the original assessment as a result of the updated Wylfa Newydd Power Station and Off-Site Power Station Facilities designs, and section 12.2 considers the potential effects of the Associated Development, which are now being included in the application for development consent.
2. This chapter should be read in conjunction with Chapter 12 of the 2016 scoping report.

### 12.1 Changes to Existing Scope

3. Chapter 12 of the 2016 Scoping Report set out the scope, methodology and criteria for assessing potential radiological effects on the safety, security and protection of people and the environment in relation to the design, construction, operation and decommissioning of the Wylfa Newydd Power Station and the transport of nuclear material.
4. Key changes to the Power Station Site described in chapter 3 of this addendum that could potentially affect radiological effects include modifications to the design of the:
  - Reactor Building and Main Stack from a twin cruciform to a single power island;
  - Marine Off-Loading Facility;
  - Radioactive waste storage buildings; and
  - Cooling Water System and breakwaters.
5. These structures were all considered in the 2016 Scoping Report and the amendments proposed do not affect discharge or storage inventories, and so do not change the scope of the proposed assessment.
6. A number of additional points are noted from the Scoping Opinion provided by the Secretary of State in response to the 2016 Scoping Report. These include the following, which make reference to comments included in Appendix B Responses to 2016 Scoping Opinion:
  - The Environmental Statement will clearly present summary baseline data, provide details of the assessment methodology and refer to any guidance used (Appendix B ref.40).
  - The 2016 Scoping Report scoped out the assessment of accidental radiological releases. However, the 2016 Scoping Opinion received from the Secretary of State suggested that the potential for accidental radiological releases should be included within the radiological issues assessment (as now required by the recent revision to the EIA Directive). The potential for accidental radiological releases will therefore be included in the Environmental Statement. This will be reported as an appendix to the radiological issues chapter (Appendix B ref.10).
  - The Environmental Statement will consider the potential for mobilisation of radionuclides during construction works, both terrestrial and within the marine environment (Appendix B ref.41, 45). However, as there would be no radioactive material added it is considered likely that this would be assessed as having negligible effect based on the results of soils survey and marine sediment monitoring. This topic

will be cross referenced within the Soils and Geology and Marine Environment chapters.

- A summary of radioactive waste management arrangements relevant to the topic will be provided, including the possibility of radioactive waste remaining on-site following the Wylfa Newydd Power Station operational phase in the event that a Geological Disposal Facility is not available (Appendix B ref.43).
- The transportation of fresh fuel and radioactive waste during the operation of the Wylfa Newydd Power Station will now be considered within the Environmental Statement. All available information regarding proposed transport methods, including frequency, likely modes and routes, and an assessment of potential effects will be provided (Appendix B ref.44).

### 12.1.1 Potential Environmental Effects and Potential Mitigation

7. This section builds upon the corresponding section in the 2016 Scoping Report, and summarises the assessments that will be undertaken to assess potential effects during construction, operations and decommissioning as well as the potential for effects from accidental releases.
8. The Espoo (EIA) Convention sets out the obligations to assess the environmental impact of certain activities at an early stage of planning. It also sets out the general obligation of States to notify and consult each other on all major projects under consideration that are likely to have a significant adverse environmental impact across boundaries. The requirements of the Espoo (EIA) Convention shall be considered as part of the ES.
9. No radioactive waste or discharges would be generated as part of construction activities. The potential radiological effects associated with construction activities result from inhalation and inadvertent ingestion of dust whilst engaging in construction activities in the Wylfa Newydd Project areas. Analysis of soil samples from the Power Station Site shows concentrations of radioactivity to be similar to those measured at other locations in north Wales: dominated by natural radioactivity, with a small component resulting from residual deposition from the Chernobyl accident. It is judged that impacts from exposures at these levels would be not significant, but calculations will be undertaken to support this.
10. The potential radiological effects associated with the Wylfa Newydd Power Station during the operation phase result from permitted discharges from the Wylfa Newydd Power Station of radioactive material to air and sea and from direct radiation from buildings on the Power Station Site.
11. In addition, transportation of fresh fuel and low-level radioactive waste during the operation of the Wylfa Newydd Power Station would result in small direct exposures at locations adjacent to the transport routes.
12. The assessment of the potential effects from accidental radiological releases will be included in the Environmental Statement. This assessment will draw on previously prepared information, in accordance with advice provided in the 2016 Scoping Opinion. This will include information required for the Article 37 assessment of the Euratom Treaty (EU 2010), which requires all member states to provide information and/or plan to the European Commission relating to the disposal of radioactive waste to determine whether radioactive contamination of the water, soil or airspace of another Member State may occur.
13. Mitigation of these effects via the application of Best Available Techniques (BAT) will be embedded within the design process to minimise discharges and the radiological effect of discharges such as optimisation of stack height to ensure effective dispersion. As the design progresses from the generic UK Advanced Boiling Water Reactor design assessed in the Generic

Design Assessment process, through to specific implementation proposed at the Wylfa Newydd Power Station, BAT is embedded within the design and operation of the Wylfa Newydd Power Station. This applies throughout the lifetime of the Wylfa Newydd Project and is reappraised during periodic reviews of the Environmental Permit.

14. The potential radiological effects associated with the Wylfa Newydd Power Station during the decommissioning phase would be similar to those during the operations phase, as the generation of radioactivity will reduce significantly with the shutdown of reactors. Waste treatment plants would continue to operate and Intermediate Level Waste (ILW) and Spent Fuel (SF) would be stored on-site before its ultimate removal and transport to the UK waste disposal facility. The timing of disposal of ILW and SF would be determined by Horizon's Waste Transfer Contract with the UK Government.
15. Mitigation during the decommissioning phase would again be via the implementation of BAT via the reviews of the site Environmental Permit.

### 12.1.2 Proposed Scope, Methodology and Criteria

16. The assessment of radiological effects will use the methodologies and doses calculated for the Radiological Environmental Permit application for the Wylfa Newydd Power Station. and the Article 37 submission for unplanned releases.
17. The radiological assessment process for environmental permitting applications involves:
  - the definition of the study area;
  - the quantification of the discharges to air and sea, and of direct radiation from the site;
  - the identification of pathways by which radiation exposures to these discharges and radiations may occur;
  - the calculation of dispersion of the discharged material via these pathways and of resulting radioactivity concentrations in relevant environmental material;
  - the identification of exposed groups and species and their characterisation in terms of occupancy and food consumption; and
  - the calculation of doses resulting from potential exposures.

To assess doses resulting from transport of radioactive materials, an assessment is made of:

- the external dose rate of a variety of radioactive material transport packages;
  - an assessment of the likely routes the transport would use;
  - the potential duration of exposures of members of the public whilst the package is in proximity during transport; and
  - the calculation of doses resulting from potential exposures.
18. For radiological effects, regulatory guidance provides the following tiered dose assessment criteria.

**Table 12.1 Dose levels in UK legislation/guidance (Environment Agency, 2012)**

Human radiological impacts (dose bands)	Requirement
1.0mSv/y is the UK public dose limit	UK public dose limit
0.5mSv/y	Dose constraint for exposures from a site

Human radiological impacts (dose bands)	Requirement
0.3mSv/y	Dose constraint for exposures from a single source
0.15mSv/y	Public Health England recommendations on constraints for new nuclear build.
0.02mSv/y	Basic Safety Objective to be applied for any person off-site Screening level dose above which more detailed assessments are required
0.01mSv/y (as above).	Guidance to the nuclear regulators as doses below which regulators should not seek further reductions in public dose, provided the operator is using BAT to limit discharges.

19. The Environment Agency (EA) and NRW also require an assessment of the likely combined impact of radioactive discharges from all relevant existing and prospective sites on humans and non-human biota as part of the permit application for radioactive substance activities (Environment Agency, 2012). The results of such assessments may be compared to an annual dose of 1mSv/y to members of the public, and a guideline value of 40µGy/h to non-human biota, the threshold below which the EA considers there will be no adverse effect on non-human biota or the integrity of protected sites (such as SACs and SPAs) (Coplestone et al, 2001, Allott et al, 2009).

## 12.2 Associated Development

20. The nature and extent of the proposed works in relation to the Associated Development contain no activities which would have a bearing on potential radiological effects.
21. It is therefore proposed to scope out this environmental topic area from the assessment of the Park and Ride facility, the Logistics Centre and A5025 Off-line Highway Improvements.

## 13 Soils and Geology

1. This chapter outlines the changes in scope in relation to the soils and geology assessment since submission of the 2016 Scoping Report. Section 13.1 addresses the potential change in the scope of the original assessment as a result of the updated Wylfa Newydd Power Station and Off-Site Power Station Facilities designs, and section 13.2 considers the potential effects of the Associated Development now being included in the application for development consent.
2. This chapter should be read in conjunction with Chapter 13 of the 2016 Scoping Report.

### 13.1 Changes to Existing Scope

3. Chapter 13 of the 2016 Scoping Report set out the scope, methodology and criteria for assessing potential impacts on soils and geology in the vicinity of the Wylfa Newydd Development Area.
4. Key changes to the Power Station Site described in chapter 3 of this Addendum that could affect soils and geology include:
  - reduced footprint of the Power Station;
  - changes to the Cooling Water Outfall configuration;
  - the co-location of three Off-Site Power Station Facilities at Llanfaethlu; and
  - expansion of the On-Site Campus (Temporary Workers' Accommodation) within the Wylfa Newydd Development Area.
5. An additional point was noted from the Scoping Opinion provided by the Secretary of State in response to the 2016 Scoping Report as set out below.
  - The Scoping Opinion requested further clarification of the study area used (Appendix B ref.47). The study area for soils and geology has since been revised to include the Wylfa Newydd Development Area and a 250m buffer. The initial topic study area was defined to incorporate potential environmental receptors located within adjacent surface water catchments, in order to cover the maximum possible lateral extents of any potential effects. However, the majority of potential effects on soils and geological receptors are likely to be associated with the direct disturbance of ground conditions, which would therefore be limited in extent.
6. The remaining scope remains as described in the 2016 Scoping Report.

### 13.2 Associated Development

7. The Associated Development has been described as part of the Stage Two Pre-Application Consultation. In addition, the scope of the A5025 Off-line Highway Improvements was consulted on in 2015 (see chapter 5 of this addendum). The baseline presented below provides a summary of this information to support the scope of this addendum.

#### 13.2.1 Existing Environment

8. In order to assess the baseline conditions relevant to soils and geology, a desk-based review of a range of publically available information has been completed and with the exception of the Logistics Centre, site walkovers have been undertaken. Agricultural Land Classification (ALC) surveys have also been completed at Dalar Hir and the A5025 where works are proposed. Site walkovers and ALC surveys will be undertaken for the Logistics Centre if found necessary.



9. For the purposes of scoping, information and records were accessed relating to the existing geological and soils environment within 250m of the site area boundary for each development. A summary of the key findings is presented in table 13.1, and an environmental constraints plan is included in Appendix C.

**Table 13.1 Summary of baseline information**

Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
<p><b>Soils</b></p> <p>The site is underlain by soils of the Brickfield association. These soils are fine loamy soils with low natural fertility.</p> <p>An Agricultural Land Classification (ALC) survey for the site has determined that the soils are classified as Subgrade 3b moderate quality. The soils on the site are considered as medium value receptors.</p> <p><b>Artificial geology</b></p> <p>Artificial geology and made ground is considered unlikely to be present beneath the majority of the site due to its agricultural and pastoral nature.</p> <p><b>Superficial geology</b></p> <p>With the exception of a small area towards the centre of the southern boundary of the site in which no superficial deposits are shown in mapping, the site is entirely underlain by Diamicton glacial till.</p> <p><b>Bedrock geology</b></p> <p>The majority of the site, excluding a small eastern portion, is underlain by rocks of the New Harbour Group.</p> <p>The eastern portion of the site is underlain by Ordovician Rocks (undifferentiated).</p>	<p><b>Sites of Geological Importance</b></p> <p>There are no sites of geological importance within 500m of the site (Natural England, n.d.; GeoMôn, 2007).</p> <p>However, the Isle of Anglesey is designated as a UNESCO Global Geopark (named GeoMôn Geopark).</p> <p><b>Soil</b></p> <p>Provisional Agricultural Land Classification data indicate urban land, but natural soils are likely to be present; but no information is currently available on type or ALC.</p> <p><b>Artificial geology</b></p> <p>It is anticipated that natural soils are present across the majority of the study area, with made ground present in isolated locations.</p> <p><b>Superficial geology</b></p> <p>The site is primarily underlain by Diamicton glacial till. There is a small area of glaciofluvial deposits present in the centre of the site.</p> <p><b>Bedrock geology</b></p> <p>The majority of the site is underlain by rocks of the New Harbour Group.</p> <p><b>Sites of Geological Importance</b></p>	<p><b>Sites of Geological Importance</b></p> <p>There are no sites of geological importance within 500m of the site (Natural England, n.d.; GeoMôn, 2007).</p> <p>However, the Isle of Anglesey is designated as a UNESCO Global Geopark (named GeoMôn Geopark).</p> <p><b>Soils</b></p> <p>Brickfield 2 is the main soil type present in the vicinity of the A5025 Off-line Highway Improvements; however, East Keswick 1 soils are present in some parts of the site. Both Brickfield 2 and East Keswick 1 soils have naturally low fertility.</p> <p>An ALC survey was undertaken in March 2016 to establish the type and distribution of agricultural soils across land associated with the A5025 Off-line Highway Improvements. Generally, much of the off site area is classified as Grade 4 or 5, with some areas of Grade 2, 3a and 3b around the LLanfaethlu and Llanfachraeth areas.</p> <p><b>Artificial geology</b></p> <p>It is considered likely that made ground will be present along the existing A5025 corridor (associated with its original construction), and beneath areas of current and/or historical built development.</p> <p><b>Superficial geology</b></p> <p>The superficial geology beneath the study area predominantly comprises Diamicton glacial till, although there are areas of tidal flat deposits in the vicinity of Valley</p>

Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
<p><b>Sites of Geological Importance</b></p> <p>There are no sites of geological importance within 500m of the site (Natural England, n.d.; GeoMôn, 2007).</p> <p>However, the Isle of Anglesey is designated as a UNESCO Global Geopark (named GeoMôn Geopark).</p> <p><b>Geological resources</b></p> <p>The eastern portion of the site and study area has been identified as a Category 2 Aggregate Safeguarding Area (BGS &amp; Welsh Assembly, 2012) for sandstone.</p> <p><b>Potential sources of contamination</b></p> <p>The contaminative history of the site is limited to contamination arising from agricultural activities and the infilling of small pits and ponds.</p> <p>The Zetica Regional Bomb Risk Map for Isle of Anglesey (Zetica, 2015) identifies that the study area is within a moderate risk area for encountering unexploded ordnance.</p>	<p>There are no sites of geological importance within 500m of the site (Natural England, n.d.; GeoMôn, 2007).</p> <p>However, the Isle of Anglesey is designated as a UNESCO Global Geopark (named GeoMôn Geopark).</p> <p><b>Geological resources</b></p> <p>A Category 1 Aggregate Safeguarding Area for sand and gravel is present beneath the majority of the site.</p> <p><b>Potential sources of contamination</b></p> <p>Information on historical uses of the site has not yet been reviewed. However, information obtained from a historical ground investigation suggests that the site is not affected by contamination.</p>	<p>(BGS, 1980). Glaciofluvial deposits and alluvium are present within the valleys of existing surface watercourses.</p> <p><b>Bedrock geology</b></p> <p>The bedrock geology underlying the majority of the study area comprises Pre-Cambrian to Cambrian metamorphic rocks of the New Harbour and Gwna Groups (BGS, 1980).</p> <p>In the central section of the study area there are also small areas of Ordovician Rocks and Skerries Group bedrock geologies.</p> <p><b>Sites of Geological Importance</b></p> <p>There are no sites of geological importance within 500m of the site (Natural England, n.d.; GeoMôn, 2007).</p> <p>However, the Isle of Anglesey is designated as a UNESCO Global Geopark (named GeoMôn Geopark).</p> <p><b>Geological resources</b></p> <p>The existing A5025 crosses a number of Category 2 Aggregate Safeguarding Areas, and is located close to two Category 1 Aggregate Safeguarding Areas (BGS &amp; Welsh Assembly, 2012).</p> <p><b>Potential sources of contamination</b></p> <p>The majority of the A5025 corridor has remained relatively unchanged to the present day, with fields and agricultural farmland dominating the area and a number of small linear settlements present. Potential sources of contamination are limited to a former landfill located near the route and a number of infilled reservoirs and mills located on or near the route.</p>

Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
		The Zetica Regional Bomb Risk Map for Isle of Anglesey identifies that the majority of the A5025 is within a low risk area of encountering unexploded ordnance, with the Valley area identified as having a moderate risk.

### 13.2.2 Potential Environmental Effects and Mitigation

10. Potential environmental effects arising from the constructional and operational phases of the Associated Development are outlined below.

#### ***Park and Ride facility at Dalar Hir and Logistics Centre***

11. Potential environmental effects arising from the constructional and operational phases of the Park and Ride facility at Dalar Hir and the Logistics Centre are similar and include:

- The loss (sealing) of soil resources;
- Degradation of the soils' physical, chemical, and biological condition could also occur as a result of construction activities;
- Loss of access or sterilisation of mineral resources beneath the site;
- Pollution incidents during construction causing contamination of the soil; and
- The mobilisation of contaminants as a result of disturbance of contaminated soils during construction works.

#### ***A5025 Off-line Highway Improvements***

##### ***Construction phase***

12. The following effects could potentially arise during construction of the A5025 Off-line Highway Improvements:

- Degradation of soils' physical, chemical, and biological condition could also occur as a result of construction activities;
- Acute and chronic harm to construction workers as a result of any encountered contaminated materials;
- The creation of new contaminant pathways or mobilisation of existing contaminants which may pose a risk to human health or the environment;
- Pollution incidents during construction causing contamination of the soil; and
- Loss of access or sterilisation of mineral resources beneath the site.

##### ***Operational phase***

13. The following effect could potentially to arise as a consequence of operation of the road.

- Permanent loss of access to mineral resources located beneath the Off-line Highway Improvements.

#### ***Potential mitigation***

14. Loss (sealing) of soil resources can be mitigated against through careful stripping and removal of topsoil prior to construction works. Mitigation against the degradation of soils would entail adherence to best practice guidance contained in Good Practice Guide for Handling Soils (MAFF, 2000) and Construction Code of Practice for the Sustainable Use of Soils on Sites (Defra, 2009).
15. Ground investigations will be completed prior to construction. A ground investigation has already been completed for the A5025 Off-line Highway Improvements which showed that potential sources of contamination are limited to a former landfill located near the route and a number of infilled reservoirs and mills located on or near the route. A Contamination Remediation plan would be implemented for all areas where contamination is identified to mitigate any potential risks arising from the presence and disturbance of contaminants.

16. Good Practise Pollution prevention measures such as the use of oil interceptors or sustainable drainage systems would be implemented to prevent leaks and spills and to reduce the effects of any accidental releases that may occur. These will be defined as part of the Environmental Statement.

### **13.2.3 Proposed Scope, Methodology, and Criteria**

#### ***Scope***

17. A 250m study area around the Associated Development, including the A5025 Off-line Highway Improvements, will be used for the assessment of likely effects on soils and geology (including contamination). This distance is considered appropriate given the baseline conditions and end use of the sites, predominantly for transport related activities. This is in line with the study area proposed for the WNDA and Off-Site Facilities.
18. As no sites of geological importance have been identified within the study areas for Park and Ride facility at Dalar Hir, the Logistics Centre and the A5025 Off-line Highway Improvements, geological receptors will be scoped out of further assessment in the EIA.

#### ***Methodology***

19. With the exception of the A5025 Off-line Highway Improvements, the assessment of effects on soils and geology from the Associated Development will be in accordance with best practice guidance detailed in section 13.4 of the 2016 Scoping Report.
20. For the A5025 Off-line Highway Improvements, the assessment methodology will be in accordance with guidance contained within the Design Manual for Roads and Bridges. Volume 11, Section 3, Part 11 - Geology and Soils (Highways Agency, 1993). Impacts related to the management of excavated materials will be undertaken based on the 'simple' assessment presented in Annex 1, Table A&B of the DMRB Interim Advice Note 153/11 guidance (Highways England, 2011).

#### ***Assessment criteria***

21. The assessment criteria for valuing the receptors and assessing magnitude and significance will be set out within the Environmental Statement and will be the same as those presented in the 2016 Scoping Report



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## 14 Surface Water and Groundwater

1. This chapter outlines the changes in scope in relation to the surface water (including fluvial geomorphology) and groundwater assessment since submission of the 2016 Scoping Report. Section 14.1 addresses the potential change in the scope of the original assessment as a result of the updated Wylfa Newydd Power Station and Off-Site Power Station Facilities designs, and section 14.2 considers the potential effects of the Associated Development now being included in the application for development consent.
2. This chapter should be read in conjunction with Chapter 14 of the 2016 Scoping Report.

### 14.1 Changes to Existing Scope

3. Chapter 14 of the 2016 Scoping Report sets out the scope, methodology and criteria for assessing potential impacts on surface and groundwater in the vicinity of the Wylfa Newydd Development Area.
4. Key changes to the Wylfa Newydd Power Station described in chapter 3 of this addendum that could affect surface water and groundwater include:
  - reduction in the footprint of the buildings (including associated reduction in basement footprints and dewatering requirements);
  - expansion of the On-Site Campus (Temporary Workers' Accommodation) and location on-site adjacent to Tre'r Gof SSSI;
  - co-location of the Off-Site Power Station Facilities at Llanfaethlu; and
  - area of land for landscaping added to the Power Station Site.
5. These changes will be assessed in terms of the potential effects they may have on the surface water and groundwater environment.
6. The 2016 scoping report proposed a precautionary approach to the study area based on surrounding stream catchments and groundwater areas up to 3km surrounding the Wylfa Newydd Development Area and a detailed assessment within 1.8km. A study area for fluvial geomorphology of 1km around the Wylfa Newydd Development Area was proposed. It is considered that the scope of the assessment as detailed within the 2016 Scoping Report will be sufficient to undertake the assessment of current design proposals.
7. A number of additional points are noted from the Scoping Opinion provided by the Secretary of State in response to the 2016 Scoping Report. These include the following, which make reference to comments included in Appendix B Responses to 2016 Scoping Opinion:
  - The surface water and groundwater assessment will have regard for relevant aspects of the marine environment assessment, soils and geology assessment, terrestrial and freshwater ecology assessment, and to changes of coastal processes and the assessment of effects on coastal geomorphology (Appendix B ref.48).
  - Comprehensive baseline reports will be provided as appendices to the Environmental Statement with summary information and appropriate cross-referencing to the relevant Environmental Statement chapters (Appendix B ref.49). This baseline will include groundwater contours.
  - Detailed information on the scope, methodology and assessment criteria applied to the surface water and groundwater assessment will be provided in the Environmental

Statement, including definitions for the value of a receptor and the magnitude of the change on that receptor. The modelling approach has been discussed with NRW, and the approach to designated habitats includes input from ecology specialists (Appendix B ref.50). The modelling focuses on Tre'r Gof SSSI.

- Consultation has taken place with NRW on the approach to Water Framework Directive (WFD) assessment, and it has been agreed with NRW that a standalone WFD compliance assessment will be provided as an appendix to the Environmental Statement (Appendix B ref.51). This will assess the Wylfa Newydd Project in relation to WFD objectives, including implications for the attainment of Good Ecological Status/Good Ecological Potential in relation to the water bodies for the purposes of Article 2(21) and (22) of the WFD. The assessment will also consider the need for mitigation measures. The WFD water body references within the Environmental Statement will reflect changes made in the revised Western Wales River Basin Management Plan (2015-2021).
- The IACC requested that the surface water connections between Llyn Dinam SAC and the proposed Park and Ride facility at Dalar Hir scheme, should be considered at the detailed project stage (Appendix B ref.52). A review of surface water movement has been completed and no significant connection has been identified between the Dalar Hir site and Llyn Dinam; as such, further evaluation is not required.
- The potential for a significant effect on the Afon Wygyr, to the east of Cemaes, is considered to be low, as the catchment lies outside of the Wylfa Newydd Development Area; however, as it lies within the fluvial geomorphology study area, it will be considered in the Environmental Statement (Appendix B ref.53).
- The Wylfa Newydd Project would require increased water supply during its construction and operational phases (Appendix B ref.54). The Wylfa Newydd Project would be located in the Dŵr Cymru Welsh Water water resources zone of North Eryri Ynys Môn, which covers the whole of Anglesey and the mainland adjacent to the Menai Straits (North Eryri). The Environmental Statement will assess the overall water demand of the Wylfa Newydd Project and the impacts on water supply.
- A Flood Consequence Assessment (FCA) will be included as an Environmental Statement appendix and will be cross-referenced within both the surface water and groundwater chapter and the coastal processes and geomorphology chapter (Appendix B ref.55). Flood risk modelling will be carried out for the FCA to address changes in landform, and TAN 15 mapping of flood risk will be referenced. Section 14.2.6 of the 2016 Scoping Report states a predicted tidal flood level of 13.3m above Ordnance Datum (AOD) for the 0.01% Annual Exceedance Probability (AEP). This event is over and above events which are stipulated in TAN 15, but such low probability events are required as part of the nuclear safety case (as set out in NPS EN-1 and NPS EN-6). The consequences of failure (blockage/collapse) of the culvert at Porth Wylfa beach for fluvial and pluvial events, including safe flood routing etc., will also be assessed. The opening paragraph in section 14.2.5 of the 2016 Scoping Report will be expanded in the Environmental Statement so that the tidal flood risk is clearly stated due to the Power Station site's close proximity to the sea.
- The effects of abstraction as part of temporary dewatering will be a key focus of the assessment (Appendix B ref.56). The discharges to surface water will be subject to a separate assessment as part of an application for an Environmental Permit, although the potential effect will also be detailed in the Environmental Statement.
- Comprehensive information on the proposed drainage design for the Power Station Site will be included in the Environmental Statement (Appendix B ref.57).
- Details of sewage discharges will be included in the assessment, and proposed mitigation will be included (Appendix B ref.58).

- Further information will be provided on how the catchments in the surface water study area have been defined, and on the potential for any hydrological pathways between adjacent catchments (Appendix B ref.59).

## 14.2 Associated Development

8. The Associated Development has been described within the PEI Report as part of the Stage Two Pre-Application Consultation. In addition, the scope of the A5025 Off-line Highway Improvements was consulted on in 2015 (see Chapter 5 of this addendum). The baseline presented below provides a summary of this information to support the scope of this addendum.

### 14.2.1 Existing Environment

9. A data review has been undertaken to identify the hydrological conditions in relation to the Associated Development proposals.
10. The data review showed that both surface water and groundwater within the study area could provide a source for local water supply, support and/or be linked to water-dependant ecological features that are classified as designated sites. Surface water bodies could also be important landscape, hydromorphological and ecological features in their own right.
11. Site walkovers were undertaken at the proposed sites of the Park and Ride facility at Dalar Hir and A5025 Off-line Highways Improvements in February 2016. If found necessary, site walkovers will also be undertaken at the Logistics Centre at Parc Cybi to inform the Environmental Statement.
12. The key findings of the baseline surveys are presented in table 14.1 below. An environmental constraints plan is included in Appendix C.

Table 14.1 Summary of baseline information

Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
<p><b>Groundwater</b></p> <p>The soils at the proposed site of the Park and Ride facility at Dalar Hir are defined as 'slowly permeable seasonally wet acid loamy and clayey soils'. Such soils will limit infiltration to the ground and are often associated with areas of water logging and high rates of surface runoff/low rates of groundwater recharge.</p> <p>The Dalar Hir site is situated on glacial till superficial deposits that are defined by NRW as Unproductive Strata. Such units are considered to have a negligible significance for water supply.</p> <p>The till overlies bedrock comprising metamorphic rocks (mica schist and psammite) with igneous intrusions. To the east, the till is underlain by sandstone and conglomerate. NRW has classified these bedrock formations as Secondary B aquifers. Secondary B aquifers comprise lower permeability layers that may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathered strata.</p> <p>There are no major or public groundwater abstractions in the area, but there may be some small private water supplies used for a variety of purposes.</p> <p>The aquifer beneath the Dalar Hir site forms part of the WFD groundwater body known as Ynys Môn Secondary, which cover all of Anglesey. The</p>	<p><b>Groundwater</b></p> <p>The proposed Logistics Centre is situated on glacial till superficial deposits that are defined by NRW as Unproductive Strata. Such units are considered to have a negligible significance for water supply. A small area of glaciofluvial sands and gravel is located at the southern end of the site.</p> <p>The till overlies bedrock comprising metamorphic rocks (mica schist, psammite and pelite). NRW has classified these bedrock formations as Secondary B aquifers.</p> <p>There are no known groundwater abstractions at the site, although there are likely to be small abstractions in the area around the site (a number of wells are shown on Ordnance Survey mapping).</p> <p><b>Surface water and fluvial geomorphology</b></p> <p>Two or three watercourses or ditches have been recorded historically within the site.</p> <p>A watercourse runs across the northern part of the site on an east-west alignment, and passes beneath Lon Trefignath before being collected in the drainage</p>	<p><b>Groundwater</b></p> <p>The underlying bedrock is classed as a Secondary B aquifer. These are predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.</p> <p>The majority of the superficial deposits, corresponding to till deposits, are classed as unproductive. These are deposits with low permeability that have negligible significance for water supply or river base flow. However, there are numerous small areas of Secondary A aquifer which are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These generally correspond to alluvial deposits and follow the course of streams. The areas of superficial Secondary A aquifer are generally classified as being of High Vulnerability.</p> <p>The low permeability superficial till deposits and low permeability soils (acid loams and clays) across much of the study area suggest that, other than the isolated areas of alluvial (Secondary A) aquifer, groundwater is likely to be relatively well protected from surface impacts.</p> <p>The study area is located in the Ynys Môn management catchment within the Western Wales River Basin District. The Ynys Môn Minor WFD groundwater body (GB41002G204400), which includes much of Anglesey, was assessed by the Environment Agency in 2009 to be of Good Quality (Quantitative). However, the</p>

Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
<p>waterbody is defined as having poor chemical status, although this is likely to be highly variable across the island, and the status beneath the site is not known.</p> <p>The presence of low permeability soils and till affords the bedrock aquifer some protection in the event of contamination by leaks and spills of fuels/oils during the construction phase. The vulnerability of the aquifer to potential contamination from surface activities is therefore likely to be low.</p> <p><b>Surface water and fluvial geomorphology</b></p> <p>The land within the Dalar Hir site is generally flat but rises up to its western boundary and is situated between 15m and 25m AOD. It is located within the base of a shallow valley, which is orientated broadly running from north to south. A small stream flows from the north to the south along the base of the valley. This watercourse is referred to as the Nant Dalar Hir.</p> <p>The Nant Dalar Hir reaches the site boundary close to its north-eastern corner then flows in a south-westerly direction across the site and is culverted beneath both Holyhead Road and the A55.</p> <p>The Nant Dalar Hir is fed on-site by a small drain that rises to the west of the site near the Dalar Hir farmhouse. This flows first eastward and then southward before passing beneath Holyhead Road. The drain then flows eastward between Holyhead</p>	<p>system provided as part of the A55.</p> <p>A second watercourse runs along the eastern boundary of the site, at the foot of the A55 embankment for a distance of approximately 130m, before passing in a culvert, beneath the A55.</p> <p>A third watercourse runs along the southern boundary of the site for a distance of approximately 100m, before passing beneath Lon Trefignath in a culvert and running through the mixed woodland plantation.</p> <p>Anecdotal advice suggests that there may be some below-ground connection from the main ditch to the watercourse which runs along the eastern boundary of the site, although this has not been confirmed.</p> <p>Two small ponds have been recorded historically on the site, including one dug for educational purposes in the central part of the site and a second located in a hollow to the north of the Trefignath Burial Chamber.</p> <p><b>Flood risk</b></p> <p>Based on mapping on the NRW and Welsh Government websites, the proposed Logistics Centre would be located within Flood Zone A (as defined in</p>	<p>groundwater body was assessed to have Poor Chemical Quality due to hazardous substances which were classified by the Environment Agency as being associated with mines and the potential for nutrients and hazardous substances to impact on groundwater dependent terrestrial ecosystems. As the groundwater body is extensive, the chemical water quality will vary locally and is likely to be much better in some areas than the overall classification.</p> <p>The study area is located within a WFD Drinking Water Protection Area but there are no Groundwater Source Protection Zones on Anglesey. There are no Nitrate Vulnerable Zones; the closest is located approximately 10km away.</p> <p>Initial information received from the IACC returned no records of private water supplies within the study area. Available mapping shows a number of wells in the vicinity of the A5025 Off-line Highway Improvements; however, whether these need to be considered as sensitive receptors will depend on the nature of the wells and whether they are in use. The potential existence of private water supplies within the study area therefore remains to be confirmed.</p> <p><b>Surface water and fluvial geomorphology</b></p> <p>Five WFD surface water bodies have been identified within the study area, as follows:</p> <ul style="list-style-type: none"> <li>• Un-named - Crigyll/Caradog catchment (GB110102058930);</li> <li>• Alaw (GB110102058980);</li> </ul>



Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
<p>Road and the A55 and then joins Nant Dalar Hir just prior to the culvert beneath the A55. It is likely that this drain receives surface water runoff during wet periods and is not sustained by base flow from a spring or seep.</p> <p>The Dalar Hir site is also crossed by a series of ditches and wetted field boundaries. These are assessed to be man-made ditches that appear to have been dug out for land drainage purposes. The field boundaries are typically defined by embankments with a drain on either side. These drains discharge in a generally southerly direction and, during wetter periods, form marshy ground and small ponds within the site along Holyhead Road. A number of additional and larger ponds are situated to the south of Holyhead Road with further ponds to the south of the A55. These are associated with the road drainage systems.</p> <p>Despite its apparently poor morphological status, Nant Dalar Hir is known to have some ecological importance due to the presence of European eel, which is a protected species. This was observed during the aquatic surveys at a location immediately downstream of the site and the A55 culvert.</p> <p>Approximately 1km downstream of the site, Nant Dalar Hir enters Llyn Traffwll, a lake designated as an SSSI. The SSSI citation describes the water body as a moderately nutrient-rich lake, which is of biological interest due to the range of aquatic plants, and is also important for wintering wildfowl. Water discharges from Llyn Traffwll within a</p>	<p>TAN 15), indicating that the site is at little or no risk of fluvial or tidal flooding.</p>	<ul style="list-style-type: none"> <li>• Tan R'Allt (GB110102059100);</li> <li>• Un-named - Wygyr catchment (GB110102059160); and</li> <li>• Un-named - Wygyr catchment (GB110102059180).</li> </ul> <p>The most significant of these watercourses in terms of upstream catchment areas are the Alaw (57km<sup>2</sup>) and Tan R'Allt (20km<sup>2</sup>).</p> <p>In addition to this, there are a significant number of smaller channels and ditches which could act as preferential flow pathways to secondary receptors. This includes a relatively significant channel that flows in a southerly direction parallel to, and to the east of, the A5025 for around 6km between Llanrhuddlad and its confluence with the Tan R'Allt. A number of small drains also flow away from the A5025 corridor to Llyn Garreg-Lwyd SSSI.</p> <p>Geomorphology and hydromorphology are key factors contributing to whether a water body can achieve or maintain Good Ecological Status. To date, there is little information on the baseline geomorphological conditions of the watercourses and waterbodies in the study area; however, surveys will be undertaken to inform the baseline conditions.</p> <p>Data exist on the chemical, biological and ecological health of the watercourses on and around the Wylfa Newydd Development Area from monitoring undertaken by Horizon. Away from this area, limited surface water quality baseline monitoring has been undertaken by Horizon, and these data will be assessed to inform the baseline conditions.</p> <p>Some data are available from NRW; however, this is</p>



Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
<p>channel that flows through the Valley Wetlands Nature Reserve before discharging into a larger watercourse, the Afon Crigyll. The Afon Crigyll ultimately discharges into the Irish Sea at Rhosneigr.</p> <p>The Afon Crigyll has been classified as a water body by NRW under the WFD. As detailed above, the site is drained by Nant Dalar Hir and other minor drains, all of which are tributaries of the Afon Crigyll. As all tributaries are considered to form part of the WFD water body catchment, the details of the WFD classification are directly relevant to the site.</p> <p><b>Flood risk</b></p> <p>Based on mapping on the NRW and Welsh Government websites, the Dalar Hir site is located within Flood Zone A (as defined in TAN 15), indicating that the site is at little or no risk of fluvial or tidal flooding. This assumes that all hydraulic structures are free flowing.</p> <p>NRW surface water flood mapping indicates the presence of a significant surface water flood pathway through the centre of the site. This flow path follows the topographic base of the valley and is likely to represent the original natural course of the Nant Dalar Hir.</p> <p>Flows along this surface water flow pathway, and runoff more generally from the site, have the potential to back up upstream of Holyhead Road as evidenced by the existing on-site ponds along the</p>		<p>limited and mainly confined to the Afon Alaw where the chemistry and biology of the river is monitored at Llanfigael Farm upstream of the A5025 Off-line Highway Improvements. These data will be reviewed as part of the assessment.</p> <p>The statutory designated ecological sites associated with the A5025 proposals have been reviewed in relation to their potential consideration in the assessment, with likely hydrological and hydrogeological linkages tabulated below. Non-statutory sites will also be considered as part of the assessment.</p> <ul style="list-style-type: none"> <li>• Beddmanarch-Cymyran SSSI (scoped in for surface water and groundwater).</li> <li>• Llyn Llygeirian SSSI (scoped in for groundwater/out for surface water).</li> <li>• Llyn Garreg-Lwyd SSSI (scoped in for surface water/out for groundwater).</li> <li>• Cemlyn Bay SPA, SAC and SSSI (scoped out).</li> <li>• Cae Gwyn SSSI (scoped in for groundwater/out for surface water).</li> <li>• Tre'r Gof SSSI (scoped out).</li> </ul> <p><b>Flood risk</b></p> <p>The majority of the A5025 Off-line Highway Improvements are situated in areas designated as Flood Zone A by the Welsh Government. The main exceptions to this are in places where the A5025 crosses larger watercourses and at the far southern extents of the corridor close to the junction with the A5.</p> <ul style="list-style-type: none"> <li>• A5 junction – This area is low-lying and is</li> </ul>

Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highway Improvements
southern boundary of the site.		<p>designated as Flood Zone C1, indicating that the annual probability of inundation is greater than 0.1% but that protection is provided by flood defences.</p> <ul style="list-style-type: none"> <li>• Crossing of the Afon Alaw – The valley immediately surrounding the river channel is designated as Flood Zone C2, indicating that the annual probability of inundation is greater than 0.1% and there are no flood defences.</li> <li>• There are also some minor areas shown on NRW flood risk maps that represent surface water flood pathways.</li> </ul>

## 14.2.2 Potential Environmental Effects and Mitigation

### ***Park and Ride Facility at Dalar Hir***

13. The key potential effects on the water environment associated with the proposed Park and Ride facility at Dalar Hir relate to the following:

- deterioration of and ongoing effects on groundwater and surface water quality;
- changes to flood risk;
- changes to and loss of on-site drainage and water routing through the site;
- loss of recharge to groundwater due to hardstanding, changes to groundwater levels and flow;
- loss or physical changes to aquatic habitat on-site; and
- changes to groundwater and surface water flows and levels effecting water features on-site.

14. In addition, flood risk posed to the development proposals will also need to be considered and an FCA will be prepared. Potential flood risk effects associated with the Park and Ride facility at Dalar Hir comprise:

- small changes in surface contours altering flood flow conveyance capacity;
- changes in surface contours and surfacing altering catchment areas and runoff rates;
- loss of functioning of channel controls including culverts and road crossings;
- construction of new channel controls associated with access routes;
- high sediment loading/deposition changing conveyance of channels/structures; and
- alteration of existing surface water flow rates.

### ***Logistics Centre***

15. The key potential effects on the water environment associated with the Logistics Centre relate to the following:

- deterioration of, and ongoing effects, on groundwater and surface water quality;
- changes to flood risk;
- changes to and loss of on-site drainage and water routing through the site; and
- loss of recharge to groundwater due to hardstanding, changes to groundwater levels and flow.

16. In addition, flood risk posed to the development proposals will also need to be considered and an FCA will be prepared. Potential flood risk effects associated with the Logistics Centre comprise:

- small changes in surface contours altering flood flow conveyance capacity;
- changes in surface contours and surfacing altering runoff rates;
- construction of new channel controls;
- high sediment loading/deposition changing conveyance of channels/structures; and
- alteration of existing surface water flow rates.

### ***A5025 Off-line Highway Improvements***

17. The key potential effects on the water environment during the construction phase without mitigation could include, but may not be limited to, the following:

- Generation of sediment-laden runoff and subsequent discharge of this to watercourses and sensitive European Designated Sites.
- Inadvertent discharge of pollutants such as chemicals, oils or cementitious material to any of the identified surface or groundwater receptors.
- Disruption of surface water or groundwater flows, in particular in areas where excavations are proposed.
- Mobilisation of existing contamination due to changes in the water table and consequential changes to the groundwater regime.
- Creation of new pathways for contaminants to migrate to surface water and groundwater and associated receptors. This could be from pollutants including sediment in surface water runoff or from on-site spills.
- Construction activities relating to structures (such as culverts and outfalls) in watercourses, drains or WFD water bodies. This could temporarily remove natural vegetation and lead indirectly to alteration of in-channel processes.
- Temporary loss of floodplains associated with land take for construction related activities.

18. Potential effects on the water environment during the operational phase could include, but may not be limited to, the following:

- Effects on groundwater or surface water quality associated with regular accretion of sediments and oils on the road surface, and subsequent mobilisation under storm conditions.
- Effects on groundwater or surface water quality associated with a major spillage of substances such as oil or other liquid contaminants.
- Alteration in groundwater flows due to cuttings, embankments and foundation structures; the flows could potentially support local surface water systems and/or ecological groundwater dependant SSSI receptors (in particular Beddmanarch-Cymyran and Llyn Llygeirian SSSI).
- Changes to surface water flows associated with an increase in hardstanding (due to the larger paved areas) and new drainage systems. This could alter existing flow dynamics within a watercourse leading to changes in the geomorphological characteristics and associated ecological habitat and exacerbated flood risk downstream.
- Localised changes to groundwater recharge due to changes to location and extent of hardstanding.
- Physical modifications to watercourses/ditches and WFD water bodies through diversion or the construction of structures such as culverts and outfalls. This could alter flow and sediment processes within the channels as well as altering lateral connectivity with the floodplain. Riparian corridors could also be removed.
- Creation of new contaminant migration pathways, e.g. due to creation of cuttings and other excavations or removal of previous foundations upon displacing former road routes.
- Mobilisation of any existing contamination due to changes in the water table and consequential changes to the groundwater flow regime, e.g. changes in ground covering and rainwater infiltration.

- Changes in land level associated with new or altered road embankments in the floodplain altering the ability of the floodplain to store or convey flood waters.

### ***Potential Mitigation***

19. The principles of mitigation outlined in section 14.3 of the 2016 Scoping Report will be implemented to prevent or minimise potential effects on surface water and groundwater in relation to the Associated Development. The development and implementation of an Environmental Management Plan will take account of best practice methods and include pollution prevention strategies.

## **14.2.3 Proposed Scope, Methodology, and Criteria**

### ***Scope***

20. The scope, methodology and criteria for assessing potential effects on surface and groundwater outlined in section 14.4 of the 2016 Scoping Report will also apply to the Associated Development.
21. Detailed technical assessments and surveys will be undertaken to address specific areas of concern. These will include the assessments outlined below.
  - FCA: Based on the assumption that the development layout can be adapted to address any major areas of concern, this will be a qualitative assessment undertaken for all Associated Development proposals, considering both the risk posed to the proposed development and the impact of the proposals on flooding, including those relating to the management of surface water runoff.
  - Fluvial geomorphology assessment: This would include input to the drainage design of the sites including buffer strips and outfalls.
  - A WFD Assessment will consider in detail the nature of the aquatic environment within any watercourses and the groundwater body where physical impacts are proposed. The quality elements considered are biological, physico-chemical and hydromorphological (surface water only).
  - Identification of private water supplies within 500m of the site boundaries. For the A5025 Off-line Highways Improvements, a 500m corridor will be used from the proposed boundary. .
  - Impacts on European Designated Sites (e.g. SSSIs) and other watercourses.
  - Restoration and or decommissioning of the Associated Development sites will be considered in the Environmental Statement.

### ***Methodology***

22. The methodology for the assessment shall be in line with that described in 14.4.2 of the 2016 Scoping report.

### ***Assessment Criteria***

23. The assessment criteria for valuing the receptors and assessing magnitude and significance will be set out within the Environmental Statement and will be the same as those presented in the 2016 Scoping Report and with regard comments received on the 2016 scoping opinion.

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## 15 Coastal Processes and Coastal Geomorphology

1. This chapter outlines the changes in scope in relation to the coastal processes and coastal geomorphology chapter since submission of the 2016 Scoping Report.
2. Section 15.1 addresses the potential change in the scope of the original assessment as a result of the updated Wylfa Newydd Power Station and Off-Site Power Station Facilities designs, and section 15.2 considers the potential effects of the Associated Development now being included as part of the application for development consent.
3. This Chapter should be read in conjunction with Chapter 15 of the 2016 Scoping Report.

### 15.1 Changes to Existing Scope

4. Chapter 15 of the 2016 Scoping Report sets out the scope, methodology and criteria for assessing potential impacts on coastal processes and coastal geomorphology in the vicinity of the Wylfa Newydd Development Area.
5. Key changes to the Wylfa Newydd Power Station described in chapter 3 of this addendum that could affect coastal process and geomorphology include:
  - changes to the MOLF and breakwaters including alteration of the dredging regime and construction methods.
  - Changes to the cooling water outfall.
6. These structures and activities were considered as part of the 2016 Scoping Report, and the amendments outlined in Chapter 3 of this Addendum are not considered to materially change the outcome of that assessment, which remains as described in the Chapter 15 of the 2016 Scoping Report.
7. A number of additional points are noted from the Scoping Opinion provided by the Secretary of State in response to the 2016 Scoping Report. These include the following, which make reference to comments included in Appendix B Responses to 2016 Scoping Opinion:
  - The potential effects of dredging during construction and operation will be assessed as part of the marine licensable activities assessment, the scope of which is provided in Appendix A of this addendum. This includes the effects of fine-sediment dispersion and disposal of rock and dredge spoil on the seabed at the Holyhead Deep disposal site (Appendix B ref.60).
  - All relevant guidance will be considered within the assessment as detailed in the 2016 Scoping Report, along with TAN 14: Coastal Planning (1998), which was unintentionally omitted from the list of TANs considered relevant in the 2016 Scoping Report (Appendix B ref.61).
  - Changes from the revised design of the offshore structures on waves and currents will be modelled together with any corresponding movement of fine sediment (Appendix B ref.62). The effects of fine sediment on the seabed and other geomorphology receptors will be assessed through modelling should the wave and current modelling demonstrate that this is required. Potential changes to seabed sediments will be explicitly considered, and NRW is advising on a number of key scenarios for modelling as part of ongoing stakeholder consultation.



- The thermal plume aspects of the hydrodynamic modelling will now be covered separately in a water chemistry section in the marine environment chapter (Appendix B ref.63).
- NRW advised that the study area should be defined by the zone of influence (which could potentially be beyond 5km) to assess the effects of dredging on fine-sediment dispersion (Appendix B ref.64). In total, the coastal processes study area can be extended to one or more tidal excursion zones as needed, and this extent will be determined through the modelling. Early modelling runs have indicated that the effects of offshore structures on waves and currents is relatively local to the development within Cemlyn Bay. Modelling will be undertaken in accordance with NRW feedback.
- The Environmental Statement will explicitly assess the effects of the marine works (during both the construction and operational phases) on sediment processes and any potential effects on the shingle ridge (a geomorphology receptor) which is critical to the functioning of the Cemlyn Bay SSSI/SAC and the Ynes Feurig, Cemlyn Bay and the Skerries SPA. The coastal geomorphology assessment will also inform the EIA and HRA (Appendix B ref.65, 66).
- Sediment dispersion will be modelled and the results provided in the Environmental Statement (Appendix B ref.67). Modelling is ongoing for the Cemlyn Lagoon/Cemlyn Bay areas, and meetings with NRW have been held and further meetings are planned (see also response above to Appendix B ref 64). The potential effects of fine sediment arising from land surfaces will also be considered in the Environmental Statement chapter. This issue will be cross-referenced in the surface water and groundwater chapter.
- The coastal processes and geomorphology chapter will cross-refer to other chapters where appropriate, particularly the marine environment chapter of the Environmental Statement (Appendix B ref.48).
- The Flood Consequence Assessment will be appended to the surface water and groundwater chapter of the Environmental Statement and referenced in the coastal processes and coastal geomorphology chapter (Appendix B ref.55).

## 15.2 Associated Development

8. There are no marine activities in relation to the Associated Development proposals for the Wylfa Newydd Project. Due to this, and the distance of the developments from the marine environment, there would not be any significant changes to relevant coastal processes or effects on coastal geomorphology receptors.
9. It is therefore proposed that potential effects from the Park and Ride facility at Dalar Hir, the Logistics Centre and the A5025 Off-line Highway Improvements are scoped out from the coastal processes and coastal geomorphology chapter.

## 16 The Marine Environment

1. This chapter outlines the changes in scope in relation to the marine environment since submission of the 2016 Scoping Report. Section 16.1 addresses the potential change in the scope of the original assessment as a result of the updated Wylfa Newydd Power Station and Off-Site Power Station Facilities designs, and section 16.2 considers the potential effects of the Associated Development now being included in the application for development consent.

### 16.1 Changes to Existing Scope

2. Chapter 16 of the 2016 Scoping Report set out the scope, methodology and criteria for assessing potential marine impacts at sensitive receptors in the vicinity of the Wylfa Newydd Development Area and associated transportation routes.
3. Key changes to the Power Station described in chapter 3 of this addendum that could affect the marine environment include:
  - changes to the MOLF and breakwaters including alteration of the dredging regime and construction methods;
  - changes to the cooling water discharge outfall.
4. These structures and activities were considered as part of the 2016 Scoping Report. The study area and methodologies defined in the 2016 scoping report identified a 5km radius from the Power Station Site based on consideration of mixing zones and modelling information. The changes proposed do not substantially move or change the structures to the extent that a change to the study area would be required. The assessment methodology has already accounted for the design and operation of these structures. The scope of the assessment therefore remains as described in the 2016 Scoping Report.
5. A number of additional points are noted from the Scoping Opinion provided by the Secretary of State in response to the 2016 Scoping Report. These include the following, which make reference to comments included in Appendix B Responses to 2016 Scoping Opinion:
  - The survey and modelling methodologies will be agreed with the IACC and NRW in advance, for example the hydrodynamic modelling for the thermal plume (Appendix B ref.68).
  - The design of the breakwaters is ongoing and opportunities for habitat enhancements are being explored to consider potential opportunities for biodiversity enhancement measures (Appendix B ref.69).
  - The presence of the breakwater would provide a sheltered area which may change the fish species present in the area due to changes in conditions (Appendix B ref.70). These potential effects will be considered in the Environmental Statement.
  - The assessment will consider the candidate SACs and SPAs in the same manner as designated sites. These include the North Anglesey Marine / Gogledd Môn Forol cSAC and the Anglesey Terns / Morwenoliaid Ynys Môn SPA (Appendix B ref.71, 72).
  - The Welsh Government is in the process of developing the first Welsh National Marine Plan and this will be considered in the assessment (Appendix B ref.73).
  - The potential for effects relating to marine Invasive Non-Native Species (INNS) will be assessed using a risk-based approach and this will consider all relevant marine construction activities, shipping and any potential influence of thermal plume from the cooling water outfall on the settlement of marine INNS (Appendix B ref.74). The risk will

be assessed and appropriate mitigation measures proposed in the Environmental Statement.

- The Environmental Statement will clearly differentiate between direct and indirect effects on the marine environment, particularly in the context of habitat loss and/or alteration (Appendix B ref.75).
- Cemaes Bay is a European-designated bathing water site, located approximately 500m to the east of the Wylfa Newydd Development Area and the impact on bathing water quality will be considered when looking at impacts on freshwater and marine sites, during both construction and operation (Appendix B ref.76). This assessment will be referred to in the surface water and groundwater chapter and socio-economics chapter.
- The potential for construction activities to produce sediment plumes and indirectly affect foraging birds will be considered (Appendix B ref.77). The assessment of construction effects will consider effects upon qualifying species, particularly terns. Cumulative effects will require careful consideration, particularly with regard to the potential effects upon seabirds. The assessment of effects will be informed with reference to the findings of the terrestrial and freshwater ecology chapter.
- Possible presence of Sabellaria reef locations within the benthic impact zone will be fully investigated and potential effects clearly set out in the Environmental Statement. The Environmental Statement will consider the impacts of changes to the hydrodynamic regime on benthic habitat during the construction and operational phases of the Project (Appendix B ref.78).
- The Environmental Statement will include detail on the proposed screening and fish protection systems (including fish deterrents and fish recovery and return systems) (Appendix B ref.79). As well as the fish species found, the design of the fish protection system will also be informed by details of the approach velocity and volumes as well as the design itself. NRW has advised that effects on all fish species designated for protection by Welsh Ministers in accordance with Section 7 of the Environment (Wales) Act 2017 should be considered in the Environmental Statement. This will be done. The effects on fish linked to SACs will also be assessed in order to inform the HRA.
- As fish are an important food source of species that are features of European Designated Sites (e.g. terns and harbour porpoise), information on the fish protection systems will be needed to inform the HRA (Appendix B ref.80). Potential effects on fish that are food sources for such species will be assessed in the Environmental Statement (and will inform the HRA). The Environmental Statement will provide a comprehensive assessment of how the results of the baseline fish and plankton monitoring relate to the actual predicted effects of the Power Station.
- The assessment of effects on plankton communities will consider how physicochemical (temperature/irradiance/hydrological) changes that may occur could affect plankton (Appendix B ref.81). The Environmental Statement will also consider the 'knock-on' effects on key species within the associated marine food chain. This information will also be used to inform the HRA.
- Data collected for marine mammals, including quantitative data collected using dedicated boat based surveys, will be provided in the Environmental Statement and will be supported by other available datasets for the area (Appendix B ref.82).
- Given that construction activities are proposed to take place within the marine environment and that the proposed development would introduce new vessel movements to the area during construction and operation, underwater noise and vibration effects on ecological receptors will be considered in the marine environment chapter of the Environmental Statement. Mitigation options to protect marine mammals will be clearly set out in the Environmental Statement (Appendix B ref.83).

## 16.2 Associated Development

6. Due to the distance of the proposed Associated Development from the marine environment, there would not be any significant effects on marine water quality or on other marine ecology receptors, including phytoplankton and zooplankton; subtidal and intertidal habitats and communities; fish, marine mammals or seabirds.
7. The Park and Ride facility at Dalar Hir, Logistics Centre and A5025 Off-line Highways Improvements are therefore proposed to be scoped out from further assessment in relation to the marine environment.

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## 17 Cultural Heritage

1. This chapter outlines the changes in scope in relation to the cultural heritage assessment since the submission of the 2016 Scoping Report. Section 17.1 addresses the potential change in the scope of the original assessment as a result of the updated Wylfa Newydd Power Station and Off-Site Power Station Facilities designs, and section 17.2 considers the potential effects of the Associated Development now being included in the application for development consent.

### 17.1 Changes to Existing Scope

2. Chapter 17 of the 2016 Scoping Report set out the scope, methodology and criteria for assessing potential cultural heritage effects in relation to the design, construction, operation and decommissioning of the Wylfa Newydd Project.
3. Key changes to the Wylfa Newydd Project described in chapter 3 of this addendum that could potentially affect archaeology and cultural heritage include:
  - increase in platform heights for some buildings;
  - reduced footprint of the Power Station Site and changes to the layout to create a single power island;
  - change in crane height during construction to a maximum of 250m;
  - changes to the MOLF and breakwaters;
  - the co-location of three Off-Site Power Station Facilities at Llanfaethlu (and avoidance of effects at the former AECC site); and
  - expansion of the On-Site Campus (Temporary Workers' Accommodation) within the Wylfa Newydd Development Area.
4. Section 17.4.2 of the 2016 Scoping Report (paragraph 4) stated that investigations to satisfy the requirements for the archaeological mitigation works would be undertaken as part of the Site Preparation and Clearance proposals for which consent would be sought under the TCPA. However, subsequent to the recent optimisation process it is now proposed that the majority of the archaeology mitigation works be considered as part of the application for development consent. This section updates section 17.4.2 of the 2016 Scoping Report.
5. The key changes to the design have resulted in a smaller footprint for some of the facilities, but raising platform heights and the crane may affect the setting of some of the heritage assets. These changes, will be assessed using the same methods presented in the 2016 Scoping Report. The remainder of the scope of the assessment remains unchanged.
6. A number of additional points are noted from the Scoping Opinion provided by the Secretary of State in response to the 2016 Scoping Report. These include the following, which make reference to comments included in Appendix B Responses to 2016 Scoping Opinion:
  - The results of archaeological trial trenching will be used to update the cultural heritage baseline (Appendix B ref.84).
  - Any archaeological mitigation measures and/or management plans will be cross-referenced with others, including the LEMP (Landscape and Environmental Masterplan), such that mitigation measures are complimentary and not contradictory (Appendix B ref.85).
  - The study area for terrestrial archaeology, historic buildings and the historic landscape will be defined as the Power Station Site and an area extending 6km from it (Appendix

B ref.86). Where off-site facilities fall outside the 6km study area, bespoke study areas will be defined, and agreed with Gwynedd Archaeological Planning Service (GAPS) and IACC.

- Measures to mitigate predicted effects on marine archaeological remains will be identified within the Environmental Statement (Appendix B ref.87).
- The statutory Grade II designation of Cestyll Garden as a Historic Park and Garden under section 18 of the Historic Environment (Wales) Act 2016 will be taken into account in the Environmental Statement (Appendix B ref.88). The draft guidance on setting produced by Cadw will also inform the assessment.

## 17.2 Associated Development

### 17.2.1 Existing Environment

7. For the Park and Ride Facility at Dalar Hir and the Logistics Centre at Parc Cybi the study areas has been defined by the site boundaries and a zone extending from the site boundary up to 500m. Designated heritage assets outside the study areas have been identified and included in the baseline where there was a potential for effects on their setting. This has been undertaken using professional judgement.
8. For the A5025 Off-line Highways Improvements, a 200m corridor, extending from the road boundary has been used, based on the guidance provided by Volume 11, Section 3, Part 2 - Cultural Heritage (HA 208/07) of the Design Manual for Roads and Bridges (DMRB),. Designated heritage assets outside the study area were included in the baseline where there was potential for impacts on their setting, based on professional judgement. The studies undertaken to establish the baseline information for these study areas are presented in Table 17.1 and a summary of the key findings of the baseline surveys are included in table 17.2. Key receptors are shown on the environmental constraints plan contained in Appendix C.



**Table 17.1 Summary of studies undertaken to establish baseline information**

Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highways Improvements
<p>The cultural heritage baseline has been established based on the results of:</p> <ul style="list-style-type: none"> <li>• Cultural heritage desk-based surveys;</li> <li>• Site inspections and walkover surveys (2016);</li> <li>• Archaeological geophysical surveys (April and May 2016), and</li> <li>• Archaeological trial trenching (October 2016)</li> </ul>	<p>Desk-based surveys, walkover surveys and extensive non-invasive and invasive archaeological investigations will be undertaken in advance of or during the construction of Parc Cybi if necessary.</p> <p>Site walkovers at Parc Cybi are currently ongoing.</p>	<p>The cultural heritage baseline has been established based on the results of:</p> <ul style="list-style-type: none"> <li>• Cultural heritage desk-based surveys;</li> <li>• Site inspections and walkover surveys (2016);</li> <li>• Archaeological geophysical surveys (2016);</li> <li>• Archaeological trial trenching (Oct-Nov 2016);</li> <li>• Archaeological coring (2016), and</li> <li>• Archaeological watching briefs on Ground Investigations (GI) (2016).</li> </ul>

**Table 17.2 Summary of Baseline Information**

Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highways Improvements
<p>The baseline for the study area is characterised by :</p> <ul style="list-style-type: none"> <li>• prehistoric archaeological remains identified by geophysical survey and trial trenching including burnt mounds;</li> <li>• 19th century farm houses of low value and structures associated with Telford's A5 including a Grade II Listed milestone; and</li> <li>• a historic landscape largely agricultural in character comprising 18th - 19th century field enclosures and post-enclosure enlargement fields.</li> </ul>	<p>The baseline for the study area is characterised by:</p> <ul style="list-style-type: none"> <li>• archaeological remains of prehistoric settlement identified by archaeological investigations, and two Scheduled Monuments comprising Ty-Mawr Standing Stone and Trefignath Burial Chamber;</li> <li>• high potential for the presence of unknown archaeological remains; and</li> <li>• a historic landscape still largely agricultural in character comprising 18th - 19th century field enclosure.</li> </ul>	<p>The baseline for the study area is characterised by:</p> <ul style="list-style-type: none"> <li>• archaeological remains of prehistoric date including Neolithic settlement at Llanfaethlu, and standing stones such as Capel Soar Standing Stone (a Scheduled Monument);</li> <li>• archaeological remains from the medieval and post-medieval period relating to agriculture including the former sites of buildings, wells, field boundaries and mills;</li> <li>• historic buildings the majority of which are post-medieval in origin including low or medium value 19<sup>th</sup> century farm houses, agricultural buildings, domestic cottages and a number of mill complexes reflecting the rural character of the study area, and places of worship including the Grade II* Listed Building St</li> </ul>

Park and Ride facility at Dalar Hir	Logistics Centre	A5025 Off-line Highways Improvements
		<p>Maethlu's church and later nonconformist chapels; and</p> <ul style="list-style-type: none"><li>• a historic landscape of predominantly post-medieval date reflecting various changes in the organisation of the agricultural landholdings, 19<sup>th</sup> century settlements along the A5025 and a small industrial valley associated with former mills and mill houses.</li></ul>

## 17.2.2 Potential Environmental Effects and Mitigation

9. This section provides a summary of the main likely significant effects on heritage assets and measures proposed to mitigate these effects.

### ***Park and Ride facility at Dalar Hir***

10. Effects on archaeological remains would result from their removal or partial removal during construction. These effects would be mitigated by archaeological recording, for example through strip, map and sample, which would include publication and dissemination of the results of the archaeological recording commensurate with their significance and the preparation and submission of an ordered archive. There is also potential for effects on archaeological remains due to noise and visual intrusion into their setting from plant and machinery during construction and decommissioning and the continued presence of the Park and Ride facility during operation.
11. Movement and operation of machinery during construction and decommissioning and peak time vehicle noise during operation would affect the setting of Bryngoleu farmhouse and buildings.
12. Temporary construction effects on the settings of archaeological remains and historic buildings would be mitigated by adherence to good practice measures designed to reduce noise during construction (such as noise barriers, use of low noise equipment etc.)
13. Effects on historic buildings would result from the removal of part of the boundary wall adjacent to Telford's London to Holyhead Road and the remains of Dalar Hir Farmstead. Effects on these heritage assets would be mitigated through building recording in advance of construction and publication and dissemination of the results commensurate with their significance and the preparation and submission of an ordered archive.
14. Construction would also remove elements of two historic landscape types, including pre-1850 field boundaries, including four hedgerows identified as "important" under section 4 of the Hedgerows Regulations 1997. Where it is not possible to retain these, these effects would be mitigated through recording in advance of construction and publication and dissemination of the results of the recording commensurate with their significance and the preparation and submission of an ordered archive.

### ***Logistics Centre***

15. While there would be no physical impact, during construction there is potential for effects on Ty-Mawr Standing Stone (AN012) and Trefignath Burial Chamber (AN011), both Scheduled Monuments, due to noise and visual intrusion into their setting from construction activities. There is also potential for effects on unknown archaeological remains in areas where archaeological mitigation has not previously been undertaken.
16. During operation, the continued presence of the Logistics Centre would affect the settings of these Scheduled Monuments.
17. The temporary construction effects on the settings of archaeological remains and historic buildings would be mitigated by best practice measures designed to reduce noise during construction. The layout of the Logistics Centre would be designed to minimise intrusion of buildings into the setting of the heritage assets.

### ***A5025 Off-line Highways Improvements,***

18. Effects on archaeological remains would result from their removal or partial removal during construction. These effects would be mitigated by archaeological recording, for example through

strip, map and sample, which would include publication and dissemination of the results of the archaeological recording commensurate with their significance and the preparation and submission of an ordered archive. There is also potential for effects on archaeological remains, including Capel Soar Standing Stone (a Scheduled Monument), due to noise and visual intrusion into their setting from plant and machinery during construction and the continued presence of the road during operation.

19. There would be effects on designated and undesignated historic buildings from noise and visual intrusion into their settings during construction and the continued presence of the road during operation. Effects on the historic landscape during construction would primarily result from removal of historic landscape elements, including hedgerows identified as important under the Hedgerows Regulations 1997, severance of historic landscape types and changes in land use. These effects would be mitigated through archaeological recording in advance of construction, publication and dissemination of the results of the recording commensurate with their significance and the preparation and submission of an ordered archive. The continued presence of the road would also result in effects during operation.
20. Construction activities and the road during operation would be visible from the eastern boundary of the setting of Carreglwyd Grade II\* Registered Park and Garden. Construction activities would be temporary, however, the presence of the road would be permanent. Neither the construction activities or operational road would be visible within the Significant Views, and would therefore not affect the ability to understand the designated landscape. At present no significant effect is predicted on this heritage asset during construction or operation.
21. The temporary construction effects on the settings of archaeological remains and historic buildings would be mitigated by good practice measures designed to reduce noise during construction (such as noise barriers, selection of low noise equipment etc). Visual effects on the setting of archaeological remains and historic buildings during operation would be mitigated where through landscape screening in keeping with the character of the landscape and setting where possible.

### 17.2.3 Proposed Scope, Methodology, and Criteria

#### **Scope**

22. The scope of the EIA will consider construction and operational effects on heritage assets comprising archaeological remains, historic buildings and the historic landscape.

#### **Methodology**

23. The cultural heritage baseline for these study areas will be established based on the sources identified in Table 17.1. The need for additional baseline data gathering, including additional non-invasive or invasive investigations, will be reviewed and established through consultation with CAPS, Cadw and IACC as required.

#### **Criteria**

24. For the Dalar Hir Park and Ride facility and the Logistics Centre, the method for the assessment of value of assets, magnitude and significance of will be based guidance provided in section 17.4.2 of the 2016 Scoping report.
25. For the A5025 Off-line Highways Improvements , the assessment of the value of assets, magnitude of impact and significance of effect will be undertaken based on the guidance swet out in DMRB Volume 11 Section 3 – Standards for Highways (HA 208/07). .

26. The assessments will be informed by relevant best practice guidance including Conservation Principles for the sustainable management of the historic environment in Wales (Cadw, 2011), and Technical Advice Note 24 (Draft): Historic Environment (Wales) Act 2016, Cadw's draft Best Practice Guidance Documents currently in various stages of preparation and consultation, the Chartered Institute for Archaeologists' (CIfA) Code of Conduct (2014) and Standard and Guidance for Historic Environment Desk-Based Assessment (2014).
27. The assessment criteria will be in line with the principles set out in Chapter 7 of the of the 2016 Scoping Report.

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## 18 Socio-economics

1. This chapter outlines the changes in scope in relation to the socio-economic aspects since submission of the 2016 Scoping Report. Section 18.1 addresses the potential change in the scope of the original assessment as a result of the updated Wylfa Newydd Power Station and Off-Site Power Station Facilities designs, and section 18.2 considers the potential effects of the Associated Development now being included in the application for development consent.
2. This chapter should be read in conjunction with chapter 18 of the 2016 Scoping Report.

