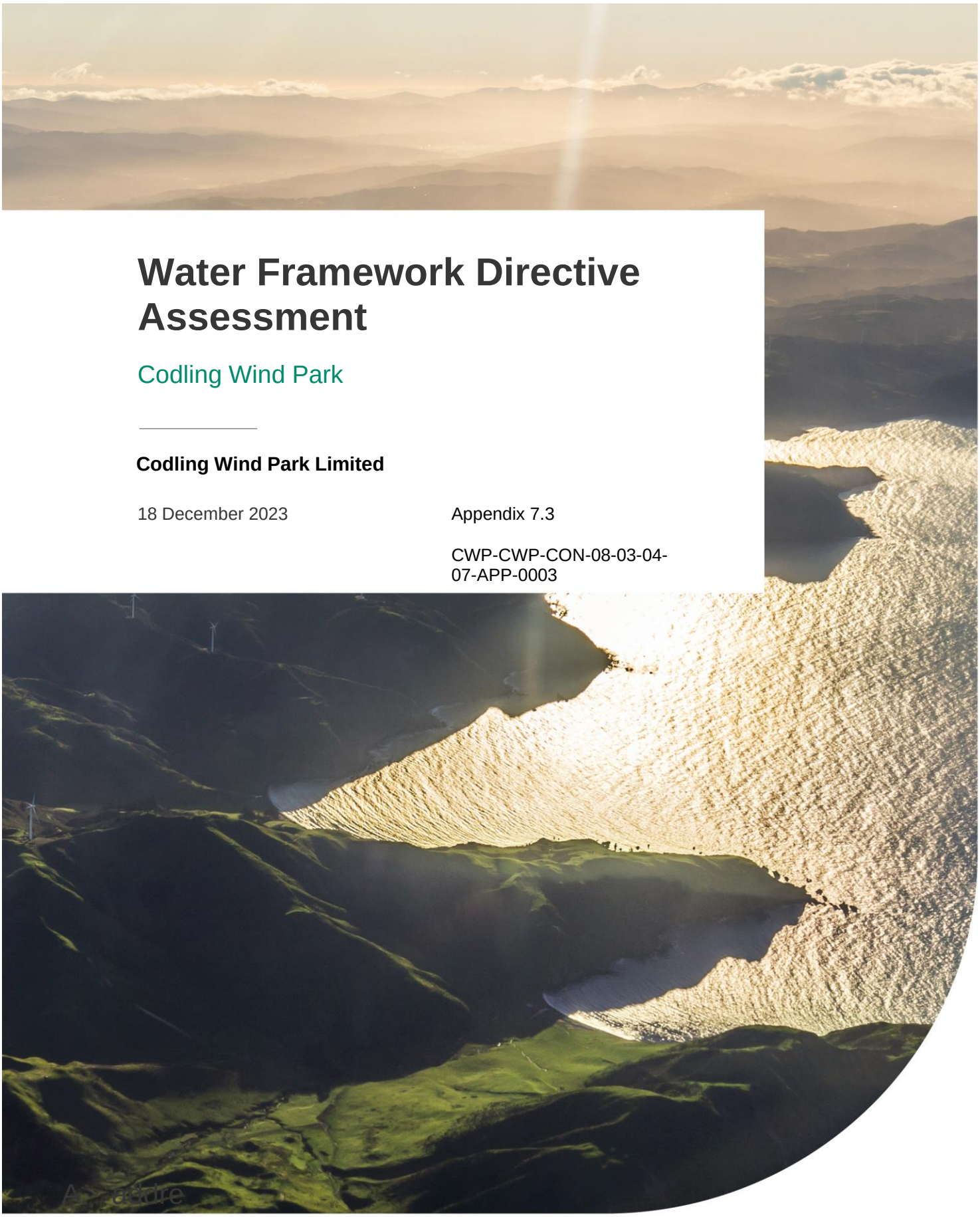
codling wind park

Environmental Impact Assessment Report

Volume 4

Appendix 7.3 Water Framework Directive Assessment



Water Framework Directive Assessment

Codling Wind Park

Codling Wind Park Limited

18 December 2023

Appendix 7.3

CWP-CWP-CON-08-03-04-07-APP-0003

OUR VISION

Working to create a world powered by renewable energy

natural power

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Contents

Abbreviations

AA	Appropriate Assessment
AESI	Adverse effect on site integrity
AL	Action Level
CEMP	Construction Environmental Management Plan
CWP	Codling Wind Park
CWPL	Codling Wind Park Limited
DAS	Dumping at sea
DCC	Dublin City Council
DHLGH	Department of Housing, Local Government and Heritage
DWPA	Drinking Water Protected Area
EC	European Commission
EEZ	Exclusive Economic Zone
EIAR	Environmental; Impact Assessment Report
EPA	Environmental Protection Agency
EPA-SCMU	Environmental Protection Agency Catchment Science & Management Unit
EQSD	Environmental Quality Standards Directive
ESB	Electricity Supply Board
FRA	Flood risk assessment
GES	Good environmental status
GSI	Geological Survey of Ireland
HMWB	Heavily modified water body
HSE	Health Service Executive
IAC	Inter-array cabling
IGI	Institute of Geologists Ireland
INNS	Invasive non-native species
JASPERS	Joint Assistance to Support Projects in European Regions
LAWPRO	Local Authority Waters Programme
LSE	Likely significant effect
MAC	Maritime Area Consent
MHW	Mean high water
MLW	Mean low water
MSFD	Marine Strategy Framework Directive
NBDC	National Biodiversity Data Centre
NCMC	National Co-Ordination and Management Committee
NIS	Natura Impact Statement

NPWS	National Parks & Wildlife Service
NSAs	Nutrient sensitive areas
NTIG	National Technical Implementation Group
NTU	Nephelometric Turbidity Units
O & M	Operations and maintenance
OECC	Offshore export cable corridor
OOS	Out-of-service
OSPAR	Oslo and Paris Conventions
OSS	Offshore Sub Stations
OTI	Onshore transmission infrastructure
PINS	Planning Inspectorate
PLGR	Pre-lay grapnel run
PLONAR	Pose Little or No Risk to the Environment
PSA	Particle size analysis
PWBO	Protection of Water Bodies Office
RBMP	River Basin Management Plan
SAC	Special Area of Conservation
SFPA	Sea-Fisheries Protection Authority
SPA	Special Protected Area
SSC	Suspended sediment concentration
SUDS	Sustainable Drainage Systems
TJB	Transition joint bay
TOC	Total organic carbon
UWWT	Urban Waste Water Treatment
UXO	Unexploded Ordnance
WCS	Worst case scenario
WFD	Water Framework Directive
WPAC	Water Policy Advisory Committee
Zol	Zone of influence

Glossary

Heavily modified water body	waterbodies that have had their physical characteristics, or hydromorphological conditions, modified for the purposes of a specified use
Artificial water body	surface water bodies which have been created in a location where no water body existed before, and which have not been created by the physical

	alteration, movement or realignment of an existing water body
Water body	An individual unit of a water feature used for monitoring and planning purposes. For example in groundwater this is part of an aquifer. For surface water, this is a discrete and significant element of surface water, such as part of a stream, river or canal, a transitional water or a stretch of coastal water. There are various types including a body of surface water, a body of groundwater and artificial water bodies. Finally, there is a particular type of water body called ‘heavily modified water body’ which is a surface water which has been significantly altered by human activity and so must be considered in a different way to an ‘unmodified’ water body.
1 nautical mile (NM) limit	Marine jurisdiction of the Water Framework Directive (WFD)

1. Introduction

This Marine Water Framework Directive (WFD) Assessment (from here on referred to as the WFD Assessment) has been prepared on behalf of Codling Wind Park Limited (CWPL) in order to support an application to install and operate the Codling Wind Park (CWP) Project.

CWP is an offshore wind farm located 11-22 km off the coast of Dublin and Wicklow, on the east coast of Ireland, in the Irish Sea. This appendix should be read in conjunction with **Chapter 4 Project Description** of the **Environmental Impact Assessment Report (EIAR) Volume 2 , Volume 3 Chapter 6 Marine geology, Sediments and Coastal Processes, Volume 3 Chapter 7 Marine Water Quality, Volume 3 Chapter 8 Subtidal and Intertidal Ecology, and Volume 3 Chapter 20 Hydrology and Hydrogeology**.

The purpose of a WFD assessment is to determine the potential impact an activity may have on any immediate or linked water bodies, and whether or not it complies with the relevant River Basin Management Plan(s) (RBMP). Any activity that is part of the CWP Project that could have the potential to lower the status of any water quality elements of a water body or preclude the measures necessary to achieve good status must be assessed to determine its compliance with the WFD.

1.1. Water Framework Directive

The EU Water Framework Directive (2000/60/EC) requires all Member States to protect and improve water quality in all waters in order to achieve good ecological status by 2015 or, at the latest, by 2027 (Government of Ireland, 2022). The WFD requires that management plans be prepared on a river basin basis and specifies a structured method for developing these plans.

The WFD came into force in 2000 and was transposed into Irish Law by the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003) (as amended) (the 'Regulations'), and applies to rivers, lakes, groundwater, and transitional coastal waters. The Regulations provide for the implementation of the WFD in Ireland and cover governance, characterisation, establishment of quality standard criteria, environmental objectives, programmes of measures for the improvement and maintenance of water quality in Ireland.

The objectives of the WFD are:

- To protect and enhance all inland surface waters (rivers and lakes including artificial waters such as canals and reservoirs), transitional waters (estuaries), coastal waters to 1 nautical mile (NM) and groundwaters (aquifers) in order to reach or maintain 'good' ecological status, and 'good' chemical status to 1 NM;
- To ensure the overall status of each water body does not deteriorate relative to the baseline reported in the RBMP.

1.1.1. Implementation of the WFD

Implementation of the WFD is the responsibility of the Minister for the Department of Housing, Local Government and Heritage (DHLGH), as advised and assisted by the Water Policy Advisory Committee (WPAC) (established under S.I. 350 of 2014). The National Co-Ordination and Management Committee (NCMC), is responsible for preparation of the RBMP and associated measures, linking science, policy and programme delivery. Technical implementation of the RBMP is overseen by the National Technical Implementation Group (NTIG) which is chaired by the Environmental Protection Agency (EPA). Delivery of RBMP measures is coordinated by five local authority regional committees, supported by the Local Authority Waters Programme (LAWPRO) at the regional and local level, with technical advice from the EPA. Each committee produces a Regional Integrated Catchment Management Programme, which will set out the areas prioritised for action at water body, sub-catchment or catchment level. LAWPRO also provides local authorities, community and voluntary groups with technical advice and assistance in relation to local, regional, national, EU and corporate funding related to water management.

Within the Dublin region, the Protection of Water Bodies Office (PWBO) has the remit to administer Dublin City Council's (DCC's) legislative responsibilities under the:

- EU Water Framework Directive 2000;
- Water Pollution Act 1977 (as amended);
- Bathing Water Regulations 2008, and;
- Water Services Act 2014 (Irish Water SLA).

1.1.2. The River Basin Management Plan

The WFD is administered in each EU state via the RBMP, which allows for assessment, planning, implementation, and review in 6 year cycles. The Draft RBMP for Ireland 2022-2027 (the Third Cycle RBMP) (DHLGH, 2021a) was subject to a 6-month public consultation from September 27th 2021 to March 31st 2022 (RPS, 2022). The final RBMP is currently being prepared.

The Second Cycle River Basin Management Plan (RBMP) included environmental objectives, such as to protect, enhance and restore the status of surface and ground waters, control of abstraction and reduction and reversing pollution; to comply with the objectives and standards under which protected areas (as relevant to the WFD) have been established and ensure full compliance with EU legislation. Measures included in the Second Cycle RBMP were outlined in 14 categories according to the nature of the pressure. Measures included:

- Address pressures from rural diffuse & point sources;
- Address pressures from urban waste-water & urban runoff;
- Address pressures from forestry;
- Address pressures from harvesting of peat;
- Protect water bodies from invasive species;
- Improve physical condition of water environment;
- Address abstraction pressures;
- Water and Land-Use Planning;
- Assessment and Management of Flood Risks;
- Climate-Change Adaptation;
- National Lead Strategy for Drinking Water; and
- Hazardous Chemicals in the Aquatic Environment.

The Third Cycle RBMP is also required to include a programme of measures to enable the achievement of objectives of the RBMP which are set out in Appendix 2 (DHLGH, 2021b), and a list of proposed areas for action which are set out in Appendix 3 (DHLGH, 2021b) which are intended to deliver an "increased level of ambition encompassing all waterbodies with clear strategies to protect those that are still at good status or above and to improve water bodies that are at less than good status", however these have not yet been finalised.

As such, both the second cycle RBMP (2018 to 2021) and third RBMP (2022 to 2027) are considered within this assessment, in respect of water body status and targets, noting that the third RBMP has not yet published water body status for the period and targets are subject to change following consultation.

