MONA OFFSHORE WIND PROJECT

Environmental Statement

Volume 3, Chapter 2: Hydrology and Flood Risk (F02)

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Image of an offshore wind farm

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Deadline 7 Changes

This document has been updated at Deadline 7 of the Mona Offshore Wind Project examination in order to reflect the change to the Order Limits, forming the Change Request, which was accepted by the Examining Authority on 19 December 2024.

The following figures have been updated to reflect the updated onshore order limit change:

- Figure 2.1: Hydrology and flood risk study area
- Figure 2.2: Cumulative projects screened into the CEA assessment

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Glossary

Term	Meaning
Annual Exceedance Probability	The chance that a storm event of a particular size is experienced or exceeded during any year.
Catchments	An area that serves a watercourse with rainwater. Every part of land where the rainfall drains to a single watercourse is in the same catchment.
Climate Change	A long term change in weather patterns, in the context of flood risk, climate change will produce more frequent severe rainfall.
Discharge Consents	Consent granted by Natural Resources Wales to discharge into watercourses, subject to conditions.
Field drainage	Limiting the effect of flooding by maintaining surface water and land drainage systems.
Flood Consequence Assessment (FCA)	A Flood Consequence Assessment is an assessment of the risk of flooding from all flood mechanisms, including the identification of flood mitigation measures, in order to satisfy the requirements of the planning policy Wales and the technical advice note 15.
Flood defences	A structure that is used to reduce the probability of floodwater affecting a particular area.
Flood Risk Activity Permit (FRAP)	A Flood Risk Activity Permit is required for activities in or near a (designated) main river and associated flood defences and/or within a flood plain of a main river from Natural Resources Wales.
Flood Zone 1	Low Probability Land having a less than 1 in 1,000 annual probability of river or sea flooding.
Flood Zone 2	Medium Probability Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.
Flood Zone 3	High Probability Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding.
Fluvial flooding	Fluvial flooding occurs when rivers burst their banks as a result of sustained or intense rainfall.
Geology	The scientific study of the origin, history and structure of the earth.
Greenfield runoff rate	Rates of surface water runoff from a site that is undeveloped (greenfield).
Ground conditions	The chemical and physical characteristics of the soil at a particular location and how it has been affected by historical land uses.
Groundwater	All water which is below the surface of the ground in the saturated zone and in direct contact with the ground or subsoil.
Lead Local Flood Authority	Lead Local Flood Authorities are responsible for managing flood risk from surface water, groundwater and ordinary watercourses. Lead Local Flood Authorities have responsibility for developing a Local Flood Risk Management Strategy for their area identifying local sources of flooding. The local strategy produced must be consistent with the national strategy. It will set out the local organisations with responsibility for flood risk in the area, partnership arrangements to ensure co-ordination between these organisations, an assessment of the flood risk, and plans and actions for managing the risk.
Main rivers	Larger streams and rivers which are legally designated by Natural Resources Wales.
Ordinary watercourses	The term used to describe a water course owned and operated by a local Drainage Board, a Lead Local Flood Authority or a private land owner.

Term		Meaning
Ordinary watercourse consent		Consents required for works in an ordinary watercourse from the relevant Lead Local Flood Authority.
Planning Policy Wales Edition 11		Planning Policy Wales Edition 11 sets out the land use planning policies of the Welsh Government. The objective is to ensure the planning system contributes towards sustainable development and improves the social, economic, environmental land cultural well-being of Wales.
River Basin Management Plan		River Basin Management Plans describe the current state of the water environment in the river basin district. It sets out what improvements are possible by 2015 and how the actions will make a difference to the local environment - the catchments, estuaries, the coast and groundwater.
Shoreline Management Plan		A Shoreline Management Plan is a large-scale assessment of the risks associated with coastal processes and sets out a policy framework to address these risks to people and the developed, historic and natural environments. Coastal processes include tidal patterns, wave height, wave direction and the movement of beach and seabed materials.
Strategic Flood Risk Assessment		A Strategic Flood Risk Assessment provides information on areas at risk from all sources of flooding.
Surface water runoff		Surface water runoff is flow of water that occurs when excess stormwater, meltwater, or other sources of water flows over a surface.
Sustainable Drainage Systems		A sequence of management practices and control measures designed to mimic natural drainage processes by allowing rainfall to infiltrate, and by attenuating and conveying surface water runoff slowly at peak times.
SuDS Approving Body		A service delivered by the Local Authority (Conwy County Borough Council and Denbighshire County Council) to ensure that drainage proposals for all new developments over 100m² of construction area are fit for purpose, designed and built in accordance with the National Standards for Sustainable Drainage published by Welsh Ministers.
Technical advice note 15 (2004)		Technical Advice Note 15 provides technical guidance which supplements the policy set out in Planning Policy Wales in relation to development and flooding. It advises on development and flood risk as this relates to sustainability principles, and provides a framework within which risks arising from both river and coastal flooding, and from additional run-off from development in any location, can be assessed.
Tidal (Coastal) flooding		Tidal flooding is caused by extreme tidal conditions including high tides and storm surges, overtopping local flood defences or coastal features.
Treated Effluent		Water that has received primary, secondary or advanced treatment to reduce its pollution or health hazards and is subsequently released from a wastewater facility after treatment.
UK Climate Projections 2009		Climate projections expressed in terms of absolute values. A projection of the response of the climate system to emission scenarios of greenhouse gases and aerosols, or radiative forcing scenarios based upon climate model simulations and past observations.
Undefended Flood Zone		Natural Resources Wales mapped river and sea flood water extents which do not take into account the presence of flood defences.
Water Framework Directive (WFD)		Directive 2000/60/EC establishing a framework for the Community action in the field of water policy. It aims to secure the ecological, quantitative and qualitative functions of water. It requires that all impacts on water will have to be analysed and actions will have to be taken within river basin management plans.
Water Framework Directive (WFD)	Poor WFD Status	Major change from natural conditions as a result of human activity. Some restrictions on the beneficial uses of the water body. Some impact on amenity. Moderate impact on wildlife and fisheries.
	Moderate WFD Status	Moderate change from natural conditions as a result of human activity. Some restrictions on the beneficial uses of the water body. No impact on amenity. Some impact on wildlife and fisheries.

Term		Meaning
	Good WFD Status	Slight change from natural conditions as a result of human activity. No restriction on the beneficial uses of the water body. No impact on amenity or fisheries. Protects all but the most sensitive wildlife.
Water Quality		The physical, chemical and biological characteristics of water.
Welsh Water		Welsh Water is a water company which supplies drinking water, drainage and sewerage services for the majority of Wales via a network of pipe and pump infrastructure.

Acronyms

Acronym	Description
AEP	Annual Exceedance Probability
BGS	British Geological Society
CCBC	Conwy County Borough Council
CEA	Cumulative Effect Assessment
CIRIA	Construction Industry Research and Information Association
CoCP	Code of Construction Practice
DCC	Denbighshire County Council
DEFRA	Department for Environment, Food & Rural Affairs
DMRB	Design Manual for Roads and Bridges
EA	Environment Agency
EIA	Environmental Impact Assessment
FCA	Flood Consequence Assessment
FMfP	Flood Map for Planning
FRAP	Flood Risk Activity Permit
FRAW	Flood Risk Assessment Wales
GPP	Guidance for Pollution Prevention
IEMA	Institute of Environmental Management and Assessment
LLFA	Lead Local Flood Authority
MDS	Maximum design scenario
MLWS	Mean Low Water Springs
MHWS	Mean High Water Springs
NPS	National Policy Statement
NRW	Natural Resources Wales
NSIP	Nationally Significant Infrastructure Project
PPW	Planning Policy Wales
SFCA	Strategic Flood Consequence Assessment
SPZ	Source Protection Zone

Acronym	Description
SSSI	Special Site of Scientific Interest
SuDS	Sustainable Drainage Systems
TAN	Technical Advice Note
WFD	Water Framework Directive
ZoI	Zone of Influence

Units

Unit	Description
%	Percentage
ha	Hectare (area)
km	Kilometre
km^2	Square kilometres
kV	Kilovolt (electrical potential)
m	Metres (distance)
m^2	Metres squared (area)
m^3	Metres cubed (volume)
mm	Millimetres
MW	Megawatt (power)
nm	Nautical miles

2 Hydrology and flood risk

2.1 Introduction

2.1.1 Overview

2.1.1.1 This chapter of the Environmental Statement presents the assessment of the potential impact of the Mona Offshore Wind Project on hydrology and flood risk. Specifically, this chapter considers the potential impact of the Mona Offshore Wind Project landward of Mean Low Water Springs (MLWS) during the construction, operations and maintenance, and decommissioning phases.

2.1.1.2 The assessment presented also informs and is informed by the following technical chapters:

- Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the Environmental Statement
- Volume 3, Chapter 3: Onshore ecology of the Environmental Statement
- Volume 3, Chapter 7: Land use and recreation of the Environmental Statement.

2.1.1.3 This chapter also draws upon information contained within the following documents:

- Volume 7, Annex 2.1: Flood consequences assessment of the Environmental Statement
- Volume 7, Annex 2.2: Surface watercourses and NRW flood zones of the Environmental Statement
- Volume 7, Annex 2.3: Surface water abstraction licences, discharge consents and pollution incidents of the Environmental Statement
- Volume 7, Annex 2.4: Water Framework Directive surface water and groundwater assessment of the Environmental Statement.

2.2 Policy context

2.2.1 Legislation

2.2.1.1 The legislative context for the Mona Offshore Wind Project is set out in Volume 1, Chapter 2: Policy and legislative context of the Environmental Statement. In addition, the following legislation has also been considered:

- Water Resources Act 1991 principally relates to the protection of controlled waters (i.e., rivers, lakes, canals and groundwater) from pollution. It sets out the responsibilities of the Natural Resources Wales (NRW) in relation to water pollution, resource management, flood defence, fisheries, and in some areas, navigation. It also regulates discharges to controlled waters, namely rivers, estuaries, coastal waters, lakes and groundwater. The act allows the NRW to create byelaws for flood defence and drainage purposes (paragraph 5 of Schedule 25 of the Water Resources Act 1991)
- The Environmental Permitting (England and Wales) Regulations 2016 applies in relation to flood risk activity in, over or under a watercourse. Consent is required from the NRW to undertake works or to erect structures within 8 m of a non-tidal water body and 16 m of a tidal body. An environmental permit is also required for any discharges to surface watercourses (Schedule 25 EPR 2016)

- Land Drainage Act 1991 (under section 23) requires consent from the relevant Drainage Board for any works likely to obstruct, or affect the flow of, a watercourse. Under byelaws, consent is required from the relevant drainage authority for any development within a particular distance of a drainage work. The relevant drainage authorities are NRW, Conwy County Borough Council (CCBC) and Denbighshire County Council (DCC)
- The Flood and Water Management Act 2010 aims to improve flood risk management and designated Lead Local Flood Authorities (LLFAs) (CCBC and DCC as the LLFAs within the Mona Onshore Development Area). The act places a series of responsibilities on LLFAs to improve flood risk management to surface water, groundwater and ordinary watercourses across their jurisdictional area
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 establishes a legislative framework for the protection of surface waters and groundwater. The Regulations place a general duty on the Secretary of State and the NRW to exercise their 'relevant functions' so as to secure compliance with the EU-derived domestic legislation preserved under s.2 of the European Union (Withdrawal) Act 2018.

2.2.2 Planning policy context

2.2.2.1 The Mona Offshore Wind Project will be located in Welsh offshore waters (beyond 12 nautical miles (nm) from the Welsh coast) and inshore waters, with the onshore infrastructure located wholly within Wales. As set out in Volume 1, Chapter 1: Introduction and overarching glossary of this Environmental Statement, the Mona Offshore Wind Project is an offshore generating station located in Welsh waters and is a Nationally Significant Infrastructure Project (NSIP) as defined by Section 15(3) of the Planning Act 2008 (as amended) (the 2008 Act). As such, there is a requirement to submit an application for a Development Consent Order (DCO) to the Planning Inspectorate to be decided by the Secretary of State for the Department for Energy Security and Net Zero.

2.2.3 National Policy Statements

2.2.3.1 There are currently six energy National Policy Statements (NPSs), three of which contain policy relevant to offshore wind development and the Mona Offshore Wind Project, specifically:

- Overarching NPS for Energy (NPS EN-1) which sets out the UK Government's policy for the delivery of major energy infrastructure (Department for Energy Security and Net Zero, 2024a)
- NPS for Renewable Energy Infrastructure (NPS EN-3) (Department for Energy Security and Net Zero, 2024b)
- NPS for Electricity Networks Infrastructure (NPS EN-5) (Department for Energy Security and Net Zero, 2024c).

2.2.3.2 NPS EN-1 and NPS EN-3 include guidance on what matters are to be considered in the assessment. These are summarised in Table 2.1 below. NPS EN-1 and NPS EN-3 also highlight a number of factors relating to the determination of an application and in relation to mitigation. These are summarised in Table 2.2 below.

2.2.3.3 NPS EN-5 includes guidance on what matters are to be considered in the onshore assessment of electrical networks. These are summarised in

2.2.3.4 Table 2.3. NPS EN-5 also highlights factors relating to the determination of an application and in relation to mitigation and are summarised in Table 2.4.

Table 2.1:Summary of the NPS EN-1 and NPS EN-3 provisions relevant to hydrology and flood risk.

Summary of NPS EN-1 and EN-3 provision	How and where considered in the Environmental Statement
NPS-EN1	
Climate Change Adaption	
Climate change is already having an impact and is expected to have an increasing impact on the UK throughout this century. The UK Climate Projections 2018 show an increased chance of milder, wetter winters and hotter, drier summers in the UK, with more intensive rainfall causing flooding. Sea levels will continue to rise beyond the end of the century, increasing risks to vulnerable coastal communities. Within the lifetime of energy projects, these factors will lead to increased flood risks in areas susceptible to flooding, and to an increased risk of the occurrence of floods in some areas which are not currently thought of as being at risk. A robust approach to flood risk management is a vital element of climate change adaptation; the applicant and the Secretary of State should take account of the policy on climate change adaptation in Section 4.10 [paragraph 5.8.5 NPS EN-1].	A site-specific Flood Consequence Assessment (FCA) has been undertaken for the Mona Offshore Wind Project assesses the Mona Onshore Development Area, including for the permanent infrastructure at the Onshore Substation. The approach undertaken for the FCA is detailed within 2.3.7. The FCA is reported in Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement and has been undertaken in line with Planning Policy Wales (PPW) 11, Technical Advice Note (TAN) 15. The FCA is summarised within section 2.3.8. The characterisation of the hydrology and flood risk baseline has been informed by NRW Flood Risk Mapping and takes into account climate change allowance based on UKCP09 and emerging UKCP18 research data (noting that the current Welsh guidance have not updated their climate change projections to incorporate UKCP18 data as of yet) which is presented within section 2.3.9.
Flood Risk	
A site-specific flood risk assessment should be provided for all energy projects in Zones B and C in Wales. In Zone A in Wales, an assessment should accompany all proposals involving: • sites of 1 hectare or more • land which has been identified by the EA or NRW as having critical drainage problems • land identified (for example in a local authority strategic flood risk assessment) as being at increased flood risk in future • land that may be subject to other sources of flooding (for example surface water) • where the EA or NRW, Lead Local Flood Authority, Internal Drainage Board or other body have indicated that there may be drainage problems. This assessment should identify and assess the risks of all forms of flooding to and from the project and demonstrate how these flood risks will be managed, taking climate change into account [paragraph 5.8.13 – 5.8.14 NPS EN-1].	Due to the scale of the Mona Onshore Development Area, a FCA has been undertaken. The FCA is reported in Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement. The approach undertaken for the FCA is detailed within 2.3.7. The FCA considers all forms of flooding and demonstrates how flood risk will be managed, taking into account the effects of climate change and is summarised within section 2.3.8 and section 2.3.9.
The minimum requirements for Flood Consequence Assessments (FCA) are that they should: • Be proportionate to the risk and appropriate to the scale, nature and location of the project;	A FCA fulfilling the requirements stipulated within NPS EN-1 has been prepared. The FCA is reported in Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement and has been undertaken in line

Summary of NPS EN-1 and EN-3 provision	How and where considered in the Environmental Statement
• Consider the risk of flooding arising from the project in addition to the risk of flooding to the project; • Take the impacts of climate change into account, across a range of climate scenarios, clearly stating the development lifetime over which the assessment has been made; • Be undertaken by competent people, as early as possible in the process of preparing the proposal; • Consider both the potential adverse and beneficial effects of flood risk management infrastructure, including raised defences, flow channels, flood storage areas and other artificial features, together with the consequences of their failure and exceedance; • Consider the vulnerability of those using the site, including arrangements for safe access and escape; • Consider and quantify the different types of flooding (whether from natural and human sources and including joint and cumulative effects) and include information on flood likelihood, speed-of-onset, depth, velocity, hazard and duration; • Identify and secure opportunities to reduce the causes and impacts of flooding overall, making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management; • Consider the effects of a range of flooding events including extreme events on people, property, the natural and historic environment and river and coastal processes; • Include the assessment of the remaining (known as 'residual') risk after risk reduction measures have been taken into account and demonstrate that these risks can be safely managed, ensuring people will not be exposed to hazardous flooding; • Consider how the ability of water to soak into the ground may change with development, along with how the proposed layout of the project may affect drainage systems. Information should include: – Describe the existing surface water drainage arrangements for the site – Set out (approximately) the existing rates and volumes of surface water run-off generated by the site. Detail the proposals for restricting discharge rates – Set out proposals for managing and discharging surface water from the site using sustainable drainage systems and accounting for the predicted impacts of climate change. If sustainable drainage systems have been rejected, present clear evidence of why their inclusion would be inappropriate – Demonstrate how the hierarchy of drainage options has been followed.	with Planning Policy Wales (PPW) 11, Technical Advice Note (TAN) 15. Due to the scale and nature of the development, the FCA focuses upon the Landfall area located within Flood Zone 3 and the permanent infrastructure at the Onshore Substation. The approach undertaken for the FCA is detailed within section 2.3.7. The FCA considers all forms of flooding, including residual flood risk and demonstrates how flood risk will be managed, taking into account the effects of climate change and is summarised within section 2.3.8 and section 2.3.9. The FCA includes a characterisation of development vulnerability in terms of flood risk in line with TAN 15 guidance. Mitigation measures regarding hydrology and flood risk are detailed within Table 2.20. The drainage strategy for the Mona Onshore Substation layout has been included as part of the DCO application (Outline Operational Drainage Management Strategy – Document Reference J27). In accordance with Operational Drainage Management Strategy the rate of surface water runoff discharging into local watercourses will be no greater than existing rates for all events up to the 1% Annual Exceedance Probability (AEP) (1 in 100 annual chance) plus 40% allowance for climate change. Where practicable the volume of runoff will not increase following development. The Outline Operational Drainage Management Strategy includes details of the body responsible for the maintenance of SuDS within the Mona Onshore Substation.

Summary of NPS EN-1 and EN-3 provision	How and where considered in the Environmental Statement
– Explain and justify why the types of SuDS and method of discharge have been selected and why they are considered appropriate. Where cost is a reason for not including Sustainable Drainage Systems (SuDS), provide information to enable comparison with the lifetime costs of a conventional public sewer connection – Explain how SuDS have been integrated with other aspects of the development such as open space or green infrastructure, so as to ensure an efficient use of the site – Describe the multifunctional benefits the sustainable drainage system will provide – Set out which opportunities to reduce the causes and impacts of flooding have been identified and included as part of the proposed sustainable drainage system – Explain how run-off from the completed development will be prevented from causing an impact elsewhere – Explain how the sustainable drainage system been designed to facilitate maintenance and, where relevant, adoption. Set out plans for ensuring an acceptable standard of operation and maintenance throughout the lifetime of the development • Detail those measures that will be included to ensure the development will be safe and remain operational during a flooding event throughout the development's lifetime without increasing flood risk elsewhere • Identify and secure opportunities to reduce the causes and impacts of flooding overall during the period of construction • Be supported by appropriate data and information, including historical information on previous events [paragraph 5.8.15, NPS EN-1].	
Further guidance can be found in TAN15 for Wales or successor documents [paragraph 5.8.16 NPS EN-1].	A FCA has been prepared taking into account the requirements of PPW and TAN15 on flood risk. The FCA is reported in Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement.
Applicants for projects which may be affected by, or may add to, flood risk should arrange pre-application discussions before the official pre-application stage of the NSIP process with the NRW, and, where relevant, other bodies such as Lead Local Flood Authorities, Internal Drainage Boards, sewerage undertakers, navigation authorities, highways authorities and reservoir owners and operators [paragraph 5.8.18 of NPS EN-1].	NRW, the LLFAS (CCBC and DCC) and Dŵr Cymru / Welsh Water have been consulted during the consenting process and their responses to the Scoping Report are included in Table 2.6. The Mona Onshore Development Area is not located within an Internal Drainage District (Welsh version of Internal Drainage Board). A summary of key consultation issues raised during consultation activities undertaken for the Mona Offshore Wind Project relevant to hydrology and flood risk is presented within Table 2.6Table 2.6: Summary of key consultation issues raised during consultation activities undertaken for the Mona Offshore Wind Project relevant to hydrology and flood risk.

