

MONA OFFSHORE WIND PROJECT

Outline Construction Surface Water Drainage Plan

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Image of an offshore wind farm

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RPS

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Mona Offshore Wind Ltd.

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Acronyms

Acronym	Description
AEP	Annual Exceedance Probability
BGS	British Geological Survey
CIRIA	Construction Industry Research and Information Association
CoCP	Code of Construction Practice
Defra	Department for Environment, Food and Rural Affairs
EIA	Environmental Impact Assessment
LLFA	Lead Local Flood Authority
MHWS	Mean High Water Springs
NRW	Natural Resources Wales
PPW	Planning Policy Wales
SuDS	Sustainable Drainage System
UKCP18	United Kingdom Climate Projections 2018
WFD	Water Framework Directive

1 OUTLINE SURFACE WATER AND DRAINAGE MANAGEMENT PLAN

1.1 Overview

- 1.1.1.1 This Outline Construction Surface Water and Drainage Management Plan is provided as an annex to the Outline Code of Construction Practice (CoCP) (Document Reference J26), which is a requirement of the draft Development Consent Order (DCO) (Document Reference C1). It sets out the key management measures for surface water and drainage that will be implemented during the construction phase of the Mona Offshore Wind Project.
- 1.1.1.2 This Plan seeks to manage potential impacts that occur from the construction of the onshore elements of the Mona Offshore Wind Project. These elements occur landward of Mean High Water Springs (MHWS) and comprise:
- Mona Landfall (above MHWS only)
 - Mona Onshore Cable Corridor
 - Mona Onshore Substation
 - 400kV Grid Connection Cable Corridor.
- 1.1.1.3 In addition to these elements, this Plan also considers the temporary construction compounds, storage areas and accesses required to support the construction of the Mona Offshore Wind Project.
- 1.1.1.4 The relevant planning authority for the landfall and the western section of the Onshore Cable Corridor (i.e. west of Bodelwyddan) is Conwy County Borough Council; the relevant planning authority for the eastern section of the Onshore Cable Corridor, the Onshore Substation and the 400kV Grid Connection Cable Corridor is Denbighshire County Council.

1.2 Purpose of this Outline Construction Surface Water and Drainage Management Plan

- 1.2.1.1 The draft Development Consent Order (DCO) (Document Reference C1) includes a requirement for the preparation of a final CoCP. The final CoCP will be supported by a series of management plans including a Construction Surface Water and Drainage Management Plan (as part of the final CoCP), which must be submitted to and approved by the relevant planning authority prior to the commencement of onshore works.
- 1.2.1.2 The purpose of this Outline Construction Surface Water and Drainage Management Plan is to set out the key management and monitoring procedures in relation to surface water and drainage that will be required during construction of the onshore and intertidal elements of the Mona Offshore Wind Project.
- 1.2.1.3 This is an outline document based on the design set out in Volume 1, Chapter 3: Project Description of the Environmental Statement (Document Reference F1.3) and includes measures that have been identified as part of the EIA process. These measures are to ensure that any potential environmental effects reported in the Environmental Statement will either be avoided and/or mitigated. In the event that the Development Consent Order (DCO) is granted, a detailed Construction Surface Water

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and Drainage Management Plan will be prepared following the principles of this outline Plan and agreed with the relevant planning authority prior to construction.

1.2.1.4 This Outline Construction Surface Water and Drainage Management Plan should be read in conjunction with the Outline CoCP (Document Reference J26) and its supporting appendices. Additionally, the following documents include contextual information:

- Volume 3, Chapter 1: Geology, hydrogeology and ground conditions, of the Environmental Statement.
- Volume 3, Chapter 2: Hydrology and flood risk, of the Environmental Statement.
- Volume 7, Annex 2.1: Flood Consequences Assessment of the Environmental Statement.
- Volume 7, Annex 2.4: Water Framework Directive of the Environmental Statement
- Outline Operational Drainage Management Strategy (Document Reference J27).