1.2. Marine Strategy Framework Directive Assessment

The Marine Strategy Framework Directive (MSFD) 2008/56/EC of the European Parliament and of the Council adopted on 17 June 2008 requires European member states, including Ireland, to reach good environmental status (GES) in the marine environment by the year 2020 at the latest. The directive is very similar to the Water Framework Directive, but the focus is on the marine environment (Marine Institute and DHLGH, 2013; 2022; 2021). The MSFD was transposed into Irish law by the European Communities (Marine Strategy Framework) Regulations S.I. No. 249 of 2011 (as amended). The MSFD includes marine waters, defined as the 'bay closing line' or low water mark out to the State's territorial boundary, the Exclusive Economic Zone (EEZ).

An initial assessment of the marine environment (Marine Strategy Part 1, Art. 8 of the MSFD) (DHLGH and Marine Institute, 2013) provided a description of GES (Art. 9), environmental targets and associated indicators (Art. 10). The Irish government adopted the updated version of Part 1 in 2020 (DHLGH, 2020). The MSFD monitoring programmes (Marine Strategy Part 2, Art. 11) outlines the updated version of monitoring strategies and programmes, which was first adopted in 2015. A revised version of the programme of measures (Marine Strategy Part 3, Art. 13) is scheduled (DHLGH, 2021d).

There is no formal approach or guidance to assessing compliance with the MSFD, therefore assessment of compliance with the MSFD is considered outside the scope of this appendix and is instead to be addressed in **Chapter 7 Marine Water Quality**.

1.3. Approach to WFD Assessment

The EPA have published an information fact sheet for the assessment of marine water quality (EPA, 2023), however currently there is no specific guidance for water quality assessment in Ireland, therefore assessment will be undertaken in line with the "Water Framework Directive Project assessment checklist tool", published by the Joint Assistance to Support Projects in European Regions (JASPERS) (2018), as well as UK guidance "Clearing the Waters for All" (Environment Agency, 2017) and the Planning Inspectorate (PINS) Advice Note 18: The Water Framework Directive (PINS, 2017). These guidance documents are considered to represent best industry practice at this time.

1.4. Assessment Methodology

The assessment methodology used here is based on guidance provided by JASPERS (2018), the Environment Agency (2017) and PINS (2017), as follows:

- Stage 1 Screening
- Stage 2 Scoping
- Stage 3 Identification of mitigation
- Stage 4 Impact Assessment
- Stage 5 Article 4.7 Derogation

1.4.1. Stage 1 Screening

Stage 1 requires the identification of relevant water bodies in the study area under the following criteria:

- All surface water bodies that could potentially be impacted by the proposed activities associated with the Project;
- Any surface water bodies that have direct connectivity or which could be indirectly affected (e.g. upstream and/or downstream from the Project); and
- Any groundwater bodies that underlie the Project and therefore have the potential for direct impacts, and any hydraulically connected groundwater bodies that may receive indirect impacts.

In addition, Stage 1 Screening is required to identify activities which have the potential to result in deterioration of a water body, prevent the water body from achieving good or good ecological potential, or fail to comply with the objectives of that water body. A deterioration is defined as a reduction in waterbody status (e.g. from good to moderate, moderate to poor, or good to fail) or non-compliance with its specific objectives as set out in the RBMP or as set out for associated protected areas. The Environment Agency's (2017) guidance recommends that low risk activities can be screened out due to their limited capacity to affect water quality. Categories of activities recommended to screen out are identified in Table 1.

Table 1: Low risk activities screened out of WFD Assessment

Activity as per Environment Agency (2017) guidance	Irish equivalent	Rationale
A self-service marine licence activity, including: • Burial at sea[1]; • Markers (e.g. posts, buoys); • Minor removals (litter, discreet minor objects/debris – recent and archaeological, boreholes, trial pits, grab samples; • Removal or replacement of a single pile; • Maintenance (scaffolding, repainting of existing structures, sand or grit blasting, removal of marine growth, rendering, resurfacing or repointing of existing structures or slipways, ladder installation and other minor repairs).	Maritime Area Consent (MAC)	Works are typically small scale and temporary with limited potential to affect water quality.
An accelerated marine licence for dredging activity between 500 and 3,000 cm3 per campaign, and less than 10,000 cm3 per year, complying with local restrictions and other site-specific criteria for environmental protection	Dumping at Sea (DAS) Permit • Material is required to be inert and of natural origin in the absence of suitable alternative reuse and disposal methods; • EPA may request an Appropriate Assessment (AA) and submission of a Natura Impact Statement (NIS).	Suitability of material for dumping at sea is established during the application process.
Regular maintenance at pumping stations	Compliance with planning permission	Works are undertaken in line with an existing licence, required for normal functioning
Removal of blockages or obstacles (e.g. litter) from within 10 m of an existing structure to maintain flow	Compliance with planning permission	Required for normal functioning of drainage systems
Replacement or removal of existing pipes, cables or services crossing over a water body	Planning permission / Maritime Area Consent (MAC)	No change or improvement to water environment

[1] Burial at Sea is permitted under Section 66 of the Merchant Shipping (salvage and Wreck) Act, 1993, no specific licence or permit is required. Burial at sea guidelines have been issued by the Department of Transport (2023).

Activity as per Environment Agency (2017) guidance	Irish equivalent	Rationale
(not including any new structure or supports, bed or bank reinforcement		
Over-water replacement or repairs to bridge, pier or jetty surfaces (or similar structure) where bank or bed disturbance is minimised	Planning permission / Maritime Area Consent (MAC)	No change to water environment

Activities will be summarised to include construction, operation and decommissioning. Any activity which is does not have the potential to result in the deterioration of the water body can be screened out at this stage.

1.4.2. Stage 2 Scoping

Scoping is required in order to identify risks to water body status from the proposed activities that are screened in, based on the relevant water bodies and their water quality elements (including information on status, objectives, and the parameters for each water body, as defined in Section 1.5). These are then considered against specific criteria provided by JASPERS' (2018) EU Guidance and the Environment Agency's (2017) UK Guidance by means of a scoping template, which has been adapted to suit Irish waters. The scoping stage assesses whether elements identified during screening could have a significant non-temporary effect on the status of WFD quality elements.

Where a risk is identified (i.e. the answer to a scoping question is "yes"), the quality element will be scoped in for Impact Assessment at Stage 3. Where no risk is identified (i.e. answer to the scoping question is "no"), the quality element will be scoped out. Scoping questions are provided in Table 2 and undertaken for each water body in Appendix A.

Table 2: Scoping questions for transitional and coastal water bodies, adapted from Enviroment Agency (2017) Guidance

No.	Parameter	Scoping Questions
1	**Biology**	
	Habitats[2]	Will the footprint[3] or Zone of Influence (ZoI)[4] of the activity cover an area of 0.5 km^2 or larger?
		Will the footprint or ZoI of the activity cover 1% or more of the total water body area?
		Will any higher sensitivity habitat be within 500 m of the footprint of the footprint or the ZoI?
		Will the footprint or ZoI of the activity cover 1% of lower sensitivity habitats in the water body?
	Fish (transitional water bodies only)	Is the activity in an estuary and could it affect fish in the estuary, outside the estuary but could delay or prevent fish entering it, or could affect fish migrating through the estuary?

[2] Habitats include 'lower' and 'higher' sensitivity habitats as defined by Environment Agency's (2017) UK Guidance, compared to Irish legislation for habitat protection, see Section 1.5.1.1.

[3] The footprint of the activity is considered to be the area of direct disturbance caused by the proposed activities and is summarised in Section 2.

[4] The Zone of Influence (ZoI) of the activity is defined as the area of potential impact beyond the footprint of the works, and is based on site-specific sediment plume modelling.

No.	Parameter	Scoping Questions
		Could the activity impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)?
		Could the activity cause entrainment or impingement of fish?
2	**Hydromorphology**	
	Hydromorphology	Could the activity impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status?
		Could the activity significantly impact the hydromorphology of any water body?
		Is the activity in a water body that is heavily modified for the same use as the activity?
3	**Water Quality**	
	Physicochemical and phytoplankton	Could the activity affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)?
		Is the activity in a water body with a phytoplankton status of moderate, poor or bad?
		Is the activity in a water body with a history of harmful algae?
	Chemistry	Could the activity release chemicals that are on the Environmental Quality Standards Directive (EQSD) list?
		Will the activity disturb sediment with contaminants above Irish Lower Action Levels (ALs) or Cefas AL1?
		If the activity has a mixing zone, are the chemicals released on the EQSD List?
4	**WFD Protected Areas**	
	Protected Areas	Are there any WFD protected areas within the impact footprint or ZoI of the activity?
5	**Invasive Non-native Species (INNS)**	
	INNS	Could the activity introduce or spread INNS to a water body?

The decisions recorded in the scoping tables are based on expert judgement, informed by available data. The result of Stage Two will be a list of water bodies, activities and quality elements to be carried forward for further consideration in the Stage Four detailed impact assessment.

1.4.3. Stage 3 Identification of mitigation

Any mitigation measures deemed necessary following detailed impact assessment at Stage 3, the relevant mitigation measures will be set out, and any residual impact will be assessed in line with the RBMP for Ireland.

1.4.4. Stage 4 Impact Assessment

Where assessment has been considered necessary at Stage 2 Scoping, an impact assessment is carried out for each aspect identified. The assessment will establish whether there is potential for:

- Deterioration of WFD status (ecological, chemical or potential ecological status) sufficient to affect the classification of the relevant water body;

- Prevention of the water body to obtain good ecological or status or good potential ecological status in the future (other than for heavily modified water bodies, which, as a result of physical alterations by human activity, are substantially changed in character and cannot, therefore, meet "good ecological status"); or
- Non-compliance with the specific objectives of the WFD as set out in the RBMP or for advice for the associated protected areas for water-dependent features.

Clear definition of spatial and temporary scale of potential impacts will be considered in order to determine their significance, and whether any mitigation measures are required to bring the impact to an acceptable level, i.e. prevent deterioration of WFD status, prevention of the attainment of good ecological status, or non-compliance.

Impacts of the project on other European legislation, for example the Habitats Directive, Birds Directive, Shellfish Waters Directive, and Revised Bathing Water Directive, will also be considered in line with Articles 4.8 and 4.9 of the WFD. Where necessary, reference will be made to supporting information contained in the relevant chapters of the EIAR, and in the case of Natura 2000 protected areas, the **Report to Inform AA Screening (CWP-CWP-CON-08-03-01-REP-0001)** and **Natura Impact Statement (CWP-CWP-CON-08-03-02-REP-0001).**

1.4.5. Stage 5 Article 4.7 Derogation

Where potential deterioration of a water body has been identified, or it has been determined that a water body would likely be prevented from achieving good status, an assessment will be carried out in consultation with the relevant regulators in accordance with Article 4(7) of the WFD to ensure the following conditions are met:

- all practicable steps are taken to mitigate the adverse impact on the status of the body of water;
- the reasons for those modifications or alterations are specifically set out and explained in the river basin management plan required under Article 13 of the WFD and the objectives are reviewed every six years;
- the reasons for those modifications or alterations are of overriding public interest and/or the benefits to the environment and to society of achieving the objectives set out in paragraph 1 of the WFD are outweighed by the benefits of the new modifications or alterations to human health, to the maintenance of human safety or to sustainable development, and
- the beneficial objectives served by those modifications or alterations of the water body cannot for reasons of technical feasibility or disproportionate cost be achieved by other means, which are a significantly better environmental option, which would need to be set out in the next RBMP.

A successful derogation may include additional mitigation or monitoring measures being implemented during construction and operation.

1.5. Water body Classifications

Ireland's river basin management planning process is based on a single national River Basin District covering an area of 70,273 km^2, broken down into 46 catchment management units, 583 sub-catchments, and a total of 4,842 waterbodies, ranging from three to 15 water bodies in each sub-catchment (DHLGH, 2021a).

A water body is a discrete and significant individual unit of a water feature used for monitoring and planning purposes, and can be terrestrial (rivers and lakes), transitional (estuaries) or coastal (inshore waters to 1 NM). Artificial water bodies such as canals and reservoirs are also included.

1.5.1. WFD Water body classification elements

A water body is defined by a set of descriptor characteristics, or elements. These are used to assess a water body's quality and assign two WFD classifications: ecological and chemical.

Ecological status is recorded on the scale of ‘high’, ‘good’, ‘moderate’, ‘poor’ or ‘bad’. ‘High’ denotes largely undisturbed conditions and the other classes represent increasing deviation from this natural condition. The ecological status classification for the water body is determined from the worst scoring element, i.e. to reach or maintain ‘good’ ecological status, and good chemical status, a water body must score at least ‘good’ in each element.