Summary of NPS EN-1 and EN-3 provision	How and where considered in the Environmental Statement
Water quality and resources	
Where the project is likely to have effects on the water environment, the applicant should undertake an assessment of the existing status of, and impacts of the proposed project on, water quality, water resources and physical characteristics of the water environment, and how this might change due to the impact of climate change on rainfall patterns and consequently water availability across the water environment, as part of the Environmental Statement or equivalent (see section 4.3 and 4.10) [paragraph 5.16.3 of NPS EN-1].	The baseline environment (see section 2.3) is described for the Mona hydrology and flood risk study area. An assessment of the impacts on water quality, resources and physical characteristics is provided in section 2.7. The requirements of relevant River Basin Management Plans and the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017, including regulation 19 have been considered (where relevant) in Volume 7, Annex 2.4: Water Framework Directive surface water and groundwater assessment, of the Environmental Statement.
The ES should in particular describe: • The existing quality of waters affected by the proposed project and the impacts of the proposed project on water quality, noting any relevant existing discharges, proposed new discharges and proposed changes to discharges • Existing water resources affected by the proposed project and the impacts of the proposed project on water resources, noting any relevant existing abstraction rates, proposed new abstraction rates and proposed changes to abstraction rates (including any impact on or use of mains supplies and reference to Abstraction Licensing Strategies) and also demonstrate how proposals minimise the use of water resources and water consumption in the first instance • Existing physical characteristics of the water environment (including quantity and dynamics of flow) affected by the proposed project and any impact of physical modifications to these characteristics • Any impacts of the proposed project on water bodies or protected areas (including shellfish protected areas) under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 and source protection zones (SPZs) around potable groundwater abstractions • How climate change could impact any of the above in the future • Any cumulative effects. [paragraph 5.16.7 NPS EN-1].	The baseline water quality and resources for the hydrology and flood risk study area are described in section 2.3.8. Watercourses in the hydrology and flood risk study area have been identified and information on abstractions, discharges, pollution incidents and water quality is presented within Volume 7, Annex 2.3: Surface water abstraction licences, discharge consents and pollution incidents of the Environmental Statement. The impacts on surface watercourses are described in section 2.7. SPZs are referred to in Volume 3 Chapter 1: Geology, hydrogeology and ground conditions of the Environmental Statement. However, there are no SPZs within the geology, hydrogeology and ground conditions study area. A review of the Water Framework Directive (WFD) classifications for watercourses within the hydrology and flood risk study area has been undertaken (see Table 2.10). A WFD assessment is presented in Volume 7, Annex 2.4: Water Framework Directive surface water and groundwater assessment, of the Environmental Statement. Cumulative effects have been assessed as part of the Cumulative Impact Assessment within section 2.9.
NPS-EN3	
Offshore wind farms will not be affected by flooding. However, applicants should demonstrate that any necessary land-side infrastructure (such as cabling and onshore substations) will be appropriately resilient to climate-change induced weather phenomena. Similarly, applicants should particularly set out how the proposal would be resilient to storms. [paragraph 3.4.7 NPS EN-3].	Resilience to storms is discussed in Volume 2, Chapter 1: Physical processes of the Environmental Statement in relation to the Mona offshore environment including the intertidal area. The resilience to flood risk within the Mona Onshore Development Area, including for the permanent infrastructure at the Onshore Substation are set out within this chapter and Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement.

Table 2.2: Summary of NPS EN-1 policy on decision making relevant to hydrology and flood risk.

Summary of NPS EN-1 provision	How and where considered in the Environmental Statement
Climate change adaption	
The Secretary of State should be satisfied that applicants for new energy infrastructure have taken into account the potential impacts of climate change using the latest UK Climate Projections and associated research and expert guidance (such as the Welsh Government's Climate change allowances and flood consequence assessments) available at the time the ES was prepared to ensure they have identified appropriate mitigation or adaptation measures. This should cover the estimated lifetime of the new infrastructure, including any decommissioning period. Should a new set of UK Climate Projections or associated research become available after the preparation of the ES, the Secretary of State (or the Examining Authority during the examination stage) should consider whether they need to request further information from the applicant [paragraph 4.10.13 – 4.10.14 NPS EN1]	A site-specific FCA has been undertaken for the Mona Offshore Wind Project assesses the Mona Onshore Development Area, including for the permanent infrastructure at the Onshore Substation. The FCA is reported in Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement and has been undertaken in line with Planning Policy Wales (PPW) 11, Technical Advice Note (TAN) 15. The FCA is summarised within section 2.3.8. The characterisation of the hydrology and flood risk baseline has been informed by NRW Flood Risk Mapping and takes into account climate change allowance based on UKCP09 and emerging UKCP18 research data (noting that the current Welsh guidance have not updated their climate change projections to incorporate UKCP18 data as of yet) which is presented within section 2.3.9.
Flood Risk	
In determining an application for development consent, the Secretary of State should be satisfied that where relevant: • The application is supported by an appropriate FRA • The Sequential Test has been applied and satisfied as part of site selection • A sequential approach has been applied at the site level to minimise risk by directing the most vulnerable uses to areas of lowest flood risk • The proposal is in line with any relevant national and local flood risk management strategy • SuDS (as required in the next paragraph on National Standards) have been used unless there is clear evidence that their use would be inappropriate • In flood risk areas the project is designed and constructed to remain safe and operational during its lifetime, without increasing flood risk elsewhere (subject to the exceptions set out in paragraph 5.8.42) • The project includes safe access and escape routes where required, as part of an agreed emergency plan, and that any residual risk can be safely managed over the lifetime of the development • Land that is likely to be needed for present or future flood risk management infrastructure has been appropriately safeguarded from development to the extent that development would not prevent or hinder its construction, operation or maintenance [paragraph 5.8.36, NPS EN-1].	A FCA fulfilling the requirements stipulated within NPS EN-3 has been prepared. The FCA is reported in Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement and has been undertaken in line with Planning Policy Wales (PPW) 11, Technical Advice Note (TAN) 15. Due to the scale and nature of the development, the FCA focuses upon the Landfall area located within Flood Zone 3/Zone C2 and the permanent infrastructure at the Onshore Substation. The Justification Test has been undertaken within the FCA for the Mona Landfall and has assessed to have been passed. The approach undertaken for the FCA is detailed within 2.3.7. The FCA considers all forms of flooding, including residual flood risk and demonstrates how flood risk will be managed, taking into account the effects of climate change and is summarised within section 2.3.8 and section 2.3.9. The FCA includes a characterisation of development vulnerability in terms of flood risk in line with TAN 15 guidance. Mitigation measures regarding hydrology and flood risk are detailed within Table 2.20.

Summary of NPS EN-1 provision	How and where considered in the Environmental Statement
In addition, the development consent order, or any associated planning obligations, will need to make provision for appropriate operation and maintenance of any SuDS throughout the project's lifetime. Where this is secured through the adoption of any SuDS features, any necessary access rights to property will need to be granted. Where relevant, the Secretary of State should be satisfied that the most appropriate body is being given the responsibility for maintaining any SuDS, taking into account the nature and security of the infrastructure on the proposed site. Responsible bodies could include, for example the landowner, the relevant lead local flood authority or water and sewerage company (through the Ofwat-approved Sewerage Sector Guidance), or another body, such as an Internal Drainage Board [paragraph 5.8.38 – 5.8.39 NPS-EN1].	The drainage strategy for the Mona Onshore Substation layout has been included as part of the DCO application (Outline Operational Drainage Management Strategy – Document Reference J27). In accordance with Operational Drainage Management Strategy the rate of surface water runoff discharging into local watercourses will be no greater than existing rates for all events up to the 1% AEP (1 in 100 annual chance) plus 40% allowance for climate change. Where practicable the volume of runoff will not increase following development. The Outline Operational Drainage Management Strategy includes details of the body responsible for the maintenance of SuDS within the Mona Onshore Substation.
Energy projects should not normally be consented within Zone C2 in Wales, or on land expected to fall within these zones within its predicted lifetime. This may also apply where land is subject to other sources of flooding (for example surface water). However, where essential energy infrastructure has to be located in such areas, for operational reasons, they should only be consented if the development will not result in a net loss of floodplain storage, and will not impede water flows. Exceptionally, where an increase in flood risk elsewhere cannot be avoided or wholly mitigated, the Secretary of State may grant consent if they are satisfied that the increase in present and future flood risk can be mitigated to an acceptable and safe level and taking account of the benefits of, including the need for, nationally significant energy infrastructure as set out in Part 3 above. In any such case the Secretary of State should make clear how, in reaching their decision, they have weighed up the increased flood risk against the benefits of the project, taking account of the nature and degree of the risk, the future impacts on climate change, and advice provided by the EA or NRW and other relevant bodies [paragraph 5.8.41 – 5.8.42 NPS EN-1].	As presented within the FCA and section 2.3, the Mona Onshore Substation and the majority of the Mona Onshore Development Area are located entirely within Flood Zone 1/Zone A. Zone C2 is present within the Mona Landfall area only and are associated with tidal flooding. The Justification Test has been undertaken within the FCA for the areas of C2 and has assessed to have been passed. The approach undertaken for the FCA is detailed within 2.3.7. The FCA considers all forms of flooding, including residual flood risk and demonstrates how flood risk will be managed, taking into account the effects of climate change and is summarised within section 2.3.8 and section 2.3.9. Mitigation measures regarding hydrology and flood risk are detailed within Table 2.20.
Where new energy infrastructure is, exceptionally, necessary in flood risk areas (for example where there are no reasonably available sites in areas at lower risk), policy aims to make it safe for its lifetime without increasing flood risk elsewhere and, where possible, by reducing flood risk overall. It should also be designed and constructed to remain operational in times of flood. Proposals that aim to facilitate the relocation of existing energy infrastructure from unsustainable locations which are or will be at unacceptable risk of flooding, should be supported where it would result in climate resilient infrastructure. If, following application of the Sequential Test, it is not possible, (taking into account wider sustainable development objectives), for the project to be located in areas of lower flood risk the Exception Test can be applied as defined in https://www.gov.uk/guidance/flood-risk-and-	As presented within the FCA and section 2.3, the entirety of the Onshore Substation and the majority of the Mona Onshore Development Area is located in Zone A (as described in section 2.3). Zones C1/C2 are present within the Mona Landfall area only. The Justification Test (the Welsh equivalent of the Exception Test, as defined by NPS EN-1 2023) has been undertaken for the Mona Landfall area within Zone C2 within the FCA (see Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement) and has assessed to have been passed.

Summary of NPS EN-1 provision	How and where considered in the Environmental Statement
coastal-change#table2. The test provides a method of allowing necessary development to go ahead in situations where suitable sites at lower risk of flooding are not available. [paragraph 5.8.7 – 5.8.9 NPS EN-1].	
Both elements of the Exception Test will have to be satisfied for development to be consented. To pass the Exception Test it should be demonstrated that: • The project would provide wider sustainability benefits to the community that outweigh flood risk; and • The project will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible will reduce flood risk overall [paragraph 5.8.11 NPS EN-1].	The Justification Test (the Welsh equivalent of the Exception Test, as defined by NPS EN-1 2023) has been undertaken as part of the FCA which is presented within Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement. The onshore cable route has to pass through an area of flood risk associated with tidal flooding in order to reach the Onshore Substation and will provide wider sustainability benefits by delivering green energy into the National Grid. Flood risk will be managed through a Flood Management Plan (Document Reference: J26.7), which forms part of the Outline Code of Construction Practice (Document Reference J26). As such the Justification Test is assessed to be passed.
Development should be designed to ensure there is no increase in flood risk elsewhere, accounting for the predicted impacts of climate change throughout the lifetime of the development. There should be no net loss of floodplain storage and any deflection or constriction of flood flow routes should be safely managed within the site. Mitigation measures should make as much use as possible of natural flood management techniques [paragraph 5.8.12 NPS EN-1].	The FCA considers all forms of flooding, including residual flood risk and demonstrates how flood risk will be managed, taking into account the effects of climate change and is summarised within section 2.3.8 and section 2.3.9. Mitigation measures regarding hydrology and flood risk are detailed within Table 2.20. The drainage strategy for the Mona Onshore Substation layout has been included as part of the DCO application (Outline Operational Drainage Management Strategy – Document Reference J27). In accordance with Operational Drainage Management Strategy the rate of surface water runoff discharging into local watercourses will be no greater than existing rates for all events up to the 1% AEP (1 in 100 annual chance) plus 40% allowance for climate change. Where practicable the volume of runoff will not increase following development.
Water quality resources	
The Secretary of State should be satisfied that a proposal has regard to current River Basin Management Plans and meets the requirements of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (including regulation 19). The specific objectives for particular river basins are set out in River Basin Management Plans. The Secretary of State must refuse development consent where a project is likely to cause deterioration of a water body or its failure to achieve good status or good potential, unless the requirements set out in Regulation 19 are met. A project may be approved in the absence of a qualifying Overriding Public Interest test only if there is sufficient certainty that it will not cause deterioration or compromise the achievement of good status or good potential. The Secretary of State should also consider the interactions of the proposed project with other plans such as Water Resources Management Plans and Shoreline/Estuary Management Plans [paragraph 5.16.14 – 5.16.15 NPS EN-1].	The assessment and the proposed mitigation measures have taken into account the requirements of the River Basin Management Plan, Shoreline Management Plan and WFD to ensure all potential impacts on the water environment are mitigated to within acceptable levels (see Table 2.20).

Summary of NPS EN-1 provision	How and where considered in the Environmental Statement
The Secretary of State should consider proposals to mitigate adverse effects on the water environment and any enhancement measures put forward by the applicant and whether appropriate requirements should be attached to any development consent and/or planning obligations are necessary [paragraph 5.16.16 NPS EN-1].	Appropriate mitigation measures are set out in Table 2.20 and an Outline Code of Construction Practice (CoCP) (Document Reference J26) has been prepared as part of the DCO application.
The Secretary of State should consider whether mitigation measures are needed over and above any which may form part of the project application. A construction management plan may help codify mitigation at that stage. The risk of impacts on the water environment can be reduced through careful design to facilitate adherence to good pollution control practice. For example, designated areas for storage and unloading, with appropriate drainage facilities, should be clearly marked. The impact on local water resources can be minimised through planning and design for the efficient use of water, including water recycling. If a development needs new water infrastructure, significant supplies or impacts other water supplies, the applicant should consult with the local water company and the EA or NRW [paragraph 5.16.8 – 5.16.10 NPS EN-1].	The approach to flood risk is presented in Volume 7, Annex 2.1: Flood Consequence Assessment of the Environmental Statement and has been summarised in this chapter. Appropriate mitigation measures are set out in Table 2.20 and an Outline Code of Construction Practice (CoCP) (Document Reference J26) has been prepared as part of the DCO application.

Table 2.3:Summary of NPS EN-5 provisions relevant to hydrology and flood risk.

Summary of NPS EN-5 provision	How and where considered in the Environmental Statement
Climate Change Adaption	
As climate change is likely to increase risks to the resilience of some of this infrastructure, from flooding for example, or in situations where it is located near the coast or an estuary or is underground, applicants should in particular set out to what extent the proposed development is expected to be vulnerable, and, as appropriate, how it has been designed to be resilient to: • Flooding, particularly for substations that are vital to the network; and especially in light of changes to groundwater levels resulting from climate change [paragraph 2.3.2 NPS EN-5].	A site-specific FCA has been undertaken for the Mona Offshore Wind Project assesses the Mona Onshore Development Area, including for the permanent infrastructure at the Onshore Substation. The FCA considers all forms of flooding, including residual flood risk and demonstrates how flood risk will be managed, taking into account the effects of climate change and is summarised within section 2.3.8 and section 2.3.9. Mitigation measures regarding hydrology and flood risk are detailed within Table 2.20 The drainage strategy for the Mona Onshore Substation layout has been included as part of the DCO application (Outline Operational Drainage Management Strategy – Document Reference J27). In accordance with Operational Drainage Management Strategy the rate of surface water runoff discharging into local watercourses will be no greater than existing rates for all events up to the 1% AEP (1 in 100 annual chance) plus 40% allowance for climate change. Where practicable the volume of runoff will not increase following development.

Table 2.4:Summary of NPS EN-5 policy on decision making relevant to hydrology and flood risk.

Summary of NPS EN-5 provision	How and where considered in the Environmental Statement
Section 4.10 of EN-1 advises that the resilience of the project to the effects of climate change must be assessed in the Environmental Statement (ES) accompanying an application. For example, future increased risk of flooding would be covered in any flood risk assessment (see Sections 5.8 in EN-1). Consideration should also be given to coastal change (see sections 5.6 in EN1) [paragraph 2.3.3, NPS EN-5].	A site-specific FCA has been undertaken for the Mona Offshore Wind Project assesses the Mona Onshore Development Area, including for the permanent infrastructure at the Onshore Substation. The FCA considers all forms of flooding, including residual flood risk and demonstrates how flood risk will be managed, taking into account the effects of climate change and is summarised within section 2.3.8 and section 2.3.9. Mitigation measures regarding hydrology and flood risk are detailed within Table 2.20.

2.2.4 National and local planning policies

2.2.4.1 The assessment of potential changes to hydrology and flood risk has also been made with consideration to the specific policies set out in:

- PPW 11
- TAN 15, 2004 and 2023
- Conwy Local Development Plan, 2013
- Denbighshire Local Development Plan, 2013.

2.2.4.2 Key provisions are set out in Table 2.5 along with details as to how these have been addressed within the assessment.

Table 2.5: Local Planning Policy of relevant to hydrology and flood risk.

Policy	Key provisions	How and where considered in the Environmental Statement
PPW 11		
Chapter 13 'Minimising and Managing Environmental Risk and Pollution' Section 13.4	Development proposals in areas designed as being of high flood hazard should only be considered where: • New development can be justified in that location, even though it is likely to be at risk from flooding • The development proposal would not result in the intensification of existing development which may itself be at risk • New development would not increase the potential adverse impacts of a flood event.	Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement has been undertaken in line with PPW.
TAN 15		
	An FCA to support a development application, should be proportionate to the risk and appropriate to the scale, nature and location of the development. The following will need to be considered: • The consequences of flooding on the development, the consequences of the development on flood risk elsewhere and if	Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement has been undertaken in line with TAN 15.

Policy	Key provisions	How and where considered in the Environmental Statement
	appropriate mitigation measures can be incorporated into the design • Mechanisms of flooding, including sources of floodwater, how floodwater enters and flows across a site, height, and speed of floodwaters • Uncertainties in estimating flood events including use of historical records and forecasting • Security of proposed developments over their lifetime and ensuring those using the development have an awareness of the potential risks from flooding • Description of consequences under a range of extreme events including: mechanisms, sources, depths, speed, rate of rise, overland flood routes, velocity, access and egress, impacts on natural heritage, impact on flood risk in surrounding areas • Structural adequacy of defences to contain flows and withstand overtopping and if required the suitability of implementing a buffer zone adjacent to defences • Measures required to ensure flooding is managed to acceptable levels and ensure that the impact upon flood risk elsewhere in the flood plain is managed.	
Conwy County Borough Council: Adopted Local Development Plan (October 2013)		
Strategic Policy DP/1 – Sustainable Development Principles	Development will only be permitted where it is demonstrated that it is consistent with the principles of sustainable development. All developments are required to: • Take account of and address the risk of flooding and pollution in the form of noise, lighting, vibration, odour, emissions or dust in line with Policies DP/2 and DP/3 – 'Promoting Design Quality and Reducing Crime'.	The risk of flooding as a result of the Mona Offshore Wind Project is identified in in Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement.
Policy DP/3 Promoting Design and Reducing Crime	All new development will be of high quality, sustainable design which provides usable, safe, durable and adaptable places, and protects local character and distinctiveness of the Plan Area's built historic and natural environment. The Council will require development to: • Provide sustainable urban drainage systems to limit waste water and water pollution and reduce flood risk in line with national guidance and Policy NTE/8 – 'Sustainable Drainage Systems'.	Sustainable drainage systems are considered in Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement.
Policy NTE/6 Energy Efficiency and Renewable Technologies in New Development	The efficient use and conservation of natural resources are essential to the overall quality of life within the Plan Area and to support wider social and economic sustainability objectives. The Council will: • Ensure that all new developments incorporate the principles of sustainable design such as: appropriate layout, massing, orientation, use of	Sustainable drainage systems are considered in The Outline Operational Drainage Management Strategy (Document Reference J27) and referenced within Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement.

Policy	Key provisions	How and where considered in the Environmental Statement
	materials, rain water harvesting, energy efficiency, sustainable drainage, and waste recycling areas/storage in line with the Development Principle Policies and NTE/8 – 'Sustainable Drainage Systems', NTE/9 – 'Foul Drainage' and NTE/10 – Water Conservation'.	
Policy NTE/8 Sustainable Drainage Systems	The use of Sustainable Drainage Systems will be required wherever reasonably practicable with preference for onsite disposal and where satisfactory arrangements can be put in place for the long term maintenance of those systems. Where this is not proposed a developer will need to justify that discharge is necessary and is adequately controlled. Subsequent preference for surface water drainage will be for: • Drainage to a surface water body (river, lake etc.) subject to appropriate treatment and attenuation • Drainage to surface water sewer • Drainage to combined sewer.	Sustainable drainage systems are considered in The Outline Operational Drainage Management Strategy (Document Reference J27) and referenced within Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement.
Denbighshire Local Development Plan (October 2013)		
Policy RD 1 Sustainable Development and Good Standard Design	Development proposals will be supported within development boundaries provided that all the following criteria are met: • Satisfies physical or natural environmental considerations relating to land stability, drainage and liability to flooding, water supply and water abstraction from natural watercourses. Development will only be permitted where it is demonstrated that it is consistent with the principles of sustainable development. All developments are required to: • Take account of and address the risk of flooding and pollution in the form of noise, lighting, vibration, odour, emissions or dust in line with Policies DP/2 and DP/3 – 'Promoting Design Quality and Reducing Crime'.	The risk of flooding as a result of the Mona Offshore Wind Project is identified in Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement. A Water Framework Directive Assessment has been undertaken within Volume 7, Annex 2.4: Water Framework Directive surface water and groundwater assessment, of the Environmental Statement.

2.2.5 Additional guidance

2.2.5.1 The design and construction of the Mona Offshore Wind Project will also adhere to the relevant regulatory and industry best practice guidance, including, but not limited to:

- Guidance for Pollution Prevention (GPP) 1: A general guide to preventing pollution (NRW *et al.,* 2020)
- GPP 2: Above ground oil storage tanks (NRW *et al.,* 2017a)
- GPP 4: Treatment and disposal where there is no connection to the public foul sewer (NRW *et al.,* 2017b)
- GPP 5: Works and maintenance in or near water (NRW *et al.,* 2018a)
- GPP 8: Safe storage and disposal of used oils (NRW *et al.,* 2017c)

- Pollution Prevention Guidelines (PPG18): Managing Fire Water and Major Spillages (NRW *et al.,* June 2000)
- GPP 20: Dewatering of underground ducts and chambers (NRW *et al.*, 2018b)
- GPP 21: Pollution incident response plans (NRW *et al.,* 2017d)
- GPP 22: Dealing with spills (NRW *et al.,* 2018c)
- GPP 26: Safe storage of drums and Intermediate bulk containers (IBCs) (NRW *et al.,* 2018d).

