MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS

Surface and groundwater management plan

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Contents

Glossary

Term	Meaning
400 kV grid connection cables	Cables that will connect the proposed onshore substations to the existing National Grid Penwortham substation.
400 kV grid connection cable corridor	The corridor within which the 400 kV grid connection cables will be located.
Applicants	Morgan Offshore Wind Limited (Morgan OWL) and Morecambe Offshore Windfarm Ltd (Morecambe OWL).
CIRIA	The construction industry research and information association. It is an independent, not-for-profit, member-based research organisation that exists to champion performance improvement in construction.
Code of Construction Practice	A document detailing the overarching principles of construction, contractor protocols, construction-related environmental management measures, pollution prevention measures, the selection of appropriate construction techniques and monitoring processes.
Commitment	This term is used interchangeably with mitigation and enhancement measures. The purpose of commitments is to avoid, prevent, reduce or, if possible, offset significant adverse environmental effects. Primary and tertiary commitments are taken into account and embedded within the assessment set out in the ES.
Development Consent Order	An order made under the Planning Act 2008, as amended, granting development consent.
Environmental Impact Assessment	The process of identifying and assessing the significant effects likely to arise from a project. This requires consideration of the likely changes to the environment, where these arise as a consequence of a project, through comparison with the existing and projected future baseline conditions.
Environmental Statement	The document presenting the results of the Environmental Impact Assessment process.
Flood Risk Assessment	A flood risk 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 National Planning Policy Framework and Planning Practice Guidance.
Flood Zone 1	Land having a less than 1 in 1,000 annual probability of river or sea flooding which is considered a low probability of flooding.
Flood Zone 2	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 which is considered a medium probability of flooding.
Flood Zone 3	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 which is considered a high probability of flooding.
Groundwater	All water which is below the surface of the ground in the saturated zone and in direct contact with the ground or subsoil.
Intertidal area	The area between Mean High Water Springs and Mean Low Water Springs.

Term	Meaning
Intertidal Infrastructure Area	The temporary and permanent areas between MLWS and MHWS.
Landfall	The area in which the offshore export cables make landfall (come on shore) and the transitional area between the offshore cabling and the onshore cabling. This term applies to the entire landfall area at Lytham St. Annes between Mean Low Water Springs and the transition joint bay inclusive of all construction works, including the offshore and onshore cable routes, intertidal working area and landfall compound(s).
Lead Local Flood Authority	Authorities that 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.
Local Authority	A body empowered by law to exercise various statutory functions for a particular area of the United Kingdom. This includes County Councils, District Councils and County Borough Councils.
Main rivers	The term used to describe a watercourse designated as a Main River under the Water Resources Act 1991 and shown on the Main River Map. These are usually larger rivers or streams and are managed by the Environment Agency.
Maximum design scenario	The realistic worst case scenario, selected on a topic-specific and impact specific basis, from a range of potential parameters for the Transmission Assets.
Mean High Water Springs	The height of mean high water during spring tides in a year.
Mean Low Water Springs	The height of mean low water during spring tides in a year.
Morecambe Offshore Windfarm: Generation Assets	The offshore generation assets and associated activities for the Morecambe Offshore Windfarm.
Morecambe Offshore Windfarm: Transmission Assets	The offshore export cables, landfall, and onshore infrastructure required to connect the Morecambe Offshore Windfarm to the National Grid.
Morecambe OWL	Morecambe Offshore Windfarm Limited is a joint venture between Zero-E Offshore Wind S.L.U. (Spain) (a Cobra group company) (Cobra) and Flotation Energy Ltd.
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	The offshore export cables, landfall, and onshore infrastructure for the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm. This includes the offshore export cables, landfall site, onshore export cables, onshore substations, 400 kV grid connection cables and associated grid connection infrastructure such as circuit breaker compounds. Also referred to in this report as the Transmission Assets, for ease of reading.
Morgan Offshore Wind Project: Generation Assets	The offshore generation assets and associated activities for the Morgan Offshore Wind Project.
Morgan Offshore Wind Project: Transmission Assets	The offshore export cables, landfall and onshore infrastructure required to connect the Morgan Offshore Wind Project to the National Grid.