Heavily modified waterbodies are waterbodies that have had their physical characteristics, or hydromorphological conditions, modified for the purposes of a specified use (e.g. ports, electricity generation, flood protection), and as a result may not be capable of achieving good ecological status. Instead, heavily modified waterbodies have different environmental objectives applied (Good Ecological Potential) to account for this. All WFD standards for other elements such as nutrients and chemicals must still be met, and the modifications must be mitigated as far as possible (EPA, 2022f). Heavily modified waterbodies are classified based on which of the natural waterbody types they most closely resemble and are recorded on an alternative scale of ‘maximum’, ‘good’, ‘moderate’, ‘poor’ or ‘bad’ (JASPERS, 2018).

Artificial waterbodies are surface water bodies which have been created in a location where no water body existed before, and which have not been created by the physical alteration, movement or realignment of an existing water body. Designation of artificial waterbodies is a separate process to the heavily modified waterbody designation. The majority of Ireland’s artificial waterbodies are canals (EPA, 2022f), and status is recorded on an alternative scale of ‘maximum’, ‘good’, ‘moderate’, ‘poor’ or ‘bad’ (JASPERS, 2018).

The RBMP sets a deadline by which ‘good’ status must be reached for each water body and that measures are put in place to ensure quality of these waters is restored to at least ‘good’ status or good potential (with some narrow exceptions) by 2027 at the latest. Where it is anticipated that this goal is not achievable (e.g. in areas where historic mining activities are a significant pressure, or water bodies are known to be slow respond to measures) exemption provisions in line with Article 4 of the WFD can be implemented to extend the deadline DHLGH, 2021a). Status information for each water body is provided by the EPA’s online GIS Maps (EPA, 2022a).

WFD elements against which surface water bodies (rivers, lakes, transitional and coastal including artificial waters) are assessed are:

- Hydromorphology;
- Biology (habitats and fish);
- Water quality;
- Protected areas; and
- INNS.

Groundwater bodies are classified according to their quantitative and chemical status elements.

Chemical status is assessed by compliance with environmental standards for chemicals that are listed in the European Commission (EC) Environmental Quality Standards Directive (2008/105/EC) as amended by the Priority Substances Directive (2013/39/EU) (EPA, 2022b). Of the 45 substances listed in the directive, 23 substances are being monitored in rivers and lakes and 36 substances are being monitored in transitional and coastal waters. The EU has also established a Watch List of emerging pollutants and other substances where additional information is required to assess the risk posed by these substances to the environment (EPA, 2022b). Chemical status is recorded as ‘good’ or ‘fail’. The chemical status classification for the water body is determined by the worst scoring chemical.

1.5.1.1. Biology – Habitats

The potential risk to sensitive habitats, including designated sites and habitats with particular ecological importance is considered. Sensitive habitats are defined as those identified legally and via international conventions, such as the Habitats Directive and Oslo and Paris Conventions (OSPAR) List of Threatened and/or Declining Species and

Habitats (OSPAR, 2023). These were summarised in the Environment Agency (2017) Guidance for use in the WFD assessment. An impact assessment (Stage 3) should be undertaken where the footprint of the activity is:

- 0.5 km² or larger;
- 1% or more of the water body's area;
- within 500 m of any higher sensitivity habitat; or
- 1% or more of any lower sensitivity habitat.

As per Environment Agency (2017) guidance, benthic habitats are divided into higher sensitivity and lower sensitivity habitats and are listed in Table 3.

Table 3: Definition of higher and lower sensitivity habitats

Habitats listed in Environment Agency (2017) guidance	Equivalent in Irish Legislation
Higher Sensitivity	
Chalk reef	• Littoral Chalk Communities: OSPAR list of threatened and/or declining species and habitats
Clam, cockle and oyster beds	• *Ostrea edulis* Beds: OSPAR list of threatened and/or declining species and habitat
Intertidal seagrass	• *Zostera* Beds: OSPAR list of threatened and/or declining species and habitats
Maerl beds	• OSPAR list of threatened and/or declining species and habitats
Mussel beds, including blue and horse mussel	• Intertidal *Mytilus edulis* beds and *Modiolus modiolus* beds: OSPAR list of threatened and/or declining species and habitats
Polychaete reef	• *Sabellaria spinulosa* reefs: OSPAR list of threatened and/or declining species and habitats
Saltmarsh	• Estuaries; Atlantic Salt Meadows (1330); Mediterranean salt meadow (1410)
Subtidal kelp beds	• Kelp forest: OSPAR list of threatened and/or declining species and habitats
Subtidal seagrass	• *Zostera* Beds: OSPAR list of threatened and/or declining species and habitats
Lower Sensitivity	
Cobbles, gravel and shingle	• Reefs (1170): Habitats Directive Annex I
Intertidal soft sediments like sand and mud	• Tidal mudflats (1140): Habitats Directive Annex I • OSPAR list of threatened and/or declining species and habitats
Rocky shore	• Reefs (1170): Habitats Directive Annex I
Subtidal boulder fields	• Reefs (1170): Habitats Directive Annex I
Subtidal rocky reef	• Reefs (1170): Habitats Directive Annex I

Habitats listed in Environment Agency (2017) guidance	Equivalent in Irish Legislation
Subtidal soft sediments	• *Haploops* and Pea pen and burrowing megafauna: OSPAR list of threatened and/or declining species and habitats

Source: Environment Agency (2017) Guidance

1.5.1.2. Biology – Fish

Estuaries are important habitat for migrating fish in particular, several of which are protected under the Habitats Directive (Council Directive 92/43/EEC), Wildlife Acts, and associated Instruments (Nelson *et al*., 2019).

According to the WFD (2000/60/EC) fish species should be considered for assessment if activities:

- Are in an estuary;
- Are outside an estuary but could delay or prevent fish from entering an estuary; or
- Could affect fish migration through an estuary to freshwater.

1.5.1.3. Hydromorphology

According to the WFD (2000/60/EC) hydromorphology is a physical characteristic which supports biological elements. Hydromorphology should be considered for impact assessment where activities are anticipated to alter the movement of water within the water body area, such as changes to tidal flows or alter sediment transport, which can directly impact the potential status of other characteristics, in particular biological elements.

1.5.1.4. Water Quality

Water quality encompasses the chemical status of the water body, but also clarity, temperature, salinity, oxygen levels, nutrients and microbial patterns. According to the WFD (2000/60/EC)water quality should be considered as a receptor if activities:

- Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days);
- Are in a water body with a phytoplankton status of moderate, poor or bad; or
- Are in a water body with a history of harmful algae.

1.5.1.5. WFD Protected Areas

Protected areas are those listed in Article 7(1) and Annex IV of the WFD. Each member state is required to establish a register or registers of all protected areas lying within in each River basin district with water-dependent features. The EPA (2023) GIS Portal Map (as of December 2018) lists the following on the WFD Register of Protected Areas:

- Drinking Water;
- Bathing Water Areas;
- Shellfish Areas;
- Salmonid River Regs (S.I. 293 only);
- Nutrient Sensitive Areas;
- SAC with Water Dependent Habitats/Species;
- SPA with Water Dependent Habitats/Species; and

A register of protected areas is required to be produced by the State under Article 6.

1.5.1.5.1. Drinking Water

Designated drinking waters are divided into three categories:

- Drinking Water – Rivers;
- Drinking Water – Lakes; and
- Drinking Water – Groundwater

Public water supplies are managed by Irish Water and regulated by the EPA which is the drinking water quality regulator, responsible for enforcing the Drinking Water Regulations for public water supplies (EPA, 2023). Due to the brackish groundwater, there are no drinking water resource underlying the onshore transmission infrastructure (OTI).

National priorities identified by the EPA which should be addressed on a national level to protect and improve drinking water supplies are as follows:

- Keeping water free of harmful bacteria (disinfection);
- Minimising harmful disinfection by-products;
- Eliminating lead from pipework;
- Preventing pesticides from entering our waters;
- Managing risks to water supplies; and
- Ensuring all water treatment plants are effective.

1.5.1.5.2. Natura 2000 Designated Sites

Natura 2000 is a network of nature protection areas in the territory of the EU and is made up of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) designated respectively under the Habitats Directive and Birds Directive. For SPAs and SACs, details on water dependencies of protected habitats and species were provided by the National Parks & Wildlife Service (NPWS), and a subset of relevant SACs and SPAs are provided on the EPA portal (protected areas tab) for the purpose of the WFD RBMP Cycle 3.

Due to the high concentration and overlap of designations in the Dublin area, a conservative approach has been taken to include any additional management required for Ramsar sites and Nature Reserves in this assessment.

1.5.1.5.3. Bathing waters

Bathing waters are designated in accordance with the EU Bathing Water Directive (2006/7/EC), which is implemented in Ireland by the Bathing Water Regulations (EPA, 2023, and are managed and monitored by local authorities. Local authorities are regulated by the EPA in line with the Bathing Water Quality Regulations 2008 (S.I. No. 79/2008) (Bathing Water Regulations) and advised by the Health Service Executive (HSE) on public and environmental health issues. The Bathing Waters Directive aims to improve the quality of bathing waters by monitoring the presence of faecal indicator organisms and taking such measures as to reduce the presence of these organisms. The Bathing Waters Directive is complimentary to the WFD, and protection of Bathing Waters has been subsumed into the WFD. Nevertheless, reporting and public information is still in operation under the Bathing Waters Directive.

Local authorities take water samples at regular intervals (at least once a month) throughout the bathing season from 1st June to 15th September, starting just before bathing season. A classification for each bathing waters is calculated annually based on samples from the previous four years. These four classifications range from ‘excellent’ (the highest, cleanest class) to ‘poor’ (water has not met the minimum standards) (EPA, 2023c). This information is

provided by the EPA via the Beaches.ie website (EPA, 2022c). Samples are tested for the presence of two bacterial species, *Escherichia coli* and Intestinal enterococci (EPA, 2022c), which are primarily influenced by organic waste, particularly effluent, originating from terrestrial sources. In 2022, urban wastewater was identified as the most common source of pollution affecting bathing water in Ireland, followed by agricultural run-off, dog fouling and algal blooms, particularly after heavy rainfall, which can also lead to wastewater overflows (EPA, 2023d). Consequently, improvement of bathing water quality is primarily the responsibility of Uisce Éireann to improve operation, management and maintenance of treatment plants and water networks impacting bathing waters, and local authorities to prioritise measures to improve poor bathing waters. Individuals should also ensure to mitigate their own actions, such as removing litter and dog waste. In the case of CWPL, responsibility is to assess the potential impacts of installation, O&M and decommissioning of the CWP Project on bathing waters within the ZoI.

Levels are set out in the Bathing Water Quality Regulations 2008 (S.I. No. 79/2008) and are set out in Table 4.

Table 4: Parameters of Bathing Water Quality for coastal waters

Parameter	Excellent	Good	Sufficient
Intestinal enterococci (cfu/100 ml)	100*	200	185
Escherichia coli (cfu/100 ml)	250	500	500

*Source: * Based upon a 95-percentile evaluation.*

There are also “other monitored waters” which are smaller and less popular beaches that are monitored by local authorities as a voluntary public health measure but are not formally managed under the Bathing Water Regulations (EPA, 2023d).

1.5.1.5.4. Shellfish waters

The Shellfish Waters Directive is implemented in Ireland by the European Communities (Quality of Shellfish Waters) Regulations 2006 (SI No 268 of 2006). With the aim to protect or improve shellfish waters in order to support shellfish life and growth. It is designed to protect the aquatic habitat of bivalve and gastropod molluscs, which include oysters, mussels, cockles, scallops and clams (DHLGH, 2021d). Management of these sites is concerned with physical, chemical and microbiological requirements that designated shellfish waters must either comply with or try to improve and establishment of pollution reduction programmes for the designated waters (DHLGH, 2021e). Public information on the status of Shellfish Waters is provided by the Sea-Fisheries Protection Authority (SFPA).

1.5.1.5.5. Nutrient sensitive areas

Nutrient sensitive areas (NSAs) are water bodies listed in accordance with the Urban Waste Water Treatment (UWWT) Directive 91/271/EEC on Urban Waste Water Treatment and S.I. 254 / 2001, S.I. 440/2004 and S.I. 48/2010. NSAs are managed via measures applied to terrestrial sources (e.g. sewage treatment and agricultural practices). Designation of NSAs relate to water bodies downstream of waste water discharges, in Dublin these are predominantly urban. The EPA carried out a review of NSAs downstream of large urban waste water discharges in 2020, and applied additional regulations in order to enable additional nutrient removal to wastewater treatment plants discharging to NSAs (EPA-SCMU, 2021).

1.5.1.6. Invasive non-native species (INNS)

The INNS can occur directly through the release of individuals of INNS species into the environment via activities, e.g. through use of contaminated equipment (e.g. attached to the hull of a ship or release of ballast water), or

indirectly by creating opportunities for organisms to settle or spread (e.g. habitat creation or disturbance), with ports and harbours being a key donor and recipient for invasive species (Stokes *et al*., 2006; Ware, 2009; International Maritime Organisation (IMO), 2012).