2.2.5.2 Working at Construction and Demolition Sites: PPG 6 Pollution Prevention Guidelines (NRW *et al.* 2012) was withdrawn in December 2015. However, it still provides useful best practice guidance to inform this assessment.

2.2.6 Consultation

2.2.6.1 A summary of the key issues raised during consultation activities undertaken to date specific to hydrology and flood risk is presented in Table 2.6 below, together with how these issues have been considered in the production of this Environmental Statement chapter.

Table 2.6: Summary of key consultation issues raised during consultation activities undertaken for the Mona Offshore Wind Project relevant to hydrology and flood risk.

Date	Consultee and type of response	Issues raised	Response to issue raised and/or were considered in this chapter
May 2022	DCC – Response to Scoping	The coastal areas of Denbighshire will be impacted by the construction of a series of major infrastructure schemes (coastal defence schemes and Awel y Môr offshore windfarm) and further offshore windfarm development with result in prolonged disruption from construction activities, which has the potential to significantly impact on recreational use of the beaches and the Wales Coastal path, public amenity, tourism and the local economy. The cumulative impact of the construction phase on public amenity, tourism and local economy has the potential to give rise to significant effects and should be scoped in.	Awel y Môr Offshore Wind Farm and the coastal defence schemes is included in the cumulative effects assessment (CEA), section 2.9 of this chapter.
May 2022	NRW – Response to Scoping	There are site specific flood hydraulic models that NRW have commissioned that coincide with the scoping search area, which have not been referred to in the baseline data sources. NRW (A) advise these should be obtained and considered within the FCA. These include models associated with tidal flood risk and fluvial risks including some of the pumped systems due to the presence of NRW owned pumping stations. Models can be requested via: datadistribution@naturalresourceswales.gov.uk once cabling routes have been refined.	The Point of Ayr to Pensarn flood model only covers the east extent of the Landfall. NRW confirmed the remainder of the Mona Onshore Development Area is not covered by a flood model and is located within flood zone 1.
May 2022	NRW – Response to Scoping	NRW (A) also note that the FCA will refer to the current Technical Advice Note (TAN) 15 (Welsh Government, 2004) and will also use the Emerging TAN 15: Development, Flooding and Coastal Erosion (Welsh Government, coming into force June 2023). NRW (A) advise that the NRW Flood Map for Planning (FMfP) is the more accurate data set on future flood risk (due to including allowances for climate change) than the current Development Advice Maps accompanying the existing TAN15. Whilst the scoping report refers to the FMfP all the corresponding figures showing risk areas use the Flood Risk Assessment Wales maps. The figures should be updated accordingly.	The relevant figures in Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement, have been updated to use the Flood Risk Assessment Wales maps.
May 2022	NRW – Response to Scoping	All designated main river and flood defence infrastructure crossings will be subject to a Flood Risk Activity Permit (FRAP) under the Environmental Permitting Regulations 2016 and the crossing methods for each watercourse should be detailed in the FCA. NRW (A) advise that trenchless technology should be the preferred crossing method.	The Mona Onshore Development Area does not cross any main rivers or any NRW designated flood defence infrastructure. Annex F5 4.3 Onshore Crossing Schedule of the Environmental Statement identifies the proposed crossing methodologies.
May 2022	NRW – Response to Scoping	Tidal flood risk should consider using Coastal Design Sea Levels – Coastal Flood Boundary Extreme Sea Levels (2018) dataset whilst climate change allowances will refer to Climate change allowances and flood consequence assessments.	The FCA uses modelled coastal flood data that accounts for existing tidal flood defences and flooding caused by a breach in these flood defences. Data is from the Point of Ayr to Pensarn coastal flood model. Flood depths within

Date	Consultee and type of response	Issues raised	Response to issue raised and/or were considered in this chapter
		The relevant Lead Local Flood Authority (Conwy and/or Denbighshire Councils) will need to advise on surface water flood risk and drainage arrangements as the SuDS Approval Bodies.	the landfall area from the 1 in 200 and 1 in 1000-year events have been assessed for the present-day scenario and the climate change scenario which accounts for rising sea levels.
May 2022	NRW – Response to Scoping	NRW (A) are generally satisfied with section 6.2 Hydrology and flood risk [of the Scoping Report] regarding what has been scoped into the project assessment to manage flood risk. The approach and reference documents to inform the Flood Consequence Assessment (FCA) also appear suitable.	Noted
June 2022	CCBC – Response to Scoping	The Environmental Statement should address the impact of the construction, operations and maintenance and decommissioning phases on coastal defence works, including the proposed Llanddulas to Kinmel Bay coastal defence scheme.	The FCA has taken into account the existing coastal defence wall; the proposed coastal defence scheme works are located outside the hydrology and flood risk study area.
June 2022	Planning Inspectorate – Response to Scoping	The Inspectorate agrees that operations and maintenance activities are unlikely to generate contaminated runoff and thus there will be low potential for likely significant effects with regards to pollution. The Inspectorate agrees that impact of contaminated runoff on the chemical and biological status of surface water receptors arising from the operations and maintenance of the onshore transmission assets can be scoped out of further assessment.	Noted
June 2022	Planning Inspectorate – Response to Scoping	The Scoping Report proposes to scope out accidental pollution resulting from construction, operations and decommissioning of the Proposed Development. The Inspectorate agrees that such effects are capable of mitigation through standard management practices and can be scoped out of the assessment. The Environmental Statement should provide details of the proposed mitigation measures to be included in the Environment Management Plan. The Environmental Statement should also explain how such measures will be secured.	The storage and use of fuel and chemicals during construction will be managed by measures set out in the Outline Spillage and Emergency Response Plan (Document Reference J 26.1). The storage and delivery of the oils during operation will be set out in the Design Principles (Document Reference J3)
June 2022	Planning Inspectorate – Response to Scoping	The Inspectorate agrees that operations and maintenance activities are unlikely to result in significant effects on the integrity of existing flood defences and that this matter can be scoped out of the Environmental Statement.	Noted
June 2022	Planning Inspectorate – Response to Scoping	The Inspectorate agrees that the impact of increased flood risk arising from additional surface water runoff during the operations and maintenance of the onshore export cable can be scoped out of the Environmental Statement given that the slight rise in impermeable land associated with the onshore transmission assets is unlikely to give	Noted

Date	Consultee and type of response	Issues raised	Response to issue raised and/or were considered in this chapter
		rise to likely significant effects relating to drainage patterns and surface water runoff rates.	
June 2022	Planning Inspectorate – Response to Scoping	If the Development is to implement SuDS during the construction, operations or decommissioning phase e.g. at the Mona Onshore Substation, the location and design of the SuDS should be described in the Environmental Statement and included on a figure(s).	An Outline Operational Drainage Management Strategy has been prepared based on the indicative layout of the Mona Onshore Substation and is included as part of the DCO application (Document Reference J27). The Outline Operational Drainage Management Strategy has been developed in accordance with the NPS, PPW, TAN 15 and the SuDS Manual.
June 2023	Hydrology and Flood Risk Expert Working Group – CCBC and DCC	The purpose of the meeting was to discuss the desk top sources used in the baseline characterisation; the hydrology and flood risk constraints within the Mona Onshore Development Area; coastal defence schemes and the management of flood risk issues at the landfall; and the approach of the drainage strategy for the Onshore Substation.	Baseline information on the location of flood defences and flood risk at landfall is provided in section 2.3.8 and Volume 7, Annex 2.2: Surface watercourse and NRW flood zones of the Environmental Statement. The drainage strategy is provided in the Operational Drainage Management Strategy (Document reference J27).
June 2023	Dŵr Cymru / Welsh Water – S42 Consultation Response	The proposed development site is crossed by public sewers and watermains. Under the Water Industry Act 1991 Dwr Cymru Welsh Water has rights of access to its apparatus at all times. No part of any building or operational development will be permitted within 3 metres either side of the: • 180mm combined MDPE rising main (292292.56, 378213.11). • 4” upvc watermain (294423.36, 378676.41). • 525mm foul conc sewer (294586.11, 378565.99). • 32mm MDPE watermain (294575.32, 378586.40). • 63mm MDPE watermain (94591.51, 378588.76). • 4” uPVC watermain (292147.85, 378079.10). • 3” CI watermain (291717.48, 378061.56). • 100mm uPVC foul sewer (292837.92, 378026.48). • 3” uPVC watermain (292268.71, 375532.36). • 3” CI watermain (292735.70, 374831.21).	The location of existing water management infrastructure has been taken into account in the site selection and refinement of the design (see Volume 1, Chapter 4: Site selection and consideration of alternatives of the Environmental Statement).

Date	Consultee and type of response	Issues raised	Response to issue raised and/or were considered in this chapter
		• 3” CI watermain (293622.97, 373715.42). • 3” uPVC watermain (294531.70, 373261.93). • 2” watermain (294706.33, 373295.01). • 8” abandoned raw watermain at (297383.92, 373023.15). • 62mm MDPE watermain (297796.48, 373366.31). • 6”, 8”, 10”, 200mm watermains (299242.88, 374048.84). • 90mm MDPE watermain (300411.23, 373355.20). • 90mm MDPE watermain (300353.37, 372785.03). • 280mm HPPE, 500mm DIEL, 500mm GRP watermain (301119.75, 373661.25). • 225mm surface water and VC foul sewers (301555.46, 373804.27). • 150mm and 225mm combined sewers (303449.45, 373816.32). • 10” CI, 280mm HPPE 5” CI, 500mm abandoned GRP, 350mm DIEL watermains (303147.85, 373829.49). • 150mm VC foul sewer (301690.85, 371603.71). • 90mm MDPE watermain (301965.38, 371258.66). • 63mm MDPE watermain (301729.89, 371103.77). • 32mm MDPE watermain (301305.51, 371212.07).	
June 2023	NRW – S42 Consultation Response	In the glossary, NRW (A) would expect reference to be made to FRAPs and Flood Defence (or Ordinary watercourse) Consents. FRAPs would be required for activities in or near a (designated) main river and associated flood defences and/or within a flood plain of a main river from NRW. Ordinary Watercourse Consents would be required for works in an ordinary watercourse from the relevant LLFA.	References to Flood Risk Activity Permits (FRAP) and Ordinary Watercourse Consents have been added and glossaries have been updated to include these terms. The Applicant will be seeking the disapplication of both the FRAPs and ordinary watercourse consents that are to be incorporated as protected provisions of the DCO.
June 2023	NRW – S42 Consultation Response	Also in the Glossary reference is made to Flood Zones (FZ) 1,2,3 and 3b. There are no FZ 3b in flood mapping used in Wales. For new development proposals in Wales, the maps referred to should be the Flood Map for Planning (as per the letter from Welsh Government dated 15 December 2021). It is therefore suggested that the Flood Consequence Assessment (FCA) should refer to Technical Advice Note (TAN) 15 Development and Flood Risk (2004) as the current document for land-based planning	The glossary of this chapter has been updated to include these terms. The FCA refers to TAN 15 (2004).

Date	Consultee and type of response	Issues raised	Response to issue raised and/or were considered in this chapter
		in Wales. It is expected that an updated version of TAN15 wIll be released by Welsh Government.	
June 2023	NRW – S42 Consultation Response	NRW (A) advise that in Wales there are SuDs Approval Bodies (SABs) and expand that the Lead Local Flood Authorities (LLFAs) are also responsible for managing flood risk from surface water, groundwater and from smaller streams called ordinary watercourses.	Noted. Reference has been made to LLFA to SAB to be made within sections 2.3.8 and 2.7 of this chapter of the Environmental Statement.
June 2023	NRW – S42 Consultation Response	Summary of NPS EN-1 policy on decision making relevant to hydrology and flood risk, refers to the sequential test. 'Sequential tests' is a reference used in England when deciding on site selection and flood risk. For Wales, the relevant section of TAN15 would be Section 6 for the Justification tests and reference is made to zones C, B and A for Wales within the same summary (NPS EN-1 provision). Section1.5.4.5 of the FCA is however correct.	Noted, Table 2.2 has been updated with relevant Welsh guidance. The FCA was undertaken in line with Welsh policy guidance.
June 2023	NRW – S42 Consultation Response	The FMfP should be used and not the Flood Risk Assessment Wales (FRAW) maps. The FMfP allows for climate change whilst the FRAW maps do not. Incorrect maps have therefore been utilised to accompany the figures in Volume 7 Annex 2.1: Flood Consequence Assessment.	The mapping in Volume 7, Annex 2.2: Surface watercourses and NRW flood zones of the Environmental Statement has been updated to use the Flood Map for Planning.
June 2023	NRW – S42 Consultation Response	Please confirm that the reference in section .4.4.16 and Table 2.11 Flood Map for Planning Flood Zones, relates to the Flood Map for Planning (rather than the FRAW) and advise that the FMfP allows for the impacts of climate change in the definitions. (may be taken from Figure 2 in the draft updated Technical Advice Note 15, Developing, flooding and coastal erosion (gov.wales)).	Noted, clarity has been provided
June 2023	NRW – S42 Consultation Response	Volume 7, Annex 2.1 Flood Consequences Assessment NRW (A) advise reference to climate change should be included in the bullet points in Section 1.2.1.12 Flood Map for Planning.	Noted, clarity has been provided in Volume 7, Annex 2.1 Flood Consequences Assessment of the Environmental Statement.
June 2023	NRW – S42 Consultation Response	With reference to Sections 1.3 and1.4 Onshore substation Area Flood Risk Assessment Option 2 and Option 7, NRW (A) are satisfied with these sections; however, Denbighshire County Council (DCC) as the LLFA/SAB should have the opportunity to provide comment on this section due to their statutory roles.	CCBC and DCC were given the opportunity to comment on the Flood Consequences Assessment as part of the statutory consultation.
June 2023	NRW – S42 Consultation Response	Figure 1.3 Location of flood defences at Landfall, does not show the location of the Conwy County Borough Council (CCBC) maintained defences.	Noted, the mapping in Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement has been updated.

Date	Consultee and type of response	Issues raised	Response to issue raised and/or were considered in this chapter
June 2023	NRW – S42 Consultation Response	Confirmation should be sought from CCBC that they have adopted Land Drainage (Wales) Byelaws to determine if consent would be required for any works within 8m of an ordinary watercourse.	Noted, this was discussed in the Hydrology and Flood Risk EWG meeting on 7 June 2023 (see above) with CCBC and DCC. CCBC confirmed they have adopted bylaws.
June 2023	NRW – S42 Consultation Response	Volume 7, Annex 2.2: Surface Watercourses and NRW flood zones With reference to the Glossary, Flood Zone 3b is not applicable in Wales.	Noted, the glossary in Volume 7, Annex 2.2: Surface watercourses and NRW flood zones of the Environmental Statement has been updated.
June 2023	NRW – S42 Consultation Response	It is unclear what Figures 1.3 –1.7 Surface watercourses and NRW Flood Zones, are showing–further clarity is sought on the key/legend regarding the Flood Zone and data source –is it from the FMfP or FRAW?	Noted, mapping in Volume 7, Annex 2.2: Surface watercourses and NRW flood zones of the Environmental Statement has been updated.
June 2023	NRW – S42 Consultation Response	As part of the development falls within Wales, as of 07 January 2019, this proposed development is subject to Schedule 3 of the Flood and Water Management Act 2010. The development therefore requires approval of Sustainable Drainage Systems (SuDS) features, in accordance with the"Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage system". It is therefore recommended that the developer engage in consultation with the Denbighshire Council, as the determining SuDS Approval Body (SAB), in relation to their proposals for SuDS features. Please note, Dwr Cymru Welsh Water is a statutory consultee to the SAB application process and will provide comments to any SuDS proposals by response to SAB consultation.	Dwr Cymru / Welsh Water, CCBC and DCC (SAB consultees) were consulted as part of the statutory consultation. Whilst the Outline Operational Drainage Management Strategy (Document reference J27) has been produced as part of the DCO application, the full SAB application is to be progressed once detailed design has been undertaken.

2.3 Baseline environment

2.3.1 Relevant guidance

2.3.1.1 The characterisation of the baseline environment for hydrology and flood risk has considered the following guidance:

- Construction Industry Research and Information Association (CIRIA) (C532; 2001) Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors
- CIRIA (C741; 2015b) Environmental good practice on site guide
- Design Manual for Roads and Bridges (DMRB) (August 2023) Sustainability and Environment Appraisal: LA104 – Environmental assessment and monitoring, Revision 1
- DMRB (March 2020) Sustainability and Environment Appraisal: LA 113–- Road drainage and the water environment, Revision 1.

2.3.2 Scope of the assessment

2.3.2.1 The scope of this Environmental Statement has been developed in consultation with relevant statutory and non-statutory consultees as detailed in Table 2.6.

2.3.2.2 Taking into account the scoping and consultation process, Table 2.7 summarises the issues considered as part of this assessment.

Table 2.7: Issues considered within the assessment.

Activity	Potential effects scoped into the assessment
Construction phase	
Open cut trenching: • Onshore Cable Corridor • 400 kV Grid Connection Cable Corridor	Increased surface water runoff as a result of temporary impermeable surfacing. Increased flood risk as a result of constriction of flows within watercourses that have been culverted/pumped as part of construction activities. Excavations at the landfall as part of construction have potential to disrupt the integrity of existing flood defences. Trenchless techniques and associated machinery could lead to the contamination of watercourses. There is the potential for this to impact on water quality and therefore cause a reduction in the WFD classification. Open cut trenching could lead to damage to the banks along the watercourses, contamination of watercourses and an alteration in surface water flow pathways that could affect nearby watercourses. The removal of field drains within the Mona Onshore Development Area may cause a backup on surrounding field drains, in turn increasing the flood risk to the site and surrounding receptors. Construction activities may damage field drainage, drainage and water supply infrastructure and cause flooding. This could also impact water supply quality and flow rates
Trenchless techniques: • Onshore Cable Corridor • 400 kV Grid Connection Cable Corridor	
Onshore Substation	
Haul Roads	
Construction Compounds	
Trenchless techniques in the intertidal area between MLWS and Mean High Water Springs (MHWS)	
Operation and maintenance	
Onshore Substation	Greater impermeable areas associated with the Onshore Substation could give rise to increased risk of surface water flooding.

Activity	Potential effects scoped into the assessment
Decommissioning	
Removal of onshore infrastructure (e.g. link boxes)	Decommissioning activities may damage field drainage, drainage and water supply infrastructure.
Removal of Onshore Substation and access road	

2.3.2.3 Effects which are not considered likely to be significant have been scoped out of the assessment. A summary of the effects scoped out, together with justification for scoping them out is presented in Table 2.8.

Table 2.8: Impacts scoped out of the assessment for hydrology and flood risk.

Potential impact	Justification
The impact of contaminated runoff on the chemical and biological status of surface water receptors arising from the operations and maintenance of the onshore transmission assets.	Activities associated with the operations and maintenance of the onshore transmission assets are unlikely to generate contaminated runoff. Therefore, the potential impact of contaminated runoff on the quality of surface water receptors during the operations and maintenance of the onshore transmission assets is unlikely to be significant and is proposed to be scoped out of the assessment for hydrology and flood risk.
The impact of accidental spillages/contaminant release on the quality of surface water and ground receptors during operations and maintenance of the onshore transmission assets.	Activities associated with the regular operations and maintenance of the onshore transmission assets will require the transport or storage of harmful substances. The design of the storage and delivery of these substances will meet industry standards for pollution control. These design measures will be set out in the Design Principles document (Document Reference J3). With the implementation of these design measures, the potential impact of spills/contaminant releases on the quality of surface water receptors during operations and maintenance of the onshore transmission assets is unlikely to be significant and is proposed to be scoped out of the assessment for hydrology and flood risk.
The impact of increased flood risk arising from damage to existing flood defences during the operations and maintenance of the onshore transmission assets.	Activities required to facilitate the operations and maintenance of the onshore transmission assets are unlikely to impact the integrity (or efficacy) of existing flood defences. During decommissioning, the onshore export cable will remain in place and there will be no impact on the integrity (or efficacy) of existing flood defences. Therefore, the potential impact of increased flood risk arising from damage to existing flood defence infrastructure during the operations and maintenance and decommissioning of the onshore transmission assets is unlikely to be significant and is proposed to be scoped out of the assessment for hydrology and flood risk.
The impact of increased flood risk arising from additional surface water runoff during the operations and maintenance of the Mona Onshore Cable Corridor and Mona 400 kV Grid Connection Cable Corridor.	The operations and maintenance of the Mona Onshore Cable Corridor and Mona 400 kV Grid Connection Cable Corridor may result in a minor increase in the total area of impermeable land (e.g. link boxes). However, the increase is unlikely to result in a notable change in drainage patterns and surface water runoff rates. Therefore, the potential impact of flood risk arising from additional surface water runoff during the operations and maintenance of the Mona Onshore Cable Corridor and Mona 400 kV Grid Connection Cable Corridor is unlikely to be significant and is proposed to be scoped out of the assessment.

Potential impact	Justification
The impact of contaminated runoff on the quality of 'Main Rivers' arising from the construction and decommissioning of the onshore transmission assets.	There are no Main Rivers within the hydrology and flood risk study area.

2.3.3 Methodology to inform baseline

2.3.3.1 The baseline environment for hydrology and flood risk was established by undertaking a desktop study that reviews the following:

- Publicly available data sources available from the following organisations:
  - British Geological Survey (BGS)
  - NRW
  - CCBC
  - DCC
- Information contained in a Groundsure Enviro-Geo Insights report for the hydrology and flood risk study area. That report includes general information regarding hydrological setting regarding surface water abstraction licences, pollution incidents and discharge consents.

2.3.3.2 The key datasets obtained as part of the desktop study are presented in:

- Volume 7, Annex 2.2: Surface watercourses and NRW flood zones of the Environmental Statement
- Volume 7, Annex 2.3: Surface water abstraction licences, discharge consents and pollution incidents of the Environmental Statement
- Volume 7, Annex 2.4: Water Framework Directive surface water and groundwater assessment of the Environmental Statement.