1.3 Scope of this Outline Construction Surface Water Drainage Management Plan

1.3.1.1 The scope of this Outline Construction Surface Water and Drainage Management Plan applies to the pre-commencement and construction activities of the Mona Offshore Wind Project located landward of MHWS. The Plan does not apply to activities seaward of MHWS.

1.3.1.2 Onshore site preparation works comprise the following activities (as set out in the draft DCO (Document Reference C1):

- Site clearance
- Demolition
- Early planting of landscaping works
- Archaeological investigations
- Environmental surveys
- Ecological mitigation
- Investigations for the purpose of assessing ground conditions
- Remedial work in respect of any contamination or other adverse ground conditions
- The diversion and laying of utilities and services
- Site security works
- The erection of any temporary means of enclosure
- The erection of temporary hard standing
- The erection of welfare facilities
- Creation of site accesses
- The temporary display of site notices or advertisements.

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- 1.3.1.3 The onshore site preparation works listed in 1.3.1.2 will be carried in accordance with the measures set out in this Outline Communications Plan as part of the CoCP (Document Reference J26), which is secured as a requirement of the DCO (Document Reference C1).
- 1.3.1.4 The final Construction Surface Water Drainage Plan will be in general accordance with the principles established in the Outline Construction Surface Water Drainage Plan and will be agreed with the relevant authority prior to commencing the relevant stage of the onshore works (above MHWS). For this Outline Construction Surface Water Drainage Plan, the term 'construction' includes all related engineering, construction and restoration activities as authorised by the DCO within the Order Limits.
- 1.3.1.5 The focus of this Plan is to manage surface water runoff and site drainage from construction work areas to:
- Minimise the pollution risk to waterbodies from contaminated water runoff
 - Minimise flood risk from increased surface water runoff.

1.4 Roles and Responsibilities

1.4.1 Overview

- 1.4.1.1 Although the construction team has not been appointed at the time of writing this plan, the key roles and associated responsibilities with regard to this Outline Construction Surface Water Drainage Management Plan are set out below. The Construction (Design and Management) Regulations 2015 also identify the legal duties, responsibilities and obligations of all the major roles within the construction team.
- 1.4.1.2 The responsibilities of each role will be refined in the final Construction Surface Water Drainage Management Plan.

1.4.2 Applicant

- 1.4.2.1 The Applicant will be responsible for the following:
- Ensuring that the Construction Surface Water Drainage Management Plan is implemented effectively
 - Giving necessary direction to contractors (for example, setting contractual obligations)
 - Reviewing, revising and refining the Construction Surface Water Drainage Management Plan (where necessary) in conjunction with the Principal Contractor.

1.4.3 Principal Contractor

- 1.4.3.1 The Principal Contractor will be appointed by the Applicant and has the overall responsibility for:
- Updating and delivering the detailed Construction Surface Water Drainage Management Plan on behalf of the Applicant
 - Ensuring all procedures in this Construction Surface Water Drainage Management Plan are followed

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- Ensuring all contractors are suitably qualified and experienced in implementing the measures within this Construction Surface Water Drainage Management Plan. These measures will be contained within the terms of contracts to ensure understanding and accountability
- Ensuring that all legal and contractual requirements relating to this Construction Surface Water Drainage Management Plan are met by ensuring adequate plans/procedures, licences and certificates are in place, and that they can be achieved
- Establish procedures for the regular review and recording of the quality of the works as part of its Quality Management System
- Maintain records relevant to this Construction Surface Water Drainage Management Plan.

1.4.4 Contractors/Sub contractors

- 1.4.4.1 Contractors and sub-contractors will be required to understand their responsibilities and implement the measures within the Construction Surface Water Drainage Management Plan.