Several INNS are recorded as present in the Dublin area, including marine species such as Australasian barnacle (*Elminius modestus*), carpet sea squirt (*Didemnum vexillum*) and wireweed (*Sargassum muticum*) (National Biodiversity Data Centre (NBDC), 2023; Global Biodiversity Information Facility (GBIF), 2023), as well as terrestrial species such as Japanese knotweed (*Fallopia japonica*), which has been recorded as present during site-specific surveys of the landfall (see **Chapter 21 Onshore Biodiversity**). The NBDC (2023) provides a mobile application and website for reporting sightings, as well as species alerts to notify the public and can trigger a mechanism for rapid response for control and management (NBDC, 2023).

DCC has produced an Invasive Alien Species Action Plan (Parks and Landscape Services Division of DCC, 2016-2020) to inform the public of the risks, establish biosecurity codes of practice and define targets and actions for the control of INNS in Dublin. The plan mainly concentrates on terrestrial and freshwater species.

For construction projects, activities with the potential to introduce or spread INNS include:

- Equipment or vessels which have travelled through other bodies of water, and spend long periods in ports, enabling the settlement of fouling organisms; or
- Activities that help spread existing INNS, either within the immediate water body or to other water bodies, e.g. contaminated materials, e.g. ballast water, sediments and rock.

1.5.1.7. Groundwaters

The Geological Survey of Ireland GSI classify aquifers based on the groundwater resource potential, groundwater flow type and attenuation potential. The dark limestone and shale of the Lucan Formation are classified as a Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones (LI). The site is not mapped by the GSI as an aquifer, due to the nature of the reclaimed lands in the port. The Liffey Locally Important Gravel Aquifer is located 0.9 km west of the onshore export cable (Gallagher *et al.*, 2022).

Subsoil permeability is a measure of the ease at which water or contaminants can move through the subsoils. A subsoil permeability category of high, moderate or low is assigned to all subsoils across the country which have a minimum thickness of three meters. The subsoil permeability within the study area is predominantly classified as low, indicating the soils are over 10 m thick. This corresponds with the description of the soils presented in **Chapter 19 Land Soils and Geology** which states that the soils are potentially up to 45 m thick.

Due to hydraulic separation, only groundwaters within 2km of the CWP onshore development area have the potential to be impacted by construction activities. Based on the GSI groundwater wells and springs database (EPA, 2002g), there are a number of abstractions within 2 km of the development, however there are no known abstractions on the Poolbeg Peninsula. The groundwater underlying the site is brackish and likely to remain brackish in any future scenario.

2. Project summary

The following activities relevant to the WFD assessment is summarised from **Volume 2, Chapter 4 Project Description**. The CWP Project comprises the following main components:

- The array site, within which the wind turbine generators (WTGs), inter-array cables (IACs) and the offshore substation structures (OSSs) are proposed;
- The offshore export cable corridor (OECC), within which the offshore export cables cable will be installed;

- The landfall, at which the offshore export cables are brought onshore and connected at transition joint bays (TJBs) to the onshore export cables;
- The onshore export cables ; and

The onshore substation, containing electrical equipment to enable connection to the national grid. Due to the proximity of onshore infrastructure to the marine environment each of these aspects will be screened for potential impacts on water quality.

2.1.1. Pre-installation activities

Pre-installation activities are defined as those which take place prior to the installation of any type of foundation, substructure or cable.

Pre-installation activities include:

- Surveys;
- Unexploded Ordnance (UXO) clearance; and
- Seabed clearance, including boulder clearance, pre-lay grapnel run (PLGR), out-of-service (OOS) cable removal and pre-sweeping / sandwave levelling.

2.1.2. Assessment parameters

Complex, large-scale infrastructure projects with a terrestrial and marine interface such as the CWP Project, are consented and constructed over extended timeframes. As such, the approach to the design development of the CWP Project has sought to introduce flexibility where required, among other things, to enable the best available technology to be constructed and to respond to dynamic maritime conditions, whilst at the same time to specify project boundaries, project components and project parameters wherever possible, whilst having regard to known environmental constraints.

Chapter 4 Project Description describes the design approach that has been taken for each component of the CWP Project. Wherever possible the location and detailed parameters of the CWP Project components are identified and described in full within the EIAR. However, for the reasons outlined above, certain design decisions and installation methods will be confirmed post-consent, requiring a degree of flexibility in the planning consent.

Where necessary, flexibility is sought in terms of:

- Up to two options including for certain permanent infrastructure details and layouts such as the WTG layouts.
- Dimensional flexibility; described as a limited parameter range i.e. upper and lower values for a given detail such as cable length.
- Locational flexibility of permanent and temporary infrastructure is described as Limit of Deviation (LoD) from a specific point or alignment.

A “representative scenario” is a combination of options and dimensional flexibility that is relevant to this WFD Assessment to represent all of the likely significant effects of the project on the environment is presented in **Appendix 7.2** and summarised in **Chapter 7 Marine Water Quality**.

2.1.3. Suspended Sediment Plume Modelling

The detailed modelling scenarios are provided in **Appendix 6.3**, however the results of the scenarios are summarised as follows:

Activities associated with seabed preparation such as the deposit of dredged material within the array site and OECC and cable installation activities in the OECC have the potential to lead to local increases in SSC.

Whilst construction activities in the intertidal and landfall areas such open cut trenching will disturb the sediment, the works will be conducted at low tide and as such have no potential to lead to increases in SSC.

The two activities that will result in the largest levels of SSC and associated deposition are dredging and trenching, as described in **Chapter 6 Marine Geology, Sediments and Coastal Processes**.

During dredge disposal and trenching activities, SSC's local to the release locations are predicted to be enhanced to up to c. 150 mg \ L.

Enhanced SSCs are transient, and concentrations are predicted to reduce to baseline levels no more than 15 days after the release activity.

Dredging and dredge disposal

Suspended sediment plumes created during dredge disposal operations are predicted to enhance SSC levels in the near field (i.e. to the point of release) and far field (i.e. up to circa 10 km) from the point of release).

The predicted transport of sediment plumes and subsequent deposition during dredge disposal activities within the CWP Project can be summarised as follows:

Modelled representative scenarios of dredge disposal activities within the array site indicated the predominant direction of travel for SSC plumes is eastward (away from shore). In one scenario, assessed in **Appendix 6.3**, a maximum transient increase in SSC of 150 mg/L was predicted to travel a maximum of up to 4 km over c.10 days resulting in a cumulative sediment deposition thickness of c. 6 cm, near the disposal location. In another a maximum increase of 100 mg / L was predicted to travel up to 6 km over c. 15 days resulting in a cumulative sediment deposition thickness of c. 3 cm, near the disposal location. Modelled representative scenarios of dredge disposal activities within the OECC predicted: a maximum transient increase in SSC of 80 mg / L, travelling up to 4 km westward resulting in a cumulative sediment deposition thickness of c. 2 cm, near the disposal location. In a final scenario, a maximum increase in SSC of 50 mg / L, travelling a maximum of 5 km south eastward resulting in a cumulative sediment deposition thickness of c. 4 cm, near the disposal location.

Trenching

A consequence of cable installation will be the liberation of sediment into suspension within the water column, just above the seabed. Jetting results in greater sediment suspension, introducing the potential for distribution of greater volumes of material over a larger spatial area than other cable laying techniques which may be employed during construction and thus is assessed as the representative scenario. This method involves fluidising the material to form a narrow trench into which the cable is laid.

Based upon the representative scenario, the predicted transport of sediment plumes generated during cable installation activities across the array site indicates the finest sediments will potentially be transported eastward up to 10 km at an increase of 20 mg / L, resulting in a cumulative sediment deposition thickness of < 1 cm, near the release location. Maximum SSC values of up to 40 mg / L were predicted to be transported up to 4 km eastward, resulting in a cumulative sediment deposition thickness of c. 1 cm, near the release location. However, these plumes are transient, rapidly decreasing as sand sized sediments deposit to the bed and finer sediments are dispersed.

The predicted transport of sediment plumes generated during cable installation activities across the OECC were for a maximum increase in SSC of 50 mg / L being transported for up to 7 km eastward resulting in a cumulative sediment deposition thickness of c. 2 cm, near the release location and southward and a maximum increase in SSC of 80 mg / L being transported for < 1 km eastward resulting in a cumulative sediment deposition thickness of < 1 cm, near the release location.

Therefore, the maximum thickness of the deposit on the seabed away from the trenching activities were predicted to be c. 2 cm; deposited sediments would be reworked and rapidly integrated into the prevailing sediment transport regime, and thus would have negligible impact on the prevailing environment. Consequently, enhanced SSC and

the predicted deposition thickness would not discernible above natural variation observed during storm events, with SSC's predicted, in the representative scenario, to reduce to baseline levels within c. 15 days following trenching operations.

Background levels of SSC are considered to be between 5 - 15 mg / L within the offshore development area.

Based on the maximum travelling distance of sediment from dredge disposal activities outlined, a ZoI of 7 km has been adopted for the entire OECC area for the purposes of screening and scoping.

The sediment plume from the array site has been modelled to travel up to c.10 km, however this is outside the WFD jurisdiction and carried in an easterly direction (away from the coast). None-the-less, a ZoI of 10 km has been adopted for the array site.

3. Stage 1 Screening

3.1. Screening of Activities

Table 1 summarises the conclusions of the activity screening. Impacts to the terrestrial environment relate predominantly to flood risk, which are addressed in **Chapter 20 Hydrology and Hydrogeology and Appendix 20.3**.

Table 5: Screening or activities for potential water quality impacts

Activity	Screened in/out	Justification
Pre-installation activities		
Surveys	Out	Vessel movements would be temporary and short lived, consistent with background vessel traffic (see **Appendix 16.3 Navigational Risk Assessment**). No physical interaction with the seabed, no potential for disturbance
UXO clearance	In	Potential for localised increases in suspended sediments, meaning this activity is screened in, however these would be small scale and temporary with limited potential to affect water quality.
Seabed clearance (pre-sweeping / sandwave clearance)	In	Disturbance of the seabed leading to an increase in SSC, with potential for remobilisation of contaminated sediments (if present)
Seabed clearance (Boulder clearance, PLRG and OOS cable removal)	In	Boulder clearance, PLRG and OOS cable removal are anticipated to be less than the WCS of pre-sweeping / sandwave clearance and cable trenching. Disturbance will be in the same location as cable trenching.
Construction of Generating Station		
Construction vessels	Out	Vessel movements would be temporary and short lived, consistent with background vessel traffic (see **Appendix 16.3 Navigational Risk Assessment**).
Monopile foundations	Out	Installation will generate SSC which is anticipated to be small scale, temporary and localised, with limited potential to affect water quality within the WFD jurisdiction, resulting in no physical interaction between WFD characteristics and activities, no route to impact. Monopile installation is not expected to result in significant seabed disturbance, and will be small scale, temporary and localised with limited potential to affect water quality as it will be quickly dispersed in marine waters outside of the WFD jurisdiction. There is potential for grout to be used, however it will comply with the relevant maritime industry specifications which are designed for safety, and suitable for use in the marine

		environment. No chemical pollutants or nutrients will be introduced to the environment as part of the works.
Scour protection	Out	Increases in SSC would be small scale, temporary and localised with limited potential to affect water quality
Inter-array cabling	Out	Activity is anticipated to disturb seabed, however it is outside the WFD jurisdiction. Modelling indicates that prevailing currents will carry resulting SSC away from the coast, therefore no route to impact is anticipated.
Installation of Offshore transmission Infrastructure		
OSS installation	Out	Installation will generate SSC which is anticipated to be small scale, temporary and localised, with limited potential to affect water quality within the WFD jurisdiction, resulting in no physical interaction between WFD characteristics and activities, no route to impact. Monopile installation is not expected to result in significant seabed disturbance. There is potential for grout to be used, however it will comply with the relevant maritime industry specifications which are designed for safety, and suitable for use in the marine environment.No chemical pollutants or nutrients will be introduced to the environment as part of the works.
Offshore export cable installation in Offshore and intertidal areas	In	Activity is within WFD jurisdiction, and will result in localised increases in SSC.
Cable protection	In	Activity is within WFD jurisdiction and will result in localised long term habitat loss.
Installation at Landfall		
Construction compounds / laydown areas	In	Potential for run-off, including storm water impacting water environment
TJB	In	Potential for run-off, impacting water environment
Landfall cable duct, including coastal revetment and combi wall	In	Potential for run-off.
Cable pull-in	Out	Comparable to duct installation but less small scale and temporary with limited potential to affect water quality
Reinstatement and public interface	In	Potential for run-off, including storm water impacting water environment
Coastal revetment removal and replacement	In	Replacing like for like is considered a low-impact activity, however may have implications for WFD
Installation and Construction of Onshore Infrastructure		
Cable installation	In	Potential for run-off, including storm water.