Term	Meaning
Morgan OWL	Morgan Offshore Wind Limited is a joint venture between bp Alternative Energy Investments Ltd. and Energie Baden-Württemberg AG (EnBW).
Onshore export cables	The cables which would bring electricity from the landfall to the onshore substations.
Onshore export cable corridor	The corridor within which the onshore export cables will be located.
Onshore Infrastructure Area	The area within the Transmission Assets Order Limits landward of MHWS. Comprising the offshore export cable corridor from MHWS to the transition joint bay, onshore export cable corridor, onshore substations and 400 kV grid connection cable corridor, and associated temporary and permanent infrastructure including temporary and permanent compound areas and accesses. Those parts of the Transmission Assets Order Limits proposed only for ecological mitigation and/or biodiversity benefit are excluded from this area.
Onshore Order Limits	See Transmission Assets Order Limits: Onshore (below).
Onshore substations	The onshore substations will include a substation for the Morgan Offshore Wind Project: Transmission Assets and a substation for the Morecambe Offshore Windfarm: Transmission Assets. These will each comprise a compound containing the electrical components for transforming the power supplied from the generation assets to 400 kV and to adjust the power quality and power factor, as required to meet the UK Grid Code for supply to the National Grid.
Ordinary watercourses	Watercourses (such as a river, stream, ditch, cut, sluice, dyke or non-public sewer) that are not designated a Main River under the Water Resources Act (1991). Responsibility for management lies with the Lead Local Flood Authority, or Internal Drainage Board for some watercourses where there is an Internal Drainage District.
River Basin District	Administrative area for coordinated water management, composed of multiple river basins (or catchments).
Surface water resources	Water on the surface of the land such as in a river, lake, wetland, or ocean.
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.
Transmission Assets	See Morgan and Morecambe Offshore Wind Farms: Transmission Assets (above).
Transmission Assets Order Limits: Offshore	The area within which all components of the Transmission Assets seaward of Mean Low Water Springs will be located, including areas required on a temporary basis during construction and/or decommissioning.

Term	Meaning
Transmission Assets Order Limits: Onshore	The area within which all components of the Transmission Assets landward of Mean High Water Springs will be located, including areas required on a temporary basis during construction and/or decommissioning (such as construction compounds). Also referred to in this report as the Onshore Order Limits, for ease of reading.
Water Quality	The physical, chemical and biological characteristics of water.
Water Framework Directive	Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.

Acronyms

Acronym	Meaning
AEP	Annual Exceedance Probability
ES	Environmental Statement
LLFA	Lead Local Flood Authority

Units

Unit	Description
%	Percentage

1 Outline Surface and Groundwater Management Plan

1.1 Background

1.1.1 Introduction

1.1.1.1 This document forms the Outline Surface and Groundwater Management Plan which forms an annex to the Outline Code of Construction Practice (CoCP) (document reference J1), prepared for the Morgan and Morecambe Offshore Wind Farms: Transmission Assets (referred to hereafter as 'the Transmission Assets').

1.1.2 Implementation

1.1.2.1 This Outline Spillage and Emergency Response Plan forms an appendix to the Outline Code of Construction Practice (CoCP) (document reference J1).

1.1.2.2 The Applicants have committed to implementation of detailed Code of Construction Practice(s) via the following commitment, CoT35 (see Volume 1, Annex 5.3: Commitments Register, document reference F1.5.3), and is secured by inclusion of Requirement 8 of the draft Development Consent Order (DCO) (document reference C1) Schedules 2A & 2B. Below sets out the requirement wording for Project A (Project B's requirement mirror those of Project A for this requirement and are, therefore, not repeated):

8.—(1) No stage of the Project A onshore works or Project A intertidal works may commence until for that stage a code of construction practice has been submitted to and approved by the relevant planning authority following consultation as appropriate with Lancashire County Council, Natural England, the Environment Agency and, in relation to the Project A intertidal works or, if applicable to the Project A offshore works, the MMO.

(2) Each code of construction practice must accord with the outline code of construction practice and include, as appropriate to the relevant stage -

> *(i) surface water and groundwater management plan (in accordance with the outline surface water and groundwater management plan);…*

(3) The code of construction practice approved in relation to the relevant stage of the Project A onshore works must be followed in relation to that stage of the Project A onshore works.

1.1.2.3 The Transmission Assets may adopt a staged approach to the approval of DCO requirements. This will enable requirements to be approved in part or in whole, prior to the commencement of the relevant stage of works in accordance with whether staged approach is to be taken to the delivery of the each of the offshore wind farms.

1.1.2.4 For onshore and intertidal works (landward of Mean Low Water Springs), this approach will be governed by the inclusion of Requirement 3 within the draft DCO, which requires notification to be submitted to the relevant planning authority/authorities detailing whether Project A or Project B relevant works

will be constructed in a single stage; or in two or more stages to be approved prior to the commencement of the authorised development.

1.2 Surface water and groundwater receptors, and flood risk context

1.2.1 Overview

1.2.1.1 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 for the Transmission Assets.

1.2.2 Surface water receptors

1.2.2.1 The onshore infrastructure area is situated within the North West River Basin District and is located within Ribble and Douglas Environment Agency management catchments, respectively located to the north and south of the Ribble Estuary.

Sea

1.2.2.2 The landfall of the Transmission Assets is located at Lytham St Annes.

Main rivers

1.2.2.3 The onshore infrastructure area includes the following designated main rivers:

- Main Drain and associated tributaries, including Branch Drain;
- Moss Sluice and associated tributaries;
- Dow Brook and associated tributaries;
- Middle Pool;
- Wrea Brook;
- Pool Stream;
- Ribble Link/Savick Brook;
- River Ribble; and
- Mill Brook.

Ordinary watercourses

1.2.2.4 The onshore infrastructure area includes the following ordinary watercourse features.

- Deepdale Brook.
- Tributaries of Moss Sluice.
- Tributaries of Branch Drain and Main Drain.