1.4.5 Training

- 1.4.5.1 The Applicant will ensure that all Principal Contractors and subcontractors are made aware of the detailed Construction Surface Water and Drainage Management Plan and their responsibilities. Training will be provided to ensure that all relevant members of the onshore construction teams, including sub contractors' personnel, receive focused Construction Surface Water and Drainage Management Plan training to ensure their competence in carrying out their duties.
- 1.4.5.2 Any training related to the Plan will be additional to the mandatory training requirements on site Health and Safety.

1.5 Surface Water Receptors and Flood Risk Context

1.5.1 Overview

- 1.5.1.1 A key part of managing surface water and drainage from the construction works areas is the location of existing surface water receptors and the flood risk context. This section provides a summary of the receptors and flood risk; further information is provided in Volume 7, Annex 2.2: Surface Watercourses and NRW Flood Zones of the Environmental Statement (Document Reference F7.2.2).

1.5.2 Surface water receptors

- 1.5.2.1 There are no designated Main Rivers identified within the Mona Onshore Development Area, however there are several ordinary watercourses. They comprise:
- Two tributaries of the River Gele
 - Nant y Bryniau
 - Nant y Cregiau
 - Nant Luke

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- A tributary of the River Clywd
- A tributary of the River Elwy
- Two tributaries of Nant Ganol.

1.5.3 Surface water body status

- 1.5.3.1 The current overall Water Framework Directive status for watercourses potentially affected by the onshore elements of the Mona Offshore Wind Project have been identified via the publicly available mapping. A Water Framework Directive (WFD) assessment has been undertaken and is determined that the classification for the water bodies within the Mona Onshore Development Area are classified as good and moderate. Further details can be found within Volume 7, Annex 2.4: Water Framework Directive of the Environmental Statement (Document Reference F7.2.4).

1.5.4 Flood risk context

- 1.5.4.1 The Natural Resources Wales (NRW) Flood Map for Planning (Natural Resources Wales, 2023) shows that the Mona Onshore Development Area is predominantly located within Flood Zone 1, indicating that the land is assessed as having a less than 1 in 1,000 annual probability of river or sea flooding.
- 1.5.4.2 The NRW Flood Map for Planning indicates the Mona Landfall area and its associated access is partially located within Flood Zones 2 and 3. Due to the beach profile, land landwards of the MHWS is located within Flood Zone 1. Land seaward of the MHWS is located within Flood Zone 2 and 3 (1 in 200 or greater annual probability of flooding from the sea).

1.6 Control Measures During Construction

1.6.1 Overview

- 1.6.1.1 The key objectives of the detailed Construction Surface Water and Drainage Management Plan are to:
- Minimise the level of contaminants being generated
 - Prevent contaminated water moving to a watercourse
 - Maintain silt control and drainage measures to ensure they remain effective.
- 1.6.1.2 Sources of contaminants may include:
- Silt and sediment from exposed soil
 - Chemical agents (e.g. flocculants)
 - Washout from concrete wagons and leaching from cement bound sands
 - Site drainage from haul roads.
- 1.6.1.3 All construction works for Mona Offshore Wind Project will be undertaken in accordance with best practice techniques to reduce the risk of pollution of water bodies (directly or indirectly) and to reduce the risk of flooding. This would be delivered through the CoCP and its associated management plans.

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1.6.1.4 Construction Industry Research and Information Association (CIRIA) guidance will be adopted as standard mitigation as appropriate, including from the following publications:

- Environmental Handbook for Building and Civil Engineering Projects (3 Parts: C512, C528 and C529) (CIRIA, 2000)
- Control of water pollution from construction sites. Guidance for consultants and contractors (C532) (CIRIA, 2001)
- Control of water pollution from linear construction projects. Technical guidance (C648) (CIRIA, 2006) and site guide (C649) (CIRIA, 2006b)
- Groundwater control: design and practice, second edition (C750) (CIRIA, 2016)
- Environmental good practice onsite guide (fourth edition) (C741) (CIRIA, 2015).