2.3.4 Study area

2.3.4.1 The hydrology and flood risk study area used for the assessment focuses on areas landward of MHWS where potential impacts are most likely to occur on hydrological and flood risk receptors. As such, the hydrology and flood risk study area includes:

- The area of land to be temporarily or permanently occupied during the construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project (hereafter referred to as the Mona Onshore Development Area)
- Surface water receptors and flood risk receptors located within 250 m of the Mona Onshore Development Area. The 250 m buffer is considered appropriate for data collection taking into account the likely Zone of Influence (ZoI) by hydrological receptors. The buffer has also been chosen to identify any existing receptors, assets or infrastructure that have the potential to be affected by temporary flood risk as a result of the Mona Offshore Wind Project
- Flood risk receptors located within 1 km of the Onshore Substation. The 1 km buffer was chosen primarily to identify any existing receptors, assets or infrastructure that have the potential to be affected by flood risk as a result of permanent infrastructure associated with the Mona Offshore Wind Project.

2.3.4.2 The hydrology and flood risk study area is shown in Figure 2.1. No comments were received on the hydrology and flood risk study area during the statutory process.

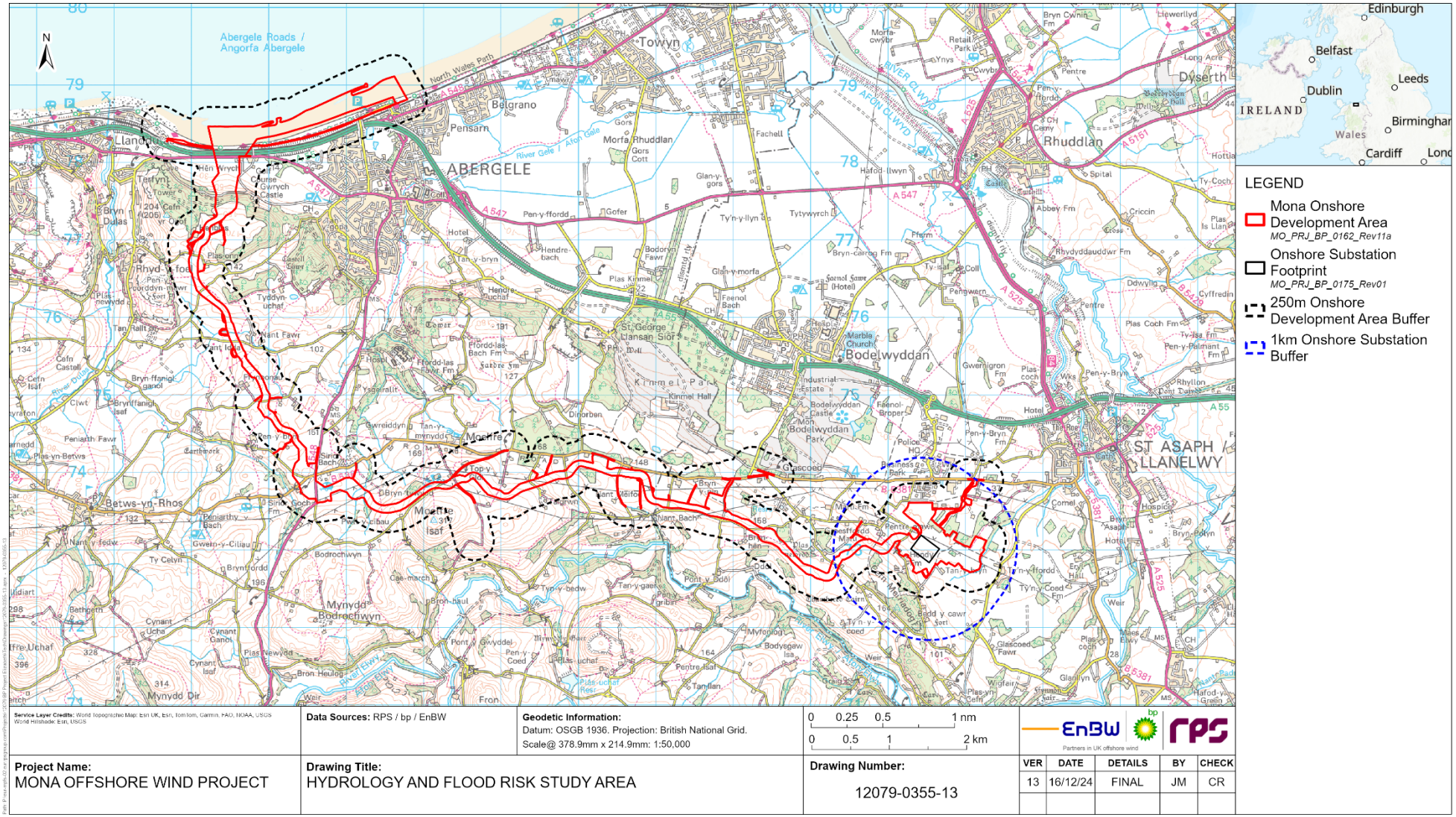

Figure 2.1: Hydrology and flood risk study area

2.3.5 Desktop study

2.3.5.1 Information on hydrology and flood risk within the hydrology and flood risk study area was collected through a detailed desktop review of existing studies and datasets. These are summarised at Table 2.9 below.

Table 2.9: Summary of key desktop reports.

Title	Source	Year	Author
BGS 1:50,000 and 1:10,000 digital geological mapping	BGS	2022	BGS
SPZs/Aquifer Designations	Groundsure Enviro+Geo insights report	2022	Groundsure
Groundsure Environmental Search (Ref: GSIP-2022-12806-10820_A-D).	NRW, BGS	2022	Groundsure
Climate change allowances	Welsh Government	2021	Welsh Government
Local Flood Risk Management Strategies	CCBC, DCC	2013 and 2014	CCBC, DCC
Flood Map for Planning (FMfP)	NRW	2022	NRW
Development Advice Map	NRW	2022	NRW
National Flood Hazard and Risk Maps	NRW	2022	NRW
DataMapWales	Welsh Government	2023	Welsh Government
Shoreline Management Plan	NRW, LLFAs, OS	2015	Northwest and North Wales Costal Group
Catchment Flood Management Plan	https://www.mycoastline.org.uk/	2021	NRW
CCBC Strategic Flood Consequence Assessment (SFCA)	CCBC	2012	CCBC
DCC SFCA	DCC	2018	DCC

2.3.6 Identification of designated sites

2.3.6.1 A review of desktop reports, publicly available information and information requests (as identified within Table 2.9) did not identify any designated surface watercourses within the hydrology and flood risk study area.

2.3.7 Flood Consequence Assessment

2.3.7.1 The Mona Onshore Development area is over 1ha and passes through Flood Zones 2 and 3. Due to the size and location of the Mona Onshore Development Area, a site-specific FCA has been undertaken in accordance with the guidance in PPW, TAN 15 and NPS EN-1. The Flood Consequences Assessment is included in Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement. The flood zones are shown in Volume 7, Annex 2.2: Surface watercourses and NRW flood zones of the Environmental Statement.

2.3.7.2 The key components of the site specific Flood Consequences Assessments are as follows:

- Review of publicly available NRW documentation, local flood management plans and future flood management schemes
- Review of strategic Flood Consequences Assessments
- Assessment of the flood risk to the existing conditions and future conditions (assuming that the Mona Offshore Wind Project is in place)
- A site specific assessment of flood risk at the Mona Onshore Development Area.

2.3.7.3 The majority of the Mona Onshore Development Area, including the Onshore Substation is located within Flood Zone 1 and has a low risk of flooding. The Flood Consequences Assessments for the Mona Onshore Development Area focuses on the locations where the Onshore Cable Corridor will be within Flood Zone 3 at the Landfall.

2.3.8 Baseline environment

Site description

2.3.8.1 The Mona Onshore Development Area makes landfall at Pensarn Beach to the west of Abergele and traverses predominantly through agricultural land and woodland. Residential settlements are sparse; with development mainly limited to farmhouses peppered within the landscape.

2.3.8.2 Limestone hills are present along the coastline and hinterland, with land steeply rising inland from the heavily modified coastline. Inland areas of the Mona Onshore Development Area generally consist of rolling hills and valleys.

Hydrological setting

2.3.8.3 The hydrology and flood risk study area includes a number of catchments associated with NRW designated Main Rivers and local authority ordinary watercourses. Definitions of these hydrological features are provided below:

- Main Rivers – watercourses where the NRW has permissive powers over their management
- Ordinary watercourses – includes rivers, streams, ditches and drains which do not form part of a Main River and are managed by CCBC and DCC as LLFAs.

2.3.8.4 The catchments of the Main Rivers within the hydrology and flood risk study area are listed below and their locations are shown in Volume 7, Annex 2.2: Surface watercourses and NRW flood zones of the Environmental Statement:

- Afon Elwy, that defines the south and east boundary to the hydrology and flood risk study area up to its confluence with Afon Clwyd
- Afon Clwyd, that flows north to its mouth at Rhyl
- Afon Dulas, that flows north to its mouth between Llanddulas and Abergele, running along the western boundary to the hydrology and flood risk study area
- Afon Gele, a short watercourse that flows north onto the low lying, drained, coastal marshes between Abergele and the mouth of Afon Clwyd.

NRW designated Main Rivers

2.3.8.5 There are no Main Rivers identified within the Mona hydrology and flood risk study area.

Ordinary watercourses

2.3.8.6 There are several ordinary watercourses located within the hydrology and flood risk study area, presented within Volume 7, Annex 2.2: Surface watercourses and NRW flood zones of the Environmental Statement and listed below:

- Two tributaries of the River Gele
- Nant y Bryniau
- Nant y Cregiau
- Nant Luke
- A tributary of the River Clywd
- A tributary of the River Elwy
- Two tributaries of Nant Ganol.

Surface water body status

2.3.8.7 A WFD assessment has been undertaken and is provided in Volume 7, Annex 2.4: Water Framework Directive surface water and groundwater assessment of the Environmental Statement. The current overall WFD status for watercourses potentially affected by the Mona Onshore Cable Corridor, Onshore Substation and Mona 400 kV Grid Connection Cable Corridor have been identified via the open access database which provides the most up to date (2021) 'Current Status' classifications for a number of main rivers within the Western Wales River Basin District and within the hydrology and flood risk study area. The WFD classification is not site specific but classifies a defined river reach based on site samples. Relevant waterbodies have been included within the WFD assessment as they are watercourses likely to be the most affected by the Mona Offshore Wind Project.

2.3.8.8 For surface waters, the WFD objectives are based on the ecological and chemical status of the waterbody (i.e. the predicted future status if technically feasible measures are implemented). These measures are required to prevent deterioration in the Current Status classifications of the waterbody and (once implemented) produce more benefits than they cost to implement. The date to achieve the objective status is determined by the type of measures which are needed in order to improve the status of the waterbody (i.e. the cost of the measures (are they affordable) and the time taken for the status to improve once the measures have been implemented).

2.3.8.9 Table 2.10 lists the watercourses with catchments within the hydrology and flood risk study area, associated WFD classification grade and overall objectives.

Table 2.10 WFD water quality data.

Name of waterbody	Waterbody type	Classification	Overall objective
Un-named Clwyd estuary west (ID: GB110066059970)	Surface Watercourse (Low, Extra Small, Calcareous)	Overall – good	Good Potential by 2015
Elwy - Clwyd to Afon Melai (ID: GB110066060020)	Surface Watercourse (Mid, Medium, Calcareous)	Overall – good (2021)	Good Potential by 2027

Name of waterbody	Waterbody type	Classification	Overall objective
Gele (ID: GB110066059980)	Surface Watercourse (Low, Small, Calcareous)	Overall - moderate (2021)	Good Potential by 2027
Dulas - un-named tributary (ID: GB110066059830	Surface Watercourse (Low, Small, Calcareous)	Overall - moderate (2021)	Good Status by 2015
North Wales (ID: GB641011650000)	Coastal (Moderately exposed, Macrotidal)	Overall - good	Good Potential by 2015

2.3.8.10 A full description of the WFD classification process and associated definitions are available in Volume 7, Annex 2.4: Water Framework Directive surface water and groundwater assessment of the Environmental Statement.

Geological and hydrogeological setting

Superficial deposits

2.3.8.11 BGS Geology of Britain mapping (1:50,000 scale) indicates the majority of the lower elevations within the Mona Onshore Development Area is underlain predominantly by glacial till (diamicton) superficial deposits, with limited isolated areas of glaciofluvial (sand and gravel) and alluvium (clay, silt sand and gravel) superficial deposits near pond features. The intertidal area is underlain by storm beach deposits (gravel) (for further details refer to Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the Environmental Statement).

Bedrock geology

2.3.8.12 The bedrock underlying the north and east part of the Mona Onshore Development Area is Clwyd Limestone Group (limestone). A band of Ffernant Formation (mudstone, siltstone and sandstone) is present north of the central area of the Mona Onshore Development Area, whilst the remainder of the Mona Onshore Development Area is underlain by Elwy Formation (mudstone, siltstone and sandstone). The east of the Mona Onshore Development Area is underlain by sandstones of the Carboniferous Warwickshire Group (for further details refer to Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the Environmental Statement).

Aquifer designation

2.3.8.13 Clwyd Limestone Group (limestone) is categorised as a Principal aquifer; permeable geology able to provide a high level of water storage and able to support water supply and/or river base flow on a strategic scale. Ffernant Formation (mudstone, siltstone and sandstone is classified as a Secondary A aquifer; permeable layers capable of supporting water supplies at a local scale, and in some cases forming an important source of base flow to rivers. Elwy Formation (mudstone, siltstone and sandstone) is classified as a Secondary B aquifer; predominantly lower permeability layers which may store and yield limited amounts of groundwater. The Warwickshire Group is categorised as a Secondary A aquifer (for further details refer to Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the Environmental Statement).

Source Protection Zones

2.3.8.14 There are no SPZs within the Mona hydrology and flood risk study area.

Groundwater body status

2.3.8.15 Table 2.11 lists the groundwater catchments within the hydrology and flood risk study area, associated WFD classification grade. All objectives are ‘Good’ by 2027.

Table 2.11: WFD groundwater quality data.

Name (NRW ID)	Water Body Type	Classification (2019)
Clwyd Permo-Triassic Sandstone (ID: GB41001G202100)	Groundwater (approximately 661 km^2 in area)	Overall – Good
Clwyd Silurian (ID: GB41002G200100)	Groundwater (approximately 154.4 km^2 in area)	Overall – Good
Conwy (ID: GB41002G203000	Groundwater (approximately 185.2 km^2 in area)	Overall – Poor

Flood risk

NRW Flood Zones

2.3.8.16 The NRW Flood Zones refer to the probability of flooding from rivers and sea in a given year, assuming no defences are in place and including climate change and are presented within the FMfP. Flood zone definitions are set out within Table 2.12.

Table 2.12 Flood Map for Planning Flood Zones.

Flood zone	Flood zone definitions
Flood Zone 1	land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).
Flood Zone 2	land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%) in any year and including climate change, or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any given year and including climate change.
Flood Zone 3	land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) in any given year and including climate change, or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any given year and including climate change.

2.3.8.17 The hydrology and flood risk study area is predominantly located within Flood Zone 1. Areas of Flood Zone 3 are located at the Mona Landfall location within the intertidal zone of Traeth Pensarn/Pensarn Beach.

2.3.8.18 A revised edition of TAN 15 is due to be implemented in early 2024 and will be supported by the new FMfP to demonstrate how flood risk will be affected by climate change in the next century. Whilst the FMfP has no official status for planning purposes until implementation of the new TAN15, NRW will use the FMfP as 'best available information' on flood risk to inform planning guidance.

NRW Flood Model

2.3.8.19 The Flood Map for Planning has been informed by Point of Ayr to Pensarn 2017 coastal flood model. Product 5 and 6 data of the Point of Ayr to Pensarn 2017 coastal flood model was obtained from NRW and provides flood extents and depths within the eastern extent of the landfall area as a result of coastal defence overtopping and breach. The modelling additionally assessed how flood depths and extents will evolve with climate change; with flood model outputs for the present-day and 2117 scenarios. The flood zones are shown in Volume 7, Annex 2.2: Surface watercourses and NRW flood zones of the Environmental Statement. Flood model data has been used in Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement.

Flood Defences

2.3.8.20 The NRW Flood Map for Planning identifies a 1,282 m coastal flood defence wall present within the east extent of the Landfall area along the onshore margin of the intertidal zone which is maintained by CCBC.

2.3.8.21 The NRW Flood Map does not identify any flood defences along the west extent of the Landfall area, however groynes and a revetment are present along the coastline in this area. Whilst these structures may provide some benefits to flood defence through preventing coastal erosion, the benefits cannot be modelled/quantified in the same way a flood wall or embankment can.

2.3.8.22 The remainder of the Mona Onshore Development Area does not benefit from any flood defences.

Water supplies, consents and pollution incidents

Surface water abstractions

2.3.8.23 The abstraction licences taken from Groundsure data records identified no surface water abstractions present within the hydrology and flood risk study area.

Groundwater abstractions

2.3.8.24 The abstraction licences taken from Groundsure data records identified no active groundwater abstractions within the Mona Onshore Development Area (for further details refer to Volume 7, Annex 1.1: Aquifers, groundwater abstractions and ground conditions of the Environmental Statement).

Discharge consents

2.3.8.25 Discharges of liquid effluent or wastewater into surface waters are regulated by the NRW using discharge consents and environmental permits. A review of Groundsure data identified approximately seven consented discharges to surface waters within the hydrology and flood risk study area. The majority of the discharges related to final/treated effluent from domestic properties. Although the volume and parameters of the discharges are regulated (via the discharge consents and permits), the quality of the receiving surface water may potentially be affected.

2.3.8.26 The details and locations of the discharge consents and permits are provided within Volume 7, Annex 2.3: Surface water abstraction licences, discharge consents and pollution incidents of the Environmental Statement.

Pollution incidents

2.3.8.27 Pollution incident mapping has been used to identify if the quality of watercourses within the hydrology and flood risk study area may have been affected by pollution. A review of Groundsure data identified two pollution incidents in the hydrology and flood risk study area, however both of the incidents were reported as category 3 (minor or minimal impact). This is defined by NRW, under the common incident classification scheme, as a substantiated incident with no impact to water quality (for further details refer to Volume 3, Chapter 1: Geology, hydrogeology and ground conditions of the Environmental Statement).

2.3.9 Future baseline scenario

2.3.9.1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 requires that '*an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed*

with reasonable effort on the basis of the availability of environmental information and scientific knowledge' is included within the Environmental Statement.

2.3.9.2 In the event that Mona Offshore Wind Project does not come forward, an assessment of the future baseline conditions has been carried out and is described within this section.

2.3.9.3 The main impact on the hydrology and flood risk future baseline is associated with the potential effects of climate change, which may impact on future peak river flow rates, rainfall intensity and sea levels. A summary of potential climate change allowances as outlined by the NRW (September 2021) is presented below. Further details of climate change allowances can be found at Flood Consequences Assessment: Climate change allowances (Welsh Government, 2021).

2.3.9.4 PPW and TAN 15 sets out how the planning system should help minimise vulnerability and provide resilience to the impacts of climate change. This includes demonstrating how flood risk will be managed now and over the development's lifetime, taking climate change into account. In response to this, NRW guidance issued in September 2021, requires that FCAs and Strategic FCAs assess both the central and upper end allowances (see Table 2.13 to understand the potential range of impacts associated with climate change).

2.3.9.5 The range allowances (Table 2.13 to Table 2.15) is based on percentiles. The 50th percentile is the point at which half of the possible scenarios for peak rainfall intensity fall below it and half fall above it:

- The Central allowance is based on the 50th percentile
- The Upper end is based on the 90th percentile.

2.3.9.6 As an example, with a central allowance of 20%, scientific evidence suggests that it is just as likely that the increase in peak rainfall intensity will be more than 20% as less than 20%.

Table 2.13: Changes to extreme rainfall intensity.

Changes to extreme rainfall intensity			
Applies across all of Wales	Total potential change anticipated for '2020s' 2015 to 2039)	Total potential change anticipated for '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper Estimate	10%	20%	40%
Central Estimate	5%	10%	20%

2.3.9.7 Guidance is also provided on increases in river flows as a consequence of climate change. The guidance provides central, upper central and higher central climate change allowance bands which should be utilised within the assessment of flood risk, including the flood risk vulnerability classification, for sites in Flood Zones 2 and 3. (see Table 2.14).

Table 2.14: Climate change allowances.

River Basin District	Allowance category	Total potential change anticipated for '2020s' (2015 to 2039)	Total potential change anticipated for '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Western Wales	Upper Estimate	25%	40%	75%
	Central Estimate	15%	25%	30%

2.3.9.8 Table 2.15 summarises potential sea level rise over various epochs (periods of time) for the Conwy County Borough Council area based on RCP8.5 70th and 95th percentiles.

Table 2.15 Predicted sea level rise.

Area of Wales	Allowence (percentile)	Mean sea level rise by 2100 (meters)	Mean sea level rise by 2120 (meters)
Conwy	70th	0.75	0.89
	95th	1.01	1.21

2.3.10 Data limitations

2.3.10.1 The assessment within this chapter is based on publicly available data obtained from the NRW, CCBC and DCC and commercial data supply companies, as well as additional information supplied from stakeholders during the scoping and consultation stages. The Applicant cannot be held responsible for any errors in this data.

2.3.10.2 The NRW flood risk data only relates to fluvial, sea and surface water sources and does not show flooding from other sources such as groundwater, direct runoff from fields or overflowing sewers. However, a description of these sources of flooding is provided in the Flood Consequences Assessment (see Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement), such that sufficient baseline information is available.

2.3.10.3 The assessment is limited by a lack of flow and water quality data for the ordinary watercourses in the hydrology and flood risk study area. However this is not a major concern as ordinary watercourse catchments within the study area predominantly respond to rainfall events, and flooding from this source is assessed using NRW surface water mapping which provide depth and flow data within ordinary watercourses as a result of a range of modelled rainfall scenarios.

2.3.10.4 Notwithstanding the above, overall a moderate to high level of certainty has been applied to the baseline and assessment presented in this chapter. Where available, catchment data regarding water quality has been used to inform the assessment. The information which was available is considered sufficient to establish the baseline within the hydrology and flood risk study area.