### 18.1 Changes to Existing Scope

3. Chapter 18 of the 2016 Scoping Report set out the scope, methodology and criteria for assessing potential socio-economic impacts at sensitive receptors in the vicinity of the Wylfa Newydd Development Area.
4. Key changes to the Wylfa Newydd Project described in chapter 3 of this addendum that could have socio-economic effects include:
  - optimisation of the design and consequential changes to the employment requirements during construction and operation;
  - the co-location of three Off-Site Power Station Facilities at Llanfaethlu; and
  - expansion of the On-Site Campus (Temporary Workers' Accommodation) within the Wylfa Newydd Development Area.
5. The key study area defined in the 2016 Scoping Report comprises the whole of Anglesey and parts of the mainland area (see figure 18.1 in the 2016 scoping report), with a daily commuting Zone defined by a 90 minute drive time distance from the Power Station Site. Effects on labour, land use, housing and business all form part of the defined scope. It is not anticipated that any of the proposed changes will have a material effect on the scope of the socio-economics assessment reported in the 2016 Scoping Report.
6. A number of additional points are noted from the Scoping Opinion provided by the Secretary of State in response to the 2016 Scoping Report. These include the following, which make reference to comments included in Appendix B Responses to 2016 Scoping Opinion:
  - Detailed descriptions of both the sensitivity and magnitude of change criteria for each of the defined study areas and the identified receptors therein will be presented in the Environmental Statement and agreed in advance with the local planning authorities and other key stakeholders (Appendix B ref.89). Baseline information and the results of the impact assessment across the different geographical study areas will be presented clearly using maps, figures and summary tables where appropriate.
  - Welsh language consideration will be a 'golden thread' throughout the Environmental Statement, especially within the socio-economic chapter where direct and indirect effects on the Welsh language will be presented (Appendix B ref.90). The cumulative effects on the Welsh language will be considered within the Welsh Language Impact Assessment (WLIA) and also reflected in the cumulative effects chapter of the Environmental Statement. Mitigation and enhancement measures will be developed with input from specialist language planners and feedback from stakeholders, to mitigate negative effects and enhance positive effects that might arise as a result of the Wylfa Newydd Project.
  - Community cohesion will be considered within the Environmental Statement, Health Impact Assessment (HIA), WLIA and Equality Impact Assessment (EqIA), and input from the



Welsh language team will be provided for the socio-economic chapter of the Environmental Statement when considering community cohesion (Appendix B ref.91).

- The socio-economic assessment will provide a breakdown of the employment figures and assumptions used, and more detailed information on the current local skills and occupations supply (Appendix B ref.92). The Wylfa Newydd Project has the potential to generate a significant number of jobs for local residents.
- More information will be provided within the baseline information in relation to the local business population with greater detail on the sectors that could benefit from supply chain opportunities and an analysis of business start-up levels (Appendix B ref.93).
- The potential effects of labour and economic displacement will be considered throughout all of the socio-economic topics (Appendix B ref.94).

## 18.2 Associated Development

7. The socio-economic assessment will predominantly be undertaken on a project-wide basis (summarised below) as described in full in the 2016 Scoping Report.
8. The project-wide assessment will address the following areas (and receptors as appropriate):
  - employment;
  - business and supply chain;
  - tourism; and
  - construction worker accommodation.
9. The Key Socio-Economic Study Area (KSA) represents the area most likely to be affected (both beneficially and adversely) by the Wylfa Newydd Power Station. It is defined by the two Travel to Work Areas of 'Bangor, Caernarfon and Llangefni' and 'Holyhead'. The KSA is further subdivided into the following sub-areas to allow facilitation of the assessment at a smaller geographical scale:
  - Anglesey North;
  - Anglesey West;
  - Anglesey South; and
  - Menai Mainland
10. This project-wide assessment will be complemented by a series of individual development chapters (including the Associated Development) to focus on local issues and receptors as appropriate, including:
  - neighbouring communities and local services;
  - public safety (essentially crime);
  - local businesses; and
  - land use (essentially agricultural land take).

### 18.2.1 Existing Environment

11. The Local Area of Influence (LAI) is 5km for the Power Station Site and 1 km around the Off-Site Power Station Facilities and Associated Development from the site boundaries. This is considered to represent the likely limit of any direct effects associated with construction or operation of the Wylfa Newydd Power Station or Associated Development, and is in line with the approach outlined in the

2016 Scoping Report. Data have been collected on a ward basis within this area, as this is the most appropriate geographic level of statistical data.

12. The baseline as reported in the 2016 Scoping Report sets out the regional context within which the Associated Development will be constructed and operated.

**Table 18.1: Summary of baseline information**

Topic	Park and Ride Facility at Dalar Hir	Logistics Centre at Parc Cybi	A5025 Off-line Highways Improvements
Community	<p>Llanfihangel-yn-Nhywyn is the closest community to the Park and Ride Facility. A restaurant and Eglwus St. Mitiangel's church are the only services provided within this community.</p> <p>Gwyddfor Residential Home is a privately owned care home with 19 residents. Registered care categories for this care home are dementia, learning disability, mental health condition, old age, physical disability and younger adults. The proximity of this care home to the Park and Ride Facility and the type of residents makes this a sensitive receptor, to be included within the socio-economic assessment.</p> <p>Some residential properties are also sporadically located within the local area of influence.</p> <p>A transmitting station is located within the local area of influence to the south of the Park and Ride Facility.</p>	<p>The nearest existing socio-economic receptors are the Holyhead Retail Park, Penrhos Business Park and the former Anglesey Aluminium industrial complex, located 300 - 350m to the north and east, beyond the A55 Outline consent has been granted for the industrial estate at Parc Cybi. However, the only development to date within Parc Cybi has been the creation of the new access road from the A55, incorporating improvements to the cycle path through the estate, and development of one plot.</p> <p>Kingsland and Trearddur Bay are the nearest residential areas to the site, but both are located 700m away.</p> <p>The town of Holyhead is located over 1km to the north-west of the Logistics Centre. This town supports the Port of Holyhead, from which there are ferry services to Ireland.</p>	<p>Communities that could be affected by the A5025 Off-line Highway Improvements comprise Valley Llanfachraeth, and Llanfaethlu and Cefn Coch. Community facilities within these villages and settlements include shops, places of worship, hotels and accommodation, recreational areas, service providers and places of education. A small number of facilities are also located along the A5025 outside of these communities; these facilities are important for local residents and are shown in figure More isolated properties and facilities exist beyond these communities.</p> <p>Three wards (Llanfaethlu, Mechell and Valley) have higher levels of economically inactive people compared to the Welsh average.</p> <p>Eight businesses have been identified as receptors which are relevant to the assessment. These comprise two hotels, a service station, a post office and convenience store, a public house, a bed and breakfast, a local coffee shop and garage services.</p>
Tourism	<p>The Cartio Môn Go-Karting centre is adjacent to the Dalar Hir Park and Ride facility.</p>	<p>Trearddur Bay is also a popular tourist attraction. Recreational facilities in the area include Trearddur Bay Golf Course and Holyhead Sports Centre located over 700m to the west. Ysgol Kingsland, a primary school, is located at the southern end of Kingsland.</p>	<p>Two hotels, a public house, a bed and breakfast, and a local coffee shop could be affected by the proposals.</p>

Topic	Park and Ride Facility at Dalar Hir	Logistics Centre at Parc Cybi	A5025 Off-line Highways Improvements
Land Use	The majority of the local area of influence is farmland and the individual farm holdings have not been identified at this time. Further consideration will be given to the individual farm holdings in the Environmental Statement.	Not available at present. Ongoing surveys to be completed	<p>The main land use along and immediately surrounding the A5025 Off-line Highways Improvements within Sections 1, 3, 5 and 7 is agricultural.</p> <p>A survey was undertaken in March 2016 to establish the type and distribution of agricultural soils across land associated with the A5025 Off-line Highway Improvements. This confirmed that the highest quality soils for agriculture (Grades 1 to 3a) are found within Llanfachraeth, Llanfaethlu, and Cefn Coch). Lower quality soils (Grades 3b to 5) were also recorded in these sections, and across all of Valley.</p>
Welsh Language	Welsh language has a strong presence on Anglesey and forms an integral part of community life and local education.	Welsh language has a strong presence on Anglesey and forms an integral part of community life and local education.	Local facilities such as shops provide an important community service where the Welsh language is spoken. Welsh language has a strong presence on Anglesey and forms an integral part of community life and local education.

## 18.2.2 Potential Socio-economic Effects and Mitigation

13. In addition to the potential effects described in the 2016 Scoping Report (Section 18.3), effects associated with the Associated Development including the A5025 include:

- Temporary local employment (direct and indirect) at the Logistics Centre at Parc Cybi and the Park and Ride Facility at Dalar Hir during construction and operation.
- Removal of through-traffic from the village of Llanfachraeth (via A5025 Off-line Highways Improvements) improving local access to the Ysgol Gynradd Llanfachraeth school due to a reduction in traffic.
- Improved access to healthcare, schools and to Amlwch; due to the reduction of the impact of traffic, particularly within the villages.
- Impacts on local businesses through increase in traffic movements and impacts on amenity (e.g. Go-karting facility at Dalar Hir Park and Ride).
- Changes and/or severance of access for local businesses and residents especially along the A5025.
- Changes in land use and loss of agricultural land (especially A5025 improvements and the Park and Ride Facility at Dalar Hir), including temporary land take for construction compounds.
- Beneficial impacts associated with indirect stimulus of the wider economy.
- Disruption due to noise and air quality to residents during construction and operation (e.g. Gwyddfor Residential Home close to the Park and Ride Facility at Dalar Hir).
- Impacts on employment and potential future use during decommissioning of the Dalar Hir Park and Ride Facility and the logistics centre at Parc Cybi

14. Potential mitigation for the Associated Development includes:

- Implementation of apprenticeship and training programmes to increase the future likelihood of employment opportunities for locally based residents.
- Implementation of the Code of Construction Practice (CoCP) and Construction and Operational Environmental Management Plans to minimise impacts from noise and air quality on local residents, and minimise loss of agricultural land.
- Minimising landtake wherever possible.
- Provision of alternative access arrangements where necessary.
- Use of appropriate signage to mitigate the potential loss of trade at local businesses during construction.
- Implementation of traffic management measures (such as traffic routing, reduced speed limits) to minimise construction-related disruption at properties and businesses.

## 18.2.3 Proposed Scope, Methodology, and Criteria

### Scope

15. The socio-economic assessment shall follow the scope, methodology and criteria as defined in section 18.4 of the 2016 Scoping Report.

## 19 Public Access and Recreation

1. This chapter outlines the changes in scope in relation to the public access and recreation aspects since submission of the 2016 Scoping Report. Section 19.1 addresses the potential change in the scope of the original assessment as a result of the updated Wylfa Newydd Power Station and Off-Site Power Station Facilities designs, and section 19.2 considers the potential effects of the Associated Development now being included in the application for development consent.
2. This Chapter should be read in conjunction with Chapter 19 of the 2016 Scoping Report.

### 19.1 Changes to Existing Scope

3. Chapter 19 of the 2016 Scoping Report set out the scope, methodology and criteria for assessing potential public access and recreation effects at sensitive receptors in the vicinity of the Wylfa Newydd Development Area.
4. Key changes to the Wylfa Newydd Project described in chapter 3 of this addendum that could affect public access and recreation include:
  - optimisation of the design and consequential changes to access such as public car parks, foot paths etc.;
  - the co-location of three Off-Site Power Station Facilities at Llanfaethlu; and
  - expansion of the On-Site Campus (Temporary Workers' Accommodation) within the Wylfa Newydd Development Area, as this locates development closer to the Wales Coast Path.
5. These design changes will not materially affect the scope of the public access and recreation assessment as described in the 2016 Scoping Report for the Power Station Site.
6. A number of additional points are noted from the Scoping Opinion provided by the Secretary of State in response to the 2016 Scoping Report. These include the following, which make reference to comments included in Appendix B Responses to 2016 Scoping Opinion:
  - All Public Rights of Way (PRoW) will be considered in the assessment along with permissive routes that are known to be in regular use within the Wylfa Newydd Development Area. The Wales Coast Path will be considered as a receptor, and the potential need for its temporary diversion during the construction phase and permanent diversion during the operational phase will be assessed and reported within the Environmental Statement (Appendix B ref.95). Potential effects on the Wales Coast Path would be minimised where possible. Figures showing the proposed diversions/temporary closures will be included in the Environmental Statement.
  - Potential construction and operational effects on recreational receptors will be included in the assessment, and it will consider coastal access, including access to beaches (Appendix B ref.96). The Wylfa Information Centre has now closed and it is therefore no longer a receptor and will therefore be scoped out of the assessment.
  - Criteria for recreation and public access will be presented in the Environmental Statement, and a summary of NRW's Wales Coast Path Route Criteria will also be included (Appendix B ref.97).

## 19.2 Associated Development

### 19.2.1 Existing Environment

7. There are no PRow or permissive trails across or along the boundaries of the proposed site of the Park and Ride facility at Dalar Hir, although there is a single footpath to the North West of the Park and Ride facility (IACC Public Rights of way map accessed April 2016). However, there would be no direct impacts on any recreational activities or on this footpath. This development has therefore been scoped out of the environmental assessment for this topic, and only the Logistics Centre and the A5025 Highway Improvements proposals are considered in this chapter.

#### ***Logistics Centre at Parc Cybi***

8. The Lon Trefignath cycle path runs across the wider Parc Cybi site; providing a link between the Trearddur Farm Caravan Park and Holyhead. This cycle path is used by residents, recreational walkers and cyclists as a route between the coast, Trearddur, Kingsland and Holyhead.
9. With outline planning consent for the industrial estate at Parc Cybi, the new access road from the A55 has been developed which incorporates the local road and the cycle path (Lon Trefignath) running through the site. As a consequence, the cycle path now runs alongside the access road to and across the site entrance to the Logistics Centre site.
10. Other recreational facilities in the area include Trearddur Bay Golf Course and Holyhead Sports Centre located over 700m to the west, of the site boundary beyond an area of open countryside and accessed via the B4545.

#### ***A5025 Off-line Highway Improvements***

11. For the A5025 Off-line Highway Improvements, the baseline analysis has considered and identified the following:
  - existing provisions for pedestrians, cyclists, and equestrians;
  - users of public transport (bus services); and
  - community relationships within a study area comprising the 250m development corridor around the A5025 Off-line Highway Improvements.
12. Analysis has also been undertaken of available views currently afforded to vehicle travellers moving along the A5025.
13. The review of existing non-motorised user (NMU) (pedestrians, cyclists and equestrians) provision associated with the existing A5025 identified a range of crossing points, most of which are associated with junctions or comprise PRowS that pass over or under the carriageway. Such provisions currently provide valuable points of access across the road.
14. A network of PRowS exists which include designated footpaths, many of which traverse the study area and/or interface with the existing A5025. A total of 39 local PRowS intersect with the A5025 between Tregele and Valley, many of which join with other routes within the study area and connect local communities.
15. The Wales Coast Path is a long-distance walking trail which encompasses the Isle of Anglesey Coastal Path. There are three points at which routes along the National Cycle Network cross the A5025 by way of a staggered junction; these are in Tregele, Llanrhuuddlad and Llanyngenedl.



16. In relation to public transport, there are two bus routes that use the A5025 between Amlwch and Holyhead. Bus route 61, operated by Lewis y Llan provides a service between approximately 07:00 and 19:00, Monday to Friday. A further service, operated by Arriva (bus route 562), provides for two buses daily between Monday and Friday. Within the study area, there are 12 bus stops serving the communities of Tregele, Llanfairynghornwy, Llanrhuddlad, Llanfaethlu, Llanfachraeth, Llanynghenedl and Valley.
17. There are six main communities within the study area: Tregele, Llanfairynghornwy, Llanrhuddlad, Llanfaethlu, Llanfachraeth, Llanynghenedl and Valley. Additional scattered farmsteads and cottages are also accessed from the A5025. A range of facilities exist within these communities including churches, primary schools, shops, pubs and playgrounds. Community linkages are severed by the A5025, which currently routes through the centre of these settlements.
18. Travellers moving along the A5025 corridor experience a varied appreciation of the surrounding landscape and built environment, depending on the direction of their journey and the mode/speed of travel. The A5025 is positioned within low-lying topography for much of its length from Valley to Llanfachraeth, rising gently onto more undulating landform through the settlements of Llanfaethlu and Llanrhuddlad. Much of the existing outlook from rural parts of the corridor is open or intermittent in nature, characterised by a regular pattern of agricultural fields framed by established hedgerows, stone walls and post-and-wire fencing.

## 19.2.2 Potential Environmental Effects and Mitigation

### *Logistics Centre at Parc Cybi*

19. The Lon Trefignath cycle path passes across the entrance to the Logistics Centre and would be crossed by construction traffic for the duration of the works, posing a safety risk to users and affecting the amenity of this part of the recreational route through noise disturbance, dust and air pollutant emissions.
20. The Trearddur Bay Golf Course and Holyhead Sports Centre are over 700m to the west of the site boundary and their access does not pass the Logistics Centre, but there may be long distance views of the construction works. The results from the Landscape and Visual Assessment will be used to inform the assessment of potential effects on views and the need for mitigation, however, it is likely these effects would not be significant.
21. The potential operational effects from the Logistics Centre would be localised and involve:
  - safety risks to cyclists from the movement of Heavy Goods Vehicles (HGVs) entering the Logistics Centre across the Lon Trefignath cycle path; and
  - amenity disturbance (e.g. noise and dust emissions) to users of the cycle path passing the site from upwards of 70 goods vehicles moving about the site on a daily basis.
22. The potential adverse effects on users of the Lon Treignath cycle path from operational staff accessing the site are not considered likely to be significant, as the design only allows parking for 12 cars on the basis that the staff would be working shifts.
23. A regular turnover of 60 to 70 goods vehicles, each going in and out, could potentially create a significant effect. It is assumed that there would be an average of around 150 HGVs per day, with a peak of around 40 HGVs per hour. However, any potential effects would be localised around the proposed Logistics Centre entrance and in the context of the nearby A55 and planned conversion of the surrounding land to an industrial area, the effect would likely only be of minor significance.

24. Amenity disturbance effects would not be significant within the context of existing sources of disturbance, including the A55 to the north the proposed Logistics Centre and the planned conversion of the surrounding land to an industrial area.
25. Good practice mitigation measures would be put in place during construction and decommissioning to reduce noise levels and air pollution.
26. Any improvements to the Public rights of way shall be embedded into the operational design, and are therefore unlikely to require additional mitigation.

### ***A5025 Off-line Highway Improvements***

27. During construction of the A5025 Off-line Highway Improvements, there may be temporary closures and diversions of PRoWs and other routes used by NMUs, which may inconvenience travellers and/or lengthen their journey times. Construction activities, which may generate noise, dust and movement of vehicles, may also affect the amenity of PRoWs.
28. A review of existing bus traveller provisions indicates a potential requirement to relocate bus stops onto the A5025 Off-line Highway Improvements, which could cause temporary disturbance while works are undertaken. The nature of construction activity and vehicle movements along the A5025 may also give rise to temporary disruption to other stops during the works, particularly in terms of access and potential effects on journey times for services.
29. The operational effects of the A5025 Off-line Highway Improvements are likely to centre on PRoW severance, the extents of which would depend upon the final form of the preferred option in terms of physical obstructions to the route, e.g. embankments. In certain locations, PRoW diversions may be required to avoid obstructions and/or to route pedestrians to other sections of road which offer increased sightlines to improve crossing opportunities and safety.
30. Within the communities that would be bypassed as a result of the A5025 Off-line Highway Improvements, there is the potential for positive effects as a result of reduced severance as traffic flows decrease. This would potentially increase connectivity for NMUs within the communities and enhance the experience of NMU journeys to community facilities such as schools, playgrounds and shops.
31. There is a potential need for alteration of existing bus routes and services, particularly in respect of the A5025 Off-line Highway Improvements, and a possible need for new bus stops. Notwithstanding this, the potential for long-term effects to occur on bus travellers would be limited.
32. In relation to changes in traveller views from the road, there is limited potential for short- and long-term changes to the composition of transient views to occur. Although the change in outlook for travellers would be more marked along the A5025 Off-line Highway Improvements and through bypassed sections, any such changes would be localised and are unlikely to prove a significant detractor to journey ambience.
33. Effects associated with the A5025 Offline Highway Improvements would include;
  - the retention of existing PRoW arrangements wherever possible in the design of the bypasses, bend improvements and interfaces with main roads and side roads;
  - the development and inclusion of alternative routes for non-motorised users, such as new footpaths and crossing points, and provisions for cyclists; and

- the use of existing or redundant sections of carriageway for alternative means, such as changing a bypassed section of road to a cycleway.

### 19.2.3 Proposed Scope, Methodology and Criteria

#### **Scope**

34. PRowS will be considered within 2km of the development areas for the Logistics Centre.
35. Based on the information described in 19.2.2 above for the A5025 Off-line Highway Improvements, a study area of 250m either side of the existing A5025 between Valley and Treglele will be adopted in the assessment. This distance will be sufficient to capture effects on all roads and other PRowS that physically interface with or cross the A5025 Off-line Highway Improvements, and will also encompass communities along the A5025. There is only limited potential for long term operational effects on bus travellers to occur, and, likewise, only limited potential for significant changes to views from the road, therefore it is proposed that these aspects be scoped out of the EIA.

#### **Methodology**

36. The assessment will take account of the following:
- how the proposals would affect accessibility for the widest possible range of people;
  - how the proposals would affect safety and security for pedestrians and cyclists;
  - how the proposals would affect crossing points, as well as the continuity of journeys along and beyond the improvements;
  - diversions from existing routes, and the potential creation of new barriers to movements;
  - how the proposals would affect the amenity of routes; and
  - whether the proposals would encourage or deter journeys by active travel modes.
37. The potential effects on NMUs will be assessed on the basis of increase in travel distance required due to diversions as a result of the proposals; the safety and security of users; and the effect on users of changes in traffic flows. The latter assessment will focus on potential delays that may occur due to traffic severance as a result of users having to wait longer for a sufficient break in traffic flows to allow for a safe crossing between linkages.
38. Footpath inspection surveys will be undertaken along with a review of key linkages. The quality of PRowS will provide an indication as to NMu usage. The assessment of community effects will be based on accessibility to local facilities within communities and any differences (positive or negative) resulting from progression of the A5025 Off-line Highway Improvements and Logistics Centre.
39. The above constitute important factors which will inform final form, design and mitigation measures and opportunities for enhancing journeys on foot or by bicycle. Consultation with the IACC and NRW will continue regarding possible mitigation measures, with additional consultation with other organisations including Sustrans, Ynys Môn Ramblers and Ramblers Cymru as appropriate.

***Assessment criteria***

40. Assessment criteria for the Associated Development shall be developed in line with those set out in in section 19.4.2 of the 2016 Scoping Report and described in full in the ES For the A5025 Off-line Highway Improvements, these criteria will also be in line with DMRB requirements.

## 20 Traffic and Transport

1. This chapter outlines the changes in scope for the traffic and transport assessment proposed since submission of the 2016 Scoping Report. Section 20.1 addresses the change in scope required as a result of the optimised design and inclusion of the Associated Development now being considered as part of the application for development consent. This includes the A5025 Off-line Highways Improvements.

### 20.1 Changes to Existing Scope and Associated Development

2. The proposed traffic and transport assessment as described in the 2016 Scoping Report provides a project wide scope and methodology that is both regional and integrated in terms of study area, modes of transport, receptors and methods of assessment.
3. Figure 20.2 of the 2016 Scoping Report defined a study area which encompasses the A5025 from Valley to the Wylfa Newydd Development Area (WNDA) and the Menai Bridge to WNDA. This encompasses all of the A5025 Off-line Highway Improvements sections now incorporated into the application for development consent. In addition, the A55 from Holyhead to Junction 11 is also included in the Study Area.
4. The study area as defined already encompasses the Logistics Centre at Parc Cybi and the Park and Ride Facility at Dalar Hir.
5. The Traffic Modelling methodology set out in section 20.4.4 of the 2016 Scoping Report, stated that the predicted effects from the Logistics Centre at Parc Cybi, the Park and Ride Facility at Dalar Hir and the A5025 Off-line Highways Improvements would be included in the assessment.
6. The assessment of the optimised design and Associated Development will be assessed at this regional and integrated level. The inclusion of these design changes will therefore be accommodated within the scope defined within the 2016 Scoping Report.
7. A number of additional points are noted from the Scoping Opinion provided by the Secretary of State in response to the 2016 Scoping Report. These include the following, which make reference to comments included in Appendix B Responses to 2016 Scoping Opinion:
  - The Environmental Statement will clearly explain the inter-relationships between the overarching Integrated Traffic and Transport Strategy (ITTS), and other transport-related reports such as the Freight Management Strategy (FMS) (Appendix B ref.98).
  - The Environmental Statement will clearly describe the number of road-based deliveries that shipping would negate, based on a 'worst case' scenario. The ITTS will further consider any potential construction and operational shipping effects on the commercial operation of Holyhead Port (Appendix B ref.99).
  - The routes used to access the Power Station Site from each of the proposed Associated Development locations will be included as part of the Assessment (Appendix B ref.100). The assessment of operational effects will also consider journeys to the Off-Site Power Station Facilities (Appendix B ref.101).

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## 21 Waste and Materials

1. The 2016 Scoping Report proposed that waste management be addressed in the project description section of the ES and that the environmental effects be addressed in the relevant chapters of the ES, such as air quality, noise and vibration, soils and geology, archaeology and cultural heritage, and traffic and transport.
2. It is now proposed to include a dedicated chapter in the ES to consider conventional waste and materials on a project-wide basis.
3. This is a new chapter. There was no chapter on Waste and Materials in the 2016 Scoping Report.

### 21.1 Introduction

4. This chapter considers the generation of waste and materials associated with the Wylfa Newydd Project and assesses the likely significance of potential environmental effects from waste generation and management activities, taking into account the possible effects on local waste infrastructure.
5. Under the Waste Framework Directive, conventional waste is defined as “...*any substance, or object, which the holder discards, intends to or is required to discard.*” Where wastes are being reused on site these are considered to be a ‘non wastes’ and include materials such as rock and minerals.
6. The purpose of this chapter is to report the estimated amounts of conventional waste and materials that may be generated as a result of the Wylfa Newydd Project and to identify how it can be managed, taking into consideration any mitigation measures. For wastes that would be exported from the Wylfa Newydd Project, the availability and known capacity of receiving treatment and disposal sites will also be assessed. The capacity available for handling each waste type in local facilities within North Wales, and where, appropriate facilities in North-west England will be considered.
7. The key project stages and activities which would generate waste and materials associated with the Wylfa Newydd Project are:
  - Construction – such as clearance of above-ground features, demolition of pre-existing structures/buildings, removal of vegetation, soils and contaminated soils as well as construction of buildings and engineering works;
  - Operation – such as maintenance works, site administration and welfare facilities; and
  - Decommissioning – such as demolition of buildings and removal of foundations.
8. This chapter provides details on the types of waste and materials likely to be generated and management methods that may be implemented.
9. For the Associated Development that are required only for the construction phase of the Wylfa Newydd Project (i.e. the Park and Ride Facility at Dalar Hir, the On-Site Campus and the Logistics Centre), decommissioning effects will be considered within the ES.
10. However, the chapter does not assess the potential effects on the capacities of the receiving waste management sites when accepting waste generated through decommissioning of the Wylfa Newydd Power Station. It is difficult at this stage to predict the future availability of waste



management facilities, therefore, this would be assessed as part of the Environmental Assessment for the decommissioning that will be undertaken prior before decommissioning commences.

11. The transportation of fresh fuel and radioactive waste during the operation of the Wylfa Newydd Power Station, and the potential storage of radioactive waste on-site after operation, will not be included in the conventional waste and materials assessment, but rather, these issues will be considered in the ES as part of the radiological issues assessment. The management of radioactive wastes, which arise from the operation of the Power Station, is considered separately in chapter 12.

## 21.2 Wylfa Newydd Power Station and Associated Development

### 21.1.1 Existing Environment

12. The baseline conditions for waste have been determined through a desk study, using information obtained through publically available sources and from government agency publications.
13. In general, waste is managed at a county, regional or sub-regional level depending on type, volumes generated and availability of waste-management facilities.
14. The Wylfa Newydd Project would produce a range of waste and material types, including inert, non-hazardous and hazardous wastes, some of which would require management, treatment and/or disposal off-site. The baseline position represents the most recently available published data from Natural Resources Wales and the Environment Agency in England concerning municipal and construction demolition and excavation waste arisings at a regional level (North Wales and North-west England) and country level (Wales). Historically, local authorities have not been required to report on data pertaining to construction, demolition and excavation waste, and so only limited information is available.
15. This information has been reviewed to establish the current capacities available in North Wales and North-west England. The current landfill capacities (in cubic metres) for the different types of landfill for Wales, North Wales and North-west England are presented in table 21.1.
16. It should be noted that the landfill capacity information detailed in table 21.1 would accommodate all waste types, including municipal, construction and commercial and industrial.

**Table 211.1 Landfill capacity in Wales, North Wales 2013 (NRW 2013) and North-west England 2015**

Landfill type	North-west England (2015)	North Wales (2013)	Wales (2013)	North Wales and North-west England
	Cubic meters			
Hazardous merchant	4,682,000	-	-	4,682,000
Hazardous restricted	150,000	-	191,000	150,000
Non-hazardous with SNRHW cell*	9,404,000	-	3,126,000	9,404,000
Non-hazardous	27,087,000	4,074,000	17,751,000	31,161,000

Landfill type	North-west England (2015)	North Wales (2013)	Wales (2013)	North Wales and North- west England
	Cubic meters			
Non-hazardous restricted	3,224,000	66,000	5,926,000	3,290,000
Inert	6,292,000	1,715,000	3,176,000	8,007,000
Total	50,840,000	5,855,000	30,170,000	56,695,000
* Some non-hazardous sites can accept some Stable Non-Reactive Hazardous Wastes (SNRHW) into a dedicated cell, but this is usually a small part of the overall capacity of the site.				

17. There is currently limited hazardous-waste landfill capacity within Wales and no hazardous-waste landfills in North Wales. This means that, unless new capacity becomes available in the region, any hazardous waste produced by the Wylfa Newydd Project would need to be disposed of in hazardous-waste landfills outside of North Wales. It is expected that Non-hazardous wastes shall be disposed of within Wales where possible.
18. The annual quantity of waste treated at recycling, recovery composting and food waste treatment facilities (in tonnes) for Wales, North Wales and North-west England are detailed in table 21.2.

**Table 21.2 Quantity of waste treated in Wales, north Wales 2013 and north-west England 2015**

Waste Type	Wales (2013)	North Wales (2013)	North-west England (2015)	North Wales & North-west England
	Tonnes			
Biological (food) waste	157,000	5,000	5,666,000	5,671,000
Composting	100,000	65,000	595,000	660,000
Recycling/recovery	3,405,000	554,000	7,387,000	7,941,000
Hazardous waste treatment	472,000	209,000	804,000	1,013,000

19. This outlines the tonnages of waste treated from each region by facility type. While this does not represent the capacity available for treatment, it does demonstrate the quantity of waste currently being treated, and therefore the effect of waste produced from the Wylfa Newydd Project can be assessed against these tonnages. The annual permitted capacity for incinerators in North Wales and North-west England is shown in table 21.3.

**Table 21.3 Incinerator permitted capacity – Wales, north Wales 2013 and north-west England 2015**

	Wales (2013)	North Wales (2013)	North-west England (2015)	North Wales & North-west England
	Tonnes			
Incineration	259,000	181,000	1,466,000	1,647,000

20. In addition to the capacity detailed in the tables above, there are a number of newer facilities in North Wales that would not have been captured in the NRW statistics published in 2013. The additional 83,500 tonnes per annum of anaerobic digestion capacity for non-hazardous materials and 200,000 tonnes per annum of incineration capacity are shown in table 21.4 below.

**Table 21.4 Additional treatment capacity in North Wales**

Facility name	Facility type	Location	Capacity (tonnes per annum)	Operational date
Llwyn Isaf	Anaerobic digester	Caernarfon	11,500	2013
Waen	Anaerobic digester	Denbighshire	22,500	2014
Mona Anaerobic Digestion Plant	Anaerobic digester	Anglesey	49,500	2017/18
Parc Adfer	Incinerator	Deeside	200,000	2019

21. The volumes of waste and materials arising from the enabling works, main construction, operation and decommissioning phases of the Wylfa Newydd Power Station are currently being developed as part of the design development for the ES. These will be quantified and reported in the Waste and Materials chapter of the ES.

## 21.2.2 Environmental Effects and Potential Mitigation

### *Potential construction impacts*

22. During the construction phase, it is likely that wastes such as inert wastes, timber, packaging, and mixed construction and demolition (C&D) wastes would be produced. Most of the waste generated at the site would be offcuts from fitting materials, packaging and spent material from the construction activities. It is likely that some of the waste would need to be taken off site for recycling, treatment or disposal. Quantities of waste shall be defined in the ES.
23. Materials arisings would include dredging spoil, including soft sediment and rock; and soils and rock from bulk earthworks and deep excavations and tunnelling. The majority of these would be re-used across the Wylfa Newydd Project.

### *Potential operational impacts*

24. The wastes produced during the operational phase include used air filters, scrap metal, used insulation material, general office waste and other miscellaneous wastes. It is likely that the majority of operational waste generated would need to be taken off site for recycling, treatment or disposal. It is not anticipated that large quantities of materials would be generated during the operational phase.

### ***Potential decommissioning impacts***

25. Decommissioning wastes for the temporary facilities include inert wastes, and mixed demolition (C&D) wastes. It is likely that some of the waste would need to be taken off site for recycling, treatment or disposal.

### ***Mitigation***

26. Good practice measures including implementation of the waste hierarchy, re-use of materials on site would be adopted to ensure that waste arising during the construction, operation and decommissioning phases of the Wylfa Newydd Power Station is managed appropriately and effectively.
27. Horizon will develop a Management of Materials and Waste document that will identify a series of good practice measures to be adopted through all phases of the development to reduce and manage the amount of waste generated by the Wylfa Newydd Project.
28. The Site Waste Management Plan (SWMP) will detail how waste generated during the construction of the Wylfa Newydd Power Station would be dealt with, in accordance with the Code of Construction Practice. The SWMP would be prepared before construction work commences as a requirement of the DCO.
29. These mitigation measures will be part of the contractor's Construction Environmental Management Plan.
30. It is recognised that waste management relates to issues being assessed in other chapters of the ES, such as soils and geology, surface water and groundwater, archaeology and cultural heritage, noise and vibration, and air quality. The environmental effects in relation to these topics will not be duplicated in this chapter, but consideration will be given to possible mitigation through choice and management of materials and waste.

## **21.2.3 Proposed Scope, Methodology and Criteria**

### ***Scope***

31. For this topic area no specific guidance is available that provides definitions for receptor sensitivity, magnitude or likely significance of effects. In this context, potential effects will be identified and their significance assessed based upon the professional judgement of suitably qualified and experienced specialists applying experience gained from similar projects, and supported by evidence and baseline information.
32. The scope of this assessment considers the availability of waste management facilities in North Wales and North West England suitable for reception of construction and operational wastes generated by the Wylfa Newydd Power Station. The assessment does not consider the potential effects on the capacities of the receiving waste management sites when accepting waste generated through decommissioning of the Wylfa Newydd Power Station. However, the assessment will cover the decommissioning of the temporary facilities required for construction including the On-site Campus, the Park and Ride facility at Dalar Hir and the Logistics Centre.
33. The study area includes:
- all land contained within the Wylfa Newydd Development Area; and
  - the regional areas (Anglesey, North Wales and North-west England) where waste management facilities are located.

34. Reference will be made to relevant assessments undertaken on other relevant topics within the ES, but the potential effects will be considered only to the extent that they are not already covered under other topics and revisited only to identify possible mitigation in terms of waste and materials.

### ***Assessment methodology***

35. The assessment will involve a desk-based study including the following elements:

- identification of relevant legislation, sources of information and local strategies and plans;
- consideration of solid waste arisings during the construction, operational and decommissioning phases of the Wylfa Newydd Power Station; and
- compliance with the waste hierarchy (e.g. reduce, reuse, recycling, recovery and/or disposal) when managing all wastes.

36. The assessment of effects will include:

- an estimation of the likely construction, operational decommissioning waste arisings;
- an assessment of the potential impact of the estimated construction and operational waste arisings in the context of baseline conditions and local infrastructure capacity;
- an assessment of the potential impacts of the estimated waste arisings from the construction of a pipeline to assist with the removal of the Cooling Water from the Wylfa Newydd Power Station;
- identification and consideration of any best practice measures (to minimise or eliminate adverse effects caused by waste) that would be adopted as mitigation, and looking at where secondary and reprocessed materials could be used on-site;
- an assessment of the significance of projected waste arisings following mitigation, demonstrating how mitigation would reduce the impacts/effects of the waste arisings; and
- an assessment of the cumulative impacts with other local developments identified (where information and data are available).

### ***Assessment criteria***

37. For evaluation purposes, sensitivity will be determined by identifying the nature of the waste expected to be produced and how it would be managed, taking into consideration the waste hierarchy. The higher the waste management approach is on the waste hierarchy the lower its environmental burden, therefore materials reused on-site are assessed to have negligible sensitivity and wastes that are predominantly sent for recycling off-site are assessed to have a low sensitivity.
38. Criteria for determining the magnitude of effects will, where possible, use waste management capacity information. However, due to the limited information on waste management facilities' capacities, this assessment will also use the estimated quantities of wastes generated by the Wylfa Newydd Power Station compared to the quantity of similar waste managed locally and regionally to identify the likely magnitude of effects compared to existing waste management activities.
39. Professional judgement will be applied to determine the likely significance of effects through comparing the sensitivity/capacity of the resource and the magnitude of effect. The sensitivity and magnitude criteria used to assess the effects of waste generated by the Wylfa Newydd Power Station have been developed specifically for the purposes of this waste assessment, using

policies and guidance that seek to minimise potential environmental effects associated with waste. These include (but are not limited to).

- Towards Zero Waste (Welsh Government, 2010)
- National Planning Policy for Waste (2014)
- TAN 21 – Waste, ‘Toward Zero Waste – One Wales: One Planet’ (Welsh Government, 2013)
- TAN12 – Design (Welsh Government, 2016)
- Contaminated Land; Applications in Real Environments (CL:AIRE) Definition of Waste Code of Practice (DoWCoP) (2011)
- Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Department for Environment, Food & Rural Affairs, 2009)
- Quality Protocol: Aggregates from Inert Waste (Environment Agency, Waste & Resources Action Programme - WRAP (2013)
- Japanese Knotweed Code of Practice, Version 3 (Environment Agency, 2013)
- Demolition Protocol (Institute of Civil Engineers - ICE) (2008)

40. The criteria used to determine the sensitivity of receptors specific to waste are set out in table 21.5 below

**Table 21.5 Criteria for determining sensitivity**

Sensitivity	Topic-specific criteria
High	Waste and/or material is hazardous; or predominantly disposed of to landfill.
Medium	Waste and/or material is non-hazardous; or predominantly sent to energy recovery.
Low	Waste and/or material is inert; or predominantly segregated and sent for composting, recycling or reuse, or for further segregation, sorting and reprocessing.
Negligible	Waste and/or material is inert or predominantly reused, or recycled then reused on-site.

41. The magnitude of change is a measure of the scale or extent of the change in the baseline condition, irrespective of the value of the receptor(s) affected. The criteria used to determine the magnitude of change are set out in table 21.6.

**Table 21.6 Criteria for determining the magnitude of change for topic receptors**

Magnitude of change	Topic-specific criteria
Large	The waste would require more than 25% of the local infrastructure's capacity; or the proportion of waste produced on an annual basis at the application site is above 25% when compared to the quantity of similar waste managed in the region annually.

Magnitude of change	Topic-specific criteria
Medium	The waste would require between 10% and 25% of the local infrastructure's capacity; or the proportion of waste produced on an annual basis at the site is between 10% and 25% when compared to the quantity of similar waste managed in the region annually.
Small	The waste would require between 5% and 10% of the local infrastructure's capacity; or the proportion of waste produced on an annual basis at the site is between 5% and 10% when compared to the quantity of similar waste managed in the region annually.
Negligible	The waste would require below 5% of the local infrastructure's capacity; or the proportion of waste produced on an annual basis at the site is below 5% when compared to the quantity of similar waste managed in the region annually.



## 22 Cumulative Effects

1. This chapter outlines the changes in scope in relation to the cumulative effects assessment since submission of the 2016 Scoping Report.
2. Section 22.1 addresses the potential change in the scope of the original assessment as a result of the updated Wylfa Newydd Power Station and Off-Site Power Station Facilities designs and the Associated Development now being included in the application for development consent.
3. This chapter should be read in conjunction with chapter 21 of the 2016 Scoping Report.

### 22.1 Changes to Existing Scope and Associated Development

#### 20.1.1 Previous Approach

4. At the time of the 2016 Scoping Report, the intention was for the cumulative effects assessment reported within the ES to be limited to those effects to which the Power Station Site and the Off-Site Power Station Facilities would contribute. It would have excluded cumulative effects that would be contributed to only by other component developments within the Wylfa Newydd Project.
5. At that time, it was proposed to take a modular approach to the cumulative effects assessment. This would have involved a cumulative effects assessment for each of the Wylfa Newydd Project component developments in turn, which would have been reported in their respective Environmental Statements or Environmental Reports. The scope of each of these assessments would have been limited, as explained above, to those effects contributed to by the component development in question.
6. In order to bring together the findings of the modular assessment and to complete a project-wide cumulative effects assessment, a separate Cumulative Impact Assessment Report was proposed. Preliminary versions were to have accompanied each application under the TCPA with a final version reporting on all cumulative effects from the Project submitted as part of the application for development consent.

#### 20.1.2 Revised Approach

7. Because Associated Development will now be included in the application for development consent, Horizon is proposing to take a different approach to the assessment of cumulative effects. There will no longer be a modular approach or a separate project-wide Cumulative Impact Assessment Report. Instead, Horizon will carry out a project-wide cumulative effects assessment and present it in a cumulative effects volume within the Wylfa Newydd Project ES (see chapter 7 of this addendum for a summary of the proposed structure of the ES).
8. Two of the proposed Associated Development are outside of the scope of the application for development consent and for which it is proposed that consent be sought by means of TCPA applications. These are the A5025 On-line Highways Improvements and the Visitor Centre.
9. Additionally, as discussed in section 1.2 of this addendum, consent for Site Preparation and Clearance works shall be sought through both TCPA as well as through the application for development consent.
10. Having regard for these different consenting processes, Horizon proposes the following scope for the intra-project and inter-project cumulative effects assessments:

- Intra-project effects will cover effects caused by any combination of Wylfa Newydd Project developments within the application for development consent.
  - Inter-project effects will bring in consideration of the three Horizon TCPA developments as well as external projects.
11. The 2016 Scoping Report provided the long list and short list of Reasonably Foreseeable Future Projects in Tables 21.3 and 21.4 respectively. These lists have recently been updated and consultation with relevant stakeholders was undertaken in April 2017 on the revised lists. The final agreed lists used in the assessment will be provided in the Wylfa Newydd Project ES.
  12. The methods for the assessment of effects, including the determination of significance, are unchanged from those set out in the 2016 Scoping Report.
  13. Changes are proposed to how intra-development effects are reported. Previously, as discussed in the 2016 Scoping Report, intra-development effects were to be identified at the end of individual topic chapters for each of the development sites. However, in order to improve clarity and avoid duplication, it is now proposed to prepare a chapter on 'combined topic effects' in each of the development volumes within the ES. These effects will be assessed in the same way as the previous 'intra-development' effects would have been.

## 23 Glossary of Technical Terms and Abbreviations

Full title	Abbreviation	Description
4 R's Model	4R	Hydraulic modelling software that represents surface and sub-surface flows to assist with the generation of flow duration curves.
A		
Above Ordnance Datum	AOD	Above the mean sea level at Newlyn in Cornwall calculated between 1915 and 1921, taken as a reference point for the height data on Ordnance Survey maps.
Additional mitigation		Measures that have been identified through the assessment process to reduce environmental effects further.
Advanced Boiling Water Reactor	ABWR	A third generation evolution of the boiling water reactor design. The Power Station will use the ABWR design provided by Hitachi-GE, adapted for use in the UK.
Agricultural Land Classification	ALC	A system used to grade agricultural land according to versatility, quality and suitability for growing crops as set out in the Agricultural Land Classification for England and Wales issued by the Department for Environment, Food & Rural Affairs (1998). The top three grades, Grade 1, 2 and 3a, are referred to as 'Best and Most Versatile' land.
Air Quality Management Plan	AQMP	A plan which sets out the details of dust and emissions mitigation measures, including monitoring procedures, equipment specification, monitoring locations, duration and reporting requirements.
Air Quality Objective	AQO	Defined levels of air quality and maximum pollution limits as specified in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland, 2007.
Abnormal Indivisible Loads	AILs	A load that cannot be divided for the purpose of being carried on a road without undue expense or risk of damage.
Alternative Emergency Control Centre	AECC	A facility that is physically separate from but local to the Power Station and forms part of the Power Station. This would provide back-up command and communications facilities that would be used to manage an incident at the Power Station Site in the extremely unlikely event that the primary facilities on the Power Station Site were not available.
Annual Average	AA	Average over a year.

Full title	Abbreviation	Description
Annual Exceedance Probability	AEP	Flood frequency is expressed in terms of an annual exceedance probability (AEP), which is the inverse of the annual maximum return period. For example, the 100-year flood (a flood likely to occur once every 100 years) can be expressed as the 1% AEP flood, which has a 1% chance of being exceeded in any year.
Area of Outstanding Natural Beauty	AONB	Areas of countryside in England, Wales and Northern Ireland which have been designated under the Countryside and Rights of Way Act 2000 for the purpose of conserving and enhancing the natural beauty of the designated area.
Area of Potential Concern	APC	Term used to highlight areas of potential contamination.
Article 37	-	
Associated Development	AD	Development to support delivery of the Power Station, for example highway improvements along the A5025, Park and Ride facilities for construction workers, at least one Logistics Centre and On-Site Campus accommodation.
<b>B</b>		
Baseline	-	A reference level of existing environmental conditions against which a project is measured and controlled.
Bedrock	-	Solid bedrock formations underlying superficial deposits (if present).
Below ground level	bgl	Term used to differentiate below ground from above ground.
Benthic	-	Living on or in the seabed.
Best and Most Versatile (Agricultural Land Classification)	BMV	Used to define Agricultural Land Classification Grades 1, 2 and 3a.
Biosecurity	-	Measures to protect the environment against harmful non-native flora and fauna.
Birds Directive	-	Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (codified version).
British Geological Survey	BGS	A body which aims to advance geoscientific knowledge of the United Kingdom landmass and its continental shelf by means of systematic surveying, monitoring and research.
British Standard	BS	Standard produced by the British Standards Institution.
British Standards	BSI	A group which produces British Standards

Full title	Abbreviation	Description
Institution		across industry sectors and which is formally designated as the National Standards Body (NSB) for the UK.
Burnt Mound	-	An archaeological feature, located close to a source of water, consisting of shattered stones and charcoal, normally with an adjacent hearth, pit or trough.
C		
Candidate Special Area of Conservation	cSAC	Sites that have been submitted to the European Commission to be considered for designation under the Habitats Directive but not yet formally adopted.
Candidate Wildlife Site	CWS	A candidate non-statutory designated site for nature conservation proposed by a local authority.
Carbon monoxide	CO	A pollutant gas generated by combustion sources. At very high concentrations (such as may occur inside a building with a faulty heating appliance), it can be a dangerous asphyxiant.
Catchment	-	A drainage/basin area within which precipitation drains into a river system and eventually into the sea.
Chartered Institute of Ecology and Environmental Management	CIEEM	A professional membership body representing and supporting ecologists and environmental managers in the UK, Ireland and abroad. Previously known as Institute of Ecology and Environmental Management (IEEM).
Code of Construction Practice	CoCP	A document outlining a series of measures and standards of work for adoption throughout the entire construction period. Ensures compliance with legislation and the effective planning, management and control of construction activities, with the aim of controlling adverse effects on the local community and the environment.
Conservation Area	-	An area designated under section 69 of the Planning (Listed Building and Conservation Areas) Act 1990 as being an area of “ <i>special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance</i> ”.
Construction & demolition	C&D	A waste type designation.
Construction Environmental Management Plan	CEMP	A plan which outlines how a construction project will avoid, minimise or mitigate effects on the environment and surrounding area and the protocols to be followed in implementing these measures in accordance with

Full title	Abbreviation	Description
		environmental commitments.
Contaminated Land: Applications in Real Environments	CL:AIRE	An organisation that has developed methods and guidance for remediating contaminated land and methods for monitoring and investigating sites.
Cooling Water	-	The water used to remove heat from the Generating Unit.
Consultation Summary Report	-	A report which outlined the approach that was followed for the Pre-Application Consultation Stage 1 on the Wylfa Newydd Project
Countryside Council for Wales	CCW	The organisation that was, until 31 March 2013, the wildlife conservation, landscape and countryside access authority for Wales. It was merged with Forestry Commission Wales, and Environment Agency Wales to form Natural Resources Wales, a single body managing Wales's environment and natural resources, on 1 April 2013.
Critical level	-	An air quality standard or guideline for ambient concentrations of a pollutant which applies at ecological receptors.
Critical load	-	A quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge. This is used to assess modelled nitrogen and acid deposition at ecological receptors.
Cumulative effect	-	Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project.
Cumulative Effects Assessment	CEA	An assessment to identify the potential significant effects caused by the interactions of the effects on the environment from different aspects of the same project and from other projects.
<b>D</b>		
Daily Construction Commuting Zone	DCCZ	The defined area for assuming reasonable daily commuting behaviour to the Power Station Site during the construction and operation of the Power Station.
Decibel	dB	The scale used to measure noise is the decibel (dB) scale which extends from 0 to 140 decibels (dB), corresponding to the intensity of the sound pressure level.
Decibels (A-weighted)	dBA	A-weighted decibels, abbreviated dBA, or dBa, or dB(a), are an expression of the relative loudness of sounds in air as perceived by the

Full title	Abbreviation	Description
		human ear.
Definitive Map	-	A legal record showing the legal route of the Public Right of Way along with details of any stiles or gates. Where a route exists on a different alignment either on the ground or on standard Ordnance Survey mapping the Definitive Map takes presence. The map is held by the IACC. Each route recorded on the Definitive Map is given a reference number by which it can be identified.
Department for Energy and Climate Change	DECC	The UK Government department formerly responsible for (among other things) energy and climate change issues, including the security of the UK's energy supplies. These functions are now within the BEIS.
Department for Environment, Food and Rural Affairs	Defra	The UK Government department responsible for the environment, food and rural affairs.
Deposition (dust)	-	The vertical passage of a substance (e.g. dust) to a surface or the ground.
Deposition (sediment)	-	The laying down of part, or all, of the sediment load of a stream on the bed, banks or floodplain which forms various sediment features such as bars, berms and floodplain deposits.
Design Manual for Roads and Bridges	DMRB	A comprehensive manual, prepared by the Highways Agency (now Highways England) that sets out all current standards, advice notes and other published documents relating to the design, assessment and operation of trunk roads (including motorways).
Detailed Onshore Ground Investigation	DOngI	Ground investigation undertaken onshore in 2014 and 2015.
Development Consent Order	DCO	The consent for a Nationally Significant Infrastructure Project required under the Planning Act 2008.
Development Plan	-	A plan produced by the Local Authority which sets out the local planning policies and identifies how land is used, and for determining what will be built where.
Dispersion modelling	-	The mathematical simulation of how air pollutants disperse in the ambient atmosphere. A dispersion model is used to estimate or predict the downwind concentration of air pollutants emitted from sources such as industrial facilities or road traffic.
Dŵr Cymru Welsh Water	DCWW	A company which supplies drinking water and wastewater services to most of Wales and parts of western England and is regulated under the



Full title	Abbreviation	Description
		Water Industry Act 1991 as amended by the Water Act 2014.
Dust and Air Quality Management Plan	DAQMP	A plan that is used to outline how a construction project will avoid, minimise or mitigate effects on air quality and methods used to control dust emissions.
<b>E</b>		
Ecological Impact Assessment	EclA	The process of identifying, quantifying and evaluating the potential impacts of defined actions on ecosystems or their components which may be carried out as part of a formal Environmental Impact Assessment.
Ecological status	-	The overall ecological status of surface waters assessed by a number of different quality elements (hydromorphological, chemical/physico-chemical and biological) that represent indicators of the overall quality of the water body.
EIA Directive	-	Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment.
EIA Regulations	-	Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2016.
Elements	-	Individual parts which make up the landscape, such as trees, hedges and buildings.
Embedded mitigation	-	Measures to avoid or reduce environmental impact that can reasonably be incorporated into the design of the scheme that is submitted to the relevant local authority as part of the planning application for the Proposals.
Enabling Works	-	The works required to remove and clear parts of the Wylfa Newydd Development Area of vegetation, topsoil, existing services, utilities and other features and structures, including ecology mitigation, in order to allow the earthworks and Main Construction stage activities to commence. This work would also include the installation of any new services or utilities required to support the Main Construction stage activities.
Environment Agency	-	The executive non-departmental public body with responsibility for environmental regulation in England.
Environmental Impact Assessment	EIA	The process through which the likely significant effects of a development on the environment are identified and assessed.

Full title	Abbreviation	Description
Environmental Protection UK	EPUK	A national charity that provides policy analysis and advice on air quality, land quality, waste and noise and their effects on people and communities in terms of a wide range of issues including public health, planning, transport, energy and climate.
Environmental Survey Laboratory	ESL	The ESL would be required for normal operation of the Wylfa Newydd Power Station and would provide facilities to manage environmental surveys in the local area, including equipment for the analysis of samples.
Environmental Management Plan	EMP	A document that sets out the key environmental and planning/consenting considerations that must be taken into account for any works taking place.
Environmental Permit	-	A permit required under the Environmental Permitting Regulations for carrying on regulated activities.
Environmental Statement	ES	The document(s) setting out the EIA process and the findings of the EIA as required under the EIA Regulations.
European Commission	EC	The executive body of the European Union responsible for proposing legislation, enforcing European law, setting objectives and priorities for action, negotiating trade agreements and managing and implementing European Union policies and the budget.
European Designated Site	-	<p>The generic term used by Horizon to describe the sites considered by the Habitats Regulations Assessment, namely:</p> <ul style="list-style-type: none"> <li>• Special Areas of Conservation (SACs) and Special Protection Areas (SPAs);</li> <li>• sites that are in the process of designation as SACs and SPAs; these are known as proposed SACs (pSACs), candidate SACs (cSACs), potential SPAs (pSPAs) and Sites of Community Importance (SCIs), depending on the type of designation and point of progression through the designation process; and</li> <li>• Ramsar Sites.</li> </ul>
European Geopark	EGN	A territory, which includes a particular geological heritage and a sustainable territorial development strategy supported by a European programme to promote development.
European Protected Species	EPS	Animals and plants listed under the Habitats Directive.

Full title	Abbreviation	Description
European Protected Species Licence	EPSML	The licence issued to permit an activity affecting European Protected Species that would otherwise be an offence under the Habitats Regulations.
European Union	EU	The European Union is a unique economic and political partnership between 28 European countries that together cover much of the continent.
Evaluation (archaeological)	-	The determination of the significance of effects on archaeological features and values which involves making judgements as to the value of the receptor/resource that is being affected and the consequences of the effect on the receptor/resource based on the magnitude of the impact.
Excavation	-	A programme of controlled, intrusive fieldwork which examines and records archaeological deposits, features and structures and retrieves artefacts and ecofacts and other remains within a specified area.
Existing Power Station	-	The existing Magnox nuclear power station at Wylfa.
F		
Flood Consequence Assessment	FCA	The process of assessing potential flood risk to a site and identifying whether there are any flooding or surface water management issues that may warrant further consideration or may affect the feasibility of a development. Assessment requirements are set out in Planning Policy Wales Technical Advice Note 15: Development and Flood Risk (TAN 15).
Floodplain	-	A floodplain is flat or nearly flat land adjacent to a stream or river, stretching from the banks of its channel to the base of the enclosing valley walls and (under natural conditions) experiences flooding periods of high discharge.
Fluvial	-	A term that relates to rivers and streams and the processes that occur within them.
G		
Generic Assessment Criteria	GAC	Criteria derived for land contamination risk assessment purposes using largely generic assumptions about the characteristics and behaviour of sources, pathways and receptors in order to provide a risk assessment of chronic exposure to contaminants in soil. These assumptions will be conservative in a defined range of conditions.

Full title	Abbreviation	Description
Geological Conservation Review	GCR	An initiative to provide a public record of the features of interest and importance at localities already notified or being considered for notification as 'Sites of Special Scientific Interest'. The sites selected form the basis of statutory geological and geomorphological site conservation in Britain.
Geomorphology	-	The study of landforms and the processes which create them.
Geophysical survey	-	A process involving ground-based physical sensing techniques to determine the presence or absence of anomalies likely to be caused by archaeological features, structures or deposits.
Good Ecological Potential	GEP	Describes the degree to which the quality of the water body's aquatic ecosystem approaches the maximum it could achieve, given the heavily modified and artificial characteristics of the water body that are necessary for the use or for the protection of the wider environment.
Good Ecological Status	GES	A WFD term denoting a slight deviation from 'reference conditions' in a water body, or the hydromorphological, chemical/physico-chemical and biological conditions associated with little or no human pressure.
Good practice mitigation	-	Mitigation measures that would occur with or without input from EIA feeding into the design process (for example, mitigation that represents established industry practice or legal compliance).
Great crested newts	GCN	A species of newt protected as a European Protected Species under the Habitats Directive and the Habitats Regulations.
Ground Investigation	GI	An intrusive investigation undertaken to collect information relating to the ground conditions, normally for geotechnical or land contamination purposes.
Groundwater	-	All water which is below the surface of the ground in the saturation zone (below the water table) and in direct contact with the ground or subsoil.
Groundwater Dependent Terrestrial Ecosystem	GWDTE	A wetland that critically depends on groundwater flows and chemistries to support sensitive ecosystems.
Guidelines for Landscape and Visual Impact Assessment, Third Edition	GLVIA3	The current version of guidance for undertaking Landscape and Visual Impact Assessment produced by the Landscape Institute and Institute of Environmental Management and Assessment.

Full title	Abbreviation	Description
Gwynedd Archaeological Planning Service	GAPS	The autonomous section of the Gwynedd Archaeological Trust that provides archaeological advice to the IACC as well as to developers in the public and private sectors.
<b>H</b>		
Habitats Directive		Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna.
Habitats Regulations		Conservation of Habitats and Species Regulations 2010.
Habitats Regulations Assessment	HRA	The process by which plans and projects are assessed for whether they are likely to have a significant effect on a European Designated Site either alone or in combination with other plans or projects, pursuant to the Habitats Directive and the Habitats Regulations.
Health Impact Assessment	HIA	The process by which the Proposals will be assessed to determine the health effects of the Proposals on a population, particularly vulnerable or disadvantaged groups. It will make recommendations seeking to minimise negative health effects as well as identifying opportunities to maximise positive health effects.
Heritage asset	-	A building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions because of its heritage interest. Heritage assets include designated heritage assets and assets identified by the Local Planning Authority (including local listing).
Historic Environment Record	HER	The record of heritage assets which provides information to members of the public, statutory bodies and developers about the archaeological resource in an area.
Holyhead Deep	-	An area of sea located west of Anglesey.
Hydromorphology	-	An interdisciplinary science that focuses on the fluvial interaction with surrounding landforms and sediment processes.
<b>I</b>		
Institute of Air Quality Management	IAQM	The professional body for air quality practitioners.
Intertidal	-	The area of land between mean high water and mean low water.
Invasive Non-Native Species	INNS	Non-native UK plants that are invasive, for example Japanese Knotweed.
Invertebrates	-	Animals without backbones.

Full title	Abbreviation	Description
Isle of Anglesey County Council	IACC	The local authority governing the area within which the Wylfa Newydd Project is intended to be constructed. IACC has a number of functions, including the granting of planning permission as local planning authority.
<b>J</b>		
Joint Local Development Plan	JLDP	Development Plan prepared by two or more local planning authorities.
Joint Nature Conservation Committee	JNCC	The public body that advises the UK Government and Welsh Government on UK-wide and international nature conservation.
<b>K</b>		
Key characteristics (landscape)	-	The combination of elements that are particularly important to the current character of the landscape and help to give an area its particularly distinctive sense of place.
Key socio-economic study area	KSA	The area most likely to be affected (both beneficially and adversely) by the Wylfa Newydd Project. It is defined by the two Travel to Work Areas (TTWAs) of 'Bangor, Caernarfon and Llangefni' and 'Holyhead'. The KSA boundary is defined based on a best-fit selection of 2001 Census of Population.
<b>L</b>		
	L <sub>A90</sub>	Represents the noise level exceeded for 90 percent of the measurement period and is used to indicate quieter times during the measurement period. It is usually referred to as the background noise level.
	L <sub>A10</sub>	The level exceeded for 10% of the measurement time. This has been shown to correlate well with human responses to road traffic noise.
	L <sub>A10 T</sub>	For example, LA10 18 hr is the LA10 level determined over a period of 18 hours.
Land cover	-	The surface cover of the land, which is usually expressed in terms of vegetation cover or lack of it. This is related to but not the same as land use.
Land use	-	What land is used for, based on broad categories of functional land cover, such as urban and industrial use and the different types of agriculture and forestry.
Landform	-	The shape and form of the land surface which has resulted from combinations of geology, geomorphology, slope, elevation and physical

Full title	Abbreviation	Description
Landscape and Environment Masterplan	LEMP	A fully coordinated environmental landscape design including but not limited to the formation of mounds, habitat and woodland creation, targeted biodiversity mitigation and enhancement measures, temporary and permanent public footpath diversions, management of watercourses and surface water drainage and other relevant environmental considerations.
Landscape and Visual Impact Assessment	LVIA	An assessment to identify and assess the significance of change on the landscape including specific views and general visual amenity resulting from a proposed development.
Landscape character	-	A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.
Landscape Character Area	LCA	A discrete geographical area of a particular landscape type.
Local Air Quality Management	LAQM	A process that requires local authorities across the UK to review, assess and manage the air quality within their geographical areas.
Local Biodiversity Action Plan	LBAP	A plan aimed at conserving the fauna, flora and habitats - collectively referred to as biodiversity - of a defined area, usually along local authority boundary lines.
Local Nature Reserves	LNR	Sites that are dedicated by the local authority under Section 21 of the National Parks and Access to the Countryside Act 1949 for nature conservation which have wildlife or geological features that are of special interest locally.
Local Wildlife Site	LWS	A non-statutory designated site of nature conservation interest.
Logistics Centre		An Off-Site facility at which deliveries can be consolidated into fewer loads and the timing of traffic movements to the Wylfa Newydd Development Area can be controlled during both the Enabling Works and Main Construction stages of development of the Power Station.
<b>M</b>		
Macrophyte	-	Aquatic plants that grow in or near water.
Main Construction	-	Construction activities within the Wylfa Newydd Development Area that would result in the completion of the Power Station, including final levelling and deep excavations for the Power Station foundations, civil construction activities, commissioning of both Units and site finishing.



Full title	Abbreviation	Description
Marine licensable activity	-	Activity defined within the Marine and Coastal Access Act as requiring a marine licence.
Marine Off-Loading Facility	MOLF	A facility comprising two purpose built quays to allow delivery of freight such as AILs and construction materials by sea.
Marine Plan		A plan developed to manage marine activities in a sustainable way
Metre	m	Unit of length.
Mixing zone	-	The extent of an area where water quality parameters are allowed to exceed defined acceptable limits (EQSs) as set out in the Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.
Mobile Emergency Equipment Garage	MEEG	An Off-Site facility for the managed storage of vehicles and equipment for responding to any incidents that might arise during the operational phase of the Power Station. The facility is required by the Office for Nuclear Regulation and is an essential part of the safety requirements of the Wylfa Newydd Project.
Moderate status	-	WFD term denoting a moderate deviation from the 'reference condition' in a water body, for hydromorphological, chemical/physico-chemical and biological quality elements.
Morphology	-	Describes the physical form and condition of a water body, for example the width, depth and perimeter of a river channel, the structure and condition of the riverbed and bank.
<b>N</b>		
National Policy Statement	NPS	Statements prepared and designated by the Secretary of State under the Planning Act 2008, which establish national policy for Nationally Significant Infrastructure Projects, including energy, transport and water, waste water and waste and against which applications for development consent orders are assessed.
National Policy Statement for Energy EN-1	NPS EN-1	The National Policy Statement designated by the in July 2011, which sets out the overarching national policy for delivery of major energy infrastructure projects.
National Policy Statement for Nuclear Power Generation EN-6	NPS EN-6	The National Policy Statement designated by the SoS in July 2011 which sets out national policy on new nuclear power stations identified as potentially suitable for deployment by 2028.
Nationally Significant Infrastructure Projects	NSIP	A type of project listed in the Planning Act 2008, which must be consented by a development consent order.

Full title	Abbreviation	Description
National Soil Resources Institute	NSRI	An organisation which provides expertise in soil systems, soil and land management, soil geoscience and soil spatial information.
Natural Resources Wales	NRW	The public body whose stated purpose is to ensure that the natural resources of Wales are sustainably maintained, enhanced and used, now and in the future. It absorbed the regulatory and advisory duties of the Environment Agency Wales, Countryside Council for Wales and the Forestry Commission in Wales.
Nitrogen dioxide	NO <sub>2</sub>	Nitrogen dioxide is a brown gas that is released into the atmosphere when fossil fuels are burned (for example, petrol or diesel in a car engine, or natural gas in a domestic central heating boiler or power station).
O		
Off-Line Highways improvements	-	Sections of road which move away from the existing road to form a new route – typically used to move traffic around villages etc.
Off-Site	-	Areas of land needed for the Wylfa Newydd Project that would be outside the Wylfa Newydd Development Area.
Off-Site Power Station Facilities	-	The emergency and other facilities that would be physically separate from the Power Station Site and would complement the facilities within the Power Station Site, including an Alternate Emergency Control Centre, Environmental Survey Laboratory and Mobile Emergency Equipment Garage.
On-Site Campus	-	The area within the Wylfa Newydd Power Station Site where the temporary worker accommodation during construction shall be provided.
Oxides of nitrogen	NO <sub>x</sub>	Together, nitric oxide and nitrogen dioxide are known as oxides of nitrogen. It is released into the atmosphere when fossil fuels are burned.
P		
Park and Ride facility	-	An Off-Site facility from which construction workers will park and travel via a dedicated bus service to the Wylfa Newydd Development Area.
Particulate matter	PM	Airborne particulate matter is made up of a collection of solid and/or liquid materials of various sizes that range from a few nanometres in diameter (about the size of a virus) to around 100 micrometres (about the thickness of a human hair).

