



# ElAR Volume 7: Planning Stage Plans Appendix 8: Construction Environmental Management Plan

**Kish Offshore Wind Ltd** 

# RWE #SLR GOBe

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# **Dublin Array Offshore Wind Farm**

# **Environmental Impact Assessment Report**

Volume 7, Appendix 8: Construction Environmental Management Plan

**Planning Stage** 



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# Acronyms

CEMPConstruction Environmental Management PlanCMSConstruction Method StatementCTMPConstruction Traffic Management PlanCCTVClosed Circuit TelevisionCTVCrew Transfer VesselsDARTDublin Area Rapid TransitDLRCCDún Laoghaire Rathdown County Council								
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CTMPConstruction Traffic Management PlanCCTVClosed Circuit TelevisionCTVCrew Transfer VesselsDARTDublin Area Rapid TransitDLRCCDún Laoghaire Rathdown County Council								
CCTVClosed Circuit TelevisionCTVCrew Transfer VesselsDARTDublin Area Rapid TransitDLRCCDún Laoghaire Rathdown County Council	Construction Traffic Management Plan							
CTVCrew Transfer VesselsDARTDublin Area Rapid TransitDLRCCDún Laoghaire Rathdown County Council								
DARTDublin Area Rapid TransitDLRCCDún Laoghaire Rathdown County Council								
DLRCC Dún Laoghaire Rathdown County Council								
DPM Direct Pipe Method								
Dublin Array Dublin Array Offshore Wind Farm								
ECR Export Cable Route								
EIAR Environmental Impact Assessment Report	_							
EM Environmental Manager								
EMS Environmental Management System								
ECoW Ecological Clerk of Works								
EnCoW Environmental Clerk of Works								
GCP Grid Connection Point								
GIS Gas Insulated Switchgear								
Ha Hectare								
HDD Horizontal Directional Drilling								
HDPE High density polyethylene								
HWM High Water Mark								
IAS Invasive Alien Species								
IEF Important Ecological Features								
IFI Inland Fisheries Ireland								
ISMP Invasive Species Management Plan								
JB Joint Bay								
km Kilometre								
km <sup>2</sup> Kilometre Squared								
kV kilovolts								
LAT Lowest Astronomical Tide								
m Metre								





Term	Definition
MSDS	Material Safety Data Sheets
NIS	Natura Impact Statement
NPWS	National Parks and Wildlife
0&M	Operations and Maintenance
OES	Onshore Electrical System
Onshore ECR	Onshore export cable route
OSP	Offshore Substation Platform
OSS	Onshore Substation
PEMP	Project Environmental Management Plan
PRoW	Public Right of Way
RoRo	Roll on/Roll off
STATCOM	Static Synchronous Compensator
ТСС	Temporary Construction Compounds
TJB	Transition Joint Bay
WTG	Wind Turbine Generator
WWTP	Waste Water Treatment Plant





# Glossary

Term	Definition							
Array area	The area within which the WTGs and OSP will be located.							
Dublin Array Offshore Wind Farm	Where the context so provides within the EIAR, references to Dublin Array refer to all geographical areas of the proposed development, i.e. both offshore, onshore and including the proposed O&M Base.							
ISO 14001	ISO 14001 is an internationally agreed standard that sets out the requirements for an environmental management system. This standards is accredited and audited by the International Organisation for Standardisation (ISO).							
Offshore Infrastructure	Wind turbine generators, offshore substation platform, inter array cables offshore export cables and landfall works below MHWS.							
Onshore Electrical System (OES)	All of the proposed Dublin Array transmission infrastructure from the TJB to the Carrickmines GCP i.e. the TJBs, onshore underground cables and associated infrastructure, the OSS and the onshore grid connection point.							
Onshore export cable route	The term used to describe the 7.4 km route of the onshore cables and associated infrastructure between the TJBs and the OSS							
Onshore infrastructure	The OES and the O&M Base of the Dublin Array.							
Operation and Maintenance Base (O&M Base)	This is the location from where the daily operations and normal repairs, replacement of parts and structural components, and other activities needed to preserve the offshore assets will be conducted.							
Temporary construction compounds	Four TCCs will be utilised for parking, welfare facilities, site office cabins, construction equipment, construction material laydown and storage for the duration of the OES construction phase with an occupation of up to 36 months. Three locations are identified to temporarily support the installation							
	of the OES: Landfall Site TCC (Shanganagh Cliffs) Clifton Park TCC Leopardstown TCC OSS TCC							
The Applicant	The Applicant for Dublin Array is Kish Offshore Wind Limited on behalf of Kish Offshore Wind Limited and Bray Offshore Wind Limited with the written consent of DLRCC.							
Transition Joint Bay	The proposed infrastructure at the landfall location where the offshore and onshore cables connect.							





# 1 Introduction

#### 1.1 Overview

- 1.1.1 Dublin Array Offshore Wind Farm (hereafter referred to as 'Dublin Array'') is proposed approximately 10 kilometres (km) off the east coast of Ireland on the Kish and Bray banks off the coast of counties Dublin and Wicklow. Dublin Array is being developed by Kish Offshore Wind Limited and Bray Offshore Wind Limited.
- 1.1.2 Between 39 and 50 wind turbine generators, supporting foundation and tower structures, as well as a single offshore substation platform will be located within an area of approximately 59 square kilometres (km<sup>2</sup>) known as the array, in water depths ranging from 2 metres (m) to 50 m lowest astronomical tide (LAT). Subsea electrical cables will be installed to transmit the electricity generated by the wind turbine generators to shore via the offshore substation platform where they will be jointed with the onshore export cables at the Landfall site.
- 1.1.3 The proposed onshore electrical system comprises all of the onshore electrical transmission infrastructure above the High Water Mark (HWM) associated with Dublin Array. This includes the transition joint bays (TJBs) (where the onshore and export cables will be jointed together) at Shanganagh Cliffs, the onshore export cables and a new onshore substation. The Dublin Array onshore transmission infrastructure is cumulatively referred to as the onshore electrical system (OES). Two underground 220 kilovolts (kV) cables will connect the proposed onshore substation to the existing 220 kV Carrickmines substation (referred to as the Carrickmines grid connection point (GCP)).
- 1.1.4 In order to service and maintain the offshore infrastructure, a storage and coordination facility is required (referred to in this document as the Operations and Maintenance (O&M) Base). The O&M Base will act as a storage and loading area for small and medium spare parts for the wind turbines and small ancillary equipment such as tools and consumables. The proposed development will provide offices and warehouse space together with berthing facilities for maintenance vessels associated with the ongoing operation and maintenance of the offshore infrastructure of Dublin Array. The O&M Base will be located at Dún Laoghaire Harbour.
- 1.1.5 A detailed description of Dublin Array, including a description of the onshore and offshore construction works can be found in Volume 2, Chapter 6 Project Description (hereafter referred to as Project Description) of the Environmental Impact Assessment Report.
- 1.1.6 This Planning Stage Construction Environmental Management Plan (CEMP) has been prepared to support the Environmental Impact Assessment Report (EIAR) for Dublin Array. The CEMP relates exclusively to the Dublin Array onshore infrastructure i.e. the OES and the O&M Base.
- 1.1.7 For the purposes of this report, the boundary between onshore and offshore infrastructure is the high water mark of mean or ordinary tides, which is shown as 'HWM' on Ordnance Survey Ireland Maps.





# 1.2 Purpose of the CEMP

- 1.2.1 The purpose of this CEMP is to provide a framework of the necessary environmental management and mitigation measures (as identified in the EIAR) that will be implemented prior to commencement of, and throughout the duration of the construction phase of the onshore infrastructure. This will ensure that during the daily operations undertaken during the construction phase will have a negligible effect on the local environment and sensitive receptors and the required measures are implemented in accordance with the development consent.
- 1.2.2 This CEMP outlines the minimum requirements with regard to environmental management during the construction phase works. Compliance with the CEMP does not absolve those undertaking the construction works from compliance with all legislation relating to the construction phase works.
- 1.2.3 The CEMP does not apply to the Dublin Array offshore infrastructure (i.e. seaward of the HWM). A separate Project Environmental Management Plan (PEMP) has been developed for these elements of the Project (refer to Volume 7, Appendix 1 of the EIAR).

# 1.3 Approach

- 1.3.1 The CEMP provides a framework for the following:
  - An outline of the key construction activities proposed on the onshore infrastructure of Dublin Array;
  - Outline the roles and responsibilities for implementing and maintaining environmental management throughout the construction stage of the onshore infrastructure;
  - The environmental management procedures to be implemented throughout the construction period of the onshore infrastructure; and
  - Management, monitoring and mitigation measures which will be implemented during the construction stage.
- 1.3.2 The CEMP will remain a 'live' document throughout the construction process and will be reviewed on a regular basis. Where required the document will be amended as needed to ensure information relating to construction methodologies and environmental management is up to date.
- 1.3.3 This document has been produced in conjunction with the following elements of the Dublin Array EIAR, which together will provide plans and procedures for ways of working throughout the project:
  - Volume 5, Chapter 2: Biodiversity (hereafter referred to as The Biodiversity Chapter);
  - Volume 5, Chapter 3: Land, Soils and Geology (hereafter referred to as The Land, Soils and Geology Chapter);





- Volume 5, Chapter 4: Water (Hydrology, Hydrogeology and Flood Risk) (hereafter referred to as The Water Chapter);
- Volume 5, Chapter 5: Noise and Vibration (hereafter referred to as The Noise Chapter);
- Volume 5, Chapter 6: Traffic and Transport (hereafter referred to as The Transport Chapter);
- Volume 5, Chapter 7: Landscape and Visual (hereafter referred to as The Landscape and Visual Chapter);
- Volume 5, Chapter 8: Archaeology Cultural Heritage (hereafter referred to as The Archaeology Chapter);
- Volume 5, Chapter 9: Human Health (hereafter referred to as The Human Health Chapter);
- Volume 5, Chapter 10: Air Quality (hereafter referred to as The Air Quality Chapter); and
- Volume 5, Chapter 11: Material Assets (hereafter referred to as The Material Assets Chapter).

## 1.4 CEMP structure

- 1.4.1 This CEMP is structured as follows:
  - Section 1 Introduces the proposed development, key construction activities anticipated, and the purpose of this CEMP;
  - Section 2 Describes the proposed onshore infrastructure and key onshore construction activities as described in the Project Description;
  - Section 3 Sets out a responsibility framework detailing how environmental requirements will be managed;
  - Section 4 Outlines general controls, requirements and procedures to be implemented during construction; and
  - Section 5 Sets out environmental management, monitoring and mitigation measures relating to each environmental topic.





# 2 Proposed development

## 2.1 Proposed onshore infrastructure

- 2.1.1 The proposed OES comprises all of the onshore electrical transmission infrastructure above the HWM to the existing Carrickmines 220 kV substation. The proposed onshore infrastructure is outlined in the following sections.
- 2.1.2 A detailed description of the proposed OES infrastructure is included in the Project Description.

#### Landfall Site and transition joint bays

- 2.1.3 The Landfall Site for Dublin Array is proposed at Shanganagh Cliffs at the open green space area adjacent to the Uisce Éireann Shanganagh Waste Water Treatment Plant (WWTP). It is the location where the offshore submarine export cables make landfall at the coastline and join with the onshore export cables in an underground plinth called a transition joint bay (TJB), of which there are two proposed.
- 2.1.4 The Landfall Site will accommodate one of the three main Temporary Construction Compounds (TCC) (the Landfall Site TCC) to support the construction of the TJBs, the installation of the cable ducts for the onshore ECR and the installation of the offshore export cable ducts.
- 2.1.5 An area of approximately 9,500 m<sup>2</sup> will be securely fenced off at the start of the construction phase around the proposed location of the TJBs, to form the Landfall Site TCC, which will include laydown areas and a vehicular access track. A public access way will be provided to ensure safe access to and from the beach areas at Shanganagh Cliffs.
- 2.1.6 The offshore export cable ducts will be installed from this location using trenchless technology. Once the ducts have been installed, the offshore cable circuits will then be pulled through the ducts onto land. Either of two trenchless techniques (Horizontal Directional Drill (HDD) or Direct Pipe Method (DPM)) are suitable installation techniques to bring the offshore export cable ducts under the beach and cliffs to the TJBs. Both of these trenchless techniques have been assessed as part of the EIAR. Onsite equipment will include drilling/boring equipment, storage, power generation plant and drilling fluid management infrastructure. Similarly, the onshore export cables will be routed under the existing DART/railway line using trenchless installation technology from the Landfall Site.
- 2.1.7 An additional area of approximately 6,500 m<sup>2</sup> to the east between the existing WWTP and the existing fence line along the cliffs will be temporarily fenced off from public access to facilitate cable duct laydown and assembly during the trenchless crossing activities.
- 2.1.8 Each TJB will require an excavated area of 26.5 m x 8.5 m x 2 m within which a concrete plinth base will be constructed below ground measuring 18 m x 4.5 m x 2 m. Each TJB will be colocated with a link box chamber and a communications chamber. Once the TJBs have been installed and the cables jointed, the TJB's will be backfilled to the required engineering specification.





2.1.9 On completion of the construction of the OES, the landfall site will be reinstated to its original condition in consultation with Dún Laoghaire-Rathdown County Council (DLRCC).

#### Onshore export cables

- 2.1.10 The onshore export cable route (onshore ECR) connects the TJBs at Shanganagh Cliffs to the onshore substation located 7.4 km west in Jamestown. The route traverses the townlands of Shanganagh, Hackettsland, Ballybrack, Loughlinstown, Cherrywood, Glebe, Laughanstown, Carrickmines Great, and Jamestown. The route is primarily located on public roads and greenspaces with some sections crossing privately owned agricultural lands.
- 2.1.11 The proposed onshore ECR will consist of two separate three-phase 220 kV circuits, each installed in their own parallel underground trench along the 7.4 km route. Each circuit will require associated underground infrastructure, which have been described further in the subsequent sections. This infrastructure includes;
  - Onshore export cables;
  - Joint bays;
  - Link box chambers;
  - Communication chambers and associated communication cables;
  - ▲ High density polyethylene (HDPE) cable ducts; and
  - Transition chambers.
- 2.1.12 The two circuits and associated infrastructure will be installed in two side-by-side underground trenches along the onshore Export Cable Route (ECR), predominantly using standard open-cut trenching techniques. The cables will be housed in HDPE ducts and primarily arranged in a trefoil configuration (bundled in a triangular shape).
- 2.1.13 Each circuit will consist of three cables, each within an individual 200 mm diameter HDPE duct, with three ducts per trench. Additionally, two telecommunication cables will be installed above the onshore export cables in each trench.
- 2.1.14 At eight locations along the onshore ECR, the route will cross significant transport networks and watercourses. To avoid disruption and minimise impacts on riparian corridors, trenchless drilling techniques (e.g. HDD or similar) will be used instead of open-cut trenching.
- 2.1.15 The eight trenchless crossing locations are identified using TX-01, TX-02 TX-08 references as set out in Table 1.





Reference No.	Obstacle	Location	Sector No.	Chainage in Planning Drawings (east to west)			
TX-01	DART/Railway Line	Shanganagh Cliffs – Clifton Park	1	0 – 250 m			
TX-02	Shanganagh River	Clifton Park – Bayview Glen	1	250 – 350 m			
TX-03	Shanganagh Road — Killiney Hill Road Roundabout (R119)	Bayview Glade - Shanganagh Road	1	500 – 600 m			
TX-04	Kill o' the Grange Stream	Achill Road - Loughlinstown Linear Park	1&2	950 – 1,000 m			
TX-05	Kill o' the Grange Stream	Loughlinstown Linear Park	2	1,150 - 1,200 m			
TX-06 N11, CX-06 Loughlinstown River		Eurofound – Cherrywood Park	2&3	1,900 – 2,200 m			
TX-07	M50	Carrickmines Great	4	4,700 – 5,000 m			
TX-08	Glenamuck District Distributor Road, Golf Stream	Carrickmines Great	6&7	6,300 – 6,450 m			

#### Table 1 Trenchless crossing locations along the onshore ECR

#### **Onshore Substation**

- 2.1.16 A new onshore substation (OSS) is proposed in the townland of Jamestown, near the existing 220 kV Carrickmines substation. The Carrickmines substation has been identified by EirGrid as the point at which Dublin Array will connect to the existing national electricity transmission network and is referred to as the Carrickmines GCP. The existing OSS site is located within the extent of the Ballyogan Landfill Facility and Recycling Park.
- 2.1.17 The OSS compound will consist of three, purpose built buildings, which comprise of a building housing the main 220 kV Gas Insulated Switchgear (GIS) and two Statcom (Static Synchronous Compensator) buildings. The GIS building will house the central control systems, automation systems, telecommunications systems, and monitoring equipment. The two Statcom buildings will contain converter, protection and control equipment associated with the Statcoms.





- 2.1.18 In addition to the indoor equipment the OSS will consist of several items of outdoor airinsulated plant including shunt reactors, Statcom step down transformers, auxiliary transformers and two harmonic filters compounds. These units will be enclosed within internal separately fenced compounds.
- 2.1.19 Two underground 220 kV circuits will connect the proposed OSS to the Carrickmines GCP. The grid connection circuits shall each be approximately 800 m in length.
- 2.1.20 The OSS will comprise a fully enclosed compound with a finished footprint of 1.7 hectare (ha) surrounded by a perimeter wall with stone cut cladding.
- 2.1.21 To facilitate the construction of the OSS, site preparation works will be undertaken including the provision of a TCC onsite.

#### Temporary construction compounds

- 2.1.22 Three main TCCs are proposed to support the construction phase of the OES. These will be located at the Landfall Site, Clifton Park and Leopardstown as set out in Table 2.
- 2.1.23 They will also be used for the provision of parking, welfare facilities, site office cabins as well as construction equipment and material laydown and storage for the duration of the construction phase with an occupation period of up to 36 months. All TCCs will be removed at the end of the construction phase, and sites reinstated in consultation with DLRCC.
- 2.1.24 A number of smaller localised TCCs will be utilised during the construction phase along the onshore ECR, specifically at trenchless crossing point locations to ensure the health and safety of the public while work is underway.