2.4 Impact assessment methodology

2.4.1 Overview

2.4.1.1 The hydrology and flood risk impact assessment has followed the methodology set out in Volume 1, Chapter 5: Environmental Impact Assessment methodology of the Environmental Statement. Specific to the hydrology and flood risk impact assessment, the following guidance documents have also been considered:

- The Welsh Government Statutory standards for sustainable drainage systems (Welsh Government, 2019)
- Non-statutory technical standards for sustainable drainage systems (Department for Environment, Food & Rural Affairs (DEFRA), 2015)
- CIRIA (C753, 2015) SuDS Manual
- CIRIA (C532, 2001) Technical Guidance: Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors
- CIRIA (C741; 2015b) Environmental good practice on site guide
- DMRB (August 2023) Sustainability and Environment Appraisal: LA104 – Environmental assessment and monitoring, Revision 1
- DMRB (March 2020) Sustainability and Environment Appraisal: LA 113 - Road drainage and the water environment, Revision 1.

2.4.1.2 In addition, the hydrology and flood risk impact assessment has considered the legislative framework defined in paragraph 2.2.1.

2.4.2 Impact assessment criteria

2.4.2.1 Determining the significance of effects is a two stage process that involves defining the magnitude of the impacts and the sensitivity of the receptors. This section describes the criteria applied in this chapter to assign values to the magnitude of potential impacts and the sensitivity of the receptors. The terms used to define magnitude and sensitivity are based on those which are described in further detail in Volume 1, Chapter 5: Environmental Impact Assessment methodology of the Environmental Statement.

2.4.2.2 The criteria for defining magnitude in this chapter are outlined in Table 2.16 below.

Table 2.16: Definition of terms relating to the magnitude of impact.

Magnitude of impact	Definition
High	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements e.g. significant observable degradation in water resource quality and/or increase in flood risk. Impact is of extended temporal or physical extent and of long term duration (i.e. up to ten years duration). (Adverse).
	Large scale or major improvement or in resource quality; extensive restoration or enhancement; major improvement of attribute quality (Beneficial).
Medium	Loss of resource, but not adversely affecting integrity of resource; partial loss of/damage to key characteristics, features or elements e.g. observable degradation in water resource quality and/or increase in flood risk. Impact is of moderate temporal or physical extent and of medium term duration (i.e. up to five years). (Adverse).

Magnitude of impact	Definition
	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial).
Low	Some measurable change in attributes, quality or vulnerability, minor loss or, or alteration to, one (maybe more) key characteristics, features or elements, e.g. degradation in water resource quality and/or slight increase in flood risk Impact is of limited temporal or physical extent and of short term duration (i.e. up to two years). (Adverse).
	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial).
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements for negligible duration (i.e. less than one year) (Adverse) e.g. no observable degradation in water resource quality and/or flood risk.
	Very minor benefit to, or positive addition of one or more characteristics, features or elements (Beneficial).
No change	No loss or alteration of characteristics, features or elements; no observable impact either adverse or beneficial.

2.4.2.3 The criteria for defining sensitivity in this chapter are outlined in Table 2.17 below.

Table 2.17: Definition of terms relating to the sensitivity of the receptor.

Sensitivity	Definition
Very High	Receptor with little to no capacity to accommodate change, is high value or critical importance to the local, regional or national economy. Receptor is highly vulnerable to impacts that may arise from the development and recoverability is long term or not possible. **Surface Water**: WFD current overall status of high. The surface water body supports sensitive aquatic ecological receptors and is extensively used for public water supply and large scale agricultural use. **Flood Risk**: Land is within a high risk flood zone or nationally significant infrastructure is present which is protected from flooding by natural floodplain storage.
High	Receptor with a low a capacity to accommodate change, is of moderate value with reasonable contribution to the local, regional or national economy. Receptor is generally vulnerable to impacts that may arise from the development and recoverability is flow and/or costly. **Surface Water**: WFD current overall status of good. Surface water body may support sensitive aquatic ecological receptors and is used is used for public water supply/ medium scale industrial or agricultural use. **Flood Risk**: Land is within a high to medium risk flood zone or locally significant infrastructure is present which is protected from flooding by natural floodplain storage.
Medium	Receptors with a moderate capacity to accommodate change, is of minor value with small levels of contribution to the local, regional and national economy. Receptor is somewhat vulnerable to impacts that may arise from the development and has moderate to high levels of recoverability. **Surface Water**: WFD current overall status of moderate. The surface water features may be locally important for spawning of Salmonid species. Surface water body is used for private water supply or small scale industrial/agricultural use. **Flood Risk**: Land is within a medium risk flood zone or limited constraints and a low probability of flooding of industrial properties.

Sensitivity	Definition
Low	Receptor with a high capacity to accommodate change, is of low value with little contribution to the local, regional or national economy. Receptor is not generally vulnerable to impacts that may arise from the development and/or has high recoverability. **Surface Water**: WFD current overall status of poor. Surface water bodies are not significant in terms of sensitive ecological receptors or fish spawning. Small scale (single residential or commercial use) abstraction licences are present in close proximity. **Flood Risk**: Land within a low-risk flood zone or limited constraints and a very low probability of flooding of industrial properties.
Negligible	Receptor with a very high capacity to accommodate change, is of negligible value with no contribution to local, regional or national economy. Receptor is not vulnerable to impacts that may arise from the development and/or has high recoverability. **Surface Water**: WFD current overall status of bad. No sensitive ecological receptors or fish spawning are present within the surface water bodies. No abstraction licences present within the area. **Flood Risk**: Land is within a little to no flood risk zone and no major flood risk areas are present within a 250 m radius of the site.

2.4.2.4 The significance of the effect upon hydrology and flood risk is determined by correlating the magnitude of the impact and the sensitivity of the receptor. The particular method employed for this assessment is presented in Table 2.18. Where a range of significance of effect is presented in Table 2.18, the final assessment for each effect is based upon expert judgement.

2.4.2.5 For the purposes of this assessment, any effects with a significance level of minor or less have been concluded to be not significant in terms of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

Table 2.18: Matrix used for the assessment of the significance of the effect.

Sensitivity of Receptor	Magnitude of impact				
	No Change	**Negligible**	**Low**	**Medium**	**High**
Negligible	No change	Negligible	Negligible or Minor	Negligible or Minor	Minor
Low	No change	Negligible or Minor	Negligible or Minor	Minor	Minor or Moderate
Medium	No change	Negligible or Minor	Minor	Moderate	Moderate or Major
High	No change	Minor	Minor or Moderate	Moderate or Major	Major
Very High	No change	Minor	Moderate or Major	Major	Major

2.5 Key parameters for assessment

2.5.1 Maximum design scenario

2.5.1.1 The maximum design scenarios (MDSs) identified in Table 2.19 have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. These scenarios have been selected from the Project Design Envelope provided in Volume 1, Chapter 3: Project description of the Environmental

Statement. Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within the Project Design Envelope (e.g. different infrastructure layout), to that assessed here be taken forward in the final design scheme.

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Table 2.19: MDS considered for the assessment of potential impacts on hydrology and flood risk.

[a] C=construction, O=operations and maintenance, D=decommissioning

Potential impact	Phase [a]			MDS	Justification
	C	O	D		
The impact of increased flood risk arising from additional surface water runoff during construction	✓	×	×	**Construction phase** <u>Trenchless techniques:</u> • The maximum number of trenchless techniques locations along the Mona Onshore Cable Corridor is 45 and three on the Mona 400 kV Grid Connection Cable Corridor. Dimensions of trenchless technique crossing launch pits and reception pits for watercourse and road crossings are up to 100 m^2. Trenchless technique operations will require a temporary works area of up to 2,500 m^2. <u>Open cut trenching along the Mona Onshore Cable Corridor:</u> • The area of the permanent Mona Onshore Cable Corridor is up to 450,000 m^2 based on a corridor measuring 30 m wide and 15 km in length. The temporary working corridor requires an additional 44 m wide corridor (making the total width of the Mona Onshore Cable Corridor (temporary and permanent requirements) 74 m wide representing an area of up to 1,110,000 m^2 • There are up to four cable trenches within the permanent Mona Onshore Cable Corridor, each trench measures up to 2.5 m wide at the top, 1.5m at the base and the depth is up to 1.8m • The area of each joint bay is up to 200 m^2 and each joint bay is up to 2 m deep; the volume of material excavated per joint bay is 400 m^3 (a total of up to 32,000 m^3 of material excavated for the joint bays based on 80 joint bays) • The area of each link box is up to 6 m^2 and each link box is 1 m deep; the volume of material excavated per link box is 6 m^3 (a total of up to 480 m^3 of material excavated for the link boxes based on 80 link boxes). <u>Open cut trenching along the Mona 400 kV Grid Connection Cable Corridor:</u>	The MDS for flood risk in terms of the Mona Onshore Cable Corridor and Mona 400kV Grid Connection Cable Corridor is the greatest number of cable trenches, jointing bays, link boxes and construction compounds as they represent the greatest potential for increased flood risk as a result of land disturbance. The use of open cut crossings represents the MDS for flood risk due to the change in the channel dimensions and pumping. The largest footprint of the Mona Onshore Substation and the construction compound represent the MDS for flood risk as it results in the largest possible area of disturbance and flood storage.

Potential impact	Phase			MDS	Justification
	C	O	D		
				• The area of the permanent Mona 400 kV Grid Connection Cable Corridor is up to 16,000 m^2 based on a corridor measuring 16 m wide and 1 km in length. The temporary working corridor requires an additional 32 m wide corridor (making the total width of the route to grid connection (temporary and permanent requirements) 48 m wide representing an area of up to 48,000 m^2 • There are up to two cable trenches within the permanent Mona 400 kV Grid Connection Cable Corridor, each trench measures up to 2.5 m wide at the top, 1.5 m at the base and the depth is up to 1.8 m • The area of each joint bay is up to 200 m^2 and each joint bay is up to 2 m deep; the volume of material excavated per joint bay is 400 m^3 (a total of up to 800 m^3 of material excavated for the joint bays based on a maximum of two joint bays) • The area of each link box is up to 6 m^2 and each link box is 1m deep; the volume of material excavated per link box is 6 m^3 (a total of up to 12 m^3 of material excavated for the link boxes based on two link boxes). <u>Haul Road:</u> • There is one haul road within the Mona Onshore Cable Corridor and Mona 400 kV Grid Connection Cable Corridor along the length of the corridor; it is 6 m wide excluding passing places. It will be constructed using imported engineered granular fill with geotextile style layers with a nominal thickness of 400 mm and a maximum thickness of up to 1,000 mm. Dimensions of culvert/bridge crossings for the haul road are a maximum of 3 m in diameter and 10 m in length. <u>Construction compounds:</u> • One primary construction compound (measuring up to 22,500 m^2) and up to four secondary construction compounds (each measuring 15,000 m^2) will be located within the Mona Onshore Development Area. Soils will be removed and stored;	

Potential impact	Phase			MDS	Justification
	C	O	D		
				crushed stone or other suitable material will be used across the area to create hardstanding. <u>Mona Onshore Substation:</u> • The maximum footprint of the Onshore Substation will measure 65,000 m^2: this area will include the substation buildings. The earthworks to create the platform will measure up to 75,000 m^2. The impermeable footprint of the Onshore Substation will measure up to 42,000 m^2 and will include up to four buildings. The maximum dimensions of the main building are 15 m high, 40 m wide and 90 m long • A temporary works area of 150,000 m^2 will be required to support the construction of the substation. • The attenuation pond will measure up to 10,000 m^2	
The impact of increased flood risk arising from the diversion of the watercourse at the Onshore Substation	✓	×	×	**Construction phase** <u>Onshore Substation:</u> • The maximum footprint of the Onshore Substation will measure 65,000 m^2: this area will include the substation buildings. The earthworks to create the platform will measure up to 75,000 m^2. The Onshore Substation will comprise up to four buildings • A temporary works area of 150,000 m^2 will be required to support the construction of the substation • The attenuation pond will measure up to 10,000 m^2.	The MDS for flood risk in terms of the diversion of watercourses is represented by an ordinary watercourse located to the east of Onshore Substation as this will require the maximum length of channel to be diverted around the substation. The diversion of the watercourse has potential to increase flood risk upstream of the diversion if existing flows are not accommodated within the design.
The impact of increased flood risk arising from additional surface water runoff during operation of the Mona Onshore Substation.	×	✓	×	**Operations and maintenance phase** <u>Mona Onshore Substation:</u> • The maximum footprint of the Onshore Substation will measure 65,000 m^2: this area will include the substation buildings. The earthworks to create the platform will measure up to 75,000 m^2. The impermeable footprint of the Onshore Substation will measure up to 42,000 m^2 and will include up to four buildings. The maximum dimensions of the main building are 15 m high, 40 m wide and 90 m long	The dimensions of the Mona Onshore Substation and the permanent access road represent the MDS for flood risk during operation as they result in the biggest footprint and area of impermeable surfacing.

Potential impact	Phase			MDS	Justification
	C	O	D		
				• Access to the substation will be via a new permanent access road measuring up to 15 m wide and 800 m in length.	
The impact of increased flood risk arising from damage to existing flood defences	✓	×	✓	**Construction phase** <u>Trenchless techniques in the intertidal area between MLWS and MHWS:</u> • The corridor width will be 200 m landward of MHWS and the location of the trenchless technique entry point (onshore) is Llanndulas • Up to four transition joint bays each measuring up to 300 m^2 (with a total area of 1200 m^2) and up to 4 m deep; with spacing of up to 10 between each transition joint bay • The trenchless technique working area will measure up to 20,000 m^2 • The maximum bore diameter of the trenchless technique is 1650 mm; the maximum burial depth landward of the MHWS is 30 m and the length of each cable duct is 1.4 km • The maximum number of personnel at any one time within the landfall area will be 20. **Decommissioning phase** • The offshore export cable will be removed as far as the Transition Joint Bay and disposed of onshore • The Mona Onshore Cable will remain in situ, however some of the other onshore infrastructure may be removed.	There are no NRW flood defences where the Mona Offshore Wind Project makes landfall. The beach profile provides an informal flood defence and construction of the trenchless technique entry point and Transition Joint Bays at the landfall represent the greatest potential for impact on informal flood defences. This activity and has the potential to disrupt or damage the integrity of the informal flood defence and increasing the impacts of coastal erosion.
The impact of contaminated runoff on the quality of watercourses	✓	×	✓	**Construction phase** <u>Trenchless techniques:</u> • The maximum number of trenchless techniques (e.g. trenchless technique locations) along the Mona Onshore Cable Corridor is 45 and three on the Mona 400 kV Grid Connection Cable Corridor. Dimensions of trenchless technique crossing launch pits and reception pits for watercourse and road crossings are	The MDS for indirect effects to surface water quality would result from the use of trenchless technique presents a risk of indirectly contaminating surface watercourses where they are hydraulically connected with surface runoff caused by spillages and the movement of sediment. For smaller watercourses and drains, the use of open cut trenching to cross ordinary watercourses represents the greatest impacts to surface water quality.

Potential impact	Phase			MDS	Justification
	C	O	D		
				10 m x 10 m. trenchless technique operations will require a temporary works area of 50 m x 50 m. <u>Open cut trenching along the Mona Onshore Cable Corridor</u>: • The area of the permanent Mona Onshore Cable Corridor is up to 450,000 m^2 based on a corridor measuring 30 m wide and 15 km in length. The temporary working corridor requires an additional 44 m wide corridor (making the total width of the Mona Onshore Cable Corridor (temporary and permanent requirements) 74 m wide representing an area of up to 1,110,000 m^2 • There are up to four cable trenches within the permanent Mona Onshore Cable Corridor, each trench measures up to 2.5 m wide at the top, 1.5 m at the base and the depth is 1.8 m • There is one haul road within the Mona Onshore Cable Corridor along the length of the corridor; it is 6 m wide excluding passing places. It will be constructed using imported engineered granular fill with geotextile style layers with a nominal thickness of 400 mm and a maximum thickness of up to 1,000 mm. Dimensions of culvert/bridge crossings for the haul road are a maximum of 3 m in diameter and 10 m in length. <u>Open cut trenching along the Mona 400 kV Grid Connection Cable Corridor:</u> • The area of the permanent Mona 400 kV Grid Connection Cable Corridor is up to 16,000 m^2 based on a corridor measuring 16 m wide and 1 km in length. The temporary working corridor requires an additional 32 m wide corridor (making the total width of the route to grid connection (temporary and permanent requirements) 48 m wide representing an area of up to 48,000 m^2 • There are up to two cable trenches within the permanent Mona 400 kV Grid Connection Cable Corridor, each trench measures up to 2.5 m wide at the top, 1.5 m at the base and the depth is 1.8 m	Any disruption to the local surface watercourses may affect the hydrological regime of the area increasing turbid runoff into the watercourse, leading to a reduction in WFD classification. The MDS for water quality of ordinary watercourses during decommissioning is the removal of the link boxes as this presents the greatest disturbance and potential risk of sediment and contaminants being released.

Potential impact	Phase			MDS	Justification
	C	O	D		
				• There is one haul road within the Grid Connection Cable Corridor along the length of the corridor; it is 6 m wide excluding passing places. It will be constructed using imported engineered granular fill with geotextile style layers with a nominal thickness of 400 mm and a maximum thickness of up to 1,000 mm. Dimensions of culvert/bridge crossings for the haul road are a maximum of 3 m in diameter and 10 m in length. **Decommissioning phase** • The offshore export cable will be removed as far as the Transition Joint Bay and disposed of onshore • The Mona Onshore Cable Corridor and Mona 400kV Grid Connection Cable Corridor will remain in situ, however other onshore infrastructure may be removed.	
The impact of damage to existing field drainage.	✓	×	✓	**Construction phase:** <u>Open cut trenching along the Mona Onshore Cable Corridor:</u> • The area of the permanent Mona Onshore Cable Corridor is up to 450,000 m^2 based on a corridor measuring 30 m wide and 15 km in length. The temporary working corridor requires an additional 44 m wide corridor (making the total width of the Mona Onshore Cable Corridor (temporary and permanent requirements) 74 m wide representing an area of up to 1,110,000 m^2	The greatest number of cable trenches, link boxes and joint bays represents the greatest potential impact to existing field drainage due to the greatest area of land disturbance. The construction of the cable trenches, link boxes and joint bays may result in the removal or temporary blockage of existing drainage pipeline infrastructure. The construction programme represents the maximum duration before field drainage is reinstated.
The impact of damage to existing water pipelines	✓	×	✓	• There are up to four cable trenches within the permanent Mona Onshore Cable Corridor, each trench measures up to 2.5 m wide at the top, 1.5 m at the base and the depth is up to 1.8 m • The area of each joint bay is up to 200 m^2 and each joint bay is up to 2 m deep; the volume of material excavated per joint bay is 400 m^3 (a total of up to 32,000 m^3 of material excavated for the joint bays based on 80 joint bays) • The area of each link box is up to 6 m^2 and each link box is 1 m deep; the volume of material excavated per link box is 6 m^3 (a total of up to 480 m^3 of material excavated for the link boxes based on 80 link boxes).	The greatest number of cable trenches represents the greatest potential impact to existing water pipeline infrastructure due to the greatest area of land disturbance.

Potential impact	Phase			MDS	Justification
	C	O	D		
				Open cut trenching along the Mona 400 kV Grid Connection Cable Corridor: • The area of the permanent Mona 400 kV Grid Connection Cable Corridor is up to 16,000 m^2 based on a corridor measuring 16 m wide and 1 km in length. The temporary working corridor requires an additional 32 m wide corridor (making the total width of the route to grid connection (temporary and permanent requirements) 48 m wide representing an area of up to 48,000 m^2 • There are up to two cable trenches within the permanent Mona 400 kV Grid Connection Cable Corridor, each trench measures up to 2.5 m wide at the top, 1.5 m at the base and the depth is up to 1.8 m • The area of each joint bay is up to 200 m^2 and each joint bay is up to 2 m deep; the volume of material excavated per joint bay is 400 m^3 (a total of up to 800 m^3 of material excavated for the joint bays based on a maximum of two joint bays) • The area of each link box is up to 6 m^2 and each link box is 1m deep; the volume of material excavated per link box is 6 m^3 (a total of up to 12 m^3 of material excavated for the link boxes based on two link boxes). Haul Road: • There is one haul road within the Mona Onshore Cable Corridor and Mona 400 kV Grid Connection Cable Corridor along the length of the corridor; it is 6 m wide excluding passing places. It will be constructed using imported engineered granular fill with geotextile style layers with a nominal thickness of 400 mm and a maximum thickness of up to 1,000 mm. Dimensions of culvert/bridge crossings for the haul road are a maximum of 3 m in diameter and 10 m in length. **Decommissioning phase** • The offshore export cable will be removed as far as the Transition Joint Bay and disposed of onshore	

Potential impact	Phase			MDS	Justification
	C	O	D		
				• The Mona Onshore Cable Corridor and Mona 400kV Grid Connection Cable Corridor will remain in situ, however, other onshore infrastructure may be removed.	

2.6 Measures adopted as part of the Mona Offshore Wind Project

2.6.1.1 For the purposes of the EIA process, the term 'measures adopted as part of the project' is used to include the following measures (adapted from (Institute of Environmental Management and Assessment (IEMA), 2016):

- Measures included as part of the project design. These include modifications to the location or design of the Mona Offshore Wind Project which are integrated into the application for consent. These measures are secured through the consent itself through the description of the development and the parameters secured in the DCO and/or marine licences (referred to as primary mitigation in IEMA, 2016)
- Measures required to meet legislative requirements, or actions that are generally standard practice used to manage commonly occurring environmental effects and are secured through the DCO requirements and/or the conditions of the marine licences (referred to as tertiary mitigation in IEMA, 2016).

2.6.1.2 A number of measures (primary and tertiary) have been adopted as part of the Mona Offshore Wind Project to reduce the potential for impacts on hydrology and flood risk. These are outlined in Table 2.20 below. As there is a commitment to implementing these measures, they are considered inherently part of the design of the Mona Offshore Wind Project and have therefore been considered in the assessment presented in section 2.7 below (i.e. the determination of magnitude and therefore significance assumes implementation of these measures).

Table 2.20: Measures adopted as part of the Mona Offshore Wind Project.