Full title	Abbreviation	Description
	PM <sub>10</sub>	Particulate matter with an aerodynamic diameter of 10 microns or less.
	PM <sub>2.5</sub>	Particulate matter with an aerodynamic diameter of 2.5 microns or less.
Planning Policy Wales	PPW	Guidance prepared by the Welsh Government setting out the current land use planning policy for Wales, to be taken into account by local planning authorities when preparing Development Plans.
Plant	-	The machinery or infrastructure used to construct or support the operation of a given development or facility.
Pluvial	-	A term that relates to rainfall and its characteristics.
Pool	-	A topographic low point in the bed of a channel providing a relatively deep area of water.
Possible Special Area of Conservation	pSAC	Areas under consideration for designation under the Habitats Directive.
Potential Special Protection Area	pSPA	Site under consideration for designation under the Birds Directive as a Special Protection Area.
Power Station Site	-	The indicative areas of land and sea within which the majority of the permanent Power Station buildings, plant and structures would be situated. It would include the two nuclear reactors, steam turbines, the cooling water system intake and pump house, outfall structures, breakwaters and the Marine Off-Loading Facility, as well as other ancillary structures.
Project Update Consultation	-	A report that described the informal non-statutory consultation and engagement which is ongoing as part of the Project evolution.
Public Right of Way	PRoW	Highways such as footpaths, cycle ways and national trails that allow the public a legal right of passage.
<b>R</b>		
Ramsar Sites	-	Wetlands of international importance, designated under the Ramsar Convention 1971.
Reach	-	A length of channel which, for example, may have a homogeneous morphology (river type) or restoration solution.
Reasonably Foreseeable Future Projects	RFFP	This term refers to external (third-party) projects which are currently preparing to commence construction, or which have full planning consent and can reasonably be expected to

Full title	Abbreviation	Description
		progress, and whose effects would overlap spatially and/or temporally with those of the lead project. Projects meeting these criteria have the potential to act together with the lead project to cause one or more cumulative effects.
Recharge	-	The replenishment of an aquifer by the infiltration of water, typically rainfall but can be from streams or rivers.
Regionally Important Geological/Geodiversity Sites	RIGS	Locally designated sites of importance for geodiversity.
Riparian zone (or area)	-	The riparian zone or riparian area is the interface between land and a stream or river.
River Basin Management Plan (Western Wales)	RBMP	A plan required to be prepared under the WFD which outlines the current statuses of all water bodies. The 2009 RBMP outlines a plan for achieving the protection, improvement and sustainable use of water within a river's catchment area.
Rochdale Envelope	-	An approach established by UK planning case law which involves broadly defining the project (or elements of it) but limiting it by a number of clearly defined fixed parameters. Rochdale Envelopes are typically defined by a series of maximum extents of a project (or "worst case scenarios") by which effects can be assessed.
Run-off	-	Precipitation that flows as surface water from a site, catchment or region to the sea.
S		
Scheduled Monument	-	A heritage asset designated and protected under the Ancient Monuments and Archaeological Areas Act 1979.
Scoping	-	The process of identifying the issues to be addressed by the EIA process. It is a method of ensuring that an assessment focuses on the important issues and avoids those that are considered unlikely to be significant.
Scoping Opinion	-	A written opinion of the relevant planning authority, following a request from the applicant for planning permission, as to the information to be provided in the Environmental Statement.
Screening	-	The formal process undertaken to determine whether it is necessary to carry out a statutory EIA and publish an Environmental Statement in accordance with the EIA Regulations.

Full title	Abbreviation	Description
Seascape Character Area	SCA	Similar to a landscape character assessment, a seascape character assessment is the process of identifying and describing variation in character of the seascape. It seeks to identify and explain the unique combination of elements and features that make seascapes distinctive.
Secretary of State	SoS	The cabinet minister who (among other things) ultimately determines applications for Development Consent Orders.
Section 42 Priority Species		List of Species in the 2006 NERC (Natural Environment and Rural Communities) Act which are of principal important for conservation in Wales.
Sediment	-	Organic and inorganic material that has precipitated from water to accumulate on the floor of a water body, watercourse or trap.
Setting	-	The surroundings in which a place is experienced, whilst embracing an understanding of perceptible evidence of the past in the present landscape.
Short-term	-	An effect lasting for the duration of the activity only.
Site of Special Scientific Interest	SSSI	Sites designated as being of special interest for their flora, fauna or geological or physiographical features and protected under the Wildlife and Countryside Act 1981.
Site Preparation and Clearance	SPC	The term used for the works required to clear the Power Station site in preparation for main construction of the Power Station.
Site Waste Management Plan	SWMP	A plan that is used to outline how a construction project will avoid, minimise or mitigate effects on waste production and handling on the environment and surrounding area.
Special Area of Conservation	SAC	Areas that have been identified as being important for a range of vulnerable habitats, plant and animal species within the European Union and are designated under the Habitats Directive.
Special Landscape Area	SLA	A non-statutory designation applied by the local planning authority to define areas of high landscape importance within their administrative boundary.
Special Protection Area	SPA	Sites designated under the Birds Directive due to their international importance for the breeding, feeding, wintering, or the migration of, rare and vulnerable species of birds.
Stable Non-Reactive	SNRHW	As defined by Article 16 of Annex 2 to Directive 199/31/EC, 19th December 2002 (The Landfill

Full title	Abbreviation	Description
Hazardous Waste		Directive).
Stakeholder	-	An organisation or individual with a particular interest in a project.
Strip, map and sample	-	An archaeological mitigation technique that entails stripping extensive areas under archaeological supervision, then planning and selectively excavating significant deposits.
Study area	-	The spatial area within which environmental effects are assessed (i.e. extending a distance from the development footprint in which significant environmental effects are anticipated to occur). This may vary between the topic areas.
Sulphur dioxide	SO <sub>2</sub>	A gas primarily arising from anthropogenic activities and more specifically combustion of fuels containing sulphur and sulphur compounds. Sulphur dioxide is emitted in negligible quantities during the combustion of natural gas but generally at higher concentrations for liquid fuels which have a higher sulphur content.
Superficial deposits	-	Unconsolidated (loose) deposits overlying the bedrock.
<b>T</b>		
Technical Advice Note	TAN	A series of topic-specific policy documents that supplement Planning Policy Wales.
Temporary Workers' Accommodation	-	The specially provided type of new housing stock for construction workers, which would comprise campus style development of a minimum of 500 modular single worker en suite accommodation units, arranged in blocks that would each be served by a number of communal rooms such as a kitchen, dining area and sitting room. The modular units would be designed for temporary occupation, to be dismantled and removed after use.
Tidal excursion	-	The net horizontal distance over which a water particle moves during one tidal cycle of flood and ebb.
Tourism	-	A social, cultural and economic phenomenon that entails the movement of people to places outside their usual environment for personal or business/professional purposes.
Town and Country Planning Act 1990	TCPA	The Act that forms part of the land use planning regime in the UK and (among other things) establishes the legal framework in respect of applications for, and determination of, planning permissions.

Full title	Abbreviation	Description
Travel to Work Areas	TTWA	The boundary for assuming reasonable daily commuting behaviour to the Power Station Site. Travel to Work Areas for the Power Station are considered to be 'Bangor, Caernarfon & Llangefni' and 'Holyhead' with particular focus upon the communities present within proximity of the existing A5025.
Trial trenching	-	Trial trenching is a method of archaeological evaluation used to determine the presence or absence of archaeological features, deposits or structures and assess their character and significance.
U		
Unitary Development Plan	UDP	A statutory document that sets out a council's planning policies to control development.
United Nations Educational, Scientific and Cultural Organisation	UNESCO	A United Nations body, founded in 1945, whose mission has been to contribute to the building of peace, poverty eradication, lasting development and intercultural dialogue, with education as one of its principal activities to achieve this aim.
V		
Visitor and Media Reception Centre	-	A facility serving the dual purpose of: <ul style="list-style-type: none"> <li>a visitor centre used to educate visitors through a permanent interactive exhibition and a hosting venue for educational activities and special events; and</li> <li>a media reception centre to facilitate press briefings in the event that activities or an incident at the Power Station attracted substantial media attention.</li> </ul>
Visual amenity	-	The overall pleasantness of the views people enjoy of their surroundings, which provides an attractive visual setting or backdrop for the enjoyment of activities of the people living, working, recreating, visiting or travelling through an area.
W		
Wales Coast Path	WCP	A 870 mile network of public footpaths and other routes around the coastline of Wales, which incorporates the Isle of Anglesey Coastal Footpath.
Waste Framework Directive	-	<a href="#">Directive 2008/98/EC</a> of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives.
Water body	-	A discrete section of a river, groundwater area, lake or coast that is a defined management unit



Full title	Abbreviation	Description
		under the WFD.
Water Framework Directive	WFD	Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.
Welsh Language Impact Assessment	WLIA	The systematic, criteria-based assessment of the likely impacts of a development or project on Welsh language and culture.
Wildlife and Countryside Act 1981	WCA	The principal piece of UK legislation relating to the protection of wildlife.
Wylfa Newydd Development Area	WNDA	The indicative areas of land and sea including the areas surrounding the Power Station Site that would be used for the construction and operation of the Power Station. This area is representative of the maximum area that would be physically affected by Power Station main construction activities and used to form the landscaped setting of the operational Power Station.
Z		
Zone of Theoretical Visibility	ZTV	A map, usually digitally produced, showing areas of land within which a development is theoretically visible.

## 24 References

- AECOM. 2015. *(Draft) Stage 2 Scheme Assessment Report*.
- BACTEC International Ltd. (BACTEC). 2016. *Preliminary Unexploded Ordnance Risk Assessment – GS-2753074*.
- British Geological Survey (BGS). [[www.bgs.ac.uk](http://www.bgs.ac.uk)].
- BGS. 1980. *Map Sheet 92-93, Drift Geology, Anglesey (1:50,000)*.
- BGS. 2015. *Geology of Britain Viewer*. [Online]. [Accessed on 23 November 2015]. Available from: [http://www.bgs.ac.uk/bgsrscs/rcs\\_details.cfm?code=DMTN](http://www.bgs.ac.uk/bgsrscs/rcs_details.cfm?code=DMTN).
- BGS and Welsh Assembly. 2010. *North West Wales Mineral Resource Map*. BGS, Keyworth, Nottingham.
- BGS and Welsh Assembly. 2012. *North West Wales Aggregate Safeguarding Map*. BGS, Keyworth, Nottingham.
- BGS Online Data Portal. [<http://www.bgs.ac.uk/data/mapViewers/home.html>].
- British Standard. 1993. *Evaluation and Measurement for Vibration in Buildings. Guide to Levels from Groundborne Vibration (BS 7385-2:1993)*.
- British Standard. 2003. *Description and Measurement of Environmental Noise (BS 7445:2003)*.
- British Standard. 2009. *Code of Practice for Noise and Vibration Control on Construction and Open Sites (BS 5228-2: 2009)*.
- Cambridge Environmental Research Consultants Ltd. 2004. *CERC note 54, Modelling car parks, April 2004*. Cambridge: CERC.
- Capita Symonds. 2004. *Land at Ty Mawr, Holyhead Proposed Development for Primarily Employment Purposes, Environmental Statement*, Capita Symonds, October 2004.
- Capita Symonds and Isle of Anglesey County Council (IACC). 2010. *Hard Rock and Sand & Gravel Safeguarding Areas in Ynys Môn*. Final Report.
- Centre for Ecology and Hydrology, and Natural Resource Wales (NRW). *Air Pollution Information System*. [<http://www.apis.ac.uk/>].
- Chartered Institute for Archaeologists. 2014. *Code of Conduct*. [<http://www.archaeologists.net/sites/default/files/node-files/CodesofConduct.pdf>].
- Chartered Institute for Archaeologists. 2014. *Standard and Guidance for Historic Environment Desk-Based Assessment*. [[http://www.archaeologists.net/sites/default/files/node-files/CIfAS&GDBA\\_1.pdf](http://www.archaeologists.net/sites/default/files/node-files/CIfAS&GDBA_1.pdf)].
- Chartered Institute of Ecology and Environmental Management (CIEEM). 2006. *Guidelines for Ecological Impact Assessment in the United Kingdom*.
- CL:AIRE (Contaminated Land in Real Environments). 2008. *The Definition of Waste Code of Practice (DoWCoP)*.
- COFNOD. *North Wales Environmental Information Service* [<http://www.cofnod.org.uk/Home>].
- Collins, J. (ed.). 2016. *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3<sup>rd</sup> edn). London, The Bat Conservation Trust.

Construction Industry Research and Information Association (CIRIA). 2001. *Contaminated Land Risk Assessment - A Guide to Good Practice* (C552).

Countryside Council for Wales. *LANDMAP* [<http://test.landmap.ccw.gov.uk/>].

Cranfield Land Information System. [[www.landis.org.uk](http://www.landis.org.uk)].

Department for Environment Food and Rural Affairs (DEFRA). 2007. *Hedgerow Survey Handbook. A standard procedure for local surveys in the UK*. Defra, London. 2nd Edition.

DEFRA. 2007. *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland*. Volume 1, paragraphs 116 – 121, The Stationery Office, London.

DEFRA. 2009. *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites*. The Stationery Office, London.

DEFRA 2009. *Local Air Quality Management, Technical Guidance (LAQM.TG(09))*. Accessed online 05/02/15 [<https://www.gov.uk/government/publications/local-air-quality-management-technical-guidance-laqm-tg-09>].

DEFRA. 2012. *Environmental Protection Act 1990: Part 2A – Contaminated Land Statutory Guidance*. The Stationery Office, London.

DEFRA. 2014. *Background mapping data for local authorities, 2011 based background maps*. [Online] Available from <http://uk-air.defra.gov.uk/data/laqm-background-home> [Accessed December 2015].

DEFRA. *UK-Air Information Resource* (<http://uk-air/defra.gov.uk/>).

Department of Energy and Climate Change (DECC). 2011. *National Policy Statement for Nuclear Power Generation (EN-6)*. The Stationery Office, London.

DECC. 2011. *Overarching National Policy Statement for Energy (EN-1)*. The Stationery Office, London.

Department of Transport and Welsh Office. 1988. *Calculation of Road Traffic Noise*.

English Nature. 2002. *Badgers and Development*. Worcester.

English Partnerships. 2008. *Additionality Guide*.

Environment Agency (EA). 2002. *Environmental Impact Assessment (EIA): A handbook for scoping projects*.

EA. 2004. *Model Procedures for the Management of Land Contamination: Contaminated Land Report 11 (CLR11)*.

EA. 2007. *The Ynys Môn Catchment Abstraction Management Strategy*. Environment Agency, Bristol.

EA. 2009. *Water for life and livelihoods, River Basin Management Plan Western Wales River Basin District*. Environment Agency, Bristol.

EA. 2011. *H1 Annex F – Air Emissions, Version 2.2*. Environment Agency, Bristol.

EA. 2015. *What's In Your Backyard Online Mapping*. [Online]. [Accessed on 20 November 2015]. Available from: <http://apps.environment-agency.gov.uk/wiyby/>. [[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/296952/geho04\\_11btrf-e-e.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/296952/geho04_11btrf-e-e.pdf)].

EA. "What's in my backyard" [<http://apps.environment-agency.gov.uk/wiyby/>].

- Environmental Protection UK. 2010. *Development Control: Planning for Air Quality (2010 Update)*. [[http://www.iaqm.co.uk/text/guidance/epuk/aq\\_guidance.pdf](http://www.iaqm.co.uk/text/guidance/epuk/aq_guidance.pdf)].
- Environmental Protection UK and the Institute of Air Quality Management. 2015. *Land-Use Planning & Development Control: Planning for Air Quality*, Version 1.1.
- EU. 2000. *Water Framework Directive (WFD)*. 2000. Council Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for community action in the field of water policy. Official Journal of the European Commission.
- EU. 2008. *The European Hazardous Waste Directive was replaced by the revised EU Waste Framework Directive (2008/98/EC)*.
- EU. 2008. *The EU Waste Framework Directive*.
- Georeferenced Soil Database for Europe, 2001. *Manual of Procedures*, V1.1.
- GeoMôn. 2007. *Developing a Methodology for Selecting Regionally Important Geodiversity Sites (RIGS) in Wales*. A RIGS Survey of Anglesey & Gwynedd. Amlwch, Anglesey.
- Groundsure. 2015. *Enviroinsight, Geoinsight and Large and Small Scale Historical Maps Report Pack (GS-2319783, GS-2319784, GS-2319785)*. Brighton.
- Gwynedd Council. 1993. *Gwynedd Structure Plan*. [<http://www.anglesey.gov.uk/planning-and-waste/planning-policy/current-plans-and-policies/>].
- Gwynedd County Council and Isle of Anglesey County Council (IACC). 2015. *Deposit Anglesey and Gwynedd Joint Local Development Plan (JLDP) 2011-2026*.
- Halcrow. 2010. *Heavy Route and MOLF Strategy Study (2010)*, produced by Halcrow.
- Highways Agency. 1993. *Design Manual for Roads and Bridges (DMRB)*, Volume 11, *Environmental Assessment*.
- Highways Agency. 2003. *Interim Advice Note 170/12 Version 3 - Updated air quality advice on the assessment of future NOx and NO2 projections for users of DMRB Volume 11, Section 3, Part 1 'Air Quality'*.
- Highways Agency. 2010. *Interim Advice Note 130/10 - Ecology and Nature Conservation: Criteria for Impact Assessment*.
- Highways Agency. 2011. *Interim Advice Note 153/11 - Guidance on the Environmental Assessment of Material Resources*.
- Highways Agency. 2015. *Interim Advice Note 125/15, Environmental Assessment Update*.
- Horizon. 2014. *Health Impact Assessment Scoping Report*.
- Horizon. 2015. *Air Quality Modelling and Assessment Methodology – Non-Radiological Emissions*. Report reference HNP-S5-PAC-REP-00022], November 2015.
- Horizon. 2016. *Horizon Nuclear Power Limited, Wylfa Newydd – Statement of Community Consultation, Version 2*
- Horizon. 2016. *Integrated Traffic and Transport Strategy*. [www.horizonnuclearpower.com](http://www.horizonnuclearpower.com)
- Horizon. 2016. *Report on Horizon's Approach for Siting Associated Development to Support Construction of Wylfa Newydd*. Report reference WN02.06.01-S4-OS-REP-00011. 2016.
- Hundt, L. 2012. *Bat Surveys: Good Practice Guidelines*, 2nd edition. Bat Conservation Trust. London.
- Institute of Air Quality Management. 2014. *Guidance on the assessment of dust from demolition and construction*. [<http://www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf>].

Institute of Ecology and Environmental Management. *Guidelines for Ecological Impact Assessment in the United Kingdom*, June 2006. Isle of Anglesey County Council, 1996. *Ynys Môn Local Plan*.

[[http://www.anglesey.gov.uk/upload/public/attachments/38/Local\\_Plan\\_Complete1.pdf](http://www.anglesey.gov.uk/upload/public/attachments/38/Local_Plan_Complete1.pdf)].

Institute of Environmental Assessment. 1993. *Guidelines for the Environmental Assessment of Road Traffic*.

Institute of Environmental Management and Assessment. 2004. *Guidelines for Environmental Impact Assessment*.

Institute of Environmental Management and Assessment. 2014. *Guidelines for Environmental Noise Impact Assessment*.

Institute of Environmental Management and Assessment. 2016. *Environmental Impact Assessment Guide to: Delivering Quality Development*.

IACC. *Nature website* [<http://angleseynature.co.uk/>].

IACC. 1996. *Ynys Môn Local Plan*. Anglesey.

IACC. 2005. *Stopped Unitary Development Plan*. [<http://www.anglesey.gov.uk/planning-and-waste/planning-policy/current-plans-and-policies/unitary-development-plan/>].

IACC. 2005. *Ynys Môn Unitary Development Plan (un-adopted)*.

IACC. 2007. *Supplementary Planning Guidance: Planning and the Welsh Language*.

IACC. 2009. *Anglesey Area of Outstanding Natural Beauty Management Plan, 2009 – 2014*. [<http://www.anglesey.gov.uk/planning-and-waste/countryside/areas-of-outstanding-natural-beauty-aonbs/>].

IACC. 2010. *Air Quality Detailed Assessment and Progress Report for Isle of Anglesey County Council*. Anglesey.

IACC. 2010. *Isle of Anglesey Health Impact Assessment Tool*. [<http://bit.ly/LSB0kb>].

IACC. 2011. *Air Quality Progress Report for Isle of Anglesey County Council*. Anglesey.

IACC. 2012. *Air Quality Updating and Screening Assessment for Isle of Anglesey County Council*. Anglesey.

IACC. 2013. *Air Quality Progress Report for Isle of Anglesey County Council*. Anglesey.

IACC. 2013. *Transformation Plan – the Roadmap to the New Anglesey*.

IACC. 2014. *Air Quality Progress Report for Isle of Anglesey County Council*, Anglesey.

IACC. 2014. *Approach and Methodology for Environmental and Cumulative Impact Assessment Guidance for Developers, Planning Officers and Consultants*.

IACC. 2014. *'BRITPIT' Wales extract*. Anglesey.

IACC. 2014. *New Nuclear Build at Wylfa: Supplementary Planning Guidance, Topic Paper 5: Transport*. Anglesey.

IACC. 2014. *Supplementary Planning Guidance: New Nuclear Build at Wylfa*.

IACC. 2015. *Updating and Screening Assessment for Isle of Anglesey County Council*. Anglesey.

IACC and Gwynedd Council. 2011. *Anglesey and Gwynedd Joint Local Development Plan. Full Draft for Engagement*. Anglesey.

- IACC and NRW. 2015. *Anglesey Area of Outstanding Natural Beauty Management Plan, 2015 – 2019 (consultation draft)*. Anglesey.
- Jacobs. 2013. *Consultancy Report: Baseline Phase 1 Habitat Survey Report 2013, Report to Horizon Nuclear Power Ltd.*
- Jacobs. 2013. *Dalar Hir Extended Phase 1 Habitat Survey and Great Crested Newt Habitat Assessment*.
- Jacobs. 2014. *Dalar Hir Badger (Meles meles) Baseline Surveys*.
- Jacobs. 2014. *Dalar Hir Bats and Barn Owl (Tyto alba) Baseline Surveys*.
- Jacobs. 2014. *Dalar Hir Reptiles Baseline Surveys*.
- Jacobs. 2014. *Dalar Hir Water Vole Baseline Surveys*.
- Jacobs. 2014. *Extended Phase 1 Habitat Survey Report - Dalar Hir Buffer Area*.
- Jacobs. 2014. *Great Crested Newt Baseline Surveys*.
- Jacobs. 2014. *Wylfa Newydd Project: Wylfa Freshwater Baseline Survey*.
- Jacobs. 2015. *Baseline Data Synopsis Report – Air Quality*. Report for Horizon, report reference WN03.03.01-S5-PAC-REP-00017.
- Jacobs. 2015. *Wylfa Newydd Project Consultancy Report: A5025 Terrestrial Ecology Factual Report 2014, Report to Horizon Nuclear Power Ltd.*
- Jacobs. 2017. *Wylfa Newydd Project Horizon Nuclear Power Logistics Centre at Parc Cybi: Outline Specification*.
- Joint Nature Conservation Committee (JNCC) [<http://jncc.defra.gov.uk/>].
- JNCC. 2015. *The Geological Conservation Review (GCR)*. [Online]. Available from: <http://jncc.defra.gov.uk/page-2947> [Accessed on First December 2015].
- Jones, Orford & MacFarlane. 2016. *People, Places and Policy – Knowing Contemporary Wales Through New Localities*. Routledge Publishing.
- Land Information System (LandIS). Soilscales Viewer. [<http://www.landis.org.uk/services/soilscales.cfm>].
- Landscape Institute and Institute of Environmental Management and Assessment, 2013. *Guidelines for Landscape and Visual Impact Assessment Third Edition (GLVIA3)*.
- LUC, 2012. *Review of Special Landscape Areas in Gwynedd and Anglesey: Executive Summary*. [<https://www.gwynedd.gov.uk/en/Council/Documents---Council/Strategies-and-policies/Environment-and-planning/Planning-policy/Supporting-documents/Review-of-Anglesey-and-Gwynedd-Special-Landscape-Areas-Executive-Summary.pdf>].
- Members of the National MWIA Collaborative (England). 2011. *Mental well-being impact assessment: a toolkit for well-being* [<http://bit.ly/1k7DLTR>].
- Ministry of Agriculture Fisheries and Food (MAFF). 2000. *Good Practice Guide for Handling Soils*. The Stationery Office, London.
- Mott MacDonald. 2011. *(Draft) A5025 Stage 1 Scheme Assessment Report - WYB0849 Route Improvement Contract (WYL-PD-SDT-REP-00009) for Horizon Nuclear Power Ltd.*
- Mott MacDonald. 2011. *(Draft) Environmental Impact Assessment Scoping - A5025 Route Improvement Contract for Horizon Nuclear Power Ltd including the Heritage Scoping Study, produced by Gwynedd Archaeological Trust*.

- Mott MacDonald. 2014. *A5025 Route Improvement Contract EIA Breeding Bird Survey Report*.
- Mott MacDonald. 2014. *A5025 Route Improvement Contract EIA Great Crested Newt Field Survey Results*.
- Mott MacDonald. 2014. *A5025 Route Improvement Contract EIA Hedgerow Survey Results*.
- Mott MacDonald. 2014. *A5025 Route Improvement Contract EIA Otter & Water Vole Survey Results*.
- Mott MacDonald. 2014. *A5025 Route Improvement Contract EIA Reptile Survey Results*.
- Mott MacDonald. 2014. *A5025 Route Improvement Contract EIA Winter Bird Survey Results - Winter 2013/2014*.
- Mott MacDonald. 2014. *A5025 Route Improvement Contract Preliminary Ecological Appraisal*.
- National Grid. 2012. *Options Appraisal - Toolkit for Project Teams Economic Activity methodologies*.
- Natural Environment Research Council (NERC). *Soil Portal*.  
[<http://www.bgs.ac.uk/nercsoilportal/home.htm>].
- National Policy Statement (NPS): Waste. 2012.
- NPS: National Networks. 2014.
- National Policy Statement for Nuclear Power Generation (NPS - EN6), *published by DECC (2011)*.
- National Soil Resources Institute (NSRI). 2015. *Full Soils Site Report for location 230576E, 380287N, 5km x 5km*. Cranfield University. Available at <https://www.landis.org.uk/sitereporter/>
- NRW. 2013. *Managing the risk of flooding in the Western Wales River Basin District*.  
[<http://naturalresourceswales.gov.uk/content/docs/pdfs/our-work/Policy-advice-and-guidance/managing-the-risk-of-flooding-in-the-western-wales-river-basin-district.pdf?lang=en>].
- NRW. 2015. Flood Risk Map. [Online]. [Accessed on 03/12/2015]. Available from:  
<https://naturalresources.wales/our-evidence-and-reports/maps/flood-risk-map/?lang=en>.
- NRW / Countryside Council for Wales (CCW) [<http://naturalresourceswales.gov.uk/> / <http://www.ccw.gov.uk>].
- NRW, LANDMAP Level 3 Assessments and Methodologies. [Online] Available at:  
<http://www.ccw.gov.uk/landmap>.
- Natural England and DEFRA. 2015. *Badgers: surveys and mitigation for development projects*.
- Office for National Statistics. 2011. 2011 Census.
- Ordnance Survey (OS) Explorer Map 262, Anglesey West (1:25,000).
- Planning Inspectorate. 2016. *Scoping Opinion, Proposed Wylfa Newydd Generating Station*.
- RSK. 2014. *Preliminary Sources Study Reports for Off-line Areas (RSK, 2014 a-d)*.
- Scottish Government. 2011. *Technical Advice Note: The Assessment of Noise, 2011*.  
[<http://www.scotland.gov.uk/Publications/2011/03/02104659/0>].
- Strachan, R. and Moorhouse, T. 2006. *Water Vole Conservation Handbook*, 2nd Edition. Wildlife Conservation Research Unit (WildCRU), Oxford University.
- Strategic Transport Study for Major Developments: *Final Report (Revision C) (2011)*, produced by Grontmij.



Strategic Transport Study for Major Developments: *Wylfa B Highways Review and Recommendations (2011)*, produced by Grontmij.

TACP Ltd. and IACC. 2011. *Isle of Anglesey County Council Landscape Strategy*. Anglesey.

*The Environmental Permitting (England and Wales) Regulations 2010 (as amended) (SI 2010/675)*. The Stationery Office, London.

*The Wildlife and Countryside Act 1981 (c.69)* London. Her Majesty's Stationery Office.

*Town and Country Planning Act 1990 (c.8)* London. Her Majesty's Stationery Office.

United Nations Educational Scientific and Cultural Organisation. 2015. *UNESCO Global Geoparks*. Accessed via <http://www.unesco.org/new/en/natural-sciences/environment/earth-sciences/global-geoparks/> on 24 November 2015.

UK Government's Multi-Agency Geographic Information for the Countryside (MAGIC) Accessed online 05/02/15 [<http://magic.defra.gov.uk/>].

UK Government. 1979. *Ancient Monuments and Archaeological Areas Act 1979, Chapter 46*, London: The Stationary Office.

UK Government. 1990. *Environmental Protection Act 1990*.

UK Government. 1990. *Town and Country Planning Act 1990*.

UK Government. 2007. *The Marine Works (Environmental Impact Assessment) Regulations 2007*.

UK Government. 2008. *Planning Act 2008*.

UK Government. 2008. *The Site Waste Management Plan Regulations (2008) (revoked)*.

UK Government. 2009. *Marine and Coastal Access Act 2009*.

UK Government. 2009. *The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009*.

UK Government. 2010. *Environmental Permitting (England and Wales) Regulations 2010*.

UK Government. 2010. *The Conservation of Habitats and Species Regulations 2010*.

UK Government. 2011. *The Waste (England and Wales) Regulations 2011*.

UK Government. 2015. *The Marine Works (Environmental Impact Assessment) (Amendment) Regulations 2015*.

Welsh Government. 1996. *Circular 60/96 Planning and the Historic Environment: Archaeology*.

Welsh Government. 1996. *Circular 61/96 Planning and the Historic Environment: Historic Buildings and Conservation Areas*.

Welsh Government. 1997. *TAN 11: Noise*.

Welsh Government, 2004. *TAN 15: Development and Flood Risk*.

Welsh Government. 2007. *TAN 18: Transport*.

Welsh Government, 2008. *Wales Spatial Plan (WSP): People, Places, Futures*. [<http://wales.gov.uk/dpsp/wspatialplan/documents/wsp2008update/wsp2008updateee.pdf?lang=en>].

Welsh Government. 2009. *TAN 5: Nature Conservation and Planning*.

Welsh Government. 2013. *TAN 20: Planning and the Welsh Language*.

Welsh Government. 2014. *Planning Policy Wales Edition 7*.

- Welsh Government. 2014. *TAN 21: Waste*.
- Welsh Government. 2016. *Planning Policy Wales, Edition 9*.
- Welsh Government. 2016. *TAN 12: Design*.
- Welsh Government. 2017. *Wales Act 2017*.
- Welsh Government and Managing Agents. 2014. *Interim Advice Note 135/10 (W) 'Landscape and Visual Effects Assessment' (IAN 135/10 (W))*.
- Water Framework Directive UK. 2014. *River Catchment Summary, Crigyll*. Edinburgh.
- Welsh Government. 2013. *A Noise Action Plan for Wales 2013-2018*. Cardiff.
- Welsh Office. 1999. *Circular 11/99 Environmental Impact Assessment*.
- Western Wales River Basin Management Plan. 2009.
- WHIASU. 2012. *Health Impact Assessment: A Practical Guide*.
- World Health Organization. 1946. *Preamble to the Constitution of the World Health Organization*.
- Wylfa Transport Strategy Overview (2011), produced by RPS.
- Zetica. 2015. *Regional Unexploded Bomb Risk: Isle of Anglesey*. [Online]. Available from: [www.zetica.com](http://www.zetica.com) [Accessed on 20 November 2015].

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## Wylfa Newydd Project

# Marine Works Environmental Impact Assessment Scoping Report



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# WYLFA NEWYDD PROJECT

## *Marine Works Scoping Report Addendum*

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# 1 Introduction

## 1.1 Background

1. Horizon Nuclear Power Wylfa Limited (Horizon) is proposing to submit an application under the Planning Act 2008 for an order granting development consent (DCO) for a new Nuclear Power Station (Wylfa Newydd) at Wylfa Peninsula on Anglesey, Wales and Associated Development (the Wylfa Newydd Project).
2. The Wylfa Newydd Project comprises the following:
  - The Power Station – the proposed new Nuclear Power Station including two UK Advanced Boiling Water Reactors (UK ABWRs) to be supplied by Hitachi-GE Nuclear Energy Ltd., related plant and Ancillary Structures and Off-Site Power Station Facilities. The Off-Site Power Station Facilities, which are an integral part of the Power Station, comprise the Alternative Emergency Control Centre, the Environmental Survey Laboratory and the Mobile Emergency Equipment Garage.
  - Associated Development – development to support the delivery of the Power Station, for example highway improvements along the A5025, Park and Ride facilities for construction workers, a Logistics Centre and the On-Site Campus.
3. In addition to the Development Consent Order (DCO), the Wylfa Newydd Project will require a Marine Licence. The marine licensing system under the *Marine and Coastal Access Act 2009* came into force on 06 April 2011. A Marine Licence is required before works in the marine environment can commence. Activities related to the Wylfa Newydd Project which require a Marine Licence (marine licensable activities) include:
  - construction, alteration or improvement works in or over the sea or on or under the sea bed, including maintenance of these works;
  - navigational dredging to deepen berths and channels;
  - maintenance dredging;
  - depositing any substance or object either in the sea or on or under the sea bed;
  - the deposit or removal of moorings, aids to navigation, markers and buoys; and,
  - the removal of litter.
4. Horizon is proposing to submit an application for a Marine Licence to Natural Resources Wales (NRW) to cover the marine licensable activities related to the Wylfa Newydd Project. Following consultation with NRW this Scoping Report is being produced to obtain a formal opinion (Scoping Opinion) from NRW in accordance with *The Marine Works Environmental Impact Assessment (EIA) Regulations 2007 (as amended) (Marine Works EIA Regulations)*, with respect to the marine works for the Wylfa Newydd Project. This scoping report (Marine Works Scoping Report), therefore, includes only information relevant to the Wylfa Newydd Project's marine licensable activities.
5. As part of the Application for development consent to the Planning Inspectorate Horizon has already received a Scoping Opinion (April 2016) in accordance with *The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (as amended) (Infrastructure Planning EIA Regulations)*. This Scoping Opinion was received in response to a Scoping Report submitted to the Planning Inspectorate in March 2016 (2016 Scoping Report). An addendum to the 2016 Scoping Report (2017 Addendum) has also been prepared which highlights the changes in environmental assessment scope currently proposed compared to those previously proposed in the 2016 Scoping Report.

6. Where information of relevance to the marine licensable activities is included within the 2016 Scoping Report this has been cross-referenced within this Marine Works Scoping Report. The marine dredging and deposit activities to be empowered by the DCO are limited to activities within the harbour limits and therefore disposal at Holyhead Deep disposal area, which is outside the harbour limits this area, will only be consented by the Marine Licence.
7. Horizon currently anticipates submitting an application for a Marine Licence in parallel with the Application for development consent. The Marine Licence application will be supported by a signposting document to the Wylfa Newydd Environment Statement. The signposting document will cross reference the relevant marine licensable activities and assessments.

## 1.2 Project overview

8. The following terms are used in this document when describing the geographical areas related to the Wylfa Newydd Project:
  - Power Station Site – the indicative areas of land and sea within which the majority of the permanent Power Station buildings, plant and structures will be situated. It will include the two nuclear reactors, steam turbines, the Cooling Water System (CWS) intake and pumphouse, outfall structures, breakwaters and the Marine Off-Loading Facility (MOLF), as well as other Ancillary Structures.
  - Wylfa Newydd Development Area – the indicative areas of land and sea including the areas surrounding the Power Station Site that will be used for the construction and operation of the Power Station. This area is representative of the maximum area that will be physically affected by Power Station Main Construction activities and used to form the landscaped setting of the operational Power Station.
9. The marine licensable activities associated with the Wylfa Newydd Project are located in two spatially distinct locations; the Wylfa Newydd Development Area and the Holyhead Deep Disposal Site (figure 1.1).
10. Marine licensable activities in the Wylfa Newydd Development Area include:
  - CWS - excavation and construction of a cooling water intake and outfall, together with two marine breakwaters to maintain a favourable wave climate at the intake; maintenance of the CWS and removal of debris from the CWS during operation, as well as a cooling water outfall structure to return cooling water to the sea; and
  - MOLF – construction of a bulk quay and a Roll-on, Roll-off (Ro-Ro) berthing facility and navigational dredging to deepen berths and channels; maintenance dredging and maintenance of structures and buoy movements during operation.
11. Marine licensable activities in the Holyhead Deep Disposal Site include:
  - Disposal of rock and soft sediment generated through construction of the CWS and MOLF and disposal of maintenance dredge arisings.
12. An application has been approved for the Minesto Deep Green Holyhead Deep Project (ORML1618) (Minesto, 2016) in the southern half of the Holyhead Deep Disposal Site. Whilst not constructed yet it is assumed that the presence of the Minesto Project precludes disposal of material from the Wylfa Newydd Project within this area. The disposal site for the Wylfa Newydd Project is, therefore, defined as the northern part of the Holyhead Deep Disposal Site (figure 1.1).

## 1.3 Report aims and purpose

13. This Marine Works Scoping Report accompanies a written request to NRW for a Scoping Opinion in accordance with the Marine Works (EIA) Regulations.
14. The aims and objectives of this Marine Works Scoping Report are to:



- outline the strategic background, for example proposed and existing legislation/planning guidance and required consents relevant to the marine licensable activities (see section 2);
- provide a description of the marine licensable activities related to the Wylfa Newydd Project (see section 3);
- identify alternatives to the marine licensable activities (see section 4);
- summarise consultation of relevance to the marine licensable activities undertaken to date (see section 5);
- identify the approach to EIA for the Marine Licence and provide an outline to the method of assessment (see section 6);
- identify key environmental constraints and sensitivities in relation to the marine licensable activities (see section 7);
- identify the likely key effects of the marine licensable activities, both beneficial and adverse;
- identify where receptors and pathways are to be scoped out of requiring further assessment, and the reasons for this decision;
- identify gaps in information and proposed further work in relation to the marine licensable activities; and
- provide an outline of the proposed approach for the cumulative impacts assessment.

15. The structure of this report is set out as follows.

- Chapter 1: Introduction (this section) provides background information about the marine licensable activities under the proposed Wylfa Newydd Project and outlines the marine licensing process and the aims and objectives of the Marine Works Scoping Report.
- Chapter 2: Regulatory and policy background outlines the policy and regulatory context for the Wylfa Newydd Project marine licensable activities.
- Chapter 3: Project description detailing marine licensable activities.
- Chapter 4: 'Consideration of alternatives' provides an explanation of how alternatives were considered for the marine licensable activities.
- Chapter 5: Consultation provides a summary of scoping works undertaken to date and stakeholder feedback of relevance to the marine licensable activities.
- Chapter 6: Approach to EIA for Marine Licence provides a description of the proposed approach to the EIA process and includes details of the proposed form of the Wylfa Newydd Environmental Statement and the approach to the assessment process.
- Chapter 7: Scoping provides background and the proposed approach to the scoping process before describing the proposed scope of the EIA for each of the receptors identified for consideration in relation to the marine licensable activities. In general, for each receptor, the existing information is summarised, main assessment issues are set out, and the further studies and assessments required for the receptor are indicated.
- Chapter 8: Cumulative effects presents the approach to undertaking and reporting the cumulative effects assessment.

## 2 Regulatory and policy background

### 2.1 Legislation, policy and guidance

1. A range of international, national and local legislation, policies and guidance are of relevance to the Wylfa Newydd Project and these are summarised in the 2016 Scoping report and 2017 Addendum.

#### 2.1.1 Key legislation for Marine Licence

2. The Wylfa Newydd Project marine licensable activities require a Marine Licence, under the *Marine and Coastal Access Act 2009* which came into force on 6 April 2011. The Marine Licence application will be supported by EIA to be carried out in accordance with the *Marine Works (EIA) Regulations 2007* as amended by the *Marine Works (EIA) (Amendment) Regulations 2015*. The Wylfa Newydd Environmental Statement will meet the requirements of both the Infrastructure Planning and Marine Works EIA Regulations.
3. The *Conservation of Habitats and Species Regulations 2010* (as amended) provide for the designation and protection of European Designated Sites and are of relevance to the Marine Licence application due to the proximity of a number of European Designated Sites. In order to inform the determination of changes to designated sites as a result of the Wylfa Newydd Project as a whole, Horizon will provide the necessary information for the competent authority to undertake an Appropriate Assessment for Habitats Regulations Assessment (HRA) in tandem with the EIA.
4. The *Wildlife and Countryside Act 1981* (as amended) (WCA) provides for the designation and management of Sites of Special Scientific Interest (SSSI). These sites are designated to safeguard, for present and future generations, the diversity and geographic range of habitats, species, and geological and physiographical features, including the full range of natural and semi-natural ecosystems and of important geological and physiographical phenomena throughout England and Wales. Various species of marine animals listed in Schedule 5 of the WCA are also protected from being killed, injured or disturbed under section 9 of the WCA. The EIA will set out how Horizon intends to comply with these aspects of the WCA.
5. The Water Framework Directive (WFD) establishes a framework for the management and protection of Europe's water resources. It is implemented in Wales through the *Water Environment (Water Framework Directive) (England and Wales) Regulations 2003* (as amended). It sets out a series of objectives for fluvial, lacustrine, groundwater and coastal water bodies. These include improving the water environment to achieve good/high status, maintaining existing good/high status and implementing mitigation to support the water environment at a catchment and water body scale. In order to inform the determination of changes to WFD water bodies as a result of the Wylfa Newydd Project as a whole, Horizon will undertake a WFD compliance assessment in tandem with the EIA.
6. The Marine Strategy Framework Directive (2008/56/EC) (MSFD) provides a framework for managing human activities with an ecosystem-based approach to support the sustainable use of marine goods and services. The Marine Strategy Regulations 2010 implement this Directive in Wales and include actions for competent authorities to achieve or maintain good environmental status (GES) in UK seas by 2020. Horizon will undertake an MSFD assessment, as part of the Marine Licence application, to assess the effects on achieving GES.
7. The Waste Framework Directive provides the legislative framework for the collection, transport, recovery and disposal of waste. The Directive requires all member states to take the necessary measures to ensure waste is recovered or disposed of without endangering human health or causing harm to the environment and sets out permitting, registration and inspection requirements. The Waste Framework Directive has been transposed into law as *The Waste*

(England and Wales) Regulations 2011. The Regulations provide the parameters within which the surplus materials that are classified as waste must be managed by the Wylfa Newydd Project. The options for the dredged material will be discussed further within a Waste Framework Strategy Assessment.

8. The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (London Convention) is one of the first global conventions to protect the marine environment from human activities. Its objective is to promote the effective control of all sources of marine pollution and to take all practicable steps to prevent pollution of the sea by dumping of wastes and other matter. In 1996, the 1996 Protocol to the London Convention (Protocol) was agreed to further modernise the London Convention and, eventually, replace it. Under the Protocol all marine dumping is prohibited, except for possibly acceptable wastes on the so-called “reverse list”. The purpose of the Protocol is similar to that of the Convention, but the Protocol is more restrictive. The application of a “precautionary approach” is included as a general obligation in the Protocol, and a “reverse list” approach is adopted, which implies that all dumping is prohibited unless explicitly permitted. The list of permitted dumping includes dredged material. Permitted wastes can only be dumped with authorisation from the competent authority (in this case Natural Resources Wales on behalf of Welsh Ministers). The Marine Licence application submitted by Horizon will request permission to dispose of dredged material at a licensed disposal site; this being Holyhead Deep..

## 2.1.2 Key policy

### 2.1.2.1 National plans and policies

9. The principal National Policy Statements for the Wylfa Newydd Project comprise the Overarching *National Policy Statement for Energy* (EN-1) (Department of Energy and Climate Change (DECC), 2011a) and the *National Policy Statement for Nuclear Power Generation* (EN-6) (DECC, 2011b). These are discussed in detail in the 2016 Scoping Report.
10. The *UK Marine Policy Statement 2011* (MPS) is the framework for preparing Marine Plans and taking decisions affecting the marine environment. Adopted by the Welsh Government, the MPS is intended to help achieve the shared UK vision for clean, healthy, safe, productive and biologically diverse oceans and seas. The MPS aims to enable an appropriate and consistent approach to marine planning across UK waters, and to ensure the sustainable use of marine resources and strategic management of marine activities. The Welsh Government is currently developing the first Welsh National Marine Plan (Welsh Government, 2015) (National Marine Plan). The National Marine Plan outlines a vision for the Welsh inshore and offshore marine area. The objectives of the National Marine Plan relevant to this assessment include: living within environmental limits and using sound science responsibly.
11. *Planning Policy Wales (Edition 9)* (Welsh Government, 2016) provides the main policy objectives and principles of planning in Wales. Planning Policy Wales is supplemented by a series of Technical Advice Notes (TANs) which prescribe the overarching national guidance for specific individual environmental topics.
12. The West of Wales second Shoreline Management Plan is developed for the coast between St Ann’s Head, at the entrance to Milford Haven, through to Great Orme Head, including the shoreline of the Isle of Anglesey. Shoreline Management Plans provide a large-scale assessment of the risk associated with coastal evolution and present a policy framework to address these risks to people and the developed, historic and natural environment in a sustainable manner.

### 2.1.2.2 Local plans and policies

13. The statutory development plan for the Isle of Anglesey currently comprises the *Gwynedd Structure Plan* (Isle of Anglesey County Council (IACC), 2006) and *Ynys Môn Local Plan* (IACC, 1996). The development plan will be replaced on adoption of the *Anglesey and Gwynedd Joint*

*Local Development Plan 2011-2026*, which is currently being prepared by the IACC and Gwynedd County Council (Gwynedd Council, 2016). At the time of writing, this document is at the Independent Examination stage (IACC, 2016)

14. A number of Supplementary Planning Guidance documents have been published by IACC to further inform development plan policies. These local planning policy documents are discussed in detail in the 2016 Scoping Report.

### **2.1.3 Key guidance**

15. A number of key technical guidance documents will inform the assessment. These guidance documents are widely used across the UK and represent best practice for the assessment for the various consenting regimes. Key guidance relevant to the Wylfa Newydd Project marine licensable activities includes guidance documents from the British Energy Estuarine and Marine Studies Expert Panel, the Construction Industry Research and Information Association (CIRIA), UK Technical Advisory Group (UKTAG) and the Centre for Environment, Fisheries and Aquaculture Science (Cefas). Further detail on these guidance documents will be provided within the Wylfa Newydd Environmental Statement.

## 3 Wylfa Newydd Project description

1. This section provides details on elements of the Wylfa Newydd Project located seawards of the current line of mean high water spring (MHWS) that entail marine licensable activities under the *Marine & Coastal Access Act 2009* (as amended). A full Wylfa Newydd project description is provided in the 2016 Scoping Report and the 2017 Addendum.

### 3.1 Project description for marine licensable activities

2. Figure 3.1 shows the marine infrastructure layout within the Wylfa Newydd Development Area. Key aspects include; the construction of a MOLF and berths; the construction of a CWS with mitigations measures; the construction of two breakwater structures; and the placement of shore protection around structures.

#### 3.1.1 MOLF

3. The MOLF is required to facilitate the construction of the Power Station and, therefore, will be constructed early in the programme and be operational throughout the construction phase. It will provide two purpose-built quays; a bulk quay (with two berths); and, a 'Roll on-Roll off' (Ro-Ro) quay to allow delivery by sea of bulk materials, such as aggregates, cement and reinforcing steel, and the large pre-fabricated elements required for the construction of the Power Station, including Abnormal Indivisible Loads (AILs). The MOLF's use would offset the need for the delivery of construction materials by road and, therefore, would reduce the volume of road traffic and the associated environmental effects. Current estimates predict that between 60% and 80% of all construction materials (by weight) would be delivered to Wylfa via the MOLF, including the majority of AILs.
4. The bulk quay will extend between the eastern breakwater and the Ro-Ro quay and comprise two berthing platforms providing berthing facilities for bulk vessels and unloading facilities for bulk materials, and nine dolphins providing mooring facilities for bulk vessels. The two berthing platforms would have approximate surface area dimensions of 65m by 30m. The area behind the platforms and dolphins would be filled to a platform level of between +5mOD or +6mOD, and would be protected by a rock armour revetment.
5. The Ro-Ro quay will extend eastwards from the southern end of the bulk quay (i.e. towards the shoreline) and comprise a berth with quayside infrastructure for vessel mooring and a Ro-Ro ramp for ship to shore transfer of AILs. Its quay wall will be approximately 100m in length and its quay surface will be set at a platform level of between +5mOD or +6mOD, and will be approximately 40m wide, allowing approximately 30m of width for the Ro-Ro ramp. The quay wall will continue towards the CWS intake for a further 80m, but the base of the wall will match the level required for the CWS intake. The seaward end of the quay wall for the Ro-Ro ramp could be set at the same level as the quay surface level, of between +5mOD or +6mOD, or at a lower level, such as +3.5mOD, to provide a very shallow sloping ramp up between the Ro-Ro berth and the platform level of between +5mOD or +6mOD.
6. It is anticipated that the bulk quays berthing platforms and dolphins would comprise either piled or concrete blockwork structures, and it is anticipated that the Ro-Ro quay walls would comprise either pre-cast mass concrete blocks forming a blockwork wall or rock-filled pre-fabricated steel caissons forming a mass wall. The quay walls will be topped with a reinforced concrete capping beam and reinforced concrete surface. Fenders will be installed on the berthing platforms and dolphins to accommodate the berthing energy from laden bulk vessels on a range of tides. Mooring bollards, safety ladder and safety chains will be installed on the berthing platforms and dolphins.

7. The top surface of the Ro-Ro quay will be formed from reinforced concrete slabs that are laid to falls to ensure drainage. A longitudinal drain will run along the back of the surface area to collect the water before discharge, via an oil separator (to remove oily substances) and sediment catch-pit (to removed settled solid materials). Drainage water will discharge via a flap valve into Porth-y-pistyll at a location to be determined.
8. Berthing pockets will be dredged alongside the berthing platforms, dolphins and quay wall to ensure that bulk vessels can be berthed across all states of the tide when laden. The berthing pockets extend approximately 30m from the seaward edge of the berthing platforms, dolphins and quay wall. The berthing pocket depths will depend on the draughts of the largest vessels anticipated to use the berths. An indicative berth pocket depth will be in the order of -11.5mOD, but it is possible that a depth of -12.6mOD could be required in order to accommodate the largest bulk vessels potentially using the bulk berth.
9. The shoreline behind the berthing platforms, dolphins and quay wall will be protected by placing a rock armour revetment. Land would be reclaimed behind the revetment by backfilling with material won from on site. The reclaimed land would extend from the quay walls landwards to create a platform level at +6mAOD and, therefore, would extend landwards of the current line of MHWS and beyond the marine licensing area.
10. Aids to navigation would be installed to provide safe navigation for vessels using and passing the MOLF (and breakwaters). Subject to agreement with the Maritime and Coastguard Agency and Trinity House Lighthouse Service, the aids to navigation would include a set of leading marks with lights to guide vessels between the breakwaters, and marks and lights for breakwaters, the bulk and Ro-Ro berths and the CW system intake. The aids to navigation will be in accordance with the International Association of Lighthouse Authorities' Buoyage System.
11. The vessels using the MOLF will include bulk vessels and Ro-Ro vessels. Typically, the bulk vessels will take the form of c.5,000 DWT and c.8,000 DWT aggregate bulk carriers, c.1,500 DWT and c.4,000 DWT cement bulk carriers, and c.1,500 DWT general cargo/Lo-Lo ships (for Rebar and cement in tanktainers). Typically, the Ro-Ro vessels will take the form of c.1,500 DWT barges.
12. In addition to the bulk and Ro-Ro quays, the MOLF will include a lay-by berth as a general berth that vessels can be moored against for short term waiting until the destination bulk or Ro-Ro berth is available. The lay-by berth will be on the opposite side of the harbour to the MOLF. The lay-by berth will comprise four berthing dolphins, four mooring dolphins, a berthing pocket with dimensions of approximately 160m x 30m and a depth of -11.5m AOD, a pontoon and gangway, and walkways linking the dolphins, for mooring crew access.
13. In addition to the MOLF, a pontoon will be required for mooring tugboats, pilot vessels and other small workboats during the construction of the Power Station. It will be located in the vicinity of the Ro-Ro MOLF. The pontoon will take the form of a floating pontoon (approximately 6m wide by 80m long) supported by guide piles drilled and grouted into the seabed. Fenders and bollards will be installed on the pontoon to allow for berthing. The pontoon will be connected to the shore by an articulating access bridge (approximately 3m wide by 50m long) on piled supports drilled and grouted into the seabed.

### 3.1.2 CWS and breakwaters

14. The CWS is comprised of three individual systems, all of which share a common intake. The CWS will draw water directly from the Irish Sea and this water will then pass through screens before being pumped to the condenser/heat exchangers and out through an outfall structure. The CWS requires the construction of the following elements below MHWS:
  - Intake channel and forebay structure with screening and acoustic deterrents within Porth-y-pistyll;



- breakwater structures to offer necessary weather protection to the intakes, including calming the water during stormy conditions;
- outfall structure within Porth Wnal; and
- fish recovery and return discharge structure.

### **3.1.2.1 CWS intake channel and structures**

15. The CWS intake channel will be dredged or excavated within Porth-y-pistyll to create a -10mAOD formation level. The superficial soft sediment (mainly sands and gravels) will be removed by conventional dredging plant such as a backhoe dredger, cutter suction dredger or trailing suction hopper. It is proposed that the sediment will be disposed of at sea; this being Holyhead Deep.
16. The preferred method for creating the CWS intake channel will be to undertake bedrock blasting and excavation in dry working conditions. This will be achieved by constructing temporary rubble mound cofferdams that, along with the adjacent land form, will create a basin within the sea that will be pumped dry.
17. The temporary cofferdams will be constructed by depositing rubble stone and rock armour won from the Wylfa Newydd Development Area over the foreshore and seabed to form rubble mound structures. The materials will be transported to site by road using dump trucks or by sea using barges, and will be shaped by tracked excavators either working from land or working from sea on jack-up platforms or barges.
18. The rubble mound structures will need to be watertight by integrating a wall into them. The wall could be constructed by installing steel sheet piles through the middle of the structures and grouting them into a pre-cut trenches in the seabed (i.e. trenches cut from the seabed prior to the placement of the rubble mound structure) to create an effective seal. Under this option, the piles will be installed using a vibratory piling hammer and, potentially, a hydraulic drop hammer should the piles not reach the required depth through the use of the vibratory piling hammer alone. Alternatively, the wall could be constructed by installing steel tubular piles through the middle of the structures and grouting them into the rock below the rubble mound. Under this option, the piles will be installed into holes pre-drilled through the middle of the rubble mound structures and into the bedrock using a vibratory piling hammer and, potentially, a hydraulic drop hammer should the piles not reach the required depth through the use of the vibratory piling hammer alone. Under both options the piles will be installed by construction plant working from the top of the rubble mound structures.
19. The basin will be dewatered using pumps. Once dewatered, the cofferdams should be sufficient to maintain dry conditions within the basin, although some use of pumps could be required as well. There could be water inflow to the basin, for example, through the cofferdam itself, through the ground under the cofferdam, or through at the interface between the cofferdam and the land / existing structures. Should the cofferdams not maintain the dry conditions as planned, then one or more of a number of remedial measures will be carried out. These measures could involve using pumps to continuously dewater the basin the basin. However, if the water inflow is in excess of what pumping can deal with then it could be necessary to flood the basin to equalise the water pressure on either side of the cofferdams and then carry out injection grouting to seal the inflow routes before dewatering the cofferdam once again.
20. One of the rubble mound structures used to create one of the cofferdams will also form part of the temporary causeway to facilitate construction of the western breakwater.
21. Outside the temporary cofferdam (i.e in the wet environment), the bedrock will be initially fractured by peckering with a breaker and then ripped out and dredged with a barge mounted excavator and loaded into barges. Dredged bedrock will be re-used for the construction of the cores of the western and eastern breakwaters where appropriate (i.e. geotechnically suitable) and practical (i.e. available when the breakwater construction requires it), or exported off site for re-use. The



remaining dredged bedrock that cannot be re-used will be disposed of at sea; this being Holyhead Deep.

22. The CWS intake forebay will be situated within the CWS intake channel. It will comprise raked bar screens and a concrete lined water pit. The raked bar screens will collect organic debris (e.g. seaweed) and other floating debris.
23. In order to construct the CWS intake forebay a further temporary cofferdam will be constructed in front of the intake seaward face. Twin wall cofferdams will be installed into the bedrock and infilled in between with suitable crushed rock fill material. It is anticipated that the cofferdam will be built in the dry behind the temporary rubble mound cofferdams. Trenches will be blasted into the rock on the line of the two tubular pile / sheet pile walls and the tubes / sheet piles will be stood up in place and concreted into place. Tie rods and steel waling beams will be installed between the two parallel walls and fill material placed inside the cofferdam. Two levels of tie rods could be required depending upon the design.
24. The cofferdam structures will remain in place following completion of all the CWS intake channel excavation works and until such time as the main CWS intake structure is complete. Removal and reinstatement works will be a reversal of the construction works.
25. Methods of deterring fish and other marine life from entering the intakes during operation of the Power Station will be deployed on the CW intake structure in the form of acoustic fish deterrents (AFDs). It is anticipated that the AFD's sound projectors will be mounted outside of the CWS intake structure on the bar screen divider walls below MHWS.
26. The AFDs would be subject to routine monitoring and maintenance during Power Station operation to check that it is functioning effectively. Typically, AFDs would be subject to regular maintenance involving the changing of sound projector units, transducer units, perishable seals and airbags.

### **3.1.2.2 Breakwater structures**

27. There will be two breakwaters extending out into Porth-y-pistyll that will provide protection and create acceptable wave conditions for operation of the CW intake. An added benefit of collocating infrastructure is that the breakwaters will also provide sheltered conditions for vessels accessing and berthing at the MOLF. Both breakwaters will have rock-filled cores covered with pre-cast concrete armour units and, where practical, rock armour.
28. The western breakwater will only be connected to the shore during early construction with the causeway removed during later stages of construction. From its landward end the breakwater will be aligned approximately south-west to north-east and then kinked approximately south to north. The eastern breakwater will be connected to the shore. From its landward end, it will be aligned approximately south-east to north-west.
29. The breakwaters' minimum and maximum dimensions are subject to variation depending on the refined design to be developed, it is anticipated that the western breakwater will be between approximately 400 and 500m in length. The eastern breakwater will be between approximately 130 and 150m in length.
30. For construction the seabed will be prepared to provide a solid foundation for the breakwaters by removing appropriate superficial soft sediment and laying a rock fill mat over the exposed bedrock to bring the level back up to the level of the existing seabed. The superficial soft sediment will be removed by standard dredging plant and disposed of at sea to the northern part of the Holyhead Deep site. The rock fill material will be transported to site by sea using a split hopper barge or a side stone dumping vessel, and will be deposited directly onto the excavated seabed. If required, the material will be levelled using a barge mounted backhoe excavator.

31. The western breakwater will be constructed from land working seawards via the haul road on the temporary causeway and from sea working landwards using marine-based plant. These construction works will be undertaken simultaneously and will be connected at their meeting point.
32. The western breakwater's core will be constructed by depositing dredged material (i.e. fractured bedrock) and rubble stone won from the Wylfa Newydd Development Area, with a rock size varying from one kilogramme to one tonne, on top of the prepared seabed to form a mound. Once in place, the mound's surface will be trimmed to the design profile. Depending on whether the construction is taking place from the land or the sea, the core material will be transported to site by road using dump trucks or by sea using split hopper barges and/or side stone dumping vessels, and will be trimmed by long-reach tracked excavators working on the breakwaters or from jack-up platforms or barges in the sea. A rock underlayer with rock size varying from one tonne to six tonnes, depending upon the location along the breakwater, will be placed on top of the core material. Pre-cast concrete armour units (or rock armour, if used; see below) will be placed over the mound. The armour units could vary in size (e.g. from 12 tonnes to 34 tonnes) depending upon the location along the breakwater. The further out to sea, the larger the armour unit size. The armour units will be placed in a precise grid pattern to ensure they are interlocked. The rock underlayer and armour units will be transported to site by sea using barges and/or via the haul road using dump trucks, and will be unloaded directly onto the breakwaters using cranes working from the breakwaters.
33. The eastern breakwater will be constructed from land working seawards using similar methods, materials and plant as described for the western breakwater.
34. During Power Station operation the breakwaters will be subject to routine visual inspection to check that they were structurally intact, particularly after major storm events. No routine maintenance of breakwaters should be required, but it is possible that the breakwaters could require some occasional maintenance, which is most likely to take the form of the re-positioning and/or replacement of dislodged and/or damaged armour units. In the case of the western breakwater, this will require the use of floating plant; there will be no land based access to the breakwater from the land.

### **3.1.2.3 CWS outfall structure**

35. A CWS outfall structure will be constructed close to the shoreline at Porth Wnal adjacent to the Existing Power Station outfall and within the Porth Wnal Dolerite Regionally Important Geological Site. The CWS outfall will be a reinforced concrete open spillway channel sloping down from two tunnel outlets to -3.9mOD.
36. Construction is likely to be in the dry behind a temporary coffer dam similar in type to the intake forebay coffer dam.

### **3.1.2.4 Fish recovery and return structure**

37. A fish recovery and return system will be built into the CWS intake and will recover fish from the drum and band screens. The discharge point will be below MHWS and located to the north of the eastern breakwater. The location of discharge and type of outfall structure is currently being examined but is likely to involve installation of a surface, covered conduit with a discharge point into Porth-y-pistyll, utilising existing marine structures where possible.

## **3.1.3 Disposal of dredged material**

38. Dredged material arising from the marine works will be re-used onsite (e.g. for core material in the CWS intake breakwaters) or offsite where practicable, and the remaining material would be disposed of at sea. The dredged material would be transported to site by self-propelled split hull barges and deposited within the site's boundary (or a defined area within the site's boundary).

39. Depending on the marine ground investigation findings and re-use opportunities, the dredging works could generate up to approximately 242,000m<sup>3</sup> of soft sediment (i.e. approximately 462,000 tonnes) and up to approximately 368,000m<sup>3</sup> of fractured bedrock (i.e. approximately 709,714 tonnes). It is likely that the soft sediment would be disposed of at sea and the fractured bedrock would be re-used and/or disposed of at sea.
40. The preferred disposal site is the IS040 disposal site within the northern half of the Holyhead Deep site. This site's boundary is rectangular (approximately 7nm north-south and 2nm east-west), and is situated approximately 12km west of Wylfa. It has been open since 1983 and has received a maximum of 451,129 tonnes of dredged material in one calendar year (1995).
41. During operation of the Power Station the possibility exists that maintenance dredging would be required. The potential likelihood of siltation and need for maintenance dredging is still to be determined.

## 4 Consideration of alternatives

1. The EIA Regulations require the developer to consider alternatives to the proposed development. In terms of the marine licensable activities there are relatively few available alternatives which will not have discernibly greater environmental effects or meet the full requirements of the development needs without being prohibitively expensive. The 2016 Scoping Report and 2017 Addendum provide a summary of the main alternatives considered for the Power Station and Off-Site Power Station Facilities, and the decisions made to date, taking into account environmental effects, economic, commercial and technical feasibility.
2. This Marine Works Scoping Report additionally summarises the alternatives for the disposal of dredged material consisting of sediments and/or rocks including associated water and organic matter content. The alternative options for use of this material in terms of the waste hierarchy are discussed in section 4.4.
3. A summary of the main alternatives considered for the marine licensable activities is outlined below. The Wylfa Newydd Environmental Statement will provide a full description of alternatives considered for the Power Station, Off-Site Power Station Facilities and Associated Development including the 'do nothing' scenario, alternative locations, layouts, technologies and systems.

### 4.1 The 'do nothing' scenario

4. The 'do nothing' alternative in relation to the marine licensable activities is that the CWS and MOLF are not constructed and any associated disposal is not undertaken.
5. The implications of the 'do nothing' scenario in relation to the CWS and MOLF are described within the 2016 Scoping Report. The Wylfa Newydd Environmental Statement will consider in detail the 'do nothing' scenario.

### 4.2 Options for the CWS

6. The 2016 Scoping Report included a review of the site selection options for the CWS. Full details of these alternative assessments (to include alternative locations, layouts technologies and systems) as well as the construction methodology options for the CWS will be included within the Wylfa Newydd Environmental Statement.

### 4.3 Options for the MOLF

7. The 2016 Scoping Report included a review of the site selection options for the MOLF. Full details of the site, and layout selection assessment and options for construction will be included within the Wylfa Newydd Environmental Statement.

### 4.4 Options for marine construction methodology

8. Two options were considered relating to the construction methods for activities in Porth-y-pistyll which included either a wet (offshore dredging using marine vessels) or a partially dry environment (dry excavation incorporating a large cofferdam). The preferred construction methodology will be undertaken in the partially dry environment. The assessment of these alternatives and justification for the final option will be included within the Wylfa Newydd Environmental Statement.

## 4.5 Options for marine materials

9. The construction and operation of the Power Station will require the disposal of dredged material consisting of sediments and/or rocks including associated water and organic matter content.
10. Options for material disposal have been considered with respect to the waste hierarchy. This includes the reduction of marine material requiring disposal through Project design review, re-use where possible within the Wylfa Newydd Development Area after washing (e.g. for landscape mounding or as backfill material), re-use by third parties, transport of some or all of the material to a suitable land-based disposal location after washing or the disposal of all or some of the material at sea.
11. A Waste Strategy Framework Assessment will accompany the Marine Licence application to fully justify the fate of marine materials. The disposal figures presented in section 3.1.3 provide the worst case figures for disposal and in reality it may be that some of the material can be re-used within the wider Wylfa Newydd Project. The fate of marine dredged materials will be clarified within the Wylfa Newydd Environmental Statement.
12. Assuming disposal at sea was a necessity, a review of four offshore disposal options has been undertaken. This covered three existing sites (IS040, IS050, IS055) and the option to designate a new disposal site. The review concluded that from a preliminary assessment of constraints, disposal of marine dredged material at sea is a viable option and the most appropriate disposal option would be to utilise the existing disposal site IS040, known as Holyhead Deep. The rationale for this decision will be fully documented within the Waste Strategy Framework Assessment.
13. As it is understood that Holyhead Deep has previously primarily been used for the disposal of soft sediment, a site characterisation for the Holyhead Marine Disposal Site will be included within the Wylfa Newydd Environmental Statement, including an assessment of potential effects of soft and hard sediment disposal at this site.

## 5 Consultation

### 5.1 Previous scoping works

1. Horizon has continued to develop the Wylfa Newydd Project proposals both during and subsequent to the completion of a number of stages of consultation. Feedback from consultees, and from stakeholder and public engagement, has influenced changes to the Wylfa Newydd Project design and proposals. This Marine Works Scoping Report thus provides an update on details of the scheme design in relation to the marine licensable activities of the Wylfa Newydd Project and also builds on a number of comments received during consultation in relation to the marine works.
2. The production of this Marine Works Scoping Report has thus been guided not only by good practice and guidance materials, but also by the aspects relevant to the marine licensable activities of:
  - the 2010 Scoping Opinion provided by the Infrastructure Planning Commission;
  - feedback from Pre-Application Consultation Stage One;
  - the 2016 Scoping Opinion provided by the Planning Inspectorate;
  - feedback from documents prepared for Pre-Application Consultation Stage Two; and
  - other discussions and meetings with the community and key stakeholders.
3. A summary of these consultations is provided below.

#### 5.1.1 2010 Scoping Opinion

4. Horizon requested a formal opinion in November 2009 on the information to be provided in the Wylfa Newydd Environmental Statement (in the form of a Scoping Opinion request). Horizon's request for a Scoping Opinion was accompanied by an EIA Scoping Report, which provided a high-level description of a new Nuclear Power Station at Wylfa Head and identified key potential effects of the Wylfa Newydd Project for each EIA topic area during the construction and operation phases. The EIA Scoping Report also set out preliminary proposals for mitigating these likely effects. The Scoping Opinion was issued in April 2010.
5. The original Scoping Report submitted to the Infrastructure Planning Commission and the Scoping Opinion received can be accessed on the National Infrastructure Planning website at:  
<https://infrastructure.planninginspectorate.gov.uk/projects/wales/wylfa-newydd-nuclear-power-station/?ipcsection=docs>

#### 5.1.2 Pre-Application Consultation Stage One

6. Horizon completed its formal Pre-Application Consultation Stage One (PAC1) in December 2014. The aim of this was to provide clear information to allow the development of an open and ongoing dialogue with key stakeholders and the community. Four documents were prepared to provide a variety of levels of technical information and together formed the consultation materials. The local community, members of the public and statutory and non-statutory consultees were consulted during this stage. The information can be accessed on the Horizon website at:  
<http://consultation.horizonnuclearpower.com/stage-1/consultation-documents>.

#### 5.1.3 2016 Scoping Report

7. As part of the formal scoping process the Planning Inspectorate administered consultation with a number of statutory stakeholders on the contents of the 2016 Scoping Report. Key issues and

recommendations raised by stakeholders from this consultation were formally communicated by the Secretary of State in a Scoping Opinion issued to Horizon in April 2016.