TCC Name	Landfall Site TCC	Clifton Park	Leopardstown				
Location	Shanganagh Cliffs	Clifton Park (Sector 1)	Leopardstown, Carrickmines Little				
Approximate size (m <sup>2</sup> )	9,500 m <sup>2</sup>	4,000 m <sup>2</sup>	14,000 m <sup>2</sup>				
	Construction of the TJBs;	Tranchlass crossing under the					
	Trenchless crossing under the DART/Railway Line (TX-01);	Trenchless crossing under the DART/Railway Line (TX-01);					
Use	Trenchless crossing activities under Shanganagh Cliffs to install the	Trenchless crossing activities under Shanganagh River (TX-02);	Storage; Welfare.				
	offshore export cable ducts;	Storage;					
	Storage;	Welfare.					
	Welfare.						
Main Access	Shanganagh Cliffs	Via Shanganagh Wood	Via Leopardstown Racecourse access road north of the M50 (Junction 15)				
Description of existing site	Open greenspace area	Open greenspace area bordered to the north and west by Shanganagh River, to the east by the DART/railway line and to the south by Shanganagh Wood road. Bordered to the north, west and east by treeline and hedgerows.	A brownfield site with deteriorated artificial surfaces. Overgrown vegetation and shrubs across the site. An unused access gate is situated off the Leopardstown Racecourse Access Road south of the site via Glenamuck Road North (R842). The light rail Luas line demarcates the site to the north and west. Castle Villas housing estate borders the east of the site				

Table 2 The main temporary construction compounds to support the onshore ECR construction activities





Ballinteer	Dun Lac	oghaire											
133		XA											
116	R116												
Application Site Boundary													
Application Site Boundary Temporary Construction Compound (TCC)													
		•	. ,										
DRAWING STATUS													
	PUE	SLIC											
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# 2.2 Construction Programme

#### O&M Base

2.2.1 A preliminary indicative construction schedule for the proposed O&M Base development is outlined in Table 3. The O&M Base construction is likely to commence in advance of the offshore construction program to allow the facility be used as a base for CTV during the offshore construction. There will not be any heavy engineering or manufacturing processes at the site during offshore construction.

Construction	Activity	Approximate
phase		timeline
Site Preparation	Erection of temporary site fencing & hoarding;	8 weeks
	Erection of site offices;	
	Location of onsite services.	
Demolition	Demolition of RoRo ramp structures, concrete towers and	12 weeks
	levelling;	
	Demolition of existing Harbour Maintenance Building;	
	Demolition of elements of the existing fender structure;	
	Clearance of existing surface on St. Michael's Pier.	
O&M Building	Construction of new concrete pavement at the location of	78 weeks
	the demolished RoRo ramp;	
	Construction of new foundations for O&M building;	
	Construction of new O&M building including all civil	
	elements (drainage, etc.);	
	Construction of new substation building, including laying all	
	electrical cables for the development;	
	Installation of floating pontoon and access gangway;	
	Erection of site O&M Base fencing, secure access gates,	
	lighting masts and site CCTV;	
	Installation of pontoon infrastructure & fit out for services.	
O&M Building	Fit out of structures – O&M building, proposed substation	24 weeks
	and pontoon.	
Final	Commissioning of all structures and demobilising from site.	4 weeks
Commissioning		
Total Build Period		126 weeks

#### Table 3 Indicative O&M Construction Schedule

#### Onshore Electrical System

- 2.2.2 The installation of the OES, excluding surveys and site preparation, is anticipated to take approximately 36 months. The programme, shown in Table 4 illustrates the typical duration of the installation activities associated with each of the major onshore components, and how they may progress in relation to each other.
- 2.2.3 The onshore construction is likely to commence in advance of the offshore construction program. It is likely that the latter part of the OES programme will be concurrent with offshore construction operations.





- 2.2.4 Construction of the OSS is likely to commence in an early phase of the overall construction programme as shown in Table 4.
- 2.2.5 Typical working hours during construction will be from 07:00 to 19:00 Monday Friday and from 08:00 to 14:00 Saturday. Construction will occur during normal construction working hours, with the exception of works associated with the entry and exit pits at the TJB(s) and special crossings associated with trenchless construction techniques which will typically occur 24 hours per day, seven days per week for defined periods within the construction programme.
- 2.2.6 It is possible that the construction of the O&M Base and the construction of the OES may occur concurrently.





#### Table 4 Overview of typical construction programme for the Onshore Electrical System works

		Y1			Y2			Y3				¥4				
Activity	Q1	Q2	Q3	Q4												
Landfall Site																
Site Preparation																
Installation of offshore export ducts at Landfall (trenchless installation)																
Onshore ECR activities (incl. TJBs)																
Cable pulling and jointing (onshore & offshore)																
Demobilisation & Reinstatement																
Duct laydown and assembly area																
Onshore Export cable route														·		
Cable ducts and JB installation (including trenchless crossings)																
Cable Pulling & Jointing																
Commissioning																
Landfall Site TCC																
Clifton Park TCC																
Leopardstown TCC																
Onshore substation																
Site Preparation																
Civil Works																
Electrical Works																
Commissioning																
OSS TCC																





# 3 General construction management and responsibilities

3.1.1 This section outlines the key roles and responsibilities for the management of construction activities, ensuring compliance with environmental commitments, and best practice construction methodologies. Clear allocation of responsibilities is essential for effective communication, coordination, and implementation of mitigation measures throughout the construction phase. All personnel involved in the project, from contractors to site supervisors, will be required to adhere to the environmental management framework set out in this CEMP, ensuring that construction activities are carried out in a manner that minimises environmental impact and aligns with regulatory requirements.

# 3.2 Roles and responsibilities

#### Applicants role

- 3.2.1 The Applicant will be responsible for obtaining all necessary consents prior to the commencement of works, in compliance with current legislation governing environmental protection.
- 3.2.2 The Applicant will appoint a design team to prepare the detailed design for the onshore infrastructure. The appointed designer will ensure all planning and environmental obligations are incorporated where possible, in the design of the onshore infrastructure.
- 3.2.3 The Applicant will appoint a Contractor(s) to undertake each element of the onshore infrastructure works. The awarded contract(s) for onshore infrastructure construction will include a contractual requirement for the Contractor(s) to comply with the EIAR, Natura Impact Statement (NIS), development consent conditions, and the mitigation measures outlined in this CEMP.
- 3.2.4 The Applicant will appoint an Ecological Clerk of Works (ECoW) to oversee and monitor the Contractors compliance with the environmental commitments, planning conditions, and regulatory requirements set out in the CEMP. The ECoW will ensure that construction activities are carried out in accordance with best environmental practices, provide guidance to the Contractor, identify potential environmental risks, and liaise with relevant stakeholders, including regulatory authorities, to ensure compliance.
- 3.2.5 The Applicant will be responsible for ensuring that the Contractor manages construction activities in accordance with this CEMP.
- 3.2.6 An licensed archaeologist will be appointed by the Applicant to undertake a programme of archaeological testing/surveys as required in advance of construction and provide advice throughout the construction phase as appropriate.





#### Stakeholder engagement and communication manager

- 3.2.7 The responsibilities and duties of the Stakeholder and Communications Manager include the following;
  - Ensure consultation and liaison is being conducted with the general public, local landowners, community groups, public representatives and business groups and ensure they are being kept suitably informed of Dublin Array progress;
  - Feedback from community/bodies evaluation and assessment to provide feedback resolution;
  - Ensure relevant project information is made available to the general public and the media; and
  - Review and approval of material intended for the project website, project newsletters and notices.

#### Contractor(s) requirements

- 3.2.8 The appointed Contractor(s) will be responsible for developing a detailed CEMP prior to construction in accordance with this planning stage CEMP. The Contractor's CEMP will serve as a reference for preparing method statements, ensuring they incorporate the required environmental controls and mitigation measures.
- 3.2.9 If the construction of the onshore infrastructure is divided into multiple work packages, each appointed Contractor will be responsible for preparing a package-specific CEMP covering their scope of works. Separate work packages may be required for the OES and the O&M Base, among other project components.
- 3.2.10 The Applicant will review and approve the Contractors CEMP to ensure consistency and integration between the documents.
- 3.2.11 The contractor(s) will be required to develop and implement an CEMP that follows the principles of IS14001, therefore it is expected that the CEMP will include inter alia:
  - The contractor's Environmental Policy;
  - Procedures for identification and evaluation of environmental aspects;
  - The contractor's operational control procedures;
  - The contractor's procedures for Emergency Preparedness and Response; and
  - A Details of interested parties, legal and other requirements.
- 3.2.12 Competence records and company performance monitoring information including management review and results of audits.





- 3.2.13 All Contractors on site must comply with applicable environmental legislation, incorporating relevant published standards, accepted industry practices, and both national and international guidelines and codes of practice.
- 3.2.14 The Contractor will implement a comprehensive induction programme for all employees and subcontractors. This will ensure that all site personnel understand site rules and their environmental responsibilities. The induction will also identify training needs and ensure appropriate follow-up training is provided.

#### Contractor's construction manager

- 3.2.15 The Contractor(s) will appoint a competent Construction Manager(s) to oversee the day-today management of the onshore construction works. The Construction Manager(s) will be responsible for ensuring that construction activities are carried out safely, efficiently, and to a high standard, in full compliance with relevant health and safety regulations, environmental procedures, and the commitments outlined in the CEMP and accompanying CMSs.
- 3.2.16 They will also coordinate with the EnCoW and other relevant personnel to ensure environmental compliance and best practices are maintained throughout the construction phase.

#### Contractor's environmental manager

- 3.2.17 The Construction Manager will be supported by an Environmental Manager (EM), who will be appointed by the Contractor. The EM will be responsible for ensuring that all mitigation measures and environmental management procedures detailed in the CEMP and associated CMSs are implemented effectively. The EM will oversee compliance prior to the commencement of works and throughout the construction phase, carrying out monitoring and audits as required.
- 3.2.18 The EM will be a qualified and experienced environmental professional with an up-to-date knowledge of relevant environmental legislation and its implications for the proposed works. The EM's key responsibilities will include:
  - Developing, maintaining, and implementing the CEMP, ensuring alignment with the Contractor's Environmental Management System (EMS);
  - Conducting regular environmental inspections and audits and maintaining adequate records;
  - Ensuring that all construction activities comply with relevant and up-to-date environmental legislation;
  - Attending stakeholder meetings and relevant site or construction team meetings, as well as managing complaints and concerns raised by stakeholders;
  - Ensuring that all site personnel receive the necessary environmental training and maintaining training records; and





Responding to environmental incidents, ensuring they are recorded, reported, and managed in line with CEMP procedures, and implementing corrective actions as needed.

# 3.3 Environmental management procedures

#### Training, awareness and procedures

- 3.3.1 The Contractor(s) will establish an Environmental Training and Awareness Programme and will ensure that all construction employees receive adequate training prior to commencement of construction activities.
- 3.3.2 All site personnel will undertake this tailored environmental awareness training as part of the site induction and be made aware of their responsibilities in respect of the detailed CEMP. Construction staff will receive training with regard to mitigation measures and procedures and in the use of relevant mitigation material, for example the use of and location of spill prevention kits.
- 3.3.3 The site induction will include a general overview of site-specific environmental issues, the environmental sensitivities of the area, procedures for dealing with unforeseen environmental incidents and details of how these issues are to be managed.
- 3.3.4 A project programme will be developed prior to commencement of construction operations and will be reviewed and updated on a regular basis to take account of progress of the project and any relevant changing circumstances relating to the project. Site personnel will be made aware of any significant changes following the training, some of which may result in the need for appropriate additional training.
- 3.3.5 Relevant environmental bulletins and notices will be displayed on notice boards in welfare and office areas where applicable. Any relevant environmental procedures will be set out in the CEMP.

### Communication

### Monitoring, recording and audits

- 3.3.6 The performance of the Contractor(s) and construction activities will be monitored by the Applicant on a regular basis. The Contractor(s) will be required to submit a monthly report to the Applicant that details compliance with the CEMP, results of monitoring and audits, reports of any incidents or complaints raised.
- 3.3.7 The programme for monitoring and audits shall be specified in the contract and CEMP. It is likely to be a combination of internal and external inspections and audits. Environmental audits may be completed at any time by the Applicant, Records of all inspections carried out would be made and distributed accordingly with any actions being addressed in a reasonable time.
- 3.3.8 Records would be controlled through the document management system.





#### Non-conformity and corrective actions

3.3.9 Any non-conformances arising will be recorded and submitted as part of the reporting process. Any non-conformity would be investigated by the Contractor(s) and reported to the Applicant, if necessary, immediately. All corrective actions would be recorded with dates for action. An overall register would be kept and regularly reviewed by the Applicant, the Site Manager and the EM.

#### Feedback mechanism

- 3.3.10 The Applicant is committed to effective stakeholder engagement, ensuring active participation and feedback from groups affected by the project throughout the duration of the construction stage of Dublin Array.
- 3.3.11 During the onshore construction of Dublin Array, third parties, including local residents and other stakeholders, may wish to provide feedback on ongoing activities or related matters. The CEMP will include a documented procedure outlining how feedback can be submitted and the subsequent steps to be followed. This procedure will specify the escalation process to ensure that any concerns or opportunities raised are appropriately addressed.
- 3.3.12 The Contractor will establish a process for managing all enquiries, including complaints. A log will be maintained to record all enquiries, along with details of responses and any actions taken. This log will be available for inspection upon request by DLRCC. All observations, queries, and complaints will be addressed in a timely manner.
- 3.3.13 The Applicant, including the Community Engagement Manager, Environmental Manager, and Ecological Clerk of Works will be immediately informed of any environmental-related issues raised.





# 4 General requirements

## 4.1 General site management and housekeeping

- 4.1.1 Good housekeeping is necessary to maintain a safe work environment and to lower the risk of any environmental incidents from any work area associated with the construction of the onshore infrastructure of Dublin Array. A housekeeping policy will be adopted which will outline the basic requirements and procedures for the range of day to day activities.
- 4.1.2 The housekeeping policy will be applied to the construction areas at all times. As far as reasonably practicable the following principles will be applied:
  - The construction works area will be secured to prevent unauthorised access;
  - Installing appropriate security measures, including lighting, fencing, and hoarding, at each work area;
  - A site layout map showing key areas such as first aid posts, spill kits, material and waste storage and welfare facilities will be created;
  - Contact details of key personnel including the Site Manager, Environmental Manager and Liaison Officer will be provided to all site personnel;
  - Preventing infestation by pests or vermin through appropriate measures, including regular disposal of food and materials that may attract them;
  - Maintaining all plant, materials, and equipment required for construction in good working order, ensuring they remain clean and tidy;
  - ▲ Wheel washing facilities will be cleaned frequently;
  - Maintenance of any rights of way affected by the works including implementation of temporary diversions where construction works will lead to temporary closure; and
  - Keeping construction compounds, access routes, and designated parking areas free of excess dirt, rubbish, and debris, while implementing effective dust suppression measures when required during spells of dry weather.
- 4.1.3 Appropriate welfare facilities will be provided for construction staff and site personnel, including locker rooms, drying rooms, toilets, and showers. These facilities will be located at the temporary construction compounds and designated works areas.
- 4.1.4 Potable water will be supplied from Uisce Éireann mains where available. Where mains supply is not accessible, potable water will be transported to the site via tanker or large bottles.
- 4.1.5 Grey water for non-drinking purposes, such as construction activities and toilet facilities, will be sourced through rainfall collection or transported to the site via tanker.





- 4.1.6 Sanitary wastewater will be collected and stored in on-site holding tanks. These tanks will be emptied regularly by licensed contractors and disposed of in accordance with regulatory requirements.
- 4.1.7 Material deliveries will be planned and scheduled to ensure that materials arrive at the working areas as needed, minimising on-site storage.
- 4.1.8 For activities requiring multiple vehicle deliveries, such as concrete pours, logistics will be carefully managed to prevent queuing on public roads near the working areas, as far as practicable.

## 4.2 Construction working hours

4.2.1 Typical working hours during construction of the onshore infrastructure will be from 07:00 to 19:00 Monday – Friday and from 08:00 to 14:00 Saturday. Certain work activities may be undertaken at night and/or at weekends. Working outside normal hours may also be necessitated through considerations of safety or weather and sub-contractor availability. Exceptional construction activities will be carried out in consultation with DLRCC.

# 4.3 Construction traffic management

- 4.3.1 The appointed Contractor will prepare a detailed Construction Traffic Management Plan (CTMP) before site works commence, ensuring alignment with the construction programme and methodologies. A planning-stage CTMP is included in Annex A of this CEMP.
- 4.3.2 The CTMP will outline the management of all onshore construction traffic, focusing on environmental safeguards and mitigation measures identified in the Transport Chapter of the EIAR. It will also serve as a guide for planning and executing the onshore infrastructure works.
- 4.3.3 The CTMP will be maintained as a 'living' document, updated by the Contractor throughout construction as needed. It will also be implemented through the CEMP to ensure compliance with traffic management measures.
- 4.3.4 The outline CTMP identifies construction access routes and includes specific traffic management procedures for:
  - Construction traffic access to the Landfall Site at Shanganagh Cliffs;
  - Construction traffic access to the OSS site;
  - Construction traffic access to the TCCs;
  - ▲ General construction access to other sections of the onshore export cable route;
  - Construction traffic access to the O&M Base at Dún Laoghaire Harbour; and
  - Measures to minimise disturbance from construction traffic in sensitive areas along the cable route.





# 4.4 Lighting

4.4.1 A procedure will be established for the management of lighting at the construction sites to avoid light pollution and disturbance, particularly for any out of hours working. In general, lighting will only be required where works are taking place in hours of darkness, or for safety or security.

#### 4.5 Waste management

4.5.1 The Applicant and Contractors shall take all reasonable steps to apply the waste hierarchy (Figure 2) as far as reasonably practicable by avoiding waste generation in the first instance and based on the best environmental outcome give priority to reuse, recycling, recovery and last of all disposal.



#### Figure 2 The waste hierarchy

- 4.5.2 Contractors will be required to develop a Waste Management Plan and shall include but not be limited to:
  - A description of each waste type expected to be produced in the course of the work scope;
  - An estimate of the quantity (volume) of each different waste stream/type of waste expected to be produced;
  - A written statement demonstrating what actions were taken to minimise the volume of each type of waste produced prior to commencement of the activity generating the waste; (Reuse, Recycle, Recover, Dispose) including any treatment;
  - The storage arrangements for each waste type; and





- Procedures for identification of the waste management actions proposed for each different waste type, including re-using, recycling, recovery and disposal.
- 4.5.3 All waste generated from the project operations must be adequately controlled during storage and transportation without causing harm or pollution to the environment. The Applicant and Contractors shall:
  - Ensure waste undergoes basic pre-sorting and segregation on site before it is transferred to an authorised/licensed disposer;
  - Ensure that the description of the waste is accurate and contains all the information for safe handling, transport, treatment, recovery or disposal by subsequent holders;
  - Ensure only companies authorised to carry out collection, transport and final treatment are utilised;
  - Ensure that waste is stored in a manner that one distinct waste stream does not contaminate another, e.g. oil contaminated rags or cardboard must not be placed in with the general waste, which is destined for landfill;
  - Encourage the workforce to think about where they place their waste and discharge the waste hierarchy;
  - Ensure that waste receptacles are lidded or covered to prevent contents becoming airborne in high winds. Likewise, consideration shall be given to the storage of waste liable to be affected by rainfall or scavenging animals;
  - Where practical ensure waste receptacles are stored at least 10 metres from any watercourse/controlled water;
  - Ensure waste is transported from site at an appropriate frequency by a registered waste carrier to prevent overfilling of waste receptacles/containments facilities; and
  - Ensure that cleaning activities (e.g. for plant, vehicles, wheel washes, concrete truck wash out etc.) are carried out in an appropriate enclosed area and waste water captured for treatment and as per the licencing requirements or applicable legislation.