1.6.2 Planning and layout

1.6.2.1 A field drainage survey will be undertaken as part of the pre-commencement activities. Pre-construction drainage will be installed to intercept existing land drains and divert water away from the working area where possible. This will also ensure that existing drainage flows are maintained (i.e. conveyance of existing flows without increasing fluvial flood risk upstream).

1.6.2.2 Temporary construction compounds along the Mona Onshore Cable Corridor have been located away from surface watercourses. Where possible, stockpiling of materials will be located away from any existing watercourse, ponds, boreholes and main drainage outfalls. Where this is not practicable due to space constraints, mitigation measures (such as bunds) will be implemented to provide an adequate barrier between the potential source of contaminated water runoff and the receptor.

1.6.3 Timing

1.6.3.1 It is recognised that many factors affect the programme and avoidance of the wetter months of the year or periods of wet weather can be impractical. However, the programming of certain works can be important to reduce flood risk and the risk of water pollution. The following principles will be considered, where practicable and in accordance with the Soil Management Plan (Document Reference J26.8):

- Where possible, earth moving works and soil stripping should be undertaken during the drier months of the year (typically early spring to early autumn) (see Outline Soil Management Plan (Document Reference J26.8))
- When undertaking earth moving works, periods of very wet or prolonged wet weather will be avoided, to minimise the risk of generating water runoff contaminated with fine particulates. Where this is unavoidable, the adequacy of standard mitigation measures to control fine sediment laden runoff should be continuously reviewed
- The construction of temporary culverts, where the Mona Onshore Cable Corridor crosses smaller watercourses, will be timed during low flow conditions where practicable, dynamics and sediment transport
- Where practicable, the permanent drainage will be constructed early in the works programme, to avoid increasing the rate and volume of surface water runoff (and

therefore, surface water risk) from an increase in impermeable areas or by reducing permeability by compacting soils.

1.6.4 Installation of surface water and drainage measures

1.6.4.1 Prior to the commencement of construction, temporary measures to control water runoff from the construction compounds and work areas will be implemented. These measures include:

- Where required, the installation of drainage either side of the Mona Onshore Cable Corridor to ensure existing land drainage flow is maintained. Interceptor drains will be installed where the haul road crosses water courses or public highways
- The installation of drains/ditches around construction compounds and the Mona Onshore Substation to intercept surface water runoff and divert it around the working areas
- Silt fences (or equivalent) will be used to intercept overland flow and prevent sediment from being carried to ditches and streams
- Soil will be stored and managed in accordance with Defra Construction Code of Practice for Sustainable Use of Soils on Construction Sites (Defra, 2018)
- Where required, tools and heavy plant will be washed down and cleaned in designated areas within the Mona Onshore Development Area. At all wash down locations, the wash down water would be collected for treatment before discharge to surface water drainage in line with the appropriate permit or otherwise removed from site for appropriate disposal at a licenced waste facility
- Temporary drainage channels will be kept free from debris and other material through maintenance of a clean and tidy site
- Surface water from the cable trenches during the construction period will be pumped via settling tanks or ponds to remove sediment and potential contaminants, prior to discharge within the Mona Onshore Cable Corridor
- The rate of discharge to any watercourse of construction site water runoff would be no greater than a controlled rate agreed in advance with the LLFA and appropriate measures will be taken to dissipate the flow energy at the temporary outfall to prevent erosion of the bed and banks of the receiving water body (for example correct orientation of the outfall and the use of baffle pads)
- Existing road or track crossings of watercourses will be used where practicable. Where temporary crossings of the watercourses are required, plant would not track along the channel without adequate protection being installed prior to works, and temporary open-span crossings should be used as far as reasonably practicable.
- Sustainable Drainage Systems (SuDS) will be used where practicable to ensure no increase in surface water runoff rates or volumes from the construction sites and compound areas (for example compound car park) to surrounding land drainage ditches and to manage surface water flood risk. The installation of SuDS will follow guidance set out within the SuDS Manual (CIRIA, 2015). Subject to consent and in consultation with NRW, the SuDS will discharge to the local watercourses, ditches or to ground within the site boundaries.