8. Consultee comments raised within the Scoping Opinion have been considered, and where appropriate, will be incorporated within the scope of the EIA. To aid the Secretary of State in determining how consultation feedback has influenced the EIA, stakeholder comments, along with Horizon's responses, will be included within the DCO ES. Specifically, where comments raised within the Scoping Opinion have affected the final scope of the assessment, this will be highlighted. The 2016 Scoping Report and the subsequent Scoping Opinion form the basis for this Marine Works Scoping Report.
9. The 2016 Scoping Report and the Scoping Opinion received in April 2016 can be accessed on the National Infrastructure Planning website at:

<https://infrastructure.planninginspectorate.gov.uk/projects/wales/wylfa-newydd-nuclear-power-station/?ipcsection=docs>.

### 5.1.4 Pre-Application Consultation Stage Two

10. Horizon completed its second stage of pre-application consultation (PAC2) in October 2016. The aim of the consultation was to provide information, and encourage feedback, on a range of aspects on the Wylfa Newydd Project. This included aspects such as the approach and preferred sites for the On-Site Campus; the layout, appearance and landscaping of Associated Development and Off-Site Power Station Facilities; and the effects of the Project on the environment.
11. PAC2 was the formal pre-application consultation in terms of satisfying both section 42 and section 47 of the Planning Act 2008, and formed the second statutory stage of consultation for the Wylfa Newydd Project. The consultation conformed to the commitments established in Horizon's Statement of Community Consultation (SOCC), and met with the objectives of Horizon's Maximising Inclusion Strategy, which applies to all stages of consultation.
12. The documentation included a description of how the Wylfa Newydd Project has evolved since previous consultation in September 2014 and presented preliminary and precautionary findings on the impact assessment. The Pre-Application Consultation Stage 2 material can be accessed on the Horizon website at:  
<http://consultation.horizonnuclearpower.com/stage-2/overview>.
13. Horizon completed PAC2 in October 2016. Comments raised during PAC2 have been considered, and will be reported via the Planning Inspectorate's website.

### 5.1.5 Stage Three Pre-Application Consultation

14. As a result of Project design changes and the inclusion of Associated Development in the Application for development consent following the introduction of the Wales Act 2017, a further round of pre-application consultation, PAC3, will commence in May 2017. As with PAC1 and PAC2, the consultation will be widely advertised across Anglesey as well as on Horizon's website to satisfy the requirements of the *Planning Act 2008*.
15. PAC3 will build on Horizon's previous engagement activities and explain the way in which the Wylfa Newydd Project has evolved, the environmental implications, and the reasons for the changes. The focus of PAC3 will be on design changes since PAC2, and will include descriptions of where environmental effects are expected to be different. It will identify the likely environmental effects and how we are proposing to mitigate them. that the contents of PAC3 will satisfy a number of requirements of the Preliminary Environmental Information (PEI) report.
16. An updated SOCC has also been issued to the IACC.



### 5.1.6 Other stakeholder engagement and consultation

17. In addition to the above a number of topic-specific consultations have been undertaken with relevant stakeholders. Details of these consultations will be provided in the Wylfa Newydd Environmental Statement.

## 5.2 Stakeholder engagement of relevance to the Marine Licence

18. Generally, the 2010 Scoping Opinion approved of Horizon's focus on certain EIA topic areas, whilst advising that greater emphasis should be placed in the Wylfa Newydd Environmental Statement on the interrelationship between EIA topic areas. The key considerations raised in the 2010 Scoping Opinion were taken into account during design of the Wylfa Newydd Project in the earlier stages and were used to refine the information reported within the 2016 Scoping Report.
19. Consultation with stakeholders and the local community during PAC1 and PAC2 provided valuable information for the development of the Wylfa Newydd Project and contributed to the identification of environmental constraints and sensitivities, as well as potential environmental effects and measures for their mitigation. Full details of key queries and suggestions relevant to the marine licensable activities (raised in PAC1 and PAC2) have been considered within this Report at table 5.1, and will be considered in full within the Wylfa Newydd Environmental Statement. Consultation feedback from the 2016 Scoping Report relevant to the marine licensable activities has been used to inform the development of this Marine Works Scoping Report where appropriate. Full details of key queries and suggestions relevant to the marine licensable activities (raised in the 2016 Scoping Opinion) have been considered within the Marine Works Scoping Report as included in Annex A.2, and will be considered in full within the Wylfa Newydd Environmental Statement.
20. Key issues from the consultation feedback to date that are relevant to the Marine Licence application are summarised in Table 5.1.

**Table 5.1 Summary of stakeholder feedback relevant to the marine licensable activities**

Theme	Consultation feedback	Horizon response
Project description	Need for definitive description of the Project in respect of the key marine elements of the scheme	The full detail will be provided in the Wylfa Newydd Environmental Statement.
Construction	The Environmental Statement should detail whether any arisings from construction activities will be re-used on site or removed off-site. If the latter, the Environmental Statement should quantify the number of vehicle or vessel movements this would result in.	The Wylfa Newydd Environmental Statement will provide a detailed description of construction methodology including the need for the disposal of material in the marine environment, and the associated vessels.
Decommissioning	The process and methods of decommissioning should be considered and options presented in the Environmental Statement, where possible.	The Wylfa Newydd Environmental Statement will review and confirm the decommissioning activities. Due to the timescales of decommissioning it is not intended to be signposted for the Marine Licence application.

Theme	Consultation feedback	Horizon response
Alternatives	The Environmental Statement will need to provide a robust coverage of alternatives in respect of site selection, layout and technologies and taking into account environmental effects, economic, commercial and technical feasibility.	The Wylfa Newydd Environmental Statement will provide a full description of alternatives for the marine licensable activities, including the 'do nothing' scenario, alternative locations, layouts, technologies and systems. The Marine Works Scoping Report provides an overview of the marine disposal options (see section 4).
Assessment methodology	Technical justification of the survey and modelling methodologies should be provided with particular reference to designated sites and agreement with the statutory nature conservation bodies.	Survey methodologies have been agreed in consultation with regulators. As the design work has progressed, surveys have been subject to rationalisation, in consultation with regulators, to target specific locations and habitats.  Calibration and validation of the modelling has been discussed with NRW, and the Wylfa Newydd Development Area hydrodynamic model has also been subject to a third-party audit.
	The Environmental Statement should include reasoned justification for study areas used.	Study areas have been refined through ongoing consultation with regulators and will be defined and reasoned justification provided within the Wylfa Newydd Environmental Statement.
	The criteria for determining receptor value and magnitude of effect should be clearly expressed within the Environmental Statement and the application of professional judgement clearly justified.	The full detail of the EIA methodology will be provided and will provide a clear expression of the criteria for determining receptor value and magnitude in the Wylfa Newydd Environmental Statement. The Marine Works Scoping Report provides an overview of the methodology to be used (see section 6) which aligns with information provided in the 2016 Scoping Report and Pre-Application Consultation Stage Two
	Direct and indirect effects should be considered.	Direct and indirect effects on the marine environment will be assessed as separate pathways within the Wylfa Newydd Environmental Statement.
	The potential effects on hydrodynamics during operation should be identified.	The effects on hydrodynamics of the permanent presence of marine structures will be included within assessments. This is currently envisaged to sit within the

Theme	Consultation feedback	Horizon response
		construction phase of the Wylfa Newydd Environmental Statement.
Consultation	The Environmental Statement should include a list of the consultation undertaken with relevant stakeholders during the EIA process.	Full details of consultation undertaken will be included within the Wylfa Newydd Environmental Statement. This Marine Works Scoping Report includes information on consultation relevant to marine licensable activities (see section 5).
EIA Topics	An assessment of effects on shipping should be included within the EIA.	Shipping and navigation will be included as an individual chapter within the Wylfa Newydd Environmental Statement. An overview of the main assessment issues in relation to potential effects on shipping and navigation as result of marine licensable activities is provided in section 7.5 of this Marine Works Scoping Report.
Additional Assessments	<p>The Environmental Statement should include:</p> <ul style="list-style-type: none"> <li>• WFD Compliance Assessment</li> <li>• FCA</li> <li>• HRA</li> </ul> <p>The applicant should seek further advice from regulators on the preparation and completion of these reports.</p>	Consultation with regulators has been undertaken. The HRA, WFD and FCA reports will be presented as standalone reports appended to the Wylfa Newydd Environmental Statement.

## 5.3 Updates since the 2016 Scoping Report

21. Since the issue of the 2016 Scoping Report, a number of changes and additions have been made to the Wylfa Newydd project. These are summarised in Table 5.2.

**Table 5.2 Summary of key updates.**

Topic	2016 Scoping Report	Marine Works Scoping Report
Reference to Site	<p>Four areas were used when describing the Project:</p> <ul style="list-style-type: none"> <li>• the Power Station Site;</li> <li>• Wylfa NPS site;</li> <li>• Wylfa Newydd Development Area; and</li> <li>• Offsite areas.</li> </ul>	<p>The marine licensable activities associated with the Wylfa Newydd Project will be located in two spatially distinct locations; the Wylfa Newydd Development Area and the Holyhead Deep Disposal Site.</p> <p>Works at the Wylfa Newydd Development Area include construction and maintenance of the:</p> <ul style="list-style-type: none"> <li>• CWS; and</li> <li>• MOLF.</li> </ul> <p>Works at Holyhead Deep Disposal Site include:</p> <ul style="list-style-type: none"> <li>• disposal of rock and soft sediment.</li> </ul>

Topic	2016 Scoping Report	Marine Works Scoping Report
Project Description	Project assumed dredged material would be re-used within the site.	Details of the disposal of marine material to the Holyhead Marine Disposal Site have been included (section 3.1.3).
	The CWS outfall was presumed to be most likely to south-west of Wylfa Head, at the site of the outfall from the Existing Power Station.	CWS outfall confirmed to be at the site of the outfall from the Existing Power Station.
	Construction within Porth-y-pistyll included options for a semi-dry or wet environment.	The preferred construction will take place within a semi-dry environment.
Alternatives	Alternatives and design evolution were included for CWS and MOLF.	An overview of the alternatives to marine disposal have been considered within this Marine Works Scoping Report (section 4.5). A full assessment will be included within the Waste Strategy Framework Assessment, and documented within the Wylfa Newydd Environmental Statement.
Consultation	This chapter summarises the consultation undertaken up to early 2016.	This chapter includes a summary of additional consultation undertaken to November 2016 and provides a summary of key consultation themes received from stakeholders.
Scoping	<p>The 2016 Scoping Report considered the effects during:</p> <ul style="list-style-type: none"> <li>• Enabling Works</li> <li>• Construction</li> <li>• Operation</li> <li>• Decommissioning</li> </ul>	<p>Marine licensable activities will occur during the following stages:</p> <ul style="list-style-type: none"> <li>• Construction – placement of structures including associated dredging and disposal</li> <li>• Operation – including maintenance dredging, maintenance of structures and buoy movements and removal of debris from intake structure.</li> </ul> <p>Wider operational and decommissioning effects will be considered within the Wylfa Newydd Environmental Statement but would not be signposted for the Marine Licence.</p>
Baseline descriptions	Brief outline of the baseline description.	In the time since the 2016 Scoping Report was submitted, our environmental specialists have continued to gather marine environmental baseline information through a series of detailed surveys. This information has been included for relevant receptors.
EIA Topics	<p>The EIA topics included:</p> <ul style="list-style-type: none"> <li>• Air quality</li> <li>• Noise and vibration</li> <li>• Landscape and visual</li> <li>• Terrestrial and freshwater ecology</li> </ul>	<p>The Wylfa Newydd Environmental Statement will include all aspects covered in the 2016 Scoping Report. The relevant marine licensable activities will be signposted and include the following topics:</p> <ul style="list-style-type: none"> <li>• Coastal processes and geomorphology;</li> </ul>

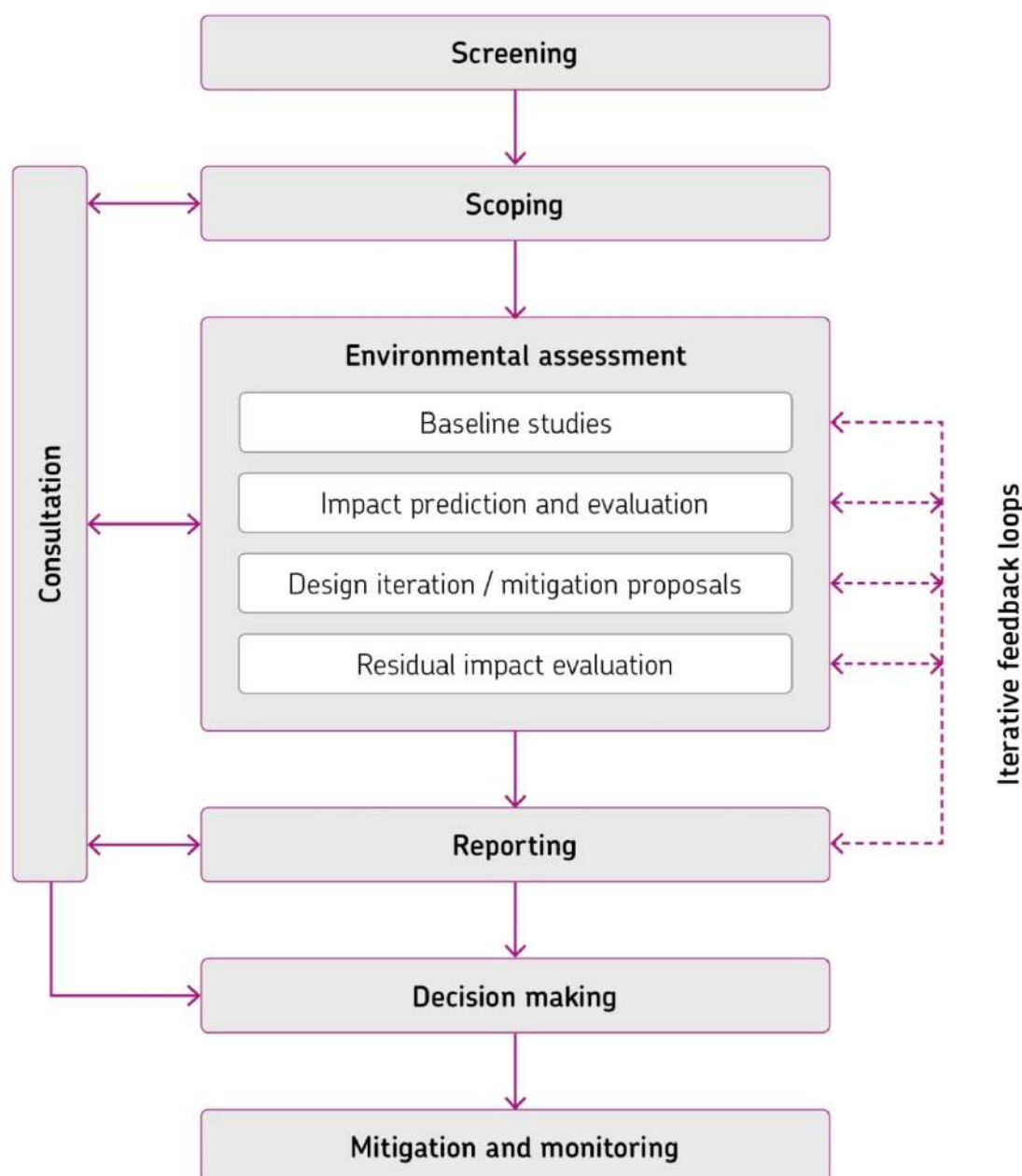
Topic	2016 Scoping Report	Marine Works Scoping Report
	<ul style="list-style-type: none"> <li>• Radiological issues</li> <li>• Soils and geology</li> <li>• Surface water and groundwater</li> <li>• Coastal processes and geomorphology</li> <li>• The marine environment</li> <li>• Archaeology and cultural heritage</li> <li>• Socio-economics</li> <li>• Public access and recreation</li> <li>• Traffic and transport</li> </ul>	<ul style="list-style-type: none"> <li>• The marine environment;</li> <li>• Archaeology and cultural heritage – this section focuses on marine archaeology;</li> <li>• Landscape and visual – this section focuses on seascape; and</li> <li>• Public access and recreation – this section focuses on coastal and marine users.</li> </ul> <p>The Wylfa Newydd Environmental Statement will also include new items not included in the 2016 Scoping Report and will be signposted in the Marine Licence application. These new marine licensable items include:</p> <ul style="list-style-type: none"> <li>• Shipping and navigation; and</li> <li>• other sea users.</li> </ul> <p>The potential effects of changes to air quality and noise and vibration on marine receptors will be included, where relevant, within the individual receptor sections.</p> <p>The marine licensable activities are not predicted to have any effects on the following topics (see section 7.1.1):</p> <ul style="list-style-type: none"> <li>• Terrestrial and freshwater ecology (excluding migratory species and seabirds);</li> <li>• Radiological issues for power station operation;</li> <li>• Soils and geology above mean high water springs;</li> <li>• Surface water and groundwater;</li> <li>• Socio-economics; and</li> <li>• Traffic and transport (excluding shipping).</li> </ul>

## 6 Approach to EIA for the Marine Licence

### 6.1 EIA methodology

1. An EIA will underpin the Application for development consent in accordance with the Infrastructure Planning EIA Regulations. Due to the size and nature of marine licensable activities an EIA is also required in accordance with the Marine Works EIA Regulations 2007 (as amended). Horizon's approach is to provide a single Environmental Statement to support both applications and therefore the Wylfa Newydd Environmental Statement will meet both of these regulations. The Marine Licence application will be supported by a signposting document to the relevant marine licensable aspects and the Marine Works EIA Regulations 2007 (as amended).
2. The EIA process can be described as "the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made" (International Association for Impact Assessment, 2009). In the UK, this involves the following steps underpinned by stakeholder consultation.
  - Screening, the process for determining if a proposed development requires a formal EIA or not.
  - Scoping, establishing the form and nature of assessments to be undertaken as part of an EIA, focusing on the most relevant topics where there is potential for significant effects.
  - Environmental assessment, an iterative process that starts by defining the existing 'baseline' environmental conditions, followed by prediction and evaluation of beneficial and adverse effects across a development's life-cycle, identifying measures to mitigate adverse environmental effects (by way of considering alternative design options, iterative design changes or management plans), and evaluating residual effects that may persist after the establishment of mitigation.
  - Reporting the findings of a formal EIA in an Environmental Statement.
  - Decision-making by a competent authority, informed by the findings of an EIA and other planning considerations.
  - Mitigation and monitoring the success of measures established to reduce predicted adverse environmental effects.
3. The EIA process has the following objectives :
  - to be proportionate, focusing on likely significant effects; and
  - to provide a tool to inform better design, help decision-making and protect the environment.
4. The overall EIA process is represented in figure 6.1.

**Figure 6.1 The EIA process**



## 6.2 Screening and scoping

5. The development of Wylfa Newydd Power Station involves the construction and operation of a Nuclear Power Station and as such is deemed to be a Schedule 1 project under the Infrastructure Planning EIA Regulations. All Schedule 1 projects require a formal, statutory EIA and for this reason it was not necessary to seek a formal screening opinion.
6. The Wylfa Newydd Environmental Statement has already been scoped (see section 5.1) and thus the purpose of this Marine Works Scoping Report is to ensure that any potential effects in relation to the marine licensable activities of the Wylfa Newydd Project are considered in the Wylfa Newydd Environmental Statement and signposted in the Marine Licence application. Any material changes to the Wylfa Newydd Project and additional baseline information received to date has been considered within this Marine Works Scoping Report. The approach to the production of the Marine Works Scoping Report is discussed in more detail in section 7.



## 6.3 Environmental assessment

7. The process of environmental assessment involves the following stages and activities:
  - Defining the baseline conditions, achieved through a combination of desk-based studies, site visits, detailed surveys and consultation.
  - Impact prediction and evaluation, across different phases and stages of a development's life-cycle.
  - Identifying measures to mitigate adverse environmental effects, by way of optioneering, iterative design changes, or management plans.
  - Identification and evaluation of the residual effects that may persist, post-establishment of mitigation.
  - Reporting the findings of the EIA process in the Environmental Statement.
8. The EIA significance criteria were defined within the 2016 Scoping Report. The criteria for the Marine Licence application will be consistent with those used in the Wylfa Newydd Environmental Statement. In general, the approach is to consider that an environmental effect may be significant if, in the professional judgement of the expert undertaking the assessment, it would meet at least one of the following criteria:
  - it leads to an exceedance of defined guidelines or widely recognised levels of acceptable change (which will be different for different topics within the EIA);
  - it is likely that the consenting authority will reasonably consider applying a planning condition, requirement or legal agreement to the consent to require specific mitigation to reduce or overcome the effect;
  - it threatens or enhances the viability or integrity of a receptor or receptor group of concern; or
  - it is likely to be material to the ultimate decision about whether or not the consent application should be approved.
9. The agreed study area for each receptor will be outlined within each of the specialist topic chapters of the Wylfa Newydd Environmental Statement, and will reflect the geographical area over which relevant significant effects may potentially arise.
10. The EIA Directive requires transboundary consultation to take place where a Member State is aware that a project is "likely to have significant effects on the environment in another Member State". Horizon will consider the potential for such transboundary effects as part of its EIA although it is considered that such effects are unlikely to arise.

### 6.3.1 Rochdale envelope

11. With such a complex development, it is inevitable that some detail will change between the initial design process, the appointment of contractors, and the final detailed design and construction process. In such circumstances, NPS EN-1 and Planning Inspectorate Advice Note 9 (Planning Inspectorate, 2012) recognise that using the 'Rochdale Envelope' approach may be beneficial. Advice Note 9 gives three key areas where the level of project detail and amount of flexibility are particularly relevant:
  - *"during consultation and publicity at the pre-application stage;*
  - *when preparing the EIA; and*
  - *in the description of the project within the application documents"*.
12. By defining a Rochdale Envelope, a series of maximum extents of a project are established in respect of which significant effects can be assessed. These maximum extents are often termed

the 'worst case scenario'. The detailed design of the Wylfa Newydd Project can then be varied at a later date within this 'envelope' without rendering an EIA inadequate.

13. Following the 2016 Scoping Report, the design details and parameters of the Power Station have been further refined to enable a more accurate assessment of the likely significant effects of the Power Station. Where Project design details have not been finalised, the EIA will be based on a reasonable 'worst case' in accordance with the Rochdale Envelope approach and requirements of PINS Advice Note Nine. The same approach will be taken for the Associated Development. The details of the approach to assessment will be explained in the ES.

## 6.4 Reporting

14. The Wylfa Newydd Environmental Statement will be produced in such a way that the relevant sections can be used to satisfy the EIA requirements for a number of parallel applications for the Wylfa Newydd Project (for example the Marine Licence and Application for development consents, amongst others).
15. For consistency, each Environmental Statement topic chapter is likely to be similarly structured in accordance with the following headings:
  - Introduction;
  - Guidance and consultation (topics specific guidance and consultation that has informed the assessment);
  - Methodology (describing the study area, how the baseline has been characterised and impacts evaluated);
  - Baseline environment;
  - Design basis and activities;
  - Assessment of effects;
  - Additional mitigation;
  - Residual effects; and
  - References.
16. For ease of assessment a signposting document to the Wylfa Newydd Environmental Statement will be provided with the Marine Licence application to highlight sections relevant to the marine licensable activities. In this respect, it is intended that the Wylfa Newydd Environmental Statement will provide the environmental information to support the Marine Licence application. Due to the proposed disposal of rock at a disposal site that has previously primarily been used for the disposal of soft sediment, it is also intended that the EIA will include a site characterisation for the proposed disposal site.
17. Further supporting documents will also be provided with the Marine Licence to include:
  - a shadow HRA signposting document;
  - a WFD Compliance Assessment;
  - a Waste Strategy Framework Assessment;
  - a MSFD; and
  - a biosecurity strategy

## 6.5 Mitigation measures

18. Mitigation is the term to describe measures used to prevent or reduce adverse environmental effects. The EIA process enables mitigation measures to be identified.

19. In addition to design iteration and mitigation proposals set out in the 2016 Scoping Report, the Institute of Environmental Management and Assessment's (IEMA) *Environmental Impact Assessment Guide to: Delivering Quality Development 2016* (IEMA, July 2016), has been used as guidance in the consideration of mitigation. The document sets out three types of EIA mitigation measures which have been implemented: primary (referred to as 'embedded' in the EIA), secondary (referred to as 'additional' in the EIA) and tertiary (referred to as 'good practice' in the EIA).
20. Mitigation will be applied throughout the Wylfa Newydd Project according to 'Good Practice' measures. Measures will be set out in Code of Construction Practices (CoCP) and a Code of Operation Practice (CoOP), with location-specific measures identified in relevant sub-CoCP. The CoCPs and sub-CoCPs will provide the general and topic-specific standards and measures to provide effective planning, management and control of all construction activities with the aim of controlling potential impacts upon people, businesses and the natural and historic environment. This updated section 7.2.3 of the 2016 scoping report. .
21. During the assessment process, 'additional mitigation' measures will also be identified to further reduce environmental effects.

# 7 Scoping

## 7.1 Background

1. The intention of this Marine Works Scoping Report is to ensure that any potential effects in relation to the Marine Licence application are considered in the EIA.
2. Based on feedback from previous consultation documents and our existing knowledge of the baseline conditions within the study area, the following receptors are considered to be potentially relevant to the marine licensable activities and thus have been included within this Marine Works Scoping Report:
  - coastal processes and coastal geomorphology;
  - the marine environment;
    - water and sediment quality (including radiological);
    - nature conservation;
    - marine benthic habitats and species (including non-native species);
    - plankton;
    - marine fish (including commercial fisheries and migrating species);
    - seabirds (including coastal birds e.g. chough); and
    - marine mammals.
  - shipping and navigation (including commercial shipping, recreational and fishing navigation);
  - archaeology (focusing on marine archaeology);
  - landscape and visual (focusing on seascape);
  - public access and recreation (focussing on coastal and marine users); and
  - other sea users.
3. The effects resulting from changes in air quality and noise and vibration will be covered within the relevant receptor topics putlined above and are not considered as receptors in their own right.

### 7.1.1 Receptors scoped out of the Marine Licence application

4. The marine licensable activities are not predicted to have any effects on the following topic receptors. This is due to the marine nature of the works, which are not likely to effect directly or indirectly on terrestrial receptors:
  - terrestrial and freshwater ecology (excluding migratory species and seabirds);
  - radiological issues from power station operation;
  - soils and geology above mean high water;
  - surface water and groundwater;
  - socio-economics; and
  - traffic and transport (excluding shipping).
5. Furthermore, the 2016 Scoping Opinion agreed that impacts to ozone, odour, insect infestation, accidental radiological release, seismic risk and aviation and defence interests can be scoped out of the EIA.
6. It is therefore proposed that these topics are scoped out of the EIA for a Marine Licence, and as such, they are not discussed further within this Marine Works Scoping Report.

## 7.2 Scoping process

7. The following headings as described in sections 7.2.1 to 7.2.3 below are applied to each of the identified receptors as set out in section 7.1 above and these are set out in full between sections 7.3 to 7.9 below. These sections have the following key headings:
  - existing environment (baseline summary);
  - main assessment issues; and
  - identification of data gaps and further work required.

### 7.2.1 Existing environment

8. These sections provide a brief overview of the existing environment for each of the identified receptors. For the most part, the description of the existing environment has been separated into two sub-sections to cover the two spatially distinct areas associated with the marine licensable activities – the Wylfa Newydd Development Area and the Holyhead Marine Disposal Site (figure 1.1).
9. A summary of available data sources is also included.

### 7.2.2 Main assessment issues

10. Potential effects of the Wylfa Newydd Project marine licensable activities on each of the receptors have been identified across the phases of:
  - Construction; and
  - Operation.
11. Marine licensable activities undertaken during the construction phase include the construction and placement of the two breakwaters, the CWS and the MOLF, dredging of the channel (including the temporary cofferdam), disposal of dredged material to sea, aids to navigation and temporary structures to facilitate construction (pontoon, barge berth). The identification of pathways during the construction phase will be separated into two sub-sections to cover the two spatially distinct areas associated with the marine licensable activities – the Wylfa Newydd Development Area and the Holyhead Marine Disposal Site. It should be noted that the assessment of effects on hydrodynamics will be included within this construction phase as this relates to the phase when the permanent structures are placed within the marine environment. EIA assessments will therefore include the presence of structures.
12. Marine licensable activities undertaken during the operation phase include maintenance dredging, maintenance of structures and buoy movements and removal of debris from the CWS intake screens. These activities are located at the Wylfa Newydd Development Area. The marine licensable activities at the Holyhead Marine Disposal Site during the operation phase are restricted to the disposal of maintenance dredge arisings.
13. The wider operational effects of the Power Station were identified within the 2016 Scoping Report and will be fully assessed within the Wylfa Newydd Environmental Statement although not signposted within the Marine Licence application because they do not represent marine licensable activities.
14. Decommissioning the Power Station will not occur for another 60+ years and would require a further EIA under the *Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999* (as amended). Baseline conditions and the technologies of that time would be used to assess the decommissioning process. An overview of the assessment of decommissioning activities that would be required in the decommissioning phase of the Power Station was provided in the 2016 Scoping Report. There are not considered to be any additional pathways for inclusion in relation to the marine licensable activities and thus the decommissioning

phase is not discussed further within this Marine Works Scoping Report. A qualitative assessment of decommissioning activities will be included within the Wylfa Newydd Environmental Statement.

### 7.2.3 Identification of data gaps and further work required

15. For those receptors listed in section 7.1, any remaining gaps in information for the purposes of assessing the impacts will be identified and the further work to fill these gaps proposed.

## 7.3 Coastal processes and coastal geomorphology

16. This chapter covers the assessment of the potential changes to coastal processes as well as the potential effects on specific coastal geomorphology receptors (features), associated with the Wylfa Newydd Project marine licensable activities.
17. The Wylfa Newydd Project marine licensable activities could change hydrodynamic and sedimentary processes both locally and potentially over a wider area. These changes to processes are described and predicted with respect to the baseline conditions and the consequence or significance of change for the environmental receptors (including designated sites).
18. Coastal geomorphology is the study of the evolution and development of the coast under the effect of winds, currents, waves and sea-level changes. Human activities can cause effects to coastal geomorphology features including beach and cliff erosion. Geomorphologists aim to understand the history of landforms and their dynamics and to predict such changes.

### 7.3.1 Existing environment

#### 7.3.1.1 Wylfa Newydd Development Area

19. A multi-method approach has been followed to characterise the coastal processes, sediments and geomorphological forms. It has involved the collection of data and information through desk study and surveys in the field.

##### 7.3.1.1.1 Bathymetric, geology and sediments information

20. The bathymetry (features and shape of the seabed) around north Anglesey is shown in figure 7.1. At Porth-y-pistyll the coast is characterised by rocky headlands and small sandy bays. Beyond the coastal zone there are also distinctive subtidal rocky seabed knolls, rising 4-5m above the seabed floor. At Wylfa Head, large, rocky outcrops dominate and rapidly shelf into waters some 30m to 40m deep. The seabed here consists of an irregular wave-like rock head surface, covered in part by a complex boulder clay sequence. In turn this is covered by thin lag deposits (see figure 7.2).
21. The sand and gravel lag deposits on the sea bed have been swept into the many coves in the area and form the sediments at the back of Cemlyn and Cemaes Bays. Cemlyn Lagoon has in part been formed by the accumulation and formation of a shingle barrier beach. These gravels and cobbles are a legacy deposit likely to be supply-limited and therefore potentially vulnerable to change.
22. Porth-y-pistyll can be described from a geomorphological perspective as a bay-head or pocket beach contained within an embayment bounded by headlands (between Cerrig Brith and Trwyn y Galen-ddu). Normally, sediments captured in such bays may undergo some longshore drift within the bay itself, but the sediment may generally be unable to escape from the enclosed system due to the relatively high wave energy conditions affecting the headlands.

##### 7.3.1.1.2 Tides, currents and eddies

23. The tides in north Anglesey are semi-diurnal occurring approximately every 12.4 hours. Tidal currents are particularly strong off Anglesey. They are west-to-east off Wylfa Head on the flood

(incoming tide) and east-to-west on the ebb (outgoing tide). Ebb currents were recorded as being stronger than the flood with a maximum recorded ebb current speed of 2.3m/s recorded.

24. A maximum measured tidal range of 7.5m has been recorded at Wylfa Head and Cemaes Bay. The maximum and minimum recorded tide levels were +3.9mOD (Ordnance Datum) to -3.6mOD respectively. The most extreme tide levels predicted by Defra/Environment Agency (2011) are rises of +4.7mOD at Cemaes Bay and +4.6mOD at Wylfa. These levels are based on extrapolation and the annual probability of occurrence is 0.01%.
25. The area of sea to the north of Wylfa Head causes a stable eddy structure to form in Cemlyn Bay (to the west) and Cemaes Bay (to the east) on both the flood and ebb tides. The rotation and strength of eddies varies over the flood-ebb cycle. The maximum current speeds recorded were 0.95m/s (to the west of Wylfa Head) and 1.1m/s (to the east). The headland itself influences the main direction of the flows. Within the two bays, current speeds are lower. Eddies also assist with interchange of water between the two bays and the effect of strong currents north of Wylfa Head.

#### 7.3.1.1.3 Wave Climate

26. The locally complicated coastline includes west-, north- and east-facing elements. Whilst the highest wave conditions a short distance offshore come from broadly westerly directions, the highest wave conditions at Wylfa Newydd come from broadly northerly directions.
27. There are two types of wave affecting the study area, namely swell waves originating outside the area and locally generated wind waves. The wave climate along the Anglesey coastline, therefore, varies in response to a number of factors:
  - swell waves approaching from the Irish Sea;
  - wind conditions;
  - fetch (distance) over which winds can blow and generate waves;
  - water levels;
  - orientation of the coastline and presence of headlands and rock outcrops; and
  - inshore bathymetry.
28. The northern coast of Anglesey is exposed to waves approaching predominantly from 270°N to 0.90°N. (Halcrow, 2012). A series of wave buoys deployed between August 2010 and February 2011 indicates a predominant wave direction from the west. The orientation of the coastline prevents swell waves approaching from the south-west. However, locally generated wind waves approach from a range of other directions.
29. Significant wave heights were found to be lower in the sheltered bays compared with offshore. The average significant wave height west of Wylfa Head was 0.68m (recorded between October 2010 and January 2011). At the furthest offshore mooring the average significant wave height recorded was 1.24m.
30. As waves enter shallow water close to the shore they undergo transformation. As the water depth decreases, so the wavelength and the wave phase velocity both decrease. Wave height increases prior to breaking. At this stage the water is shallow enough to allow the orbiting water particles to affect the bed. A wave-induced current is generated. Although complex, generally there are two types of current considered: those normal to the shore (shore normal) and those parallel to the shore (shore parallel or longshore).
31. Longshore transport along the coastline tended to be weak because of the effects of shoaling within the bays and diffraction around the headlands. If longshore currents do exist, they tend to reduce as they push sediment towards one side of a bay and the beach line rotates to face the incoming waves.



32. Shore normal wave-induced transport may occur with a general easterly direction along the north Wales coast. At some localities littoral drift may change direction dependent on the prevailing wind directions.

#### 7.3.1.1.4 Coastal geomorphology

33. The topic study area is composed of mainly hard rock cliffs with pocket sandy bays. Much of the unconsolidated material along the coastline eroded or detached during the glacial period, and has since been moved and sorted by currents driven by tidal and wave forces.
34. Six key coastal geomorphology types were identified during a walkover survey at the Wylfa Newydd Development Area in November 2014. These broad categorisations include hard rock cliff; crescent-shaped bay with natural cliffs or artificial wall at head of beach; saltmarsh; crescent-shaped bay with shingle beach/barrier; man-made lagoon behind shingle beach; and hard rock platform exposed at low tide. At the local scale most key coastal geomorphology features were represented including a number of beach cusps, a small tombolo and remnant sand dunes. Due to the steep nature of the joining streams, very short lengths of 'tidal estuary' were observed. For example, at Cemaes village about 100m length of water body was determined to have both freshwater and saline influences (Horizon, 2015).
35. There are two sites on Anglesey specifically designated for coastal geomorphology, namely Newborough Warren which is important for its coastal features, and Tywyn Aberffraw comprising a large and intact dune system. These are 62km and 54km respectively from the Power Station Site. As a result of their distance from the site, they have been screened out of further assessment as there would be no anticipated effects.
36. Coastal geomorphology receptors that could potentially be affected by changes in coastal processes as a result of the proposed development are described in Table 7.1.

**Table 7.1 Geomorphology receptors**

Geomorphology receptor	Description
The seabed	This covers the area within Porth-y-pistyll and surrounding bays west of Wylfa Head.
Cemaes Bay	This is situated to the east of Wylfa Head within the Anglesey North water body.
Cemlyn Bay	This is situated within the Skerries WFD water body immediately to the west of Wylfa Head.
Esgair Gemlyn	A shingle beach situated about 400m from the Power Station at its central point, protected as part of the Cemlyn Bay SAC.
Cemlyn Lagoon	This is designated as a SAC and Site of Special Scientific Interest (SSSI) (and is also covered by the Ynys Feurig, Cemlyn Bay and the Skerries Special Protection Area (SPA). The existence of the lagoon is dependent on the presence of Esgair Gemlyn.
Hen Borth Cliff	A geological SSSI which is an important (cliff) exposure of a glacial drumlin feature, located approximately 1500m from the Power Station at its central point.

#### 7.3.1.2 Holyhead Marine Disposal Site

37. The Holyhead Marine Disposal Site for the Wylfa Newydd Project is defined as the northern part of the Holyhead Deep Disposal Site (see figure 1.1). An application has been submitted for the Minesto Deep Green Holyhead Deep Project (Minesto, 2016) in the southern half of the Holyhead

Deep Disposal Site. The Environmental Statement and supporting technical appendices for the Minesto Project included broad scale surveys to assess potential effects of the Wylfa Newydd Project in the context of the wider sea area (i.e. the Irish Sea). These data serve as a valuable resource which can be used to characterise the wider environmental baseline for Holyhead Deep in the context of the Holyhead Marine Disposal Site for the Wylfa Newydd Project.

38. In addition, the Irish Sea has been extensively surveyed by numerous researchers and organisations. Information contained within the Minesto Environmental Statement (Minesto, 2016) has been further supplemented by published data to provide a more robust and comprehensive assessment of baseline conditions.
39. High resolution multibeam bathymetry data collected by SEACAMS between 2013 and 2014 shows that much of the Holyhead Marine Disposal Site is between 40m and 60m deep, although depths in the northernmost depression reach up to 100m. There is a small rock platform protrusion on the northern boundary, where depths range between 35m and 39m (Seazone, 2014 in Xodus Group, 2015).
40. The Irish Sea is a high-energy shelf sea (Simpson and Hunter, 1974) forced principally by semi-diurnal lunar and solar tides (Howarth, 2005). The tidal range in the eastern Irish Sea is high, with amplitudes of 7m in Liverpool Bay and around 4m at Anglesey resulting in high tidal current velocities. The tidal excursion along the north coast of Anglesey is between 20km and 25km to the south-west (ebb) and south-east (flood), respectively.
41. Within the vicinity of the Holyhead Deep Disposal Site, depth-averaged tidal currents generally range between 1.75m/s and 2m/s, with velocities exceeding 2.5m/s during spring tides. Tidal current velocity tends to vary little with depth, except near the seabed, where there is a high shear layer a few metres thick (Howarth, 2005).
42. Bed shear stress in the waters off Anglesey, including the Holyhead Marine Disposal Site, is dominated by tidal processes (Robins *et al.*, 2014). Within the Holyhead Deep Disposal Site, bed shear stress generally ranges from 6N/m<sup>2</sup> to 10N/m<sup>2</sup>, decreasing to 4N/m<sup>2</sup> in the northernmost depression (SEACAMS, Johnsson, pers. comm. in Minesto, 2016).
43. Owing to the enclosed nature of the Irish Sea, the majority of waves are locally generated and therefore have a short period and significant wave height (Howarth, 2005). The maximum 50-year return value of the wave period is 10s within the Irish Sea compared to 15s at the outer entrance which is characterised by high energy swell waves. Within the Irish Sea the 50-year return value of significant wave height varies between 8m and 10m (Howarth, 2005).
44. The maximum 50-year period return values of the hourly-mean wind speed at a height of 10m is 34 – 36m/s gusting up to 50m/s. This is directed from the north, north-east and south-east. The North Atlantic Oscillation Index dictates the inter-annual variability in wind and wave climate in the Irish Sea (Howarth, 2005).

### **7.3.1.3 Sea level rise projections**

45. The projected sea level rise has been derived using UKCP09 guidance and the latest UK guidance on relative sea level rise (Environment Agency, 2011). A projected relative sea level rise of 488mm is estimated by 2090. It is, however, recognised that there is a continuing uncertainty with respect to sea level rise.

## **7.3.2 Main assessment issues**

46. The potential effects of the marine licensable activities on coastal processes and coastal geomorphology are outlined in Table 7.2 for the Wylfa Newydd Development Area and Table 7.3 for the Holyhead Marine Disposal Site.

**Table 7.2 Potential effects of the marine licensable activities on coastal processes and coastal geomorphology at the Wylfa Newydd Development Area**

Potential effect	Phase	Comment
Loss of and change to the nature of the seabed	Construction	The construction of the two breakwaters, including the temporary causeway, the MOLF and cooling water intake and outfall and marine excavation will lead to the loss of and change to the nature of the seabed.
Alteration to waves, current patterns and sediment processes potentially causing scour	Construction	Construction of the two breakwaters, including a temporary causeway, MOLF, and cooling water intake and outfall may lead to alterations to hydrodynamic and sediment processes.
Release of suspended sediment and subsequent deposition on the seabed due to dredging operations	Construction	Dredging operations have the potential to release suspended sediments into the sea with potential for deposition.
Release of suspended sediment and subsequent deposition on the seabed due to installation of the marine works	Construction	Installation of the two breakwaters including the temporary causeway, the MOLF and subsequent removal of the causeway have the potential to release suspended sediments into the sea with potential for deposition.
Change in natural seabed morphology during dredging	Construction	Wet marine excavation, including dredging, may alter seabed morphology.
Coastal squeeze	Construction	Coastal squeeze caused by the presence of the breakwaters and MOLF may lead to the loss of intertidal (seabed) morphological features.
Release of suspended sediment and subsequent deposition on the seabed due to maintenance dredging operations	Operation	A small and temporary increase in fine sediment may result from ongoing maintenance dredge commitments.

**Table 7.3 Potential effects of the marine licensable activities on coastal processes and coastal geomorphology at the Holyhead Marine Disposal Site**

Potential Effect	Phase	Comment
Change in natural seabed	Construction	The deposition of the rock fraction within the disposal site may alter the seabed morphology and

Potential Effect	Phase	Comment
morphology		hydrodynamics near the seabed.
Release of suspended sediment and subsequent deposition on the seabed due to disposal operations	Construction	Disposal of the fine fraction of dredged material will increase suspended sediments with potential for deposition.
Release of suspended sediment and subsequent deposition on the seabed due to maintenance dredging disposal operations	Operation	Disposal of maintenance-dredged material will increase suspended sediments with potential for deposition.

### 7.3.3 Identification of data gaps and further work required

47. In order to inform the determination of changes to coastal processes and the assessment of effects on coastal geomorphology receptors as a result of the marine licensable activities, a number of work streams have been progressed by Horizon. These are:

- Hydrodynamic modelling at the Wylfa Newydd Development Area;
- Hydrodynamic modelling at the Holyhead Marine Disposal Site;
- Sediment dispersion and deposition modelling at the Wylfa Newydd Development Area; and
- Sediment dispersion and deposition modelling at the Holyhead Marine Disposal Site.

48. Horizon has developed a marine hydrodynamic model to aid understanding of the potential influence of the structures associated with the Wylfa Newydd Project marine licensable activities on the marine environment. The hydrodynamic model has been developed in consultation with NRW and will simulate the marine environment around the Wylfa Newydd Development Area and up to 50km offshore. The Delft3D hydrodynamic model utilises bathymetric (depth of the seabed) data collected during targeted surveys and from hydrographic charts. The model design includes two 3D grids nested within an outer 2D grid, providing the high resolution outputs necessary to enable an assessment of different scenarios. One of the key purposes of the marine hydrodynamic model is to provide context to the Wylfa Newydd Development Area and aid assessment of the effects of marine licensable activities on:

- waves;
- currents (tidal flows);
- suspended sediment concentrations (plumes); and
- accretion/erosion rates.

49. In addition, Horizon has developed a hydrodynamic model to aid the understanding of the potential effects of the disposal of soft and hard sediment at the Holyhead Marine Disposal Site. The model will build on the existing Delft3D hydrodynamic model with the addition of a 3D grid area to cover the Holyhead Marine Disposal Site. The hydrodynamic model will aid in the assessment of the fate of fine sediments, including dispersion and settling rates, due to the

disposal of soft sediments as well as the effects on hydrodynamics of the disposal of the rock fraction at the Holyhead Marine Disposal Site.

50. Further information on the detail of these models and their development through consultation with regulators will be included within the Wylfa Newydd Environmental Statement.

## 7.4 The marine environment

### 7.4.1 Water and sediment quality

51. This chapter covers the assessment of the potential changes to water and sediment quality associated with the Wylfa Newydd Project marine licensable activities.

#### 7.4.1.1 Existing environment

##### 7.4.1.1.1 Wylfa Newydd Development Area

##### 7.4.1.1.1.1 Water quality

52. Marine water quality sampling was carried out between 2010 and 2014 (figure 7.3). Measured parameters changed as the programme progressed between 2010 and 2014, but included metals, organics, nutrients, suspended solids, radioisotopes, chlorination by-products, anti-corrosive agents contained in Existing Power Station process water and a range of in situ parameters (for example, temperature, salinity and dissolved oxygen). Two additional water quality surveys were carried out to provide an indication of non-operational water quality conditions, following cessation of the discharge from the Existing Power Station on 30 December 2015.
53. Physical data have shown there to be no evidence of permanent haloclines (salinity layers) or thermoclines (temperature layers), nor any seasonal layering of the water column. Nutrient concentrations were consistently low, indicating very little nutrient enrichment in the survey area. Dissolved oxygen measurements were typical of levels in coastal waters around Anglesey. Effects were more prominent immediately adjacent to the Existing Power Station outfall discharge (within 50m) with temperatures ranging between 11.0°C at the bed to 15.22°C at the surface and unstable salinity values throughout the water column. However, the influence of the Existing Power Station outfall was shown to be localised with the effects dissipating quickly.
54. The majority of chlorination by-products analysed were below their limit of detection or in very low concentrations. Organic compounds were almost always below the limits of detection and concentrations of metals were very low in general. All metals were found in low concentrations at levels below the relevant Environmental Quality Standards (EQS), with the exception of one sample in one month where mercury levels were slightly above the maximum allowable concentration EQS.
55. Average suspended sediment concentrations were found to not vary significantly between sites, with calculated annual averages ranging from 6.1mg/L in 2011 to 13.0mg/L in 2014.
56. Radioisotope monitoring in Cemaes Bay and Cemlyn Bay found that radioactivity was consistent with previously recorded data. It is widely recognised that the levels of artificial radionuclides in and around the Irish Sea are strongly influenced and elevated by concentrations derived from discharges at Sellafield, Springfields and Heysham, which can all but mask locally derived activity.
57. In general, marine water quality results were consistent across all the survey sites within the study area and the waters are regarded as being good quality in line with WFD.
58. There are three coastal water bodies designated under the Water Framework Directive (WFD) in close proximity to the Power Station Site (figure 7.4). The Anglesey North water body is currently achieving 'moderate' ecological status and the Skerries water body is at 'high' ecological status. These water bodies are characterised by strong tidal currents and a maximum tidal range of

7.5m. Cemlyn Lagoon water body is currently achieving 'good' ecological potential. It is located approximately 900m west of the Power Station Site and is separated from the coastal waters by a shingle bank, with a narrow channel at the western end.

59. There is a designated bathing water site located at Cemaes, approximately 1.5km east of the Power Station Site. There are four classifications for bathing water quality: excellent, good, sufficient and poor. In 2016, Cemaes bathing water was classified by Natural Resources Wales as being at 'poor' status. Cemaes Bay is subject to short-term pollution issues which are caused when heavy rainfall washes faecal material into the sea from livestock, sewage and urban drainage via rivers and streams (NRW, 2016a).
60. There are no designated shellfish waters in proximity to the Wylfa Newydd Development Area; the closest one is located at Red Wharf Bay on the east of Anglesey over 25km away.

#### 7.4.1.1.1.2 Sediment quality

61. Sediment quality sampling was carried out between 2010 and 2014 from sites within 5km of the Wylfa Newydd Development Area (figure 7.5).
62. Sublittoral substrates in the study area were found to be a mix of exposed rocks and sandy sediments while further offshore mixed sediments were prevalent, which concurred with previous studies (Robinson *et al.*, 2011). Granulometric data and field observations from both the 2010 and 2011 surveys indicate that substrates varied considerably over the study area from muds to coarse gravel and cobbles, a pattern clearly related to the scouring effects of the prevailing high-energy currents. Muddy sands were evident within Cemaes Bay, which is consistent with its more sheltered location. Sediments in Porth-y-Felin in the south-west corner of Porth-y-pistyll were predominantly coarse sand, whilst to the east of the bay sediments were classified as muddy sand or sand.
63. Sediment quality samples collected between 2010 and 2015 showed the sediment quality in the area to be generally good. The highest levels of most sediment-bound metals were recorded at inshore sites, particularly in Cemaes Bay where the highest concentrations of copper, zinc, cadmium, mercury, lead, arsenic and chromium were consistently recorded. However, comparison with Cefas Action Levels found no exceedance of Action Level 2 in any sample. Concentrations of the majority of metals and hydrocarbons within sediments were below the levels at which adverse biological effects would be expected to occur.
64. A detailed survey of radioactivity in soil samples from the Wylfa Newydd Development Area showed no evidence of elevated radionuclide concentrations above background at the construction site. Marine studies undertaken near the coast suggest there is very little fine consolidated sediment in the area and that measured environmental radioactivity concentrations in these sediments are low.

#### 7.4.1.1.2 *Holyhead Marine Disposal Site*

65. As part of the characterisation of the marine environment around the proposed Holyhead Marine Disposal Site, water samples were collected at surface (approximately 1m below the surface) and mid-depth at six different locations throughout the survey area in October 2016 (see figure 7.6). At each site, the main physico-chemical parameters were measured *in situ* within the water column (vertically), including temperature, salinity, dissolved oxygen (% saturation and concentration), pH and oxidation reduction potential (ORP), also referred to as Redox. Full details of these surveys will be included within the Wylfa Newydd Environmental Statement.
66. Information contained within the Minesto Environmental Statement as well as other surveys undertaken by numerous researchers and organisations within the Irish Sea has been used to provide a more robust and comprehensive assessment of baseline conditions.



#### 7.4.1.1.2.1 Water quality

67. The Holyhead Marine Disposal Site is located within approximately 12km of two coastal water bodies designated under the WFD including Caernarfon Bay North and The Skerries (figure 7.4). Caernarfon Bay North is currently achieving 'good' ecological status and The Skerries water body is at 'high' ecological status (NRW, 2016b).
68. Within approximately 20km of the Holyhead Marine Disposal Site there are a total of six areas that are classified as bathing waters (NRW, 2016a). In 2015, five areas achieved an 'excellent' classification passing the bathing water quality standard whilst Cemaes achieved a 'sufficient' classification.
69. Marine water quality samples undertaken in 2016 show a very well mixed water body. Conservative properties (temperature and salinity) were found to be very stable throughout the water column and through the survey area. This indicates the absence of permanent stratification within the area and a unique mass of water. For all determinands, no exceedance from annual averages or maximum allowable concentration values were reported when compared to EQSs. Moreover, all concentrations reported were in line with 'Good' chemical status defined by the WFD and consistent with coastal water with an absence of pollution substances. A summary of the physico-chemical results from the Holyhead Marine Disposal Site include the following.
- Temperature within the survey area varied between 13.99°C and 14.08°C. The difference recorded within the vertical water column at each site was 0.05°C or lower.
  - Salinity values recorded within the survey area varied between 33.99 and 34.15. The difference recorded within the vertical water column at each site was 0.16 or lower.
  - Dissolved oxygen (saturation) recorded within the survey area varied between 90.5% and 96.2%. The difference recorded within the vertical water column at each site was 5.7% or lower.
  - Dissolved oxygen (concentration) recorded within the survey area varied between 7.54mg/L and 8.01mg/L. The difference recorded within the vertical water column at each site was 0.47mg/L or lower.
  - pH values recorded within the survey area varied between 8.18 and 8.23. The difference recorded within the vertical water column at each site was 0.03 or lower.
  - Redox or oxidation reduction potential values recorded within the survey area varied between 291.3mV and 325.7mV. The difference recorded within the vertical water column at each site was 14. mV or lower.
70. Kennington and Rowlands (2004) classified areas of the Irish Sea with respect to hydrology, nutrient chemistry and ecology. The Holyhead Marine Disposal Site falls into an area classified as 'offshore mixed waters'. Here waters are highly saline (>34) and exhibit moderate winter nutrient conditions. Waters in this typology are generally well mixed, although a weak thermocline can develop during extended times of fine weather.

#### 7.4.1.1.2.2 Sediment quality

71. The seabed off the northwest coast of Anglesey is largely defined by the presence of an extensive subsea platform of hard pre-Cambrian rock, which extends north-westerly to around 25km offshore (Rees, 2005). The seabed therefore tends to be characterised by patches of either exposed bedrock or bedrock thinly overlain by boulders and lag gravel. There are also intermittent ribbons of sand where the remnants of glacial moraines or other protruding features baffle currents. Overall, it is an area of coarse tide-scoured rough ground (Rees, 2005).
72. British Geological Survey data (BGS DigSBS250) suggest that the western region of the Holyhead Deep Disposal Site were characterised by 'sandy gravels' whilst to the east the seedbed was made up of 'rock and sediment'. A small area of 'rock' exists on the north-east boundary of the disposal site, occupying 2.74km<sup>2</sup>.



73. Benthic grabs surveys were carried out by SEACAMS in 2013 and 2014 and found sediments ranged from 'very coarse gravels' and 'coarse gravels' in the south-east area of the Holyhead Deep Disposal Site to isolated areas of 'sandy very fine gravel' and 'sandy medium gravel' in the north-east region (Xodus Group, 2015).
74. Sediment samples categorised according to the standard Folk triangle system (Folk, 1954) were made up of 56.71% 'sandy gravel', 33.65% 'rock and sediment' and 9.61% 'rock (undifferentiated)' (Xodus Group, 2015).

#### **7.4.1.2 Main assessment issues**

75. The potential effects of the marine licensable activities on water and sediment quality are outlined in Table 7.4 for the Wylfa Newydd Development Area and Table 7.5 for the Holyhead Marine Disposal Site.
76. Due to the fact that radioactivity in soil samples was considered to be low there is considered to be little potential for additional doses from remobilisation of sediment-borne radioactivity during marine construction works. On this basis, there is no further consideration of the radiological effects from marine licensable activities.

**Table 7.4 Potential effects of marine licensable activities on water and sediment quality at the Wylfa Newydd Development Area**

Potential effect	Phase	Comment
Changes to water quality from dredging	Construction	Re-suspended sediments due to dredging activity have the potential to result in increased turbidity, elevated suspended sediment concentrations (SSC) and the release of sediment-bound contaminants in the water column. Subsequent deposition of re-suspended sediment may alter sediment quality at other locations.
Changes to water quality from maintenance dredging	Operation	A small and temporary increase in fine sediment may result from ongoing maintenance dredge commitments. Subsequent deposition of re-suspended sediment may alter sediment quality at other locations.

**Table 7.5 Potential effects on water and sediment quality at the Holyhead Marine Disposal Site**

Potential effect	Phase	Comment
Changes in water quality from disposal	Construction	Disposal of the fine fraction of dredged material may result in elevated SSC and subsequent deposition on the surrounding seabed. Disposed sediments also have the potential to release toxic contaminants which can cause changes in a range of water quality parameters including turbidity, SSC and dissolved oxygen.
Changes in water quality from maintenance dredge disposal	Operation	Disposal of maintenance-dredged material may result in changes to turbidity, SSC and dissolved oxygen.

#### **7.4.1.3 Identification of data gaps and further work required**

77. In order to inform the determination of changes to water and sediment quality as a result of the marine licensable activities a number of work streams have been progressed by Horizon. These include:

- hydrodynamic modelling at the Wylfa Newydd Development Area;
- hydrodynamic modelling at the Holyhead Marine Disposal Site; and
- detailed WFD compliance assessment.

78. Horizon has developed a marine hydrodynamic model to aid understanding of the potential influence of the marine licensable activities associated with the Wylfa Newydd Project on the marine environment (see section 7.3.3). One of the key purposes of the marine hydrodynamic model is to provide context of the Wylfa Newydd Development Area and aid assessment of the effects of the fate of fugitive sediments from dredging. This will include an assessment of potential effects on water chemistry from the potential mobilisation of sediment bound contaminants.
79. Horizon will also develop a hydrodynamic model to aid the understanding of the potential effects of the disposal of soft and hard sediment at the Holyhead Marine Disposal Site (see section 7.3.3). The hydrodynamic model will aid in the assessment of the fate of fine sediments, including dispersion and settling rates, due to the disposal of soft sediments at the Holyhead Marine Disposal Site.
80. The WFD establishes a framework for the management and protection of Europe's water resources. It is implemented in England and Wales through the *Water Environment (Water Framework Directive) (England and Wales) Regulations 2003* (the Water Framework Regulations). A detailed WFD compliance assessment will be undertaken to determine the implications of the marine licensable activities on water bodies within the vicinity of the Wylfa Newydd Project. In agreement with NRW this WFD assessment will be appended to the Wylfa Newydd Environmental Statement.
81. Further information on the detail of these data collection methodologies and model development, including consultation with NRW, will be included within the Wylfa Newydd Environmental Statement.

## 7.4.2 Nature conservation

### 7.4.2.1 Existing environment

82. There are a number of sites subject to nature conservation designations (both statutory and non-statutory) of international, national and local importance within and surrounding the Wylfa Newydd Development Area and Holyhead Marine Disposal Site. These include Special Areas of Conservation (SACs), Special Protection Areas (SPAs), and Sites of Special Scientific Interest (SSSI) (figure 7.7). It should be noted that there are a number of statutory designations relating to landscape and heritage that could be affected by the Wylfa Newydd Project.
83. The designated sites of national/international importance that are considered to be relevant to the assessment of the Wylfa Newydd Project marine licensable activities are listed in Table 7.6.

**Table 7.6 Internationally and nationally designated sites for nature conservation relevant to the marine licensable activities**

Site	Designation	Primary reason for designation
Bae Cemlyn/ Cemlyn Bay	SAC	Coastal lagoon habitat, including a bryozoan ( <i>Conopeum seurati</i> ), the lagoon cockle ( <i>Cerastoderma glaucum</i> ) and the lagoonal mud snail ( <i>Ventrosia ventrosa</i> ). Perennial vegetation of stony banks is present as a qualifying feature but is not the primary reason for designation.
Glannau Môn: Cors heli/Anglesey Coast	SAC	Saltmarsh and dune habitat characterised by <i>Salicornia</i> species and Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritima</i> ).

Site	Designation	Primary reason for designation
Bae Lerpwl/ Liverpool Bay	SPA	Designated for overwintering populations of red throated divers ( <i>Gavia stellata</i> ) (5.4% of GB population five year peak mean 2001/02 - 2006/07) and common scoters ( <i>Melanitta nigra</i> ) (3.4% of GB population five year peak mean 2001/02 – 2006/07).
Glannau Aberdaron and Ynys Enlli/Aberdaron Coast and Bardsey Island	SPA	The site supports a resident population of Chough <i>Pyrrhocorax pyrrhocorax</i> which depend on the diverse mix of habitats present and their low-intensity agricultural management. The site also holds a large breeding colony of Manx Shearwaters <i>Puffinus puffinus</i> . The shearwaters feed outside the SPA in the nearby waters as well as more distantly in the Irish Sea.
Ynys Feurig, Cemlyn Bay and The Skerries	SPA	The SPA supports four species of breeding tern: Arctic tern ( <i>Sterna paradisaea</i> ) (five year mean of 1,290 pairs representing 2.9% of population in the UK, 1992-1996); common tern ( <i>Sterna hirundo</i> ) (five year mean of 189 pairs representing 1.5% of population in the UK, 1992-1996); roseate tern ( <i>Sterna dougallii</i> ) (five year mean of three pairs representing 5% of population in the UK, 1992-1996); Sandwich tern ( <i>Thalasseus sandvicensis</i> ) (five year mean of 460 pairs representing 3.3% of population in the UK, 1993-1997). Terns are known to nest on the islands in Cemlyn Lagoon.
North Anglesey Marine/ Gogledd Môn Forol	Candidate SAC (cSAC)	Proposed for harbour porpoise ( <i>Phocoena phocoena</i> ).
Anglesey Terns/ Morwenoliaid Ynys Môn	SPA	Proposed as a marine extension to the existing Ynys Feurig, Cemlyn Bay and The Skerries SPA, to include the marine area used by foraging terns during the breeding season.
Cemlyn Bay	SSSI	Breeding bird assemblage comprising Arctic tern ( <i>Sterna paradisaea</i> ), common tern ( <i>Sterna hirundo</i> ), roseate tern ( <i>Sterna dougallii</i> ) and sandwich tern ( <i>Thalasseus sandvicensis</i> ).  Vegetated shingle which is characterised by sea kale ( <i>Crambe maritima</i> ), sea radish ( <i>Raphanus raphanistrum</i> subsp. <i>maritimus</i> ) and yellow horned poppy ( <i>Glaucium flavum</i> ).
Beddmanarch- Cymyran	SSSI	Selected primarily for its ornithological and botanical interest. There are large areas of sandbank, mudflat and saltmarsh, as well as two stands of dune heath. The site also has marine biological interest. A wide range of water birds, both on passage and in winter, are attracted to the area which is especially important for overwintering ringed plover, greenshank, red breasted merganser and goldeneye.  On the mudflats there are beds of eelgrass ( <i>Zostera</i> spp ) and all three British species have been recorded. Saltmarsh vegetation fringes most of the site but only forms extensive stands in sheltered bays and estuaries. The coastal dune heath at both Traeth y Gribin and Cymyran are interesting examples of this locally

Site	Designation	Primary reason for designation
		uncommon habitat type.

#### **7.4.2.2 Main assessment issues**

84. A pathway of effect from activities within the Wylfa Newydd Development Area to a number of internationally and nationally designated sites exist. The potential effects on designated nature conservation interest features have been assessed in the appropriate receptor group sections, as follows:

- section 7.4.3: Marine benthic habitats and species;
- section 7.4.5: Marine fish;
- section 7.4.6: Seabirds; and
- section 7.4.7: Marine mammals.

#### **7.4.2.3 Identification of data gaps and further work required**

85. In order to inform the determination of changes to designated sites as a result of the marine licensable activities, Horizon will provide the necessary information for the Competent Authority to undertake an Appropriate Assessment for Habitats Regulations Appraisal (HRA) in tandem with the EIA.

86. For the Wylfa Newydd Project, the complex consenting process over an extended period of time necessitates a modular approach to HRA, where each specific Project element is screened in turn and eventually will contribute towards a single HRA. The potential cumulative and in-combination effects of each specific Project element will also be considered in this process. Extensive consultation regarding the HRA has already been undertaken with the local authority, NRW and others, and this will continue alongside the EIA process.

### **7.4.3 Marine benthic habitats and species**

87. This section covers the assessment of the potential changes to intertidal and subtidal habitats and species as well as non-native species associated with the Wylfa Newydd Project marine licensable activities.

#### **7.4.3.1 Existing environment**

##### **7.4.3.1.1 Wylfa Newydd Development Area**

88. Seabed habitats and species have been surveyed using a number of methods including quadrat surveys (carried out annually from 2010 to 2014), grab sampling for invertebrates (carried out in 2010, 2011 and 2015), drop-down camera surveys (carried out in spring 2010 to 2012 and 2014), a marine habitat mapping survey of Porth-y-pistyll (carried out in 2014) and diver surveys of the area immediately adjacent to the existing cooling water outfall (carried out in 2011, 2012 and 2015). Full details of these surveys will be included within the Wylfa Newydd Environmental Statement.

##### **7.4.3.1.1.1 Intertidal habitats and species**

89. Intertidal habitats were characterised by exposed rocky substrates which were found to support a complex array of communities influenced by the type of surface, how exposed they were and tidal height. Where the intertidal rocky shore is colonised by marine flora and fauna, it is considered to be an example of 'reef' habitat listed on Annex 1 of the Habitats Directive, although it is not a qualifying feature of any nearby designated site. The Annex I habitat 'perennial vegetation of stony banks' is present within the Cemlyn Bay SAC.

90. The intertidal biotope mapping survey of Porth-y-pistyll identified that intertidal areas of the bay were composed of a mosaic of habitats, ranging from muds and sands to exposed bedrock (figure

7.8). Along the north-western shoreline of the bay, the upper shore was characterised by steep bedrock, while the mid and lower-shore substrata were composed of bedrock and boulders; much of the eastern side of the bay was characterised by moderately exposed rocky platforms. Blue mussel bed, *Fucus ceranoides* on reduced salinity eulittoral rock and coastal saltmarsh communities were all found in the south-eastern corner of the bay, at Porth-y-Felin, occupying 0.68ha, 0.18ha and 0.14ha respectively. Although it is recognised that their presence adds to the diversity of habitats and species within Porth-y-pistyll, these biotopes are not considered to be particularly important examples of the habitats.

91. Many rock pools were recorded from the low to high shore at Porth-y-pistyll and Cerrig Brith, the majority of which were described as 'seaweed and sediment floored' pools (LR.FLR.Rkp.SwSed). This habitat is noted as a feature of 'special interest' within the nearby Cemlyn Bay SSSI, and being relatively uncommon, rock pools are thought to add ecological value to the bay. In 2014, five rock pools were surveyed and were found to be rich in flora and fauna, especially in the mid and upper shore.
92. Intertidal surveys from both the late 1980s and present day have shown the Existing Power Station outfall causes a gradient of effects on habitats and species. The distribution of dog whelk was restricted to no closer than 255m from the existing outfall in 1987 and 215m in 2010. In both 1987 and 2010, barnacles were recorded at all sites (the closest site being 10m from the outfall), with a pattern of increasing abundance and density with increasing distance from the existing outfall. Limpets were recorded at all sites with no obvious change in abundance between sites.

#### 7.4.3.1.1.2 Subtidal habitats and species

93. Surveys of the subtidal habitats and communities along the north Anglesey coast found the area to be very diverse, from muds to coarse gravel and cobbles. This pattern of sediments along the coast was clearly driven by the complex seabed topography and tidal streams in the area.
94. The area of seabed immediately around Wylfa Head is predominantly a large brittlestar bed over coarse, mixed substrate (sands, gravels and cobbles). The tide-swept headlands of Wylfa Head, Llanbadrig Head and beyond support diverse sponge and cnidarian (hydroids, soft corals, anemones, etc.) communities. Closer inshore, within the more sheltered Cemaes and Cemlyn Bays, the substrate turns to a more muddy sand dominated by the bivalves *Abra alba* and *Nucula nitidosa*; both are species typical of the biogeographical area. This muddy sand habitat also exists just to the north of Porth-y-pistyll.
95. Survey results from 2010, 2011 and 2015 recorded the presence of *Sabellaria spinulosa*. Only one site had fragments with elevated structures up to 5cm, which would meet the criteria for low 'reefiness' as defined by Gubbay (2007), and this was only recorded in a single replicate at site WS08 (in 2011) which is over 1.5km from the Wylfa Newydd Development Area.
96. The subtidal biotope survey of Porth-y-pistyll identified 21 biotopes several of which were better depicted following the intertidal mapping work on account of their intertidal locations (figure 7.9). Within the bay, the gradation of biotopes from the infralittoral fringe to the sublittoral sediments can be generally described as *Laminaria digitata* (kelp) communities leading down to dense forests of *Laminaria hyperborea* (kelp) and on to sparser, but even more extensive, *L. hyperborea* parks (lower density of kelp). Within the middle of the bay were large patches of 'dense foliose red seaweeds on silty, moderately exposed infralittoral rock' and to a lesser extent 'infralittoral muddy sand'; there were also several smaller patches of sedimentary habitat along the shallower margins, e.g. in the south-west and south-east corners.
97. Subtidal surveys from both the late 1980s and present day have shown the Existing Power Station outfall causes a gradient of effects on habitats and species on the seabed. Within 100m the effect was acute, however, beyond approximately 300m from the outfall there were no measurable differences compared with reference sites.