Measures adopted as part of the Mona Offshore Wind Project	Justification	How the measure will be secured
Primary measures: Measures included as part of the project design		
The Mona Onshore Cable Corridor, Mona 400kV Grid Connection Cable Corridor and the construction site accesses will be designed to minimise land take and to avoid, where possible, impacts on existing drainage networks and features.	To minimise impacts on existing drainage networks and features.	This commitment has been achieved through the site selection process and documented in Volume 1, Chapter 4: Site selection and consideration of alternatives of the Environmental Statement.
All major crossings (such as major roads and rail crossings) will be undertaken using trenchless techniques.	To minimise impacts on existing drainage networks and features.	The commitment is documented in Volume 5, Annex 4.3: Onshore Crossing Schedule of the Environmental Statement.
The haul road will be constructed from an engineered fill, with geotextile layers, the material will be granular and semi-permeable of an appropriate standard as documented in the Outline Construction Method Statement (Document Reference J26.15) and appended to the Outline CoCP.	To control flood risk.	The preparation of a detailed CoCP would be secured through a requirement of the DCO. The detailed CoCP would include a detailed Construction Method Statement.
The diversion of the ordinary watercourse at the Onshore Substation will be appropriately designed to ensure the existing watercourse capacity is maintained (i.e. conveyance of existing flows without increasing fluvial flood risk upstream) as documented in the Outline Operational Drainage Management Strategy (Document Reference J27).	To control flood risk.	The preparation of a detailed Operational Drainage Management Strategy would be secured as a requirement of the DCO.

Measures adopted as part of the Mona Offshore Wind Project	Justification	How the measure will be secured
A pre-construction drainage scheme will be designed for both the Mona Onshore Cable Corridor and Onshore Substation work sites as documented in the Outline Construction Surface Water and Drainage Management Plan (Document Reference J26.6) and appended to the Outline CoCP.	To ensure that the water quality and flow rates are unaffected.	The preparation of a detailed CoCP would be secured through a requirement of the DCO. The detailed CoCP would include a detailed Construction Surface Water and Drainage Management Plan.
Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice		
Preparation of a detailed Code of Construction Practice (CoCP) to ensure the effective management of environmental impacts during the construction phase of onshore and intertidal elements of the Mona Offshore Wind Project. The detailed CoCP will be in general accordance with the Outline CoCP within the DCO application (Document Reference J26) and include regulatory guidance and industry best practice guidance including: • A detailed Construction Surface Water Drainage Management Plan. It will set out the methods for managing surface water runoff and groundwater, to protect the local environment and sensitive receptors and include measures to prevent surface water flooding during construction • A detailed Spillage and Emergency Response Plan to set out pollution prevention measures and an emergency response plan for accidents and spillages. • A field drainage strategy - Any field drainage intercepted during the cable installation will either be reinstated following the installation of the cable or diverted to a secondary channel. All construction work will be undertaken in accordance with the detailed CoCP (Document reference J26) and good practice guidance including, but not limited to: • Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors CIRIA (C650) CIRIA – SuDS Manual (CIRIA, 2015).	To control flood risk and pollution. To accord with guidance and best practice for construction works. To ensure field drainage is maintained during construction and reinstated on the completion of construction.	The preparation of a detailed CoCP would be secured would be secured through a requirement of the DCO. The detailed CoCP would include the following detailed management plans: Construction Surface Water and Drainage Management Plan; Spillage and Emergence Response Plan and a field drainage strategy.
Preparation of a detailed Operational Drainage Management Plan for the Onshore Substation. The detailed Plan will be in general accordance with the Outline Operational Drainage Management Strategy (Document Reference J27). It will set out how existing runoff rates to the surrounding water environment will be maintained at pre-development rates. The detailed Operational Drainage Management Plan will provide the detailed design of the realigned watercourse and will ensure that 8 m buffer is maintained between	To address the requirements of NPS EN-1, the TAN-15, NRW.	The preparation of a detailed Operational Drainage Management Plan would be secured through a requirement of the DCO.

Measures adopted as part of the Mona Offshore Wind Project	Justification	How the measure will be secured
the banks of the ordinary watercourse and the Onshore Substation.		
Preparation of a detailed Construction Method Statement that will be in general accordance with the Outline Construction Method Statement (Document Reference J26.15). The detailed Construction Method Statement will also include: • A detailed method statement for watercourse crossings (e.g. for temporary culvert crossings, appropriately sized flume pipes, equal to or greater than the diameter of the flume upstream and to an agreed length, will be placed on or below the hard bed of the watercourse). The watercourse crossing method statement will provide design details for each watercourse crossing location and would be agreed with the relevant authority prior to construction. .	To control flood risk and pollution.	The preparation of a detailed CoCP would be secured through a requirement of the DCO. The detailed CoCP would include a detailed Construction Method Statement.
Preparation of a detailed Flood Management Plan for the construction support activities on the beach. The Plan will be in general accordance with the Outline Flood Management Plan (Document Reference J 26.7).	To control flood risk.	The preparation of a detailed CoCP would be secured through a requirement of the DCO. The detailed CoCP would include a detailed Flood Management Plan.
Preparation of a detailed Landfall Construction Method Statement that will be in general accordance with the Outline Landfall Construction Method Statement (Document Reference J26.14). The Landfall Construction Method Statement will also include: • Measures to maintain the existing level of flood protection by avoiding the creation of a new pathway for flood water via the offshore export cable borehole and duct (e.g. sealing the end of the ducts).	To control flood risk.	The preparation of a detailed CoCP would be secured through a requirement of the DCO. The detailed CoCP would include a detailed Landfall Construction Method Statement.
The design of the oil storage and delivery facility at the Onshore Substation during the operations and maintenance will be in accordance with industry standards for pollution prevention as set out in the Design Principles (Document Reference J3).	To reduce the risk of surface water pollution.	The preparation of detailed Design Principles would be secured as a requirement of the DCO.
A Decommissioning Plan will be prepared to ensure the effective management of environmental risk during the decommissioning of the Mona Onshore Substation and access road.	To control flood risk and pollution.	These measures would be secured as a requirement of the DCO.

2.6.1.3 The design of the watercourse crossings will be agreed with the relevant authority before construction commences; the provisions of the Ordinary Watercourse Consents will be disapplied and incorporated as protected provisions of the DCO.

2.7 Assessment of significant effects

2.7.1 Overview

2.7.1.1 The impacts of the construction, operations and maintenance, and decommissioning phases of the Mona Offshore Wind Project have been assessed on hydrology and flood risk. The potential impacts arising from each phase of the Mona Offshore Wind Project are listed in Table 2.19, along with the MDS against which each impact has been assessed.

2.7.1.2 A description of the potential effect on hydrology and flood risk receptors caused by each identified impact is given below.

2.7.2 The impact of increased flood risk arising from additional surface water runoff

Construction phase

Magnitude of impact

2.7.2.1 The Mona Landfall will be installed using trenchless techniques: the entry pits will be located in farmland to the south of the A547 and the punch out locations will be below MLWS. This is unlikely to lead to an increase flood risk inland. Further information regarding the landfall construction is provided in the Outline Landfall Construction Method Statement (Document reference 26.14).

2.7.2.2 Within the hydrology and flood risk study area, impacts on flood risk would arise from any temporary change in runoff over the areas affected during construction, such as temporary construction compounds, haul road, construction accesses and the Mona Onshore Cable Corridor. Construction methodologies (as set out in Table 2.20) will be implemented to ensure the risk of flooding is not increased (e.g. use of permeable gravel overlying a permeable geotextile membrane of an appropriate standard for construction compounds, haul road and construction accesses and installation of drainage features to maintain land drainage flow).

2.7.2.3 In terms of crossings, the majority of watercourses will be undertaken using trenchless techniques. For crossings of smaller watercourses (that are frequently dry) and drainage channels, open cut trenched techniques may be used. The proposed crossing techniques for each location is identified in Volume 5, Annex 4.3: Onshore crossing schedule of the Environmental Statement. Descriptions of the crossing techniques are provided within the Volume 1, Chapter 3: Project description of the Environmental Statement and the Outline Construction Method Statement (Document reference J26.15). Where trenched techniques are utilised for dry or low flow ditches, if required appropriate mitigation will be used, with any temporary pumped flow rates will be appropriately designed to ensure conveyance of existing flows without increased fluvial flood risk upstream of the site via the constriction of flows.

2.7.2.4 Watercourses crossed by haul roads are expected to be culverted/bridged as part of construction activities with maximum 3 m diameter, 10 m long culvert/bridge crossings. Culvert/bridge works will be appropriately sized to ensure conveyance of existing flows without increasing fluvial flood risk upstream of the site via the constriction of flows. The culvert/bridge works will be temporary as the haul roads will only be required during the construction period.

2.7.2.5 The Outline Construction Method Statement (Document reference J26.15) includes outline methods for the proposed crossings. The crossings will be constructed broadly

in line with the method statement: the methodologies will be developed further (in discussion with NRW) during the detailed design stage.

2.7.2.6 The impacts on flood risk from the temporary change in runoff are only likely to affect the surrounding local receptors and, assuming that designed in and construction measures (Table 2.20) are implemented, there is unlikely to be any observable degradation in flood risk. The magnitude of impact is predicted to be indirect, of local spatial extent, short term duration and continuous. The impact magnitude is therefore considered to be **negligible**.

Sensitivity of receptor

2.7.2.7 The section of beach where construction support activities will take place and part of the Landfall is located within Flood Zone 2 and 3. Part of the beach itself is designated as a Site of Special Scientific Interest (SSSI): Traeth Pensarn SSSI is designated for its vegetated shingle beach plant communities. The remainder of the Mona Onshore Development Area and Onshore Substation is located in Flood Zone 1 within a predominantly rural area, with limited residential properties within the surrounding area.

2.7.2.8 Taking into account the most sensitive land use within the Mona Onshore Development Area, the sensitivity of the land within the hydrology and flood risk study area is of high vulnerability, medium recoverability and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of effect

2.7.2.9 Overall, the magnitude of the impact is deemed to be negligible, the sensitivity for the hydrology and flood risk study area is considered to be high. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

2.7.3 The impact of increased flood risk arising from the diversion of the ordinary watercourse at the Onshore Substation

Construction phase

Magnitude of impact

2.7.3.1 The most upstream extent of an ordinary watercourse is located directly to the east of the Onshore Substation and flows from the southwest to the northeast. In total, the watercourse has a small hydraulic catchment of 0.3km^2 as it is conveyed past the Onshore Substation.

2.7.3.2 The construction of the Mona Onshore Substation will require the diversion of a section (approximately 400 m long) of the watercourse around the perimeter of the substation (see Volume 1, Chapter 3: Project description of the Environmental Statement). The diversion will be appropriately designed to ensure conveyance of existing flows without increasing fluvial flood risk upstream of the site via the constriction of flows. The magnitude of impact is predicted to be indirect, of local spatial extent, long term duration and continuous. The impact magnitude is therefore considered to be **low**.

Sensitivity of receptor

2.7.3.3 The WFD status the ordinary watercourses is determined by the WFD classifications of Elwy - Clwyd to Afon Melai (ID: GB110066060020) river waterbody catchment in which the ordinary watercourse is located within, as presented within Table 2.10. It is also noted that all watercourses have been assigned an objective to achieve 'Good' overall status. Taking this into consideration, the ordinary watercourse is considered

to be of high vulnerability, moderate recoverability and moderate value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of effect

2.7.3.4 The watercourse has a small hydraulic catchment in which only limited flows are to be conveyed. The watercourse is to be diverted for a short length within an appropriately designed diversion to ensure flood risk is not increased. The design of the diversion will be provided in the detailed Operational Drainage Management Strategy (see Table 2.20). As such, the magnitude of the impact is deemed to be low, the sensitivity of the setting is considered to be high. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

2.7.4 The impact of increased flood risk arising from additional surface water runoff during operation of the Mona Onshore Substation

Operations and maintenance phase

Magnitude of impact

2.7.4.1 The Onshore Substation has been subject to an FCA (Volume 7, Annex 2.1: Flood Consequence Assessment of the Environmental Statement) in order to meet the requirements of planning policy and best practice. The Mona Onshore Substation would be designed to ensure surface water flows are discharged off-site at the greenfield runoff rate. With the incorporation of mitigation measures outlined in Table 2.20 and a drainage strategy to be agreed with the LLFA it has been determined that there will be no change from the baseline hydrological environment. The magnitude of impact is predicted to be indirect, of local spatial extent, long term duration and continuous. The impact magnitude is therefore predicted to be **no change**.

Sensitivity of receptor

2.7.4.2 The Onshore Substation is located within Flood Zone 1 and has a low risk of flooding from all assessed sources. The land adjoining the Mona Onshore Substation is of low flood risk vulnerability within the rural landscape, high recoverability and low value with limited residential, commercial or industrial properties in the vicinity. The sensitivity of the receptor is therefore, considered to be **low**.

Significance of effect

2.7.4.3 Overall, the magnitude of the impact is deemed to be no change, the sensitivity of the receptor is considered to be low. The effect will, therefore, be of **negligible** significance, which is not significant in EIA terms.

2.7.5 The impact of increased flood risk arising from damage to existing flood defences

Construction phase

Magnitude of impact

2.7.5.1 Whilst a coastal flood defence wall is present within the east extent of the landfall, no additional NRW designated flood defence structures are present within this area. Groynes and a revetment are present within the landfall area and the elevation of the beach above the shoreline acts as an informal flood defence.

2.7.5.2 Trenchless techniques will be used to cross the intertidal area, under the informal sea defences (including Pensarn beach), coastal footpath/cycleway, historic landfill,

railway line, A55 and A547 to reduce disturbance to the receiving environment and infrastructure. These measures are outlined in Volume 1, Chapter 3: Project description of the Environmental Statement and the Outline Landfall Construction Method Statement (Document reference J26.14).

2.7.5.3 The drill pop out will be located below MLWS, the exact location will be confirmed during detailed design stage. Temporary protection of the exit location may be required between the installation of the trenchless technique duct and when the cable pulling occurs. Where protection is required, it will be in accordance with the commitment that it will create no more than a 5% reduction in water depth without the approval of the Maritime and Coastguard Agency. The temporary protection is unlikely to affect the profile of the beach or the informal flood defence it provides. Further information on coastal erosion is provided in Volume 2, Chapter 1: Physical processes of the Environmental Statement.

2.7.5.4 The magnitude of impact is predicted to be indirect, of local spatial extent, long term duration and intermittent. The impact magnitude is therefore considered to be **negligible**.

Sensitivity of receptor

2.7.5.5 A NRW designated coastal flood defence wall is present along the onshore margin of the intertidal area maintained by CCBC. Informal flood defence structures including groynes and revetments are also present. Part of the beach itself is designated as a SSSI: Traeth Pensarn SSSI is designated for its vegetated shingle beach plant communities and as such, has a national importance. This section of the beach has high value and high vulnerability, a medium recoverability and therefore is considered to have a **high** sensitivity.

Significance of effect

2.7.5.6 Overall, the magnitude of the impact is deemed to be negligible, the sensitivity of the receptor is considered to be high. The effect will therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Decommissioning phase

Magnitude of impact

2.7.5.7 The offshore export cables will be removed at the drill punch out location below MLWS during decommissioning. This is unlikely to affect the profile of the beach or the informal flood defence it provides. Further information on coastal erosion is provided in Volume 2, Chapter 1: Physical processes of the Environmental Statement.

2.7.5.8 The magnitude of impact is predicted to be indirect, of local spatial extent, short term duration and intermittent. The impact magnitude is therefore considered to be **negligible**.

Sensitivity of receptor

2.7.5.9 The landfall has a high value, high vulnerability, a medium recoverability and therefore is considered to have a **high** sensitivity.

Significance of effect

2.7.5.10 Overall, the magnitude of the impact is deemed to be negligible, the sensitivity of the receptor is considered to be high. The effect will, therefore, be of **minor adverse**, which is not significant in EIA terms.

2.7.6 The impact of contaminated runoff on the quality of watercourses

Construction phase

Magnitude of impact

2.7.6.1 The majority of watercourses along the Mona Onshore Cable Corridor and Mona 400kV Grid Connection Cable Corridor will be crossed using trenchless techniques (see Volume 1, Chapter 3: Project description of the Environmental Statement). The impacts on these watercourses from construction activities involving the use of trenchless techniques and associated machinery could lead to an increase in turbid runoff, high pH water runoff, bentonite breakouts during drilling and spillages/leaks of fuel, oil etc. affecting nearby watercourses. There is the potential for this to impact on water quality and therefore cause a reduction in the WFD classification.

2.7.6.2 Trenched techniques may be used where the Mona Onshore Cable Corridor, Mona 400kV Grid Connection Cable Corridor crosses smaller watercourses (that are frequently dry) and drainage channels. Trenching could lead to damage to the banks along the watercourses, an increase in turbid runoff, spillages/leaks of fuel, oil etc. and an alteration in surface water flow pathways that could affect nearby watercourses.

2.7.6.3 The Mona Onshore Cable Corridor and the Mona 400kV Grid Connection Cable Corridor could also act as a drainage channel, leading to runoff from construction areas affecting nearby watercourses.

2.7.6.4 Measures outlined in Table 2.20 and the Outline CoCP (Document reference J26) are expected to intercept runoff and ensure that discharges are controlled in quality and volume causing no degradation in WFD classification. The magnitude of impact is predicted to be indirect, of local spatial extent, short term duration and intermittent. The impact magnitude is therefore considered to be **negligible**.

Sensitivity of receptor

2.7.6.5 Taking a precautionary approach in assuming surrounding waterbody catchments have achieved/maintained ‘Good’ status at the time when construction begins, the surface watercourses within the hydrology and flood risk study area have been assessed with a WFD status of ‘Good’. The watercourses are therefore, considered to be highly vulnerable in relation to WFD classification status, but of moderate recoverability and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of effect

2.7.6.6 Overall, the magnitude of the impact is deemed to be negligible, the sensitivity of the receptor is considered to be high. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Decommissioning phase

Magnitude of impact

2.7.6.7 During decommissioning it is assumed that the Onshore Substation and access road will be removed. The Onshore Cable Corridor and 400Kv Grid Connection Cable Corridor will remain in situ, however other onshore infrastructure (e.g. link boxes) may be removed.

2.7.6.8 The impacts of decommissioning of the Mona components will be reduced through the incorporation of management measures (outlined in Table 2.20) including emergency spill response procedures including clean up and remediation of contaminated soils, appropriate water proofing of exposed cable ducts. A final decommissioning plan will require approval from the statutory consultees prior to the undertaking of decommissioning works. The magnitude of impact is predicted to be indirect, of local spatial extent, short term duration and intermittent. The impact magnitude is therefore considered to be **negligible**.

Sensitivity of receptor

2.7.6.9 The watercourses are considered to be highly vulnerable in relation to WFD classification status, but of moderate recoverability and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of effect

2.7.6.10 Overall, the magnitude of the impact is deemed to be negligible, the sensitivity of the receptor is considered to be high. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

2.7.7 The impact of damage to existing field drainage

Construction phase

Magnitude of impact

2.7.7.1 The impact on field drainage and irrigation from open cut techniques and the installation of link boxes and joint bays during the construction phase could temporarily affect surface water flow pathways, impacting on water quality and potential flow rates. The removal of field drains within the Mona Onshore Substation may cause a backup on surrounding field drains, in turn increasing the flood risk to the site and surrounding receptors.

2.7.7.2 A pre-construction drainage scheme will be designed for the Mona Onshore Cable Corridor and Mona 400kV Grid Connection Cable Corridor and Onshore Substation. Interceptor drains are to be installed prior to the start of the construction so that all existing drainage flows are maintained. The drains will also prevent water from the working easement from migrating onto the adjacent land. These measures will be incorporated into the detailed Construction Surface Water and Drainage Management Plan and appended to the CoCP (refer to Table 2.20)With the incorporation of appropriate construction mitigation techniques the impact is predicted to be of local spatial extent with a minor shift away from existing hydrological environment of local receptors. The magnitude of impact is predicted to be direct, of local spatial extent, short term duration and intermittent. The impact magnitude is therefore considered to be **negligible**.

Sensitivity of receptor

2.7.7.3 Field drains are considered to be of moderate vulnerability along the Mona Onshore Cable Corridor, Mona 400kV Grid Connection Cable Corridor and Onshore Substation, moderate to high recoverability and low value. The sensitivity of the receptor is therefore considered to be **medium**.

Significance of effect

2.7.7.4 Overall, the magnitude of impact is deemed to be negligible, the sensitivity of the receptor is considered to be medium. The effect will therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Decommissioning phase

Magnitude of impact

2.7.7.5 During decommissioning it is assumed the Onshore Substation and access road will be removed The Onshore Cable Corridor and 400Kv Grid Connection Cable Corridor will remain in situ however, other onshore infrastructure may be removed.

2.7.7.6 The impacts of decommissioning of the Mona components will be reduced through the incorporation of management measures (outlined in Table 2.20) including emergency spill response procedures within a decommissioning plan. . The plan will be approved by the statutory consultees prior to the undertaking of decommissioning works. The magnitude of the impact is predicted to be direct, of local spatial extent, short term duration and intermittent. The impact magnitude is therefore predicted to be **negligible**.

Sensitivity of receptor

2.7.7.7 Field drains are considered to be of moderate vulnerability along the Mona Onshore Cable Corridor, moderate to high recoverability and low value. The sensitivity of the receptor is therefore considered to be **medium**.

Significance of effect

2.7.7.8 Overall, the magnitude of impact is deemed to be negligible, the sensitivity of the receptor is considered to be medium. The effect will therefore, be of **minor adverse** significance, which is not significant in EIA terms.

2.7.8 The impact of damage to existing water pipelines

Construction phase

Magnitude of impact

2.7.8.1 The impact on pipeline infrastructure from trenchless techniques during the construction phase could temporarily disrupt local water infrastructure, impacting water quality, potential flow rates and public and private local water supply networks.

2.7.8.2 The site selection of the Mona Onshore Development Area has taken into account the location of major services utilities (see Volume 1, Chapter 4: Site selection and consideration of alternatives of the Environmental Statement), with micro-routing or appropriate construction techniques employed where required to avoid impact to local services.