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- 1.6.4.2 Measures will be implemented to ensure that surface water runoff from the construction site to prevent discharge to any natural pond. Construction water runoff will only be discharged into a watercourse under a permit from the relevant authority (where required) and following treatment and attenuation where required. This would ensure that any sediment (including any adsorbed pollutants) carried in suspension in the surface water runoff would have settled out before it is discharged to the receiving watercourses under a Watercourse Consent from the Lead Local Flooding Authority.
- 1.6.4.3 Examples of measures to control the impacts of silt laden runoff are provided below:
- Floc Mats provide a biodegradable water treatment and silt capture solution for cleaning muddy water and preventing silt pollution:
 - Placed in ditches and channels, as water moves over and through the biodegradable mat fibres they capture and trap silt, clay and other fine sediment naturally. It provides a low carbon, cost effective way of treating water without the need for pumps, saving energy and CO₂.
 - Construction & infrastructure site ditches and channels with low flow
 - Drainage from construction sites
 - River restoration and maintenance operations
 - Improved settlement in attenuation ponds and lagoons.

1.7 Managing flood risk

1.7.1 Surface water

- 1.7.1.1 Where watercourse crossings would be required along the Mona Onshore Cable Corridor and Mona 400kV Grid Connection Cable Corridor during construction, a 10% (1 in 10) Annual Exceedance Probability (AEP) event standard is proposed to be used to size these crossing structures.. This would ensure a low risk of the works causing an increase in flooding to receptors, particularly as the risk of an event occurring during the short construction timescales would be low.

1.7.2 Groundwater

- 1.7.2.1 The risk from groundwater flooding (during excavation) will be managed using appropriate dewatering working practices to ensure safe dry working environments. Where dewatering discharge to watercourses is proposed, discharge rates will be controlled to achieve no environmentally significant change to flood risk. If required, dewatering discharge would be temporarily paused during flood events to prevent any increased flood risk during the flood event.
- 1.7.2.2 Any temporary works would be designed as to not create temporary build-up of groundwater levels which may lead to groundwater flooding.

1.8 Management of foul water from construction compounds

- 1.8.1.1 Foul water will primarily be generated from the welfare facilities at construction compounds. The management of foul water will be confirmed in the detailed Construction Surface Water and Drainage Management Plan; it is likely to be managed using storage tanks emptied regularly by a tanker (with appropriate waste carrier licence) for offsite disposal at a suitably licenced waste facility.

1.9 Monitoring

- 1.9.1.1 Surface water quality will be monitored throughout the construction phase of the onshore elements of the Mona Offshore Wind Project. Monitoring will be designed to demonstrate compliance with any environmental permits. Monitoring will also contribute to ensuring that mitigation measures are operating as planned, identifying any detrimental effects on the water environment and to allow any pollution incidents to be identified and remedied.
- 1.9.1.2 A Water Quality Monitoring Plan will be prepared prior to construction by the Principal Contractor(s) that will set out the scope of the monitoring as part of compliance with the environmental permit. As a minimum, the monitoring would consist of regular site visits, to make visual checks.

1.10 Re-instatement of drainage

- 1.10.1.1 Any field drainage intercepted during construction will be reinstated following completion of construction or diverted to a secondary channel. Landowners and occupiers would be informed of the design of drainage works required during construction, including: pipe layout, falls, dimensions and outfalls (if required). The drainage will be reinstated in a condition that is at least as effective as the previous condition (as identified in the relevant condition and/or drainage survey) and will follow best practice for field drainage installations taking into account site-specific conditions.

1.11 References

- CIRIA (2000). Environmental Handbook for Building and Civil Engineering Projects Part 1-3 (C512, C528 and C529).
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