### 4.6 Hazardous materials

- 4.6.1 Any hazardous material used during the construction phase works shall be stored in a safe and secure manner whilst either waiting to be removed from site or waiting to be used. The container the material is to be stored in shall be lockable and suitable for the material to be stored.
- 4.6.2 Anyone handling hazardous materials shall complete control of substances hazardous to health assessments which will incorporate data sheets and requirements supplied by the manufacturers.
- 4.6.3 The storage of any hazardous material shall be as close to its source of use as possible in order to minimise site movement hence minimising risk.





4.6.4 Hazardous waste shall be removed from site immediately and not stored on site. Any waste shall be removed by only suitably licensed waste management companies.

# 4.7 Reinstatement of working areas

4.7.1 The Contractor(s) will develop a construction program identifying when reinstatement works will take place and a restoration plan will be developed as part of the CTMP.





# 5 Environmental management, monitoring and mitigation

5.1.1 The following sections detail the minimum mitigation measures to be implemented prior to the start of construction. Measures outlined below should also be read in conjunction with those described in both the EIAR and NIS.

# 5.2 Biodiversity

5.2.1 During construction, the Contractor(s) are required to implement the mitigation measures outlined in Table 5 as outlined in the Biodiversity Chapter.





#### Table 5 Summary of Proposed Mitigations - Biodiversity

Ecological Feature	Mitigation
Habitat	<ul> <li>Habitats will be reinstated following the completion of the construction phase.</li> </ul>
	<ul> <li>Construction works will be set back from the river and stream channels, except for the two open-cut trenched crossings at Sector 7, and where it is not possible to maintain an adequate set back, suitable measures to prevent run-off from entering the watercourse (such as temporary interceptor drains) will be used to prevent runoff going to the watercourse. Additional control measures such as silt fences will be deployed.</li> </ul>
	<ul> <li>Suitable fencing will be erected between the boundary of the Locally Important Biodiversity Sites (LIBS) and the boundary of the nearby TCC with signs stating "Sensitive Biodiversity Area" to avoid accidental damage or loss of the habitats attributed to the LIBS.</li> </ul>
	<ul> <li>Protective fencing will be installed around retained habitats of importance to prevent accidental encroachment, loss or damage to retained habitats during the construction phase.</li> </ul>
	<ul> <li>An Ecological Clerk of Works (ECOW) will be employed to oversee construction at key ecological sensitive locations to minimise risks to IEFs.</li> </ul>
	<ul> <li>Pre construction verification survey will be undertaken in advance of tree or vegetation clearance to check for the presence of nesting birds, badger setts, hedgehogs, amphibians, or other protected species will be carried out by suitably qualified Ecologist. Additional reasonable avoidance measures will be implemented and appropriate NPWS licences will be acquired in advance where necessary.</li> </ul>
	<ul> <li>Vegetation which could support nesting birds (e.g. trees, scrub or long grass) will be cleared outside the main bird breeding season (March to August inclusive) to avoid damage to, or destruction of nests.</li> </ul>
	<ul> <li>Store chemicals where they cannot be accessed by wildlife.</li> </ul>
	<ul> <li>Low levels of artificial lighting will be employed at the O&amp;M Base during the construction phase during the hours of darkness for safety and security reasons. A detailed lighting scheme design will be undertaken as part of the detailed design and motion sensor lights will be used to ensure lighting on site is minimised only to when required.</li> </ul>





Habitat	There will be no demolition of O&M buildings during the nesting bird season (March to September inclusive).
	<ul> <li>Vegetation which could support nesting birds (e.g. trees, scrub or long grass) will be cleared outside the main bird breeding season (March to August inclusive) to avoid damage to, or destruction of nests.</li> </ul>
	<ul> <li>High value habitats such as woodland, hedgerows, and treelines, will be protected from direct impacts in areas where HDD is proposed rather than trenching, thus avoiding further unnecessary reduction in habitats.</li> </ul>
	<ul> <li>The habitats of highest value for birds have been retained through the route design and any habitats that are directly impacted will regenerate naturally or will be reinstated.</li> </ul>
	<ul> <li>A verification survey for Black guillemot will be conducted at St. Michael's pier in the breeding season immediately prior to the commencement of the construction of the O&amp;M Base to confirm their continued absence. Further mitigation may be required in the event that this species is confirmed breeding in this location.</li> </ul>
	<ul> <li>Shorebird surveys will be conducted following the completion of the proposed development to monitor the shorebird assemblage populations following the completion of the project. This will inform potential future impacts for similar developments.</li> </ul>
	<ul> <li>Maintain high standard of house keeping during the construction operations.</li> </ul>
	<ul> <li>Suitable fencing will be erected around any areas of Dry calcareous grassland (GS1) this habitat to prevent the accidental access by heavy machinery or storage of construction materials. Necessary losses or damage (e.g., caused by heavy plant used during the construction phase) will be minimised and retained areas will be protected from incidental damage or nutrient increase.</li> </ul>
	<ul> <li>Where damage does occur to this habitat, reinstatement planting through a suitable native wildflower seed mix planting, or seedbank collection, storage and replanting, following the completion of the construction phase.</li> </ul>
	<ul> <li>Necessary losses or damage (e.g., caused by heavy plant used during the construction phase) to areas of dry meadow habitat will be minimised and retained areas will be protected from incidental damage or nutrient increase.</li> </ul>
	<ul> <li>Areas of this habitat that is to be retained and located adjacent to the proposed development area will be protected through the erection of Heras fencing to prevent the accidental encroachment of works activities into the retained habitat.</li> </ul>
	<ul> <li>The habitat will be replanted following the completion of the construction phase; however, this would require time to meet the condition of the habitat that is lost/damaged.</li> </ul>
	<ul> <li>A suitable seed mix will be used for replanting to avoid the risk of a less biodiverse grassland being created.</li> </ul>
	<ul> <li>Reinstatement planting will be created within the lost grassland habitat (as shown on the OSS Landscaping Plan, Drawing 229100714-MMD-00-XX-DR-C-0250), subject to agreement with DLRCC.</li> </ul>





Ecological Feature	Mitigation
	Necessary losses or damage (e.g., caused by heavy plant used during the construction phase) to areas of dry meadow habitat will be minimised and retained areas will be protected from incidental damage or nutrient increase. Areas of this habitat that is to be retained and located adjacent to the proposed development area will be protected through the erection of Heras fencing to prevent the accidental encroachment of works activities into the retained habitat. The habitat will be replanted following the completion of the construction phase; however, this would require time to meet the condition of the habitat that is lost/damaged. A suitable seed mix will be used for replanting to avoid the risk of a less biodiverse grassland being created. Reinstatement planting will be created within the lost grassland habitat (as shown on the OSS Landscaping Plan, Drawing 229100714-MMD-00-XX-DR-C-0250), subject to agreement with DLRCC.
	Necessary hedgerow losses will be minimised and retained areas will be protected from incidental damage.
	<ul> <li>Retained hedgerows located close to construction activities (e.g., within 10 m) will be appropriately protected during the construction phase through the erection of suitable fencing (e.g., Heras fencing). This will include their RPA, which will protect potential harm from soil compaction by heavy machinery and materials.</li> </ul>
	<ul> <li>The full extent of potential losses will be replanted/reinstated, using suitable native woody species.</li> </ul>
	<ul> <li>Dead hedging will be implemented where losses to this habitat are necessary. This will involve putting the cut branches and foliage from necessary hedgerow removal back.</li> </ul>
	<ul> <li>New hedgerow will be created surrounding the proposed OSS to reinstate for the loss of c. 10 m hedgerow during the construction phase (refer to the Landscaping Plan shown on Drawing 229100714-MMD-00-XX-DR-C-0250), subject to agreement to be agreed in consultation with DLRCC.</li> </ul>
Bats	<ul> <li>The habitats of highest value for bats will be retained through the avoidance of these areas in the route selection process for the OES and any habitats that are lost will be replanted, where possible.</li> </ul>
	<ul> <li>Where possible lighting installations will be directed away from trees, known bat roosts and retained habitats for bats (including trees identified as T14 &amp; T15 in Sector 2 along the onshore ECR).</li> </ul>
	<ul> <li>A survey of T14 and T15 trees will be undertaken at an appropriate time in the bat rooting season, at the earliest available opportunity.</li> </ul>
	<ul> <li>A sound barrier will be erected to protect potential roost locations in T14 and T15 from potential effects of noise. This will also benefit the potential bat roosts by preventing accidental illumination of these potential roost sites.</li> </ul>
	<ul> <li>An NPWS derogation licence for the disturbance and potential loss of trees T14 and T15 in Sector 2 will be acquired if a bat roost is identified. Alternative roosting provisions must be in place prior to the loss of these trees (if required).</li> </ul>





Ecological Feature	Mitigation
	<ul> <li>Enhancement for bat habitat will be achieved through the provision of bat roosting boxes.</li> </ul>
Fish	<ul> <li>Two streams in Sector 7 will require open-cut trenching. Where in-stream works for the cable installation are required in Sector 7, the method statement will be greed in consultation with IFI &amp; in-stream works will be limited to July - September as per IFI's guidance.</li> </ul>
	<ul> <li>The Inland Fisheries Ireland (IFI) Guidelines on the Protection of Fisheries during construction works in or adjacent to waters (2016) will be implemented.</li> </ul>
	<ul> <li>Where in-stream works for the cable installation are required in Sector 7, the method statement will be greed in consultation with IFI &amp; in-stream works will be limited to July - September as per IFI's guidance.</li> </ul>
	<ul> <li>In-stream works will be timed to avoid critical periods to salmonids (1 October to 31 April).</li> </ul>
	<ul> <li>Designated location for plant and vehicle washout will be established with adequate storage capacity. Washout water will be stored in the washout area before being transported offsite or treated.</li> </ul>
	<ul> <li>Appropriate sediment control measures will be installed, surface water ingress into open trenches will be limited through measures such as directing surface water drainage away from excavations.</li> </ul>
	<ul> <li>Fuel and chemical storage will be stored in storage units with 110% bunding storage.</li> </ul>
	<ul> <li>Implementation of CIRIA C648, Control of Water Pollution from Linear Construction Projects.</li> </ul>
	<ul> <li>Appropriate sediment control measures will be installed.</li> </ul>
	<ul> <li>The impact of dust on habitat will be During hot, dry weather a water bowser will be used to control dust arising from the access track;</li> </ul>
	<ul> <li>A wheel cleansing will be operated within the site to ensure materials from the construction sites are not transferred onto the highway.</li> </ul>
	<ul> <li>Road cleaning will take place when required to remove any deposits that are carried from the construction locations. It is anticipated that any road cleaning activities would remain local to the site access.</li> </ul>
Invertebrates	<ul> <li>Habitats likely to support significant numbers or notable invertebrates (comprising unmanaged grasslands, hedgerows, scrub, fragmented areas of woodland and the freshwater habitats), and that will be retained, will be appropriately protected throughout the construction phase.</li> </ul>
Badgers	<ul> <li>In advance of construction pre-construction verification faunal surveys will be undertaken to identify the presence of badger sets on the study area.</li> </ul>





Ecological Feature	Mitigation
	Excavations will be covered overnight or a ramp provided to prevent the accidental entrapment of badgers.
	Where possible and safety considerations allow, fell trees away from badger setts and avoid blocking any badger pathways.
	<ul> <li>Where possible lighting installations will be directed away from any identified badger setts.</li> </ul>
	If required, plant dense native shrubs around setts to provide added protection (e.g., gorse, blackthorn, holly and elder).
	<ul> <li>Sett 1, located in Sector 2, will be monitored for a period of 5-days (minimum) immediately prior to the construction phase starting to verify and check that it is still disused. If it is found to be active then a derogation licence will be required for disturbance and sett closure due to its proximity to the proposed construction area. If found to be active, sett 1 will require temporary closure using one-way gates to avoid the accidental harm to badgers during the construction phase. Following the implementation of the one-way gates, the sett will be monitored for a minimum period of 21-days, to ensure that all badgers have vacated the sett. The gates will be removed following the completion of all construction activities within 30 m of this sett.</li> </ul>
	<ul> <li>If any active badger setts are identified:</li> </ul>
	<ul> <li>The implementation of a 50 m buffer will be instigated and appropriate mitigation will be advised by the Ecological Clerk of Works.</li> </ul>
	<ul> <li>An NPWS derogation license would be sought from the NPWS for any disturbance.</li> </ul>
	<ul> <li>No heavy machinery will be used within 30 m of the sett entrance or light machinery within 20 m (unless carried out under licence).</li> </ul>
	<ul> <li>Badger setts will be protected from all works through a 50 m buffer during the breeding season (December to June inclusive).</li> </ul>
	<ul> <li>All contractors/operators will be made fully aware of any new badger setts identified. Fell trees away from badger setts and avoid blocking any badger pathways.</li> </ul>
	<ul> <li>Direct any security lighting away from setts.</li> </ul>
Hedgehogs	<ul> <li>Identified hedgehogs will be moved to a nearby area of similar/suitable retained habitat.</li> </ul>
Otter	<ul> <li>Pre-construction verification otter surveys will be conducted no more than 10-12 months in advance of construction commencing. This will ensure that there will be sufficient time to comply with all licensing and additional mitigation requirements (e.g., holt exclusion and/or the creation of artificial holts). Where holts are found to be inactive, they will be destroyed immediately using a mechanical digger, under the supervision of the holder of the NPWS derogation.</li> <li>Where holts are found that are likely to be disturbed, their activity level will be assessed to verify whether they are active or inactive.</li> </ul>





Ecological Feature	Mitigation
	<ul> <li>If a otter holt is identified within 150 m of proposed works (NRA, 2008), a NPWS license will be secured to progress with required mitigation measures.</li> </ul>
	<ul> <li>A minimum 150 m buffer zone will be implemented around known otter holts with protectional fencing, where appropriate to protect against the accidental encroachment of construction activities and staff into the location of the holt. Any works encroaching this buffer will require a derogation licence from NPWS.</li> </ul>
	<ul> <li>Exposed ducts and pipes stored onsite will have the ends covered to prevent mammals becoming trapped; excavations will either be covered overnight and a ramp provided to prevent the accidental entrapment of otters.</li> </ul>
	<ul> <li>Where possible lighting installations will be directed away from the water courses and associated riparian habitat.</li> </ul>
	<ul> <li>The cliff area will be appropriately protected from accidental damage from construction works with fencing at both the upper and lower levels, where appropriate, to ensure that no heavy machinery or plant can encroach close to the cliffs where accidental erosion or damage may occur.</li> </ul>
Invasive Species	<ul> <li>A pre-construction verification survey will be undertaken to locate the presence and distribution of IAS within the study area.</li> </ul>
	<ul> <li>An appropriate buffer will be used to cordon off invasive species outside the works footprint.</li> </ul>
	<ul> <li>A planning stage Invasive Species Management procedure (ISMP0 is included in Volume 7, Appendix 8: CEMP, annex C. The measures will be undertaken to avoid the uncontrolled spread of IAS. Remedial actions during the construction phase will be implemented to ensure that the IAS does not regrow.</li> </ul>
Habitat- Trees	<ul> <li>Fencing will be erected around the temporary trenchless crossing compound and will not encroach the precautionary zones/RPA of any of the trees comprising Loughlinstown Woods proposed Natural Heritage Area (pNHA).</li> </ul>
	<ul> <li>Reinstatement planting will provide additional hedgerow relative to the baseline.</li> </ul>
	<ul> <li>Necessary losses of mature woodland will be minimised and retained areas will be protected from incidental damage. The full extent of potential losses will be replanted/reinstated with tree planting.</li> </ul>
	<ul> <li>Suitable fencing will be erected around any areas of Dry calcareous grassland (GS1) this habitat to prevent the accidental access by heavy machinery or storage of construction materials. Necessary losses or damage (e.g., caused by heavy plant used during the construction phase) will be minimised and retained areas will be protected from incidental damage or nutrient increase.</li> </ul>
	<ul> <li>Where damage does occur to this habitat, reinstatement planting through a suitable native wildflower seed mix planting, or seedbank collection, storage and replanting, following the completion of the construction phase.</li> </ul>




Ecological Feature	Mitigation
	<ul> <li>Prior to the commencement of construction works that could affect trees within a particular location along the ECR, an Arboricultural Method Statement (AMS) will be developed for that location in accordance with BS 5837:2012. Trees in relation to design, demolition and construction – Recommendations.</li> </ul>
	<ul> <li>The objective of the AMS will be to inform the construction/development process and protect retained trees during the construction phase. The AMS will be informed by detailed design and produced by a suitably qualified arboriculturist in liaison with the contractor undertaking the works. The AMS will consider the following key elements as a minimum:</li> </ul>
	Protective Fencing
	<ul> <li>Location and specification of Tree Protection Fencing (in line with BS 5837:2012)</li> <li>Location and specification of alternative protective fencing, if required</li> <li>Details of appropriate signage demarcating tree protection areas</li> <li>Construction Exclusion Zones (CEZ)</li> </ul>
	<ul> <li>Location of CEZ including detail of suitable demarcation and restrictions that will be in place within these areas during construction</li> <li>Temporary Ground Protection</li> </ul>
	<ul> <li>Location and detail of temporary ground protection measures to prevent soil compaction around tree roots</li> <li>New Permanent Surfacing within RPAs</li> </ul>
	<ul> <li>Location and detail of any new surfacing within RPAs</li> <li>Canopy Protection</li> </ul>
	<ul> <li>Details of measures to avoid damage to tree canopies including staff awareness and pruning to facilitate access for plant and equipment is required.</li> <li>Use of Hazardous Materials:</li> </ul>
	<ul> <li>Measures to prevent accidental release of materials hazardous to tree roots within RPAs</li> <li>Key persons and contractors who could be working along the onshore ECR in areas where there is potential for impact on trees to occur, will receive training by the appointed arboriculturist (e.g. via a tool box talk) on commencement of the construction works. This training, as a minimum, will cover how trees are potentially damaged (above ground and below ground) and the specific protection measures confirmed within the AMS.</li> </ul>