#### 7.4.3.1.2 Holyhead Marine Disposal Site

98. A total of 17 sites were surveyed in October 2016 using drop-down camera (DDC) (figure 7.6). A high-resolution digital camera (frame size of 592 x 444 mm, 3264 x 2488 pixels), produced underwater imagery and live and recordable video outputs. Images were analysed by identifying all visible taxa to the lowest possible taxonomic level using relevant taxonomic keys and photographic guides. The species and environmental features observed were used to classify the habitats and assign biotope codes following the Joint Nature Conservation Committee (JNCC) Marine Habitat Classification for Britain and Ireland (Connor et al., 2004). The results presented here are preliminary and full details of these surveys will be included within the Wylfa Newydd Environmental Statement.
99. Information contained within the Minesto Environmental Statement as well as other surveys undertaken by numerous researchers and organisations within the Irish Sea has been used to provide a more robust and comprehensive assessment of baseline conditions.

##### 7.4.3.1.2.1 Subtidal habitats and species

100. Across the 17 sites surveyed in October 2016, a mosaic of sedimentary and rocky habitats and features was observed. In general, these habitats supported a relatively impoverished tide-swept epifaunal community. However, some discrete features of conservation interest were detected. This resulted in seven broad biotopes being ascribed across the study area (table 7.7).
101. The sites clustered along the eastern margin of the Holyhead Marine Disposal Site were predominantly rocky, assigned to biotopes belonging to CR.HCR ('High energy circalittoral rock') and CR.MCR. ('Moderate energy circalittoral rock'), whereas towards the central and eastern areas of the site more mixed sediments dominated, with biotopes assigned falling within the code SS.SMx.CMX ('Circalittoral mixed sediment'). However, overlapping biotopes were also observed, highlighting the spatial heterogeneity of the seabed.
102. Overall, there was a low richness and density of sessile epifaunal species observed across the study area. The most commonly observed erect species was the scour-tolerant species *Flustra foliacea* (hornwrack bryozoan) and the large dahlia anemone *Urticina felina*. Other erect species commonly observed included the hydroids sertularidae (e.g. *Hydrallmania falcata*) and Nemertesia sp. and sponges (*Porifera*). At only two sites was a dense turf of sessile epifaunal species observed (HHD\_03 and HHD\_04) where unidentifiable hydroids and erect porifera were often dominant. Encrusting sessile biota was dominated by barnacles (*Balanus* sp.) and the serpulid keel worm *Pomatoceros* sp.
103. Commonly observed mobile fauna across almost all sites was the starfish *Asterias rubens* and caridean shrimp. Also recorded were hermit crabs (paguridae indet.), spider crabs (e.g. *Hyas coarctatus*), squat lobster (*Munida* sp.) whelks (*Nucella lapillus*), and other various more cryptic gastropods such as the necklace shell *Euspira* sp. and the painted top shell *Calliostoma zizyphinum*.
104. Across nine of the 17 sites there was evidence of tubes belonging to the polychaete, the ross worm *Sabellaria spinulosa*. At one site in the west of the study area (HHD\_17) biogenic reef structures were observed. Across all 17 sites no evidence of *Modiolus modiolus* (horse mussel) beds were found, with the exception of a few single examples of dead valve shells.

**Table 7.7 Biotopes and reefs identified from the drop-down camera survey**

Biotope	Code	Description
Circalittoral Rock (and other hard	CR.HCR.FaT	Very tide-swept faunal communities
	CR.HCR.FaT.BalTub	<i>Balanus crenatus</i> and <i>Tubularia indivisa</i> on extremely

Biotope	Code	Description
substrate)		tide-swept circalittoral rock
	CR.HCR.XFa	Mixed faunal turf communities
	CR.MCR.EcCr.UrtScr	<i>Urticina felina</i> and sand-tolerant fauna on sand-scoured or covered circalittoral rock
	CR.MCR.CSabSspi	<i>Sabellaria spinulosa</i> encrusted circalittoral rock
Sublittoral Sediments	SS.SMx.CMx	Circalittoral mixed sediment
	SS.SMx.CMx.FluHyd	<i>Flustra foliacea</i> and <i>Hydrallmania falcata</i> on tide-swept circalittoral mixed sediment

#### 7.4.3.1.3 Non-native species

105. The North Wales Wildlife Trust has identified 17 species which it considers to be non-native marine species of concern in North Wales. These invasive species have either already been recorded in Wales or are expected to arrive soon. In 2014, the Wales Marine Non-native Species Inshore Monitoring Network (2015) recorded four of these species in Holyhead Harbour which is in close proximity to the Wylfa Newydd Development Area. These include carpet sea squirt (*Didemnum vexillum*), Japanese skeleton shrimp (*Caprella mutica*), orange-tipped sea squirt (*Corella eumyota*) and orange cloak sea squirt (*Botrylloides violaceus*).
106. A further five invasive non-native species, not listed as species of concern by the North Wales Wildlife Trust, were also recorded in Holyhead Harbour; these included bryozoans (*Tricellaria inopinata* and *Schizoporella japonica*), sea squirts (*Asterocarpa humilis* and *Bugula neritina*) and barnacles (*Austrominius modestus*).
107. Surveys undertaken in 2014 as part of the Welsh Government Resilient Ecosystems Fund (Wood *et al.*, 2015) recorded three additional invasive non-native species in Holyhead Harbour that were not recorded in the Wales Marine Non-native Species Inshore Monitoring Network (2014) survey. These included the leathery sea squirt *Styela clava*, a colonial sea squirt, *Aplidium* cf *glabrum* and Japanese kelp, *Undaria pinnatifida*.
108. Recording of non-native species has been carried out as part of the analysis of survey results from all marine ecology surveys since 2010. All non-natives recorded during the survey programme are already known to occur around the coast of north Anglesey and are not unique to any particular area. Species recorded to date are:
- *Asparagopsis armata* (red alga);
  - *Anotrichium furcellatum* (red alga);
  - *Heterosiphonia japonica* (red alga);
  - *Codium fragile* sub sp. *tomentosoides* (green alga);
  - *Sargassum muticum* (brown alga); and
  - *Elminius modestus* (barnacle).
109. Non-native species are not considered to be receptors in themselves; however, the potential effects associated with non-native species will be discussed as part of the effect assessment, and the potential effects on other receptors will be considered.



### 7.4.3.2 Main assessment issues

110. The potential effects of marine licensable activities on marine benthic habitats and species are outlined in Table 7.8 for the Wylfa Newydd Development Area and Table 7.9 for the Holyhead Marine Disposal Site.

**Table 7.8 Potential effects of marine licensable activities on marine benthic habitats and species at the Wylfa Newydd Development Area**

Potential effect	Phase	Comment
Indirect effects due to changes in water quality	Construction	Construction of the marine works, including dredging activities have the potential to increase suspended sediment concentrations and release toxic contaminants bound in sediments. This can cause changes in a range of water quality parameters including turbidity, SSC and dissolved oxygen which in turn can impact on marine benthic habitats and species.
Direct footprint of the works leading to mortality of species and loss of habitats	Construction	Direct loss of intertidal and subtidal habitats and species may occur from temporary construction activities such as excavation and dredging and the construction of temporary and permanent marine structures.
Colonisation of new substrate	Construction	Following construction, new substrate and hard structures within Porth-y-pistyll will be available for colonisation.
Physical disturbance of habitats	Construction	Changes in hydrodynamic conditions (including waves, currents, water levels, shear stress and scour), suspended sediment concentrations and direct changes to the seabed and sedimentary processes may physically disturb subtidal and intertidal habitats and species.
Introduction and spread of non-native species	Construction	The movement of marine plant and vessels could transport invasive non-natives as fouling on hulls and in ballast waters. Construction materials also have the potential to introduce non-native species. Additionally the introduction of new hard surfaces in the marine environment has the potential to facilitate the encroachment of non-native species. Changes in existing habitat could also influence the introduction and spread of non-native species, for example the creation of a relatively sheltered environment on the inside of breakwater structures and shallow subtidal areas.
Indirect effects due to changes in water quality during maintenance dredging	Operation	Maintenance dredging has the potential to increase suspended sediment concentrations and release toxic contaminants bound in sediments. This can cause changes in a range of water quality parameters including turbidity, SSC and dissolved oxygen which in turn can impact on marine benthic habitats and species.
Physical disturbance of habitats, including smothering from maintenance dredging activities	Operation	<p>Direct changes to the seabed may physically disturb subtidal habitats and species.</p> <p>A small and temporary increase in fine sediment may result from ongoing maintenance dredge commitments, leading to potential smothering of marine benthic habitats and species.</p>

**Table 7.9 Potential effects of marine licensable activities on marine benthic habitats and species at the Holyhead Marine Disposal Site**

Potential Effect	Phase	Comment
Direct footprint of the works leading to mortality of species and loss of habitats	Construction	The deposition of the rock fraction within the disposal site will lead to the direct loss of habitats and species under the footprint.
Physical disturbance of habitats	Construction	The deposition of the rock fraction within the disposal site may lead to changes in hydrodynamic conditions (including waves, currents, water levels, shear stress and scour), suspended sediment concentrations and direct changes to the seabed and sedimentary processes which could physically disturb marine benthic habitats and species.  Disposal of the fine fraction of material may result in smothering of benthic habitats and species.
Indirect effects due to changes in water quality	Construction	Disposal of the fine fraction of dredged material may result in elevated SSC and subsequent deposition and smothering of benthic habitats and species. Disposed sediments also have the potential to release toxic contaminants which can cause changes in a range of water quality parameters including turbidity, SSC and dissolved oxygen which in turn can impact on marine benthic habitats and species.
Introduction and spread of non-native species	Construction	The movement of dredging vessels could transport invasive non-natives as fouling on hulls and in ballast waters.  Additionally dredging may remove non-native species present in the Wylfa Newydd Development Area and translocate them to the disposal site.
Physical disturbance	Operation	Disposal of maintenance-dredged material may result in smothering of subtidal habitats and species.
Indirect effects due to changes in water quality	Operation	Disposal of maintenance-dredged material may result in changes to turbidity, SSC and dissolved oxygen which in turn can impact on marine benthic habitats and species.
Introduction and spread of non-native species	Operation	The movement of vessels during maintenance dredging could transport invasive non-natives as fouling on hulls and in ballast waters.  Additionally maintenance dredging may remove non-native species present in the Wylfa Newydd Development Area and translocate them to the disposal site.

#### **7.4.3.3 Identification of data gaps and further work required**

111. In order to inform the determination of changes to marine benthic habitats and species as a result of the marine licensable activities a number of work streams have been progressed by Horizon. These include:

- hydrodynamic modelling at the Wylfa Newydd Development Area;

- data collection at the Holyhead Marine Disposal Site;
- hydrodynamic modelling at the Holyhead Marine Disposal Site; and
- Biosecurity Risk Assessment.

112. Horizon has developed a marine hydrodynamic model to aid understanding of the potential influence of the marine licensable activities associated with the Wylfa Newydd Project on the marine environment (see section 7.3.3). One of the key purposes of the marine hydrodynamic model is to understand potential changes to sediment transport and deposition, water levels, currents and bed shear stresses. This information will be used to aid the assessment of effects on marine benthic habitats and species.
113. Data collection at the Holyhead Marine Disposal Site will provide a greater understanding of potential effects in relation to the context of the existing site. Infaunal grab samples have been collected from within the Holyhead Marine Disposal Site to provide further biological information (see figure 7.6 for proposed sample locations). The aim of this work is to provide greater resolution of the benthic habitats, while determining the presence of any features of conservation interest within, and adjacent to, the proposed disposal site.
114. Horizon has also developed a hydrodynamic model to aid the understanding of the potential effects of the disposal of soft and hard sediment at the Holyhead Marine Disposal Site. The hydrodynamic model will aid in the understanding of the fate of fine sediments, including dispersion and settling rates, due to the disposal of soft sediments as well as the effects on hydrodynamics from the disposal of the rock fraction at the Holyhead Marine Disposal Site. This information will be used to aid the assessment of effects on marine benthic habitats and species.
115. To minimise the risk of introduction and establishment of non-native species, a Biosecurity Risk Assessment and Method Statement will be produced, set by industry standard guidelines such as The International Convention for the Control and Management of Ships' Ballast Water and Sediments.
116. Further information on the detail of these data collection methodologies and model development, including consultation with regulators, will be included within the Wylfa Newydd Environmental Statement.

## 7.4.4 Plankton

117. This chapter covers the assessment of the potential changes to plankton (phytoplankton and zooplankton) associated with the Wylfa Newydd Project marine licensable activities.

### 7.4.4.1 Existing environment

#### 7.4.4.1.1 Wylfa Newydd Development Area

118. Sampling of phytoplankton (microscopic plants) and zooplankton (microscopic animals) was carried out between May 2010 and September 2014 (figure 7.3). The abundance and community composition of phytoplankton was similar between the sites monitored and these displayed seasonal patterns, driven by changes in light and nutrients in the water column. The start of the phytoplankton production period was characterised by a spring peak in abundance in May/June. Phytoplankton abundance and chlorophyll-a (an indicator of phytoplankton productivity) values were below the criteria set for bloom conditions under the WFD guidance. Diatoms were the most abundant phytoplankton group for the majority of the monitoring period and the species encountered were typical of the Irish Sea. During the monitoring period, 11 nuisance/harmful and 12 toxic algal species were reported at very low cell densities, below the threshold values at which an individual taxon is considered to reach bloom densities under WFD classification.
119. The abundance of zooplankton was dominated by copepods and showed a lag response to the seasonal peaks in phytoplankton abundance. In all years, the highest zooplankton abundances were recorded in spring, whilst lowest numbers were recorded during winter. There

were no differences in zooplankton abundance or composition between the sites, and the species recorded were typical of the Irish Sea.

#### 7.4.4.1.2 Holyhead Marine Disposal Site

120. Considering likely similarities in water quality characteristics, the results of the phytoplankton and zooplankton monitoring programme which was carried out in and around the Wylfa Newydd Development Area between May 2010 and September 2014 (see section 7.4.4.1.1), are considered applicable to the Holyhead Marine Disposal Site.

#### 7.4.4.2 Main assessment issues

121. The potential effects of marine licensable activities on plankton are outlined in Table 7.10 for the Wylfa Newydd Development Area and Table 7.11 for the Holyhead Marine Disposal Site.

**Table 7.10 Potential effects of marine licensable activities on plankton at the Wylfa Newydd Development Area**

Potential effect	Phase	Comment
Indirect effects due to changes in water quality	Construction	Construction of the marine works, including dredging activities has the potential to increase suspended sediment concentrations and release toxic contaminants bound in sediments. This can cause changes in a range of water quality parameters including light penetration, turbidity, SSC and dissolved oxygen which in turn has the potential to affect planktonic species.
Indirect effects due to changes in water quality during maintenance dredging	Operation	Maintenance dredging has the potential to increase suspended sediment concentrations and release toxic contaminants bound in sediments. This can cause changes in a range of water quality parameters including light penetration, turbidity, SSC and dissolved oxygen which in turn has the potential to affect planktonic species.

**Table 7.11 Potential effects of marine licensable activities on plankton at the Holyhead Marine Disposal Site**

Potential effect	Phase	Comment
Indirect effects due to changes in water quality	Construction	Disposal of the fine fraction of dredged material may result in elevated SSC and release toxic contaminants bound in sediments. This can cause changes in a range of water quality parameters including light penetration, turbidity, SSC and dissolved oxygen which in turn has the potential to affect planktonic species.
Indirect effects due to changes in water quality	Operation	Disposal of maintenance-dredged material may result in changes to light penetration, turbidity, SSC and dissolved oxygen which in turn has the potential to affect planktonic species.

#### 7.4.4.3 Identification of data gaps and further work required

122. In order to inform the determination of changes to plankton as a result of the marine licensable activities at the Wylfa Newydd Development Area, a number of work streams have been progressed by Horizon. These include:

- hydrodynamic modelling at the Wylfa Newydd Development Area; and
- hydrodynamic modelling at the Holyhead Marine Disposal Site.

123. Horizon has developed a marine hydrodynamic model to aid understanding of the potential influence of the marine licensable activities associated with the Wylfa Newydd Project on the marine environment (see section 7.3.3). One of the key purposes of the marine hydrodynamic model is to understand potential changes to water quality and currents. This information will be used to aid the assessment of effects on plankton.
124. Horizon will also develop a hydrodynamic model to aid the understanding of the potential effects of the disposal of soft sediment at the Holyhead Marine Disposal Site. The hydrodynamic model will aid in the understanding of the fate of fine sediments, including dispersion and settling rates, due to the disposal of soft sediments as well as the effects on hydrodynamics from the disposal of the rock fraction at the Holyhead Marine Disposal Site. This information will be used to aid the assessment of effects on plankton.
125. Further information on the modelling approach and the results of these modelling and assessment works will be included within the Wylfa Newydd Environmental Statement.

## 7.4.5 Marine fish

126. This chapter covers the assessment of the potential changes to marine fish associated with the Wylfa Newydd Project marine licensable activities.

### 7.4.5.1 Existing environment

#### 7.4.5.1.1 Wylfa Newydd Development Area

127. Baseline data on marine fish communities have been collected over the period 2010 to 2015 using a multi-method approach to collect data on ichthyoplankton (larval fish), intertidal and subtidal fish communities.
128. Ichthyoplankton abundances followed similar seasonal patterns at all sites with the highest abundances occurring from February to May. Ichthyoplankton samples were dominated by sandeels (*Ammodytidae*), followed by flatfish (*Pleuronectidae*), herring family (*Clupeidae*) and gobies (*Gobiidae*).
129. There are three known spawning grounds relevant to the Power Station. A notable plaice (*Pleuronectes platessa*) spawning ground is located on the north coast of Anglesey, whilst spawning grounds for whiting, cod and sandeel are located to the east of Anglesey off the north coast of Wales (Ellis *et al.*, 2012). The north coast of Anglesey is also considered to represent a nursery ground for whiting and sole.
130. Intertidal and subtidal fish surveyed varied noticeably between seasons. Dominant species in intertidal shallow waters were sandeel, clupeids, sand smelt (*Atherina presbyter*), plaice and gobies. In deeper subtidal waters, dominant species were dab (*Limanda limanda*) and whiting (*Merlangius merlangus*).
131. The most dominant species retained on the cooling water screens (impinged) at the Existing Power Station was sprat (*Sprattus sprattus*), in terms of abundance, and lesser-spotted dogfish (*Scyliorhinus canicula*), in terms of biomass. Seasonal peaks in abundance and biomass were evident in the results with peaks observed between late December and March. The highest number of larval fish passing through the cooling water screens (entrained) at the Existing Power Station was observed between early February and late August.
132. A number of species of conservation importance, which are listed in accordance with the requirements of section 7 of the *Environment (Wales) Act 2016*, were recorded from the marine fish survey programmes. These included sandeels, plaice, herring, cod, Dover sole, whiting and sea trout.
133. Migratory species known to the study area include European eel (*Anguilla anguilla*), brown trout (*Salmo trutta*), river lamprey (*Lampetra fluviatilis*), Atlantic salmon (*Salmo salar*) and sea

trout (*Salmo trutta*). However, only European eel, river lamprey and brown trout were recorded during fish surveys.

134. Of the elasmobranchs (sharks, skates and rays), by far the most commonly caught of those species listed in accordance with the requirements of section 7 of *the Environment (Wales) Act 2016* were thornback rays (*Raja clavata*).

#### 7.4.5.1.2 Holyhead Marine Disposal Site

135. A desk-based assessment carried out for the Minesto Project (Minesto, 2016) collated existing data on fish species and their habitats in the vicinity of the Holyhead Deep Disposal Site, including spawning and nursery grounds.
136. Demersal species such as cod, plaice, sandeel, sole, anglerfish (*Lophius piscatorius*) and whiting are all known to have low intensity spawning grounds that encompass Holyhead Deep (Ellis *et al.*, 2012). Spawning is seasonal and depending on the life strategies of these species, they are not necessarily permanent residents within the area. Of these species, only whiting and anglerfish are known to utilise Holyhead Deep as nursery grounds although this is considered to be a low intensity area (Ellis *et al.*, 2012). Nursery grounds are assumed to be active for much of the year. No high intensity spawning or nursery grounds of known species are considered to be present within Holyhead Deep.
137. Mackerel and sprat, both of which are pelagic species, have spawning grounds within the Holyhead Deep Disposal Site. For mackerel, the intensity of spawning within this area is considered to be low (Ellis *et al.*, 2012), whilst for sprat the intensity is unknown (Coull *et al.*, 1998).
138. Elasmobranchs likely to be present within the vicinity of Holyhead Deep include basking shark (*Cetorhinus maximus*), nursehound (*Scyliorhinus stellaris*), small spotted catshark (*Scyliorhinus canicula*), spotted ray (*Raja montagui*) and tope shark (*Galeorhinus galeus*). There have been ten sightings of basking sharks in the vicinity of Holyhead Deep between 1987 and 2006. This species is considered likely to be present in the disposal site, as are nursehounds, small spotted catsharks, spotted rays and tope sharks (Bloomfield and Solandt, 2006). Data from Ellis *et al.* (2012) indicate that no elasmobranch species spawn in the vicinity Holyhead Deep. Tope shark and spotted ray are known to use the area for nursery but the intensity of use is low (Ellis *et al.*, 2012).
139. Diadromous species may transit Holyhead Deep on an occasional basis to reach freshwater spawning grounds on the west coasts of England and Wales. These include twaite shad (*Alosa fallax*) and river lamprey (*Lampetra fluviatilis*). The closest spawning region to Holyhead Deep is the Menai Strait (JNCC, 2015a; 2015b) however neither species is considered a qualifying feature of the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC. The Menai Strait is also the closest area of importance to Holyhead Deep for the Atlantic salmon (*Salmo salar*) (JNCC, 2015c) although it is not considered a qualifying feature of the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC.
140. Due to the water depth and sediment types known to be present in Holyhead Deep, it is predicted that brown crab (*Cancer pagarus*), velvet crab (*Necora puber*), queen scallop (*Aequipecten opercularis*), king scallop (*Pecten maximus*) and ocean quahog (*Arctica islandica*) are all likely to be present. However their distribution would be limited to areas of mixed coarse ground, sand or gravel and soft sediments (Carter, 2008; Marshall and Wilson, 2008; Wilson, 2008; Neal and Wilson, 2008; Sabatini and Pizzola, 2008).

#### 7.4.5.1.3 Commercial fisheries

141. Due to the wide-ranging spatial extent of commercial fishing operations the baseline for the Wylfa Newydd Project has been discussed here as a whole (i.e. to include both the Wylfa Newydd Development Area and the Holyhead Marine Disposal Site).



142. Within the International Council for the Exploration of the Sea (ICES) fisheries assessment area 35E5, which encompasses Anglesey, the most important commercial species are listed below along with their percentage contribution to the total tonnage landed from the sea area between 2010 and 2014 (IMMO, 2014):

- whelk (*Buccinum undatum*), contributing 50%;
- queen scallop (*Aequipecten opercularis*), contributing 37%;
- king scallop (*Pecten maximus*), contributing 11%; and
- European lobster (*Homarus gammarus*), contributing 1%.

Dover sole (*Solea solea*), common prawn (*Palaemon* spp.) and edible crab (*Cancer pagurus*) each contributed <1% (IMMO, 2014).

143. Commercial potting for shellfish is the primary fishery that operates along the north Anglesey coastline. Species targeted by inshore potting include European lobster, edible crab and common prawns. To the west, potting for whelk occurs further offshore whilst an inshore fishery is present around the east coast of Anglesey (NRW, 2010). Bottom set nets targeting demersal fish species are known to operate in isolated regions around Cemlyn Bay, Amlwch and to the north between The Skerries and Middle Mouse. Dredging for queen scallop occurs approximately 8km off the north coast of Anglesey whilst a king scallop fishery operates to the east in the vicinity of Red Wharf Bay and west of Holyhead (NRW, 2010). No commercial trawling activities are known to operate off the north coast of Anglesey.

144. The main commercial fishing ports on Anglesey include Cemaes, Amlwch and Holyhead. Between 2010 and 2014, scallop (queen and king) constituted over 70% (13,291 tonnes) of all landings at these three ports whilst whelks, lobster and edible crab constituted 28% (5,406 tonnes), 0.46% (87 tonnes) and 0.17% (37 tonnes), respectively.

#### 7.4.5.2 Main assessment issues

145. The potential effects of marine licensable activities on marine fish are outlined in Table 7.12 for the Wylfa Newydd Development Area and Table 7.13 for the Holyhead Marine Disposal Site.

**Table 7.12 Potential effects of marine licensable activities on marine fish at the Wylfa Newydd Development Area**

Potential Effect	Phase	Comment
Indirect effects due to changes in water quality	Construction	Construction of the marine works, including dredging activities have the potential to increase suspended sediment concentrations and release toxic contaminants bound in sediments. This can cause changes in a range of water quality parameters including turbidity, SSC and dissolved oxygen which in turn can impact on marine fish species.
Direct footprint of the works leading to loss of habitat, feeding resource and refuge area	Construction	Direct loss of intertidal and subtidal habitats and species may occur from temporary construction activities such as excavation and dredging and the construction of temporary and permanent marine structures. This could have an indirect effect on marine fish receptors due to the loss of spawning and nursery habitat, refuge and feeding resource (e.g. invertebrates and detritus) resulting in displacement.
Physical disturbance of habitats including from scour and	Construction	Changes in hydrodynamic conditions (including waves, currents, shear stress and scour), suspended sediment concentrations and direct changes to the seabed and sedimentary processes may physically disturb subtidal



Potential Effect	Phase	Comment
smothering		and intertidal habitats and communities. This could have an indirect effect on marine fish receptors due to the loss of spawning and nursery habitat, refuge and feeding resource (e.g. invertebrates and detritus) resulting in displacement.
Underwater noise from construction activities	Construction	Underwater noise generated during marine construction has the potential to impact upon fish. The following construction activities are considered as sources of noise and vibration: dredging; drilling; piling; and vessel movements.
Changes in visual stimuli leading to species disturbance	Construction	Marine-based construction activities could lead to an increase in visual stimuli for marine fish which could potentially lead to avoidance behaviour and could affect reproduction and foraging activities.
Disturbance during maintenance dredging and vessel movements	Operation	Activities during operation may potentially affect marine fish species due to an increase in underwater noise and visual stimuli.
Indirect effects due to changes in water quality during maintenance dredging	Operation	Maintenance dredging has the potential to increase suspended sediment concentrations and release toxic contaminants bound in sediments. This can cause changes in a range of water quality parameters including turbidity, SSC and dissolved oxygen which has the potential to affect marine fish species.

**Table 7.13 Potential effects of marine licensable activities on marine fish at the Holyhead Marine Disposal Site**

Potential Effect	Phase	Comment
Direct footprint of the works leading to mortality of species and loss of habitats	Construction	The deposition of the rock fraction within the disposal site may lead to the direct loss of habitats and species under the footprint. This could have an indirect effect on marine fish receptors due to the loss of spawning and nursery habitat, refuge and feeding resource (e.g. invertebrates and detritus) resulting in displacement.
Physical disturbance	Construction	<p>The deposition of the rock fraction within the disposal site may lead to changes in hydrodynamic conditions (including waves, currents, water levels, shear stress and scour), suspended sediment concentrations and direct changes to the seabed and sedimentary processes which could physically disturb subtidal habitats and species. Disposal of the fine fraction of material may also result in smothering of subtidal habitats and species.</p> <p>This could have an indirect effect on marine fish receptors due to the loss of spawning and nursery habitat, refuge and feeding resource (e.g. invertebrates and detritus) resulting in displacement.</p>
Indirect effects due to changes in	Construction	Disposal of the fine fraction of dredged material may result in elevated SSC. Disposed sediments also have

Potential Effect	Phase	Comment
water quality		the potential to release toxic contaminants which can cause changes in a range of water quality parameters including turbidity, SSC and dissolved oxygen which in turn can impact on marine fish species.
Underwater noise from disposal activities	Construction	Underwater noise generated during disposal operations has the potential to impact upon fish.
Changes in visual stimuli leading to species disturbance	Construction	Disposal operations could lead to an increase in visual stimuli for marine fish which could potentially lead to avoidance behaviour and could affect reproduction and foraging activities.
Physical disturbance	Operation	Disposal of maintenance-dredged material may result in smothering of subtidal habitats and species. This could have an indirect effect on marine fish receptors due to the loss of spawning and nursery habitat, refuge and feeding resource (e.g. invertebrates and detritus) resulting in displacement.
Indirect effects due to changes in water quality	Operation	Disposal of maintenance-dredged material may result in changes to turbidity, SSC and dissolved oxygen which in turn can impact on marine fish species.
Underwater noise from disposal activities	Operation	Underwater noise generated during maintenance dredge disposal operations has the potential to impact upon fish.
Changes in visual stimuli leading to species disturbance	Operation	Maintenance dredge disposal operations could lead to an increase in visual stimuli for marine fish which could potentially lead to avoidance behaviour and could affect reproduction and foraging activities.

#### **7.4.5.3 Identification of data gaps and further work required**

146. In order to inform the determination of changes to marine fish species as a result of the marine licensable activities a number of work streams have been progressed by Horizon. These include:

- hydrodynamic modelling at the Wylfa Newydd Development Area;
- underwater noise modelling at the Wylfa Newydd Development Area;
- hydrodynamic modelling at the Holyhead Marine Disposal Site; and,
- underwater noise modelling at the Holyhead Marine Disposal Site.

147. Horizon has developed a marine hydrodynamic model to aid understanding of the potential influence of the marine licensable activities associated with the Wylfa Newydd Project on the marine environment (see section 7.3.3). One of the key purposes of the marine hydrodynamic model is to aid understanding of the potential changes to sediment transport and deposition, water levels, currents and bed shear stresses. This information will be used to aid the assessment of effects on marine fish species.

148. To allow assessment of the potential effects from marine construction, underwater noise modelling will be completed for all planned elements of construction. Modelling will be undertaken using the RAMSGeo software package which is designed to model any noise source where it is reasonable to assume it is a point source. The model allows for the incorporation of variable bathymetry and a complex seabed and therefore provides an accurate representation of noise propagation.

149. Horizon will also develop a hydrodynamic model to aid the understanding of the potential effects of the disposal of soft and hard sediment at the Holyhead Marine Disposal Site. The hydrodynamic model will aid in the understanding of the fate of fine sediments, including dispersion and settling rates, due to the disposal of soft sediments as well as the effects on hydrodynamics of the disposal of the rock fraction at the Holyhead Marine Disposal Site. This information will be used to aid the assessment of effects on marine fish species.
150. Underwater noise generated by vessels at the disposal site will be modelled to facilitate the assessment of effects on marine mammals and fish.
151. Further information on the modelling approaches and the results of these modelling and assessment works will be included within the Wylfa Newydd Environmental Statement.

## 7.4.6 Seabirds

152. This chapter covers the assessment of the potential changes to seabirds associated with the Wylfa Newydd Project marine licensable activities.

### 7.4.6.1 Existing environment

#### 7.4.6.1.1 Wylfa Newydd Development Area

153. Seabird surveys were carried out between 2010 and 2015. The methodologies used included vantage point surveys within a study area out to a distance of approximately 1km from the coast (encompassing the area of sea between the western side of Cemlyn Bay and Cemaes Bay), intertidal zone surveys at Porth-y-pistyll and Cemlyn Bay and specific surveys of Cemlyn Lagoon (figure 7.10). Following advice received from NRW, additional boat-based surveys are ongoing. Boat-based tracking surveys will collect data on the origins, flightpaths and behaviour of individual birds and transect surveys will collect data primarily on abundance, distribution and behaviour along 2.5km transects (figure 7.11).
154. Four target species (species for which the Ynys Feurig, Cemlyn Bay and The Skerries SPA is designated) were recorded during the vantage point surveys (September 2010 – September 2014): Arctic tern (*Sterna paradisaea*), common tern (*Sterna hirundo*), roseate tern (*Sterna dougallii*) and sandwich tern (*Sterna sandvicensis*). The vast majority of both Arctic/common and Sandwich terns recorded were observed commuting through the survey areas, with only a fraction recorded foraging within the survey areas.
155. Boat-based surveys revealed that sandwich terns had high foraging ranges, primarily radiating eastwards from the Cemlyn Bay colony, along the north Anglesey coast and into the shallow sandy bays along the east of the island. Common/Arctic terns were found generally to forage within 5km of the colony, with occasional tracks heading much further north and east with some notable feeding activity north of Harry Furlough's Rocks.
156. Sixty-two secondary species were recorded during the vantage point surveys. The secondary species recorded using the survey areas in the highest numbers were black-headed gull (*Chroicocephalus ridibundus*), common auks (guillemot (*Uria aalge*) and razorbill (*Alca torda*)) and herring gull (*Larus argentatus*).
157. The intertidal zone surveys in Porth-y-pistyll (April 2012 to March 2015) recorded a total of 30 species loafing and/or foraging including wigeon (*Anas penelope*), curlew/whimbrel (*Numenius arquata/N. phaeopus*), herring gull, great black-backed gull (*Larus marinus*), black-headed gull and oystercatcher (*Haematopus ostralegus*). In Cemlyn Bay, the intertidal zone surveys recorded a total of 16 species between October 2014 and March 2015.
158. A total of 37 species were recorded loafing or foraging in Cemlyn Lagoon between September 2012 and April 2013, including black-headed gull, herring gull, curlew/whimbrel and golden plover (*Pluvialis apricaria*).

159. Three species of gulls were recorded using the colony on the rocks to the north of the Existing Power Station during April 2013; herring gull, lesser black-backed gull (*Larus fuscus*) and great black-backed gull.
160. Although not a seabird, chough (*Pyrrhocorax pyrrhocorax*) has been included here as they have specific ecological requirements including coastal cliff and grazed maritime grassland. Chough is frequently described as a characteristic of the Wylfa Head proposed candidate Wildlife Site, although they are not cited as a notable feature for its designation (IACC, 2014b). Data on chough were gathered during breeding and over-wintering bird surveys together with information supplied by the North Wales chough recorder Adrienne Stratford. Surveys were undertaken each year between 2009 and 2015.
161. Chough has been observed in each year of monitoring. Data from both breeding and wintering survey methodologies show that the species is present year-round and is breeding within the study area. The survey data show that short coastal grassland habitats are generally the most important foraging areas for chough.

#### 7.4.6.1.2 Holyhead Marine Disposal Site

162. A desk-based ornithology study was undertaken by Minesto which assessed the density of seabirds, their breeding colonies, migration and sensitivity to potential effects in the vicinity of Holyhead Deep, the results of which are presented below (Minesto, 2016). This was a broad search, with the inclusion of bird populations across the Irish Sea and can therefore be considered applicable to the wider area around Holyhead Deep.
163. Existing boat-based and aerial survey data identified relatively low densities of seabirds in the vicinity of Holyhead Deep with many species' presence being limited to the breeding season. Auks (guillemots, razorbills and puffins) are the most common species recorded during the breeding season (April to August inclusive). Other species such as Manx shearwater, gannet, common and arctic terns occur in low densities. During the post-breeding and non-breeding periods, these species either disperse offshore or migrate south and are therefore largely absent from the area for the remainder of the year.
164. Common guillemots, razorbill, Atlantic puffin, and northern gannet are recognised as being potentially sensitive receptors to disposal in Holyhead Deep. Their populations and densities are based on the assumption that they come from defined breeding colonies within their mean maximum foraging range.
165. A precautionary estimate suggests that the densities of common guillemot near Holyhead Deep were on average four birds per km<sup>2</sup> and peaked at eight birds per km<sup>2</sup>. The regional breeding population is estimated to be 213,320 adults.
166. Razorbills were expected to have average and peak densities of one bird per km<sup>2</sup> and three birds per km<sup>2</sup> respectively, but are likely to fall to 0.5 birds per km<sup>2</sup> during the non-breeding season. At the main razorbill colonies, Gwynedd, Seabird 2000 census estimated the population at 3,965 adults (on going monitoring has shown a negligible change in numbers since then).
167. Both the Atlantic puffin and northern gannet are predicted to have average densities of 0.5 birds per km<sup>2</sup> and peak densities of one bird per km<sup>2</sup> near Holyhead Deep in a worst case scenario. However, the regional breeding population for northern gannet is considerably higher than that of the Atlantic puffin with 175,650 and 4,608 adults respectively.
168. The worst case scenario densities fall approximately in the middle of the range reported for seas around the UK, however these assumptions are highly precautionary as outside of the breeding season there is typically greater uncertainty.
169. Excluding razorbill, the bird species considered were all qualifying features of several SPAs within the mean maximum foraging range of the Wylfa Newydd Development Area.

#### 7.4.6.2 Main assessment issues

170. The potential effects of marine licensable activities on seabirds are outlined in Table 7.14 for the Wylfa Newydd Development Area and Table 7.15 for the Holyhead Marine Disposal Site.

**Table 7.14 Potential effects of marine licensable activities on seabirds at the Wylfa Newydd Development Area**

Potential effect	Phase	Comment
Direct footprint of the works leading to loss of habitat, feeding resource and refuge area	Construction	Direct loss of intertidal and subtidal habitats and species may occur from temporary construction activities such as excavation and dredging and the construction of temporary and permanent marine structures. This could have an indirect effect on seabirds due to the loss of habitat, refuge and feeding resource (e.g. invertebrates and fish).
Physical disturbance of habitats including from scour and smothering	Construction	Changes in hydrodynamic conditions (including waves, currents, shear stress and scour), suspended sediment concentrations and direct changes to the seabed and sedimentary processes may physically disturb subtidal and intertidal habitats and communities. This could have an indirect effect on seabirds due to the loss of feeding resource (e.g. invertebrates and fish) resulting in displacement.
Indirect effects due to changes in water quality	Construction	Construction of the marine works, including dredging activities have the potential to increase suspended sediment concentrations and release toxic contaminants bound in sediments. This can cause changes in a range of water quality parameters including turbidity, SSC and dissolved oxygen which in turn can impact on seabird foraging activities and prey resource.
Underwater noise from construction activities	Construction	An increase in underwater noise during construction activities may lead to avoidance behaviour and could potentially affect foraging activities which may have wider implications for populations.
Airborne noise from construction activities	Construction	An increase in airborne noise during construction activities may lead to avoidance behaviour and could potentially affect breeding or foraging activities which may have wider implications for populations.
Changes in visual stimuli leading to species disturbance	Construction	Marine-based construction activities could lead to an increase in visual stimuli for seabirds which could potentially lead to avoidance behaviour and could affect reproduction and foraging activities.
Disturbance during maintenance dredging and vessel movements	Operation	Activities during operation may potentially lead to avoidance behaviour of target and secondary seabirds, due to an increase in underwater and airborne noise as well as visual stimuli.
Indirect effects due to changes in water quality during maintenance dredging	Operation	Maintenance dredging has the potential to increase suspended sediment concentrations and release toxic contaminants bound in sediments. This can cause changes in a range of water quality parameters including turbidity, SSC and dissolved oxygen which in turn can impact on seabird foraging activities.

**Table 7.15 Potential effects of marine licensable activities on seabirds at the Holyhead Marine Disposal Site**

Potential effect	Phase	Comment
Direct footprint of the works leading to loss of prey resource	Construction	The deposition of the rock fraction within the disposal site may lead to the direct loss of habitats and species under the footprint. This could have an indirect effect on fish species and as a result to seabirds due to the loss of prey resource.
Physical disturbance leading to loss of prey resource	Construction	Changes to hydrodynamic conditions and sedimentary processes as a result of the disposal of rock and fine material may have an indirect effect on fish species and as a result to seabirds due to the loss of prey resource.
Indirect effects due to changes in water quality	Construction	Disposal of the fine fraction of dredged material may result in elevated SSC. Disposed sediments also have the potential to release toxic contaminants which can cause changes in a range of water quality parameters including turbidity, SSC and dissolved oxygen which in turn can impact on seabird foraging activities.
Changes in visual stimuli leading to species disturbance	Construction	Disposal operations could lead to an increase in visual stimuli for seabirds which could potentially lead to avoidance behaviour and could affect reproduction and foraging activities.
Airborne noise from disposal activities	Construction	An increase in airborne noise during disposal activities may lead to avoidance behaviour and could potentially affect breeding or foraging activities.
Physical disturbance leading to loss of prey resource	Operation	Disposal of maintenance dredge material may result in smothering of benthic habitats and species. This could have an indirect effect on fish species and as a result to seabirds due to the loss of prey resource.
Indirect effects due to changes in water quality	Operation	Disposal of maintenance-dredged material may result in changes to turbidity, SSC and dissolved oxygen which in turn can impact on seabird foraging activities.
Changes in visual stimuli leading to species disturbance	Operation	Maintenance dredge disposal operations could lead to an increase in visual stimuli for seabirds which could potentially lead to avoidance behaviour and could affect reproduction and foraging activities.
Airborne noise from disposal activities	Operation	An increase in airborne noise during maintenance dredge disposal activities may lead to avoidance behaviour and could potentially affect breeding or foraging activities which may have wider implications for populations.

#### **7.4.6.3 Identification of data gaps and further work required**

171. In order to inform the determination of effects on seabirds as a result of the marine licensable activities a number of work streams have been progressed by Horizon. These include:

- hydrodynamic modelling at the Wylfa Newydd Development Area;
- underwater noise modelling at the Wylfa Newydd Development Area;
- airborne noise modelling at the Wylfa Newydd Development Area;
- Zone of Theoretical Visibility plans; and



- hydrodynamic modelling at the Holyhead Marine Disposal Site.

172. Horizon has developed a marine hydrodynamic model to aid understanding of the potential influence of the marine licensable activities associated with the Wylfa Newydd Project on the marine environment (see section 7.3.3). The outcome of this modelling and the potential effects on marine fish species (as a key prey resource) will be used to assess the indirect effects on seabirds.
173. To allow assessment of the potential effects on fish from marine construction, underwater noise modelling will be completed for all planned elements of construction. Modelling will be undertaken using the RAMSGeo software package which is designed to model any noise source where it is reasonable to assume it is a point source. The model allows for the incorporation of variable bathymetry and a complex seabed and therefore provides an accurate representation of noise propagation.
174. The airborne noise levels anticipated to be generated by the construction works will be modelled with the results compared against the existing baseline conditions. The general approach to be adopted for the noise and vibration modelling and assessments has been agreed with NRW and IACC and is set out in the Horizon Document 'Noise and Vibration Modelling and Assessment Methodology Wylfa Newydd Project DCRM Ref Number: HNP-S5-PAC-REP-00014'.
175. Zone of Theoretical Visibility plans will be prepared based on topographical data and generated by computer programme. These will allow for an assessment of sightlines towards the construction works and thus potential disturbance effects.
176. Horizon will also develop a hydrodynamic model to aid the understanding of the potential effects of the disposal of soft and hard sediment at the Holyhead Marine Disposal Site. The outcome of this modelling and the potential effects on marine fish species (as a key prey resource) will be used to assess the indirect effects on seabirds.
177. Further information on the modelling approaches and the results of these modelling and assessment works will be included within the Wylfa Newydd Environmental Statement.

## 7.4.7 Marine mammals

178. This chapter covers the assessment of the potential changes to marine mammals (cetaceans and pinnipeds) associated with the Wylfa Newydd Project marine licensable activities.

### 7.4.7.1 Existing environment

#### 7.4.7.1.1 Wylfa Newydd Development Area

179. Specialist surveyors trained as marine mammal observers recorded mammals between 2010 and 2017 using recognised land-based and boat-based survey techniques to record their presence. Land-based surveys included Vantage Point surveys from land (between 2010 and 2014) and seal surveys (from October 2016 to January 2017) to investigate potential pupping and haul-out sites during the grey seal breeding season.
180. Dedicated vessel transect surveys were carried out monthly from May 2016 to March 2017 around the north coast of Anglesey with the purpose of capturing spatial or temporal patterns in marine mammal presence and to enable estimates of animal densities in the survey area.
181. Data have also been collected from three C-PODs (autonomous underwater noise cetacean click detector) which were deployed to augment existing data and to provide additional understanding of area usage.
182. Additional opportunistic/casual sightings recorded during other ecological baseline surveys (land and boat-based) have also been reported. A number of external organisations were contacted in order to collate their marine mammal records to supplement sightings made during the comprehensive baseline survey programme and provide an informative and detailed picture of



the distribution and occurrence of marine mammals around the Anglesey coastline as well as the wider study area. Full details of these surveys will be provided within the Wylfa Newydd Environmental Statement.

183. A review of cetacean sightings in Welsh waters collated since 1990 (Evans *et al.*, 2015) shows 18 species of cetacean in Welsh waters, with 14 having being sighted in north Wales within the last 10 years. Of these 14 species, most represent occasional sightings with only three species being frequently observed:
- Harbour porpoise (*Phocoena phocoena*);
  - Bottlenose dolphin (*Tursiops truncatus*); and
  - Risso's dolphin (*Grampus griseus*).
184. Harbour porpoise (*Phocoena phocoena*) are distributed across the whole of the north coast of Anglesey; they are present year round and higher numbers of observations were recorded in the summer months. Studies of the wider area show their distribution is not uniform with hot spots located around the north-west and north coast of Anglesey, north to the Isle of Man and off the west coast of the Llŷn Peninsula southwards into Cardigan Bay. Higher numbers of harbour porpoise were sighted around Wylfa Head compared with the shallow bays of Porth-y-pistyll and Cemaes.
185. Bottlenose dolphin (*Tursiops truncatus*) are present throughout the year with most sightings occurring during the summer months. Records show the distribution of bottlenose dolphin is concentrated to the east of the study area along the coast between Bull Bay and Llandudno. Other reported hotspots are located within Cardigan Bay SAC and around the Llŷn Peninsula and Sarnau SAC.
186. No records of Risso's dolphin (*Grampus griseus*) were made during the land-based and boat-based surveys over the period 2010 – 2014, although it is known to be present in the waters around Anglesey.
187. Two species of pinniped, the grey and common seal, frequent the Irish Sea and, of these, only the grey seal has been recorded on a regular basis by Westcott (2002), Westcott and Stringell (2003 and 2004) and Marine Scotland (2015) around north Anglesey.
188. There are a number of major grey seal haul-out sites identified in three districts of north Wales (Llŷn Peninsula, Anglesey and West Hoyle Bank at the mouth of the Dee Estuary), all of which have been surveyed between 2001 and 2003 for either pup production or site usage (Westcott, 2002; Westcott and Stringell, 2003; 2004). Grey seals spend most of their lives at sea, coming ashore to breed, rest or moult. In Wales, grey seals breed between August and December, with the peak month reported as September, and moult three to five months later during spring.
189. Within the study area, grey seal (*Halichoerus grypus*) are present year round with peak sightings occurring between April and May. A total of 61 individuals were recorded between 2011 and 2014. There are many suitable haul-out locations for grey seal across Anglesey, two of which (Carmel Head and The Skerries) are known for grey seal breeding (Westcott, 2002; Westcott and Stringell, 2004). There are no major haul-out sites within the Wylfa Newydd Development Area, but it is recognised that individual grey seals will haul-out intermittently wherever there is a suitable intertidal habitat.

#### 7.4.7.1.2 Holyhead Marine Disposal Site

190. A total of 20 cetacean and two pinniped species have been recorded in the Irish Sea (Baines and Evans, 2012). Of these, four are known to occur regularly in the northern Irish Sea and within the vicinity of the Holyhead Marine Disposal Site, either on a year-round basis or on an annual-seasonal basis (Reid *et al.*, 2003; Hammond *et al.*, 2005; Berrow *et al.*, 2010; Baines and Evans

2012; Hammond *et al.*, 2013). These comprise three cetacean species (harbour porpoise, bottlenose dolphin and Risso's dolphin) and one pinniped species (grey seals).

191. Harbour porpoise are the most frequently recorded cetacean species in the Irish Sea and are widespread across the region (Northridge *et al.*, 1995; Pollock *et al.*, 1997; de Boer *et al.*, 2002; Baines and Evans, 2012). Localised hotspots of abundance appear to exist off the north and west of Anglesey (Northridge *et al.*, 1995; Reid *et al.*, 2003; Mackey *et al.*, 2004), in particular around Point Lynas and South Stack, including Holyhead Deep (Baines and Evans, 2012). Harbour porpoise are likely to be present at these locations throughout the year, with little seasonal variation.
192. Bottlenose dolphin is regularly observed in the Irish Sea, predominantly in the coastal waters between Cardigan Bay and Anglesey (Mackey *et al.*, 2004; Pesante *et al.*, 2008a; Pesante *et al.*, 2008b). However, of the 42 marine mammal sightings recorded by SEACAMS (2015) in the west Anglesey area over a period of six months, only one was a bottlenose dolphin which corresponds to a rate of 0.05 sightings per hour. During dedicated surveys carried out within the Holyhead Deep Disposal Site, no bottlenose dolphins were recorded from the entire survey area (375km survey effort) (Minesto, 2016). Considering the above, it seems extremely unlikely that Holyhead Deep represents an area of particular importance to bottlenose dolphins, although individuals are known to be present.
193. In Welsh waters, Risso's dolphin has a relatively localised distribution, occurring along a band running south-west to north-east that includes Pembrokeshire, the Llŷn Peninsula and Anglesey, as well as the south-east coast of Ireland and around the Isle of Man (Baines and Evans, 2012). However, no Risso's dolphin were sighted by SEACAMS (2015) and neither Gordon *et al.* (2011) nor Shucksmith *et al.* (2009) made any mention of Risso's dolphin observations during their studies of the north Anglesey coast. It is unlikely that the Holyhead Deep area is of particular importance to this species, though it is possible that they could use the area on occasion.
194. Grey seals are common and widely distributed across Welsh waters, which hold approximately 90% of the Irish Sea breeding population, estimated to be somewhere in the region of 5,000-7,000 animals (Kiely *et al.*, 2000). There are three key aspects of their distribution and use of the Irish Sea: breeding haul-outs, non-breeding haul-outs and at-sea distribution.
195. A number of small breeding haul-out sites exist around the Llŷn Peninsula and the coast of Anglesey. The North Stack coast was found to be the second most important pupping locality in the North Wales region (Westcott and Stringell, 2004). These breeding haul-out sites tend to be used all year as non-breeding haul-outs for moulting and during feeding trips (Westcott, 2002; Westcott and Stringell, 2003; Westcott and Stringell, 2004; Baines and Evans, 2012). Westcott and Stringell (2004) highlight that two sites closest to the Holyhead Deep, the North Stack Coast and Carmel Head, comprised a relatively high proportion of pups, signifying that the sites are '*heavily used during the breeding season but little outside that time*'.
196. Hammond *et al.* (2005) examined at-sea distributions and found the north coast of Wales and offshore areas to around 40km from the coast, which encompasses Holyhead Deep, was a high density region. However, of the 42 marine mammal sightings recorded by SEACAMS (2015) in the west Anglesey area, only two were grey seal. This corresponds to a rate of 0.10 sightings per hour. Furthermore, dedicated surveys of Holyhead Deep recorded two sightings found from the 375km of total survey effort (SEACAMS, 2015). However, there is evidence to suggest that the site may be used by both adult and juvenile grey seal, and that the nearby coast may be of importance to a small number of animals during the breeding season. Based on the data regarding grey seal use of the Irish Sea and Welsh coast presented here, it is unlikely that Holyhead Deep represents a particularly important area in the context of the wider Irish Sea.
197. Data collected during the marine mammal baseline programme carried out in the Wylfa Newydd Development Area reports broadly similar abundance patterns for harbour porpoise, bottlenose dolphins, Risso's dolphin and grey seal. Considering marine mammals are highly

mobile with many species known to have large home ranges, the similarities between these results and other studies conducted in the Irish Sea is not unexpected.

#### 7.4.7.2 Main assessment issues

198. The potential effects of marine licensable activities on marine mammals are outlined in Table 7.16 for the Wylfa Newydd Development Area and Table 7.17 for the Holyhead Marine Disposal Site.

**Table 7.16 Potential effects of marine licensable activities on marine mammals at the Wylfa Newydd Development Area**

Potential effect	Phase	Comment
Direct footprint of the works leading to loss of habitat and feeding resource	Construction	Direct loss of intertidal and subtidal habitats and species may occur from temporary construction activities such as excavation and dredging and the construction of temporary and permanent marine structures. This could have an indirect effect on marine mammals due to the loss of feeding resource (e.g. invertebrates and fish). The loss of intertidal areas under the footprint of the marine works would have a direct effect on grey seals due to the loss of suitable haul-out sites.
Physical disturbance of habitats including from scour and smothering	Construction	Changes in hydrodynamic conditions (including waves, currents, shear stress and scour), suspended sediment concentrations and direct changes to the seabed and sedimentary processes may physically disturb subtidal and intertidal habitats and communities. This could have an indirect effect on marine mammals, due to the loss of feeding resource (e.g. invertebrates and fish).
Indirect effects due to changes in water quality	Construction	Construction of the marine works, including dredging activities, has the potential to increase suspended sediment concentrations and release toxic contaminants bound in sediments. This can cause changes in a range of water quality parameters including turbidity, SSC and dissolved oxygen which in turn can impact on marine mammal foraging ability and prey resource.
Underwater noise from construction activities	Construction	Underwater noise generated during marine construction has the potential to result in avoidance behaviour, or auditory injury in marine mammals. Dredging, drilling and vessel movements are considered sources of noise and vibration.
Airborne noise from construction activities	Construction	Pinnipeds (grey seals) that have surfaced or have hauled out could be affected by airborne noise from construction activities. Disturbance from noise could potentially cause grey seals to stop feeding, resting, travelling and/or socialising, with possible long-term effects of repeated disturbance including permanent displacement and/or a decline in fitness and productivity.
Changes in visual stimuli leading to species disturbance	Construction	Pinnipeds (grey seals) that have surfaced or have hauled out could be deterred from the area by changes to visual stimuli from marine-based construction activities.
Physical injury of marine mammals from vessel	Construction	Moving marine construction plant and vessels could strike marine mammals resulting in physical injury (e.g. corkscrew injuries) and, in the worst case, mortality.

Potential effect	Phase	Comment
strikes		
Disturbance during maintenance dredging and vessel movements	Operation	Activities during operation may potentially result in avoidance behaviour or auditory injury in marine mammals due to an increase in underwater and airborne noise (surfaced pinnipeds) as well as visual disturbance.
Indirect effects due to changes in water quality during maintenance dredging	Operation	Maintenance dredging has the potential to increase suspended sediment concentrations and release toxic contaminants bound in sediments. This can cause changes in a range of water quality parameters including turbidity, SSC and dissolved oxygen which in turn can impact on marine mammal foraging ability and prey resource.
Physical injury of marine mammals from vessel strikes	Operation	The presence of vessels during maintenance dredging, structure maintenance or debris removal from CWS will result in increased vessel movements in the area leading to the risk of physical injury to marine mammals (e.g. corkscrew injuries) and, in the worst case, mortality.

**Table 7.17 Potential effects of marine licensable activities on marine mammals at the Holyhead Marine Disposal Site**

Potential effect	Phase	Comment
Direct footprint of the works leading to loss of prey resource	Construction	The deposition of the rock fraction within the disposal site would lead to the direct loss of habitats and species under the footprint. This could have an indirect effect on fish species and as a result on marine mammals due to the loss of prey resource.
Physical disturbance leading to loss of prey resource	Construction	Changes to hydrodynamic conditions and sedimentary processes as a result of the disposal of rock and fine material may have an indirect effect on fish species and as a result on marine mammals due to the loss of prey resource.
Indirect effects due to changes in water quality	Construction	Disposal of the fine fraction of dredged material may result in elevated SSC. Disposed sediments also have the potential to release toxic contaminants which can cause changes in a range of water quality parameters including turbidity, SSC and dissolved oxygen which in turn can impact on marine mammal foraging ability and prey resource.
Underwater noise from disposal activities	Construction	Underwater noise generated during disposal operations has the potential to result in avoidance behaviour or auditory injury in marine mammals.
Changes in visual stimuli leading to species disturbance	Construction	Disposal operations could lead to an increase in visual stimuli for marine mammals which could potentially lead to avoidance behaviour and could affect reproduction and foraging activities.

Potential effect	Phase	Comment
Physical injury of marine mammals from vessel strikes	Construction	Disposal vessels could strike marine mammals resulting in physical injury (e.g. corkscrew injuries) and, in the worst case, mortality.
Physical disturbance leading to loss of prey resource	Operation	Disposal of maintenance dredge material may result in smothering of benthic habitats and species. This could have an indirect effect on fish species and as a result on marine mammals due to the loss of prey resource.
Indirect effects due to changes in water quality	Operation	Disposal of maintenance-dredged material may result in changes to turbidity, SSC and dissolved oxygen with the potential for smothering which in turn can impact on marine mammal foraging ability and prey resource.
Underwater noise from disposal activities	Operation	Underwater noise generated during maintenance dredge disposal operations has the potential to result in avoidance behaviour and auditory injury in marine mammals.
Changes in visual stimuli leading to species disturbance	Operation	Maintenance dredge disposal operations could lead to an increase in visual stimuli for marine mammals which could potentially lead to avoidance behaviour and could affect reproduction and foraging activities.
Physical injury of marine mammals from vessel strikes	Operation	Maintenance dredge disposal vessels could strike marine mammals resulting in physical injury (e.g. corkscrew injuries) and, in the worst case, mortality.

#### 7.4.7.3 Identification of data gaps and further work required

199. In order to inform the determination of effects on marine mammals as a result of the marine licensable activities a number of work streams have been progressed by Horizon. These include:

- hydrodynamic modelling at the Wylfa Newydd Development Area;
- underwater noise modelling at the Wylfa Newydd Development Area;
- airborne noise modelling at the Wylfa Newydd Development Area;
- hydrodynamic modelling at the Holyhead Marine Disposal Site; and,
- underwater noise modelling at the Holyhead Marine Disposal Site.

200. Horizon has developed a marine hydrodynamic model to aid understanding of the potential influence of the marine licensable activities associated with the Wylfa Newydd Project on the marine environment (see section 7.3.3). The outcome of this modelling and the potential effects on fish and invertebrate species (as key prey resources) will be used to assess the indirect effects on marine mammals.

201. To allow assessment of the potential effects from marine construction on marine mammals, underwater noise modelling will be completed for all planned elements of construction. Modelling will be undertaken using the RAMSGeo software package which is designed to model any noise source where it is reasonable to assume it is a point source. The model allows for the incorporation of variable bathymetry and a complex seabed and therefore provides an accurate representation of noise propagation.

202. The airborne noise levels anticipated to be generated by the construction works will be modelled with the results compared against the existing baseline conditions to provide an

indication on potential effects to surfaced pinnipeds. The general approach to be adopted for the noise and vibration modelling and assessments have been agreed with NRW and IACC and is set out in the Horizon Document 'Noise and Vibration Modelling and Assessment Methodology Wylfa Newydd Project DCRM Ref Number: HNP-S5-PAC-REP-00014'.

203. Horizon will also develop a hydrodynamic model to aid the understanding of the potential effects of the disposal of soft and hard sediment at the Holyhead Marine Disposal Site. The outcome of this modelling and the potential effects on fish and invertebrate species (as key prey resources) will be used to assess the indirect effects on marine mammals.
204. Underwater noise generated by vessels at the disposal site will be modelled to facilitate the assessment of effects on marine mammals and fish.
205. Further information on the modelling approaches and the results of these modelling and assessment works will be included within the Wylfa Newydd Environmental Statement.

## 7.5 Shipping and navigation

206. This chapter covers the assessment of the potential changes to shipping and navigation associated with the Wylfa Newydd Project marine licensable activities. Shipping and navigation refers to commercial shipping, recreational navigation and fishing navigation. These include:

- commercial shipping – including navigation into and out of the offshore area of the Wylfa Newydd Development Area and the Holyhead Marine Disposal Site, as well as existing established navigation routes including commercial ferry services;
- recreational navigation – including racing and cruising areas; and
- fishing navigation – including commercial and recreational fishing boats.

### 7.5.1 Existing environment

207. Due to the wide-ranging spatial extent of shipping and navigation receptors, the baseline for the Wylfa Newydd Project has been discussed here as a whole (i.e. to include both the Wylfa Newydd Development Area and the Holyhead Marine Disposal Site).

#### 7.5.1.1 Navigational environment

208. Porth-y-pistyll is not currently used by commercial vessels and due to the navigational features in the area, large vessels typically navigate around four nautical miles (NM) from the coastline. The largest port within the wider study area is Holyhead which is operated by Stena Line Ports Ltd. Holyhead Port has ferry services to Ireland operated by Stena Line and Irish Ferries. The other harbours located within the wider study area are at Cemaes Bay and Amlwch. These harbours are mainly used by smaller recreational and fishing vessels. It should be noted however, that a pilot service for vessels navigating to and from Liverpool is located at Amlwch, the associated pilot boarding station is located 2nm North of Point Lynas (see figure 7.12).
209. A significant feature within the wider study area is the Skerries traffic separation scheme (TSS). This TSS is regularly used by vessels transiting to and from ports on the north coast of Wales and the north-west coast of England, in particular Liverpool. The TSS is located 4.2nm from the Wylfa Newydd Development Area at its closest point, meaning that large commercial vessels are unlikely to transit close to the Wylfa Newydd Development Area, although it is noted that it overlaps with the Holyhead Marine Disposal Site. There is a deep water anchorage located 2nm north-east of Moelfre, close to Dulas Bay. This anchorage is routinely used by commercial vessels before proceeding to the Port of Mostyn.

#### 7.5.1.2 Statutory responsibilities and management procedures

210. There are no Statutory Harbour Authorities that currently cover the Wylfa Newydd Development Area. Recreational vessels regularly report their departure and intentions to the



coastguard station situated at Holyhead, and vessels navigating to or from Holyhead contact Holyhead Port Control which is operated by Stena Line Ports Ltd.

### **7.5.1.3 Recreational facilities**

211. Within the wider study area there are recreational facilities available at Holyhead marina. The marina has approximately 350 berths and a large number of swinging moorings. Holyhead sailing club operates out of Holyhead marina, the sailing club is Royal Yachting Association accredited and offers courses in the area (see figure 7.13 for locations).
212. The bays and inlets along the north coast of Anglesey provide sheltered anchorages for recreational craft in the area when the wind is in a south-west, through to south-easterly direction. The bays do not provide permanent mooring facilities and are mainly used for cruising as a stop-off point for overnight anchoring or a short break to wait for tide or wind during a transit.

### **7.5.1.4 Fishing activities**

213. Fishing regularly takes place in the area to the north of Anglesey with vessels based at Cemaes Harbour and Amlwch Harbour. These harbours are both home to vessels that regularly fish in Cemlyn Bay (the Wylfa Newydd Development Area is located to the east of Cemlyn Bay). There are approximately seven vessels fishing within Cemlyn Bay, some of which currently lay pots and shoot lines within the Wylfa Newydd Development Area.

### **7.5.1.5 Aids to navigation**

214. A range of aids to navigation are used within the wider study area; figure 7.12 identifies their locations. There are a number of cardinal marker buoys to the east of Wylfa Newydd Development Area which mark areas where there are rocks close to the surface. The cardinal marker buoys are situated at the extremity of a navigational hazard with the 'top mark' indicating which side is safe for vessels to pass.
215. A radar beacon (racon) is in operation at the Skerries lighthouse. The racon will be shown on a vessel's radar as the Morse code for the corresponding letter shown on the nautical chart. The purpose of the racon is to present a visual representation on the vessels radar screen, highlighting, in this case, the location of the lighthouse. This is widely used so that in periods of reduced visibility vessels can navigate safely in the area.
216. A differential global positioning system station is located at Point Lynas. This station transmits a correction to the GPS receivers within a maximum range of approximately 300NM to increase the positional accuracy of the system.

### **7.5.1.6 Emergency response**

217. Various emergency responses are available within the study area. The following organisations provide resources to render assistance in the event that a marine emergency occurs.

#### **7.5.1.6.1 HM coastguard**

218. The Maritime and Coastguard Agency is responsible for the initiation and co-ordination of all civilian maritime Search and Rescue within the UK Maritime Search and Rescue Region. This includes the mobilisation, organisation and tasking of adequate resources to respond to persons either in distress at sea, or to persons at risk of injury or death along the shoreline within the UK. HM Coastguard has access to a range of resources including aircraft and coastal search teams. The study area considered here falls within the jurisdiction of the Holyhead Coastguard Operations Centre.



#### *7.5.1.6.2 Local rescue organisations*

219. There are two lifeboat stations in the vicinity of the Wylfa Newydd Project located at Holyhead and Moelfre, shown on figure 7.12. The coverage area for the two lifeboat stations is sufficient to cover the north coast of Anglesey.

#### **7.5.1.7 Marine incidents**

220. The most commonly occurring incident within the wider study area is that of 'equipment failure (vessel)' followed by 'other nautical safety' and 'capsize/sinking'. These incidents generally occur in larger concentrations at Holyhead and Moelfre, then to a lesser extent along the coastline of Anglesey.

#### **7.5.1.8 Vessel movements**

##### *7.5.1.8.1 Recreational vessels*

221. Through analysis of yacht club information and anecdotal discussions with recreational boaters the recreational usage of the area has been determined. Transits of recreational craft collated from automatic identification system data, representative of 84 days in 2015 are shown in figure 7.14.

222. Recreational vessels generally transited approximately 1nm to the north of the Wylfa Newydd Development Area. A transit line can be seen entering Cemaes Bay before continuing out of the area. This vessel was likely to have anchored in Cemaes Bay to either gain shelter from weather conditions or as a rest stop. Anecdotal information from Holyhead sailing club (per comms. Kim Argyle, 2016) suggests that vessels typically navigate between the mainland and Middle Mouse Rock to the east of the Wylfa Newydd Development Area.

223. In general cruising takes place all year round with increased intensity in the summer months; any recreational sailing will also be heavily biased towards the weekend. Holyhead sailing club organises yacht racing between April and October with several of their racing routes following the north coast of Anglesey. These events include a range of yacht sizes and types, all of which are large enough to navigate within the coastal area.

##### *7.5.1.8.2 Fishing vessels*

224. Figure 7.14 shows that there is no recorded fishing traffic currently using Cemlyn Bay. However, anecdotal information (per comms, David Williams, 2016) suggests that up to seven local vessels under 12m in length use the area. These vessels are trawling, potting and line fishing within Cemlyn Bay. The vessels are operated for either recreational fishing or for commercial purposes such as chartered fishing.

##### *7.5.1.8.3 Commercial vessels*

225. Automatic identification system data, representative of 84 days collected in 2015 has been used to create transit lines shown in figure 7.14. The majority of vessels keep offshore of Anglesey with routes that run through the Skerries TSS and do not cross into the Wylfa Newydd Development Area. Vessels that navigate closer inshore, transit to the north of the Skerries Lighthouse to avoid the shallow rocks and banks closer inshore, and generally proceed past the Wylfa Newydd Development Area at a distance of 1.7nm. Vessels with shallower draughts, such as high speed craft and port service craft, regularly pass to the south of the Skerries, approximately 0.5nm from the Wylfa Newydd Development Area.

226. A large proportion of vessels transiting through the study area are high speed craft (42.9%). These vessels are predominantly wind farm transfer vessels operating between Holyhead and the Irish Sea wind farms in the area. These vessels have a shallow draught and are highly manoeuvrable, so can safely navigate inshore of the TSS.

## 7.5.2 Main assessment issues

227. The potential effects of the marine licensable activities on shipping and navigation are outlined in Table 7.18 for the Wylfa Newydd Development Area and Table 7.19 for the Holyhead Marine Disposal Site.