2.7.8.3 Discussions with Dŵr Cymru / Welsh Water and landowners will be undertaken at the detailed design stage to confirm the location of public water supplies. Prior to any construction activities, Utility surveys will be undertaken to establish if any infrastructure is present prior to any intrusive work being undertaken. Potential impacts to private water supplies are considered in Volume 7, Annex 1.2: Groundwater sources of supply – hydrogeological risk assessment of the Environmental Statement.

2.7.8.4 Works to be undertaken within proximity to Dŵr Cymru/Welsh Water assets will be designed in accordance with the water authorities design standards and will require to be approved by Dŵr Cymru / Welsh Water prior to the commencement of works.

2.7.8.5 Any impacts of construction which affect water supply infrastructure are likely to cause temporary disruption of water supply to residents/businesses in the local surrounding area. The impact would be of limited temporal extent and short term duration.

2.7.8.6 The magnitude of impact is predicted to be indirect, of local spatial extent, short term duration and intermittent. The impact magnitude is therefore considered to be **negligible**.

Sensitivity of receptor

2.7.8.7 Water supply pipelines are considered to have a moderate value and contribute to the local and regional economy. It has high vulnerability to the construction impacts of the Mona Offshore Wind Project and low recoverability due to high costs. The sensitivity of the receptor is therefore considered to be **high**.

Significance of effect

2.7.8.8 Prior to construction, it is expected reasonable mitigation measures will be adopted to address the risk of damage to existing water pipelines. Overall, the magnitude of the impact is deemed to be negligible, the sensitivity of the setting is considered to be high. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Decommissioning phase

Magnitude of impact

2.7.8.9 During decommissioning it is assumed the Onshore Substation and access road will be removed. The Onshore Cable Corridor and 400Kv Grid Connection Cable Corridor will remain in situ, however other onshore infrastructure (e.g. link boxes) may be removed.

2.7.8.10 The impacts of decommissioning of the Mona components will be reduced through the incorporation of management measures (outlined in Table 2.20) including emergency spill response procedures including clean up and remediation of contaminated soils, appropriate water proofing of exposed cable ducts. A final decommissioning plan will require approval from the statutory consultees prior to the undertaking of decommissioning works. The magnitude of the impact is predicted to be direct, of local spatial extent, short term duration and intermittent. The impact magnitude is therefore predicted to be **negligible**.

Sensitivity of receptor

2.7.8.11 Drainage pipeline infrastructure has high vulnerability to the decommissioning impacts of the Mona Offshore Wind Project and low recoverability due to high costs. The sensitivity of the receptor is therefore considered to be **high.**

Significance of effect

2.7.8.12 Overall, the magnitude of the impact is deemed to be negligible, the sensitivity of the receptor is considered to be high. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

2.7.9 Future monitoring

2.7.9.1 No hydrology and flood risk monitoring to test the predictions made within the impact assessment is considered necessary and is not proposed at this time.

2.8 Cumulative effect assessment methodology

2.8.1 Methodology

2.8.1.1 The Cumulative Effects Assessment (CEA) takes into account the impact associated with the Mona Offshore Wind Project together with other projects and plans. The projects and plans selected as relevant to the CEA presented within this chapter are based upon the results of a screening exercise (see Volume 5, Annex 5.1: Cumulative Effects Assessment screening matrix of the Environmental Statement). Each project has been considered on a case-by-case basis for screening in or out of this chapter's assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.

2.8.1.2 The hydrology and flood risk CEA methodology has followed the methodology set out in Volume 1, Chapter 5: Environmental Impact Assessment methodology of the Environmental Statement. As part of the assessment, all projects and plans considered alongside the Mona Offshore Wind Project have been allocated into ‘tiers’ reflecting their current stage within the planning and development process, these are listed below.

2.8.1.3 A tiered approach to the assessment has been adopted, as follows:

- Tier 1
  - Under construction
  - Permitted application
  - Submitted application
  - Those currently operational that were not operational when baseline data were collected, and/or those that are operational but have an ongoing impact
- Tier 2
  - Scoping Report has been submitted and is in the public domain
- Tier 3
  - Scoping report has not been submitted or is not in the public domain
  - Identified in the relevant Development Plan
  - Identified in other plans and programmes.

2.8.1.4 This tiered approach is adopted to provide a clear assessment of the Mona Offshore Wind Project alongside other projects, plans and activities.

2.8.1.5 The specific projects, plans and activities scoped into the CEA, are outlined in Table 2.21 and Figure 2.2.

Table 2.21: List of other projects, plans and activities considered within the CEA.

Project/Plan	Status	Distance from the Mona Onshore Development Area (km)	Distance from the Mona Onshore Substation (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Tier 1-							
Awel y Môr Offshore Wind Farm (Onshore infrastructure)	Application determined	0	0.1	Application for the construction of an offshore windfarm. Consent granted in Q3 2023.	Construction to commence in 2026.	Site to be commissioned by 2030.	Yes
Major Development 40/2017/1232	Granted	0.64	1.09	Application for the erection of the seven industrial units with associated parking, landscaping and external storage areas.	Not provided but assumed to overlap with Mona Offshore Wind Project	Not provided but assumed to overlap with Mona Offshore Wind Project	Yes
Major Development 46/2021/0159	Granted	0.23	0.80	Application for the erection of a commercial vehicle sales unit (sui generis). Formation of associated parking area, landscaping and associated works. Outline Planning application for the erection of five business buildings.	Not provided but assumed to overlap with Mona Offshore Wind Project	Not provided but assumed to overlap with Mona Offshore Wind Project	Yes
Tier 3							
St Asaph Solar Farm	Pre-application	0	0.87	A proposed solar farm with a potential generating capacity of between 10MW and 350Mw.	Not provided but assumed to overlap with Mona Offshore Wind Project	Not provided but assumed to overlap with Mona Offshore Wind Project	
NGET 31/2023/0525	Pre-application (EIA	0.03	0.41	Extension to the existing Bodelwyddan electricity substation	Not provided but assumed to overlap	Not provided but assumed to overlap with Mona	Yes

Project/Plan	Status	Distance from the Mona Onshore Development Area (km)	Distance from the Mona Onshore Substation (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
	screening request)				with Mona Offshore Wind Project	Offshore Wind Project	
NGET	Pre-application	0.03	0.41	Application under section 37 of the Electricity Act 1989 for the installation of new overhead lines.	Not provided but assumed to overlap with Mona Offshore Wind Project	Not provided but assumed to overlap with Mona Offshore Wind Project	Yes
NGET	Pre-application	0.03	0.41	Permitted development comprising extension to the GIS hall required to facilitate the extension to the existing Bodelwyddan electricity substation.	Not provided but assumed to overlap with Mona Offshore Wind Project	Not provided but assumed to overlap with Mona Offshore Wind Project	Yes

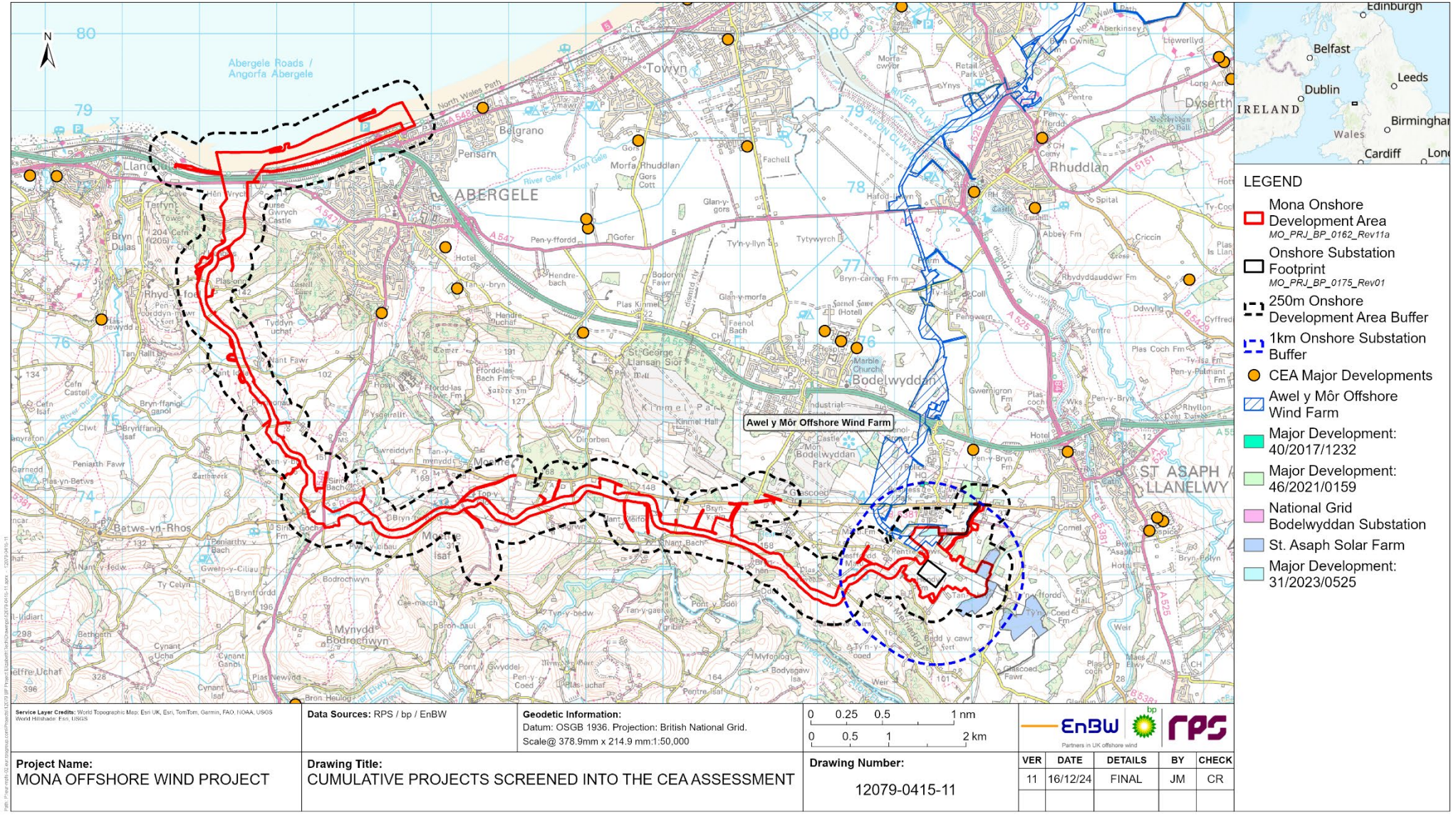

Figure 2.2: Cumulative projects screened into the CEA assessment.

2.8.2 Maximum design scenario

2.8.2.1 The MDSs identified in Table 2.22 have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. The cumulative effects presented and assessed in this section have been selected from the Project Design Envelope provided in Volume 1, Chapter 3: Project description, of the Environmental Statement as well as the information available on other projects and plans, in order to inform a MDS. Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within the Project Design Envelope (e.g. different wind turbine layout), to that assessed here, be taken forward in the final design scheme.

2.8.2.2 The CEA has considered the Mona Offshore Wind Project, alongside the National Grid Bodelwyddan substation extension proposal. The CEA has been undertaken on the basis of the latest available information in the public domain, which is the Autumn 2023 consultation material. It is understood that the application for the proposal is imminent. If further information is available for the proposal before the Mona Offshore Wind Project receives Development Consent, the Applicant will provide an update to the cumulative assessment presented within this chapter.

2.8.2.3 The MARES Connect project is proposing to submit a planning application in 2024 for an interconnector cable, landfall and onshore substation with connection to the National Grid. The project has identified several landfall zones and zones for its onshore substation and there is the potential for overlap with the Mona Onshore Development Area. The CEA has not considered the Mona Offshore Wind Project, alongside the MARES Connect project as insufficient information was publicly available prior to the Mona Offshore Wind Project DCO submission (see Volume 1, Chapter 5: Environmental Impact Assessment methodology of the Environmental Statement). However, if further information becomes available for the proposal before the Mona Offshore Wind Project receives Development Consent, the Applicant will review the information and provide any update needed to the CEA.

Table 2.22: Maximum design scenario considered for the assessment of potential cumulative effects on hydrology and flood risk.

[a] C=construction, O=operations and maintenance, D=decommissioning

Potential cumulative effect	Phase[a]			MDS	Justification
	C	O	D		
The impact of increased flood risk arising from additional surface water runoff	✓	×	×	MDS as described for the Mona Offshore Wind Project (Table 2.19) assessed cumulatively with the following other projects/plans: **Tier 1** • Awel y Môr Offshore Wind Farm (onshore infrastructure) • Major Development 40/2017/1232 • Major Development 46/2021/0159 **Tier 3** • St Asaph Solar Farm • Major Development 31/2023/0525 (NGET - extension) • NGET – overhead lines • NGET – Permitted development	The outcome of the CEA will be greatest when the construction programme of other projects overlap with the construction of Mona Offshore Wind Project as it will lead to the greatest increase in flood risk from additional surface water runoff.
The impact of increased flood risk arising from additional surface water runoff during operation of the Mona Onshore Substation	×	✓	×	MDS as described for the Mona Offshore Wind Project (Table 2.19) assessed cumulatively with the following other projects/plans: **Tier 1** • Awel y Môr Offshore Wind Farm (onshore infrastructure) • Major Development 40/2017/1232 • Major Development 46/2021/0159	The outcome of the CEA will be greatest as a result of the greatest number of projects being developed leading to an increase in surface water runoff from impermeable areas.
The impact of increased flood risk from damage to flood defences	✓	×	✓	MDS as described for the Mona Offshore Wind Project (Table 2.19) assessed cumulatively with the following other projects/plans:	The outcome of the CEA will be the greatest as a result of the flood defences being damaged by other projects.

Potential cumulative effect	Phase[a]			MDS	Justification
	C	O	D		
				Tier 3 • Mares Connect	
The impact of contaminated runoff on the quality of watercourses	✓	×	✓	MDS as described for the Mona Offshore Wind Project (Table 2.19) assessed cumulatively with the following other projects/plans: **Tier 1** • Awel y Môr Offshore Wind Farm (onshore infrastructure) • Major Development 40/2017/1232 • Major Development 46/2021/0159 **Tier 3** • St Asaph Solar Farm • Major Development 31/2023/0525 (NGET - extension) • NGET – overhead lines • NGET – Permitted development	The outcome of the CEA will be greatest when construction and/or decommissioning programmes of other projects overlap with the Mona Offshore Wind Project as it will lead to an increase in contaminated surface runoff and a deterioration in the quality of local surface watercourses.
The impact of damage to existing field drainage	✓	×	✓	MDS as described for the Mona Offshore Wind Project (Table 2.19) assessed cumulatively with the following other projects/plans: **Tier 1** • Awel y Môr Offshore Wind Farm (onshore infrastructure) • Major Development 40/2017/1232 • Major Development 46/2021/0159 **Tier 3** • St Asaph Solar Farm	The outcome of the CEA will be greatest when the construction and/or decommissioning of other projects overlap with the Mona Offshore Wind Project as it will lead to an increase in the damage to existing field drainage.

Potential cumulative effect	Phase[a]			MDS	Justification
	C	O	D		
				• Major Development 31/2023/0525 (NGET - extension) • NGET – overhead lines	
The impact of damage to existing water pipelines	✓	×	✓	MDS as described for the Mona Offshore Wind Project (Table 2.19) assessed cumulatively with the following other projects/plans: **Tier 1** • Awel y Môr Offshore Wind Farm (onshore infrastructure) • Major Development 40/2017/1232 • Major Development 46/2021/0159 **Tier 3** • St Asaph Solar Farm • Major Development 31/2023/0525 (NGET- extension) • NGET – overhead lines	The outcome of the CEA will be greatest when the construction and/or decommissioning of other projects overlap with the Mona Offshore Wind Project as it will lead to an increase in the damage to existing water pipelines.

2.9 Cumulative effects assessment

2.9.1 Overview

2.9.1.1 A description of the significance of cumulative effects upon hydrology and flood risk receptors arising from each identified impact is given below.

2.9.2 The impact of increased flood risk arising from additional surface water runoff

Tier 1

Construction phase

Magnitude of impact

2.9.2.1 Developments with greatest potential for cumulative effects include Awel y Môr Offshore Wind Farm, applications 40/2017/1232 and 46/2021/0159. This is due to these developments comprising large spatial extents of temporary hardstanding which could increase flood risk from additional surface water runoff during the construction phase compared to smaller projects within the CEA.

2.9.2.2 The construction of Awel y Môr Offshore Wind Farm infrastructure (such as compounds, haul roads and the onshore cable corridor) and applications 40/2017/1232 and 46/2021/0159 may lead to a temporary change in surface water runoff and an increased flood risk.

2.9.2.3 In relation to the above applications, is assumed, where relevant, in accordance with NPS, PPW and TAN15, that aforementioned developments would be required to implement a series of construction mitigation measures to manage surface water drainage during construction. Awel y Môr Offshore Wind Farm has committed to implement measures to manage surface water drainage during construction, as presented within the CoCP. The other developments would be expected to make similar commitments to manage surface runoff.

2.9.2.4 The cumulative impact is predicted to be of local spatial extent, short term duration, intermittent and high reversibility. The magnitude is therefore, considered to be **negligible**.

Sensitivity of the receptor

2.9.2.5 The landfall partially comprises a shingle beach located within Flood Zone 2 and 3. A coastal flood defence wall is present along the onshore margin of the intertidal area maintained by CCBC and informal structures including groynes and revetments are also present. Part of the beach itself is designated as a SSSI: Traeth Pensarn SSSI is designated for its vegetated shingle beach plant communities and as such, has a national importance.

2.9.2.6 The remainder of the Mona Onshore Development Area are situated within a predominantly rural area, with limited residential properties within the surrounding area.

2.9.2.7 Taking into account the most sensitive land use within the Mona Onshore Development Area, the sensitivity of the land within the hydrology and flood risk study area is of high vulnerability, medium recoverability and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of effect

2.9.2.8 Overall, the magnitude of the cumulative impact is deemed to be negligible, the sensitivity for the hydrology and flood risk study area is considered to be high. The cumulative effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Tier 3

Construction phase

Magnitude of impact

2.9.2.9 At the time of writing, no information is available within the public domain to confirm how increased flood risk arising from additional surface water runoff will be managed as part of the construction phase of the Tier 3 developments.

2.9.2.10 It is assumed, where relevant, in accordance with NPS, PPW and TAN15, developments would be required to implement a series of construction mitigation measures to manage surface water drainage during construction. As such, the magnitude is deemed to be **negligible**.

Sensitivity of the receptor

2.9.2.11 The landfall partially comprises a shingle beach located within Flood Zone 2 and 3. A coastal flood defence wall is present along the onshore margin of the intertidal area maintained by CCBC and informal structures including groynes and revetments are also present. Part of the beach itself is designated as a SSSI: Traeth Pensarn SSSI is designated for its vegetated shingle beach plant communities and as such, has a national importance.

2.9.2.12 The remainder of the Mona Onshore Development Area are situated within a predominantly rural area, with limited residential properties within the surrounding area.

2.9.2.13 Taking into account the most sensitive land use within the Mona Onshore Development Area, the sensitivity of the land within the hydrology and flood risk study area is of high vulnerability, medium recoverability and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of effect

2.9.2.14 Overall, the magnitude of the cumulative impact is deemed to be negligible, the sensitivity for the hydrology and flood risk study area is considered to be high. The cumulative effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

2.9.3 The impact of increased flood risk arising from additional surface water runoff during operation of the Mona Onshore Substation

Tier 1

Operations and maintenance phase

Magnitude of impacts

2.9.3.1 Developments with greatest potential for cumulative effects include Awel y Môr Offshore Wind Farm, applications 40/2017/1232 and 46/2021/0159. This is due to

these developments comprising large spatial extents of permanent hardstanding which could increase flood risk from additional surface water runoff during the operational phase compared to smaller projects within the CEA.

2.9.3.2 It is assumed, where relevant, in accordance with NPS, PPW and TAN15, that these aforementioned developments would be required to attenuate surface water runoff, where practicable, to the greenfield runoff rate prior to discharge into the local surrounding surface water environment or sewer network.

2.9.3.3 The cumulative impact is predicted to be of local spatial extent, short term duration, intermittent and high reversibility. The magnitude is therefore, considered to be **negligible**.

Sensitivity of receptor

2.9.3.4 Permanent above ground infrastructure is only proposed within the Mona Onshore Substation which is located within Flood Zone 1 and is assessed to have a low risk of flooding from all assessed sources. The land adjoining the Mona Onshore Substation is of low flood risk vulnerability within the rural landscape, high recoverability and low value with limited residential, commercial or industrial properties in the vicinity. The sensitivity of the receptor is therefore, considered to be **low**.

Significance of effect

2.9.3.5 Overall, the magnitude of the cumulative impact is deemed to be negligible, the sensitivity for the hydrology and flood risk study area is considered to be low. The cumulative effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

2.9.3.6 The sensitivity of the rest of the Mona Onshore Development Area is considered to be low. The cumulative effect will, therefore, be of **negligible** significance, which is not significant in EIA terms.

2.9.4 The impact of increased flood risk arising from damage to flood defences

Tier 3

Construction phase

Magnitude of impact

2.9.4.1 At the time of writing, no information is available in the public domain to confirm how the landfall for the MARES Connect project would be constructed. For the purpose of this assessment, it has been assumed that MARES Connect installation would also use a trenchless installation technique at landfall. The cumulative impact predicted to be of local spatial extent, short term duration, intermittent occurrence and high reversibility. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore, considered to be **negligible**.

Sensitivity of the receptor

2.9.4.2 The location of the MARES Connect project is located within the same area as the proposed landfall for Mona Offshore Wind Project.

2.9.4.3 The landfall partially comprises a shingle beach located within Flood Zone 2 and 3. A coastal flood defence wall is present along the onshore margin of the intertidal area maintained by CCBC and informal structures including groynes and revetments are also present. Part of the beach itself is designated as a SSSI: Traeth Pensarn SSSI is

designated for its vegetated shingle beach plant communities and as such, has a national importance.

2.9.4.4 The remainder of the landfall is situated within a predominantly rural area. A railway line, highway infrastructure and agricultural land use is also present within this area.