Ecological Feature	Mitigation
	<ul> <li>Regular planning by the construction team and the Arboriculturist will be undertaken in advance of scheduled works to review the programme of work and to ensure damage by machinery is avoided to the RPAs the stems and branches of trees to be retained along the ECR.</li> </ul>
	<ul> <li>The appointed arboriculturist will be present and monitor any excavation works where roots within the precautionary zone/RPA of trees could be affected along the ECR. The monitoring will seek to determine the amount and size of tree roots present and the extent of severance within the area excavated.</li> </ul>
	<ul> <li>An assessment will be made of the future viability of any trees that would incur damage to roots. Tree health, viability and stability will be dependent on the volume of root that would be removed, tree species and local context.</li> </ul>
	<ul> <li>Depending on the findings the following approaches will be taken:</li> </ul>
	<ul> <li>Trees considered unviable in the future: Where a tree's health/vitality is considered to be severely impacted arising from tree root damage and/or the tree is likely to become a health and safety hazard, due to reduced anchorage, it will be recorded and removed within 4 – 6 weeks of the excavation works taking place. The number of trees requiring removal will be reported to the local authority, prior to the works taking place. Replacement planting will be undertaken, in accordance with the DLRCC Tree Strategy 2024-2030. The number, species and location for replacement trees will be agreed with DLRCC.</li> </ul>
	<ul> <li>Trees considered viable in the future: The trees that are considered to be able to withstand the amount of tree roots lost, without significant impact on their heath/vitality and/or stability will be retained. A monitoring and management plan for each retained tree will be prepared appropriate to the amount of tree roots lost. Measures included in the plan may include soil improvement to foster regrowth of roots, tree pruning to counter balance the loss of roots and long-term monitoring for signs of declining health or stability.</li> </ul>
	<ul> <li>Under supervision from the arboriculturist, any severed roots will be pruned back with a clean cut and any exposed roots will be wrapped to prevent them from drying out. The wrapping will stay in place whilst the roots are exposed. Suitable material will be placed around the roots when the trench is back-filled. These works will be undertaken in line with section 7.2 of BS 5837:2012 (Avoiding physical damage to the roots during demolition or construction).</li> </ul>
	<ul> <li>The layout of the Clifton Park TCC, and the trenchless crossing compounds will be designed in liaison with the appointed arboriculturist. Where feasible, the layout of the TCC will aim to avoid the precautionary zones/RPAs and canopy spread of adjoining trees. The following measures will be applied, as appropriate:</li> </ul>
	<ul> <li>Tree Protection Fencing: Where TCCs are located adjacent or in very close proximity to precautionary zones/RPAs, the TCC fencing (including noise barrier fencing), can be used in-lieu of tree protection fencing (as specified in BS5837:2012). Where</li> </ul>





Ecological Feature	Mitigation
	this is used, appropriate signage identifying an exclusion zone for tree protection purposes will be displayed. Additional fencing may be required, as directed by the appointed arboriculturist.
	<ul> <li>Ground Protection Measures: Where encroachment into the precautionary zones/RPAs is unavoidable, alternative protection arrangements such as ground protection (sufficient to protect the structure of the soil from compaction) may be required. This will be designed in accordance with the requirements of section 6.2.3 of BS5837:2012.</li> </ul>
	<ul> <li>Canopy Protection Measures: Above ground equipment (such as containers, drill rigs and noise attenuation fencing), should be arranged to avoid damage to the canopies of existing trees. Where this is not possible, pruning to facilitate access for plant and equipment may be required as advised by the appointed arboriculturist.</li> </ul>
	<ul> <li>Replacement planting will be undertaken in line with Table 6-2 of Appendix 6.5.7-2 Tree Survey Report</li> </ul>
	<ul> <li>Replacement planting will be located in open green space that is under the control of DLRCC and will be agreed with DLRCC in advance of tree removal alongside the quantity, location, tree size and species to be used. The aim will be for planting to be undertaken in the first planting season following the removal of each of the groups of trees upon completion of construction.</li> </ul>
	<ul> <li>New planting will consider the existing species mix present within the survey area in relation to both arboricultural and ecological considerations. New planting offers an opportunity to increase the species and age class diversity for a given area which can boost the resilience of the local tree stock in relation to pests, disease and climate change as well as providing a greater range of amenity and other benefits.</li> </ul>
	<ul> <li>New trees will be planted in accordance with the minimum distances from new structures, services and surfacing set out in Table A.1 of BS 5837:2012. Tree stock selection, planting methods and planned maintenance will follow guidance as set out in BS 8545:2014 Trees: from nursery to independence in the landscape.</li> </ul>





## 5.3 Land, soils and geology

5.3.1 During construction, the Contractor(s) are required to implement the following mitigation measures as outlined in the Land, Soils and Geology Chapter.

#### Soil removal and temporary storage

- 5.3.2 The following mitigation measures will be implemented to minimise environmental impacts relating to the temporary removal of soil:
  - Topsoil will be stripped and stored in a bund;
  - The temporary haul road at the landfall site will be separated from the coastal path by a temporary earth bund, formed from the topsoil removed to form the haul road;
  - For general soil handling, the topsoil/subsoil to be removed will be separated. Tracking over materials to be reused will be avoided to stop compaction;
  - Measures will be implemented to prevent soil being carried onto adjacent roads at access locations;
  - Refuelling will only take place at the main TCC locations (Landfall Site, Clifton Park, Leopardstown) the site of the proposed OSS and the proposed O&M Base;
  - ▲ Refuelling of mobile plant will be undertaken using double skinned bowsers.

#### Contaminated soil

- 5.3.3 The following mitigation measures will be implemented to minimise environmental impacts relating to contaminated soils:
  - A Waste License surrender for the site will be completed in advance of construction works taking place;
  - Pre-construction testing of soils for contamination will take place;
  - Containment measures will be adopted to control site run off; and
  - Contaminated soils and hazardous materials found during the construction phase, will be stored in a safe and secure manner whilst waiting to be removed from site by authorised waste contractor and brought to a licensed facility.

#### Hazardous substances

- 5.3.4 The following mitigation measures will be implemented to minimise environmental impacts relating to accidental spills of hazardous substances:
  - Refuelling of mobile plant will be undertaken using double skinned bowsers;





- Potentially polluting, or hazardous substances (or any associated wastes) will be stored within TCCs. Potentially polluting or hazardous materials will be stored under cover, over fuel spill trays/bunded containers within designated storage areas;
- Good site management practices will be implemented to reduce risks of spills, including regular monitoring and inspection of storage vessels;
- Plant and equipment used in construction will be in good working order and regularly maintained and serviced;
- Contingency plans/procedures will be developed to adequately respond to potential spills. Emergency spill equipment will be made appropriately available on site;
- When an accidental spill results in contamination of soil, the extent of contaminated soil or subsoil will be identified and removed to a waste licenced facility for appropriate disposal: and
- The Material Safety Data Sheets (MSDS) records will be stored and requirements for use will be supplied by the manufacturers.

## 5.4 Water (hydrology, hydrogeology and flood risk)

- 5.4.1 During construction, the Contractor(s) are required to implement the following mitigation measures as outlined in the Water Chapter.
- 5.4.2 The following mitigation measures will be implemented to minimise environmental impacts relating to water:
  - ▲ Existing landfill site drains will be diverted in advance of construction (under license);
  - Containment measures will be adopted to control site run off;
  - The CIRIA C648, Control of Water Pollution from Linear Construction Projects guidance will be implemented;
  - Two open cut trench crossings proposed for the streams south of the Carrickmines Retail Park (Glenamuck North and Jamestown 10 streams). The water flows will be managed through use of a temporary dam to hold back waters with over pumping of the water downstream to enable the construction of the trenchless crossings;
  - The grid connection between the proposed OSS and the existing Carrickmines substation will cross the Carrickmines Stream within existing infill ground sitting above an existing culvert of the stream. An open cut trench method will be used for the installation of the cable in this location. The water flows will be managed through use of a temporary dam to hold back waters with over pumping of the water downstream to enable the construction of the trenchless crossings;





- Construction works will be set back from the river and stream channels, except for the two open-cut trenched crossings at Sector 7, and where it is not possible to maintain an adequate set back to prevent runoff going to the watercourse. Additional control measures such as silt fences will be deployed;
- The open cut crossings in Sector 7 will involve the installation of a temporary dam at either side of the cable crossing location to create a dry section of the steam to facilitate a dry working area for installation of the cable ducts. Temporary dam methods such as sandbagging, sheet pilling or an aqua dam will be used to construct the temporary dam. To maintain the flow of the stream it is proposed to over-pump from upstream of the dam to downstream of the works area. The trench will be then be excavated in the dry area to the required depth. The ducts will be placed, and a concrete surround poured around the ducts with a steel reinforcement mesh set in the concrete above the ducts. Cement bound granular mixture (CBGM) will then be backfilled on top of the concrete surround to the required depth and the riverbed reinstated above the CBGM. The dam will then be removed and the stream returned to its natural state;
- ▲ Appropriate temporary drainage measures will be implemented as part of the TCC and OSS TCC enabling works to manage surface water run-off and prevent water polluted with sediment and/or other contaminants leaving the site. This will include the implementation of measures such as filter drains, silt fencing, soakaways, infiltration trenches and settlement ponds/tanks. Where required the surface water will be stored and removed off-site by a licensed service provider for treatment at a licensed wastewater facility;
- The construction phase surface water management measures will apply the relevant CIRIA guidelines (CIRIA C648 Control of Water Pollution from Linear Construction Projects); and
- The surface water control measures which will be implemented during the construction phase will be subject to routine visual inspection with appropriate maintenance undertaken as identified and required to ensure that the management measures are effective.

## 5.5 Air quality and climate change

- 5.5.1 During construction, the Contractor(s) are required to implement the following mitigation measures as outlined in the Air Quality Chapter.
- 5.5.2 The following mitigation measures will be implemented to minimise environmental impacts relating to air quality:
  - Areas of bare or exposed soils and rock will be kept to a minimum, insofar as practicable, by progressive restoration of final and backfilled surfaces;
  - Where required, stockpiled soils (pending re-use) or exposed surfaces (pending further backfilling to final ground level) will be temporarily covered;





- During hot dry weather a water bowser will be used to control dust arising from exposed surfaces;
- Wash down facilities will be implemented at the entrance/exit points of work areas to prevent dust being carried offsite;
- Road sweeping of the site roads and adjacent highway roads will be undertaken where necessary; and
- In residential areas, specific measures will be implemented to control noise, dust and general nuisance to residents.

## 5.6 Noise and vibration

- 5.6.1 During construction, the Contractor(s) are required to implement the following mitigation measures as outlined in the Noise Chapter.
- 5.6.2 The following mitigation measures will be implemented to minimise environmental impacts relating to onshore noise:
  - Potentially noisy construction equipment and plant will be sited away from noise and/or vibration sensitive receptors, as far as reasonably practicable;
  - There will be a preference for the use of construction plant that will emit lower noise levels (such as plant fitted with effective silencers and noise insulation), as far as reasonably practicable; and
  - Where possible, works will limit the use of particularly noisy plant at certain times, i.e.
     do not use particularly noisy plant at night as far as reasonably practicable.
- 5.6.3 A multi-channel communication feedback strategy will be implemented. This will include advance notification of activities likely to generate perceptible noise or vibration, such as trenchless crossings. Notifications will be delivered through targeted communications for key receptors (e.g. residential dwellings) and accessible methods such as a project website. The strategy will ensure adequate notice periods, regular updates, and open channels for addressing community concerns, thereby establishing trust and reducing the likelihood of complaints.
- 5.6.4 Noise generated during the construction of the onshore elements of the project will be managed in accordance with BS 5228:2009+A1:2014 'Code of Practice for Noise and Vibration Control on Construction and Open Sites Part 1: Noise and Part 2: Vibration. This will ensure that noise levels do not exceed the criteria for a Significant Effect (in EIA terms) at any building authorised or lawfully occupied for residential or accommodation purposes at the date of the granting of planning consent, based on threshold values set out in BS 5228\*\*. To achieve this, measures such as appropriately sized acoustic barriers and/or lower noise construction equipment (as outlined in the EIAR) will be implemented, determined through detailed design and final construction equipment specifications. In the event of an emergency, deviations from these criteria may be necessary. \*\*Threshold values are defined in BS





5228:2009+A1:2014, Code of practice for noise and vibration control on construction and open sites. A Significant Effect (in EIA terms) is considered to occur where noise levels exceed these thresholds by more than 5 dB LAeq,T for a period of 10 or more days in any 15 consecutive days, or for a total number of days exceeding 40 in any 6 consecutive months when measured in accordance with BS 5228."

#### Landfall Site

- 5.6.5 The following mitigation measures will be implemented to minimise environmental impacts relating to construction activities at the Shanganagh Landfall:
- 5.6.6 A temporary 3.5 m high acoustic barrier (i.e. close boarded fence/plywood hoarding), will be installed around the southern and western perimeters of the Site. The barrier will remain insitu for the duration of the construction phase.
- 5.6.7 The following mitigation measures will be implemented to minimise environmental impacts relating to trenchless drilling techniques at the Shanganagh Landfall:
  - The use of shipping containers stacked two high, arranged in an L-shape around the drilling rigs, creating a temporary acoustic fencing with a total height of 5.2 m. This indicative configuration reduces direct noise transmission to nearby receptors by blocking line-of-sight noise propagation; and
  - A 3 m high acoustic barrier (i.e. close boarded fence/plywood hoarding) located around the pumping and mixing plant associated with drilling operations. The location of this barrier, provides targeted noise reduction for these specific sources.

#### Trenchless crossing locations

- 5.6.8 The following mitigation measures will be implemented to minimise environmental impacts relating to trenchless drilling techniques at the crossing location compounds:
  - 3 m high acoustic fencing (i.e. close boarded fence/plywood hoarding), will be located around the perimeter of the trenchless crossing compounds.

## 5.7 Traffic and transport

- 5.7.1 While the onshore export cable works will have only a temporary and limited impact on traffic during construction, localised traffic management will still be required to facilitate the installation of joint bays and the trenching/ducting for the cable. For further details on the construction activities relating to the onshore export cable route, refer to Volume 2, Chapter 6: Project Description.
- 5.7.2 During construction, the following measures will be implemented by the Contractor(s) to reduce the potential for impacts on traffic and transport during the construction phase (as outlined in the Transport Chapter):





- Trenchless techniques (HDD or DPM) will be used at the following road and transport infrastructure crossings to ensure that they remain open during the Dublin Array onshore infrastructure construction phase:
  - (TX-01) underneath the Dublin/Wexford railway line;
  - (TX-03) underneath the R119 Shanganagh Road/Killiney Hill Road Roundabout;
  - (TX-06) underneath the N11 at Loughlinstown;
  - (TX-07) underneath the M50; and
  - (TX-08) underneath the Glenamuck District Distributor Road (road currently in construction).
- During the construction phase, access to the proposed Landfall Site TCC will be via a proposed temporary access track from the public road. The proposed temporary access track has been designed to ensure that the heavy construction traffic will avoid around 300 m of the residential properties on Shanganagh Cliffs (a total of 34 properties directly fronting on to Shanganagh Cliffs);
- Only roads where the width of the carriageway is unlikely to permit one lane to be kept open will be temporarily closed to install the cable. These closures will be partial only, with access in both directions being ensured through the use of traffic management measures;
- Links where traffic management measures will be necessary are identified below. Where no traffic management is necessary these are included for information only (noting sector 7 does not include any roads and is therefore not included in Table 6).

Onshore ECR sector	Highway links followed or crossed by the Onshore ECR	Category	Traffic management required whilst onshore ECR construction works are taking place on this link
Sector 1	Bayview Glen	Local	Yes – temporary lane closure. Temporary traffic lights will be required.
	Bayview Crescent leading to Bayview Glade	Local	Yes – temporary lane closure. Temporary traffic lights required.
	R119 Shanganagh Road (crossing)	Regional	No – onshore ECR installed by trenchless technique underneath R119 (TX-03).
			Thereafter, the onshore ECR will be installed in the greenspace to the west of Shanganagh Road. No works

Table 6 Highways links where traffic management measures are necessary





Onshore	Highway links followed	Category	Traffic management required
ECR	or crossed by the		whilst onshore ECR construction
sector	Onshore ECR		works are taking place on this link
			will take place directly to Shanganagh
			Road.
	Achill Road	Local	Yes – temporary lane closure.
			Temporary traffic lights required.
Sector 2	Gleanntan	Local	Yes – temporary lane closure.
	Levelineterre Drive		Temporary traffic lights required.
	Loughinstown Drive	Local	Yes – temporary lane closure.
			this road
	Cherrywood	Local	Yes – temporary lane closure.
			Temporary traffic lights required.
Sector 3	N11 (crossing)	National	No – onshore ECR installed by
			trenchless technique underneath (TX- 06)
	R118	Regional	Yes – temporary lane closure.
			No temporary traffic lights required
			as R118 is dual carriageway in this
			sector.
	Cherrywood Avenue	Local	Yes – temporary lane closure.
			Temporary traffic lights required.
Sector 4	Consented Beckett Road	Local	Yes – temporary lane closure will be
			required to undertake the cable
			pulling during construction of the
			ECR.
	R118 (crossing)	Regional	No – onshore ECR installed
			of proposed Beckett Boad (note there
			will be lane closures on the R118 in
			Sector 3.
			Note, the R118 will remain open
			during this time as it is a dual
			carriageway in this section)
	M50 (crossing)	National/	No – onshore ECR installed by
		International	trenchless technique underneath (TX-
Contra 5			U/).
Sector 5		Local	res – temporary lane closure.
			remporary trame lights required.





Onshore ECR sector	Highway links followed or crossed by the Onshore ECR	Category	Traffic management required whilst onshore ECR construction works are taking place on this link
Sector 5	Golf Lane	Local	Yes – temporary lane closure. Temporary traffic lights required.
	R842 Glenamuck Road South	Regional	Yes – temporary lane closure. Temporary traffic lights required.
Sector 6	R842 Glenamuck Road South	Regional	Yes – temporary lane closure. Temporary traffic lights required.
	Glenamuck District Distributor Road (under construction) (crossing)	Regional	No – onshore ECR installed by trenchless technique underneath. (TX-08)

- A Travel Plan will be prepared prior to the start of construction works and will include a range of demand management measures including a target car share ratio during the construction stage;
- ▲ A CTMP will be developed for the construction phase. The CTMP sets out mitigation measures that would be suitable to apply during the construction phase prior to the commencement of the construction and during the construction phase. A planning stage CTMP is located in Annex A of this CEMP.

## 5.8 Cultural heritage (archaeology and monuments)

- 5.8.1 During construction, the Contractor(s) are required to implement the following mitigation measures as outlined in the Archaeology Chapter.
- 5.8.2 General requirements include:
  - Archaeology and cultural heritage will include details on archaeological mitigation and Written Scheme of Investigations (WSIs) following discussions with the relevant body/organisation(s). This will be supervised by a qualified and appropriately licensed Archaeologist.