Construction compounds / laydown areas	In	Includes upgrades to coastal revetment, reclamation and installation of new drainage infrastructure as well as a temporary compound during construction. Potential for localised increase in SSC from construction activities as well as secondary run-ff from onshore infrastructure (including storm water)
Operation and maintenance (O & M)	In	The potential impacts of O & M activities are considered to be consistent with construction activities, though spatially reduced and shorter duration. O&M activities may occur at any stage during the lifetime of the project.
Decommissioning	In	Decommissioning impacts are considered in the worst case, to be equivalent to or lesser than those for construction.

3.2. Screening of water bodies

The Environment Agency (2017) guidance recommends that water bodies and relevant protected areas within 2 km of the activities should be screened for WFD assessment, however as a conservative approach, screening was undertaken using the results of the **Appendix 6.3 Modelling Report**, summarised in **Section 2.1.6** and **2.1.7**. As a result, all water bodies 10 km from the offshore development area. Where applicable, two measurements are provided, firstly the minimum distance in a straight line, secondly the practical distance (i.e. including for obstacles between the two areas) reflecting the true connectivity between the offshore development area and the water body. There are three coastal and four transitional water bodies within ZoI of the CWP Project and are summarised in **Table 6** and shown in **Figures 1, 2 and 3**.

An onshore ZoI of 2 km radius from the red line boundary of the onshore infrastructure has been established in line within the Institute of Geologists Ireland (IGI) (2013) Guidelines. There are 2 surface waters (1 river and 1 canal) and 1 groundwater within the ZoI, and are included in Table 7, however both surface waters are upstream of the works and therefore are screened out as they have no connectivity to the works. Terrestrial water bodies and groundwaters are not anticipated to be impacted by marine activities as there is no route to impact. Flood risk is addressed in **Chapter 20 Hydrology and Hydrogeology and Appendix 20.3**.

Table 6: WFD Water bodies within the ZoI for the CWP Project.

WFD Water Body	MS_CD	Water body type	Min. distance to onshore infrastructure (km)	Min. distance to offshore infrastructure (km)	Screened in?	Rationale
Dublin Bay	EA_090_0000	Coastal	0	0	Yes	Overlaps OECC and landfall
Liffey Estuary Lower	EA_090_0300	Transitional	0 (substation)	0.75 (OECC)	Yes	Potentially within ZoI of onshore and offshore infrastructure
Irish Sea Dublin (HA 09)	EA_070_0000	Coastal	9.4	0 (OECC)	Yes	Overlaps OECC No connectivity with onshore infrastructure
Southwestern Irish Sea – Killiney Bay (HA10)	EA_090_0000	Coastal	11.0	0 (OECC)	Yes	Overlaps OECC No connectivity with onshore infrastructure
Tolka Estuary	EA_090_0200	Transitional	0.8	1.2 (2.3 around Great South Wall from OECC)	Yes	Potentially within ZoI of onshore and offshore infrastructure
Liffey Estuary Upper	EA_090_0400	Transitional	2.9	2.9 (7.7 around Great South Wall from OECC)	Yes	Potentially within ZoI of onshore infrastructure Outside ZoI for offshore infrastructure due to presence of sea wall
North Bull Island	EA_090_0100	Transitional	3.9 km (7.1 km from Project area to water	3.9 (6.3 around Bull Island from OECC)	Yes	Potentially within ZoI of offshore infrastructure

WFD Water Body	MS_CD	Water body type	Min. distance to onshore infrastructure (km)	Min. distance to offshore infrastructure (km)	Screened in?	Rationale
			body entrance around Bull Island)			

Source: Environmental Protection Agency (EPA) (2022a) GIS Maps online portal

** Distance measured around physical barriers (e.g. seawall) to reflect connectivity*

Table 7: WFD Water bodies within the Zone of Influence (ZoI) for the CWP Project.

WFD Water Body	MS_CD	Water body type	Min. distance to onshore infrastructure (km)	Min. distance to offshore infrastructure (km)	Screened in?	Rationale
Dublin	IE_EA_G_008	Ground waterbody	0	0 (onshore cables and substation)	Yes	Overlaps landfall onshore infrastructure
River Dodder	EA_09D010900	River	0.8	N/A (no connectivity)	No	Screened out for no connectivity (upstream)
Grand Canal Basin	09_AWB_GCB	River	1.5	N/A (no connectivity)	No	Screened out for no connectivity (upstream)

Source: Environmental Protection Agency (EPA) (2022a) GIS Maps online portal

3.3. WFD Protected areas

Protected areas within the ZoI are listed in **Table 8** and summarised in the below sections and shown **in Figures 7-2 and 7-3**.

3.3.1. Drinking water

There are no rivers or lakes designated as drinking water within the study area. All groundwater bodies nationally are identified as Drinking Water Protected Areas (DWPAs) ((EPA-SCMU), 2021).

3.3.2. Natura 2000 Sites and Designated Salmonid Waters

Associated with the screened-in water bodies, there are 4 SACs, 6 SPAs, 3 Ramsar sites, 2 nature reserves, and 2 salmon waters, however not all of these are within the ZoI. These are summarised in Table 7.

There are 2 groundwater bodies delineated and assessed as Groundwater Dependent Terrestrial Ecosystems for this catchment. Neither are within the ZoI and are therefore screened out of further assessment.

There are no designated salmonid rivers within the ZoI.

3.3.3. Bathing Areas

Bathing waters located within the offshore ZoI are associated with three water bodies, Dublin Bay, Irish Sea Dublin (HA 09) and Southwestern Irish Sea – Killiney Bay (HA 10)whilst Sandymount Strand and Shelley Banks bathing water are in close proximity to where the landfall is located. Dollymount Strand is located approx. 3.1 km from cable trenching activities (around the sea walls of Dublin Port). The remaining bathing waters are located between 1 and 3.3. km to the south (Sandycove Beach, 1.1 km; Forty Foot Bathing Place, 1 km; Seapoint, 2 km; White Rock Beach, 2.5 km; and Killiney, 3.3 km).

Other bathing waters are, Shelley Banks(overlaps), Half Moon (0.5 km), Merrion Strand (1.3 km), Dun Laoghaire Baths (1.4 km) and North Bull Wall (2.2 km).

3.3.4. Shellfish Areas

There is one designated shellfish area associated with the Liffey and Dublin Catchment, Malahide (IEPA2_0057) which intersects the Irish Sea Dublin and North-Western Irish Sea water bodies, however it is c. 13 km away from the CWP Project, and outside of the ZoI. It is therefore screened out.

3.3.5. Nutrient Sensitive Areas

There are 6 NSAs in the catchment and these are downstream of 5 urban wastewater agglomerations, only one within the ZoI. Liffey Estuary (Upper & Lower), Tolka Estuary and South Bull Lagoon (overlaps onshore infrastructure and landfall) is a terrestrial designation and has no route to impact for marine activities, however, has been screened in due to its association with the landfall and onshore works.

Table 8: List of protected areas with water-dependent features within the ZoI

Name	Criteria / Description	Current Status	Associated Water bodies	Min. distance to infrastructure (km)		Screen in?	Rationale
				Onshore	Offshore		
Designated Areas (Habitats Directive and Birds Directive)							
Rockabill to Dalkey Island SAC (Site code: 003000)	Qualifying Interests Reefs [1170] *Phocoena phocoena* (Harbour Porpoise) [1351]	Designated	Dublin Bay Irish Sea Dublin (HA 09) Southwestern Irish Sea – Killiney Bay (HA10) Northwestern Irish Sea (HA 08)	0		Yes	Overlaps
South Dublin Bay SAC (Site code: 000210)	Qualifying Interests** Mudflats and sandflats not covered by seawater at low tide [1140] Annual vegetation of drift lines [1210] Salicornia and other annuals colonising mud and sand [1310] Embryonic shifting dunes [2110]	Designated	Dublin Bay	0		Yes	Overlaps
South Dublin Bay and River Tolka Estuary SPA (Site code: 004024)	Qualifying Interests** Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Oystercatcher (*Haematopus ostralegus*) [A130] Ringed Plover (*Charadrius hiaticula*) [A137]	Designated	Dublin Bay Liffey Estuary Lower	0		Yes	Overlaps

Name	Criteria / Description	Current Status	Associated Water bodies	Min. distance to infrastructure (km)		Screen in?	Rationale
				Onshore	Offshore		
	Grey Plover (*Pluvialis squatarola*) [A141] Knot (*Calidris canutus*) [A143] Sanderling (*Calidris alba*) [A144] Dunlin (*Calidris alpina*) [A149] Bar-tailed Godwit (*Limosa lapponica*) [A157] Redshank (*28aritimtotanus*) [A162] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Roseate Tern (*Sterna dougallii*) [A192] Common Tern (*Sterna hirundo*) [A193] Arctic Tern (*Sterna paradisaea*) [A194] Wetland and Waterbirds [A999]						
Dalkey Islands SPA (Site code: 004172)	Qualifying Interests Roseate Tern (*Sterna dougallii*) [A192] Common Tern (*Sterna hirundo*) [A193] Arctic Tern (*Sterna paradisaea*) [A194]	Designated	Dublin Bay Irish Sea Dublin (HA 09)	0.5		Yes	Within ZoI
North Bull Island SPA (Site code: 004006)	Qualifying Interests Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Shelduck (*Tadorna tadorna*) [A048] Teal (*Anas crecca*) [A052]	Designated	Dublin Bay Liffey Estuary Lower Tolka Estuary North Bull Island	1.3		Yes	Within ZoI

Name	Criteria / Description	Current Status	Associated Water bodies	Min. distance to infrastructure (km)		Screen in?	Rationale
				Onshore	Offshore		
	Pintail (*Anas acuta*) [A054] Shoveler (*Anas clypeata*) [A056] Oystercatcher (*Haematopus ostralegus*) [A130] Golden Plover (*Pluvialis apricaria*) [A140] Grey Plover (*Pluvialis squatarola*) [A141] Knot (*Calidris canutus*) [A143] Sanderling (*Calidris alba*) [A144] Dunlin (*Calidris alpina*) [A149] Black-tailed Godwit (*Limosa limosa*) [A156] Bar-tailed Godwit (*Limosa lapponica*) [A157] Curlew (*Numenius arquata*) [A160] Redshank (*29aritimtotanus*) [A162] Turnstone (*Arenaria interpres*) [A169] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Wetland and Waterbirds [A999]						
Baldoyle Bay SPA (7.0 km)	Qualifying Interests Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]	Designated	Dublin Bay Liffey Estuary Lower	7.0	7.0	Yes	Within ZoI

Name	Criteria / Description	Current Status	Associated Water bodies	Min. distance to infrastructure (km)		Screen in?	Rationale
				Onshore	Offshore		
	Shelduck (*Tadorna tadorna*) [A048] Ringed Plover (*Charadrius hiaticula*) [A137] Golden Plover (*Pluvialis apricaria*) [A140] Grey Plover (*Pluvialis squatarola*) [A141] Bar-tailed Godwit (*Limosa lapponica*) [A157] Wetland and Waterbirds [A999]						
The Murrough SPA (5.9 km)	Qualifying Interests Red-throated Diver (*Gavia stellata*) [A001] Greylag Goose (*Anser anser*) [A043] Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Wigeon (*Anas penelope*) [A050] Teal (*Anas crecca*) [A052] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Herring Gull (*Larus argentatus*) [A184] Little Tern (*Sterna albifrons*) [A195]	Designated	Southwestern Irish Sea Killiney Bay (HA10)	22.9	7.5	Yes	Within ZoI

Name	Criteria / Description	Current Status	Associated Water bodies	Min. distance to infrastructure (km)		Screen in?	Rationale
				Onshore	Offshore		
	Wetland and Waterbirds [A999]						
North-West Irish Sea cSPA (1.3 km)	Qualifying Interests Red-throated Diver (Gavia stellata) [A001] Great Northern Diver (Gavia immer) [A003] Fulmar (Fulmarus glacialis) [A009] Manx Shearwater (Puffinus puffinus) [A013] Cormorant (Phalacrocorax carbo) [A017] Shag (Phalacrocorax aristotelis) [A018] Common Scoter (Melanitta nigra) [A065] Little Gull (Larus minutus) [A177] Black-headed Gull (Chroicocephalus ridibundus) [A179] Common Gull (Larus canus) [A182] Lesser Black-backed Gull (Larus fuscus) [A183] Herring Gull (Larus argentatus) [A184] Great Black-backed Gull (Larus marinus) [A187] Kittiwake (Rissa tridactyla) [A188] Roseate Tern (Sterna dougallii) [A192]	Candidate	Dublin Bay Liffey Estuary Lower Tolka Estuary North Bull Island Irish Sea Dublin (HA 09)	1.6	1.3	Yes	Within ZoI