2.9.4.5 The sensitivity of the land within the hydrology and flood risk study area is of high vulnerability, medium recoverability and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of effect

2.9.4.6 Overall, the magnitude of the cumulative impact is deemed to be negligible, the sensitivity of the receptor is considered to be high. The cumulative effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Decommissioning phase

Magnitude of impact

2.9.4.7 At the time of writing, no information is in the public domain to confirm how the landfall for the MARES Connect project would be decommissioned. It is assumed for the landfall that the Mona Offshore Project will be removed via the TJBs.

Sensitivity of the receptor

2.9.4.8 As described in paragraph 2.10.5.2, the sensitivity of the receptor is described as high value and high vulnerability, a medium recoverability and therefore is considered to have a **high** sensitivity.

2.9.5 Significance of effect

2.9.5.1 Overall, the magnitude of the cumulative impact is deemed to be negligible, the sensitivity of the receptor is considered to be high. The cumulative effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

2.9.6 The impact of contaminated runoff on the quality of watercourses

Tier 1

Construction phase

Magnitude of impact

2.9.6.1 Developments with greatest potential for cumulative effects include Awel y Môr Offshore Wind Farm and applications 40/2017/1232 and 46/2021/0159. Due to the large spatial scales of the projects listed above, it is anticipated the potential for runoff contamination and thus cumulative impacts is greatest from these projects during construction compared to other smaller projects within the hydrology and flood risk study area. The impact to watercourses takes into account the WFD classification of surrounding waterbody catchments and the mitigation measures presented within Table 2.20 and measures adopted within the Awel y Môr Offshore Wind Farm.

2.9.6.2 A cumulative impact by trenchless techniques would only occur where crossings of a specific watercourse coincide. However, Awel y Môr Offshore Wind Farm has committed to implement measures to manage surface water drainage during construction to limit any surface water runoff from the onshore scheme to downstream watercourses and cause no degradation in WFD classification.

2.9.6.3 It is understood, where relevant, in accordance with NPS, PPW and TAN15, that Awel y Môr Offshore Wind Farm and applications 40/2017/1232 and 46/2021/0159 would be required to implement a series of construction mitigation measures (i.e. GPP 5 and PPG 6) to provide appropriate management techniques to treat potentially contaminated runoff prior to discharge into the local drainage network or surrounding surface water environment, thus reducing the potential for cumulative impacts to occur.

2.9.6.4 The cumulative impact predicted to be of local spatial extent, short term duration, intermittent occurrence and high reversibility. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore, considered to be **negligible**.

Sensitivity of the receptor

2.9.6.5 The watercourses are considered to be highly vulnerable in relation to WFD classification status, but of moderate recoverability and moderate value. The sensitivity of the receptor is therefore, considered to be **high.**

Significance of effect

2.9.6.6 Overall, the magnitude of the cumulative impact is deemed to be negligible and the sensitivity of the receptor is considered to be high. The cumulative effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Decommissioning phase

Magnitude of impact

2.9.6.7 During decommissioning of the Mona Offshore Wind Project, it is assumed the Onshore Substation and access road will be removed. On this basis, decommissioning activities will be less extensive. Whilst decommissioning activities for applications 40/2017/1232 and 46/2021/0159 is unknown at this time, the Awel y Môr Offshore Wind Farm project has assumed that above ground infrastructure will be removed and commits to preparing a decommissioning plan setting out control measures.

2.9.6.8 It is expected impacts from the decommissioning of Awel y Môr Offshore Wind Farm and applications 40/2017/1232 and 46/2021/0159 will be reduced through the incorporation of management measures (e.g., decommissioning plans), implementing emergency spill response procedures including clean up and remediation of contaminated soils, appropriate water proofing of exposed cable ducts and the continued maintenance of onsite drainage. These standard tertiary mitigation measures will be required as part of the permissions for each of the cumulative schemes.

2.9.6.9 The cumulative impact is predicted to be indirect, of local spatial extent, short term duration and intermittent. The impact magnitude is therefore considered to be **negligible.**

Sensitivity of the receptor

2.9.6.10 The watercourses are considered to be highly vulnerable in relation to WFD classification status, but of moderate recoverability and moderate value in relation to the local economy. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of effect

2.9.6.11 Overall, the magnitude of the cumulative impact is deemed to be negligible, the sensitivity of the receptor is considered to be high. The cumulative effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Tier 3

Construction phase

Magnitude of impact

2.9.6.12 At the time of writing, no information is available within the public domain to confirm how the impact of contaminated runoff on the quality of watercourses will be managed within Tier 3 developments as part of the construction phase of the development.

2.9.6.13 It is assumed, where relevant, in accordance with NPS, PPW and TAN15, developments would be required to implement a series of construction mitigation measures to provide appropriate management techniques. These management techniques will treat potentially contaminated runoff prior to discharge into the local surface water environment or sewer network, thus reducing the potential for cumulative impacts to occur. As such, the magnitude is deemed to be **negligible**.

Sensitivity of the receptor

2.9.6.14 As per Tier 1 the sensitivity of the receptors is considered to be **high**.

Significance of effect

2.9.6.15 As per Tier 1 the cumulative effect will be **minor adverse** which is not significant in EIA terms.

Decommissioning phase

Magnitude of impact

2.9.6.16 At the time of writing, no information is in the public domain to confirm how the impact of contaminated runoff on the quality of watercourses will be managed within Tier 3 developments as part of the decommissioning phase of the development.

2.9.6.17 With the incorporation of appropriate decommissioning mitigation techniques (as summarised in paragraph 2.9.6.8) the impact magnitude is therefore considered to be **negligible.**

Sensitivity of the receptor

2.9.6.18 As per Tier 1 the sensitivity of the receptors is considered to be **high**.

Significance of effect

2.9.6.19 As per Tier 1 the cumulative effect will be **minor adverse** which is not significant in EIA terms.

2.9.7 The impact of damage to existing field drainage

Tier 1

Construction phase

Magnitude of impact

2.9.7.1 The impact on field drainage from open cut techniques and the installation of link boxes and joint bays during the construction phase could temporarily affect surface water flow pathways, impacting on water quality and potential flow rates.

2.9.7.2 Cumulative impacts on field drainage and irrigation would only occur where development limits coincide. Projects as a minimum, require a surface water

management strategy and drainage scheme to limit any increase in surface water runoff from the site, and to mimic (as close as practicable) the current hydrological regime. It is assumed that Awel y Môr Offshore Wind Farm, Mona Offshore Wind Project and other Tier 1 projects will be constructed using industry best practice and therefore should limit any effect on field drainage.

2.9.7.3 Given the limited spatial overlap of the Tier 1 projects and with the incorporation of appropriate construction mitigation techniques, the cumulative impact is predicted to be of local spatial extent, short term duration, of intermittent occurrence and reversible. It is predicted that any impact will affect the receptor directly. The magnitude is therefore, considered to be **negligible**.

Sensitivity of the receptor

2.9.7.4 Field drains are considered to be of moderate vulnerability along the Mona Onshore Cable Corridor, Mona 400 kV Grid Connection Cable Corridor and Onshore Substation, moderate to high recoverability and low value. The sensitivity of the receptor is therefore considered to be **medium**.

Significance of effect

2.9.7.5 Overall, the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptor is considered to be medium. The cumulative effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Decommissioning phase

Magnitude of impact

2.9.7.6 During decommissioning of the Mona Offshore Wind Project, it is assumed the Mona Onshore Cable, and Mona 400 kV Grid Connection Cable will remain in place but the link boxes and Onshore Substation, will be removed. On this basis, decommissioning activities will be less extensive. Whilst decommissioning activities for applications 40/2017/1232 and 46/2021/0159 is unknown at this time, The Awel y Môr Offshore Wind Farm has assumed that all infrastructure will be removed and commits to preparing a decommissioning plan setting out control measures.

2.9.7.7 With the incorporation of appropriate decommissioning mitigation techniques, the cumulative impact is predicted to be indirect, of local spatial extent, short term duration and intermittent. The impact magnitude is therefore considered to be **negligible.**

Sensitivity of the receptor

2.9.7.8 Field drains are considered to be of moderate vulnerability along the Mona Onshore Cable Corridor, Mona 400 kV Grid Connection Cable Corridor and Onshore Substation, moderate to high recoverability and low value. The sensitivity of the receptor is therefore considered to be **medium.**

Significance of effect

2.9.7.9 Overall, the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptor is considered to be medium. The cumulative effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Tier 3

Construction phase

Magnitude of impact

2.9.7.10 At the time of writing, no information is available in the public domain to confirm how impact of damage to existing field drainage will be managed within Tier 3 developments as part of the construction phase of the development.

2.9.7.11 Cumulative impacts on field drainage and irrigation would only occur where development limits coincide. Tier 3 developments as a minimum, require a surface water management strategy. Tier 3 developments will be constructed using industry best practice and therefore should limit any effect on field drainage. As such, the magnitude is deemed to be **negligible**.

Sensitivity of the receptor

2.9.7.12 As per Tier 1 the sensitivity of the receptors is considered to be **medium**.

Significance of effect

2.9.7.13 As per Tier 1 the cumulative effect will be **minor adverse** which is not significant in EIA terms.

Decommissioning phase

Magnitude of impact

2.9.7.14 At the time of writing, no information is available in the public domain to confirm how the impact of impact of damage to existing field drainage will be managed within Tier 3 developments as part of the decommissioning phase of the development.

2.9.7.15 With the incorporation of appropriate decommissioning mitigation techniques (e.g. the preparation of a decommissioning plan) the impact magnitude is therefore considered to be **negligible.**

Sensitivity of the receptor

2.9.7.16 As per Tier 1 the sensitivity of the receptors is considered to be **medium**.

Significance of effect

2.9.7.17 As per Tier 1 the cumulative effect will be **minor adverse** which is not significant in EIA terms.

2.9.8 The impact of damage to existing water pipelines

Tier 1

Construction phase

Magnitude of impact

2.9.8.1 Cumulative impacts on drainage pipeline infrastructure would only occur where water and sewer pipelines were located in proximity to the Mona Offshore Wind Project, Awel y Môr Offshore Wind Farm and other Tier 1 projects.

2.9.8.2 Works to be undertaken within proximity to Dŵr Cymru / Welsh Water assets will be designed in accordance with the water authorities design standards and will require to be approved by Dŵr Cymru / Welsh Water prior to the commencement of works.

2.9.8.3 The cumulative impact is predicted to be of local spatial extent, short term duration, of intermittent and high reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be **negligible**.

Sensitivity of the receptor

2.9.8.4 Pipeline infrastructure comprises water supply pipelines operated by Welsh Water, which are considered to have a moderate value and contribute to the local and regional economy. It has high vulnerability to the construction impacts of the Mona Offshore Wind Project and low recoverability due to high costs. The sensitivity of the receptor is therefore considered to be **high**.

Significance of effect

2.9.8.5 Overall, the magnitude of the cumulative impact is deemed to be negligible and the sensitivity of the receptor is considered to be high. The cumulative effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Decommissioning phase

Magnitude of impact

2.9.8.6 During decommissioning of the Mona Offshore Wind Project it is assumed the Onshore Substation and access road will be removed. The Mona Onshore Cable, and Mona 400 kV Grid Connection Cable will remain in place but other onshore infrastructure (e.g. the link boxes) be removed. On this basis, decommissioning activities will be less extensive. The Awel y Môr Offshore Wind Farm has assumed that all infrastructure will be removed (unless this would lead to a greater environmental impact) and commits to preparing a decommissioning plan setting out control measures.

2.9.8.7 It is expected any decommissioning works to be undertaken within proximity to Dŵr Cymru / Welsh Water assets will be designed in accordance with the water authorities design standards and will require to be approved by Dŵr Cymru / Welsh Water prior to the commencement of works.

2.9.8.8 With the incorporation of appropriate decommissioning mitigation techniques (e.g. updated utility search, preparation of a decommissioning plan and method statements) the cumulative impact is predicted to be indirect, of local spatial extent, short term duration and intermittent. The impact magnitude is therefore considered to be **negligible.**

Sensitivity of the receptor

2.9.8.9 Pipeline infrastructure comprises water supply pipelines operated by Dŵr Cymru / Welsh Water, which are considered to have a moderate value and contribute to the local and regional economy. It has high vulnerability to the construction impacts of the Mona Offshore Wind Project and low recoverability due to high costs. The sensitivity of the receptor is therefore considered to be **high**.

Significance of effect

2.9.8.10 Overall, the magnitude of the cumulative impact is deemed to be negligible and the sensitivity of the receptor is considered to be high. The cumulative effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Tier 3

Construction phase

Magnitude of impact

2.9.8.11 Cumulative impacts on drainage pipeline infrastructure would only occur where water and sewer pipelines were located in proximity to the Mona Offshore Wind Project, and Tier 3 projects.

2.9.8.12 At the time of writing, no information is available in the public domain to confirm how the impact of damage to existing water pipelines will be managed as part of the construction phase of Tier 3 developments. However, works to be undertaken within proximity to Dŵr Cymru / Welsh Water assets will be designed in accordance with the water authorities design standards and will require to be approved by Dŵr Cymru / Welsh Water prior to the commencement of works.

2.9.8.13 Cumulative impacts on drainage pipeline infrastructure would only occur where water and sewer pipelines were located in proximity to Tier 3 projects. The impact magnitude is therefore considered to be **negligible.**

Sensitivity of the receptor

2.9.8.14 As per Tier 1 the sensitivity of the receptors are considered to be **high**.

Significance of effect

2.9.8.15 As per Tier 1 the cumulative effect will be **minor adverse** significance which is not significant in EIA terms.

Decommissioning phase

Magnitude of impact

2.9.8.16 At the time of writing, no information is available in the public domain to confirm how the impact of damage to existing water pipelines will be managed as part of the decommissioning phase of the developments.

2.9.8.17 It is expected any decommissioning works to be undertaken within proximity to Dŵr Cymru / Welsh Water assets will be designed in accordance with the water authorities design standards and will require to be approved by Dŵr Cymru / Welsh Water prior to the commencement of works.

2.9.8.18 With the incorporation of appropriate decommissioning mitigation techniques (e.g. updated utility search, preparation of a decommissioning plan and method statements) the impact magnitude is therefore considered to be **negligible.**

Sensitivity of the receptor

2.9.8.19 As per Tier 1 the sensitivity of the receptors is considered to be **high**.

Significance of effect

2.9.8.20 As per Tier 1 the cumulative effect will be **minor adverse** significance which is not significant in EIA terms.

2.10 Transboundary effects

2.10.1.1 A screening of transboundary impacts has been carried out and has identified that there was no potential for significant transboundary effects with regard to hydrology and flood risk from the Mona Offshore Wind Project upon the interests of other states.

2.11 Inter-related effects

2.11.1.1 Inter-relationships are considered to be the impacts and associated effects of different aspects of the proposal on the same receptor. These are considered to be:

- Project lifetime effects: Assessment of the scope for effects that occur throughout more than one phase of the Mona Offshore Wind Project (construction, operations and maintenance, and decommissioning), to interact to potentially create a more significant effect on a receptor than if just assessed in isolation in these three phases (e.g. subsea noise effects from piling, operational wind turbines, vessels and decommissioning)
- Receptor led effects: Assessment of the scope for all effects to interact, spatially and temporally, to create inter-related effects on a receptor. As an example, all effects on hydrology and flood risk, such as increased flood risk may interact to produce a different, or greater effect on this receptor than when the effects are considered in isolation. Receptor-led effects may be short term, temporary or transient effects, or incorporate longer term effects.

2.11.1.2 A description of the likely interactive effects arising from the Mona Offshore Wind Project on hydrology and flood risk is provided in Volume 3, Chapter 11: Inter-related effects – onshore of the Environmental Statement.

2.12 Summary of impacts, mitigation measures and monitoring

2.12.1.1 Information on hydrology and flood risk within the Mona hydrology and flood risk study area was collected through desktop review and a site-specific FCA.

2.12.1.2 Table 2.23 presents a summary of the potential impacts, measures adopted as part of the project and residual effects in respect to hydrology and flood risk. The impacts assessed include:

- The impact of increased flood risk arising from additional surface water runoff
- The impact of increased flood risk arising from the diversion of an ordinary watercourse
- The impact of increased flood risk arising from additional surface water runoff during operation of the Mona Onshore Substation
- The impact of increased flood risk arising from damage to existing flood defences
- The impact of contaminated runoff on the quality of watercourses
- The impact of damage to existing field drainage
- The impact of damage to existing water pipelines.

2.12.1.3 Overall, it is concluded that there will be no significant effects arising from the Mona Offshore Wind Project during the construction, operations and maintenance or decommissioning phases once mitigation has been applied.

2.12.1.4 Table 2.24 presents a summary of the potential cumulative impacts, mitigation measures and residual effects. The cumulative impacts assessed include:

- The impact of increased flood risk arising from additional surface water runoff
- The impact of increased flood risk arising from additional surface water runoff during operation of the Mona Onshore Substation

- The impact of increased flood risk from damage to flood defences
- The impact of contaminated runoff on the quality of watercourses
- The impact of damage to existing field drainage
- The impact of damage to existing water pipelines.

2.12.1.5 Overall, it is concluded that there will be no significant cumulative effects from the Mona Offshore Wind Project alongside other projects/plans.

2.12.1.6 No potential transboundary impacts have been identified.

Table 2.23: Summary of potential environmental effects, mitigation and monitoring.

[a] C=construction, O=operations and maintenance, D=decommissioning

Description of impact	Phase[a]			Measures adopted as part of the project	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
The impact of increased flood risk arising from additional surface water runoff	✓	×	×	Outline CoCP (Document reference J26) and the Outline Construction Surface Water Drainage Management Plan (Document Reference J26.6) Measures included as part of the project design listed within Table 2.20.	C negligible	C: high	C: minor adverse	N/A	C: minor adverse	N/A
The impact of increased flood risk arising from the diversion of an ordinary watercourse	✓	×	×	Outline CoCP (Document reference J26) and the design commitments within the Outline Operational Drainage Management Plan (Document Reference J27) . Measures included as part of the project design listed within Table 2.20.	C: low	C: high	C: minor adverse	N/A	C: minor adverse	N/A
The impact of increased flood risk arising from additional surface water runoff during operation of the Mona Onshore Substation	×	✓	×	Outline Operational Drainage Management Strategy (Document reference J27). FCA to meet planning policy requirements and best practise standards. Measures included as part of the project design listed within Table 2.20.	C: no change	C: low	C: negligible	N/A	C: negligible	N/A
The impact of increased flood risk arising from damage to existing flood defences	✓	×	✓	Outline CoCP (Document reference J26) the Outline Landfall Construction Method Statement (Document Reference	C: negligible D: negligible	C: high D: high	C: minor adverse D: minor adverse	N/A	C: minor adverse D: minor adverse	N/A

Description of impact	Phase[a] C	O	D	Measures adopted as part of the project	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
				J26.14) and decommissioning plan. Measures included as part of the project design listed within Table 2.20.						
The impact of contaminated runoff on the quality of watercourses	✓	×	✓	Outline CoCP (Document reference J26), Outline Construction Surface Water Drainage Management Plan (Document Reference J26.6) and decommissioning plan Measures included as part of the project design listed within Table 2.20.	C: negligible D: negligible	C: negligible D: negligible	C: minor adverse D: minor adverse	N/A	C: minor adverse D: minor adverse	N/A
The impact of damage to existing field drainage	✓	×	✓	Outline CoCP (Document reference J26), the Outline Construction Surface Water Drainage Management Plan (Document Reference J26.6) and decommissioning plan Measures included as part of the project design listed within Table 2.20.	C: negligible D: negligible	C: medium D: medium	C: minor adverse D: minor adverse	N/A	C: minor adverse D: minor adverse	N/A
The impact of damage to existing water pipelines	✓	×	✓	Outline CoCP (Document reference J26) and decommissioning plan Incorporation of mitigation measures outlined in Volume 1, Chapter 3: Project description of the Environmental Statement.	C: negligible D: negligible	C: high D: high	C: minor adverse D: minor adverse	N/A	C: minor adverse D: minor adverse	N/A

Description of impact	Phase[a] C	O	D	Measures adopted as part of the project	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
				Primary and tertiary measures included as part of the project design listed within Table 2.20.						

Table 2.24: Summary of potential cumulative environmental effects, mitigation and monitoring.

[a] C=construction, O=operations and maintenance, D=decommissioning

Description of effect	Phase[a] C	O	D	Measures adopted as part of the project	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
Tier 1										
The impact of increased flood risk arising from additional surface water runoff	✓	×	×	Outline CoCP Measures included as part of the project design listed within Table 2.20.	C negligible	C: high	C: minor adverse	N/A	C: minor adverse	N/A
The impact of increased flood risk arising from additional surface water runoff during operation of the Mona Onshore Substation	×	✓	×	Outline Operational Drainage Management Strategy (Document reference J27). FCA to meet planning policy requirements and best practise standards. Mmeasures included as part of the project design listed within Table 2.20.	C: no change	C: low	C: negligible	N/A	C: negligible	N/A
The impact of increased flood risk arising from damage to existing flood defences	✓	×	✓	Outline CoCP and decommissioning plan Measures included as part of the project design listed within Table 2.20.	C: negligible D: negligible	C: high D: high	C: minor adverse D: minor adverse	N/A	C: minor adverse D: minor adverse	N/A

Description of effect	Phase[a]			Measures adopted as part of the project	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
The impact of contaminated runoff on the quality of watercourses	✓	×	✓	Outline CoCP and decommissioning plan Measures included as part of the project design listed within Table 2.20.	C: negligible D: negligible	C: negligible D: negligible	C: minor adverse D: minor adverse	N/A	C: minor adverse D: minor adverse	N/A
The impact of damage to existing field drainage	✓	×	✓	Outline CoCP and decommissioning plan Measures included as part of the project design listed within Table 2.20	C: negligible D: negligible	C: medium D: medium	C: minor adverse D: minor adverse	N/A	C: minor adverse D: minor adverse	N/A
The impact of damage to existing water pipelines	✓	×	✓	Outline CoCP and decommissioning plan Measures included as part of the project design listed within Table 2.20	C: negligible D: negligible	C: high D: high	C: minor adverse D: minor adverse	N/A	C: minor adverse D: minor adverse	N/A

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