- Tributaries of Wrea Brook.
- Tributaries of Pool Stream.
- Tributaries of Middle Pool.
- Tributaries of Mill Brook.

Internal drainage boards

1.2.2.5 The onshore infrastructure area does not encompass any watercourses under the jurisdiction of an internal drainage board.

1.2.3 Groundwater receptors

1.2.3.1 Aquifer classifications for the underlying geology within the onshore infrastructure area are:

- Secondary undifferentiated – Glacial Till, Head Deposits;
- Secondary A – Blown Sands, Glaciofluvial Deposits;
- Secondary B – Sidmouth Mudstone Formation, Taporley Siltstone Formation; and
- Principal – Sherwood Sandstone Group.

1.2.3.2 Groundwater dependent features of particular sensitivity are present within the Lytham St Annes Dunes system. The dunes support a wide range of species which vary according to the depth of water and degree of moisture retention in relation to the water table.

1.2.4 Water body status

1.2.4.1 The current overall Water Framework Directive status for waterbodies potentially affected by the onshore elements of the Transmission Assets have been identified via the publicly available mapping. A Water Framework Directive (WFD) assessment has been undertaken and all water bodies within the ZOI, with the exception of West Lancashire Quaternary Sand and Gravel Aquifers, are predicted to achieve good ecological status/potential for the surface waters or good quantitative status in the case of Fylde Permo-Triassic Sandstone Aquifers by 2027. The West Lancashire Quaternary Sand and Gravel Aquifers is the only water body currently achieving its environmental objective.

1.2.4.2 The chemical status for all surface water bodies has an environmental objective of achieving good chemical status by 2063. In all cases these water bodies are failing chemical status due to uPBTs including benzo(b)fluoranthene, benzo(g-h-i)perylene, mercury and its compounds and polybrominated diphenyl ethers (PBDEs).

1.2.4.3 Further details can be found within Table 1.8 of Volume 3, Annex 2.1: Water Framework Directive surface and groundwater assessment of the ES.

1.2.5 Flood risk context

1.2.5.1 The Environment Agency Flood Map for Planning (Environment Agency, 2024) shows that the Intertidal Infrastructure Area and Onshore Infrastructure Area is located within Flood Zone 1, 2 and 3, generally associated with tidal flooding within the western extents of the Transmission Assets and tidal and fluvial flooding within the eastern extent. Further details can be found within Volume 3, Annex 2.3: Flood Risk Assessment of the ES.

1.3 Water quality control measures

1.3.1 Overview

1.3.1.1 The key objectives of the implementation of the Surface and Groundwater Management Plan during construction are to:

- minimise the level of contaminants being generated;
- prevent contaminated water moving to a surface or groundwater body; and
- maintain silt control and drainage measures to ensure they remain effective.

1.3.1.2 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; and
- site drainage from haul roads.

1.3.1.3 All construction works for the Transmission Assets 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 of which this document forms a part (refer to Commitment (CoT) 35).

1.3.1.4 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).

1.3.2 Surface water and drainage measures

1.3.2.1 Measures to control water runoff from the onshore infrastructure area will be implemented. These measures include the following.

- Where required, the installation of pre- and post-construction drainage either side of the onshore export cable corridor and 400kV grid connection 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 temporary construction compounds and the onshore substation sites to intercept surface water runoff and divert it around the working areas where required.
- Where practicable, silt fences (or equivalent) will be used to intercept overland flow and prevent sediment from being carried to ditches and streams.
- 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.
- Where practicable, cleaning of the wheels of vehicles leaving site to prevent the accumulation of soil and sediment on road surfaces.
- In locations where large areas of exposed ground lie adjacent to watercourses, buffer strips of vegetation will be retained, where possible, to prevent runoff.
- 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 Lead Local Flood Authority (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 (e.g., correct orientation of the outfall and the use of baffle pads).
- Sustainable Drainage Systems (SuDS) will be used, where practicable, to ensure no increase in surface water runoff rates or volumes from the temporary construction compounds 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 the Environment Agency, the SuDS will discharge to the local watercourses, ditches or to ground within the site boundaries.

1.3.3 Reinstatement post-construction

1.3.3.1 Once the installation work is completed, the haul road(s) will be removed and the ground reinstated using stored subsoil and topsoil. All temporary construction compounds and temporary fencing will be removed, field drainage and/or irrigation will be reinstated, and any post-construction field drainage will be installed before the land will be reinstated. Where practicable, consideration will be given to early restoration of sections of the cable route.

1.4 Flood risk control measures

1.4.1 Surface water

1.4.1.1 Where watercourse crossings would be required along the onshore export cable corridor and 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.

1.4.2 Groundwater

1.4.2.1 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.

1.4.2.2 Any temporary works would be designed as to not create temporary build-up of groundwater levels which may lead to groundwater flooding.

1.5 References

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

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Environment Agency (2022) Adapting to Climate Change: Advice to Flood & Coastal Risk Management. Available online: https://www.gov.uk/guidance/flood-and-coastal-risk-projects-schemes-and-strategies-climate-change-allowances . Accessed May 2024