Name	Criteria / Description	Current Status	Associated Water bodies	Min. distance to infrastructure (km)		Screen in?	Rationale
				Onshore	Offshore		
	Common Tern (Sterna hirundo) [A193] Arctic Tern (Sterna paradisaea) [A194] Little Tern (Sterna albifrons) [A195] Guillemot (Uria aalge) [A199] Razorbill (Alca torda) [A200] Puffin (Fratercula arctica) [A204]						
North Dublin Bay SAC (Site code: 000206)	Qualifying Interests** Mudflats and sandflats not covered by seawater at low tide [1140] Annual vegetation of drift lines [1210] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Mediterranean salt meadows (Junctecalia maritimi) [1410] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Humid dune slacks [2190]	Designated	Dublin Bay Liffey Estuary Lower Tolka Estuary North Bull Island	1.3		Yes	Within ZoI

Name	Criteria / Description	Current Status	Associated Water bodies	Min. distance to infrastructure (km)		Screen in?	Rationale
				Onshore	Offshore		
Wicklow Reef SAC	Reefs [1170]	Designated	Southwestern Irish Sea Killiney Bay (HA10)	40	5.5	Yes	Within ZoI
Nature Reserves							
Bull Island	Supports nine internationally important habitats and a range of protected species, including: Petalwort; Marsh Fritillary Butterfly; Harbour and Grey Seal; Common Lizard; and at least three species of bat (Common Pipistrelle, Soprano Pipistrelle, and Leisler's). The island's flora is significant, with 361 plant species recorded thus far, including five rare species protected under the Flora Protection Order (2022). Internationally important numbers of waterfowl and wading birds overwinter on the islands salt marshes, tidal lagoons and mudflats. In the summer, the dunes on the island provide crucial habitat for ground nesting birds, including Skylark, Stonechats, and Meadow Pipit.	Local nature Reserve	Dublin Bay Liffey Estuary Tolka Estuary Bull Islans	2.2	1.7 (2.5 around Dublin Port)	Yes	Within ZoI
Booterstown Marshes	Internationally important feeding and roosting area for ducks, geese and waders, and probably holds the highest	Local nature Reserve	Dublin Bay	2.6	1.6	Yes	Within ZoI

Name	Criteria / Description	Current Status	Associated Water bodies	Min. distance to infrastructure (km)		Screen in?	Rationale
				Onshore	Offshore		
	concentration of wintering waterfowl of an Irish estuary, and supports Moorhen, Reed Bunting, Sedge Warbler, Teal, Snipe, Lapwing, Oystercatcher, Redshank, Dunlin, and Brent Geese. *Puccinellia fasiculata* occurs in the marsh - protected under the Wildlife Act (Flora Protection Order of 1987).						
Shellfish Areas							
Malahide WB_CD: IE_EA_020_0000 EU_PA_Code: IEPA2_0057	Razor clams	A*** Seasonal Classification 1 Aug to 01 Jan, Reverts to Class B at other times	Irish Sea Dublin (HA 09)	N/A (No route to impact from onshore works)	11	No	Outside ZoI
Bathing Waters							
Sandymount Strand	Beach	Excellent (2023)	Dublin Bay	N/A (No route to impact from onshore works)	0.79	Yes	Within ZoI

Appendix 7.3

Name	Criteria / Description	Current Status	Associated Water bodies	Min. distance to infrastructure (km)		Screen in?	Rationale
				Onshore	Offshore		
Forty Foot Bathing Place	Beach	Excellent (2021)	Dublin Bay	N/A (No route to impact from onshore works)	0.86	Yes	Within ZoI
Sandycove Beach	Beach	Excellent (2021)	Dublin Bay	N/A (No route to impact from onshore works)	0.97	Yes	Within ZoI
Seapoint	Beach	Excellent (2021) Blue flag 2022	Dublin Bay	N/A (No route to impact from onshore works)	2.24	Yes	Within ZoI
White Rock Beach	Beach	Excellent (2021)	Southwestern Irish Sea – Killiney Bay (HA10)	N/A (No route to impact from onshore works)	2.51	Yes	Within ZoI

Appendix 7.3

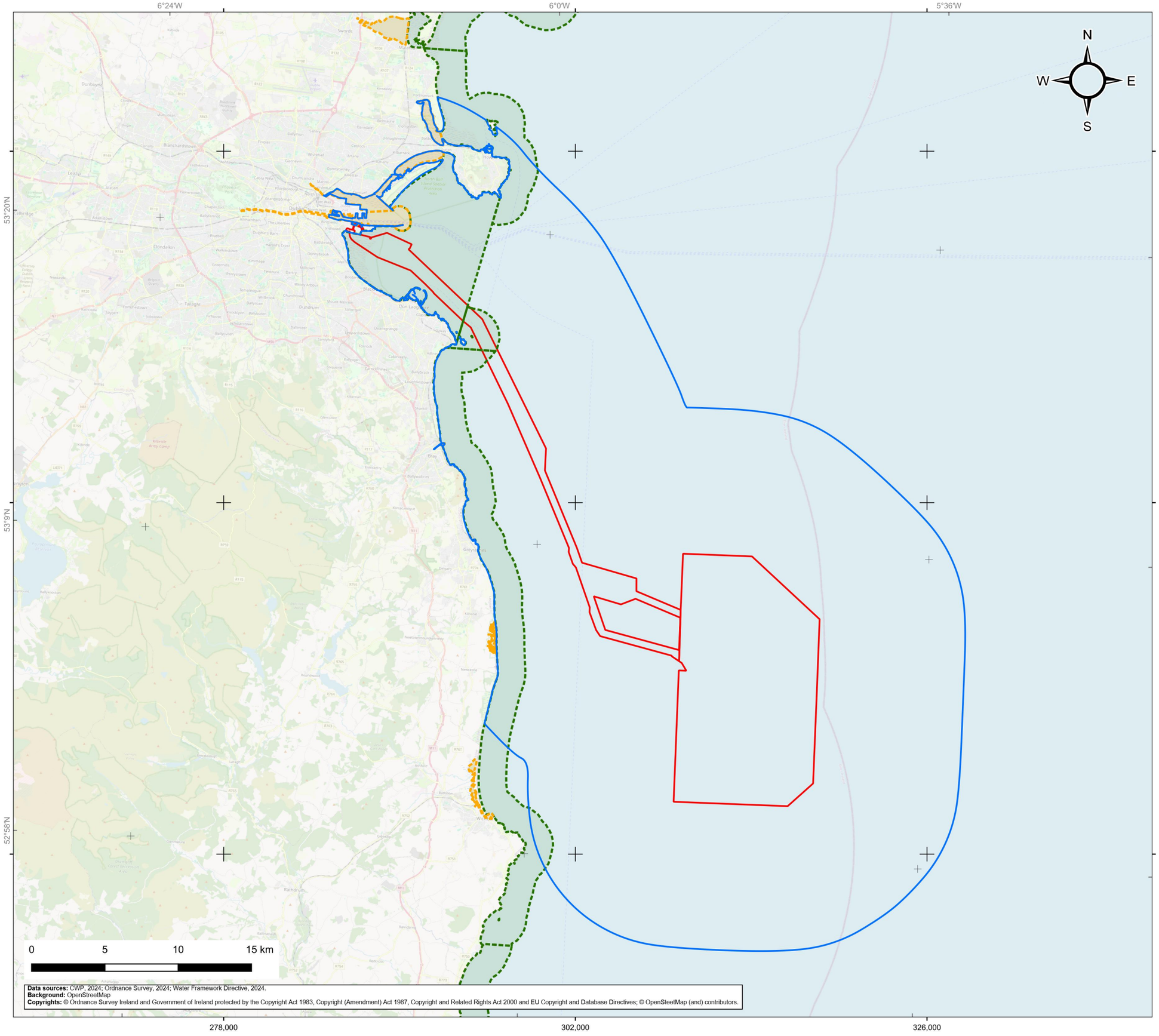
Name	Criteria / Description	Current Status	Associated Water bodies	Min. distance to infrastructure (km)		Screen in?	Rationale
				Onshore	Offshore		
Killiney	Beach	Excellent (2021)	Southwestern Irish Sea – Killiney Bay (HA10)	N/A (No route to impact from onshore works)	3.27	Yes	Within ZoI
Dollymount Strand	Beach	Good (2021)	Dublin Bay	N/A (No route to impact from onshore works)	3.49	Yes	Within ZoI
White Rock	Beach		Irish Sea Dublin (HA 09)	N/A (No route to impact from onshore works)	2.5	Yes	Within ZoI
North Bull Wall	Other bathing water	Excellent	Dublin Bay	N/A (No route to impact from onshore works)	2.2	Yes	Within ZoI

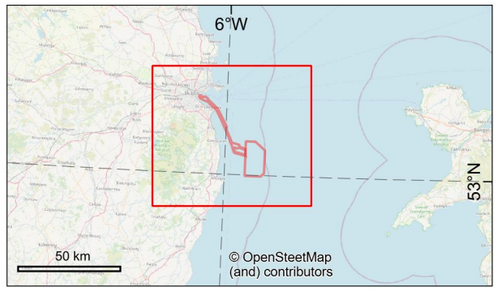
Name	Criteria / Description	Current Status	Associated Water bodies	Min. distance to infrastructure (km)		Screen in?	Rationale
				Onshore	Offshore		
Half Moon	Other bathing water	Excellent	Dublin Bay	N/A (No route to impact from onshore works)	0.5	Yes	Within ZoI
Shelley Banks	Other bathing water	Excellent	Dublin Bay	N/A (No route to impact from onshore works)	0	Yes	Within ZoI
Merrion Strand	Other bathing water	Excellent	Dublin Bay	N/A (No route to impact from onshore works)	1.3	Yes	Within ZoI
Dun Laoghaire Baths	Other bathing water	Excellent	Dublin Bay	N/A (No route to impact from onshore works)	1.4	Yes	Within ZoI

Name	Criteria / Description	Current Status	Associated Water bodies	Min. distance to infrastructure (km)		Screen in?	Rationale
				Onshore	Offshore		
Nutrient Sensitive Areas							
Liffey Estuary (Upper & Lower), Tolka Estuary and South Bull Lagoon (Ringsend) Seapoint	Secondary treatment in place	Currently not meeting objectives	Liffey Estuary Upper Liffey Estuary Lower Tolka Estuary	0	0.5	Yes	Within ZoI

**Distance calculated based on travelled distance to closest point between the marine activities and the edge of the protected area, or bathing water monitoring point to reflect connectivity with water. '0' indicates overlap with the CWP boundary.*

***Only SPAs/pSPAs which overlap with the ZoI and have connectivity via water are shown. Connectivity is established based on the features' connectivity with water (i.e. their range extends below MHW).*