**Table 7.18 Potential effects of marine licensable activities on shipping and navigation at the Wylfa Newydd Development Area**

Potential effect	Phase	Comment
Risk of collisions	Construction	During construction of the marine works there is the potential for ship to ship, or ship to structure collision.
Risk of grounding	Construction	During the dredge and marine works activity there will be an increased risk of dredge/construction vessels grounding in the vicinity of the marine works due to working close inshore, in complex tidal conditions with limited room to manoeuvre.
Displacement of vessels	Construction	The dredge and construction operations carried out as part of the marine works and resultant transit routes to and from the Wylfa Newydd Development Area will result in recreational and fishing vessels, which currently navigate within that area, being displaced into areas where larger vessels navigate.
Risk of collisions	Operation	The presence of vessels during maintenance dredging, structure maintenance or debris removal from the CWS will result in increased vessel movements in the area leading to the risk of ship to ship or ship to structure collision.
Displacement of vessels	Operation	Transit routes to and from the Wylfa Newydd Development Area will result in recreational and fishing vessels that currently navigate within that area being displaced into areas where larger vessels navigate.

**Table 7.19 Potential effects of the marine licensable activities on shipping and navigation at the Holyhead Marine Disposal Site**

Potential effect	Phase	Comment
Risk of collisions	Construction	During disposal operations there is the potential for ship to ship collision as a result of two-way traffic movements.
Displacement of vessels	Construction	Disposal operations may restrict access of vessels or alter transit routes.
Risk of collisions	Operation	During maintenance dredge disposal operations there is the potential for ship to ship collision as a result of two-way traffic movements.
Displacement of vessels	Operation	Maintenance dredge disposal operations may restrict access of vessels or alter transit routes.

## 7.5.3 Identification of data gaps and further work required

228. In order to inform the determination of changes to navigation and shipping as a result of the marine licensable activities, Horizon is carrying out a navigation and collision risk assessment.

229. The navigational risk assessment will assess the effect of the development on navigational safety, following guidance issued by the Department for Transport (DfT) and Maritime and Coastguard Agency.

## 7.6 Archaeology

230. This chapter covers the assessment of the potential changes to marine archaeology associated with the Wylfa Newydd Project marine licensable activities.

### 7.6.1 Existing environment

#### 7.6.1.1 Wylfa Newydd Development Area

231. The marine archaeological baseline has been characterised through a desk-based study, geophysical survey and diver surveys.
232. A total of 46 heritage assets are considered under the baseline for marine archaeology. These comprise three known named wrecks (the Abbotsford, the Earl of Chatham, and the Olinda) and 43 geophysical anomalies of possible archaeological interest. None of the wrecks are designated as Protected Wrecks. The locations of marine archaeological remains are shown on figure 7.15
233. Please note that while a total of 34 Recorded Losses have been identified within the marine study area, they have not been considered as part of the baseline and are not illustrated on the figures. This is because they are indicative of potential only and their locations do not, except by chance, represent material on the seabed. For example, the Recorded Loss of the Mary Sutherland was the only one located within the Wylfa Newydd Development Area. As no trace of a wreck was identified by the geophysical survey (Wessex, 2016a), a dive survey of the location of this Recorded Loss was undertaken. No trace of any archaeological material was identified by this dive survey (Wessex, 2016b).

#### 7.6.1.2 Holyhead Marine Disposal Site

234. The marine archaeology baseline has been characterised through a desk-based survey for an area extending 1km in all directions from the whole of the existing Holyhead Deep Marine Disposal Area
235. A total of 57 marine heritage assets have been identified within this study area. These comprise seven palaeogeographic features, six charted sites, 40 geophysical anomalies of uncertain origin but of possible archaeological interest and two Seascape Character Areas and two Regional Seascape Units. No Protected Wrecks were identified within the study area.
236. No known prehistoric archaeological remains, palaeogeographic features, maritime and aviation assets have been identified within the area proposed for disposal of excess dredgings. As the deposited arisings will not be visible from the surface, no effects on the two Seascape Character Areas and two Regional Seascape Units. No effects on known marine heritage assets are therefore predicted. There is however potential for effects on unknown marine heritage assets if these are present within the area proposed for disposal of excess dredgings

### 7.6.2 Main assessment issues

237. The potential effects of marine licensable activities on marine archaeology are outlined in Table 7.20 for the Wylfa Newydd Development Area and Table 7.21 for the Holyhead Marine Disposal Site. There are not considered to be any pathways of effects at the Wylfa Newydd Development Area from marine licensable activities during the operation phase.

**Table 7.20 Potential effects of marine licensable activities on marine archaeology at the Wylfa Newydd Development Area**

Potential effect	Phase	Comment
Direct damage to marine archaeological features	Construction	Temporary construction activities such as excavation and dredging, and the construction of temporary and permanent marine structures may lead to direct damage to marine archaeological features or disturbance to the relationship between a feature and its setting.
Indirect damage to marine archaeological features	Construction	Changes in hydrodynamic conditions or sedimentary regimes, e.g. increased sedimentation and scour, have the potential to cause indirect damage to marine archaeological features or disturbance to the relationship between a feature and its setting

**Table 7.21 Potential effects of marine licensable activities on marine archaeology at the Holyhead Marine Disposal Site**

Potential effect	Phase	Comment
Direct damage to marine archaeological features	Construction	The deposition of the rock fraction within the disposal site may lead to direct damage to marine archaeological features or disturbance to the relationship between a feature and its setting.
Indirect damage to marine archaeological features	Construction	Disposal of the fine fraction of dredged material may result in elevated SSC and subsequent deposition and smothering leading to the potential to cause indirect damage to marine archaeological features or disturbance to the relationship between a feature and its setting.
Indirect damage to marine archaeological features	Operation	Disposal of maintenance-dredged material may result in elevated SSC and subsequent deposition and smothering leading to the potential to cause indirect damage to marine archaeological features or disturbance to the relationship between a feature and its setting.

### 7.6.3 Identification of data gaps and further work required

238. No further work is proposed for the Wylfa Newydd Development Area.
239. The baseline for the Holyhead Marine Disposal Site will be established using the results of a marine archaeological desk-based survey. The need for additional baseline data gathering, including additional non-invasive investigations, will be reviewed and established through consultation with Gwynedd Archaeological Planning Service, Cadw and the Royal Commission on the Ancient and Historic Monuments of Wales as required.
240. It is likely that a Protocol for Archaeological Discoveries (PAD) will be in place for both areas.
241. Further information on these data sources and assessment techniques will be included within the Wylfa Newydd Environmental Statement.

## 7.7 Landscape and visual

242. This chapter covers the assessment of the potential changes to seascape associated with the Wylfa Newydd Project marine licensable activities. The definition of landscape from the European Landscape Convention includes seascapes and marine environments. The UK Marine Policy Statement indicates that, “*seascape should be taken as meaning landscapes with views of the coast or seas, and coasts and the adjacent marine environment with cultural, historical and archaeological links with each other*” (HM Government, Northern Ireland Executive, Scottish Government and Welsh Assembly Government, 2011: 21). The Guidelines for Landscape and Visual Impact Assessment, Third Edition (Landscape Institute and Institute of Environmental Management and Assessment, 2013) provide further explanation on the UK Marine Policy Statement definition as follows “*This definition includes the meeting point of land and sea but also encompasses areas beyond the low water mark, and so includes areas both near to the shore and the open sea. Any assessment of the landscape and visual effects of change in marine and coastal environments should carefully consider the relationship between land and sea in coastal areas and also take account of possible requirements to consider the open sea.*”

### 7.7.1 Existing environment

#### 7.7.1.1 Wylfa Newydd Development Area

243. The collection of seascape information has included a desk study of published sources of information on the seascape backed up by site appraisal. Data sources include:
- The National Seascape Assessment for Wales (Land Use Consultants and NRW, 2015);
  - Welsh Seascapes and their Sensitivity to Offshore Developments (Countryside Council for Wales, 2009);
  - Anglesey and Snowdonia Seascape Character Assessment (Fiona Fyfe *et al.*, 2013); and
  - Site-based local landscape and seascape character assessment undertaken in 2015 and 2016.
244. Seascape character receptors lie partially within the Isle of Anglesey Area of Outstanding Natural Beauty and the associated Heritage Coast and partially within the current Anglesey Special Landscape Area landscape designation. Published sources of seascape character comprise the following character areas (figure 7.16):
- National Seascape Assessment for Wales:
    - Marine Character Area 06 North Anglesey Coastal Waters; and
    - Marine Character Area 05 North-West Anglesey Open Waters.
  - Regional SCAs:
    - Point Lynas to Carmel Head, comprising the north coastal margin and approximately coinciding with the Landscape Assessment and Decision Making Programme (LANDMAP) Level 3 classification, North Coast visual and sensory aspect area.
  - Anglesey (and Snowdonia) Seascape Character Areas:
    - Cemlyn Bay, encompassing just over half of the Wylfa Newydd Development Area to the south-west and extending up to approximately 3km inland in places and 3km offshore;
    - Amlwch and Cemaes, encompassing just under half of the Wylfa Newydd Development Area to the north-east and extending up to approximately 1.5km inland and 1km offshore;
    - Carmel Head to Penrhyn to the west; and

- North of Anglesey, offshore to the north of the Amlwch and Cemaes Seascape Character Area.

245. A project-level local landscape and seascape character assessment has been undertaken for the Wylfa Newydd Development Area and its surroundings, based on the LANDMAP spatial layers and the Anglesey (and Snowdonia) Seascape Character Assessment (Fiona Fyfe *et al.*, 2013).
246. The coast of Marine Character Area 06 is rocky with wave-cut platforms, deeply incised bays and deep water close to shore. The crescent-shaped shingle beach at Cemlyn Bay encloses the brackish Cemlyn Bay Lagoon, which is designated as an SSSI, SPA and SAC for its importance to bird life. The low-lying coast creates a strong visual and physical connection between land and sea. The box-like form of the Existing Power Station with associated lighting at night, stands out in stark contrast. Tidal rapids and strong currents are visible from land in certain conditions, notably around Harry Furlough's Rocks (west of Cemlyn Bay) and the offshore island of West Mouse. Seascape features include the lighthouse on Point Lynas, the offshore islands of West Mouse, Middle Mouse and East Mouse and expansive views including The Skerries and the Isle of Man on the horizon.
247. The key characteristics of the Point Lynas to Carmel Head Regional Seascape Unit include the rocky convex coast of small bays and headlands, with low cliffs and the exposed northern aspect with long and open sea views. Cultural associations include the history of trade and shipping. The Existing Power Station exerts a strong local influence on landscape character between Wylfa Head and Porth-y-pistyll. Intervisibility between land and sea is mainly limited to the coastal strip and from a few high points inland, such as Parys Mountain, Mynydd Eilean and Mynydd y Garn. Offshore views to land are from occasional leisure craft, with distant views from ferries and commercial shipping. The typically rocky landscape reinforces the wild character of the coast, with the generally remote tranquillity of the Regional Seascape Character Area. The only notable disturbance is from views of the Existing Power Station and windfarms.
248. *The Anglesey (and Snowdonia) Seascape Character Assessment* (Fiona Fyfe *et al.*, 2013) provides a summary description for the Cemlyn Bay SCA, which also encompasses the west part of the Wylfa Newydd Development Area and extends to the north offshore and west to Carmel Head. Cemlyn Bay is noted as an unusual coastal feature and the Seascape Character Area description refers to the distinctive rolling drumlin fields inland of the relatively low-lying coast. Trwyn Cemlyn, with its extensive range of multi-coloured pebbles overlying metamorphic rocks, to the west of Cemlyn Bay, is cited as an example of the rich variety of the local geology.
249. The description for the Amlwch and Cemaes Seascape Character Area, which encompasses the east part of the Wylfa Newydd Development Area and extends to the north offshore and east to Amlwch, refers to an industrial character due to the long association with copper mining and associated industries and export. The area includes a number of historic harbours and settlements, including Amlwch and Cemaes. The rocky shoreline, white water and rocks dominate coastal views. The island of Middle Mouse lies just less than 1km off the coast. Some views inland are dominated by the distinctive profile of Parys Mountain.
250. On the Wylfa Newydd Development Area and immediately adjoining area, the Porth-y-pistyll local seascape character area (LSCA) lies partially within the Heritage Coast to the west of the Existing Power Station. The Porth-y-pistyll Local Seascape Character Area is a small-scale seascape unit, comprising a concave bay itself made up of several smaller bays and rocky promontories. It extends inland to the top of several low drumlins rising to between 25m and 35m above ordnance datum. The coastal edge is characterised by intertidal rock with some shingle and sand deposition within the bay, with tidal mud deposition where the stream enters the bay. The registered garden at Cestyll Garden forms a distinctive landscape feature in the centre of the area.

### 7.7.1.2 Holyhead Marine Disposal Site

251. The Holyhead Marine Disposal Site has been in regular use as a disposal site since 1983. Furthermore, the northern part of the site overlaps with a traffic separation scheme zone and the Holyhead Marine Disposal Site is located within a Royal Yachting Association sailing area (medium recreational use) (see figure 7.13). Therefore, the proposed disposal works at the Holyhead Marine Disposal Site as part of the Wylfa Newydd Project are not expected to have any effects on seascape.
252. The proposed Minesto Project will change to some extent the seascape of this area and this will be discussed further within the cumulative effects assessment within the Wylfa Newydd Environmental Statement.

## 7.7.2 Main assessment issues

253. The potential effects of marine licensable activities on seascape are outlined in Table 7.22 for the Wylfa Newydd Development Area. There are not considered to be any pathways of effects at the Wylfa Newydd Development Area from marine licensable activities during the operational phase.

**Table 7.22 Potential effects of marine licensable activities on seascape at the Wylfa Newydd Development Area**

Potential effect	Phase	Comment
Changes to seascape character	Construction	The MOLF and associated breakwaters would substantially increase the extent of developed coastline adjacent to the Existing Power Station affecting seascape character and setting.

## 7.7.3 Identification of data gaps and further work required

254. In order to inform the determination of changes to seascape as a result of the marine licensable activities at the Wylfa Newydd Development Area, a number of work streams have been progressed by Horizon. These include:
- Zone of Theoretical Visibility plans; and
  - photomontages.
255. Zone of Theoretical Visibility plans will be prepared based on topographical data and generated by computer programme. These will illustrate the maximum visual influence of the MOLF and associated breakwaters within the surrounding seascape.
256. Photomontages will be prepared to illustrate the Power Station and Off-Site Power Station Facilities and inform visual impact assessments. Specifically, they will show the scale of the proposed works within the existing landscape/seascape context.
257. A more detailed explanation of the methodology used to prepare these plans and drawings will be included within the Wylfa Newydd Environmental Statement.

## 7.8 Public access and recreation

258. This chapter covers the assessment of the potential changes to public access and recreation in relation to coastal and marine users associated with the Wylfa Newydd Project marine licensable activities (including, for example, canoeing, sailing, boat trips and angling). The effects considered take into account physical access as well as the recreational value of the coastal and marine area. Recreational navigation is covered in section 7.5.



## 7.8.1 Existing environment

### 7.8.1.1 Wylfa Newydd Development Area

259. Baseline information regarding the study area has been gathered by a desk-based assessment. This assessment included a review of relevant policies and plans, searches of local tourism websites and review of Ordnance Survey mapping and IACC's website.

260. This baseline information has been supplemented by site visits to the Wylfa Newydd Development Area, including Wylfa Head and the local beaches, in 2014 and 2015.

#### 7.8.1.1.1 Recreational users

##### 7.8.1.1.1.1 Beaches

261. There are several beaches and coves within the Wylfa Newydd Development Area that are used by people accessing the shore for recreational purposes.

262. Cemlyn Bay is unusual in that it includes a lagoon and is of interest to birdwatchers, in particular because of the tern colony that it supports. Cemlyn Bay is also a North Wales Wildlife Trust Reserve that attracts visitors. Cemaes beach is a sandy beach that is served by two car parks and is located within the centre of the village. It is a popular recreational feature, it is family friendly, though there are seasonal restrictions for dogs.

263. Porth yr Ogof and Porth Wylfa are pebble and shingle beaches and are located within the Wylfa Newydd Development Area. The use of these two beaches was observed during the walkover surveys in July 2014 and July 2015. In July 2014, six people were seen using Porth Wylfa during a half-hour period around midday. In July 2015, more than 30 people were seen using Porth yr Ogof over a half-hour period.

264. Porth-y-pistyll and Porth y Felin can be accessed from the Wales Coast Path or other public rights of way, though no use was observed during site visits.

##### 7.8.1.1.1.2 Sailing and boating

265. Anglesey offers a wide range of sailing activities. It is understood that there are moorings for boats within Cemaes Bay at present. Larger sailing boats have permanent moorings/berths at various towns around the Anglesey coast with many sailors using the waters off Wylfa Head. The coastline of Anglesey is an attractive backdrop for coastal sailing trips.

266. Wildlife watching by boat is an increasingly popular pastime along the Anglesey coastline. While there is a gull colony on Wylfa Head, it is not considered to be of such importance as to be a main draw for water-based wildlife watching. The tern colony at Cemlyn Bay has the potential to attract visitors, though these are unlikely to be water-based.

267. Sea fishing is a popular pastime and pleasure trips are known to operate out of Cemaes and Amlwch using waters within the study area. However, there are no features within the study area that make it of particular importance for sea fishing from vessels.

##### 7.8.1.1.1.3 Kayaking, jet-skiing and dayboat use

268. Both Cemlyn and Cemaes Bays offer slipways from which small boats can be launched. Powered water craft such as jet-skis can also be launched from slipways at Cemaes Bay harbour. Further access to the sea can be achieved from various coves along the coastline and canoeists have been observed launching from Porth Wylfa and Cemlyn Bay during recent site visits.

269. Windsurfing and sea kayaking are known to take place along much of the Anglesey coastline and this includes the waters within the study area.

#### 7.8.1.1.1.4 Swimming

270. Porth Wylfa and Porth yr Ogof are popular coves for swimming, as are Cemaes Bay and Cemlyn Bay. Swimming has also been observed at other locations around Wylfa Head but this is not encouraged. Whilst these sites may be popular among swimmers, there are no lifeguard services and there are alternative locations for swimming nearby.

#### 7.8.1.1.1.5 Diving

271. Diving is a popular pastime and there are numerous wreck sites around the Anglesey coastline as well as a range of marine habitats. There are no identified official dive spots in the study area.

### 7.8.1.2 *Holyhead Marine Disposal Site*

272. Whilst there are no current marine licences to dispose of dredged material at Holyhead Deep, the site has been in regular use as a disposal site since 1983 and is currently classified as open. Therefore, the proposed disposal works as part of the Wylfa Newydd Project are not expected to have any effects on amenity value. Therefore, effects on coastal and marine users within the Holyhead Marine Disposal Site have not been considered further. Potential effects on navigation are assessed in section 7.5.

## 7.8.2 Main assessment issues

273. The potential effects of marine licensable activities on coastal and marine users are outlined in Table 7.23 for the Wylfa Newydd Development Area.

**Table 7.23 Potential effects of marine licensable activities on coastal and marine users at the Wylfa Newydd Development Area**

Potential effect	Phase	Comment
Loss of recreational resource	Construction	The construction and operation of the MOLF, along with the construction of the breakwater and CWS mean that a small area of foreshore within Porth-y-pistyll would have to be closed. During construction works there may also be restricted access to the foreshore.
Loss of amenity of recreational facilities (e.g. sailing, boating and wildlife watching).	Construction	Disturbance (e.g. noise, dust, vessel movements) during construction activities may lead to the loss of amenity.
Loss of amenity of recreational facilities (e.g. sailing, boating and wildlife watching).	Operation	Disturbance (e.g. vessel movements) during maintenance dredging, structure maintenance or debris removal from CWS may lead to the loss of amenity.

## 7.8.3 Identification of data gaps and further work required

274. The baseline data is considered sufficient for assessments therefore no further work is required in order to inform the assessment of effects of marine licensable activities on public access and recreation.

## 7.9 Other sea users

275. This chapter covers the assessment of the potential changes to other sea users associated with the Wylfa Newydd Project marine licensable activities. Other sea users include:

- power interconnectors and telecommunication cables;
- licensed marine aggregate areas;
- offshore renewable sites; and
- oil and gas.

276. Potential effects on commercial fishing are considered in section 7.4.5, effects on shipping and navigation are considered in section 7.5 and effects on recreational users are considered in section 7.8.

### 7.9.1 Existing environment

277. Due to the wide-ranging spatial extent of other sea user receptors the baseline for the Wylfa Newydd Project has been discussed here as a whole (i.e. to include both the Wylfa Newydd Development Area and the Holyhead Marine Disposal Site).

#### 7.9.1.1 Power interconnectors and telecommunication cables

278. The Emerald Bridge and CeltixConnect telecommunication cables run from the south-west of Holy Island, across the Irish Sea, into Portmarnock, Ireland. These cables each have a capacity of 100 billions of bits per second. These telecommunication cables are located to the south of the Holyhead Deep Disposal Site.

279. The East-West Interconnector is a 500 MW high voltage, direct current link which runs between Woodland, County Meath in the Republic of Ireland and Deeside in North Wales. The link comprises approximately 186km of sub-sea cable and 70km of land underground cable. The East-West Interconnector is built using Voltage Source Converter technology and is the largest of its type in operation worldwide. The East-West Interconnector runs parallel to the north coast of Anglesey, approximately 20 km from the coast.

#### 7.9.1.2 Licensed marine aggregate areas

280. There are a number of licensed aggregate extraction areas within Liverpool Bay: Areas 392 and 393 (Hilbre Swash) and Area 457 (Liverpool Bay). In addition, Area 518 (Liverpool Bay) is an exploration and option area (limited licence for seabed exploration). These aggregate extraction sites are located over 60km from the Wylfa Newydd Development Area.

#### 7.9.1.3 Offshore renewable sites

281. There are three operational offshore wind farms in Welsh waters, namely Rhyl Flats (90MW, 2009), North Hoyle (60MW, 2004) and Gwynt y Môr (576MW, 2015). In addition, Burbo Bank (90MW, 2007) is located within Liverpool Bay. An extension of Burbo Bank (258MW) offshore wind farm has also been consented, and is operational. The nearest windfarm site is located over 50km from the Wylfa Newydd Development Area.

282. In June 2014, Minesto was awarded an Agreement for Lease for a 10MW tidal turbine installation in Holyhead Deep, off the coast of Anglesey. Minesto has now submitted a Marine Licence application to develop the full scale Deep Green power plant array. As this project is still in the planning stage it has been considered further in the cumulative effects assessment.

#### 7.9.1.4 Oil and gas

283. Liverpool Bay comprises a number of oil and gas fields including:

- Hamilton North (gas) – onstream in 1995 (limited gas remaining)

- Douglas (oil) – 1996 (expected to produce until approximately 2020)
- Lennox (oil and gas) – 1996 (little oil remaining)
- Hamilton (gas) – 1997 (limited gas remaining)
- Hamilton East (gas) – 2001 (now shut and not producing)
- Douglas West (oil) – 2003

284. The oil produced from the Lennox and Douglas fields is processed, blended and sent through a 20km pipeline, to the offshore storage installation, an 870,000 oil barrel capacity tanker, which is permanently moored outside shipping lanes in the Irish Sea, before being loaded into tankers, for export worldwide. The gas fields link to an onshore gas processing terminal at Point of Ayr, North Wales.

285. These sites are located over 50km from the Wylfa Newydd Development Area.

286. In addition, the Department of Energy and Climate Change granted three licences for offshore shale gas extraction in the Irish Sea in 2014, however, no offshore extraction has taken place to date.

## 7.9.2 Main assessment issues

287. Due to their spatial separation from the Wylfa Newydd Development Area there are not considered to be any potential effects of the marine licensable activities on power interconnectors and telecommunication cables, licensed marine aggregate sites, offshore renewables and oil and gas. These receptors have therefore been scoped out of requiring further assessment. The potential effects on shipping and navigation associated with these receptors are discussed in section 7.5.2.

## 7.9.3 Identification of data gaps and further work required

288. No further work is proposed due to the fact that impacts on power interconnectors and telecommunication cables, licensed marine aggregate sites, offshore renewables and oil and gas have been scoped out.

## 8 Cumulative effects

1. The EIA Regulations require the Environment Statement to include a description of the likely significant cumulative effects of the Wylfa Newydd Project on the environment.
2. Horizon will carry out a project-wide cumulative effects assessment and present it in a cumulative effects volume within the Wylfa Newydd Environmental Statement. The relevant cumulative effects from Marine Licensable activities will be signposted in the Marine Licence application.
3. The marine licensable activities will be assessed in relation to other plans, projects and/or activities which could give rise to cumulative effects. Projects will be included on the following basis:
  - projects that are under construction;
  - permitted application(s) not yet implemented;
  - submitted application(s) not yet determined; and
  - projects on the National Infrastructure's programme of projects.
4. Those projects of relevance to the marine licensable activities are outlined in Table 8.1. The final list of plans, projects and activities included within the cumulative effects volume will be reviewed, in consultation with relevant authorities, to see if any new developments or changes to the list proposed, have occurred.

**Table 8.1 Reasonably foreseeable future projects scoped in to the cumulative assessment of the Marine Licence application.**

Ref / Developer	Project title and description	Current status and availability of information
5. AN01 / Magnox Limited	6. Wylfa Decommissioning  7. Decommissioning of the Existing Power Station including care and maintenance of the existing facilities followed by decommissioning and final site clearance.	<p>The Existing Power Station ceased operation on 30 December 2015 and is currently in a defueling phase, following which, work will be undertaken into site care and maintenance.</p> <p>An Environmental Statement (2013 Update) for the decommissioning of the Existing Power Station has been prepared – <a href="http://www.hse.gov.uk/consult/condocs/cdwylfa/2013-environmental-statement.pdf">http://www.hse.gov.uk/consult/condocs/cdwylfa/2013-environmental-statement.pdf</a></p> <p>Decommissioning activities are understood to last until 2025.</p> <p>8. Magnox is currently updating the plans for decommissioning. The Environmental Statement will not be updated but various Environmental Masterplan documents will be produced.</p>
9. AN02 / Orthios Group	Anglesey Eco Park  10. Including 299 MWe biomass power station within the existing consented scheme, prawn-growing facility (aquaculture), large soil-less	<p>Outline planning permission is in place. A full planning application for the eco-park is expected to have an accompanying Environmental Statement, but this is not yet available.</p> <p>The Section 36 conditions have been complied with and a start on the site is</p>

Ref / Developer	Project title and description	Current status and availability of information
	indoor vegetable-growing facility (hydroponics), home compostable food packaging facility, the Combined Food and Power Centre of Excellence, research and development, and a deep water jetty for bulk import.	anticipated.
11. AN05 / Conygar Stena Line Ltd 12.	13. Holyhead Waterfront Redevelopment 14. A comprehensive mixed use development on 1.2km of Holyhead waterfront at Newry Beach and Porth y felin.	Planning permission granted in 2012. Subsequently awaiting the outcome of a 'village green' application which may prevent the development from proceeding. 15. An Environmental Statement is believed to have accompanied the Planning Application. At the time of writing the Environmental Statement was not available online.
AN10 / Amlwch LNG	Amlwch LNG Tankers would import liquid gas to a mooring three kilometres from the Amlwch coast. The liquified gas would then be transferred by an undersea pipeline from the mooring platform to the site near the town of Amlwch, where it would be converted back to natural gas and sent into the UK gas network.	The existing planning consent was renewed in 2013, but future plans are unclear and timescales undefined. The planning application is expected to have had an accompanying Environmental Statement by time of writing, but this was not available online.
AN11 / Minesto	Holyhead Deep 10 MW Tidal kite installation off the coast of Holyhead, plus on-land elements and grid connection.	The Environmental Statement for this proposed project has been obtained. Minesto plans to start the installation of a 10MW marine energy array in 2017, subject to the grant of planning permission. A Marine Licence was granted in April 2017.
RI02 / Dublin Port Company	Alexandra Basin Redevelopment Project. Extension of infrastructure to open up Dublin Port to larger cruise and cargo ships. The port will dredge the river Liffey to increase the depth of its berths and the entrance channel from 7m to at least 10m. This will eliminate access issues caused by tides and enable large cruise and cargo ships to turn in Alexandra Basin and dock at East Link Bridge, rather than reversing	Planning permission was granted in 2015 with construction starting in November 2016. The duration of construction is unknown. The Environmental Impact Statement is available online - <a href="http://dublinportabr.ie/eis">http://dublinportabr.ie/eis</a>

Ref / Developer	Project title and description	Current status and availability of information
	up the Liffey to their berth as they do now.	
RI03 / Dun Laoghaire Harbour Company (Ireland)	<p>Proposed New Cruise Berth For Large Cruise Ships at Dun Laoghaire Harbour.</p> <p>Dun Laoghaire Harbour Company is seeking permission for an €18m cruise berth facility to cater for jumbo cruise ships.</p>	<p>Permission granted in November 2016. The accompanying Environmental Impact Statement was not obtained at the time of writing.</p> <p>The expected construction duration is 15 to 18 months. Although construction phasing is known the scheduled start date is unknown.</p> <p>Strategic Environmental Assessment statements are available online - <a href="http://dlharbour.ie/masterplan/sea-statement">http://dlharbour.ie/masterplan/sea-statement</a></p>
NU02 / EDF Energy	Hinkley Point C (Somerset) Construction, operation and decommissioning of a new Nuclear Power Station using Areva ERP technology.	<p>A Development Consent Order for Hinkley Point C New Nuclear Power Station has now been granted. Accompanying Environmental Statement is available - <a href="http://infrastructure.planninginspectorate.gov.uk/projects/south-west/hinkley-point-c-new-nuclear-power-station/?ipcsection=docs&amp;stage=app&amp;filter=Environmental+Statement">http://infrastructure.planninginspectorate.gov.uk/projects/south-west/hinkley-point-c-new-nuclear-power-station/?ipcsection=docs&amp;stage=app&amp;filter=Environmental+Statement</a></p>
NU04 / NuGen	Moorside (Cumbria) Construction, operation and decommissioning of a new Nuclear Power Station using Westinghouse AP1000 technology.	<p>An application for a Development Consent Order is in preparation.</p> <p>Stage 1 Preliminary Environmental Information is available online - <a href="http://www.nugenconsultation.com/media/1092/stage-1-consultation-overview.pdf">http://www.nugenconsultation.com/media/1092/stage-1-consultation-overview.pdf</a></p> <p>The application is expected to be submitted to the Planning Inspectorate in April 2017.</p>



# Abbreviations

Term or abbreviation	Definition
ABWR	Advanced Boiling Water Reactor
CEA	Cumulative Effects Assessment
CWS	Cooling Water System
DCO	Development Consent Order
DfT	Department for Transport
EIA	Environmental Impact Assessment
EQS	Environmental Quality Standard
HM	Her Majesty
Horizon	Horizon Nuclear Power Limited
HRA	Habitats Regulations Assessment
IACC	Isle of Anglesey County Council
JNCC	Joint Nature Conservation Committee
MMU	Marine Mammal Management Unit
MOLF	Marine Off-Loading Facility
MW	Megawatts
MWe	Megawatt electric
NPS	National Policy Statement
NREH	National Record of the Historic Environment
NRW	Natural Resources Wales
ORP	Oxidation reduction potential
PEI	Preliminary Environmental Information
pH	potential of hydrogen
cSAC	Candidate Special Area of Conservation
Racon	Radar beacon
Ramsar	Wetlands of international importance designated under the Ramsar Convention
Redox	Oxidation reduction potential
RFFP	Reasonable foreseeable future project
SAC	Special Area of Conservation
SCA	Seascape character area
SPA	Special Protection Area
SSC	Suspended sediment concentration
SSSI	Sites of Special Scientific Interest
TAN	Technical Advice Note
TSS	Traffic Separation Scheme

Term or abbreviation	Definition
UKTAG	UK Technical Advisory Group
VMS	Vessel monitoring system
WFD	Water Framework Directive

# References

- Baines, M.E. and Evans, P.G.H. 2012. Atlas of the marine mammals of Wales. CCW Monitoring Report No. 68, 139 pp.
- Berrow, S.D., Whooley, P., O'Connell, M. and Wall D. 2010. Irish cetacean review (2000-2009). Irish Whale and Dolphin Group. 60 pp.
- Bloomfield, A. and Solandt, J. 2006. The Marine Conservation Society Basking Shark Watch 20-year report. [Online]. [Accessed 23 November 2016]. Available from: [http://www.mcsuk.org/downloads/wildlife/basking\\_sharks/BSW20%20Report.pdf](http://www.mcsuk.org/downloads/wildlife/basking_sharks/BSW20%20Report.pdf)
- Carter, M.C. 2008. *Aequipecten opercularis* Queen scallop. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews, Plymouth: Marine Biological Association of the United Kingdom. [Online]. [Accessed 02 November 2016]. Available from: <http://www.marlin.ac.uk/species/detail/1997>
- Connor, D.W., Allen, J.H., Golding N., Howell, K.L., Lieberknecht, L.M., Northen, K.O., Reker, J.B., 2004. *The Marine Habitat Classification for Britain and Ireland* Version 04.05. JNCC, Peterborough ISBN 1 861 0756 (internet version).
- Coull, K., Johnstone, R. and Rogers, S. 1998. Fishery sensitivity maps in British Waters. London: UKOOA Ltd. [Online]. [Accessed: 23 November 2016]. Available from [https://www.cefas.co.uk/media/52612/sensi\\_maps.pdf](https://www.cefas.co.uk/media/52612/sensi_maps.pdf).
16. Countryside Council for Wales. 2009. Welsh Seascapes and their Sensitivity to Offshore Developments.
- David Williams, 2016. Personal Communications (per Coms), 26 October 2016, David Williams – Cemaes Harbour Committee
- de Boer, M.N., Morgan-Jenks, M., Taylor, M. and Simmonds, M.P. 2002. The small cetaceans of Cardigan Bay. *British Wildlife*. 13(4), pp.246-254.
- Defra/Environment Agency. 2011. Coastal flood boundary conditions for UK mainland and islands: Flood and Coastal Erosion Risk management R&D. [online] [Accessed: 23 November 2016] Available from: <https://www.gov.uk/government/publications/coastal-flood-boundary-conditions-for-uk-mainland-and-islands-design-sea-levels>
- Department of Energy and Climate Change. 2011a. *Overarching National Policy Statement for Energy* (EN-1). London: The Stationery Office.
- Department of Energy and Climate Change. 2011b. *National Policy Statement for Nuclear Power Generation* (EN-6). London: The Stationery Office.
- Ellis, J., Milligan, S., Readdy, L., South, A., Taylor, N. and Brown, M. 2012. Spawning and nursery grounds of selected fish species in UK waters. Science Series Technical Report. Cefas Lowestoft, 147: 56 pp.
- Environment Agency. 2011. *Adapting to Climate Change: Advice for Flood and Coastal Erosion Risk Management Authorities*. [online] [Accessed: 23 November 2016] Available from: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/297379/geho0711btzu-e-e.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/297379/geho0711btzu-e-e.pdf)
- Evans, P.G.H., Pierce, G.J., Veneruso, G., Weir, C.R., Gibas, D., Anderwald, P. and Begoña Santos, M. 2015. Analysis of long-term effort-related land-based observations to identify whether coastal areas of harbour porpoise and bottlenose dolphin have persistent high occurrence & abundance. JNCC report No. 543, JNCC, Peterborough.

Fiona Fyfe Associates, Countryside and SEACAMS (University of Bangor). 2013. Anglesey and Snowdonia Seascape Character Assessment.

Folk, R. L. 1954. The distinction between grain size and mineral composition in sedimentary rock nomenclature. *Journal of Geology*. 62(4), pp.344-359.

Gordon, J., Thompson, D., Leaper, R., Gillespie, D., Pierpoint, C., Calderan, S., Macaulay, J. and Gordon, T. 2011. *Studies of Marine Mammals in Welsh High Tidal Energy Waters*. Produced on behalf of the Welsh Assembly Government. Document reference: JER3688R110408JG Phase 2.

Gubbay, S. 2007. Defining and managing *Sabellaria spinulosa* reefs: report of an inter-agency workshop. 1-2 May 2007. Joint Nature Conservation Committee, Peterborough, 405, 26pp.

Halcrow. 2012. Wylfa Marine Off Loading Facility Coastal Processes Study. Report no. HNP-ENG-CV-REP-00004. January 2012.

Hammond, P.S., Northridge, S.P., Thompson, D., Gordon, C.D., Hall, A.J., Aarts, G. and Matthiopoulos, J. 2005. Background information on marine mammals for Strategic Environmental Assessment 6. Consultation document for the UK Department of Trade and Industry's offshore energy Strategic Environmental Assessment programme, 73 pp.

Hammond, P.S., Macleod, K., Berggren, P., Borchers, D.L., Burt, L., Cañadas, A., Desportes, G., Donovan, G.P., Gilles, A., Gillespie, D., Gordon, J., Hiby, L., Kuklik, I., Leaper, R., Lehnert, K., Leopold, M., Lovell, P., Øien, N., Paxton, C.G.M., Ridoux, V., Rogan, E., Samarra, F., Scheidat, M., Sequeira, M., Siebert, U., Skov, H., Swift, R., Tasker, M.L., Teilmann, J., Van Canneyt, O. and Vázquez, J.A. 2013. Cetacean abundance and distribution in European Atlantic shelf waters to inform conservation and management. *Biological Conservation*. 164, pp.107-122.

Horizon Nuclear Power Wylfa Ltd. 2015. Consultancy Report: Coastal; Geomorphology Baseline for the Wylfa Newydd Project, 2014. Report No. 60PO8007-GEO-REP-002

Howarth, M.J., 2005. Hydrography of the Irish Sea SEA6 Technical Report, POL internal document No.174, Proudman Oceanographic Laboratory, Liverpool.

IACC, 1996. *Ynys Mon Local Plan*

IACC, 2006. *The Gwynedd Structure Plan*

IACC, 2011. Anglesey Landscape Strategy Update

IACC, 2014a. *New Nuclear Build at Wylfa: Supplementary Planning Guidance document*

IACC, 2014b. Anglesey Wildlife Sites: Full List of Sites and Citations – G13 Mynydd y Wylfa – Trwyn Penrhyn Coast 3594.

IACC, 2016. Joint Local Development Plan (Anglesey and Gwynedd). Available at: <http://www.anglesey.gov.uk/planning-and-waste/planning-policy/joint-local-development-plan-anglesey-and-gwynedd/> Accessed: 23 November 2016

Institute of Environmental Management and Assessment (IEMA). 2004. *The Institute of Environmental Management and Assessment's Guidelines for Environmental Impact Assessment*. Lincoln: IEMA.

Joint Nature Conservation Committee. 2015a. *Vertebrate species: fish Twaite shad *Alosa fallax* Background to SAC selection*.

Joint Nature Conservation Committee. 2015b. *Vertebrate species: fish River lamprey *Lampetra fluviatilis* Background to SAC selection*.

Joint Nature Conservation Committee. 2015c. *Vertebrate species: fish Atlantic salmon *Salmo salar* Background to SAC selection*.

Kennington, K. and Rowlands, L.I. 2004. *SEA area 6 Technical Report – Plankton Ecology of the Irish Sea*. Liverpool: Port Erin Marine Laboratory, University of Liverpool. 63 pp.

Kiely, O., Lidgard, D., McKibben, M., Connolly, N. & Baines, M. 2000. *Grey seals: Status and monitoring in the Irish and Celtic Seas*. Maritime Ireland/Wales INTERREG Report No. 3.

Kim Argyle, 2016. Personal Communications (per Coms), 26 October 2016, Kim Argyle – Holyhead Sailing Club

Landscape Institute and Institute of Environmental Management and Assessment, 2013 *Guidelines for Landscape and Visual Impact Assessment*. Third Edition, London & New York. Routledge (ISBN-10: 0415680042).

Land Use Consultants and Natural Resources Wales, 2015. *The National Seascape Assessment for Wales*. NRW evidence report No80.

Mackey, M., Perales, I Giménez, D. and Ó Cadhla, O. 2004. *SEA678 Data Report for Offshore Cetacean Populations*. Cork: Coastal & Marine Resources Centre, University College Cork.

Marine Management Organisation (MMO), 2014. Vessel Monitoring System Information [online] Available at: <https://www.gov.uk/guidance/apply-for-and-register-your-vessel-monitoring-system-device> [Accessed 7 November 2016]

Marine Scotland, 2015. Grey and harbour seal usage maps report, 2013. [Online]. Available at: <http://www.gov.scot/Resource/0043/00437053.pdf> [Accessed: 23 November 2016].

Marshall, C.E. and Wilson, E. 2008. *Pecten maximus* Great scallop. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews, Plymouth: Marine Biological Association of the United Kingdom. [Online]. [Accessed: 02 November 2016]. Available from: <http://www.marlin.ac.uk/species/detail/1398>

Minesto. 2016. Deep Green Holyhead Deep Environmental Statement. L-100194-S00-EIAS-001-023 580 pp.

Natural Resource Wales (NRW). 2010. Sea Fish Atlas. [Online]. [Accessed: 8 November 2016]. Available from: <http://lle.gov.wales/apps/marineportal/#lat=53.4150&lon=-4.4926&z=14&layers=235,97,98,99>

Natural Resources Wales (NRW). 2016a. Bathing water quality. [Online]. [Accessed 16 November 2016]. Available from: <https://naturalresources.wales/water/quality/bathing-water-quality/?lang=en>.

Natural Resources Wales (NRW). 2016b. WFD Rivers and Water Bodies in Wales. [Online] [Accessed: 23 November 2016] Available from: <http://waterwatchwales.naturalresourceswales.gov.uk/en/>.

Neal, K.J. and Wilson, E. 2008. *Cancer pagurus* Edible crab. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews, Plymouth: Marine Biological Association of the United Kingdom. [Online]. [Accessed: 02 November 2016]. Available from: <http://www.marlin.ac.uk/species/detail/1179>

Northridge, S.P., Tasker, M.L., Webb, A. and Williams, J.M. 1995. Distribution and relative abundance of harbour porpoises, white-beaked dolphins and minke whales around the British Isles. *ICES Journal of Marine Science*. 52, pp. 55-66.

Pesante, G., Evans, P.G.H., Anderwald, P., Powell, D. and McMath, M. 2008a. *Connectivity of bottlenose dolphins in Wales: North Wales photo-monitoring*. CCW Marine Monitoring Report No. 62, 42 pp.

Pesante, G., Evans, P.G.H., Baines, M.E. and McMath M. 2008b. *Abundance and life history parameters of bottlenose dolphin in Cardigan Bay: monitoring 2005-2007*. CCW Marine Monitoring Report No. 61, 81 pp.

Planning Inspectorate, 2012. Planning Inspectorate Advice Note 9: Rochdale Envelope

Pollock, C.M., Reid, J.B., Webb, A. and Tasker, M. 1997. *The distribution of seabirds and cetaceans in the waters around Ireland JNCC Report No 267*. Peterborough: Joint Nature Conservation Committee.

Rees, E. I. S. 2005. *Assessment of the status of horse mussel (Modiolus modiolus) beds in the Irish Sea off NW Anglesey*. DTI SEA6 Sub-contract report.

Reid, J.B., Evans, P.G.H. and Northridge, S. 2003. *Atlas of cetacean distribution in north-west European waters*. Peterborough: Joint Nature Conservation Committee.

Robins, P.E., Neill, S.P. and Lewis, M.J. 2014. Impact of tidal-stream arrays in relation to the natural variability of sedimentary processes. *Renewable Energy*. 72, pp.311-321

Robinson, K., Ramsay, K., Lindenbaum, C., Frost, N., Moore, J., Wright, A. and Petrey, D. 2011. Predicting the distribution of seabed biotopes in the southern Irish Sea. *Continental Shelf Research*. 31, pp.120-131.

Sabatini, M. and Pizzola, P.F. 2008. *Arctica islandica* Icelandic cyprine. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [Online]. Plymouth: Marine Biological Association of the United Kingdom. Available at: <http://www.marlin.ac.uk/species/detail/1519> [Accessed October 2016].

Sustainable Expansion of the Applied Coastal and Marine Sectors (SEACAMS). 2015. *Vessel-based marine mammal surveys off West Anglesey*. Report by SEACAMS for Minesto. July, 2015.

Shucksmith, R., Jones, N.H., Stoye, G.W., Davies, A. and Dicks, E.F. 2009. Abundance and distribution of the harbour porpoise (*Phocoena phocoena*) on the north coast of Anglesey, Wales, UK. *Journal of the Marine Biological Association of the United Kingdom*, 89(5), pp.1051-1058.

Simpson, J.H and Hunter, J. 1974. Fronts in the Irish Sea. *Nature*, 250, pp.404-406

Wales Marine Non-native Species Inshore Monitoring Network, 2015.

Welsh Government, 2013. *Wales Spatial Plan – People, Places, Futures*. Available at: <http://gov.wales/topics/planning/development-plans/wales-spatial-plan/?lang=en> [Accessed December 2016].

Welsh Government, 2015. Welsh National Marine Plan. Initial draft.

Welsh Government, 2016. *Planning Policy Wales* (Edition 9)

17. Wessex Archaeology. 2015. Deep Green Holyhead Deep Tidal Project Holy Island, Anglesey: Marine Archaeological Desk-Based Assessment. Report reference: 107791.03. Unpublished technical report.

Wessex Archaeology. 2016a. Wylfa Newydd Proposed New Nuclear Power Station Marine Archaeology Baseline Report Revision 1. Unpublished Technical Report.

Wessex Archaeology. 2016b. Wylfa Newydd Proposed New Nuclear Power Station Marine Archaeological Survey Report. Unpublished Technical Report.

Westcott S.M. 2002. *The distribution of grey seals (Halichoerus grypus) and census of pup production in North Wales, 2001*. CCW Contract Science Report No. 499, 140 pp.

Westcott, S.M. and Stringell, T.B. 2003. *Grey seal pup production for North Wales, 2002*. Countryside Council for Wales. Marine Mammal Monitoring Report No. 5 5 pp.

Westcott, S.M. and Stringell, T.B. 2004. *Grey Seal distribution and abundance in North Wales 2002-2004*. Countryside Council for Wales. Marine Mammal Monitoring Report No. 13. 80 pp.

Wilson, E. 2008. *Necora puber* Velvet swimming crab. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews, Plymouth: Marine Biological Association of the United Kingdom. [Online]. [Accessed: 03 November 2016]. Available from: <http://www.marlin.ac.uk/species/detail/1181>

Wood, C., Bishop, J and Yunnice, A. 2015. Comprehensive Reassessment of NNS in Welsh marinas. Welsh Government Resilient Ecosystems Fund (REF) Grant GU9430

Xodus Group. 2015. Holyhead Deep disposal site: characterisation and assessment of capacity to accommodate Minesto AfL. L-100194-S06-REPT-001 34 pp.



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## Appendix A Consultation Feedback

### A.1 Pre-Application Consultation Stage One

**Table A1 Horizon's responses to the Pre-Application Consultation Stage One feedback of relevance to the marine licensable activities**

Topic	Pre-Application Consultation Stage One feedback	Horizon response
Public access and recreation	The loss of coastline at Porth-y-pistyll.	The Wylfa Newydd Environmental Statement assessment will consider the loss of the coastline at Porth-y-pistyll.
Public access and recreation	The safety of jet-skiers around coastline.	The potential effects of the proposed scheme on offshore recreation will be considered within the Wylfa Newydd Environmental Statement.
Public access and recreation	The effect on birdwatching activities by boat.	
Coastal processes and coastal geomorphology	NRW noted that since the initial hydrodynamic modelling was undertaken in 2009, the reactor technology had changed and that this must be taken into account. NRW also noted that the PEI Report did not give sufficient information about modelling, scenarios and survey methods, or the results from these assessments. NRW noted that additional information and clarification on a large number of issues would be needed before they would be able to provide further advice.	Modelling of a previous design showed there to be little or no impact on coastal processes or coastal geomorphology. This was used in part for informing professional judgment at Pre-Application Consultation Stage One. The Coastal processes and coastal geomorphology chapter (of the Wylfa Newydd Environmental Statement) will be fully informed by additional data and information having now been collected and by extensive wave/climate and sediment plume modelling.
Coastal processes and coastal geomorphology	Similarly, the National Trust requested additional information about the level of baseline modelling that had been completed, noting that additional information would be needed from the ongoing modelling. The National Trust also requested modelling for the construction of the MOLF and in relation to coastal hydrodynamics and geomorphology.	The coastal processes and coastal geomorphology chapter will be fully informed by further data and information having now been collected and by wave/climate and sediment plume modelling. Stakeholder engagement is ongoing to provide an update on the work completed.

Coastal processes and coastal geomorphology	A number of general consultees reported concerns about the PEI Report, generally regarding a lack of detail as to the potential environmental impacts of the Wylfa Newydd Project. However, most of these comments are detailed in other areas of this report, particularly in the environment section.	The Coastal processes and coastal geomorphology chapter will be fully informed by further data and information collection and by wave/climate and sediment plume modelling. Stakeholder engagement is ongoing to provide an update on the work completed.
Coastal processes and coastal geomorphology	The North Wales Wildlife Trust noted a lack of sufficient detail which hindered their ability to make decisions and to provide meaningful feedback. At a high level, the North Wales Wildlife Trust identified that potential impacts of the Wylfa Newydd Project on the wildlife and coastal processes at Cemlyn were not addressed, undermining the importance of Cemlyn which they believed to be the most important ecological receptor in the area. The North Wales Wildlife Trust also noted that the absence of specific mitigation measures and a lack of detail about the Associated Development made it difficult for them to assess environmental impacts of the Wylfa Newydd Project. Finally, the North Wales Wildlife Trust provided a list of specific issues that they identified as needing to be included in the PEI Report.	The Coastal processes and coastal geomorphology chapter will be fully informed by further data and information collection and by extensive wave/climate and sediment plume modelling. The Coastal processes and coastal geomorphology chapter will be concerned with coastal processes and an assessment of coastal geomorphology receptors. Assessment of effects on ecology receptors will be dealt with in the marine environment chapter of the Wylfa Newydd Environmental Statement.
Coastal processes and coastal geomorphology	Except for the Wygyr water body, designations of WFD water bodies will be changing.	The updated WFD water bodies will be considered in the WFD assessment provided as an appendix to the Wylfa Newydd Environmental Statement.
Marine environment	IACC requested formal verification of the presence of seals (nursing mothers and pups) in the area to the west of Cemlyn.	Throughout the marine environment baseline survey period from 2010 to 2015, there have been no sightings of breeding seals or pups within the vicinity of the Wylfa Newydd Development Area. Surveys are being carried out in 2016/17 during the seal-breeding season along the coastline from Cemlyn to Porth-y-pistyll to provide further evidence to support these observations.

Marine environment	IACC raised concerns regarding the noise disturbance to recreational divers and swimmers in the Cemaes area caused by acoustic fish deterrents.	Based on experience at other power stations, the sound field of acoustic fish deterrent systems is localised and sound is only detectable in the immediate vicinity of the intake. The acoustic fish deterrent system will be located within Porth-y-pistyll, adjacent to the MOLF and recreational diving or swimming would not be possible within this area. It is therefore very unlikely that recreational divers or swimmers would be able to hear the acoustic fish deterrent.
Marine environment	NRW requested further clarification on aspects of the baseline survey rationale, methods and results.	Survey sampling methods and rationale have since been issued to NRW. Further information will be included within the Wylfa Newydd Environmental Statement and through future consultation.
Marine environment	NRW requested clarification on the geophysical survey methodology, results and interpretation with regards to identifying suitable benthic survey sites, creation of seabed habitat maps and identification of biogenic reef features.	The geophysical survey methodology, results and interpretation will be outlined the Wylfa Newydd Environmental Statement. Its use to inform the selection of benthic survey sites will also be included. The presence of biogenic reef features has been determined using a multi-method approach which has included benthic grab, drop-down camera and dive surveys. A synthesis of these findings will be provided within the Wylfa Newydd Environmental Statement.

Marine environment	NRW requested clarification on the rationale for using a '5km zone of influence' to define the marine environmental study area.	<p>The rationale for the 5km zone of influence was based on early modelling of the proposed discharge. As the present design has a lower Cooling Water discharge volume and the same temperature rise as earlier predictions, updated modelling demonstrates a smaller zone of influence within which to assess thermal impacts from the Cooling Water discharge, contaminant levels and possible changes to physical processes.</p> <p>The 'study area' which extends around 5km east and west from the Power Station with many additional sampling sites further afield, provides a more appropriate description of the area surveyed. The term 'study area' will therefore be used in place of 'zone of influence' where appropriate. The potential zone of influence relating to each receptor will be considered under the appropriate headings within the baseline sections of the Wylfa Newydd Environmental Statement.</p>
Marine environment	NRW identified a requirement to clearly identify habitats and species of conservation importance that may be affected by all stages of the development both inside and outside of protected sites, specifically referencing subtidal <i>Sabellaria spinulosa</i> reef.	Species and habitats of conservation importance will be identified within the Wylfa Newydd Environmental Statement. The presence of <i>S.spinulosa</i> biogenic reef has been investigated through a number of surveys and no structures have been recorded within or near the footprint of the marine works. These data will be summarised in the Wylfa Newydd Environmental Statement.
Marine environment	NRW identified a requirement to consider existing activities or operations in the area (e.g. local cables, pipelines, other coastal outfalls, etc.) as well as new projects or plans, within the cumulative impact assessment.	Considerations of new and existing activities or operations which are likely to have an impact on the marine environment within the vicinity of the Wylfa Newydd Development Area will be considered within the Wylfa Newydd Environmental Statement.
Marine environment	NRW welcomed early discussion on the breakwater design in terms of biodiversity enhancement measures and reducing the likelihood of colonisation by invasive non-native species (INNS).	Additional mitigation measures relating to effects within the marine environment will be outlined within the Wylfa Newydd Environmental Statement.

Marine environment	<p>NRW is aware that a number of terrestrial and aquatic INNS are present on site. In this case, biosecurity issues concern INNS and diseases. The proposed works have the potential to cause both the introduction and spread of INNS. We therefore advise that the provisions of the Environmental Statement include a Biosecurity Risk Assessment, which will be implemented during all phases of the proposal including construction and operation of the facility. This information will also be required to inform the HRA. We anticipate that the Biosecurity Risk Assessment will detail:</p> <ul style="list-style-type: none"> <li>a. measures that will be undertaken to control and eradicate INNS within the area of works; and</li> <li>b. measures or actions that aim to prevent INNS being introduced to the site for the duration of construction phase of the scheme.</li> </ul>	INNS are considered during screening in the HRA work. A Biosecurity strategy will be included with the Marine Licence application.
Marine environment	NRW emphasised that there <i>“is a high degree of connectivity around the Welsh coast and bottlenose dolphins and grey seals from Welsh SACs are regularly sighted off the north Anglesey coast”</i> . Consideration of the relevant Marine Mammal Management Unit (MMU) with the HRA was recommended.	Consideration of the assessment of effects on the Celtic and Irish Sea MMU for harbour porpoise, Irish Sea MMU for bottlenose dolphin and the west England and Wales for grey seals will be made within the Wylfa Newydd Environmental Statement and HRA.
Marine environment	NRW identified that the PEI report did not provide detailed information on the likely noise levels during construction works and recognised the need to assess impacts of noise and appropriate mitigation as per JNCC (2010) guidelines.	Underwater noise modelling has since been undertaken, the results of which will be reported with the noise chapter of the Wylfa Newydd Environmental Statement. The effects of underwater noise on marine receptors will also be considered.
Marine environment	NRW advises that an assessment of impacts on bird colonies which have mean maximum foraging ranges that overlap with the Wylfa Newydd Development Area as well as the locations of Associated Development should be included to inform the decision to scope designated sites in and out of the assessment.	The assessment will consider all bird species that have been recorded within the baseline surveys which include all species that have foraging ranges that overlap with the Wylfa Newydd Development Area.
Marine environment	The potential for construction activities to produce sediment plumes and indirectly affect foraging birds should be considered.	This will be addressed in the Wylfa Newydd Environmental Statement and HRA.

Landscape and visual amenity	The proposed breakwater will be in line with the significant view from Cestyll Garden and has a justification linked to creating a calm water environment for cooling water intake. No evidence provided to suggest that this could be achieved.	The potential effects on Cestyll Garden, including the significant views from the garden, will be assessed and are presented within the Wylfa Newydd Environmental Statement, including mitigation where relevant. A wave modelling study is currently underway and will be presented within the DCO Environmental Statement..
Landscape and visual amenity	The planned breakwater structure north-west of Porth-y-pistyll, with second and smaller breakwater to the north-east and the MOLF and its activities will have an adverse impact on the significant views from Cestyll Garden as well as on the settings of the Listed Buildings adjacent to Cestyll Garden. Further detail is required on potential impacts and mitigation.	The potential effects on Cestyll Garden, including the significant views from the garden, will be assessed and are presented within the Wylfa Newydd Environmental Statement, including mitigation where relevant. Further stakeholder engagement will be undertaken.
Landscape and visual amenity	Given the scale of the proposal and sensitive landscape and seascape location, we consider that the draft principles for the Landscape and Environmental Masterplan (LEMP) need to develop and flow from a landscape character approach so that factors contributing to landscape aesthetics (e.g. designing with the landscape form, scale, pattern of landcover, habitat potential, colour and architectural options) are developed as one scheme through the analysis of the key viewpoints.	The LEMP has been developed in order to reflect the existing landscape character of the surrounding area. A key aim is to recreate a natural agricultural landscape surrounding the Power Station on completion of Main Construction, in order to help blend it into the existing landscape.

## A.2 2016 Scoping Opinion

**Table A2 Horizon's responses to 2016 Scoping Opinion response of relevance to the marine licensable activities**

Topic	2016 Scoping Opinion response	Horizon response
Project description	The Secretary of State expects to see sufficient detail in the description of the Project in respect of the key marine elements of the scheme namely the breakwaters, MOLF, dredging activities, and the cooling water intake and outfall. Where flexibility is to be retained or uncertainty remains as to the detailed design of these aspects, this should be clearly presented and there should be a clear explanation of how a 'worst case' approach to the assessment has been adopted.	The full details of the Project will be provided in the Wylfa Newydd Environmental Statement, highlighting any areas that are presented as a worst case.
Alternatives	The Environmental Statement must set out an outline of the main alternatives studied by the applicant and provide an indication of the main reasons for the applicant's choice, taking account of the environmental effect. Matters should be included, such as <i>inter alia</i> alternative design options and alternative mitigation measures. The justification for the final choice and evolution of the scheme development should be made clear. Where other sites have been considered, the reasons for the final choice should be addressed. The Secretary of State advises that the Environmental Statement should give sufficient attention to the alternative forms and locations for the off-site proposals, where appropriate, and justify the needs and choices made in terms of the form of the development proposed and the sites chosen.	The Wylfa Newydd Environmental Statement will provide full details of the alternatives considered, and the justification for the chosen option as presented in the 2016 Scoping Report.
Mitigation	The Applicant should clearly describe mitigation that is embedded and how it is proposed to be secured within the design and presented within the DCO application. There should be a clear distinction between mitigation that is proposed in response to effects identified in the EIA and that which is inbuilt/ inherent in the design. In the case of the latter, the Secretary of State will expect to understand how the embedded mitigation has been considered within the EIA.	Additional mitigation proposed in response to effects identified in the EIA will be clearly described in a Schedule of Environmental Commitments, along with a description of how that mitigation would be secured. The Wylfa Newydd Environmental Statement will make clear definitions of the mitigation applied.
Other Impact Assessments	Section 7.3 of the 2016 Scoping Report refers to 'Other Impact Assessments' that the Applicant will undertake, namely a Health Impact Assessment (HIA)	The Wylfa Newydd Environmental Statement will cross-refer to relevant documents including the HIA and HRA.



Topic	2016 Scoping Opinion response	Horizon response
	and Habitats Regulations Assessment (HRA). The Secretary of State recommends that there is a suitable degree of cross-reference between these documents and the relevant sections of the Environmental Statement to minimise duplication and to assist in the overall cohesion of the environmental assessment information submitted as part of the DCO application. This is of particular relevance where the same evidence base is used for the purposes of multiple assessments.	
Coastal processes and coastal geomorphology	The Applicant has defined a study area within a 5km radius of the Power Station Site. Although a degree of knowledge, modelling and professional judgement has been cited as the reason for defining a 5km zone, the Secretary of State would expect the Environmental Statement to include further reasoned justification as to why this is appropriate, as well as documented 35 Scoping Opinion for Power Station agreement with statutory consultees to this effect. The Applicant's attention is also drawn to the comments of NRW (see appendix 3 of this Opinion) in relation to study areas.	<p>The issue of the study area has been further discussed with NRW on 30 September 2016 and will be addressed in the Wylfa Newydd Environmental Statement.</p> <p>Coastal geomorphology receptors do have a study area of approximately 5km as significant effects on the geomorphology of the coastline are not expected to extend beyond this distance.</p> <p>However, coastal processes study areas vary depending on the issue under discussion. For the dispersion of fugitive dredged sediment and fine silt it has been agreed to a study area which extends for a distance of up to one to two tidal excursions from the Power Station Site.</p> <p>However, in terms of the effects of marine activities on local wave and current patterns, this study area is currently coincident with the 5km study area.</p>
Coastal processes and coastal geomorphology	The Scoping Report states that the determination of the significance of effect will be through use of professional judgement, taking into account the value of the receptor and the magnitude of effect using a matrix. The Secretary of State expects that criteria for determining receptor value and magnitude of effect should be clearly expressed within the Environmental Statement and that the application of professional judgement is clearly justified in this respect. The Secretary of State also recommends early agreement with statutory consultees as to the prescription of values to individual receptors.	The criteria for determining the value of the receptor and magnitude of effect will be clearly set out in the Wylfa Newydd Environmental Statement. Comments from NRW on the value of receptors will be considered and where professional judgement has been used this will be justified.
Coastal	The Secretary of State draws the Applicant's attention to <i>TAN14 Coastal</i>	TAN 14 will be taken into account in the coastal

Topic	2016 Scoping Opinion response	Horizon response
processes and coastal geomorphology	<i>Planning</i> (1998), which is omitted from the list of TANs considered relevant to the potential environmental impacts of the proposed development in section 2.1.2. The Applicant is expected to refer to the guidance within TAN14 during the EIA process and within the Environmental Statement.	processes and coastal geomorphology chapter of the Wylfa Newydd Environmental Statement.
Coastal processes and coastal geomorphology	The Flood Consequence Assessment will need to overlap and cross-refer to both the surface water and coastal processes chapters so as to consider the impacts of the Proposed Development in terms of flooding.	The Flood Consequence Assessment will be provided as an Appendix to the Wylfa Newydd Environmental Statement and will cross-refer to both the coastal processes and coastal geomorphology chapter and the surface and groundwater chapter.
Coastal processes and coastal geomorphology	The Secretary of State would expect the potential impacts of dredging during construction and operation to be assessed as part of the EIA, with mitigation measures proposed where appropriate.	This will be addressed fully in the Wylfa Newydd Environmental Statement chapter on coastal processes and coastal geomorphology and has been extensively modelled using Delft-3D.
Coastal processes and coastal geomorphology	The Secretary of State draws the Applicant's attention to comments made in respect of consideration of designated sites as part of The Marine Environment chapter of this Scoping Opinion. It is considered that those comments apply equally in the context of the assessment of coastal processes.	The potential for effects on the geomorphology of the designated sites from changes to coastal processes will be addressed in the coastal processes and coastal geomorphology chapter of the Wylfa Newydd Environmental Statement; but the effects on habitats and species, which are features of designated sites, will be considered in the marine environment chapter of the Environmental Statement.
Coastal processes and coastal geomorphology	The Secretary of State notes the Applicant's consideration of water body classifications under the WFD as well as the need for an FCA to accompany the DCO Application. The Scoping Report does not make it specifically clear whether these reports will be standalone, incorporated within the Environmental Statement or otherwise appended to the Environmental Statement.	The WFD and FCA reports will be presented as standalone reports appended to the Wylfa Newydd Environmental Statement.
Coastal processes and coastal	In the case of the WFD, the Secretary of State understands that a WFD compliance assessment report will be prepared as part of the application documents; the Applicant is advised to consult with NRW as to the scope of	Consultation with NRW on the approach to WFD has been undertaken and it was agreed that a standalone WFD assessment will be provided as an appendix to the

Topic	2016 Scoping Opinion response	Horizon response
geomorphology	this assessment and its integration within the EIA as appropriate and is directed to their comments in Appendix 3 of this Opinion in this regard. The Applicant should also consider the most appropriate method of presenting this information and ensure it is appropriately cross-referenced throughout relevant sections of the Environmental Statement.	Wylfa Newydd Environmental Statement.
Coastal processes and coastal geomorphology	A separate section of the Environmental Statement chapter should include a list of the consultation undertaken with relevant stakeholders during the EIA process. The council would expect to have the ability to shape the approach to EIA, WFD assessment and FCA, in conjunction with NRW.	Consultation has been undertaken. A summary of the consultation undertaken for the preparation of each chapter will be provided within the Wylfa Newydd Environmental Statement.
Coastal processes and coastal geomorphology	The applicant should also be aware that consideration must be given as to whether the proposed works as part of the DCO application could prevent any mitigation measures or actions intended to achieve Good Ecological Status/Good Ecological Potential from being implemented, which could result in the water body failing to meet its objectives. Where a scheme is considered to cause deterioration, or where it could contribute to a failure of the water body to meet Good Ecological Status or Good Ecological Potential, then an Article 4.7 assessment would be required.	Consultation with NRW on the approach to WFD has been undertaken and it has been agreed that a standalone WFD assessment will be provided with the Wylfa Newydd Environmental Statement. This will assess the Wylfa Newydd Project in relation to WFD objectives, including whether it could prevent any water bodies from reaching Good Ecological Status/Good Ecological Potential or any mitigation measures or actions from being implemented. It is recognised that if the objective is not achieved then an Article 4.7 (under the Water Framework Directive) assessment would be required.
Coastal processes and coastal geomorphology	The Environmental Statement should include a WFD Compliance Assessment report and NRW advise the applicant to seek further advice from NRW on the preparation and completion of this report.	Consultation with NRW on the approach to WFD has been undertaken and it has been agreed that a standalone WFD assessment will be provided with the Wylfa Newydd Environmental Statement.
Coastal processes and coastal geomorphology	NRW advice that the applicant should update Water Framework Directive Water Body references to reflect changes made in cycle 2 of River Basin Planning (2015-2021).	The Wylfa Newydd Environmental Statement will use the 2015 (cycle 2) WFD water bodies and their current designations.
Coastal processes and coastal	Section 2.1.2 of the 2016 Scoping report describes the Welsh Planning Context where TANs have been considered relevant to the potential environmental impacts of the developments. An omission from the Scoping	TAN 14 will be included in the list of guidance documents within the Wylfa Newydd Environmental Statement and will be considered in the FCA.