## 5.9 Landscape and visual

- 5.9.1 During construction, the Contractor(s) are required to implement the following mitigation measures as outlined in the Landscape and Visual Chapter.
- 5.9.2 The following mitigation measures will be implemented to minimise environmental impacts relating to construction works at the substations:
  - Arboricultural works to be undertaken in accordance with BS3998: 2010 Tree work Recommendations (BS3998) by suitably qualified and insured contractors;





- The services of a suitably qualified arboriculturist will be retained for the duration of construction works where there is potential for trees to be affected, to support the implementation of all recommendations made;
- The appointed arboriculturist will be present and monitor any excavation works where roots within the precautionary zone/RPA of trees could be affected along the ECR;
- Prior to the commencement of construction works that could affect trees within a particular location along the onshore ECR, an Arboricultural Method Statement (AMS) will be developed for that location in accordance with BS 5837:2012;
- Key persons and contractors who will be working along the onshore ECR in areas where there is potential for impact on trees to occur, will receive training by the appointed arboriculturist (e.g. via a tool box talk) on commencement of the construction works. This training, as a minimum, will cover how trees are potentially damaged (above ground and below ground) and the specific protection measures confirmed within the AMS;
- Regular planning by the construction team and the Arboriculturist will be undertaken in advance of scheduled works to review the programme of work and to ensure damage by machinery is avoided to the RPAs the stems and branches of trees to be retained along the ECR;
- Under supervision from the arboriculturist, any severed roots will be pruned back with a clean cut and any exposed roots will be wrapped to prevent them from drying out. The wrapping will stay in place whilst the roots are exposed. Suitable material will be placed around the roots when the trench is back-filled. These works will be undertaken in line with section 7.2 of BS 5837:2012 (Avoiding physical damage to the roots during demolition or construction);
- The layout of the Clifton Park TCC, and the trenchless crossing compounds will be designed in liaison with the appointed arboriculturist. Where feasible, the layout of the TCC will aim to avoid the precautionary zones/RPAs and canopy spread of adjoining trees. The following measures will be applied, as appropriate:
  - Tree Protection Fencing: Where TCCs are located adjacent or in very close proximity to precautionary zones/RPAs, the TCC fencing (including noise barrier fencing), can be used in-lieu of tree protection fencing (as specified in BS5837:2012). Where this is used, appropriate signage identifying an exclusion zone for tree protection purposes will be displayed. Additional fencing may be required, as directed by the appointed arboriculturist.





- Ground Protection Measures: Where encroachment into the precautionary zones/RPAs is unavoidable, alternative protection arrangements such as ground protection (sufficient to protect the structure of the soil from compaction) may be required. This will be designed in accordance with the requirements of section 6.2.3 of BS5837:2012.
- Canopy Protection Measures: Above ground equipment (such as containers, drill rigs and noise attenuation fencing), will be arranged to avoid damage to the canopies of existing trees. Where this is not possible, pruning to facilitate access for plant and equipment may be required as advised by the appointed arboriculturist.
- The TCC at Eurofound which will facilitate the trenchless crossing to undertake the N11 crossing is located in proximity to several large high-quality trees. The following potential considerations will be addressed by measures in the AMS which will be informed by detailed design:
  - Ground compaction from the operation/storage of plant and machinery within the compound and along the access route into it. The AMS will specify suitable ground protection measures prior to any plant or machinery operating in this area;
  - Encroachment into the precautionary zone/RPA of some trees, due to the excavations at the HDD entry pit. The HDD bore itself is unlikely to impact on tree roots, as it will be buried more than 60 cm below ground within a short distance of the entry pit. The AMS will specify suitable root protection measures, should these be required; and
  - Above ground impact on the tree canopies, in particular due to the proposed noise attenuation fencing along the northern, western and eastern boundary of this TCC. The fencing can function as a protective barrier around the RPAs of trees if sited carefully). Suitable canopy protection measures will be confirmed within the AMS.
- Replacement planting will be undertaken in line with Table 6-2 of Appendix 6.5.7-2 Tree Survey Report. Replacement planting will be located in open green space that is under the control of DLRCC and will be agreed with DLRCC in advance of tree removal alongside the quantity, location, tree size and species to be used. The aim will be for replacement planting to be undertaken in the first planting season following the removal of each of the groups of trees upon completion of construction;
- The same details for tree planting which will be undertaken to replace existing trees at Eurofound and detail of the quantity, location, tree size and species to be used will be agreed with Eurofound in advance of any tree removal;





- New planting will consider the existing species mix present within the survey area in relation to both arboricultural and ecological considerations. New planting offers an opportunity to increase the species and age class diversity for a given area which can boost the resilience of the local tree stock in relation to pests, disease and climate change as well as providing a greater range of amenity and other benefits; and
- New trees will be planted in accordance with the minimum distances from new structures, services and surfacing set out in Table A.1 of BS 5837:2012. Tree stock selection, planting methods and planned maintenance will follow guidance as set out in BS 8545:2014 'Trees: from nursery to independence in the landscape.

## 5.10 Population and human health

- 5.10.1 During construction, the Contractor(s) are required to implement the following mitigation measures as outlined in the Human Health Chapter.
- 5.10.2 The following mitigation measures will be implemented to minimise environmental impacts relating to Human Health:
  - Construction Hours Restrictions will be implemented as described in Section 4.2;
  - The coastal path at the landfall site will be kept open and if necessary (for open cut works) a temporary diversion will be created;
  - A CTMP will be developed for the construction as discussed in Section 5.7;
  - Adequate security will be implemented to prevent, where practicable, access to working areas during construction works;
  - Ensuring that hazardous material used during the construction phase works shall be stored in a safe and secure manner whilst either waiting to be removed from site or waiting to be used;
  - Ensuring that hazardous material used during the construction phase works shall be stored in a safe and secure manner; and
  - Provision of temporary alternative paths where Public Right of Ways (PRoWs) are impacted from the development activities.

## 5.11 Material assets

- 5.11.1 During construction, the Contractor(s) are required to implement the following mitigation measures as outlined in the Material Assets Chapter.
- 5.11.2 The following mitigation measures will be implemented to minimise environmental impacts relating to Material Assets:





- ▲ Where works are required alongside or crossing a known utility infrastructure, precautions will be implemented by the appointed contractor to protect the infrastructure from damage, in accordance with the requirements of the utility companies; and
- Welfare facilities at construction sites will be provided with portable toilets which will be maintained by an approved contractor, and the waste will be disposed of to a licensed facility.





Annex A Construction Traffic Management Plan (CTMP)



## **Dublin Array Offshore Wind Farm**

## **Environmental Impact Assessment Report**

Volume 7, Chapter 8: Construction Transport Management Plan (CTMP)

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## Acronyms

Term	Definition
AIL	Abnormal Indivisible Load
СЕМР	Construction Environmental Management Plan
CSCS	Construction Skills Certification Scheme
СТМР	Construction Transport Management Plan
СТV	Crew Transfer Vessel
DLR	Dún Laoghaire Rathdown
DLRCC	Dún Laoghaire Rathdown County Council
Dublin Array	Dublin Array Offshore Wind Farm
ECR	Export Cable Route
EIAR	Environmental Impact Assessment Report
ECoW	Environmental Clerk of Works
EPA	Environmental Protection Agency
GCP	Grid Connection Point
GIS	Gas Insulated Switchgear
HDPE	High density polyethylene
HGV	Heavy Goods Vehicle
НWМ	High Water Mark
kV	Kilovolt
LGV	Light Goods Vehicle
0&M	Operations and Maintenance
OES	Onshore Electrical System
OSS	Onshore Substation
PSCS	Project Supervisor Construction Stage
тсс	Temporary Construction Compound
ТІІ	Transport Infrastructure Ireland
ТЈВ	Transition Joint Bay
TSO	Transmission System Operator
WWTW	Waste Water Treatment Works





## 1 Introduction

## 1.1 Purpose and scope

- 1.1.1 This report provides information in regard to the management of all site traffic with particular reference to environmental safeguards and mitigation required to address those impacts identified in the Environmental Impact Assessment Report (EIAR). Volume 5 Chapter 6 (Traffic and Transport) of the EIAR has been referenced where relevant.
- 1.1.2 The purpose of the Construction Transport Management Plan (CTMP) is to outline the areas for consideration when preparing the programme of works and when undertaking the construction of the onshore infrastructure.
- 1.1.3 The onshore infrastructure comprises the proposed Operations and Maintenance Base (O&M Base) at Dún Laoghaire Harbour and the Onshore Electrical System (OES). The OES comprises the Landfall Site, the Onshore Export Cable Route (onshore ECR), the Onshore Substation (OSS) and the final grid connection between the OSS and the existing 220 kilovolt (kV) substation in Carrickmines, referred to as the Carrickmines Grid Connection Point (GCP), together with temporary construction compounds (TCCs) to support the construction of the onshore infrastructure. Both the O&M Base and the OES are described in full in Volume 2, Chapter 6: Project Description (hereafter referred to as the Project Description Chapter).
- 1.1.4 This CTMP will be updated as necessary, acting as a 'living' document to ensure it is always current. Where the document is updated, it will clearly be noted as a variation. It will be the responsibility of the appointed Contractor to further update this CTMP prior to the commencement of the construction phase. The Contractor will be required to agree the contents of the CTMP with Dún Laoghaire Rathdown County Council (DLRCC) before the commencement of works on site. The Contractor will fully implement and maintain the CTMP throughout the construction phase.

## 1.2 Key considerations

- 1.2.1 This CTMP is the first stage of the requirement to manage and control all related traffic activity during the construction phase of the development. This CTMP contains the following information:
  - Section 2: Background;
  - **Section 3**: Site construction;
  - Section 4: Mitigation measures;
  - Section 4: Complaints and inquiries procedure;





- 1.2.2 The principal mitigation measures that the CTMP will cover may be summarised as follows:
  - ▲ Contractor responsibilities;
  - Signage;
  - Abnormal indivisible load (AIL) management; and
  - Onsite management.





## 2 Background

## 2.1 OES

- 2.1.1 The proposed onshore electrical system (OES) comprises all of the onshore electrical transmission infrastructure above the High Water Mark (HWM) associated with Dublin Array. This includes the transition joint bays (TJBs) at the Landfall Site at Shanganagh Cliffs, where the onshore export cables and offshore export cables will be joined together, the onshore export cables and a new onshore substation which will connect the electricity generated by the offshore wind farm to the national transmission network. The Dublin Array Offshore Windfarm (Dublin Array) onshore transmission infrastructure is cumulatively referred to as the OES.
- 2.1.2 The Applicant will construct all components of the OES, operate and maintain the infrastructure until the proving period has concluded at which time the ownership of all of the electricity transmission infrastructure from the offshore substation (OSP) to the OSS will be transferred to EirGrid to own, maintain, operate and decommission as the Transmission System Operator (TSO).
- 2.1.3 The following sections provide a description of the OES infrastructure components, and how they will be constructed.
- 2.1.4 The entire OES will be situated within the functional area of Dún Laoghaire Rathdown (DLR), extending in an east west direction from the Landfall Site at Shanganagh Cliffs to the Carrickmines GCP. The location of the proposed onshore infrastructure and the O&M Base illustrated in Figure 2.

## **TCC** locations

- 2.1.5 Three TCCs will be required for the duration of the OES construction works to accommodate the temporary storage of site offices, construction materials plant and equipment for the duration of the construction phase with an occupation period of up to 36 months. All TCCs will be removed at the end of the construction phase, and sites reinstated in consultation with DLRCC.
- 2.1.6 A number of smaller localised TCCs will be utilised during the construction phase along the onshore ECR, specifically at trenchless crossing point locations to ensure the health and safety of the public while work is underway.
- 2.1.7 The following locations have been identified and will be used for the duration of the construction of the onshore infrastructure:
  - Landfall Site adjacent to Shanganagh Cliffs;
  - Clifton Park; and
  - Leopardstown on the southern access to the Racecourse.



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## **OSS** location

- 2.1.8 The proposed OSS will be located within the former Ballyogan Landfill Facility on Ballyogan Road.
- 2.1.9 The OSS will comprise a new compound of transmission infrastructure including a Gas Insulated Switchgear building (GIS building), Statcom buildings, shunt reactors, harmonic filters and associated plant, equipment, control and protection systems. A full description is included in Volume 2 Chapter 6, Project Description.
- 2.1.10 An additional TCC for the construction of the OSS will be located within the proposed OSS site.

## **O&M Base location**

- 2.1.11 In order to service and maintain the offshore infrastructure, a storage and coordination facility is required (referred to in this document as the O&M Base). The O&M Base will act as a storage and loading area for small and medium spare parts for the wind turbines and small ancillary equipment such as tools and consumables.
- 2.1.12 The proposed development will provide offices and warehouse space together with berthing facilities for maintenance vessels (referred to as crew transfer vessels (CTVs)) associated with the offshore construction and operation and maintenance of Dublin Array.
- 2.1.13 The proposed O&M Base will be located on, and directly adjacent to St. Michaels Pier, within Dún Laoghaire Harbour.

## **Onshore Export Cable Route**

- 2.1.14 The onshore export cable route (onshore ECR) will run in an east to west direction between the TJBs at Shanganagh Cliffs to the proposed onshore substation (OSS) at Jamestown. The onshore ECR will predominantly follow the local road network within the extent of the road carriageway or adjacent soft verge in publicly accessible areas. The onshore ECR traverses the townlands of Shanganagh, Hackettsland, Ballybrack, Loughlinstown, Cherrywood, Glebe, Laughanstown, Carrickmines Great and Jamestown. Some sections of the onshore ECR traverse privately owned agricultural lands. This is detailed further in the following sections.
- 2.1.15 The onshore ECR between the TJBs and the OSS has been subdivided into seven sectors and a description of each one is set out below and is detailed further in Volume 2, Chapter 6: Project Description.





Sector No.	TX <sup>1</sup> No.	Key locations	Chainage in the planning drawings (east to west)
1	TX-01 TX-02 TX-03 TX-04	Shanganagh Cliffs Dart/Railway Line Clifton Park / Shanganagh River Bayview Shanganagh Road Achill Road	0 – 950 m
2	TX-04 TX-05	Loughlinstown Linear Park Gleanntan Loughlinstown Drive (L1067) DLRCC Parks Depot Eurofound	950 m – 2,000 m
3	TX-06	Cherrywood Park Wyattville Road (R118)	2,000 m – 2,950 m
4	TX-06 TX-07	Cherrywood Avenue Beckett Road Kilternan Link Road	2,950 m – 5,750 m
5	-	Golf Lane	5,750 m – 6,150 m
6	TX-08	Glenamuck Road South (R842) Glenamuck District Distributor Road	6,150 m – 6,350 m
7	TX-08	Carrickmines Great Jamestown	6,350 m – 7,050 m

#### Table 1 Onshore ECR sector breakdown

- 2.1.16 The proposed onshore ECR will consist of two separate three-phase 220 kV circuits, each installed in their own parallel underground trench along the 7.4 km route. Each circuit will require associated underground infrastructure, which have been described further in the subsequent sections. This infrastructure includes;
  - Onshore export cables;
  - Joint bays;
  - Link box chambers;
  - Communication chambers and associated communication cables;
  - High density polyethylene (HDPE) cable ducts; and
  - Transition chambers.



 $<sup>^{\</sup>scriptscriptstyle 1}$  TX refers to the locations of the trenchless crossings



2.1.17 The majority of the proposed infrastructure described along the onshore ECR will be installed underground through either standard open-cut trenching or trenchless techniques (horizontal directional drilling (HDD) or similar). There will be manhole inspection covers flush with the existing surface level to access the link box chambers and communication chambers co-located with each joint bay. On private lands there will be short sections of new access tracks constructed to allow EirGrid (the future asset owner) to access the joint bay locations for inspections and maintenance.



Figure 1 Example image of cable ducts in a trench in the road arranged in trefoil formation, with telecommunication ducts positioned above







Figure 2 Location of proposed onshore Infrastructure<sup>2</sup>

# 2.2 Local highway description/proposed construction traffic access routes

- 2.2.1 The following section is set out as follows:
  - Landfall TCC;
  - Clifton Park TCC;
  - Leopardstown TCC;
  - Onshore Substation (OSS); and
  - Operations and Maintenance (O&M) Base

<sup>&</sup>lt;sup>2</sup> (Extract from drawing "229100714-MMD-00-XX-DR-C-0100 Overall Site Location Map in Geographical Context)





## Landfall TCC

2.2.2 The following section sets out the proposed construction access route to the Landfall TCC.

#### N11

2.2.3 The N11 is a primary road which extends south from Dublin towards Wexford where it changes to the N25. In Dublin the N11 is a dual carriageway which extends south from the junction with the N31 Mount Merrion Avenue; the N11 becomes the M11 just to the north of Shankill.

#### **R837 Dublin Road**

- 2.2.4 The R837 Dublin Road is a single carriageway road which links from the N11 at Loughlinstown to the R119 at Shankill. For the most part it features footway provisions on both side of the carriageway, with the exception of a distance of around 200 m at it its northern end, where the footpath is on the eastern side only. R837 Dublin Road is fully illuminated and mostly free of obstructions such as street furniture or vegetation. Pedestrian crossing points along the route are characterised by dropped kerbs and tactile paving.
- 2.2.5 The road also features a cycle path running both directions which for the most part is located in the main vehicle carriageway, with the exception of the last 100 m at the north end of the road which is grade separated. The road is subject to a speed limit of 50 kph.
- 2.2.6 A range of frequent bus services can be accessed along the R837 providing connections to various destinations.

#### R119 Shanganagh Road

- 2.2.7 The R119 is a single carriageway road which links from the R761 close to Woodbrook College north to Dún Laoghaire and then west towards the N31.
- 2.2.8 The R119 features footway provisions on both sides of the carriageway on its wider sections towards Shankill and at major junctions along its route. On other sections, footways are provided on only one side of the carriageway. The footways were observed to be well-lit and mostly free of any obstructions from street furniture or vegetative growth. Pedestrian crossing points along the route are characterised by dropped kerbs and tactile paving.
- 2.2.9 The R119 north of Shankill has no cycle lanes in place and is subject to a speed limit of 50 kph.
- 2.2.10 A range of frequent bus services can be accessed along the R119 providing connections to various destinations.





#### Rathsallagh Drive

- 2.2.11 Rathsallagh Drive is a local road located to the west of the Landfall Site. The road features footways on both sides for most of its length, setback from the carriageway by grass verge. It provides access to Scoil Mhuire Catholic Primary School and a raised table, signalised pedestrian crossing is provided adjacent to the school access. There is also a raised table on the approach to the convenience store. On-street car parking bays are provided on the eastern side of the carriageway, as well as designated bays outside the shop, with on street parking occurring on the western side.
- 2.2.12 Rathsallagh Drive also provides access to the Shankill Railway Station car park, which has space for 100 vehicles and 40 bicycles. Travelling towards Shanganagh Cliffs, there is traffic calming in the form of build outs and a raised table signalised pedestrian crossing is located just to the south of the junction with Shanganagh Cliffs.
- 2.2.13 A bus route and local bus service 45B also utilises this road, with a bus stop being provided within the vicinity of the railway station.

#### Shanganagh Cliffs

- 2.2.14 Shanganagh Cliffs is a residential street close to the coast on the eastern side of Dublin. It provides access to a number of residential streets, to Shanganagh Waste Water Treatment Plant (WWTP) and the football pitches which abut the residential estate. Shanganagh Cliffs features footway provisions on both sides of the carriageway with a grassed buffer in between footway and carriageway. The footways integrate with existing footpaths within the area.
- 2.2.15 The construction access route to the Landfall TCC is set out in Figure 3.