Legend

- Planning Application Boundary (PAB)
- 10 km study area

Water Framework Directive (WFD) waterbody

- Coastal waterbody
- Transitional waterbody

codling wind park

Project: Codling Wind Park

Contractor: natural power www.naturalpower.com

Figure 1
Waterbodies

CWP doc. number: CWP-NPC-ENG-08-01-MAP-1760

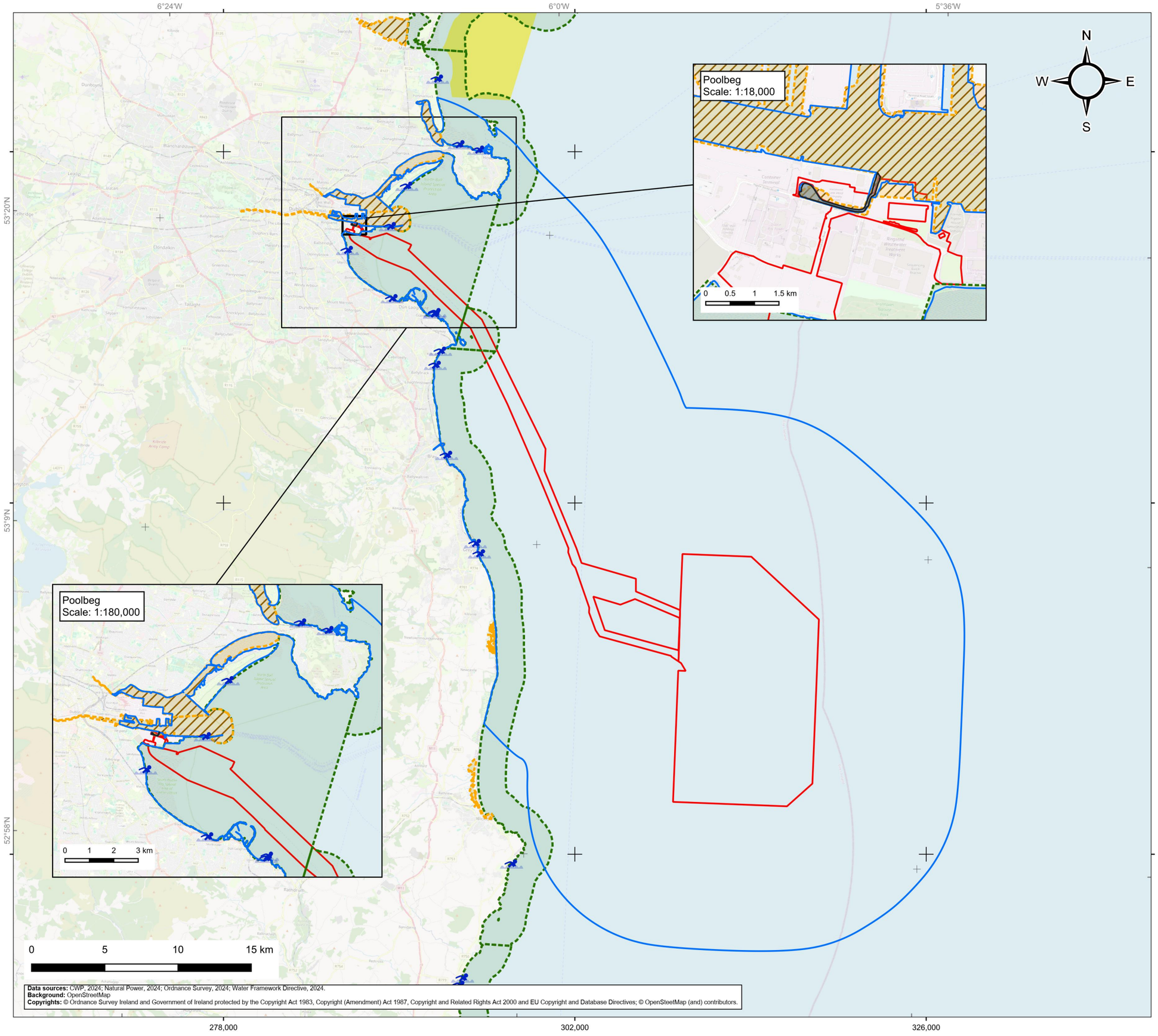
Internal descriptive code: WE - PAB..BUFF.10km.S - WBs.WFD – (EIAR.Vol.04. Ch.07.Ap.04.FIG.01)

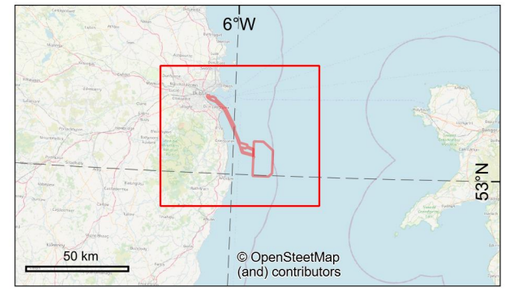
Size: A3

Scale: 1:250,000

CRS: EPSG 25830

Rev.	Updates	Date	By	Chk'd	App'd
A	Final version	2024/08/07	AC	ME/EA	SM





Legend

- Planning Application Boundary (PAB)
- 10 km study area

Waste to Energy facility

- Dublin Waste to Energy (DWtE) facility

Water Framework Directive (WFD) waterbody

- Coastal waterbody
- Transitional waterbody

Water Framework Directive (WFD) protected areas

- Shellfish water
- Nutrient sensitive area (lakes and estuaries)
- Bathing water area

Data sources: CWP, 2024; Natural Power, 2024; Ordnance Survey, 2024; Water Framework Directive, 2024.
Background: OpenStreetMap

codling wind park

Project: Codling Wind Park

Contractor: natural power www.naturalpower.com

Figure 2
Water Framework Directive (WFD) protected areas

CWP doc. number: CWP-NPC-ENG-08-01-MAP-1761

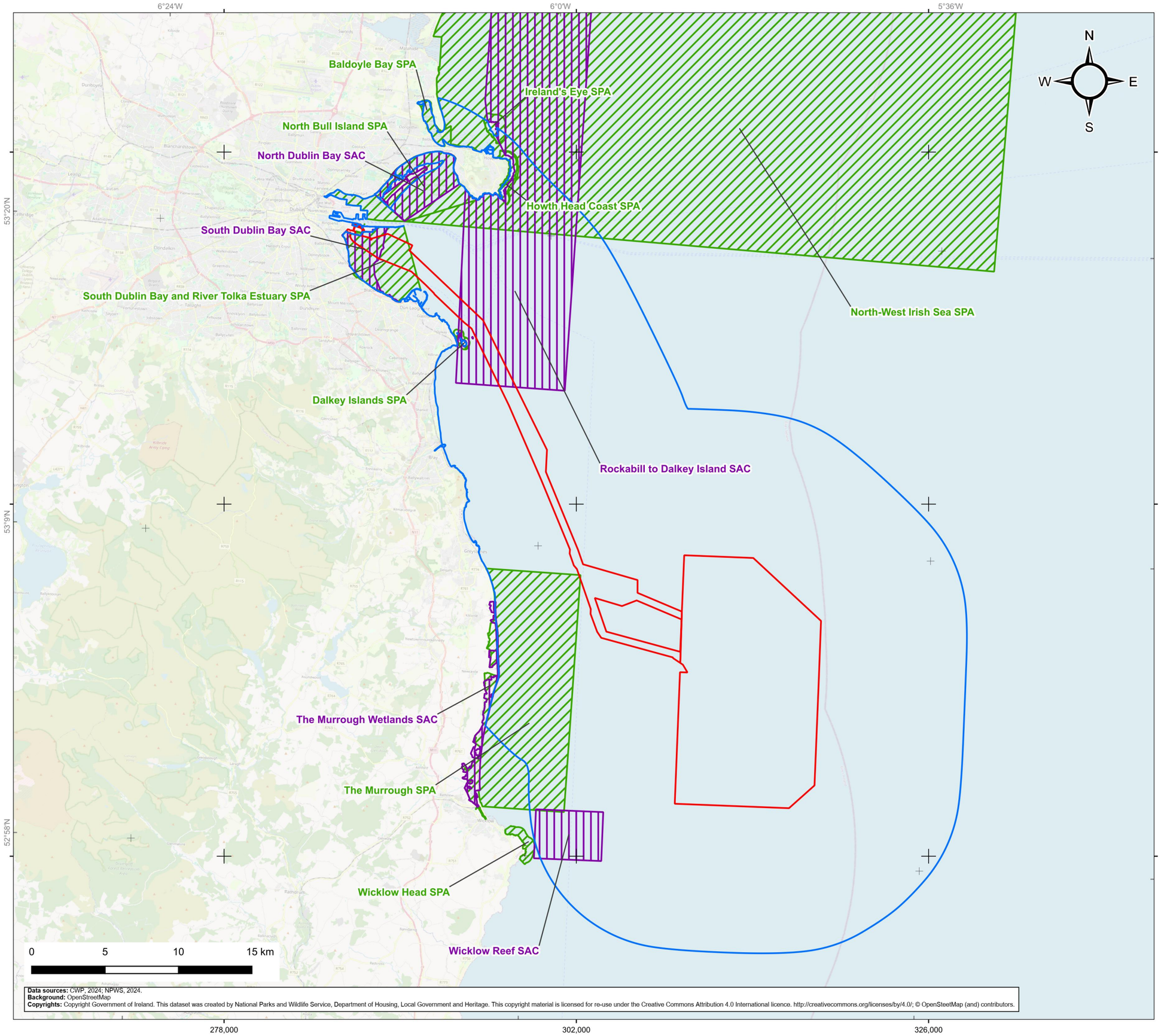
Internal descriptive code: WE - PAB..BUFF.10km.S - BW..NSAs..SW..WBs.WFD - (EIAR.Vol.04.Ch.07.Ap.04.FIG.02)

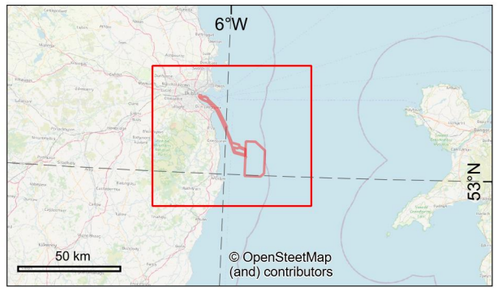
Size: A3

Scale: 1:250,000

CRS: EPSG 25830

Rev.	Updates	Date	By	Chk'd	App'd
A	Final version	2024/08/07	AC	ME/EA	SM





Legend

- Planning Application Boundary (PAB)
- 10 km study area

Designated site

- Special Area of Conservation (SAC)
- Special Protection Area (SPA)

Data sources: CWP, 2024; NPWS, 2024.
Background: OpenStreetMap

codling wind park

Project: Codling Wind Park

Contractor: www.naturalpower.com

Figure 3
Nearshore and offshore SACs and SPAs

CWP doc. number: CWP-NPC-ENG-08-01-MAP-1762

Internal descriptive code: WE - PAB..BUFF.10km.S - SACs..SPAs - (EIAR.Vol.04.Ch.07.Ap.04.FIG.03)

Size: A3

Scale: 1:250,000

CRS: EPSG 25830

Rev.	Updates	Date	By	Chk'd	App'd
A	Final version	2024/08/07	AC	ME/EA	SM

4. Stage 2 Scoping

This section summarises the findings of the scoping of the WFD assessment. A detailed consideration of the risks to each water body for each parameter is provided in **Appendix A**.

Table 9: Summary of Stage 2 Scoping

Water Body	Receptor	Potential risk to receptor?	Risk issues for impact assessment
Dublin Bay	Biology: habitats	Yes	Footprint of activity exceeds 1% of the water body's area and is within 500 m of a higher sensitivity habitat. Footprint may exceed 1% of lower sensitivity habitats present within the water body.
	Biology: fish	No	. Activities are not anticipated to delay or prevent fish entering an estuary, impact normal fish behaviour, or cause entrainment or impingement of fish.
	Hydromorphology	No	Works are small scale. No significant modifications anticipated to affect hydromorphology.
	Water quality	Yes	Increase in SSC anticipated to last up to 15 days, affecting water clarity. Levels of contaminants, when assessed against Irish guidelines, three stations had Arsenic levels above the Lower AL but below the Upper AL. Cadmium levels at one station were also between the Upper and Lower AL. When assessed against Cefas guidelines, levels of Cadmium, Chromium and

Water Body	Receptor	Potential risk to receptor?	Risk issues for impact assessment
			Zinc at one station were slightly above AL1 but below AL2. No other contaminants assessed were above Irish Lower ALs or Cefas AL1 and none were above Irish or Cefas upper limits during site-specific surveys, which may be disturbed during the works.
	Protected areas	Yes	There are WFD protected areas within the ZoI of the works.
	INNS	Yes	Activities require the use of marine vessels and equipment from outside the local area which could increase the risk of introduction or spread of INNS.
Dublin Groundwater body	Groundwater – Bedrock Aquifer	Yes	Works are small scale. Bedrock aquifer is located at a significant depth and overlain by low permeability materials. No significant modifications anticipated to the Groundwater Body.
Liffey Estuary Lower	Biology: habitats	No	Works are small scale (affect less than 1% of water body area).
	Biology: fish	Yes	Noise from piling during installation of the coastal wall could impact on normal fish behaviour in the estuary.
	Hydromorphology	No	Works are small scale, and effects imperceptible.
	Water quality	Yes	Phytoplankton status for 2016-2021 is moderate.
	Protected areas	Yes	There are WFD protected areas within the ZoI of the works.