Topic	2016 Scoping Opinion response	Horizon response
geomorphology	report is TAN 14 Coastal Planning (1998).	
Marine environment	<p>The Secretary of State is unclear about the existence of the sites named as “Northwest Anglesey” SAC and SPA. The Secretary of State is aware that NRW is currently consulting on proposals which involve the establishment of three new potential SACs:</p> <ul style="list-style-type: none"> <li>• North Anglesey Marine</li> <li>• West Wales Marine; and</li> <li>• Bristol Channel Approaches</li> </ul>	The names of the sites are noted and will be referred to consistently within the Wylfa Newydd Environmental Statement.
Marine environment	<p>The consultation also includes one new proposed SPA and the extension of two existing SPAs:</p> <p>Northern Cardigan Bay (new SPA);</p> <p>Skomer, Skokholm and the seas off Pembrokeshire (new SPA is an extension to an existing SPA); and</p> <p>Anglesey Terns (new SPA is an extension to an existing SPA).</p>	The Anglesey Terns SPA has been included within this Marine Works Scoping Report. All relevant designated sites will be included within the HRA
Marine environment	The Applicant should ensure they correctly identify designated sites within the Environmental Statement and carefully consider the scope of the EIA assessments. The Secretary of State considers that the sites for which formal consultation has begun should be considered within the assessment.	We will consider effects on the proposed sites under formal consultation within the Wylfa Newydd Environmental Statement.
Marine environment	The Secretary of State notes that European Designated Sites are located close to the proposed development, including Cemlyn Bay SAC and Ynys Feurig, Cemlyn Bay and The Skerries SPA. The Secretary of State also recognises NRW’s ongoing consultation process with regard to the establishment of three new SACs (currently designated as Candidate SACs (c s)), one new SPA and the extension of two existing SPAs as described at section 3 of this Scoping Opinion. The applicant is reminded that (as dictated by Government policy) possible SACs and SPAs should be treated as if they were formally designated (in terms of assessment of new activities) and afforded legal protection under the Habitats Directive.	The proposed SACs and SPAs will be treated in the same way as the already designated European Designated Sites in the HRA documentation and the Wylfa Newydd Environmental Statement.
Marine	When considering aspects of the environment likely to be affected by the	Where there is the potential for an source-effect

Topic	2016 Scoping Opinion response	Horizon response
environment	proposed development; including flora, fauna, soil, water, air and the inter-relationship between these, consideration should be given to the designated sites in the vicinity of the proposed development.	pathway, (be it direct or indirect) to impact on European Designated Sites these will be considered in the HRA screening and Appropriate Assessment work.
Marine environment	Effects upon European Designated Sites which are considered within the HRA should also be identified within the relevant chapters of the Environmental Statement. Particularly in the case of European Designated Sites, a consideration of effects is a requirement of separate legislation (the Habitats Directive and the EIA Regulations) and coverage within one should not remove the need for consideration within the other.	We will consider effects on the actual and proposed European Designated Sites within the Wylfa Newydd Environmental Statement and the HRA separately in accordance with the applicable legislation in each case.
Marine environment	The Secretary of State welcomes the consideration of the Water Framework Directive (WFD) within the ecological assessment and advises that appropriate cross-reference is made to the WFD assessment.	We have consulted with NRW on the approach to WFD and have agreed that a standalone WFD assessment is provided with the Wylfa Newydd Environmental Statement.
Marine environment	The Environmental Statement should set out the make-up of the cooling water, so for example its volume, chemical and thermal characteristics.	The Wylfa Newydd Environmental Statement will set out the make-up of the cooling water within the marine environment chapter.
Marine environment	IACC outlined a requirement to consider the intra-development effects upon receptors, particularly seabirds and cumulative impacts.	Intra-development effects will be considered for each topic and cumulatively within the Wylfa Newydd Environmental Statement.
Marine environment	IACC suggested that equal weight should be given to proposed and existing SAC and SPA designations in Wales.	Proposed SAC and SPA will be given equal weighting to designated sites throughout the HRA and EIA.
Marine environment	IACC, the Planning Inspectorate and NRW identified that the Scoping Opinion did not consider the potential impacts on Cemaes Bay as a European designated Bathing Water. IACC stated that mitigation measures need to be in place to maintain and, if possible, enhance water quality of the bay.	An assessment of the effects on the bathing water at Cemaes will be included within the Wylfa Newydd Environmental Statement and in the accompanying WFD Assessment. Mitigation will be outlined where appropriate.
Marine environment	The Planning Inspectorate found it unclear whether the proposed study area of 5km is only to inform the survey effort or whether the Applicant is proposing that this forms the assessment area for the EIA. The Secretary of State considers that the zone of impact of the proposed development (in terms of hydrodynamics and sediment transport) may be greater than 5km	The 5km study area describes the area where surveys were concentrated. The extent of the study area was determined based on early modelling runs that showed the extent of the potential changes to hydrodynamic processes and sediment transport. The updated

Topic	2016 Scoping Opinion response	Horizon response
	when considering all of the proposed offshore structures.	hydrodynamic modelling has confirmed this area is still appropriate for the purposes of EIA, although zones of influence will be defined for specific receptors.  This study area fully covers the areas where potential significant effects on marine environment receptors may occur.
Marine environment	The Planning Inspectorate would expect to see technical justification of the defined study areas and survey methodologies with particular reference to designated sites and agreement with the statutory nature conservation bodies. The Applicant should explain any variations in study areas across the different aspects of the marine environment that are being considered.	It is recognised that the study area should not represent a fixed area across which all aspects of the marine environment should be assessed. Further information and justification of the defined survey areas and methodologies will be provided in the Wylfa Newydd Environmental Statement and supporting appendices.
Marine environment	The Planning Inspectorate expects to see evidence of agreement with IACC and/or NRW as to survey methodologies; survey currency and modelling methodologies relied upon as part of the EIA evidence base.	Survey methodologies have been agreed in consultation with regulators including NRW and Cefas. As the design work has progressed, surveys have been subject to rationalisation, in consultation with regulators, to target specific locations and habitats.
Marine environment	The Planning Inspectorate expects to see sufficient detail in the description of the Project in respect of the key marine elements of the scheme. Where uncertainty remains, this should be clearly presented and there should be a clear explanation of how a 'worst case' approach to the assessment has been adopted.	A full description of key marine elements of the Wylfa Newydd Project will be provided in the Wylfa Newydd Environmental Statement. This will include as much detail as is available at the time of writing. Where work on the design is ongoing or options remain, a realistic worst case scenario will be identified as the basis of the assessment.
Marine environment	The Planning Inspectorate and NRW requested that the Environmental Statement should clearly differentiate direct and indirect effects on the marine environment, particularly in the context of habitat loss and/or disturbance.	Direct and indirect effects on the marine environment will be assessed as separate pathways within the Wylfa Newydd Environmental Statement.
Marine environment	NRW recommends that the Welsh National Marine Plan is considered by the Applicant.	The Welsh National Marine Plan will be considered within the Wylfa Newydd Environmental Statement.

Topic	2016 Scoping Opinion response	Horizon response
Marine environment	NRW identified a requirement to discuss modelling methodologies further, specifically the hydrodynamic modelling and calibration/validation of this.	Calibration and validation of the model has been discussed with NRW, and the model has also been subject to a third-party audit.
Marine environment	NRW noted that the cooling water volume is still to be confirmed and that further modelling work is to be undertaken. NRW advised that the study area should adequately cover the area expected to be impacted by the work (during construction and operation).	The cooling water volume has been confirmed; modelling has been carried out in line with up to date information covering the potential area of impact, the assessment of which will be presented within the Wylfa Newydd Environmental Statement.
Marine environment	NRW advised that it should be ensured that any possible reef locations within the benthic impact zone have been fully investigated and impacts clearly set out in the Environmental Statement.	Additional diver surveys have been carried out to assess the presence of reef structures within the footprint of the marine works. The results of this study will be included within the assessment of effects on benthic habitats and communities in the Wylfa Newydd Environmental Statement.
Marine environment	NRW noted that Annex 1 Rocky reef (including intertidal rocky reef if contiguous with the subtidal) has not been considered as part of the current assessment and ought to be assigned a value of medium alongside rock pool 'special interest' features.	The occurrence of this habitat will be set out in the baseline and included in the assessment within the Wylfa Newydd Environmental Statement.
Marine environment	NRW recommended early discussions with the Applicant on the breakwater design in terms of biodiversity enhancement measures and identified that post-application can be more costly than incorporation of such measures during the design phase.	Enhancement of the breakwater structure to encourage colonisation by native habitats and species has been identified as additional mitigation. Where appropriate enhancements will be incorporated into the design.
Marine environment	Section 16.2.4 of the 2016 Scoping Report states 'numerous techniques' were used for fish surveys. The Secretary of State will expect the Environmental Statement to include sufficient detail regarding all survey data and modelling used in the assessment so as to understand their bearing in the reporting of impacts identified.	A multi-method approach to the collection of baseline fish information was undertaken and full details of this will be included in the Wylfa Newydd Environmental Statement.
Marine environment	NRW requested an evidenced-based assessment of likely effects on marine mammals from the Project and advised that incidental sighting information does not provide sufficient quantitative baseline data.	Additional quantitative surveys have been carried out to provide an evidence-base to support the assessments. This information will be presented within the Wylfa Newydd Environmental Statement and HRA.





Topic	2016 Scoping Opinion response	Horizon response
Marine environment	<p>NRW recognised that the proposed marine works have the potential to generate significant noise and/or vibrations that has the potential to disturb marine mammals and welcomes further questions with regards to underwater noise modelling and assessment methodology.</p> <p>Where appropriate standard noise mitigation as per JNCC (2010) guidelines on mitigation for piling should be utilised.</p>	<p>Underwater noise modelling has been undertaken and will be used to assess the effects to marine mammals and other marine receptors within the Wylfa Newydd Environmental Statement and HRA.</p> <p>Mitigation will be identified and applied as appropriate, including use of the JNCC guidelines.</p>
Marine environment	<p>NRW identified that the Wylfa Newydd Development Area is located in the vicinity of the Ynys Feurig, Cemlyn Bay and The Skerries SPA and emphasised the importance of fully assessing the impacts on the four tern species which are features of the SPA. Appropriate mitigation should also be proposed. NRW requested sufficient baseline data to support this assessment and that mitigation measures are identified where appropriate.</p>	<p>Additional seabird surveys have been undertaken to provide a robust evidence-base for the assessment of effects on seabirds including species which are features of SPAs. This information will be reported in the Environmental Statement and HRA.</p>
Marine environment	<p>NRW identified the Applicant's intention to use Porth-y-pistyll for freight delivery from sea which, in combination with the new breakwaters, would provide a high-risk pathway for marine Invasive Non-Native Species (INNS). It was recommended that risks should be carefully assessed and mitigation measures provided.</p>	<p>The risks of the introduction and spread of INNS due to construction and operation of the Power Station will be assessed and appropriate mitigation proposed within the Environmental Statement.</p>
Marine environment	<p>Section 16.2.2 references water quality. Consideration should be given, either within this chapter, or the socio-economic chapter (tourism) to the status of Cemaes Bay bathing water quality which was judged to be only 'sufficient' during 2015. Whilst the case of deterioration appears to be primarily a result of agricultural and domestic activities (the council has been working with NRW to identify properties with sewerage connections into the sea for example) mitigation measures need to be in place to prevent sedimentation entering the bay to maintain and if possible enhance the water quality of the bay.</p>	<p>Effects from sediment and other water quality parameters, the subsequent effect on Cemaes Bay bathing water quality and any proposed mitigation will be provided within the Marine Environment chapter of the Environmental Statement.</p>
Marine environment	<p>The Scoping report does not mention that Cemaes Bay is a European designated Bathing Water, located approximately 3.5 – 4km to the east. The impact on bathing water quality should be considered when looking at impacts on freshwater and marine sites, both during construction and the</p>	<p>Effects from sediment and other water quality parameters and the subsequent effect on Cemaes Bay bathing water quality will be provided in the marine environment chapter of the Wylfa Newydd</p>

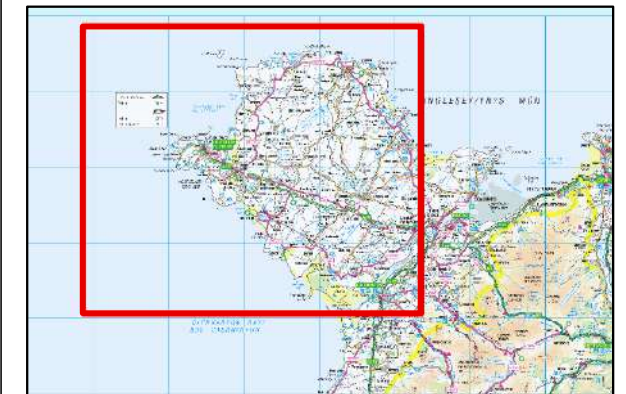
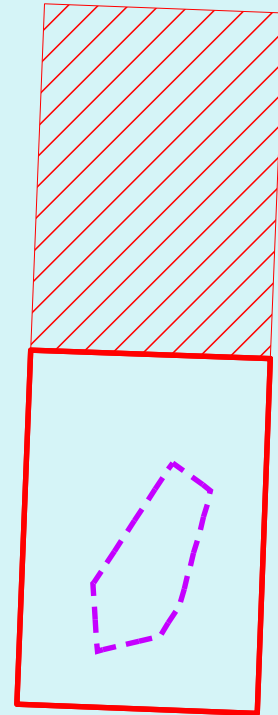
Topic	2016 Scoping Opinion response	Horizon response
	operation of the proposed facility. As well as being directly vulnerable to bacteria in wastewater (e.g. sewage and contaminated/sediment runoff), any additional sediment loading may contain bacteria that could impact on compliance. The scale and length of construction works in the marine environment has the potential to affect water quality e.g. dredging has the potential to cause mobilisation of sediments and any associated contaminants. NRW advise that impacts on the Cemaes Bay Bathing Water during the construction and operational phase are fully assessed within the Environmental Statement and the WFD Compliance Assessment report, and appropriate mitigation specified in the Environmental Statement.	Environmental Statement. Collection of baseline data has included testing of water quality in the Nant Cemaes for bacteriological quality.
Shipping and navigation	Section 8.3 of the 2016 Scoping Report states emissions of air pollutants could result from marine vessels, however there is no further reference to the assessment of these impacts, for example in table 8.1. The Environmental Statement should include an assessment of these potential impacts.	Emissions of air pollutants from marine vessels will be considered in conjunction with the emissions from construction plant and vehicles during the construction phase. The Wylfa Newydd Environmental Statement will include an assessment of these emissions.
Shipping and navigation	No reference is made to the assessment of shipping during the operation of the proposed development. The Secretary of State would expect to see justification of a 'worst case' approach to the assessment where estimates are to be relied upon. The Secretary of State expects that any assessment of construction and operational shipping impacts considers any effects on the commercial operation of Holyhead Port.	The effects of shipping will be considered within the Navigational Risk Assessment and within the Navigation and Shipping Chapter of the Wylfa Newydd Environmental Statement.
Waste Management	The Environmental Statement should detail whether any arisings from rock excavation and dredging would be re-used on site or removed off-site. If the latter, the Environmental Statement should quantify the number of vehicle or vessel movements this would result in.	Description of the proposed development will be further refined to minimise need for flexible consent, and satisfy the requirements of the EIA Regulations regarding to disposal. Full details of vehicle and vessel movements will be included in the traffic and transport, and shipping and navigation chapters of the Wylfa Newydd Environmental Statement.
Cultural heritage	Any archaeological mitigation measures and/or management plans should also be cross-referred with others including the Landscape and Environmental Management Plan and Construction Environmental Management Plan such that mitigation measures are complementary and not	Where required, any archaeological mitigation measures and/or management plans will be cross-referenced with others including the Landscape and Environmental Management Plan and Construction Environmental

Topic	2016 Scoping Opinion response	Horizon response
	contradictory.	Management Plan.
Cultural heritage	At section 17.3.2 of the 2016 Scoping Report, the applicant acknowledges that construction activities associated with the breakwater and the MOLF have the potential to remove any surviving remains of the wreck of the ship, the 'Mary Sutherland' (as well as other unknown archaeological remains). The Secretary of State would expect to see specific mitigation measures proposed in relation to this feature as part of any wider marine archaeological mitigation plan.	<p>A geophysical survey of the Recorded Loss site of the Mary Sutherland has been undertaken and archaeological dive surveys of this site have also been undertaken. Neither survey identified any trace of a wreck or any archaeological material. As there is no assessed impact, no mitigation is required.</p> <p>This will be detailed within the Wylfa Newydd Environmental Statement.</p>
Cultural heritage	It is suggested that the mitigation measures set out in 17.3.3 [of the 2016 Scoping Report] include for publication and wider dissemination of archaeological results (for example through publication of discoveries and/or on site interpretation/visitor centre).	The publication of results of archaeological mitigation will be commensurate with the significance of those results and potentially could include publication and other means of dissemination.
Public access and recreation	Given the proposed construction programme as shown in figure 3.4 [of the 2016 Scoping Report], the Secretary of State would expect the assessment of any 'temporary' impacts on public access and recreation assets to be aligned with the work stages and timescales outlined in the construction programme. Residual impacts should also be reported bearing this in mind.	The assessment of effects on public access and recreation assets will be subdivided by the activities/timescales associated with the works.
Public access and recreation	Government policy advice as set out within NPS EN-6 Volume II identifies that mitigation measures should be considered by the applicant on the matter of coastal recreation and access to the coast advising that the decision-maker consider the implications for development of the creation of a continuous signed and managed route around the coast. The council will expect to see such proposals within the Environmental Statement document.	These matters will be included within the scope of the public access and recreation chapter of the Wylfa Newydd Environmental Statement.



### Legend

-  Wylfa Newydd Development Area
-  Minesto Project Development Area
-  Marine Disposal Site
-  Holyhead Deep disposal site




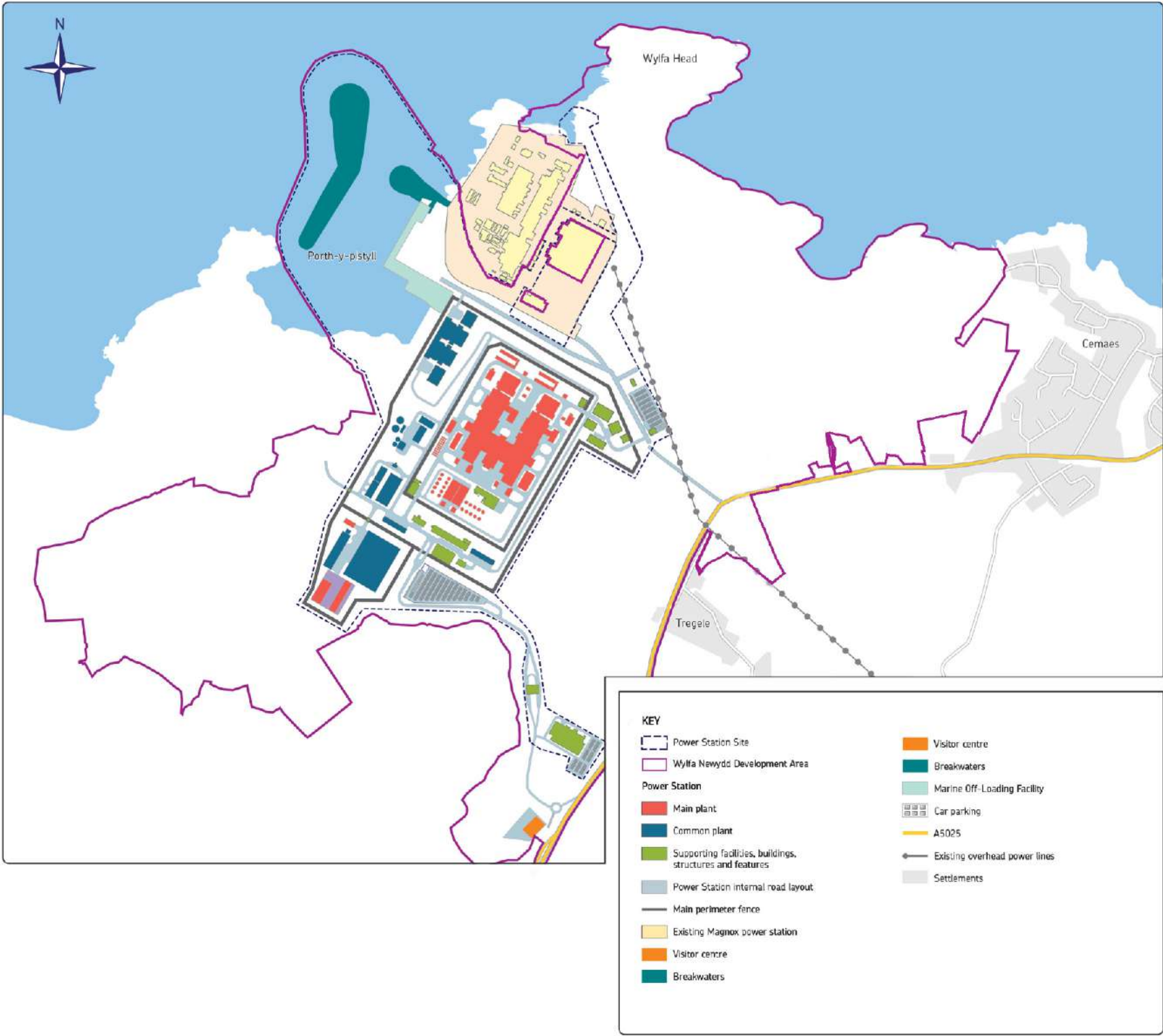
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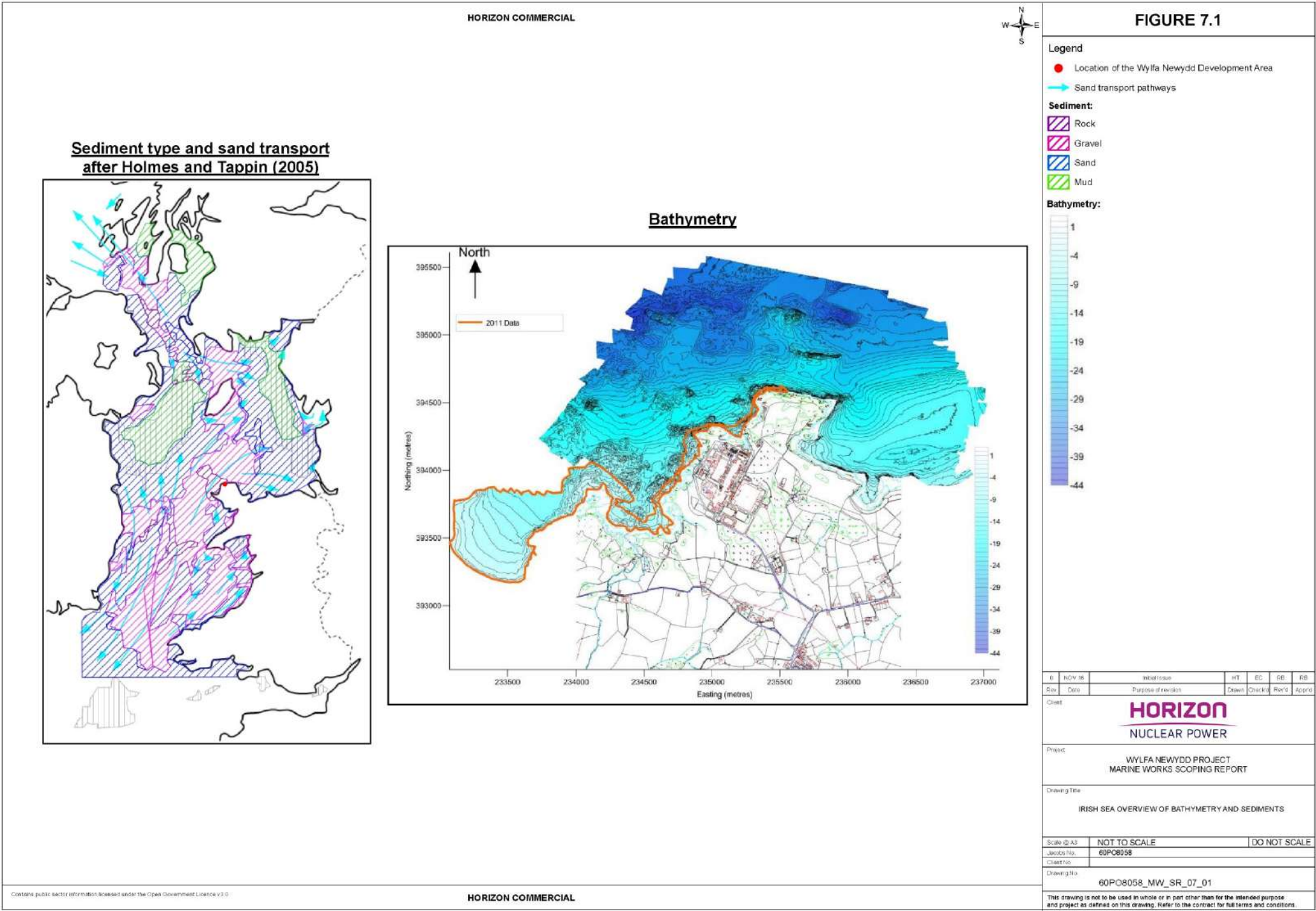


FIGURE 3.1



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Project								
WYLFA NEWYDD PROJECT MARINE WORKS SCOPING REPORT								
Drawing Title								
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Figure 7.1 Irish sea overview of bathymetry and sediments.





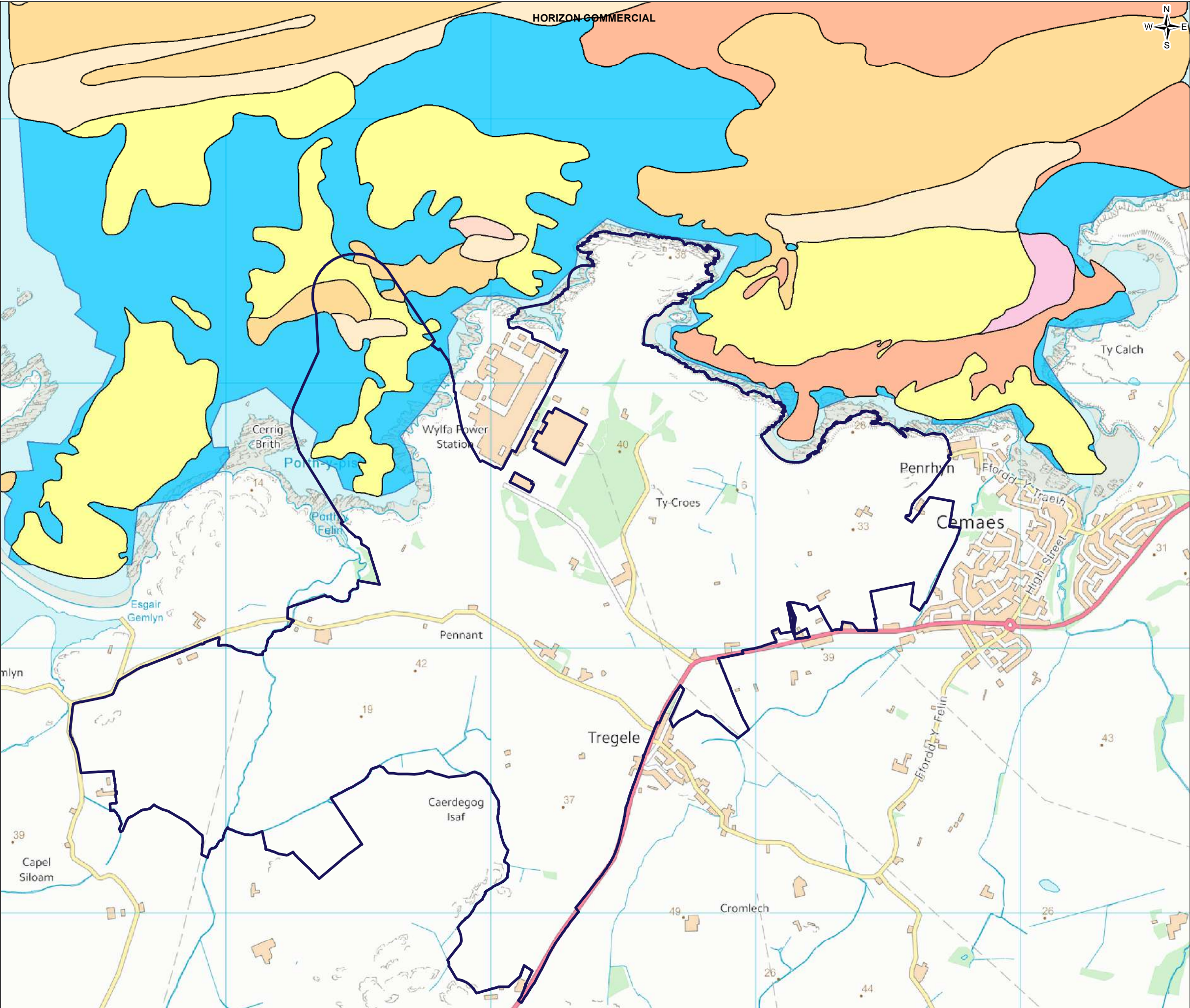


FIGURE 7.2

Legend

Wylfa Newydd Development Area

**Sea bed features**

- Bedrock
- Featureless smooth sandy seabed
- Sandy seabed with megaripples
- Smooth sandy gravel seabed
- Irregular sandy gravel seabed
- Sandy seabed with scattered cobbles
- Coarse gravel seabed
- Very coarse gravel seabed



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Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
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Drawing Title						
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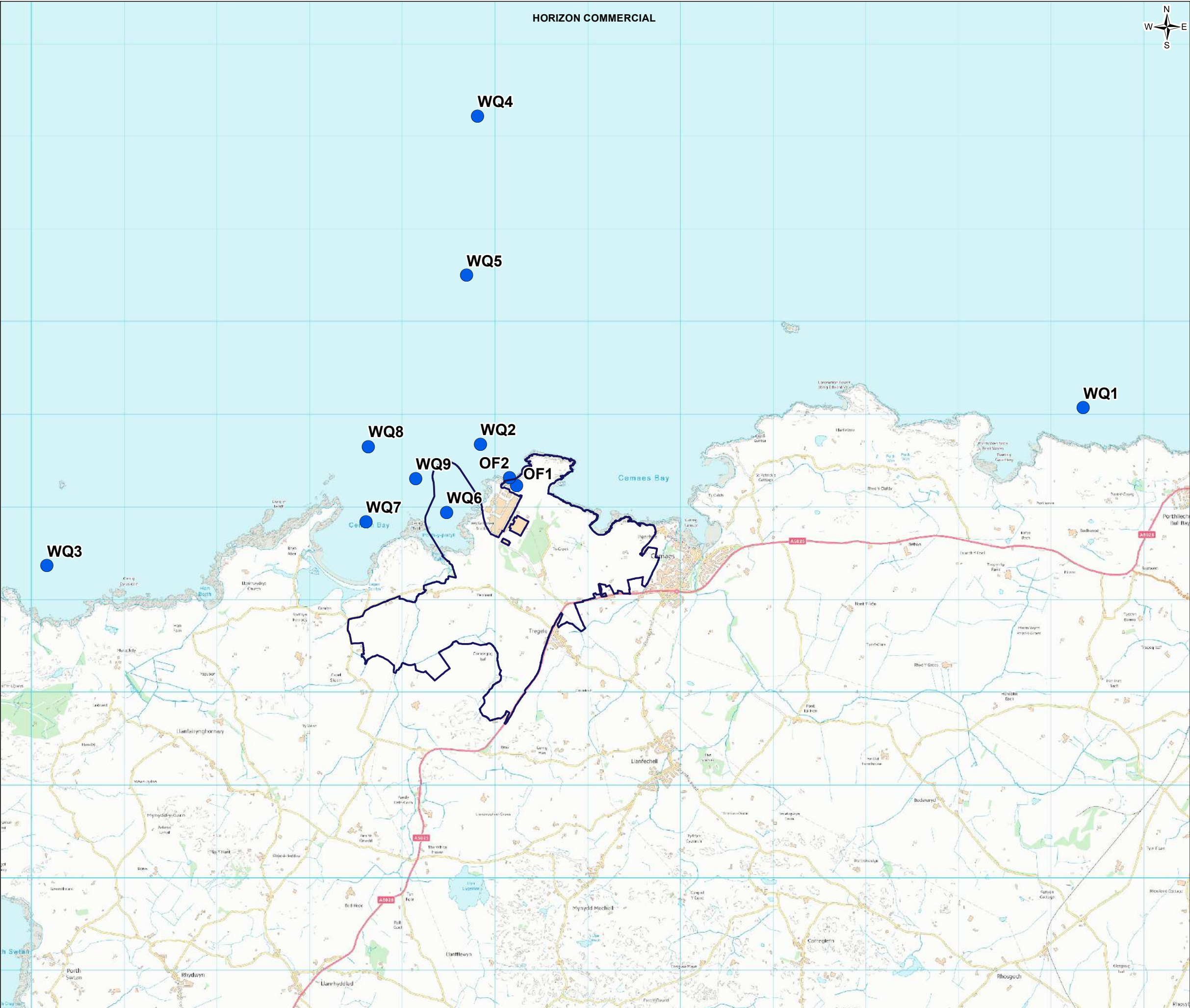


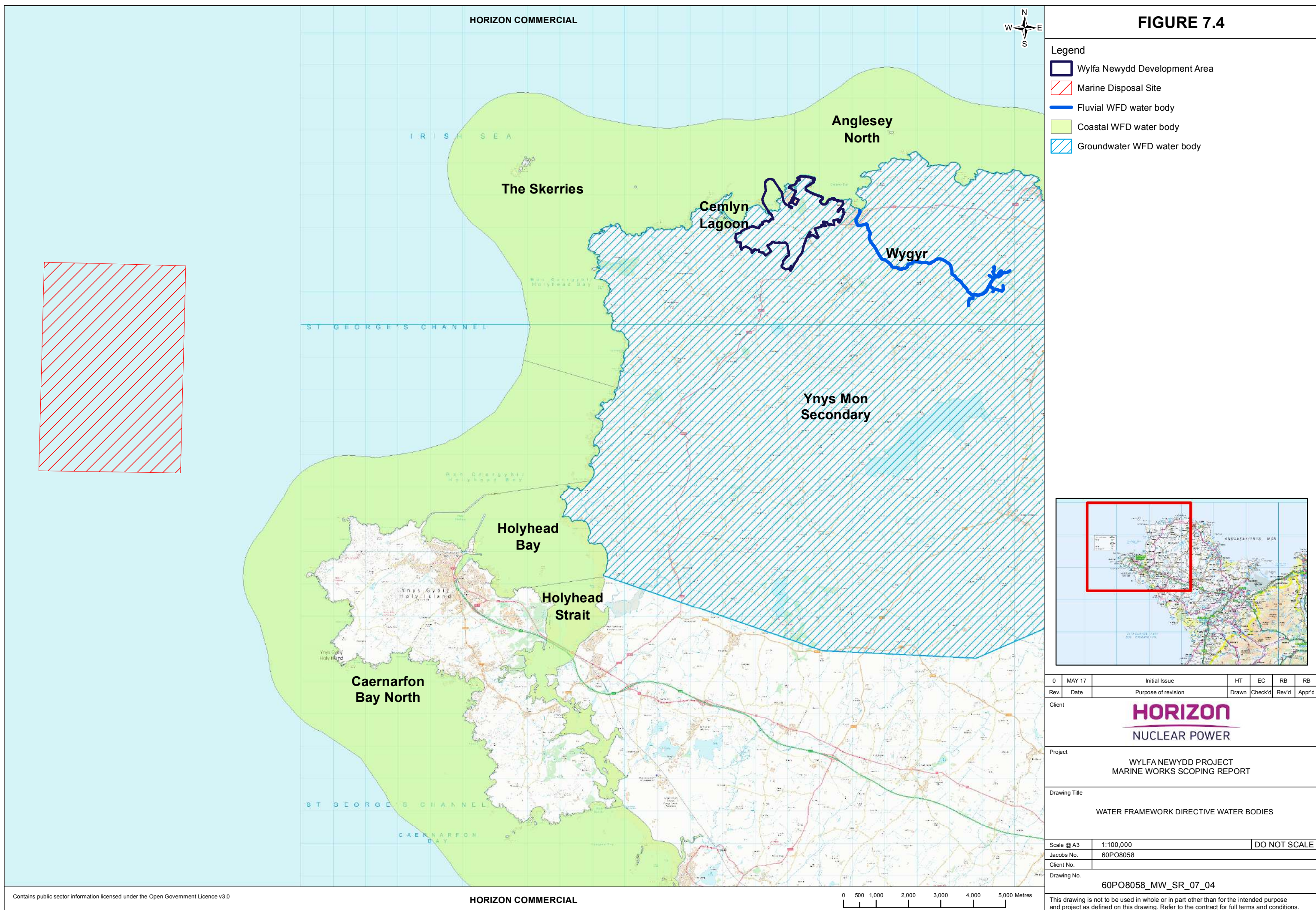
FIGURE 7.3

- Legend
- Wylfa Newydd Development Area
  - Water quality, phytoplankton and zooplankton sampling site



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Project							
WYLFA NEWYDD PROJECT MARINE WORKS SCOPING REPORT							
Drawing Title							
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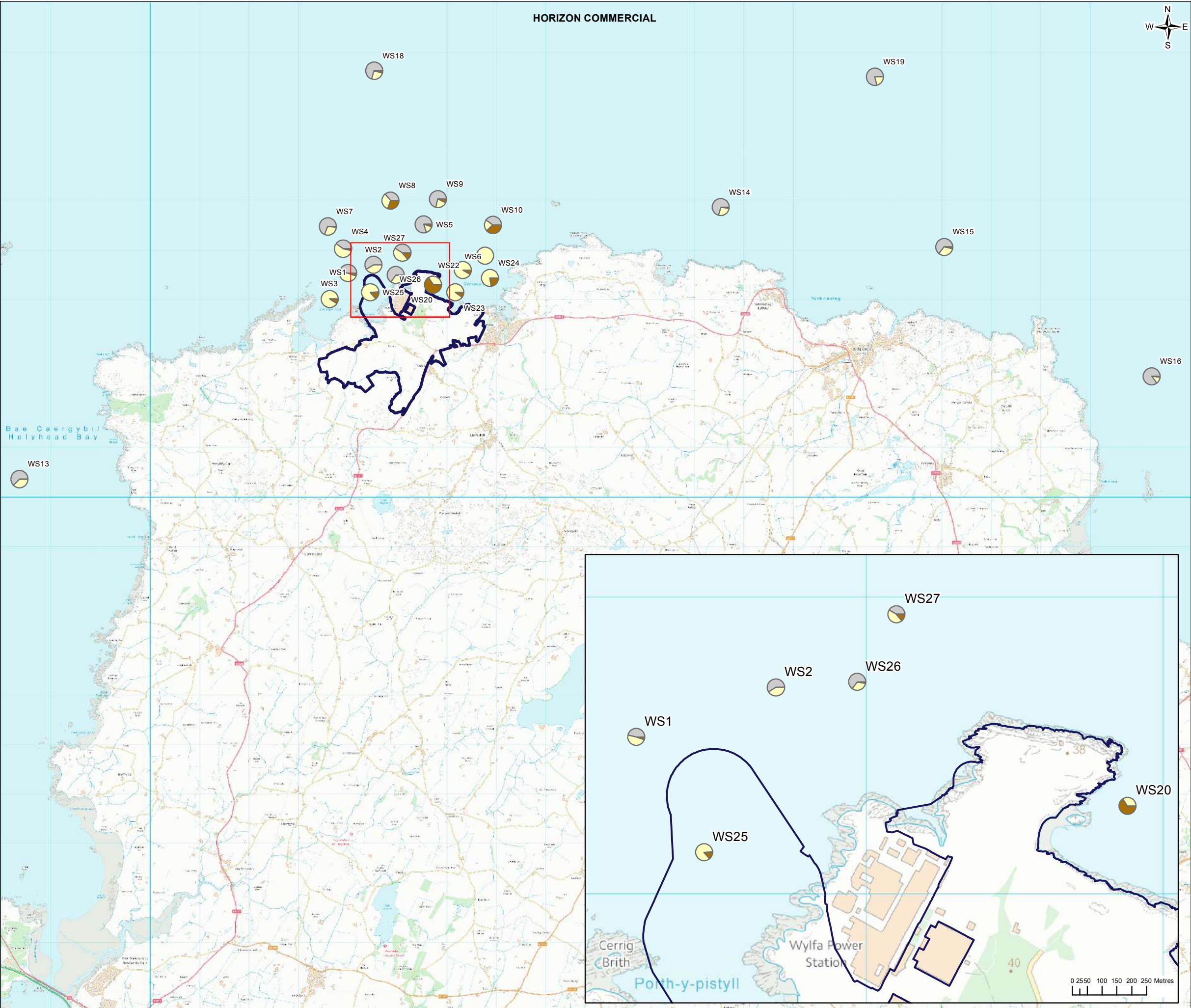


FIGURE 7.5

Legend

Wylfa Newydd Development Area

Subtidal benthic sampling site

Gravel

Sand

Mud

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Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
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Figure 7.6 Marine disposal site sampling locations.

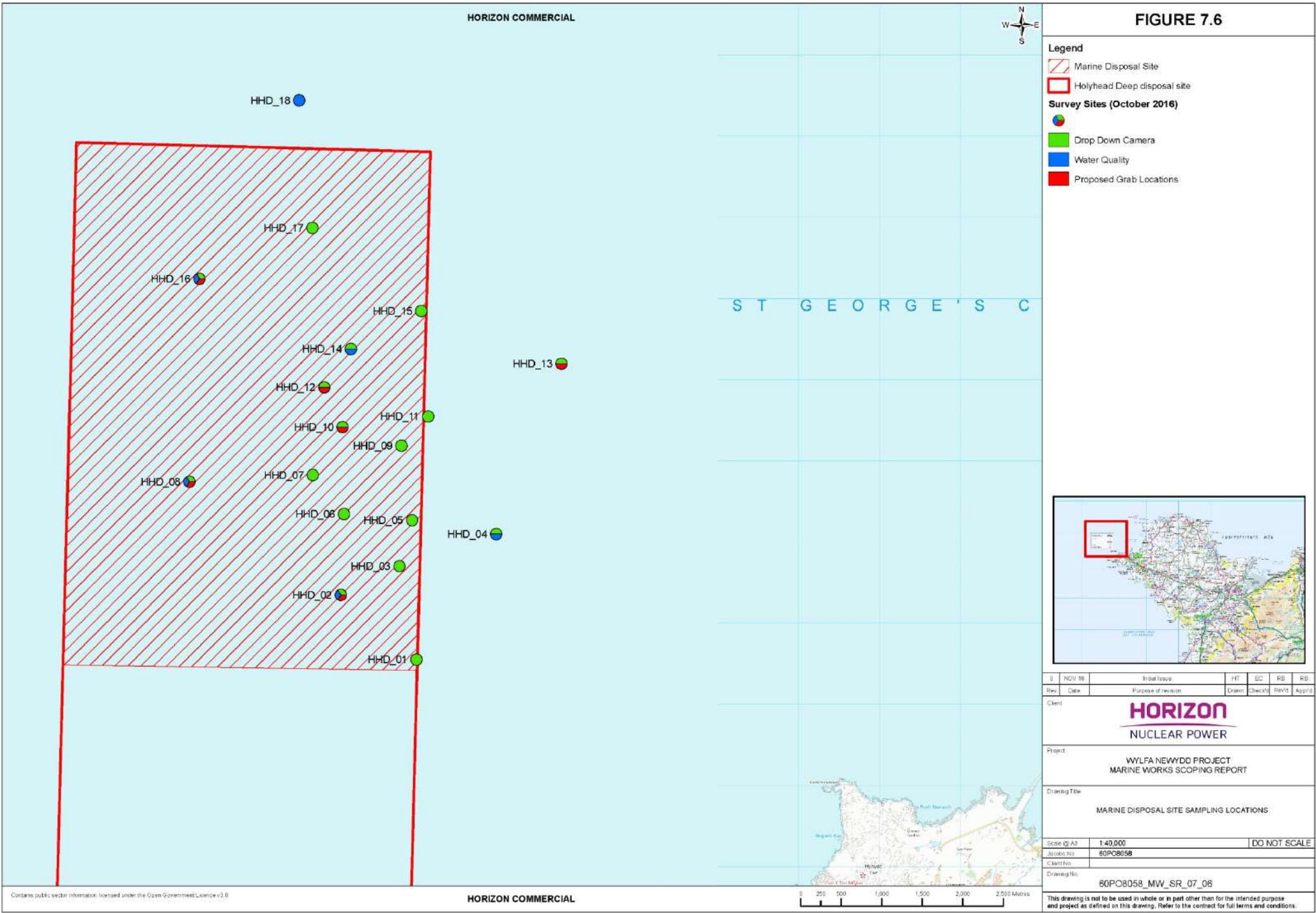




Figure 7.7 Marine and coastal designated sites of national/international importance for conservation.

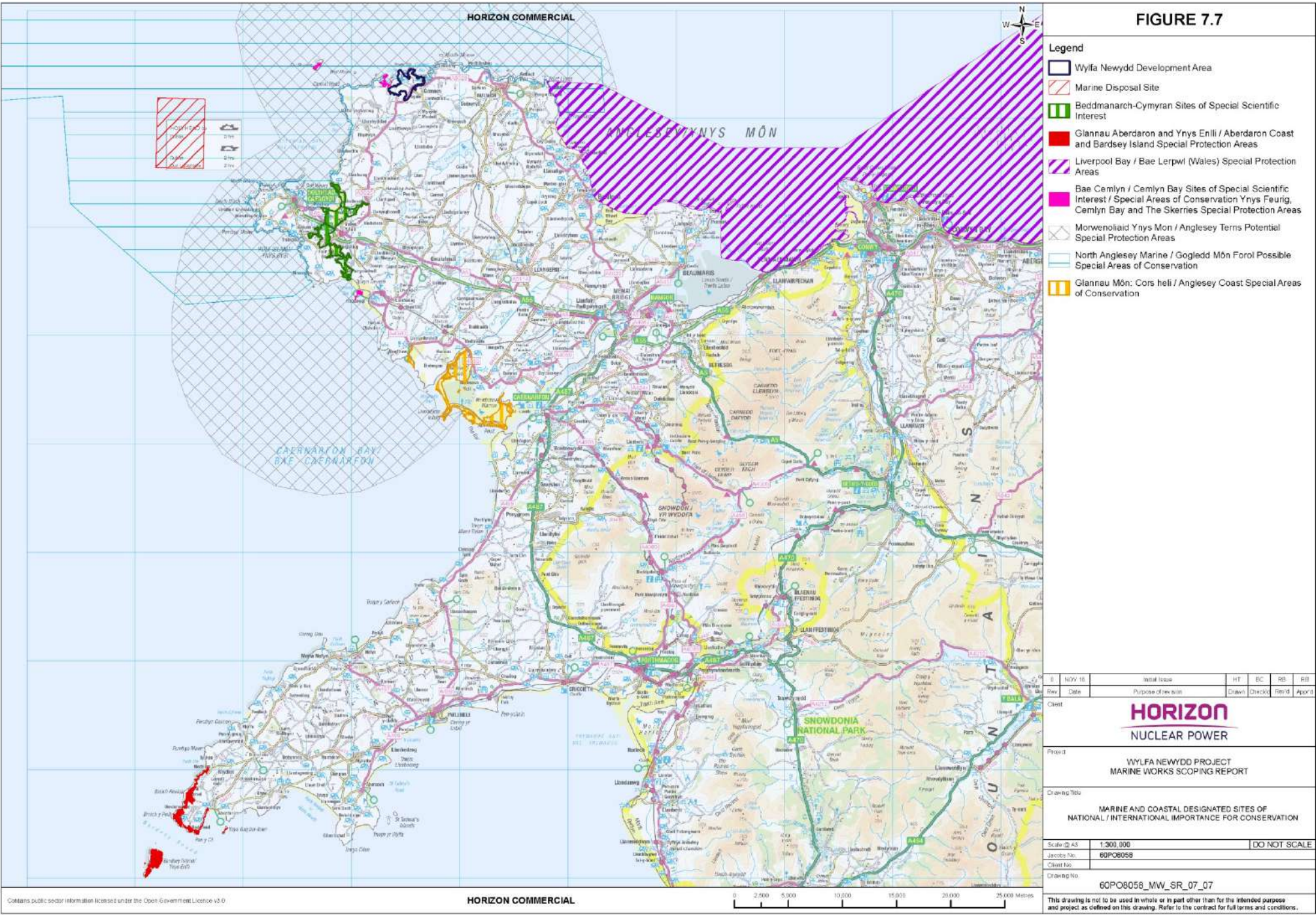




Figure 7.8 Intertidal biotope map of Porth-y-Pistyll and adjacent area.

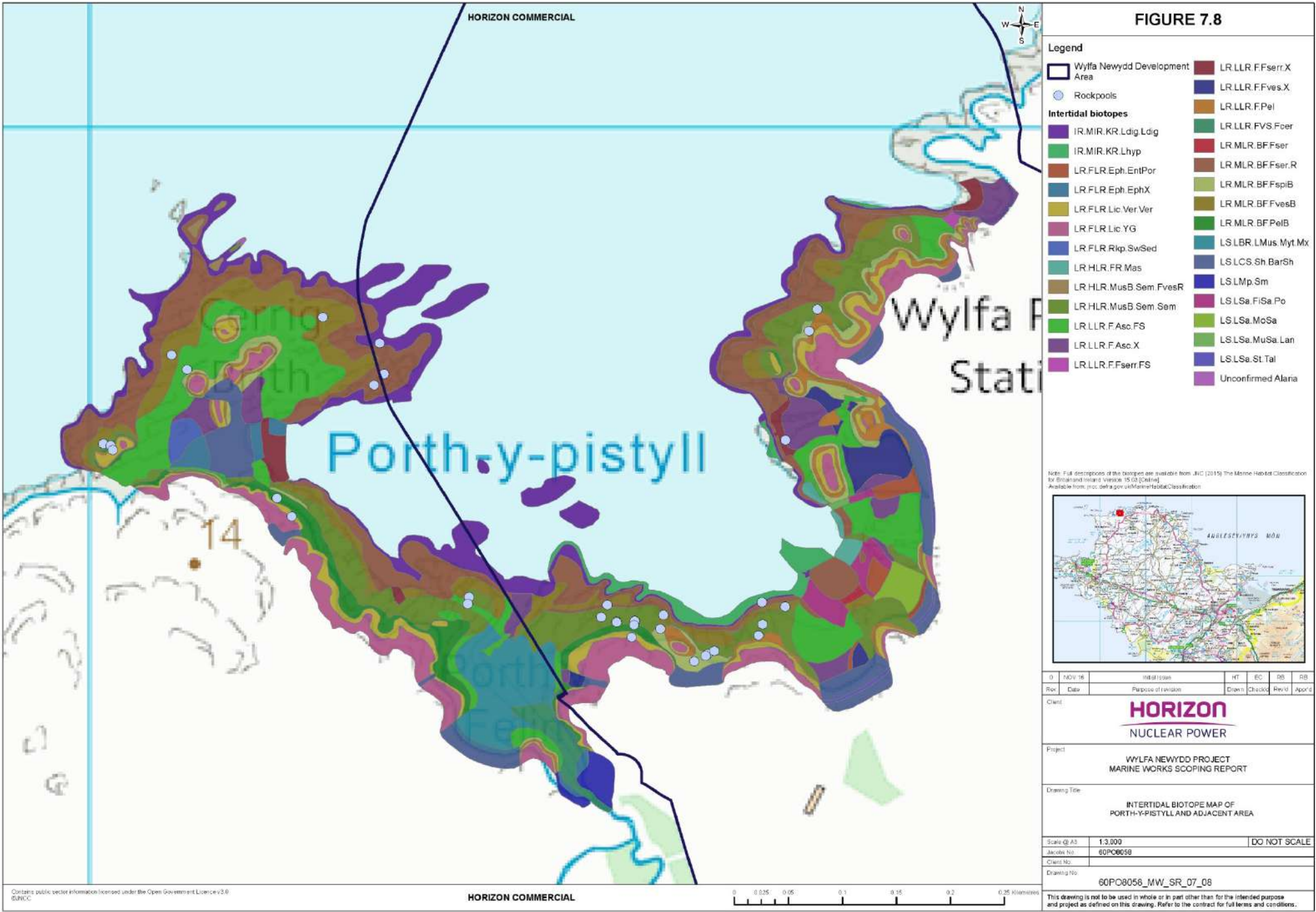
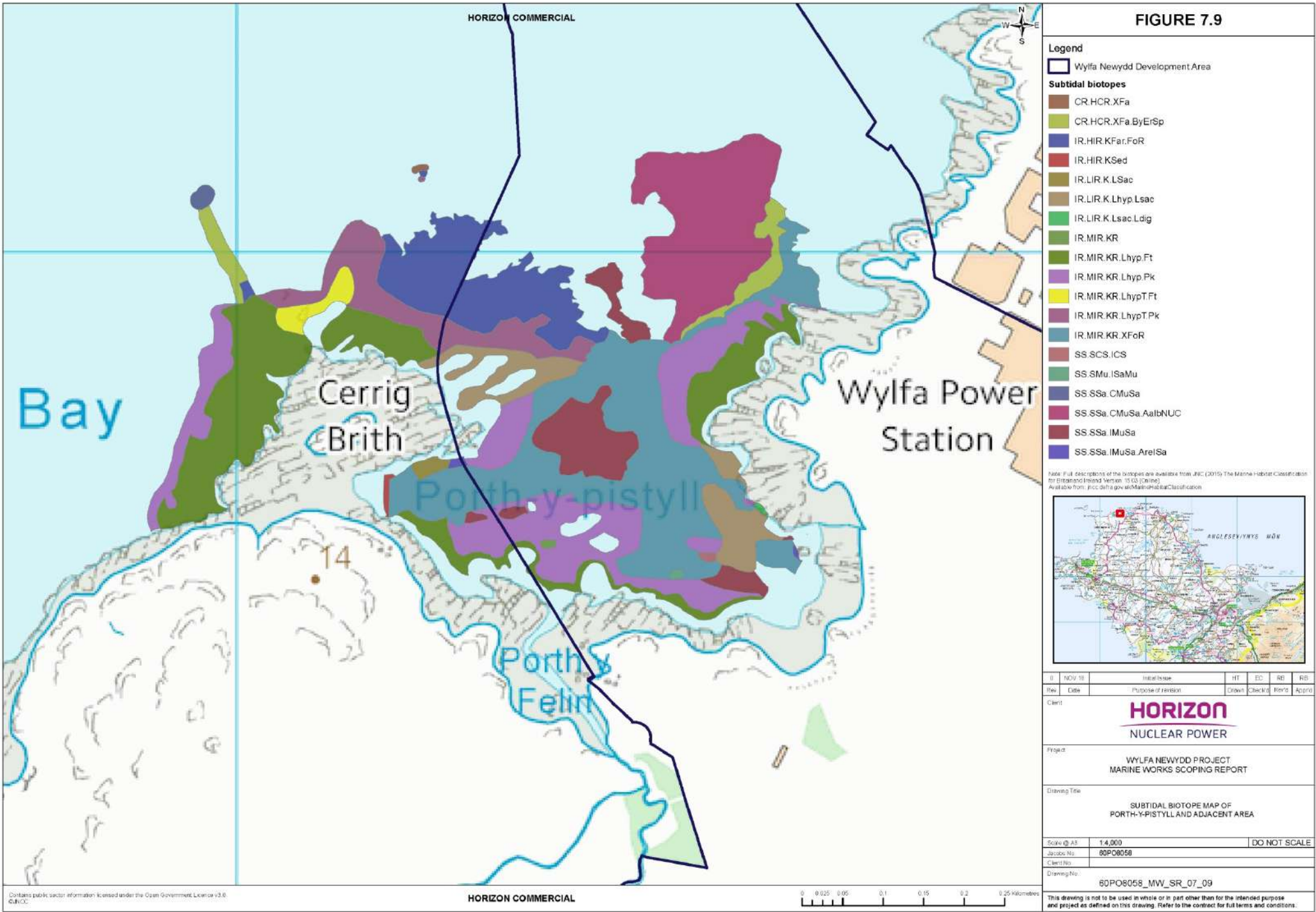


Figure 7.9 Subtidal biotope map of Porth-y-Pistyll and adjacent area.





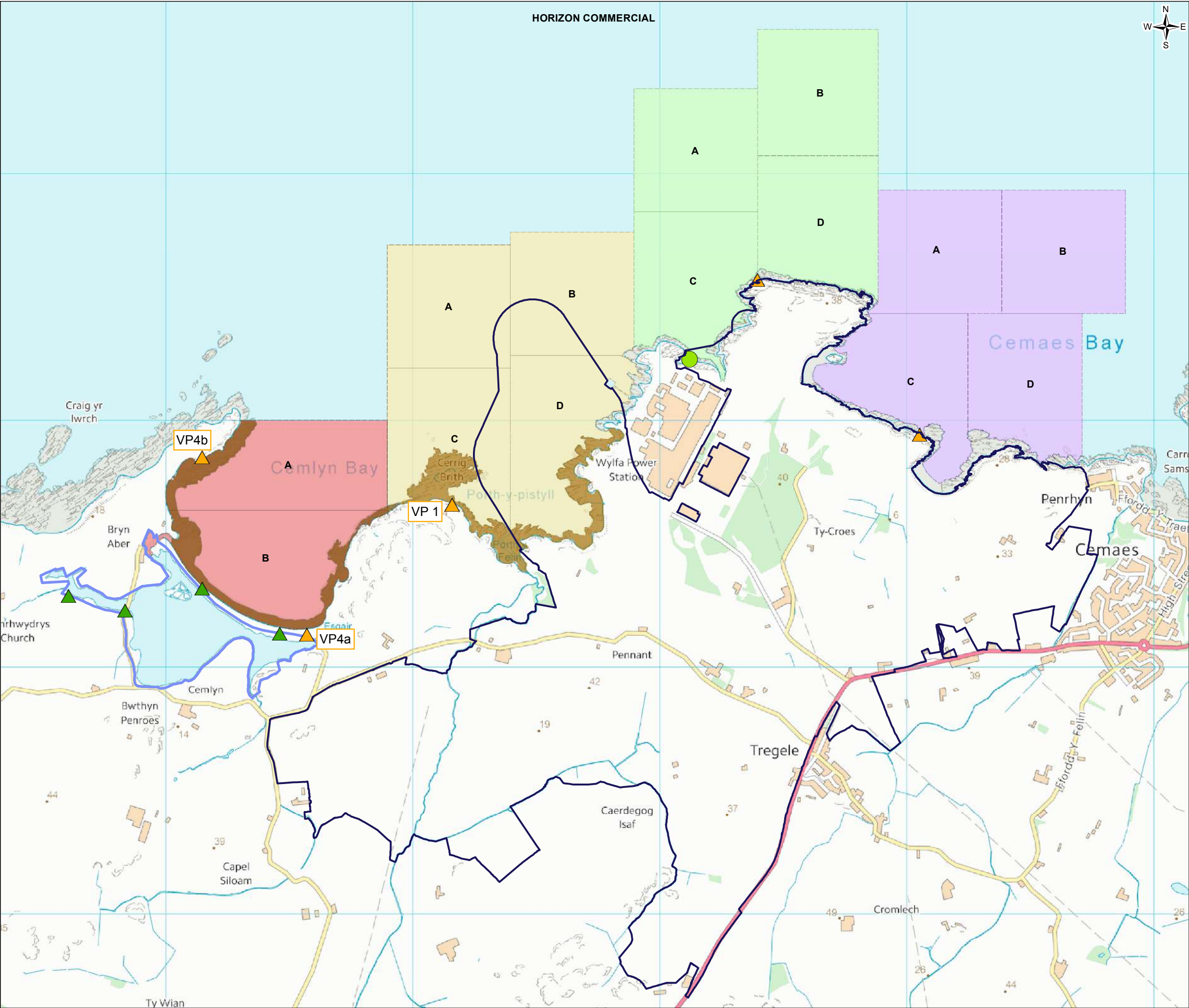
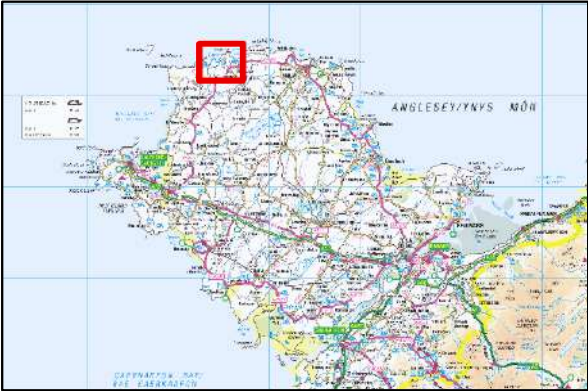


FIGURE 7.10

- Legend
- Wylfa Newydd Development Area
  - Gull colony
  - Cemlyn Lagoon Vantage Points
  - Vantage Points
  - Cemlyn Bay Lagoon Survey Area
  - Porth-y-pistyll intertidal survey area
  - Cemlyn Bay intertidal survey area
  - Vantage Point 1 Survey Area
  - Vantage Point 2 Survey Area
  - Vantage Point 3 Survey Area
  - Vantage Point 4 Survey Area



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Rev.	Date	Purpose of revision		Drawn	Check'd	Rev'd	Appr'd
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Project							
WYLFA NEWYDD PROJECT MARINE WORKS SCOPING REPORT							
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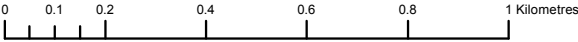




Figure 7.11 Transect survey study area – Block 1 and Block 2.

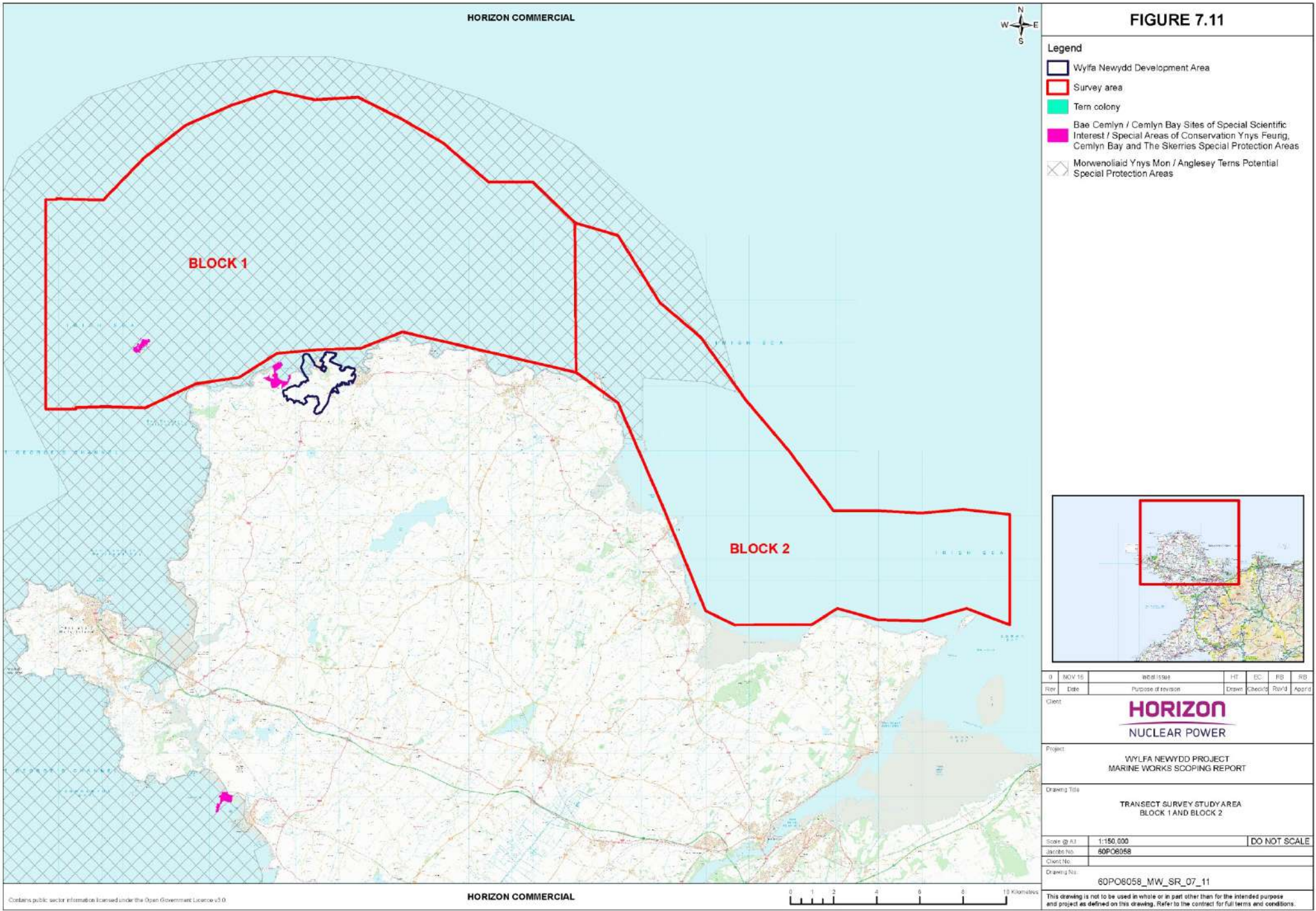




Figure 7.12 Navigational features.

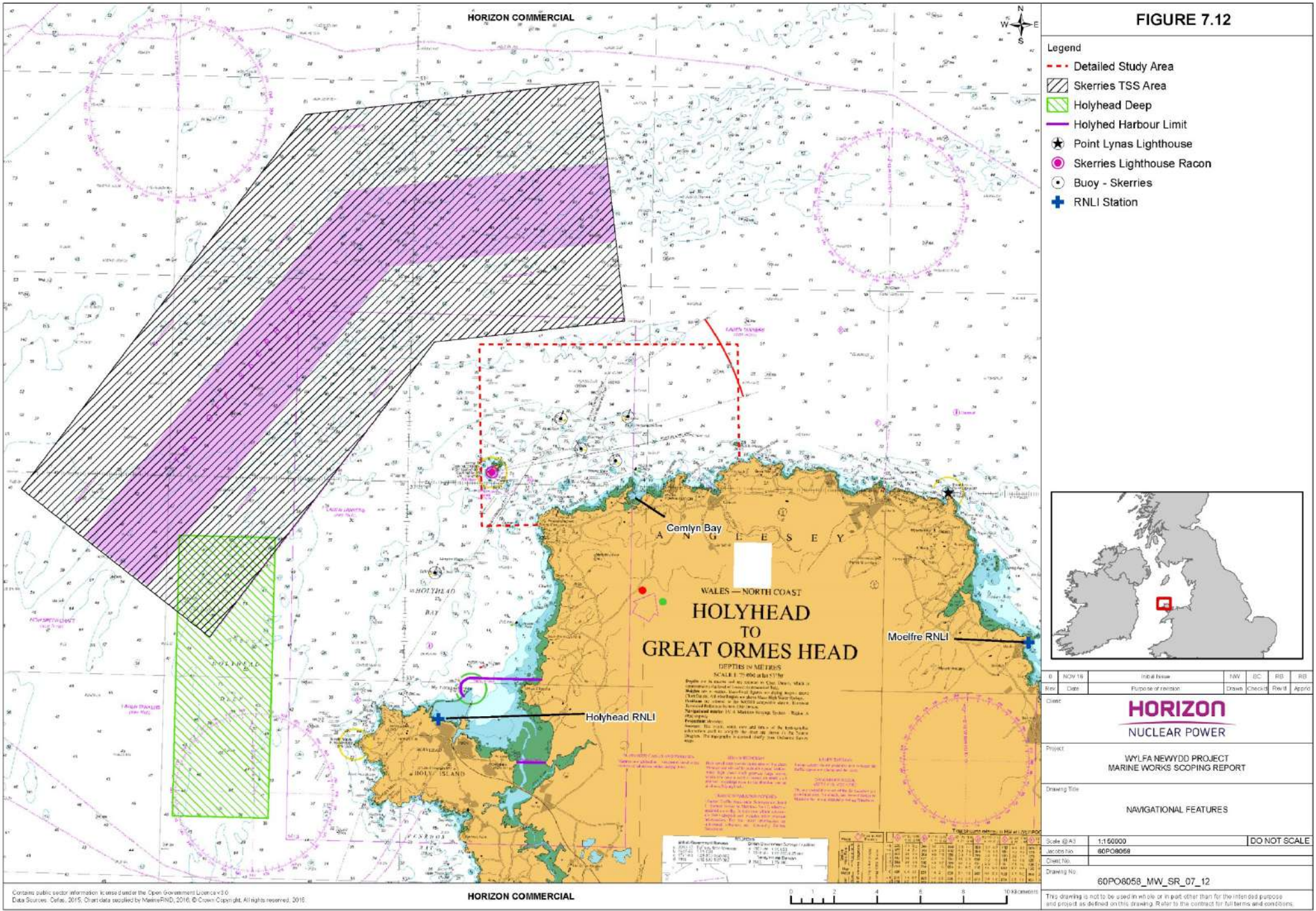




Figure 7.13 RYA recreational features.