## **Clifton Park TCC**

- 2.2.16 The Clifton Park TCC will be used for the duration of the onshore ECR construction phase. It would be accessed the same way as the Landfall Site i.e. N11/R837 Dublin Road/R119 Shanganagh Road/Rathsallagh Drive. However, instead of using the Shanganagh Cliffs local residential road, the last section of the construction access route would continue along Rathsallagh Drive until the point where it joins Clifton Park.
- 2.2.17 The construction access route to the Clifton Park TCC is set out in Figure 4.

#### Leopardstown TCC

- 2.2.18 The Leopardstown TCC will be used for the duration of the onshore ECR construction phase. It would be accessed from Junction 15 of the M50 at Carrickmines. Access would then follow the Leopardstown Access Road.
- 2.2.19 The construction access route to the Leopardstown TCC is set out in Figure 5.





## Onshore Substation (OSS)

- 2.2.20 The following section sets out the planned access route to the site of the proposed OSS and the temporary construction compound that will be located there to support the construction of the OSS.
- 2.2.21 The OSS will be accessed during the construction and operational phase directly from Junction 15 of the M50 at Carrickmines. Vehicles would then use Ballyogan Road which extends west from the Carrickmines South roundabout, immediately south of junction 15. The Luas Tram stop of Ballyogan Wood is located approximately 500 m west of the junction on the northern side of Ballyogan Road.
- 2.2.22 There are pedestrian footways on both sides of the road along with cycle lanes. As well as the Luas tram there are bus services that operate along the road.
- 2.2.23 The construction access route to the OSS is set out in Figure 6.

## The Operations and Maintenance (O&M) Base

2.2.24 The following section sets out the construction access route to the O&M Base at Dún Laoghaire Harbour. Access would be taken from the N11 at Stillorgan, followed by the N31 and R119 before following the LRN into Dún Laoghaire Harbour. Traffic leaving the O&M Base would be routed west bound along the N31, which is one-way in this section along Seapoint Avenue.

#### N31

- 2.2.25 The N31 is a national road which extends from Dún Laoghaire Harbour west to connect to the N11. At the signalised junction with the N11 at Stillorgan the N31 heads northeast for approximately 1.5 km along Mount Merrion Avenue before reaching the signalised junction with the R118 opposite Blackrock Park.
- 2.2.26 Mount Merrion Avenue is a 50 kph single carriageway road which accommodates 2-way traffic and a bus lane on alternative sides. There are wide 2.5 m footways along both sides of the road and frequent signalised pedestrian crossings; the southern footway is a shared cycleway/footway for the last 700 m as the road heads west. The N31 in this location serves a number of large residential properties set back from the road and a number of small businesses.
- 2.2.27 From the signalised junction opposite Blackrock Park, the N31 becomes a dual carriageway road through Blackrock, with two lanes in each direction with several right turn lanes and left turn filter lanes. There is a cycle lane on each side of the road adjacent to the footway. There are pedestrian crossing facilities at every signalised junction and wide footways on both sides of the road.





#### R119

- 2.2.28 From the N31/R119 junction at Temple Hill the R119 extends east as Monkstown Road, a single carriageway road and is subject to a 50 kph speed limit. There are cycle lanes on each side of the road up to Monkstown where the R119 becomes Monkstown Crescent. From here the road supports on-street parking with no cycle lanes. Monkstown Crescent becomes Longford Place, leading east into Cumberland Street. These are all the R119.
- 2.2.29 There are signalised pedestrian crossings through Monkstown and in various locations on sections of the R119 east and west of Monkstown.
- 2.2.30 At the junction with York Road, the R119 heads north towards the harbour to connect with the N31 at Clarence Street. The R119 along Cumberland Street supports a range of retail businesses and number of residential dwellings that front the footway. There are footways long both sides.

#### Construction traffic leaving O&M Base

2.2.31 Upon leaving the O&M Base construction traffic would turn right on to Harbour Road before joining the N31 at Crofton Road. The first 2.5 km section of the N31 is one-way in a westerly direction following Seapoint Avenue. This section runs between residential properties, restaurants and hotels with the coast directly to the north. There is a two lane cycleway which runs along this length and there are footway along both sides of the road.

#### Dún Laoghaire Harbour

- 2.2.32 As above, the O&M Base is to be located at Dún Laoghaire Harbour, with access from Harbour Road. Harbour Road extends for 500 m east from the junction with the R119 towards the entrance to the harbour and the roundabout junction with Queens Road. The railway track to Dun Laoghaire (Mallin) Station runs parallel to the south of Harbour Road.
- 2.2.33 Harbour Road is a single carriageway road with two lanes of traffic and footpaths along both sides. In the vicinity of this area there are two pedestrian crossings in the form of zebra crossings. There is a signalised pedestrian crossing adjacent to the harbour. The construction access route to the O&M Base is shown on Figure 7.














### 3 Onshore infrastructure construction

### 3.1 Construction programme

- 3.1.1 The installation of the onshore infrastructure, excluding surveys and site preparation, is anticipated to take approximately 36 months and onshore construction is likely to commence in advance of the offshore construction program. It is likely that the latter part of the onshore program will be concurrent with offshore construction operations. For further information on the high level construction programme and activities, refer to Volume 2, Chapter 6: Project Description.
- 3.1.2 The most intense activity during the onshore construction stage of the project will be at the OSS albeit there will be significant activities for shorter durations at the special crossings for the onshore ECR route. Construction of the OSS is likely to start early in the overall construction programme (Table 2) and works will continue in different Sectors until the wind farm and complete electrical system has been commissioned.
- 3.1.3 The largest concentration of construction staff will be at the OSS site, and this will peak at later stages of the construction programme when it is likely that there will be up to approximately 75 staff on site.
- 3.1.4 The standard hours of work will be between 07:00 19:00 Monday to Friday and 08:00 14:00 on a Saturday.
- 3.1.5 Construction will occur during normal construction working hours, with the exception of works associated with the major trenchless crossings for the offshore cable installation and the onshore ECR (TX-01, TX-06 and TX-07) which will typically occur 24 hours per day, seven days per week for defined periods within the construction programme, if the need arises in the interest of safety and efficiency, non-standard hours may be required as agreed with DLRCC.





#### Table 2 Overview of typical construction programme for the Onshore Electrical System works

Activity		Y1			Y2				Y3			Y4				
Αςτινιτγ	Q1	Q2	Q3	Q4												
Landfall Site	1						1									
Site preparation																
Installation of offshore export ducts at Landfall (trenchless installation)																
Onshore ECR activities (incl. TJBs)																
Cable pulling and jointing (onshore & offshore)																
Demobilisation & reinstatement																
Duct laydown and assembly area																
Onshore export cable route																
Cable ducts and JB installation (including trenchless crossings)																
Cable pulling & jointing																
Commissioning																
Landfall Site TCC																
Clifton Park TCC																
Leopardstown TCC																
Onshore substation																
Site preparation																
Civil works																
Electrical works																
Commissioning																
OSS TCC																





#### Table 3 Indicative O&M construction schedule

Construction	Activity	Approximate
phase		timeline
Site Preparation	Erection of temporary site fencing & hoarding;	8 weeks
	Erection of site offices;	
	Location of onsite services.	
Demolition	Demolition of RoRo ramp structures, concrete towers and	12 weeks
	levelling;	
	Demolition of existing Harbour Maintenance Building;	
	Demolition of elements of the existing fender structure;	
	Clearance of existing surface on St. Michael's Pier.	
O&M Building	Construction of new concrete pavement at the location of	78 weeks
	the demolished RoRo ramp;	
	Construction of new foundations for O&M building;	
	Construction of new O&M building including all civil	
	elements (drainage, etc.);	
	Construction of new substation building, including laying all	
	electrical cables for the development;	
	Installation of floating pontoon and access gangway;	
	Erection of site O&M Base fencing, secure access gates,	
	lighting masts and site CCTV;	
	Installation of pontoon infrastructure & fit out for services.	
O&M Building	Fit out of structures – O&M building, proposed substation	24 weeks
	and pontoon.	
Final	Commissioning of all structures and demobilising from site.	4 weeks
Commissioning		
Total Build Period		126 weeks





### 3.2 Onshore infrastructure construction traffic generation

- 3.2.1 There will be a range of vehicles requiring access to the onshore infrastructure throughout the construction phase of Dublin Array, including construction vehicles associated with the construction of the onshore ECR. These will include Heavy Goods Vehicle (HGVs) for the delivery of construction materials and equipment, construction plant (such as excavators, bulldozers, cranes) as well as cars and vans for use by construction staff.
- 3.2.2 Based on the construction access routes set out in Section 2, the total construction traffic by link (Average Annual Daily Traffic) is presented in Table 4. Further details of the links in the table are presented in Volume 5, Chapter 6: Traffic and Transport of the EIAR.

Link	Total	HGVs
Rathsallagh Drive	98	69
Ballyogan Road	169	31
R842 Link Road Between M50 J15 and		
Glenamuck Road North	63	14
Carrickmines Luas P&R Access	0	0
Grand Parade	15	0
N31 Harbour Road	44	14
7 - Marine Road	6	0
Glenamuck Road (R842)	39	14
R118 Wyattville Road (Westbound		
between Valley Drive and M50)	46	34
R118 Wyattville Road (between the		
junction of L1065 and N11)	28	14
Loughlinstown Drive	28	14
L1065 Wyattville Road	28	14
Shanganagh Road (Between junctions		
with Commons Road and Killiney Hill		
Road)	28	14
Shanganagh Cliffs	91	69
Shanganagh Road Between R119 Main		
Street and Rathsallagh		
Drive/Shanganagh Wood)	83	69
R837 Dublin Road	83	69
N31 Between Stillorgan Road and Rock		
Road, Blackrock	23	14
N31 Frascati Road	29	14
R119 Monkstown Road	29	14
R119 Cumberland Street	29	14

Table 4 Total construction traffic by link (AADT)





#### Table 5 Estimated trip generation OSS construction

Item	2-Way trips (daily)
HGV peak daily movements	31
Average car and van movements	138
Total	169





### 4 Construction Traffic Management

- 4.1.1 This section outlines the approach to managing traffic on the road network during the construction of the onshore infrastructure. The appointed Contractor will be responsible for further refining the Construction Traffic Management Plan (CTMP) before work begins, ensuring alignment with the commitments set out in the EIAR and any conditions attached to the planning consent. The CTMP will be maintained as a 'Live Document' to accommodate adjustments in response to any updates in the construction schedule or operational requirements.
- 4.1.2 The Contractor will establish and implement a monitoring framework to assess the effectiveness of the mitigation measures set out in the CTMP, ensuring that traffic impacts are appropriately managed.
- 4.1.3 Prior to undertaking any works on public roads, the Contractor will obtain a road opening licence from the relevant road authority, such as Dún Laoghaire Rathdown County Council (DLRCC), the emergency services or Transport Infrastructure Ireland (TII). The Contractor will adhere to all conditions and restrictions specified as part of the licence approval.
- 4.1.4 During the construction phase, a project website will be regularly updated with project news to provide the latest information to the community. In relation to the traffic movements associated with the site, the website will be kept up to date.

### 4.2 Contractor responsibilities

- 4.2.1 Contractors with experience of working on the installation of underground high voltage cables similar to the proposed and in this type of environment will be appointed following a competitive tendering process.
- 4.2.2 All contractors will be required to supply detailed method statements which will incorporate all planned mitigation methods. All sub-contractors are required to read, understand, and adopt all procedures outlined within this construction traffic management plan.
- 4.2.3 Where sub-contractors utilise a separate CTMP for their own work activity, this must be issued to the Project Supervisor Construction Stage (PSCS) for information. Any traffic management procedures required to secure a work area or safeguard subcontractor operatives must be co-ordinated with the PSCS (e.g. use of banksmen, operatives carrying out works roadside etc.).
- 4.2.4 The PSCS must be informed of any planned site activity and movement of site traffic and the issue of this information must be received within a suitable and agreed timescale to allow co-ordination of other site activities.





### 4.3 Signage

- 4.3.1 Any signage required on the public highway will be erected and positioned in consultation with the Roads Authority.
- 4.3.2 Warning signage on site must be complied with at all times. The two most important signs are "no entry" and "no unauthorised vehicles". To proceed beyond these signs, vehicle drivers must stop and contact the ganger/foreman in control of the area to be escorted through the local area.
- 4.3.3 General information signage to inform road users and local residents and communities of the nature and locations of the works should also be included in traffic management signage near site compounds and any works areas. This should include project contact details.

### 4.4 Abnormal Indivisible Load (AIL) management

- 4.4.1 Abnormal Indivisible Loads (AILs) would only be necessary during for delivery of transformers to the OSS. All other elements of the onshore infrastructure would be constructed using conventional HGV loads.
- 4.4.2 Access to the OSS site on Ballyogan Road would be taken from the M50 directly into the OSS site off Ballyogan Road. No road modifications are deemed necessary to facilitate the deliveries. The necessary consents and permits would be obtained in advance of any works or delivery periods.
- 4.4.3 The haulage contractor will remain responsible for obtaining all necessary permits from the relevant road and bridge authorities along the access route.
- 4.4.4 The movement of abnormal loads will need to be timed to avoid periods of heavy traffic flow to minimise disruption to the public. These include the normal daily rush hour periods, Saturdays and major public events. Specific timing restrictions imposed by the police or local authority have not been determined at this stage.
- 4.4.5 Through urban areas temporary parking restrictions may be necessary to guarantee a clear route for the abnormal loads, and these need to be arranged in advance through the appropriate local authority. The parking restrictions will need to be locally enforced.
- 4.4.6 Due to the size of vehicles required to transport these loads, escorts will be required for the entire route to control oncoming and conflicting traffic. There are two permit systems to authorise for the movement of abnormal load transport configurations, The Garda permit and a Local Authority Permit.

### Garda permit

- 4.4.7 The Garda permit applies only to designated major inter-urban routes and routes to the main ports at Dublin, Rosslare and Cork, including the facility in Ringaskiddy. The Garda permit is set out by the following Department of Transport legislation:
  - S.I. No. 147/2009 Road Traffic (Specialised Vehicle Permits) Regulations 2009; and





- S.I. No. 461/2010 Road Traffic (Specialised Vehicle Permits) (Amendment) Regulations 2010.
- 4.4.8 The Garda Permit applies to transport configurations not exceeding 27.4 metre (m) in length and 4.3 m in width and 4.65 m in height.
- 4.4.9 The combined weight of the vehicle and load must not exceed the maximum limits set out in S.I. No. 5/2003 - Road Traffic (Construction and Use of Vehicles) Regulations 2003 and the maximum height limit as per S.I. No. 366/2008 – Road Traffic (Construction and Use of Vehicles) (Amendment) Regulations 2008 (Department of Transport).

#### Local Authority Permit

- 4.4.10 A Local Authority Permit is required for all roads, (including roads designated under the Road Traffic (Specialised Vehicle Permits) (Amendment) Regulations 2010 for Garda Permits, for vehicles and loads which do not qualify under the Garda Permit Scheme, and in either or all of the following cases:
  - The weight and dimensions of the vehicle exceed the maximum permissible limits set out in the Road Traffic (Construction & use of Vehicles) Regulations 2003, as amended; and/or
  - The vehicle/load exceeds 4.65 m in height.
- 4.4.11 The access study has identified the transport configurations for the most onerous infrastructure components, transported by a specialist vehicle fleet. The maximum height relates to the design standards for bridges and structures over roads in Ireland.

### 4.5 Onsite management

- 4.5.1 The appointed Contractor will be responsible for ensuring the safe and efficient management of construction-related traffic throughout the project. This will require executing the works with due skill, care, and diligence, while proactively overseeing activities to prioritise the safety and well-being of personnel involved in the construction process. Continuous assessment of each phase of work will be undertaken to maintain safe access and operational efficiency.
- 4.5.2 Should any issues arise regarding construction traffic management on-site, the measures set out in this plan will be reviewed and revised as necessary. The Contractor will ensure full compliance with industry best practices, relevant codes of practice, statutory regulations, and all required consents.

### Onsite safety

4.5.3 All personnel entering the working area will wear appropriate hi-visibility clothing, head protection, safety footwear, eye protection and gloves at all times when outside of a vehicle.





4.5.4 Everyone required to work within the onshore infrastructure construction site will be made aware that they have a responsibility for the safety of themselves and others. All site operatives and visitors have a "duty of care" to themselves and others and need to be conscious of the surroundings and ongoing activities locally. In the event of an emergency, right of way to all emergency services will be given at all times. Emergency services and control of access will be carried out in compliance with the site emergency procedures.

### Site management of construction vehicles

- 4.5.5 The Contractor will be responsible for the safe and efficient management of site-related traffic throughout the construction phase. This will involve carrying out the works with appropriate skill, care, and diligence while actively overseeing operations to prioritise the safety and well-being of all personnel involved. Each aspect of the works will be continuously assessed to maintain safety and accessibility at all times.
- 4.5.6 If any issues arise concerning construction traffic on-site, the measures set out in this plan will be reviewed and amended as necessary. The Contractor will ensure that all activities adhere to industry best practices, applicable codes of practice, statutory requirements, and all relevant consents.

#### Parking

- 4.5.7 Parking areas located at the onshore infrastructure construction site compound will have safe and secure barriers to segregate all personnel from site plant and vehicle routes. All signage within designated parking areas must be followed, with no vehicles parked in a way which restricts either vision or access. No parking whatsoever will be allowed on public roads; all cars that are directed to the site parking area will be required to reverse park to comply with the PSCS' requirements.
- 4.5.8 A Travel Plan will be prepared by the Contractor prior to the start of construction works and will include a range of management measures including a target car share ratio for workers.

#### Visitors

4.5.9 All visitors to the site must first report to the identified main compound office for induction and sign-in. Upon arrival, they will be directed to the designated parking area within the compound. Visitors must remain under supervision at all times while on-site and are required to sign out upon departure. If access to additional locations is necessary, visitors will be accompanied accordingly.

#### Plant and equipment

4.5.10 The Contractor will ensure that all plant, equipment, and vehicles used during the works are operated by suitably competent personnel. The CTMP will include details on the following items;





- Procedures for the safe movement of plant and equipment within the site, including designated haul routes and speed limits;
- Requirement for trained, licensed, and competent personnel to operate plant and machinery (in possession of the appropriate Construction Skills Certification Scheme (CSCS) card);
- Measures to separate plant operations from pedestrian zones, including physical barriers, designated walkways, and warning signage;
- Procedures for minimising reversing movements, use of banksmen, and designated turning areas to reduce risk;
- Protocols for dealing with plant breakdowns, ensuring minimal disruption and maintaining site safety; and
- Actions to be taken in case of plant-related incidents, including fire, mechanical failure, or accidents.

#### Onsite tracks

- 4.5.11 Access tracks will be monitored daily to identify any deterioration of the track condition. Nonemergency remedial works to the track will be carried out at times outside peak times of usage and significant emergency repairs, if needed, will be undertaken immediately and adjacent track sections will be restricted from use as required to safely accommodate works.
- 4.5.12 All routes will be monitored for dust and control or suppression methods will be deployed as appropriate using towed dust suppression systems.

### TCC site traffic

- 4.5.13 All traffic visiting the TCC sites will be required to report to the gatehouse where they will obtain clear instructions before further movement is acceptable. If applicable an induction will be completed, vehicle permits will be issued, and the site rules and emergency procedure will be explained.
- 4.5.14 All traffic will use the signed site passing places and all drivers will accommodate other track users in a courteous manner. Reversing (other than to park) within the compound areas will not be permitted.
- 4.5.15 Full time site traffic (vehicles/plant situated onsite for majority of construction phase) that requires re-fuelling will follow the instructions supplied at their induction and the guidelines within their method statement for the works.





4.5.16 Heavy site traffic will be equipped with audible reversing warning with additional visual aids e.g., reversing cameras, mirrors utilised on all plant. All safety features must be inspected daily with faults immediately reported to the Foreman Fitter who will assess and repair any damage etc. to the plant. Drivers will ensure that all loads are covered fully to limit the loss of material in transit.

### Road and vehicle cleaning

- 4.5.17 The Contractor will ensure that road sweeping is undertaken to remove any project related dirt, debris and material deposited on the surrounding road network and along the haul route by construction/delivery vehicles. Road sweepers will dispose of material following sweeping of the road network, to a licensed waste facility.
- 4.5.18 A wheel and body wash will be operated within the TCCs to ensure materials from the construction of the onshore infrastructure are not transferred onto the road network, and road cleaning will take place when required to remove any deposits that are carried from the specific work site. It is anticipated that any road cleaning activities will remain local to the site access.

### Driving and speed restrictions

- 4.5.19 All vehicles (cars, light good vehicles (LGVs), HGVs and AILs) shall be driven in a safe and defensive driving manner at all times within speed limits. A zero-tolerance policy shall be adopted by all contractors, such that any infringement results in that person not returning to site.
- 4.5.20 All cars, construction vehicles and drivers of such vehicles accessing the onshore infrastructure construction site whether for commuting or commercial purposes must be road-worthy and legally compliant.





### 5 Complaints and inquiries procedure

- 5.1.1 It is important that members of the public or interested parties are able to make valid complaints or inquiries about the transport elements of the construction works. Such complaints and inquiries can provide a valuable feedback mechanism which helps reduce potential impacts on sensitive features and will also allow the construction techniques to be refined and improved.
- 5.1.2 The PSCS will appoint a site manager, and it is anticipated that any complaints and/or inquiries would be made directly to the site manager. These complaints will then be fed back to other sub-contractors as required. Contact details for the Site Manager, will be made clearly visible at the site entrance of the three main TCCs. The details will also be provided to DLRCC for their notice boards and websites.
- 5.1.3 All complaints and inquiries will be logged promptly by the site manager and kept on site for review by the Local Authority upon request. The contact details are to be included in the CTMP as shown in Table 6.

Name	Position	Contact Number(s)	Email
ТВС	Site Manager	ТВС	ТВС
ТВС	Site Contractor	ТВС	ТВС
ТВС	Planning Department	ТВС	ТВС

#### Table 6 Contact details

### 5.2 Checking and corrective action

- 5.2.1 As outlined above, it is intended for the CTMP to be a 'live document' which is updated periodically as and when required. The PSCS will be responsible for establishing a programme for monitoring the identification and management of issues, the results of which shall be fed back for inclusion within the CTMP if necessary.
- 5.2.2 Any checking or corrective action required will also be monitored. This methodology will ensure that the construction activities are being undertaken in accordance with the CTMP and that the Contractors are held to account. The procedure for addressing nonconformance/compliance and ensuring that corrective actions are undertaken is outlined below:
  - Completion of a Non-Conformance Report this will record any traffic-related incident and work that has not been carried out in accordance with the CTMP or Method Statement;
  - Completion of a Corrective Action Report this will record any identified deficiency as a result of monitoring, inspection, surveillance and valid complaint; and
  - Action Any necessary actions identified as a result of the above will be allocated to a responsible person, along with a timescale for the action to be undertaken.





5.2.3 Records of the above will be retained by the Contractor throughout the construction process. The records will be maintained either in hard copy or electronically in such a manner that they are readily identifiable, retrievable and protected against damage, deterioration or loss.





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Annex B Construction activities and water pollution issues with measures for the management and control of water (From CIRIA C648, Control of Water Pollution from Linear Construction Projects)

Construction	Measures for the management and control of water.			
activities and water				
pollution issues				
Chemicals, Fuel Storage and Refuelling	<ul> <li>Chemicals and Fuel:         <ul> <li>Delivery arrangements for bulk materials, fuel, oils; and</li> <li>Chemicals etc will be discussed with the key suppliers and, where appropriate, with subcontractors and agree emergency procedures.</li> </ul> </li> </ul>			
	Fuel Storage:			
	<ul> <li>Fuel Storage:</li> <li>Wherever possible, fuel storage areas will be located: <ul> <li>Well away from sensitive receptors (watercourses, aquifers, drains etc) - at least 50 m from a spring or borehole and 10 m from a watercourse or drain;</li> <li>On level ground;</li> <li>On an impermeable base – concrete slab or other areas of hardstanding;</li> <li>Under cover to prevent damage from the elements</li> <li>In secure areas;</li> <li>Well away from moving plant, machinery and vehicles; and</li> <li>Containers used to store materials such as fuel, hydraulic oils, chemicals, solvents etc must be fit for purpose and of sufficient</li> </ul> </li> </ul>			
	<ul> <li>strength and structural integrity to ensure that they will not fail or leak. All containers will be stored upright and clearly labelled with capacity and contents (in accordance with COSHH) and appropriate hazard warning signs displayed. Consideration will also be given to additional protection arrangements such as bunded storage areas or the use of drip trays.</li> <li>As part of the emergency plan, establish and maintain an up-to-date inventory of the type of product stored/used and the quantity available</li> </ul>			
	on site, including details of:			
	<ul> <li>Product type;</li> <li>Toda neuron</li> </ul>			
	<ul> <li>Irade name;</li> <li>IIN number;</li> </ul>			
	<ul> <li>Maximum quantity stored:</li> </ul>			
	<ul> <li>Location of material on site; and</li> </ul>			
	<ul> <li>Material safety data sheet (MSDS) or COSHH assessment.</li> </ul>			
	Any potentially hazardous wastes, such as waste oil, chemicals and			
	preservatives, must be stored in sealed containers. The materials will be			





Construction	Measures for the management and control of water.
activities and water	
pollution issues	
	stored in designated areas that are isolated from surface water drains or open waters. Skips need to be closed or covered to prevent materials being blown or washed away and to reduce the likelihood of contaminated water leakage. Any waste material will be collected by a registered waste carrier.
	Refuelling: Integrally bunded fuel tanks will be used at the site compounds during construction to store fuel. Bunded mobile bowsers fitted with fuel-dispensing equipment will be used for the refuelling of plant along the route. The mobile browsers will be refuelled at the main site construction compounds. Fuel stores and refuelling equipment, including tanks and mobile bowsers, will be visually inspected regularly for signs of spillages, leaks and damage during use. A record will be kept of these inspections and any improvements needed, which will be carried out immediately. Only designated trained and competent operatives will be authorised to refuel plant on site.
	well as dealing with an emergency incident. Emergency spill kits including absorbent materials such as sand, spill granules, absorbent pads and booms will be kept at each work site, on plant working near water and particularly at refuelling areas and where fuel or oil is stored. A spill response procedure will be set up and staff trained to deal with spillages including the use of spill kits.
Site Compounds (for TCCs and trenchless crossings)	<ul> <li>The following measures will be followed when siting compounds:</li> <li>Locate the compound away from watercourses (including ditches) and aquifers;</li> <li>Avoid locations that are designated conservation areas; and</li> <li>Site compounds will be secured against unauthorised access and all fuel storage will be secured to ensure that no vandalism results in the uncontrolled release of any fuels.</li> </ul>
Dewatering	<ul> <li>Dewatering is the process by which water is removed either from the ground or from within an excavation. Dewatering covers a range of situations and processes, but is typically applied when: <ul> <li>The water table is lowered to allow a wide or deep excavation to take place in "dry" conditions;</li> <li>An excavation extends below the water table and groundwater seeps in, requiring removal;</li> <li>Rainfall or surface water runoff has to be removed from open excavations; and</li> <li>Works need to take place in water and the area is sealed off and pumped out.</li> </ul> </li> <li>Pumped water will need to be disposed of to a grassed area for infiltration, a watercourse, a surface water drain or to a foul sewer without causing pollution.</li> </ul>





Construction	Measures for the management and control of water.
activities and water	
pollution issues	
	Submersible pumps can generate more sediment through water
	turbulence. Silt generation can be reduced by:
	<ul> <li>Using a corner of the excavation will be used as a sump and care</li> </ul>
	taken to avoid disturbing that corner;
	<ul> <li>Simple additional measures can be taken to reduce unnecessary</li> </ul>
	sediment generation such as placing the pump in a perforated
	oil drum, a short length of wide-bore perforated pipe or
	concrete manhole rings containing granular fill; and
	<ul> <li>Alternative methods include the holding the pump off the base</li> </ul>
	of an excavation
Trenchless Drilling	Trenchless techniques such as horizontal directional drilling or similar
Techniques	techniques are used to avoid direct works in or adjacent to
	watercourses.
	The benefits of trenchless techniques are:
	Minimal impacts on the watercourse;
	<ul> <li>Reduced levels of reinstatement;</li> </ul>
	<ul> <li>Faster installation;</li> <li>Deduction of significantly loss waste speik and</li> </ul>
	<ul> <li>Production of significantly less waste spoil; and</li> <li>Fower concernel restrictions</li> </ul>
	<ul> <li>Fewer seasonal restrictions.</li> <li>All fluids or grouts used in the drilling must be managed, recycled where</li> </ul>
	All fidus of grouts used in the drining must be managed, recycled where
	taken to locate the entry pit and exit pit for drilling as far away as
	nossible from watercourses
Runoff and Sediment	Sediment including all soils mud clay silt sand etc is the single main
Control	nollutant generated at construction sites and largely arises from the
control	erosion of exposed soils by surface water runoff. The adoption of
	appropriate erosion and sediment controls during construction is
	essential to prevent sediment pollution.
	Managing the reducing the quantity of runoff and sediment on site can
	be achieved through:
	<ul> <li>Sediment and erosion control measures;</li> </ul>
	<ul> <li>Estimating runoff;</li> </ul>
	<ul> <li>Planning for flood conditions;</li> </ul>
	<ul> <li>Estimating sediment generation; and</li> </ul>
	<ul> <li>Erosion and sediment control measures.</li> </ul>
	Control and treat surface water runoff before leaving the site. Ensure
	on-site operations such as constructing earth bunds, pumping or
	drainage works do not cause or worsen flooding on neighbouring land.
	Erosion control is intended to prevent runoff flowing across exposed
	ground and becoming polluted with sediments, while sediment control
	is designed to slow runoff to allow any suspended solids to settle out in
	situ.
	Measures:
	<ul> <li>Meshes, netting, mats and sheeting made of natural or</li> </ul>
	synthetic material can be used to stabilise soil temporarily or
	permanently. Typically they are suited to post-construction site
	stabilisation, but they may be used for temporary stabilisation





Construction	Measures for the management and control of water.			
activities and water				
pollution issues				
pollution issues	<ul> <li>of easily eroded soils in sensitive areas, including channels and streams where flow velocity may cause erosion;</li> <li>Matting may be applied to disturbed soils and places where existing vegetation has been removed. Organic matting materials, such as jute or straw, provide temporary protection until permanent vegetation is established and will not need to be removed, as they will rot down. They may also be appropriate when seasonal circumstances dictate the need for temporary stabilisation until weather or construction delays are resolved;</li> <li>A silt fence comprises a geotextile filter fabric, straw bales or a combination of the two installed in the path of sheet flow runoff to filter out heavy sediments. At best, a silt fence will remove heavy settleable solids, but it is not effective at reducing turbidity (fine solids in suspension). The silt fence detains sediment-laden water, promoting sedimentation behind the fence. Posts support the filter fabric, the base of which will be well buried in the ground; and</li> <li>Straw bales can also be used to filter out heavy sediments. During wet weather bales deteriorate rapidly and require frequent replacement, but they are a cost-effective temporary measure.</li> <li>Stockpiles can be a significant source of erosion and sediment. To minimise the loss of sediment from stockpiles they should be:</li> <li>Located away from drains and watercourses;</li> <li>Seeded or provided with other stabilisation measures appropriate to the length of time stored;</li> <li>Provided with earth bunds or another form of diversion to keep runoff away from stockpiles; and</li> <li>Provided with silt fences or straw/rock barriers at the toe of the stockpile to mitigate runoff during rain events.</li> </ul>			
	ECR passing through urban or built-up areas, or following existing infrastructure. Temporary measures can be put in place at the outfall (or intersection with other drainage) to remove sediments and oil, such as a catch pit, sump or a geotextile screen, or the pipe/culvert can be temporarily blocked or diverted.			
Earthworks	Where possible major earthworks to be programmed for the summer			
	periods when rainfalls are lower, and evaporation is at its seasonal high. The measures outlined above for runoff and sediment control will be implemented during earthworks campaigns. Install drainage and runoff controls before starting site clearance and earthworks			
Floodolain works	Works in the floodnlain will be completed in the short possible			
on/in	timeframe as far as reasonably possible, including temporary works, be designed for flood conditions.			
	The emergency and contingency plans will include:			





Construction	Measures for the management and control of water.
activities and water	
pollution issues	
	<ul> <li>Identify areas liable to river flooding;</li> </ul>
	<ul> <li>Schedule the construction to avoid works in flood-prone areas</li> </ul>
	during the winter; and
	<ul> <li>Monitor Met Éireann weather warnings for rainfall.</li> </ul>
	The design and operation of the works in the floodplain is not likely to
	increase the potential for flooding or create a risk of flood damage.
Topsoil stripping and	When stripping topsoil a grass buffer strip next to watercourses to filter
reinstatement	runoff will be left.
	Where possible leave a 5 m grassed strip next to river banks when
	stripping topsoil or place grassed soil bunds along river banks etc to
	prevent site runoff gaining direct access to watercourses.
	Only strip topsoil when required for construction activities in order to
	prevent bare areas of soil and stockpiled soils for extended periods of
	time
Watercourse crossing	Examples of working in or near water include open-cut crossings and
works on/near	trenchless crossings
	An emergency plan for the whole site will be prepared, containing
	particular contingencies for a pollution incident in or adjacent to water.
	Emergency equipment such as absorbent mats, booms, straw bales,
	geotextile matting and rags will be kept adjacent to the watercourse.
	Undertake visual monitoring of water course on a regular basis and
	keep record of inspections and measures or actions taken.
	When excavations in water are required such as at crossings where
	trenching is required, the area is generally cut off from the water by one
	of the following options:
	<ul> <li>Clay bund;</li> </ul>
	<ul> <li>Sand bags;</li> </ul>
	<ul> <li>Stop planks;</li> </ul>
	<ul> <li>Cofferdams (using sheet piles, diaphragm walls etc.);</li> </ul>
	<ul> <li>Caissons; and</li> </ul>
	<ul> <li>Specialist dams (fabric, inflatable etc).</li> </ul>
	Short-term works (i.e. lasting no more than one day) across the whole
	width of a watercourse, particularly in still or slow-flowing water, can be
	undertaken by simply damming off the works area. When works are
	likely to take longer, and/or the flow is high, over pumping will be
	required to maintain the "flow" of water from upstream to downstream
	of the works without flooding the site.
	Although some works require "hard" bank protection, "soft"
	techniques, which allow vegetation to establish at the water's edge, will
	be employed wherever possible. Leaving the ground surface broken up
	to revegetate naturally is a simple, cost-effective method, as used in the
	reinstated river crossing. Rapid stabilisation for areas prone to erosion
	can be achieved by placing biodegradable matting (hessian, coir etc)
	and seeding it with fast-growing grasses. Other "soft" techniques
	available include reed-planted coir fibre rolls and brushwood rolls.
	Timber washboards (Figure 20.16), gabions and stone-filled mattresses,
	pitch and dry stone walls are also appropriate.





Construction activities and water pollution issues	Measures for the management and control of water.
	Works near watercourses: Surface runoff is the most significant risk because of the short distance from the works to the watercourse. The following points are specifically relevant to work adjacent to watercourses. Before existing vegetation is removed, a buffer strip will be left along the edge of the watercourse and/or around the works to help filter any silty runoff. Earth bunds, cut-off ditches or silt fences will be constructed around site compounds and other works to isolate them from the water body. If necessary, runoff can be channelled to a settlement area before it is released to the watercourse (with permission). Where volumes are small, runoff will be directed over grassland where possible.
Water discharge	Water discharge (runoff) will be managed and treated as per the measures outlined above for Runoff and Sediment Control.
Water treatment	Runoff will be managed and treated as per the measures outlined above for Runoff and Sediment Control.





### Annex C Invasive Species Management Plan





# ₩SLR

# **Dublin Array Offshore Wind Farm**

### Volume 7, Appendix 8: Invasive Species Management Plan

### Kish Offshore Wind Limited Bray Offshore Wind Limited

Prepared by:

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SLR Project No.: 501.065303.00001 Client Reference No: 501.000571

22 February 2025

Making Sustainability Happen

### **Basis of Report**

This document has been prepared by SLR Environmental Consulting (Ireland) Ltd (SLR) with reasonable skill, care and diligence, and taking account of the timescales and resources devoted to it by agreement with Kish Offshore Wind (on behalf of Kish Offshore Limited and Bray Offshore Wind Limited) (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

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### Acronyms and Abbreviations

CEMP	Construction Environmental Management Plan
cm	Centimetres
CTV	Crew Transfer Vessel
DAFM	Department of Agriculture, Food and the Marine
EIAR	Environmental Impact Assessment Report
IAS	Invasive Alien Species
ISMP	Invasive Species Management Plan
m	Metres
NIS	Natura Impact Statement
O&M Base	Operations and Maintenance Base
Onshore ECR	Onshore Export Cable Route
OES	Onshore Electrical System
OSS	Onshore Substation
PPE	Personal Protective Equipment
SLR	SLR Environmental Consulting (Ireland) Limited
ТІІ	Transport Infrastructure Ireland

### 1.0 Introduction

This planning stage ISMP is provided as an Annex within Volume 7, Appendix 8: Construction Environment Management Plan (CEMP). The CEMP outlines the minimum requirements with regard to environmental management during the construction phase works. The ISMP sets out the key methods for the management of invasive alien species (IAS) during construction of the OES. Further information about construction mitigation measures to be employed during the construction period is included in the CEMP.