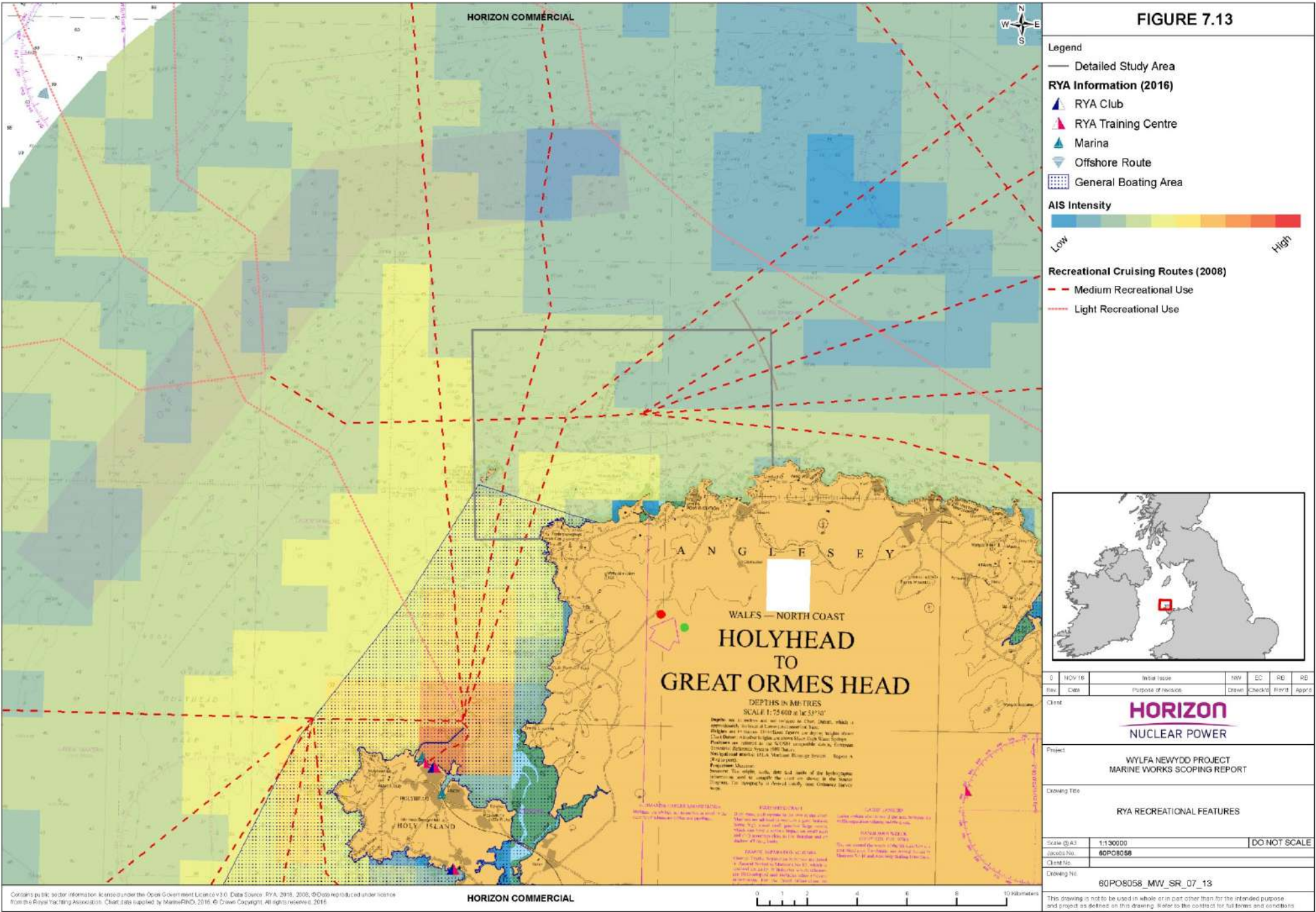
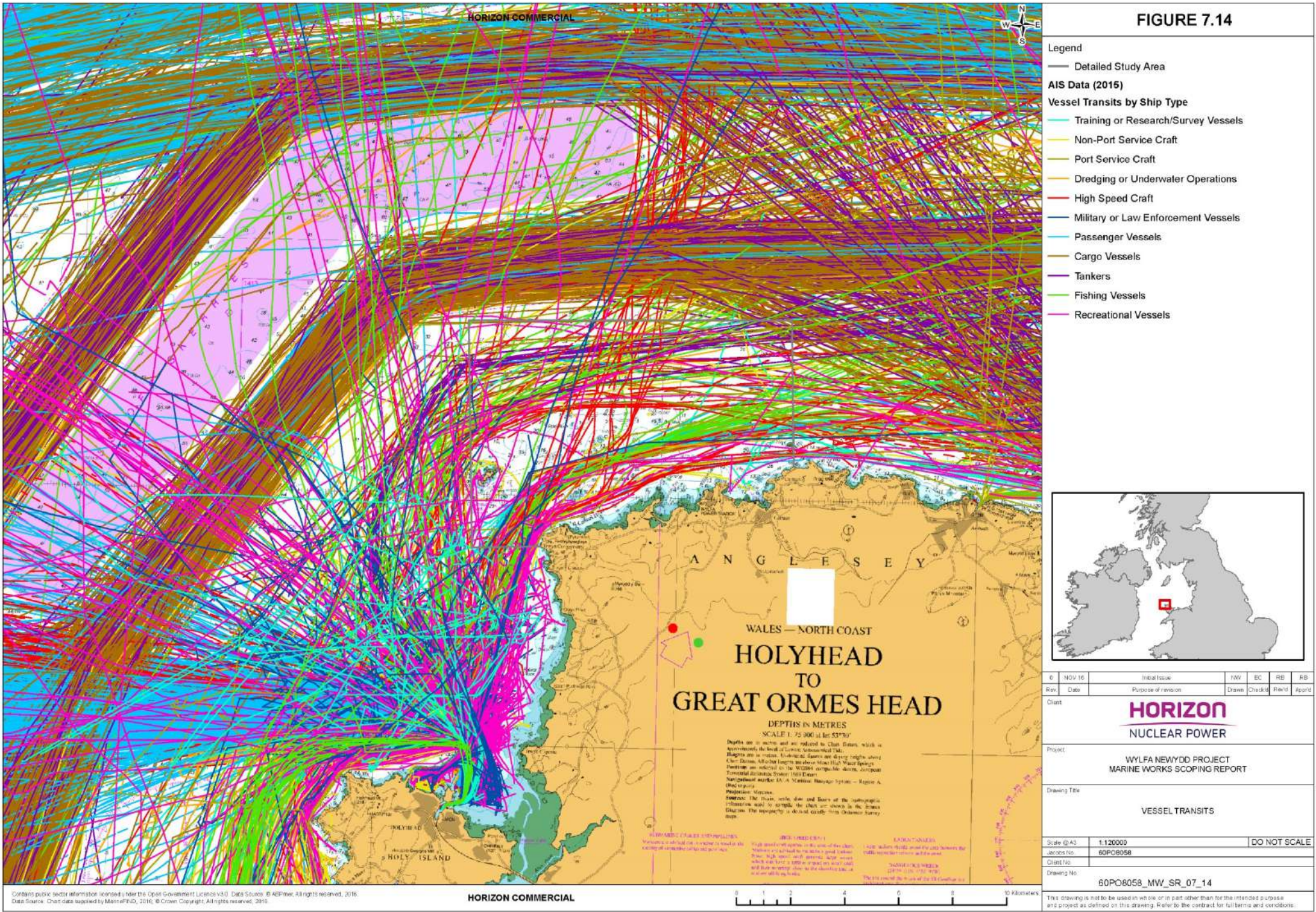




Figure 7.14 Vessel transits.





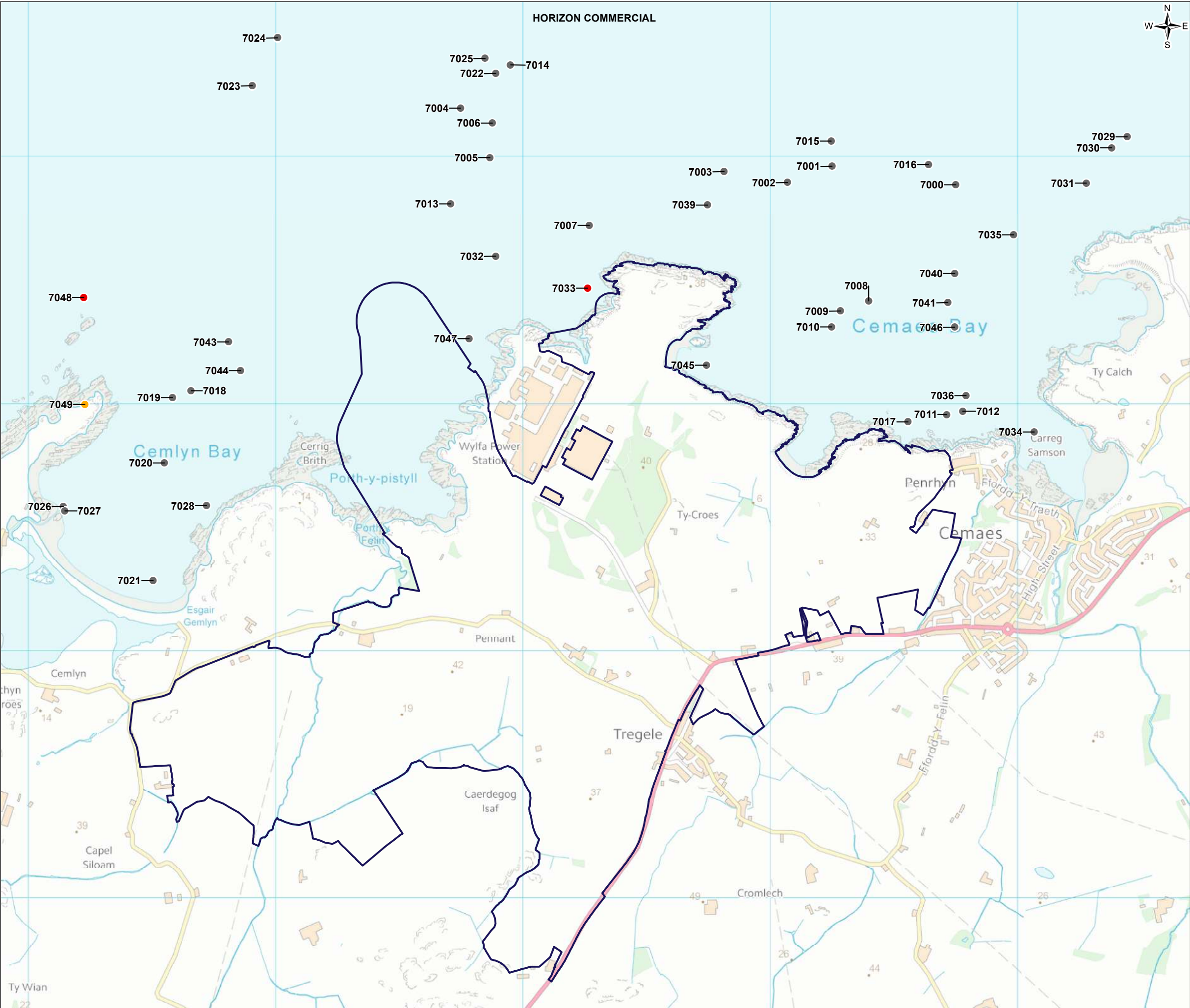
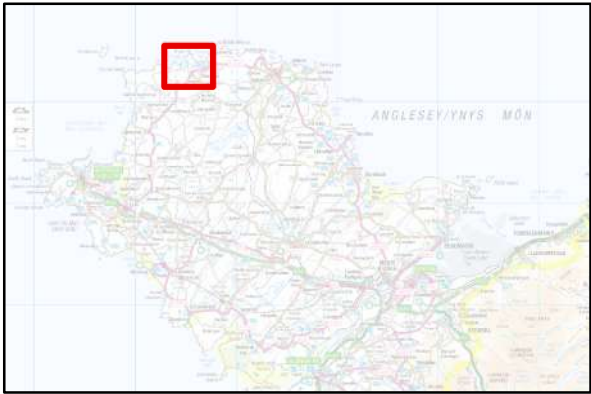


FIGURE 7.15

- Legend
- Wylfa Newydd Development Area
  - Undesignated cultural heritage asset of high value
  - Undesignated cultural heritage asset of medium value
  - Undesignated cultural heritage asset of unknown value



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Rev.	Date	Purpose of revision			Drawn	Check'd	Rev'd	Appr'd
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Project								
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Drawing Title								
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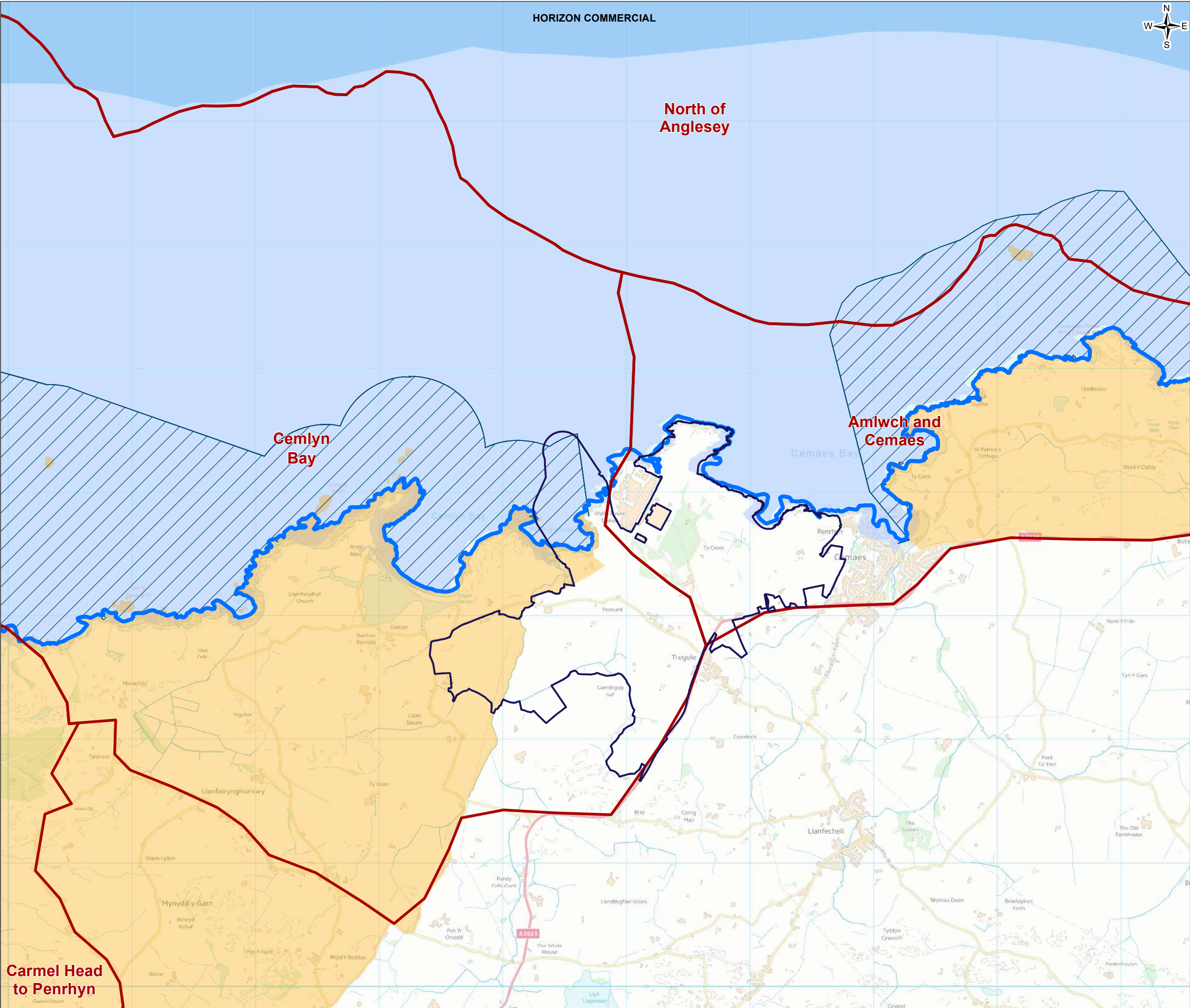

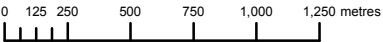


FIGURE 7.16

- Legend
- Wylfa Newydd Development Area
  - Isle of Anglesey Area of Outstanding Natural Beauty
  - North Anglesey Heritage Coast
  - National Marine Character Areas
    - North Anglesey Coastal Waters
    - North-West Anglesey Open Waters
  - National Welsh Seascape Character Areas
    - Point Lynas to Carmel Head
    - Anglesey and Snowdonia Seascape Character Area
      - North of Anglesey
      - Cemlyn Bay
      - Amlwch and Cemaes
      - Carmel Head to Penrhyn



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## Appendix B: Consultation Responses to 2016 Scoping Report

Ref.	Receptor	Consultee	Comment	Addendum Chapter
1	General	IACC	It is important that each element of the overall scheme is identified within the ES and correctly allocated as between the DCO application and planning applications under the Town and Country Planning Act 1990 (and the marine licence).	Chapter 1 Chapter 3
2	General	PINS	Figure 3.4 of the Scoping Report shows that the enabling works would commence before the anticipated date of the DCO application decision. It should be made clear that these enabling works are the 'site preparation and clearance works' referred to in Section 21.1 of the Scoping Report which would be consented under the TCPA and not through the DCO.	Chapter 1
3	General	PINS	Sections 1.3 and 2.1.2 of the Scoping Report identify the AECC and ESL as associated development; however these are noted elsewhere in the Scoping Report as forming part of the proposed development. This should be clarified within the ES.	Chapter 3
4	Legislation	IACC	IACC highlight that there is no relevant category of "associated development" in Wales. The Applicant may wish to consider using alternative terminology within the ES for these facilitative works.	Chapter 2
5	Legislation	IACC	Reference should be made to the council's Transformation Plan – The Roadmap to the new Anglesey.	Chapter 2
6	Consideration of alternatives	PINS	The ES must set out an outline of the main alternatives studied by the applicant and provide an indication of the main reasons for the applicant's choice, taking account of the environmental effect. Matters should be included, such as inter alia alternative design options and alternative mitigation measures. The justification for the final choice and evolution of the scheme development should be made clear. Where other sites have been considered, the reasons for the final choice should be addressed.	Chapter 4

Ref.	Receptor	Consultee	Comment	Addendum Chapter
7	Consideration of alternatives	IACC	The alternatives ES chapter should identify other alternatives considered for the siting of the MEEG and AECC/ESL and state whether the applicant considered siting separately the AECC and the ESL. With regard to the MEEG and AECC/ESL, the chapter should provide the result of the site selection process which is presently referenced within the scoping report. In particular it should set out the range of sites identified and the reasons for the selection of the preferred sites. This information might be most appropriately provided as an appendix to the ES.	Chapter 4
8	Scoping	PINS	The Scoping Report identifies areas of potential contamination within the site and that tunnel excavations would be required to construct the cooling water intake system. The Secretary of State considers that the potential mobilisation of contaminants and the storage of spoil on site have the potential to generate odour and therefore does not agree to this topic being scoped out of the assessment at this stage.	Chapter 6 Chapter 8, Section 8.1
9	Scoping	PINS	As per 5.6.7 of NPS EN-1, an assessment of insect infestation is required. It is recommended that any conclusions drawn as part of the PCSR are fully cross referenced within the ES for completeness. On the basis that this information is provided within the ES, no further assessment is required.	Chapter 6
10	Scoping	PINS	The Secretary of State notes that the Applicant has committed to meet the requirements of the new EIA Directive and therefore advises the Applicant gives consideration to assessing accidental radiological releases within the EIA.	Chapter 6 Chapter 12
11	Scoping	PINS	The Secretary of State advises the Applicant gives consideration to assessing seismic risk within the EIA.	Chapter 6
12	Approach to EIA	PINS	The Applicant should clearly describe mitigation that is embedded and how it is proposed to be secured within the design and presented within the DCO application. There should be a clear distinction between mitigation that is proposed in response to effects identified in the EIA and that which is inbuilt / inherent in the design. In the case of the latter, the Secretary of State will expect to understand how the embedded mitigation has been considered within the EIA.	Chapter 7

Ref.	Receptor	Consultee	Comment	Addendum Chapter
13	Approach to EIA	PINS	The applicant should provide to the Secretary of State as soon as possible any additional available information about potential significant trans-boundary effects and identify the affected state(s).	Chapter 7
14	Approach to EIA	PINS	Approach to the 'Rochdale Envelope' should take into consideration 'Flexibility' as set out in Appendix 1 of the Scoping Opinion	Chapter 7
15	Approach to EIA	IACC	The discussion on the Rochdale envelope is very brief in the scoping report. The council is keen to achieve a proportionate balance which allows a 'buildable' consent, with an appropriate mechanism for the approval of details. This needs to be compliant with EIA requirements and allow affected communities and other stakeholders to understand properly during consultation and at the point of submission/examination the range of outcomes which the DCO, if granted, is intended to allow.	Chapter 7
16	Air quality	PINS	The Applicant should discuss and where possible agree their approach to the assessment, including the establishment of the baseline environment, the proposed assessment methodology and any mitigation measures with the Environmental Health Department of the IACC and Natural Resources Wales (NRW).	Chapter 8, Section 8.1
17	Air quality	PINS	The ES should detail the methodologies used and clearly explain how the levels of significance (in EIA terms) will be established.	Chapter 8, Section 8.1
18	Air quality	PINS	The ES should define the parameters used for dispersion modelling of combustion emissions. The Secretary of State recommends that dispersion modelling considers a range of possibilities and seeks to ensure that the 'worst case' scenario is assessed, for example the 'worst case' may occur as a short term impact.	Chapter 8, Section 8.1
19	Air quality	IACC	Table 8.1 should list the methodology to be used in the assessment of emissions from marine vessels, and potential effects from which is noted in section 8.3 of the Scoping Report.	Chapter 8, Section 8.1
20	Noise and vibration	PINS	The ES should provide details of the baseline vibration environment and a justification for the choice of monitoring location. The Secretary of State advises that the Applicant discusses their approach to the assessment of vibration with the IACC.	Chapter 9, section 9.1

Ref.	Receptor	Consultee	Comment	Addendum Chapter
21	Noise and vibration	PINS	An earth bund is proposed at the perimeter of the Power Station Site adjacent to Tregale (Section 3.5.1 of Appendix D of the Scoping Report), which is to be taken into account within the noise modelling. The Applicant should ensure that this bund is shown on relevant figures within the ES and secured either as mitigation and / or a works number within the DCO.	Chapter 9, section 9.1
22	Noise and vibration	PINS	A final version of the technical note detailed in Appendix D of the 2016 Scoping Report should be appended to the ES. The ES should make it clear which elements of the assessment detailed in the technical note are for the proposed development and also detail how the significance of noise and vibration impacts will be determined in EIA terms.	Chapter 9, section 9.1
23	Noise and vibration	PINS	Detail of the construction works should be included within the ES chapter. Similarly, detail of other construction methods should be provided within the ES.	Chapter 9, section 9.1
24	Noise and vibration	PINS	The Secretary of State welcomes the production of Environmental Management Plans and recommends that a draft version of the plan is provided with the DCO application and is adequately secured therein.	Chapter 9, section 9.1
25	Noise and vibration	NRW	NRW consider that noise and vibration has the potential to impact on mobile features of other protected sites (e.g. chough using the site, which are linked to Glannau Ynys Gybi SPA). We advise that the ES should clearly set out how it assesses impacts on mobile features of other national (SSSI) and European protected sites (SAC/SPA/Ramsar).	Chapter 9, section 9.1
26	Noise and vibration	NRW	NRW advise that the ES in support of the DCO should fully assess both construction and operational impacts of noise and vibration on ecological receptors and on the special qualities of the Anglesey Area of Outstanding Natural Beauty (AONB).	Chapter 9, section 9.1
27	Landscape and visual	IACC	The Applicant's attention is drawn to the comments of the IACC (see Appendix 3 of the Scoping Opinion) regarding sources that could be used to define the existing environment.	Chapter 10, Section 10.1
28	Landscape and visual	IACC	Where there is public access to heritage features then the potential for visual effect upon visitors for example should be set out within the visual assessment. Equally should the features be noted as contributing to the landscape character of an area, then potential effects upon them should also feature within the landscape assessment.	Chapter 10, Section 10.1

Ref.	Receptor	Consultee	Comment	Addendum Chapter
29	Landscape and visual	PINS	The LEMP should provide details of the earth mounding and woodland planting that is proposed to screen the development including for example the location, dimensions and details of how long planting would take to establish. The LEMP should include any measures that would be implemented at the off-site facilities i.e. the AECC, ESL and MEEG.	Chapter 10, Section 10.1
30	Landscape and visual	IACC	The council is concerned about the potential for effects upon the AONB, both direct landscape effects but also secondary or indirect effects arising from changes to the historic environment present within it.	Chapter 10, Section 10.1
31	Landscape and visual	PINS	The Secretary of State advises that the Applicant gives consideration to the potential impact of smoke and steam on amenity.	Chapter 10, Section 10.1
32	Landscape and visual	PINS	Cumulative and combined impacts should not be overlooked, in particular the need to consider the potential landscape and visual implications of transmission infrastructure, and the decommissioning works at the existing power station.	Chapter 10, Section 10.1
33	Terrestrial and freshwater ecology	NRW	Government policy that the proposed sites are treated as a designated SPA.	Chapter 11, Section 11.1
34	Terrestrial and freshwater ecology	NRW	The ES should include a Biosecurity Risk Assessment, to be implemented during all phases of the proposal including construction and operation of the facility. Anticipate that the Biosecurity Risk Assessment will detail: a. measures that will be undertaken to control and eradicate INNS within the area of works; b. measures or actions that aim to prevent INNS being introduced to the site for the duration of construction phase of the scheme.	Chapter 11, Section 11.1
35	Terrestrial and freshwater ecology	IACC	It's the Local Planning Authorities understanding that Wylfa Head is designated as a Local Nature Reserve (LNR). Until the matter is satisfactorily resolved the local planning authority is not willing to scope out the matter from ES.	Chapter 11, Section 11.1
36	Terrestrial and freshwater ecology	IACC	At a local level, effects upon wildlife of local importance should be considered, both declared local nature reserves (Wylfa Head, see above) and species and habitats listed within the LBAP.	Chapter 11, Section 11.1

Ref.	Receptor	Consultee	Comment	Addendum Chapter
37	Terrestrial and freshwater ecology	PINS	The Secretary of State welcomes the consideration of the Water Framework Directive (WFD) within the ecological assessment and advises that appropriate cross reference is made to the WFD assessment.	Chapter 11, Section 11.1
38	Terrestrial and freshwater ecology	PINS	The potential impacts of lighting on ecological receptors during both construction and operation should be assessed within the ES. Appropriate cross reference should be made to the landscape and visual impact assessment.	Chapter 11, Section 11.1
39	Terrestrial and freshwater ecology	NRW	We advise that the ES includes provisions concerning ecological compliance audit requirements. We anticipate that the EIA will propose key performance indicator for assessing compliance with proposed method statements, planning conditions and licence conditions.	Chapter 11, Section 11.1
40	Radiological issues	IACC	The ES should consider summarising the baseline data within a table and consideration should also be given to RIFE monitoring data.	Chapter 12, Section 12.1
41	Radiological issues	PINS	The Secretary of State advises that the ES considers the potential for mobilisation of radionuclides during construction works, both terrestrial and within the marine environment.	Chapter 12, Section 12.1
42	Radiological issues	PINS	It is unclear how the radiological assessment will be presented as the Scoping Report mainly refers to the production of an EP-RSR application and the Article 37 Submission. The Secretary of State would expect there to be an assessment within the ES itself and the ES should provide details of the assessment methodology and refer to any guidance used.	Chapter 12
43	Radiological issues	IACC	The longer term potential impacts of radiological storage should be effectively captured within the ES. In particular consideration should be given to the possibility of waste remaining on site following the station's operational phase in the event that a GDF is not available. Radiological storage can also give rise to negative perceptions and the resulting effects upon human health should be considered within relevant EIA topics rather than solely within the Health Impact Assessment.	Chapter 12, Section 12.1



Ref.	Receptor	Consultee	Comment	Addendum Chapter
44	Radiological issues	NRW	The ES should assess, through appropriate modelling, the transfer of radionuclides present in the gaseous and aqueous radioactive wastes through the environment. The assessments should predict the dispersion of the radionuclides in the air or the sea, their transfer to, and accumulation in, other environmental media.	Chapter 12, Section 12.1.2
45	Radiological issues	IACC	The council expects substantiation of the claim that there will be no radiological impact from construction activities. In particular, consideration should be given to existing contamination in soil that could be re-suspended as dust, groundwater through dewatering or marine sediments being disturbed by the construction of the water discharge and intake systems and the MOLF.	Chapter 12, Section 12.1
46	Radiological issues	NRW	The radiological impacts on non-human species as a result of liquid and atmospheric discharges from the power station should be assessed with respect to the four broad habitat groups that are representative of the range of habitats in the locality of the power station (i.e. marine, freshwater, terrestrial and coastal). This assessment should use appropriate modelling to support the ES and HRA.	Chapter 12, Section 12.1.2
47	Soils and geology	PINS	The Secretary of State notes a discrepancy between the stated study area and the ALC survey which was undertaken only within the Wylfa Newydd Development Area (as shown in Figure 13.1). Any departures from the defined study area should be clearly explained within the chapter.	Chapter 13, Section 13.1
48	Surface water and groundwater	PINS	The Applicant should carefully consider how to present overlapping topic areas such that potential effects of the proposed development can be clearly understood, in particular in relation to considering inter-relationship of effects between these topic areas.	Chapter 14, Section 14.1
49	Surface water and groundwater	PINS	The Secretary of State would expect to see further details of baseline data collection as part of the ES either in appendices or otherwise summarised.	Chapter 14, Section 14.1
50	Surface water and groundwater	PINS	The modelling approach should be agreed with NRW and consider any overlap with the ecological assessments such that it accounts for impacts on designated sites for nature conservation.	Chapter 14, Section 14.1

Ref.	Receptor	Consultee	Comment	Addendum Chapter
51	Surface water and groundwater	NRW	The applicant should also be aware that consideration must be given as to whether the proposed works as part of the DCO application could prevent any mitigation measures or actions intended to achieve Good Ecological Status (GES) / Good Ecological Potential (GEP) from being implemented, which could result in the water body failing to meet its objectives. Where a scheme is considered to cause deterioration, or where it could contribute to a failure of the water body to meet GES or GEP, then an Article 4.7 assessment would be required.	Chapter 14, Section 14.1
52	Surface water and groundwater	IACC	The council is aware of NS N-6 Volume 2 C.9.52 recorded by Government that no adverse effects would result from water resources and quality impacts on the Llyn Dinam SAC and that a detailed assessment of the groundwater connections between Llyn Dinam SAC and Wylfa should be considered at the detailed project stage. Clarity on this matter should be provided.	Chapter 14, Section 14.1
53	Surface water and groundwater	IACC	The council would expect to be able to comment on the applicant's methodology for identification of the surface water study area as this is not provided within the report. In particular the council would wish to see the catchment adjacent to (east of) Cameas included.	Chapter 14, Section 14.1
54	Surface water and groundwater	NRW	Appendix C, paragraph 4.11 refers to the Infrastructure Planning Commission's original Scoping Opinion comments that information should be provided in the ES on the Wylfa water supply. However, we note that no information is presented in this Scoping report to indicate that this information will be provided in the ES. The ES should acknowledge the project's overall water demand and the impacts on water supply.	Chapter 14, Section 14.1
55	Surface water and groundwater	PINS	The Secretary of State notes the Applicant's consideration of water body classifications under the WFD as well as the need for a Flood Consequences Assessment (FCA) to accompany the DCO Application. The Scoping Report does not make it specifically clear whether these reports will be standalone, incorporated within the ES or otherwise appended to the ES.	Chapter 14, Section 14.1
56	Surface water and groundwater	IACC	The scope should consider resources receptors in the surface water study area, such as surface water abstractions.	Chapter 14, Section 14.1
57	Surface water and groundwater	Welsh Water	The Environmental Impact Assessment should provide comprehensive information on the drainage strategy for the development site.	Chapter 14, Section 14.1

Ref.	Receptor	Consultee	Comment	Addendum Chapter
58	Surface water and groundwater	NRW	Appendix C, paragraph 4.11 advises that the ES should include details of how sewage will be treated along with the potential impact of any discharges on the environment. The current Scoping report does not provide any information to indicate that such information will be provided. NRW note that both the construction and operational phase has the potential to generate large volumes of sewage. NRW advise that the potential environmental impact of any sewage discharges on the environment (including protected sites) should be fully assessed in the ES.	Chapter 14, Section 14.1
59	Surface water and groundwater	IACC	Further information should be provided on how the catchments in the surface water study area been defined and the applicant should state its confidence that there is no hydrological pathway between adjacent catchments.	Chapter 14, Section 14.1
60	Coastal processes and coastal geomorphology	PINS	The Secretary of State would expect the potential impacts of dredging during construction and operation to be assessed as part of the EIA, with mitigation measures proposed where appropriate.	Chapter 15, Section 15.1
61	Coastal processes and coastal geomorphology	NRW	Section 2.1.2 of the Scoping report describes the Welsh Planning Context where TANs have been considered relevant to the potential environmental impacts of the developments. An omission from the scoping report is TAN 14 Coastal Planning (1998).	Chapter 15, Section 15.1
62	Coastal processes and coastal geomorphology	NRW	The coastal processes assessment will need to include the effects from all the offshore structures on hydrodynamics and sediment movement, not just the cooling water extent, and be of high enough resolution to identify any subtle but important effects. NRW advise that the study area should be defined by the zone of impact (which may potentially be considerably beyond 5km) from the effects of structures on hydrodynamics and sediment transport. Please note that professional judgement will need to be backed by evidence/data.	Chapter 15, Section 15.1
63	Coastal processes and coastal geomorphology	PINS	The ES should set out the make-up of the cooling water for example its volume and chemical and thermal characteristics.	Chapter 15, Section 15.1

Ref.	Receptor	Consultee	Comment	Addendum Chapter
64	Coastal processes and coastal geomorphology	NRW	NRW consider it essential the study area is based on current design detail and scope in all projects with N2K status in the sediment sub cell area until evidence is presented to scope them out. Section 15.4.1 and section 16.4.1 both state the study area being 5km and tidal influence being 20-25km. NRW would expect to see studies out to the tidal excursion area with asymmetry being taken into account to understand the baseline conditions and future forecasts with structures in place. The sediment sub cell will encompass the tidal excursion boundary and NRW advise that this is the starting point for an impact assessment.	Chapter 15, Section 15.1
65	Coastal processes and coastal geomorphology	NRW	The ES should fully assess the effects of the marine works (during both construction and operational phase) on sediment processes and the likely effects on the shingle ridge which is critical to the functioning of the Cemlyn Bay SSSI/SAC and is also critical to the functioning of the SPA as the nesting site. These assessments will also be required to inform the HRA that the SoS will need to undertake.	Chapter 15, Section 15.1
66	Coastal processes and coastal geomorphology	NRW	Section 15.3 which lists potential effects, does not mention possible requirements for dredging during both the construction and operational phase. NRW advise that plume effects and dredge disposal for both construction and maintenance dredging be investigated thoroughly.	Chapter 15, Section 15.1
67	Coastal processes and coastal geomorphology	NRW	NRW advise a high resolution study (modelling and field campaign) is conducted around Cemlyn Lagoon / Bay. NRW advise that the applicant models changes in hydrodynamics, such as incident wave reflection, current speed and direction off the breakwaters, MOLF and CWS, not just sediment transport.	
68	The marine environment	NRW	Further discussions are required with regard to the modelling methodology. For example, the hydrodynamic modelling for the thermal plume has not yet been agreed with NRW and we have yet to provide comment on calibration and validation studies.	Chapter 16, Section 16.1
69	The marine environment	NRW	NRW recommend early discussions with the applicant on the breakwater design (rock type, slope, architecture etc) in terms of biodiversity enhancement measures such as rockpools and reducing the likelihood of colonisation by non-native species.	Chapter 16, Section 16.1

Ref.	Receptor	Consultee	Comment	Addendum Chapter
70	The marine environment	NRW	The presence of the breakwater would provide a shallow and sheltered area which may cause fish to be attracted into and congregate within the sheltered area. Some fish species that migrate around the coast, such as sea trout and eels (European eels are protected under the Eel Regulations 2009), may also be caught up in this semi enclosed area. Fish may also be chased in by predatory fish and mammals. These effects would be likely to increase the amount of fish being affected by impingement. In addition, once the breakwaters are constructed, there could be a change in the types of fish present in the area due to changes in the flows. We advise that these effects are investigated and considered in the ES.	Chapter 16, Section 16.1
71	The marine environment	PINS	The Secretary of State is aware that NRW is currently consulting on proposals which involve the establishment of three new potential SACs: North Anglesey Marine; West Wales Marine; and Bristol Channel Approaches.	Chapter 16, Section 16.1
72	The marine environment	PINS	The consultation also includes one new proposed SPA and the extension of two existing SPA's: Northern Cardigan Bay (new pSPA); Skomer, Skokholm and the seas off Pembrokeshire (new pSPA is an extension to an existing SPA); and Anglesey Terns (new pSPA is an extension to an existing SPA).	Chapter 16, Section 16.1
73	The marine environment	NRW	NRW recommends that the Welsh National Marine Plan is considered by the applicant.	Chapter 16, Section 16.1
74	The marine environment	NRW	A marine Invasive Non-Native Species (INNS) risk assessment should be incorporated into all aspects of marine related developments and activities (including shipping and transportation for non-marine aspects of the development), as well as any potential increased effects that the cooling water outfall might have on encouraging the settlement of marine INNS. This risk will need to be assessed carefully and appropriate mitigation measures provided in the ES and HRA.	Chapter 16, Section 16.1
75	The marine environment	NRW	We advise that the ES should include clear differentiation between direct and indirect habitat loss and habitat alteration for all aspects of the marine elements work. The ES should consider the impacts of changes to the hydrodynamic regime on benthic habitat during the construction phase (due to the length and scale of the works) and operational phase (as a result of the marine structures in place).	Chapter 16, Section 16.1

Ref.	Receptor	Consultee	Comment	Addendum Chapter
76	The marine environment	PINS	The ES should consider the potential impacts on Cemaes Bay as a European designated Bathing Water.	Chapter 16, Section 16.1
77	The marine environment	PINS	The potential for construction activities to produce sediment plumes and indirectly affect foraging birds should be considered.	Chapter 16, Section 16.1
78	The marine environment	NRW	NRW advise that it should be ensured that any possible reef locations within the benthic impact zone have been fully investigated and impacts clearly set out in the ES.	Chapter 16, Section 16.1
79	The marine environment	NRW	The ES should include detail on the proposed screening and fish protection systems (including fish deterrents and return systems).	Chapter 16, Section 16.1
80	The marine environment	NRW	As fish are an important food source of species which are features of European sites (e.g. terns and harbour porpoise), information on the fish protections systems will be needed to inform the HRA. Impacts on fish that are food sources of features of European sites should be assessed in the ES.	Chapter 16, Section 16.1
81	The marine environment	NRW	We advise that plankton communities are also considered with any physicochemical (temperature/irradiance/hydrological) changes that may occur and how this may impact upon plankton. With regard to the above impacts on plankton, the ES should also consider the 'knock-on' effects on key species within the associated marine food chain. This information will also be required to inform the HRA.	Chapter 16, Section 16.1
82	The marine environment	NRW	We note that data on marine mammals have been collected through a combination of incidental sightings observed during surveys for other topic areas (boat based and land based surveys), and other datasets collected as part of other projects in North Anglesey. NRW has previously advised the applicant that sufficient information exists to describe or characterise the marine mammals in the area. However, the data may not allow an evidence-based assessment of likely environmental effects on marine mammals from the project because a quantitative baseline of data for the pathways presented is not available.	Chapter 16, Section 16.1



Ref.	Receptor	Consultee	Comment	Addendum Chapter
83	The marine environment	NRW	The proposed marine works have the potential to generate significant noise and/or vibrations that has the potential to disturb marine mammals. Standard noise Mitigation, as per JNCC (2010) guidelines on mitigation for piling, should be utilised and assessed in the EIA. NRW look forward to providing further advice with regard to the underwater noise modelling and assessment methodology.	Chapter 16, Section 16.1
84	Archaeology and cultural heritage	IACC	The council recognises that due to recent archaeological survey and evaluation that much of the archaeological baseline referenced within the chapter requires updating. Furthermore other sites previously recorded but not investigated may have been reassessed as being of far greater importance since the data was gathered to inform the scoping report.	Chapter 17, Section 17.1
85	Archaeology and cultural heritage	IACC	The council wishes to see and integrated landscape, heritage, and architecture plan produced as part of the application, in order to understand the effects on the AONB.	Chapter 17, Section 17.1
86	Archaeology and cultural heritage	PINS	The Secretary of State recommends the Applicant considers the need for bespoke study areas for each of these components of the archaeology and cultural heritage assessment. The defined area in Figure 17.1 of the Scoping Report does not account for the proposed off-site facilities. The definition of any such study areas should be agreed with the relevant consultees including Gwynedd Archaeological Planning Service (GAPS) and IACC.	Chapter 17, Section 17.1
87	Archaeology and cultural heritage	PINS	At Section 17.3.2 of the Scoping Report, the Applicant acknowledges that construction activities associated with the breakwater and MOLF have the potential to remove any surviving remains of the wreck of the Mary Sutherland (as well as other unknown archaeological remains). The Secretary of State would expect to see specific mitigation measures proposed in relation to this feature as part of any wider marine archaeological mitigation plan.	Chapter 17, Section 17.1
88	Archaeology and cultural heritage	IACC	It is likely that Cestyll Garden may benefit from a statutory designation under the Historic Environment (Wales) Bill which is awaiting Royal Assent. The applicant should consider whether it is appropriate to liaise with and seek early sight of emerging guidance on the assessment of setting from CADW or whether to adopt current English guidance. Horizon should also satisfy itself that its assessment includes for the change in status of Historic Parks and Gardens in Wales and any possible changes to the grading of other assets and greater value given to HERs.	Chapter 17, Section 17.1

Ref.	Receptor	Consultee	Comment	Addendum Chapter
89	Socio-economics	IACC	Further clarity and transparency could be given on the proposed scope, methodology and criteria.	Chapter 18, Section 18.1
90	Socio-economics	IACC	Indirect effects on the Welsh language should not be ignored, and whilst the applicant's intention to undertake a Welsh language impact assessment is welcome, greater consideration should be given to the issue of the Welsh language within the EIA.	Chapter 18, Section 18.1
91	Socio-economics	IACC	Effects upon local communities assessed within the socio-economic chapter should include for an informed consideration of community cohesion (potentially influenced by effects upon the Welsh language and which supports an Island of resilient, fair and equal cohesive communities).	Chapter 18, Section 18.1
92	Socio-economics	IACC	More detailed information will be needed on the current local skills and occupations supply so that later in the assessment consideration can be given to how this compares to the demand needed for Wylfa Newydd.	Chapter 18, Section 18.1
93	Socio-economics	IACC	More information will need to be provided on the local business population with greater detail on the sectors that could benefit from supply chain opportunities and an analysis of business start-up levels.	Chapter 18, Section 18.1
94	Socio-economics	IACC	The broad topics to be assessed for potential effects and mitigation are appropriate to the nature and size of the development. The following need to be included in the assessment: <ul style="list-style-type: none"> <li>▪ The employment assessment should also review impacts on wage inflation and competition.</li> <li>▪ Displacement effects need to be considered throughout all of the topics and are considered by the council to be a priority.</li> </ul>	Chapter 18, Section 18.1
95	Public access and recreation	PINS	The Secretary of State recognises the importance of the Wales Coastal Path as a receptor and the potential need for its temporary diversion during the construction phase and permanent diversion during the operational phase. The Secretary of State will expect to see consideration of suitable mitigation measures with regard to the routing of the coast path and strongly encourages further consultation with NRW and IACC in this respect.	Chapter 19, Section 19.1

Ref.	Receptor	Consultee	Comment	Addendum Chapter
96	Public access and recreation	IACC	The potential operational effects focus upon the PRow network and should be expanded to include the operational effects upon recreational users of the National Trust land and other areas used for public recreation within the study area particularly as a result of operational views, noise and lighting etc.	Chapter 19, Section 19.1
97	Public access and recreation	PINS	The Secretary of State expects that the impact assessment criteria will be presented and explained so as to understand how they are applicable in the context of the three sub-topic areas of the assessment as described in Table 19.1 of the Scoping Report. The Applicant is also encouraged to consider the need for separate criteria for these as appropriate.	Chapter 19, Section 19.1
98	Traffic and transport	PINS	The Secretary of State welcomes the preparation of an Integrated Traffic and Transport Strategy (ITTS) to support the Wylfa Newydd Project as a whole and will expect the Applicant to clearly explain the relationship between this document and those prepared in assessing the transport impacts of the DCO application. Similarly, the Applicant describes that a Freight Management Strategy and overarching travel plan will be prepared as part of the EIA process for the DCO. The Secretary of State will need to understand the relationship between these documents and the ITTS and their overall contribution to the residual effects reported by the Applicant in the DCO ES.	Chapter 20, Section 20.1
99	Traffic and transport	PINS	No reference is made to the assessment of shipping during the operation of the proposed development. The Secretary of State would expect to see justification of a 'worst case' approach to the assessment where estimates are to be relied upon. Equally, the assessment of road traffic impacts should be based on justified worst case assumptions in terms of the numbers of road-based deliveries that shipping would negate. The Secretary of State expects that any assessment of construction and operational shipping impacts considers any effects on the commercial operation of Holyhead Port.	Chapter 20, Section 20.1
100	Traffic and transport	IACC	The routes identified for construction traffic appear to be appropriate given the level of current knowledge which the council holds on the project. The routes should include the highways used to access the main site from each of the proposed associated development locations.	Chapter 20, Section 20.1
101	Traffic and transport	IACC	For clarity, the council assumes that the assessment of operational effects will include for an allowance for journeys to the proposed visitor centre the MEEG and the ESL/AECC.	Chapter 20, Section 20.1

Ref.	Receptor	Consultee	Comment	Addendum Chapter
102	Waste and materials	PINS	The ES should detail whether any arisings from rock excavation and dredging would be re-used on site or removed off-site. If the latter, the ES should quantify the number of vehicle or vessel movements this would result in.	Chapter 21
103	Waste and materials	IACC	The ES should set out the means by which the additional non-radioactive waste (both construction waste and municipal 'black bag' waste) will be dealt. Sufficient information should be provided within associated documents such as a waste management strategy to give confidence to the council that existing municipal waste collection and storage arrangements will not be unduly impacted upon by the project.	Chapter 21
104	Waste and materials	PINS	The environmental effects of all wastes to be processed and removed from the site should be addressed. The ES will need to identify and describe the control processes and mitigation procedures for storing and transporting waste off site. All waste types should be quantified and classified.	Chapter 21
105	Waste and materials	IACC	Reference to waste is noted as being dealt with within individual topic chapters. When considering the issue of waste, how it is created and dealt with consideration should be given to the Waste Hierarchy to ensure that waste is minimised wherever possible.	Chapter 21
106	Waste and materials	NRW	NRW advise that the impacts of waste generated during both the operational and construction phase should be fully assessed in the ES. The applicant should be aware that there are a limited number of permitted waste sites within the vicinity of the Project and that this should be considered when assessing the type and volume of waste that will be generated. The applicant should also be aware that a lack of waste options may also impact on the applicant's transport strategy and assessments of traffic volumes.	Chapter 21

Ref.	Receptor	Consultee	Comment	Addendum Chapter
107	Cumulative effects	IACC	Whilst the council understands the rationale behind the modular approach it is concerned to ensure that prior to determining any application that all potential cumulative effects are identified in relation to the development in question and other development proposals, both those which form part of the wider project as well as other, non-project related proposals. The danger of the modular approach is that an early decision on, for example the SPC, could be made without full consideration of the wider cumulative effects if such effects are only proposed to be identified within the ES for a later application (for example the DCO). The applicant must therefore ensure that sufficient information is provided to enable an assessment of potential cumulative effects to be undertaken based upon information available to it at the time that each individual application is submitted. If elements of future scheme remain to be fixed, then these uncertainties should be recognised.	Chapter 21

## Appendix C: Environmental Constraints Plans for Associated Development

This appendix contains environmental constraints plans for the following Associated Development:

- Park and Ride at Dalar Hir;
- Logistics Centre at Parc Cybi; and
- A5025 Off-line Highway Improvements Sections 1, 3, 5 and 7.

Figures are not provided for the A5025 On-line Highway Improvements Sections 2, 4, 6 and 8 as these sections will be subject to an application for planning permission under the Town and Country Planning Act 1990, and as such do not form part of this scoping report.



Figure C1 Park and Ride at Dalar Hir Constraints Plan

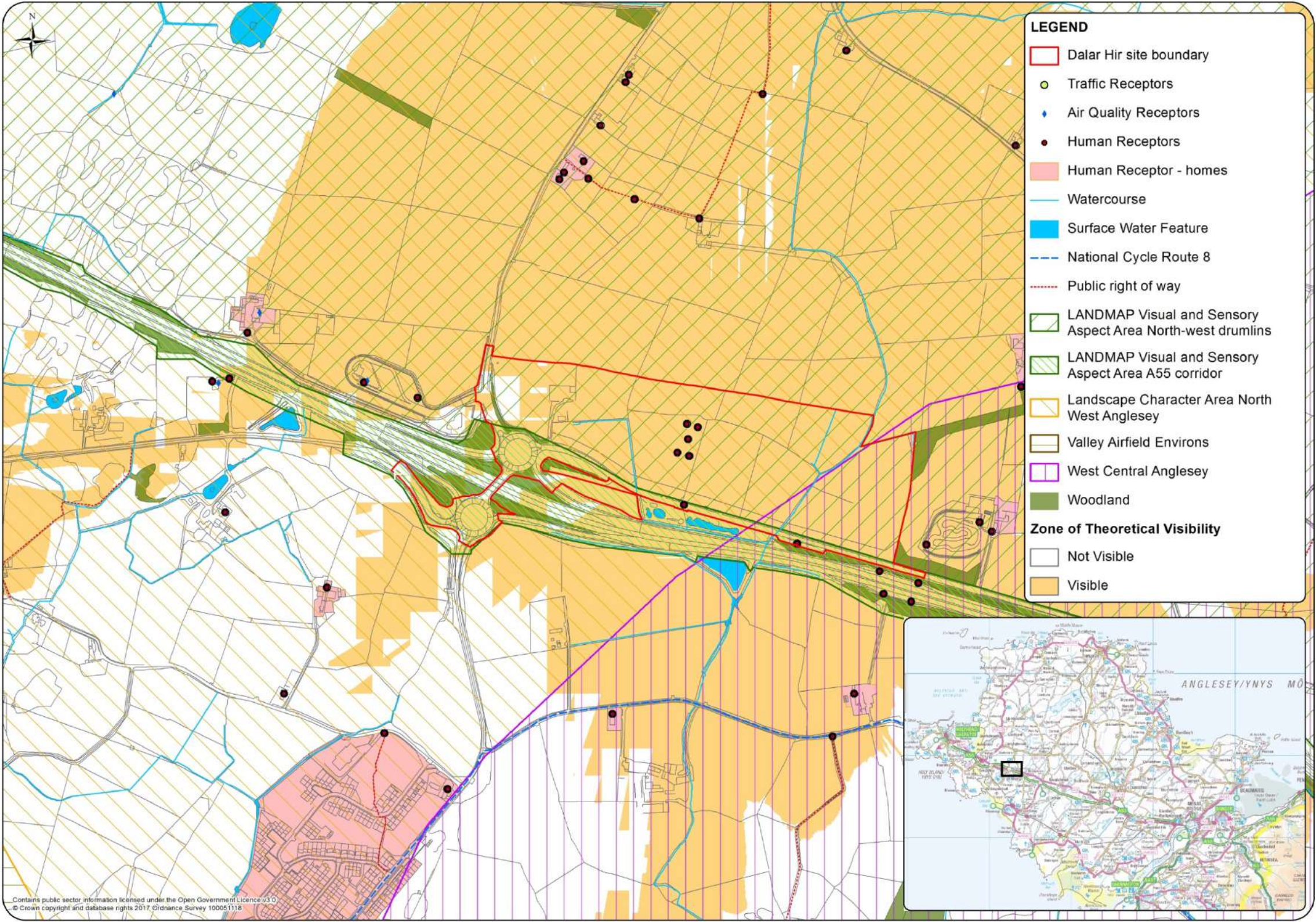




Figure C2 Logistics Centre at Parc Cybi Constraints Plan

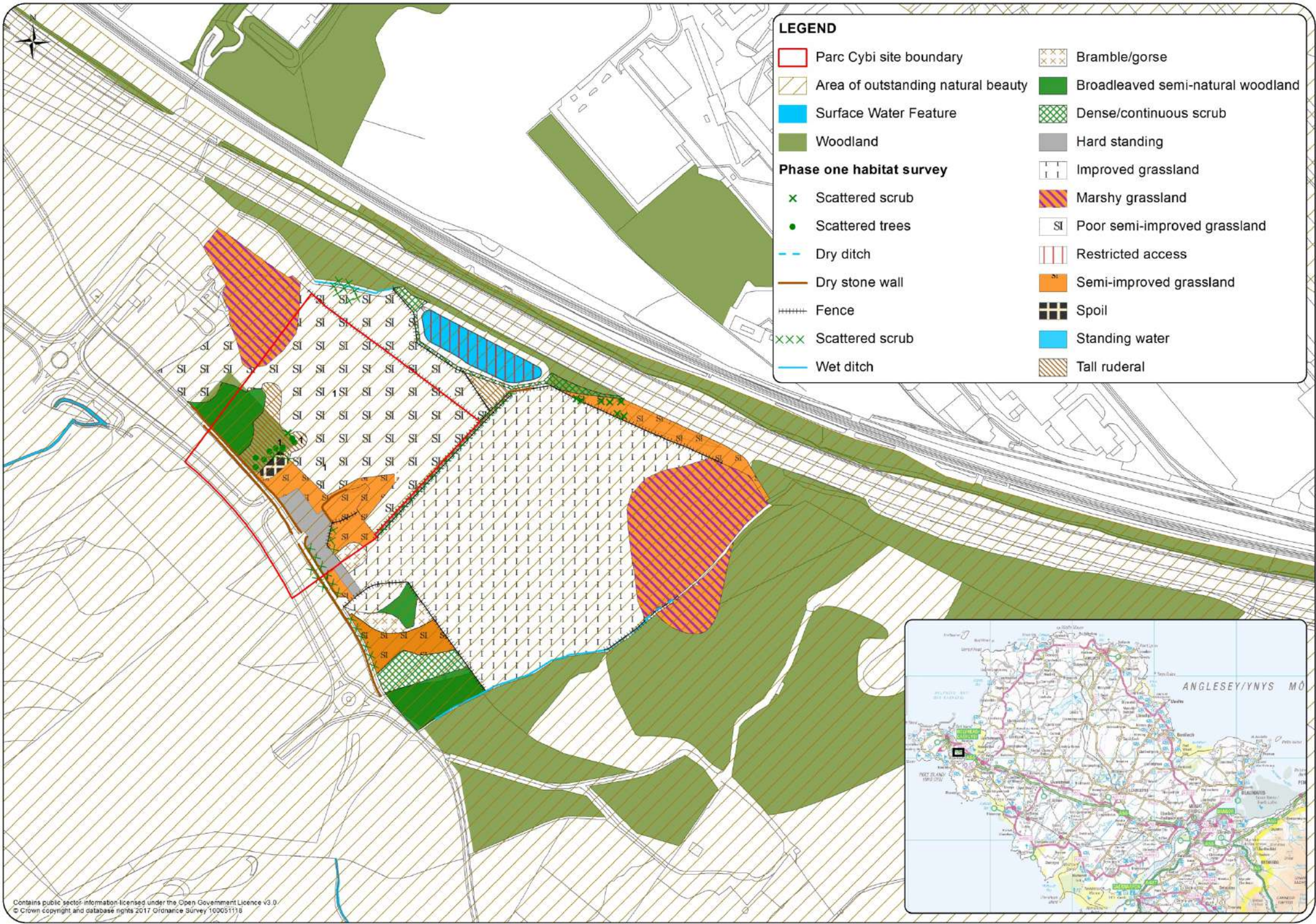




Figure C3 A5025 Off-line Highway Improvements Section 1 Constraints Plan

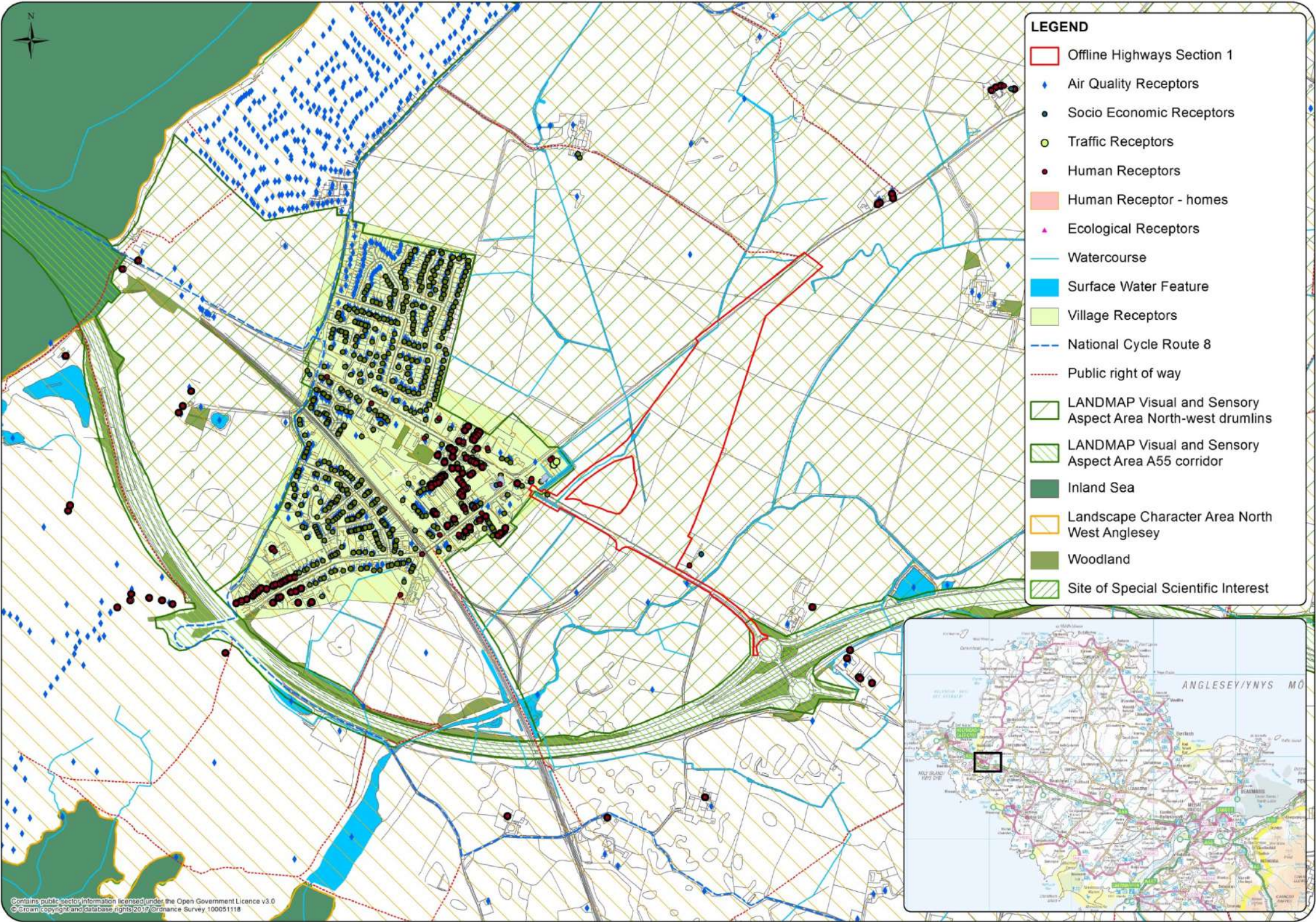




Figure C4 A5025 Off-line Highway Improvements Section 3 Constraints Plan

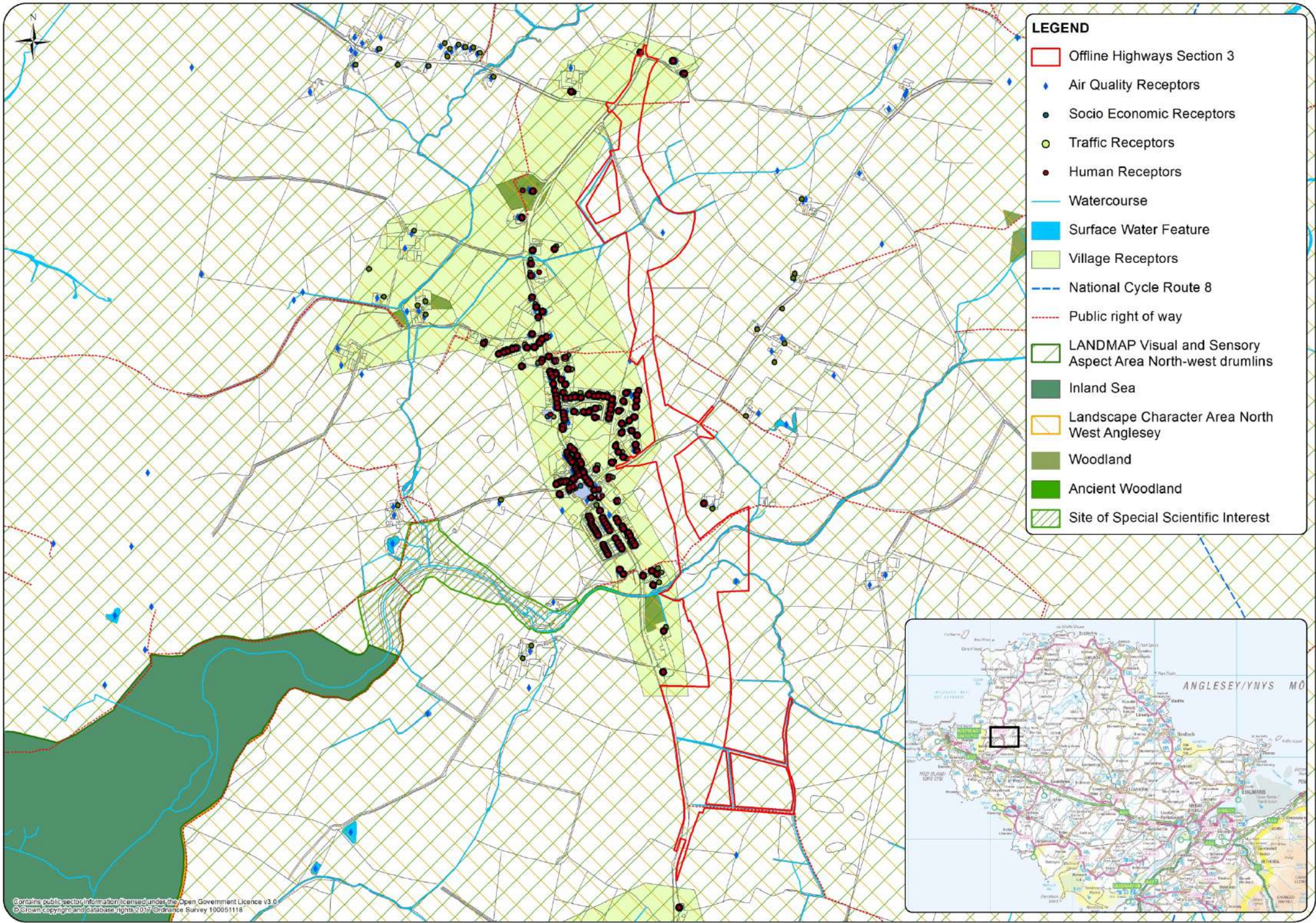




Figure C5 A5025 Off-line Highway Improvements Section 5 Constraints Plan

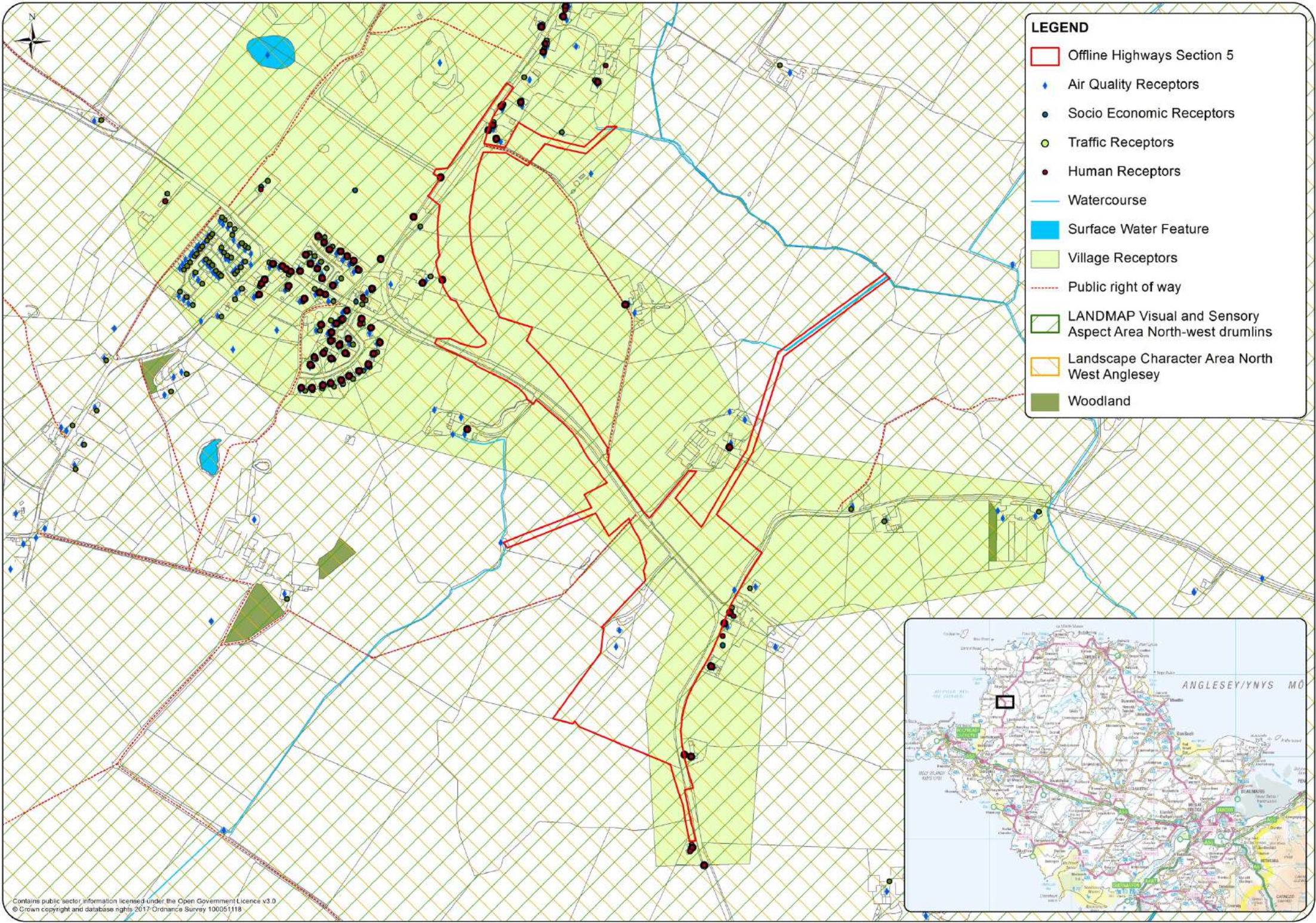




Figure C6 A5025 Off-line Highway Improvements Section 7 Constraints Plan