An IAS is defined as a non-native species that has been introduced, either intentionally or unintentionally, and poses a significant threat to native wildlife, ecosystems, or human activities. For the purposes of this report "invasive species" are those which are listed in Part 1 and Part 2 of the Third Schedule within the Habitats Directive.

Any mitigation or compensation measures set out in this document do not relate to any mitigation measures set out in the Natura Impact Statement (NIS). All measures in the ISMP will be implemented in full.

### IAS present along the OES

### 2.0 Invasive species management

### 1.1 Details of invasive species

Ecological field and desk based studies have been undertaken as part of the EIAR to characterise the terrestrial ecological environment (biodiversity) for the onshore infrastructure works. IAS were identified during the various ecological surveys, the results of which are provided in Volume 6 (Onshore Technical Appendices), Appendix 6.5.2-1: Technical Baseline Appendix for Onshore Biodiversity (hereafter referred to as the Onshore Biodiversity Technical Baseline Report). The location of IAS identified during field surveys are shown in Annex A.

Invasive alien species that were identified during field surveys are listed below:

- Giant hogweed Heracleum mantegazzianum;
- Montbretia Crocosmia x crocosmifolia;
- Japanese knotweed Reynoutria japonica;
- Ring-necked parakeet *Psittacula krameri*<sup>1</sup>; and
- Three-cornered garlic Allium triquetrum.

These were identified and located in the eastern section of the OES, with the greatest abundance in Sector 1 and one stand of giant hogweed in an agricultural field boundary ditch in Sector 7. There was no IAS recorded at the proposed O&M Base.

#### **1.2 Details of Proposed Management Measures**

The aim of the ISMP is to eradicate and/or halt the spread of invasive species via prevention, containment, treatment and eradication. To achieve this, the following management measures will be implemented during construction with reference to best-practice guidance provided in relevant sections.

<sup>&</sup>lt;sup>1</sup> Observed in flight near the rail track at the Landfall Site.

#### **1.2.1** General prevention measures

- Supervision of control measures and treatment by an appropriate qualified ecologist or invasive species specialist;
- Use of toolbox talks given by suitably qualified personnel as part of site introduction to construction workers, including what to look out for and procedures to follow if invasive species are observed;
- Where invasive species are physically removed, disturbed soil will be seeded or replanted with native plant species to prevent recolonisation of bare soil by nonnatives;
- Unwanted material originating from construction will be transported off-site by an appropriate licenced waste contractor and disposed of at a suitably licenced facility;;
- Signs will be used to provide warning to construction workers of invasive species contamination;
- Good hygiene practices will be followed;
- Removal of build-up of soil on equipment will be implemented;
- Equipment will be kept clean;
- Vehicles exiting the construction site will be washed using a pressure washer to prevent the transport of seeds;
- Wastewater from washing facilities will be stored securely and treated to prevent spread of invasive species outside the construction site; and
- Footwear and clothing of operatives working nearby invasive species will be checked for seeds, fruits or other viable material before leaving the construction site.

#### 1.2.2 General containment measures

- A pre-construction verification survey will be used to confirm the findings of the EIAR during the growing season immediately prior to the construction phase. This will be used to physically mark out the extent of invasive plant species.
- A 1 m buffer (except for named species below) will be used to cordon off invasive species outside the works footprint.

#### 1.2.3 Species-specific treatment measures

#### **Giant hogweed**

The following general recommendations for giant hogweed will be adhered to as part of the plan.

- Giant hogweed contains phototoxic sap which presents a serious health hazard to humans. A risk assessment will be prepared in advance of control measures and all construction site personnel will be made aware of the risks associated with the plant;
- Only competent and qualified personnel will be tasked with controlling giant hogweed, and they must wear personal protective equipment (PPE) including protective clothing, gloves and goggles or glasses;
- Where giant hogweed is present on public land, the area will be cordoned off and a sign explaining the risks of giant hogweed will be placed;



- Giant hogweed reproduces and spreads through seeds. Therefore, any physical control measures must only be employed before the plant has started to seed to prevent further spread. The plant does not reproduce through vegetative means; and
- Equipment, clothing and footwear will be checked following treatment operations and cleared of fruits/seeds as necessary.

In addition, five options for control of giant hogweed are proposed. Any one or a combination of these five options will be used to eradicate giant hogweed from the OES and avoid the spread of the species.

#### Option 1

**Cut the roots using a sharpened spade.** The root will be cut at least 10cm below soil level, but it may be required to cut further down (i.e. up to 25 cm) if additional soil is covering the plant. The plant will be removed from the soil and either destroyed or left to dry out. Such soil and all vegetative material will not be stock-piled within 10 m of any watercourse due to the risk of material being transferred by water. Cutting will take place in early spring and repeated in mid-summer. This method results in immediate death of the plant. However, it is not suitable for small plants and does not deal with the seed bank, therefore monitoring will be required to check for regrowth.

#### Option 2

**Pull the roots by hand**. This method should only be used for small plants and seedlings as hand pulling large plants is likely to break the stem and leave the root intact.

#### **Option 3**

**Cut the stems using a scythe**. This method will be used before the plant has started flowering. Regrowth will occur from the base, so cutting will be repeated two to three times during the growing season. When repeated carefully, this method will deplete nutrient reserves and eradicate the population in several years.

#### Option 4

**Cut the flower heads**. This method is suitable for small plants. Cutting the plants in early to late summer will prevent seed production, but if the plant is cut too early it will stimulate production of secondary stems which can flower later in the season. Plants subject to flower head removal have a high potential to regenerate and produce new flowers, therefore it is recommended to use other means of physical control in the first instance. Flower head removal will only be used as an improvised solution where no other methods of control have been attempted earlier in the season and it is too late to employ these methods. The cut umbels must be collected and destroyed.

#### **Option 5**

**Use chemical control.** Glyphosate is the recommended herbicide for the control of giant hogweed it will be applied from early March before the stem has fully elongated, and again in September to kill any regrowth or seedlings. Where sensitive native vegetation is present, herbicide will be injected into the stem as an alternative to spraying the plant. Herbicide application will not kill the seed bank, therefore monitoring and herbicide applications will be repeated annually over three to five years. Six of the fourteen locations where giant hogweed was recorded (points 5, 12, 13, 15, 16, and 27) are near watercourses. Herbicides have the potential to seriously affect the quality of aquatic ecosystems, therefore the relevant Regional Fisheries Board will be consulted if plants are to be removed within 20 m of any watercourse. Glyphosate is the most appropriate chemical treatment to use in or near water.

Since the 26<sup>th</sup> November 2015, only a Department of Agriculture, Food and the Marine (DAFM) registered professional user can apply Plant Protection Products that are authorised for professional use. As such any application of herbicide will be carried out by a professional user. Since the 26<sup>th</sup> November 2016, it has been a requirement for sprayers to have passed a Pesticide Application Equipment Test before being used to apply professional use Plant Protection Products.

The detailed recommendations of the following documents for the control of invasive species and noxious weeds will be followed:

- Chapter 7 and Appendix 3 of the Transport Infrastructure Ireland (TII) Publication: The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA, 2010)
- The Giant Hogweed Best Practice Manual (Nielsen et al., 2005)
- Good Practice Management Giant Hogweed (Invasive Species Ireland, 2018)
- Management of Giant Hogweed (Property Care Association, 2023)
- Circular Letter NPWS 2/08 Use of Herbicide Spray on Vegetated Road Verges (National Parks and Wildlife Service 2008)

Any reproductive plant material will be carefully disposed of following NRA (2010) guidelines. Any equipment used will be inspected and thoroughly cleaned, as will the footwear and clothing of operatives removing invasive species material. Any material arising from cleaning of equipment and footwear will be disposed of in a manner which will not cause the spread of invasive species.

#### Japanese knotweed

#### Japanese knotweed code of practice

To help developers, consultants, and contractors to select the most appropriate treatment option, some excerpts from the Knotweed Code of Practice<sup>2</sup> are reproduced below. The code of practice has been developed by experts in the control of Japanese knotweed and is based on the successes and failures of a number of Japanese knotweed management plans in the United Kingdom. Therefore, it represents the best available guidance on the different treatment options.

- "Unless an area of Japanese knotweed is likely to have a direct impact on the development, control it in its original location with herbicide over a suitable period of time, usually two to five years.
- Only consider excavating Japanese knotweed as a last resort, and if so, keep the amount of knotweed excavated to a minimum.
- Soil containing Japanese knotweed material may be buried on the site where it is produced to ensure that you completely kill it. Bury material at least 5 m deep.
- Where local conditions mean you cannot use burial as an option, it may be possible to create a Japanese knotweed bund. The purpose of the bund is to move the Japanese knotweed to an area of the site that is not used. This 'buys

<sup>&</sup>lt;sup>2</sup> UK Environment Agency (2013) The Knotweed Code of Practice: Managing Japanese Knotweed on development sites. Version 3. Published by the UK Environment Agency, Bristol. Available online at https://www.gov.uk/government/publications/japanese-knotweed-managing-ondevelopment-sites (now withdrawn). 24/02/2025

time' for treatment that would not be possible where the Japanese knotweed was originally located.

- Due to timing, location, landfill is the only reliable option, but it should be treated as a last resort. Landfill can be expensive and would require haulage, which would increase the risk of Japanese knotweed spreading.
- When transporting soil infested with Japanese knotweed to landfill, it is essential to carry out strict hygiene measures. If these standards are not followed, this may result in the spread of this invasive species. Japanese knotweed is a particular problem along transport routes/corridors, where it can interfere with the line of vision and can potentially result in traffic accidents."

Information is also provided by TII<sup>3</sup>, and IASI<sup>4</sup> in relation to identification, control and eradication of Japanese knotweed.

#### Exclusion zone

Prior to the construction phase/excavations, the following bio-security measures will be in place at:

- A 7 m exclusion zone, measured horizontally from the nearest visible Japanese knotweed plant, will be established around all areas infested by Japanese knotweed;
- Where part of the exclusion zone encroaches onto an active public access, or beyond a construction site boundary, this section of the exclusion zone will be positioned as close as possible to the boundary;
- The exclusion zone will be delineated with a secure temporary construction fence, such as mesh panels or timber post and netting, and be fitted with appropriate warning / advisory signage;
- Fencing will remain in place for the duration of construction works, and while the stand is being treated, allowing the rest of the fencing to be constructed. No fencing will be erected within this exclusion until treatment is completed and no new growth is detected; and
- Signs will be placed on the fence to advise construction personnel that the area contains Japanese knotweed material, and that bio-security measures are actively in force.

#### Chemical control

The desired option to treat Japanese knotweed generally is to control the infestation in-situ with a combination of physical and herbicide control over a period of time (typically 3-5 years, or until no new growth is observed). The control of Japanese knotweed will require the use of herbicides, which can pose a risk to human health, to non-target plants or to wildlife. To ensure the safety of herbicide applicators and of other public users near the construction site, it is essential that a competent and qualified person carries out the herbicide treatment, as described for giant hogweed. A qualified and experienced contractor will be employed to carry out all treatment work. The contractor will follow the detailed recommendations of the following documents for the control of invasive species and noxious weeds:



<sup>&</sup>lt;sup>3</sup> <u>https://www.tii.ie/technical-services/environment/construction/Management-of-Noxious-Weeds-and-Non-Native-Invasive-Plant-Species-on-National-Road-Schemes.pdf</u> Accessed January 202524/02/2025

<sup>&</sup>lt;sup>4</sup> Home - Invasives.ie Accessed January 202524/02/2025

- Chapter 7 and Appendix 3 of the TII Publication: The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA, 2010);
- Best Practice Management Guidelines for Japanese Knotweed (Invasive Species Ireland, 2015); and
- Circular Letter NPWS 2/08 Use of Herbicide Spray on Vegetated Road Verges (National Parks and Wildlife Service 2008).

A systemic herbicide (e.g. picloram) and/or a bioactive formulation (i.e. glyphosate) may be sprayed on foliage during dry weather or injected directly into the stems of Japanese knotweed plants identified within the proposed development site. Strong systemic herbicides are most effective at targeting the persistent roots of Japanese knotweed; however, it should be noted that they may also persist in the soil and/or kill surrounding vegetation. The length of treatment may vary depending on the type of herbicide used, i.e. highly persistent herbicides may eradicate a plant within one to two years, whereas non-persistent herbicides (such as glyphosate) may take over a period of at least three years to ensure the successful eradication of the plants.

Annual spot-checks will be conducted in May-June to identify and retreat any re-growth. Such a treatment can take up to five years to completely eradicate growth; therefore, further treatment may be required beyond the three years. This will be determined by the results of the monitoring. Japanese knotweed does not produce viable seed in Ireland and therefore seed germination in subsequent years will not be an issue. The optimal time period for treatment is May-June and September-October.

It should be noted that these herbicides can pose a general risk to non-target plants, to wildlife and/or human health. Chemical control using a bioactive formulation of glyphosate is the most appropriate herbicide for use in or near water (Environment Agency, 2010).

#### Montbretia

The following general recommendations for montbretia will be adhered to as part of the plan:

- The most effective time to remove montbretia is before full flowering occurs between July and September; and
- Due the potential of re-infestation from seeds, underground corms and rhizome fragments, regular monitoring and follow-up treatment will be required over several years.

Two options for the treatment of montbretia are proposed. Either one or a combination of these two options will be used to eradicate montbretia from the construction site and avoid spread of the species.

#### Option 1

Excavate the entire stand and bury or dispose of to a licenced landfill or incineration facility. This method will be used before the flowering/seeding season to prevent re-infestation from seeds.

#### Option 2

Herbicide may be sprayed where the stand is away from native plants and watercourses. Wiping leaves with glyphosate will provide an accurate application to isolated plants and prevent damaging adjacent non-target plants via spray drift. A qualified and experienced contractor will be employed to carry out herbicide treatment, as described for giant hogweed.

Any reproductive plant material will be carefully disposed of following NRA (2010) guidelines. Any equipment used will be inspected and thoroughly cleaned, as will the footwear and



clothing of operatives removing invasive species material. Any material arising from cleaning of equipment and footwear will be disposed of in a manner which will not cause the spread of invasive species.

#### Three-cornered garlic

No impacts of three-cornered garlic have been documented in Ireland to date, but it is known to colonise and dominate waste ground and outcompete native vegetation.

A risk assessment carried out by Inland Fisheries Ireland and the National Biodiversity Data Centre (2014) presents three options for the removal of this species, and these are proposed here. Either one of a combination of these three options will be used to eradicate three-cornered garlic from the construction site and avoid spread of the species.

#### **Option 1**

**Manual removal of bulbs is suitable for isolated plants.** The bulbs will be disposed of by crushing or incineration. Removal must be repeated over several years in spring and autumn to ensure a high level of control.

#### Option 2

**Use herbicide application**. Spraying exposed bulbs with herbicide is suitable for larger areas, but it is likely to damage sensitive native fauna. Wiping leaves with glyphosate will provide an accurate application to isolated plants and prevent damaging adjacent non-target plants via spray drift. The most effective time to apply herbicide is at the bulb exhaustion stage, which normally occurs at early flowering. Three of the 11 locations where three-cornered garlic was recorded (points 6, 15 and 17C) are near watercourses. As for giant hogweed, a licence is required for herbicide application and there are constraints for use around watercourses.

#### Option 3

**Undertake mowing**. This option is suitable where three-cornered garlic is growing on grassland or roadside verges and has not started to flower. The area should be mowed as low as possible before flowering and repeated a few weeks to control regrowth. This method should not be used if the plant has gone to seed because mowing can facilitate the spread and establishment of this species.

Any reproductive plant material will be carefully disposed of following NRA (2010) guidelines. Any equipment used will be inspected and thoroughly cleaned, as will the footwear and clothing of operatives removing invasive species material. Any material arising from cleaning of equipment and footwear will be disposed of in a manner which will not cause the spread of invasive species.

### 2.0 Implementation

#### 2.1 Roles and Responsibilities

The implementation of the ISMP will be overseen by a suitably qualified person or persons, with the required experience and expertise. All management tasks carried out under the ISMP will either be undertaken by the developer or by suitably experienced contractors acting on their behalf, and all ecological monitoring will be undertaken by suitably qualified and experienced ecologists. Reporting, Reviewing and Remedial Actions

Monitoring is proposed to measure success of the management measures and to identify whether remedial measures are required if objectives are not being met.

The construction site will be monitored annually during operational years 1-5 during the growing season for signs of regrowth of all invasive and non-native species – presence, distribution and extent of species will be used as an indicator of success with eradication representing complete success.

Monitoring results will be reported on an annual basis (during years in which monitoring takes place) and if necessary (e.g. if stated objectives were not being met), recommendations made for reasonable changes to management prescriptions, as appropriate.

Monitoring reports will be submitted to the Planning Authority and any changes proposed to management prescriptions will be discussed with them in the first instance.

### 2.2 Management and Monitoring Schedule

The monitoring schedule is shown in **Table 2-1** below.

Management works (summary)/Monitoring (summary)	Management schedule	Measures to be reported on	Reporting schedule
Pre-construction Verification survey	OES - Prior to construction	IAS presence, distribution and extent, plus management measures to be undertaken if required	Prior to construction
General prevention and containment measures	OES - During construction	As above	During construction
Species-specific treatment measures	OSS and ECR - during construction	As above	OSS and ECR - during construction OSS only - operational years
	operational years 1-5 (for OSS only)		1-5 (for OSS only)
Remedial actions (implementing any additional treatment measures)	OSS only - beyond operational year 5 if required (targets for success not yet met)	As above	OSS only - beyond operational year 5 where required

#### Table 2-1: Management and Monitoring Schedule

### 3.0 References

Circular Letter NPWS 2/08 Use of Herbicide Spray on Vegetated Road Verges

DAFM (2021) Alien Invasive Plant Species. Available at gov.ie - Alien Invasive Plant Species (gov.ie - Alien Invasive Plant Species) Accessed 30/11/2023.

HerbiGuide (2014) Three-cornered Garlic Allium triquetrum L.

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Inland Fisheries Ireland and National Biodiversity Data Centre (2014) Risk Assessment of *Allium triquetrum, Available at <u>https://invasives.ie/app/uploads/2025/02/Allium-triquetrum-</u> <u>Three-cornered-Leek1.pdf</u>* 

Invasive Species Ireland. Ireland's Invasive Species - Invasives.ie (Accessed 30/11/2023)

Invasive Species Ireland (2018) Good Practice Management - Giant Hogweed

Invasive Species Ireland (2015) Best Practice Management Guidelines for Japanese Knotweed

National Roads Authority (2010) The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Road Schemes (chapter 7 and appendix 3)

Nielsen, C., H.P. Ravn, W. Nentwig and M. Wade (eds.) (2005) The Giant Hogweed Best Practice Manual. Guidelines for the management and control of an invasive weed in Europe *Forest & Landscape Denmark*, Hoersholm, 44 pp.

Property Care Association (2023) Management of Giant Hogweed

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## Appendix A Figures












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