Water Body	Receptor	Potential risk to receptor?	Risk issues for impact assessment
	Invasive non-native species	Yes	Activities require the use of marine vessels and equipment from outside the local area which could increase the risk of introduction or spread of INNS.
Irish Sea Dublin	Biology: habitats	Yes	Works have the potential to exceed 1% of the water body's area, and are within 500 m of a higher sensitivity habitat
	Biology: fish	No	Not an estuary, no estuaries associated with this water body are within ZoI of the works.
	Hydromorphology	No	Works are small scale. No significant modifications anticipated to affect hydromorphology.
	Water quality	Yes	Increase in SSC anticipated to last up to 15 days, affecting water clarity.
	Protected areas	Yes	There are WFD protected areas within the ZoI of the works.
	Invasive non-native species	Yes	Activities require the use of marine vessels and equipment from outside the local area which could increase the risk of introduction or spread of INNS.
Southwestern Irish Sea - Killiney	Biology: habitats	Yes	Footprint of sediment plume exceeds 1% of the water body's area.
	Biology: fish	No	Not an estuary, no estuaries associated with this water body are within ZoI of the works.
	Hydromorphology	No	Works are small scale. No significant modifications anticipated

Water Body	Receptor	Potential risk to receptor?	Risk issues for impact assessment
			to affect hydromorphology.
	Water quality	Yes	Increase in SSC anticipated to last up to 15 days, affecting water clarity.
	Protected areas	Yes	There are WFD protected areas within the ZoI of the works.
	Invasive non-native species	Yes	Activities require the use of marine vessels and equipment from outside the local area which could increase the risk of introduction or spread of INNS.
Tolka Estuary	Biology: habitats	No	Works are small scale. No modifications to waterbody hydromorphology.
	Biology: fish	Yes	While noise is not a monitored characteristic under WFD, noise from piling works in the Liffey could impact on normal fish behaviour in the estuary.
	Hydromorphology	No	No overlap. No modifications to hydromorphology.
	Water quality	Yes	Phytoplankton status for 2016-2021 is moderate.
	Protected areas	Yes	There are WFD protected areas within the ZoI of the works.
	Invasive non-native species	Yes	Activities require the use of marine vessels and equipment from outside the local area which could increase the risk of introduction or spread of INNS.
Liffey Estuary Upper	Biology: habitats	No	Works are small scale.
	Biology: fish	Yes	While noise is not a monitored characteristic

Water Body	Receptor	Potential risk to receptor?	Risk issues for impact assessment
			under WFD, noise from piling works undertaken downstream could impact on normal fish behaviour in the estuary. Activities are not anticipated to delay or prevent fish entering an estuary, impact normal fish behaviour, or cause entrainment or impingement of fish.
	Hydromorphology	No	Works are small scale. No modifications to hydromorphology.
	Water quality	No	Works are small scale and temporary No predicted effects.
	Protected areas	No	There are no WFD protected areas associated with this water body.
	Invasive non-native species	Yes	Activities require the use of marine vessels and equipment from outside the local area which could increase the risk of introduction or spread of INNS.
North Bull Island	Biology: habitats	No	Works are small scale. No modifications to the water body hydromorphology
	Biology: fish	No	Activities are not anticipated to delay or prevent fish entering an estuary, or cause entrainment or impingement of fish.
	Hydromorphology	No	No modifications to the water body hydromorphology.
	Water quality	No	No predicted effects on water quality .

Water Body	Receptor	Potential risk to receptor?	Risk issues for impact assessment
	Protected areas	Yes	There are WFD protected areas within the ZoI of the works.
	Invasive non-native species	Yes	Activities require the use of marine vessels and equipment from outside the local area which could increase the risk of introduction or spread of INNS.
River Dodder	All	No	Water body is upstream of works, no overlap, no route to impact.
Grand Canal Basin	All	No	Water body is upstream of works, no overlap, no route to impact.

Based on the screening undertaken in **Table 9**, impacts can be summarised into the following:

- Direct disturbance of seabed resulting in habitat disturbance or loss, potentially affecting WFD status;
- Increase in suspended SSC as a result of seabed disturbance or run-off from terrestrial activities impacting biological characteristics and water quality, potentially WFD status; and
- Disturbance sediments resulting in release of contaminated sediments or excess nutrients, potentially affecting WFD status.

5. Stage 3 Identification of mitigation

Following completion of the impact assessment in **Section 6**, no requirement for additional mitigation has been identified beyond measures which have been adopted as part of the evolution of the project design and approach to construction, to avoid or otherwise reduce adverse impacts on the environment. These mitigation measures are referred to as 'primary mitigation'. They are an inherent part of the CWP Project and are effectively 'built in' to the impact assessment. Primary mitigation measures relevant to the assessment of Marine Water Quality are set out in **Table 10**.

Table 10 Primary mitigation measures

Project Element	Description
All offshore infrastructure (Construction)	Bedform clearance operations will be undertaken only where necessary, thereby minimising sediment disturbance and alteration to seabed morphology.
All offshore infrastructure (Construction)	A Construction Environmental Management Plan (CEMP) has been prepared to provide a management framework, to ensure appropriate controls are in place to manage environmental risks associated with the construction of the CWP Project. It outlines environmental procedures that require consideration throughout the construction process, in accordance with legislative requirements and industry best practice. In summary, the CEMP includes details of: - the Environmental Management Framework for the CWP Project including environmental roles and responsibilities (i.e. ecological clerk of works) and contractor requirements (i.e. method statements for specific construction activities); - mitigation measures and commitments made within the EIAR, Natura Impact Statement (NIS) and supporting documentation for the CWP Project. - measures proposed to ensure effective handling of chemicals, oils and fuels including compliance with the MARPOL convention; - a Marine Pollution Prevention and Contingency Plan to address the procedures to be followed in the event of a marine pollution incident originating from the operations of the CWP Project; - a Emergency Response Plan adhered to in the event of discovering unexploded ordnance; - Offshore biosecurity and invasive species management detailing how the risk of introduction and spread of invasive non-native species will be minimised; and - Offshore waste management and disposal arrangements. The CEMP will be implemented by the Applicant and its appointed contractor(s) and will be secured through conditions of the development consent. It will be a live document which will be updated and submitted to the relevant authority, prior to the start of construction.

WTGs and OSSs (Construction)	Drill fluids, where required, will comply with industry best practice and standards to minimise risk to the environment.
WTGs and OSSs (Construction)	Grouts will comply with the relevant maritime industry specifications which are designed for safety, and suitable for use in the marine environment.
All offshore infrastructure (Construction and Operation)	In general, the CWP Project has sought to specify the location, scale and extents of permanent and temporary offshore infrastructure, however in some cases a degree of locational flexibility is required. Locational flexibility of permanent and temporary infrastructure is described as a Limit of Deviation (LoD) from a specific point or alignment. LoDs, described in Chapter 4 Project Description, are required to: • Take account of additional ground conditions data acquired during pre-construction geotechnical surveys and results from pre-construction offshore UXO surveys; • Avoid and minimise adverse impacts on offshore ephemeral benthic habitats such as *Sabellaria spinulosa* reef, identified during pre-construction surveys; • Take account of the confirmed position of existing subsea infrastructure and archaeological features; and • Accommodate for unexpected on-site conditions, encountered during WTG / OSS foundation installation.
All offshore infrastructure (Decommissioning)	A Rehabilitation Schedule is provided as part of the planning application. This has been prepared in accordance with the MAP Act (as amended by the Maritime and Valuation (Amendment) Act 2022) to provide preliminary information on the approaches to decommissioning the offshore and onshore components of the CWP Project. A final Rehabilitation Schedule will require approval from the statutory consultees prior to the undertaking of decommissioning works. This will reflect discussions held with stakeholders and regulators to determine the exact methodology for decommissioning, taking into account available methods, best practice and likely environmental effects.
All offshore infrastructure (Construction)	A Marine Mammal Mitigation Protocol (MMMP) has been prepared to outline the mitigation requirements for minimising the impacts on marine mammals during the construction of the CWP Project. The MMMP will be implemented by the Applicant and its appointed contractor(s) and will be secured through conditions of the development consent. It will be a live document which will be updated and submitted to the relevant authority, prior to the start of construction. Primary mitigation measures in the MMMP include: - Pre geophysical survey visual watch by an MMO

	- Pre UXO detonation visual watch by an MMO - Pre UXO detonation PAM (if required to supplement to visual observations)
All offshore infrastructure (Decommissioning)	A Marine Mammal Mitigation Protocol (MMMP) has been prepared to outline the mitigation requirements for minimising the impacts on marine mammals during the decommissioning of the CWP Project. The MMMP will be implemented by the Applicant and its appointed contractor(s) and will be secured through conditions of the development consent. It will be a live document which will be updated and submitted to the relevant authority, prior to the start of decommissioning.
WTGs (Operation)	All WTGs for both layout options will feature a minimum blade tip clearance of 36 m above Mean Sean Level (MSL) (+37.72m LAT). This is beyond the minimum 22 m clearance required for safety of navigation and has been set by the Applicant to reduce the potential collision risk for offshore ornithology receptors
OSS's (Operation)	Once the construction of the onshore substation is complete, a survey will be conducted to identified areas which may be used by avian predator species to perch and hunt from. Anti perching bird spikes or alternatives will then be installed.
All offshore infrastructure (Construction, Operation and Decommissioning)	An Ecological Vessel Management Plan (EVMP) has been prepared to determine vessel routing to and from construction sites and ports and to include a code of conduct for vessel operators. The EVMP includes details of: - The types and specifications of vessels for the CWP Project; - How vessels will be monitored and coordinated; and - The use of defined transit routes to site from key construction and operation ports, where practicable to do so. The EVMP will be implemented by the Applicant and its appointed contractor(s) and will be secured through conditions of the development consent. It will be a live document which will be updated and submitted to the relevant authority, prior to the start of construction.
Onshore (Operation and Maintenance)	An **Onshore Substation Site Drainage and Water Supply Design Report** has been prepared to summarise the storm water and foul water drainage proposals for the CWP Project during the O&M phase, as well as the proposed potable water supply proposals. **The Onshore Substation Site Drainage and Water Supply Design Report** includes details of: - Storm water network design - Storm water collection and disposal systems - Foul water collection and disposal systems

	- Estimated potable water demand **The Onshore Substation Site Drainage and Water Supply Design Report** will be implemented by the Applicant and its appointed contractor(s) and will be secured through conditions of the development consent.

6. Stage 4 Impact Assessment

Following Stage 2 Scoping, the following water bodies have been identified where there is potential for impacts to water quality:

- Dublin Bay coastal water body;
- Liffey Estuary Lower transitional water body;
- Irish Sea Dublin coastal water body;
- Southwestern Irish Sea – Killiney Bay coastal water body; and
- Tolka Estuary transitional water body.

The characteristics with the potential to be affected are Biology: Habitats, Biology: Fish, Water Quality and Protected Areas. The same protected areas overlap several different water bodies, or are anticipated to experience the same or similar impacts, therefore these have been assessed together in **Section 6.9**.

6.1. Dublin Bay Coastal water Body

The landfall and approx. 29.5 km of the offshore export cables are intended to be located within the Dublin Bay coastal water body.

6.1.1. Biology: Habitats

Footprint of activity exceeds 1% of the water body's area, and is within 500 m of higher sensitivity habitats saltmarsh and intertidal seagrass. Footprint may exceed 1% of lower sensitivity habitats present within the water body.

Regional data (INFOMAR) suggests that the sediment types within the Dublin Bay coastal water body consist of infralittoral fine sand or Infralittoral muddy sand (A5.23 or A5.24), Infralittoral sandy mud (A5.33) and circalittoral sandy mud (A5.35). Habitats identified within the OECC during site-specific surveys (**Appendix 8.1**) were consistent with publicly available data, and characterised predominantly as *Fabulina fabula* and *Magelona mirabilis* with venerid bivalves and amphipods in infralittoral compacted fine muddy sand (Ss.SSa.IMuSa.FfabMag, or A5.242), with patches of circalittoral coarse sediment (SS.SCS.CCS, or A5.14) and *Mediomastus fragilis*, *Lumbrineris spp*. and venerid bivalves in circalittoral coarse sand or gravel (SS.SCS.CCSMedLumVen, or A5.142), with *Spirobranchus triqueter* with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles (SS.SCS.SSC.SpiB or A5.141) present in patches near the border of Dublin Bay water body and Irish Sea Dublin (HA 09) water body. These are consistent with lower sensitivity habitat types of subtidal soft sediment and coarse sediment habitats. Intertidal sediments at the landfall were characterised as Littoral Sand (LS.LSa), Littoral Mixed Sediment, (LS.LMx), and Littoral Coarse Sediment (LS.LCS).

No high sensitivity habitats were found within the OECC, intertidal seagrass (*Zoster sp.*) and saltmarsh are recorded as present within the water body. A small area of *Zostera* bed (intertidal seagrass) is present inshore near Merrion Gate, located at a distance of approx. 1.5 km from the closest point of the CWP OECC and landfall. Two local nature reserves associated with this water body contain saltmarsh habitat. Saltmarsh habitat is also recorded as present at Booterstown Marsh approx. 1.5 km to the south of the OECC and landfall, and predominantly lies inside the seawall and DART line. Water flow in and out of the Marsh is controlled via a sluice and is unlikely to be impacted by the works, though some saltmarsh habitat is recorded on Sandymount Strand opposite the nature reserve, near the seagrass beds (McCorry and Ryle, 2009).

Benthic habitats are assessed in **Chapter 8 Subtidal and Intertidal Ecology**. The assessments conclude no significant effects for both low and high sensitivity habitats.

Impacts to WFD Status

WFD status is reviewed in 6 year cycles, and given the localised nature of disturbance and short timescale of impacts, impacts to benthic habitats will not result in deterioration of WFD status, or prevent the attainment of good WFD status.

6.1.2. Water Quality

Assessment is required where activities could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days). Modelling showed significant difference between tidal excursion distances during spring and neap tides. Spring tides, which generate the greatest horizontal displacement, can extend along the tidal axis for a maximum of up to 10 km, whilst neap tides show a displacement of between 4 – 6 km (**Appendix 6.3**).

The activity has the potential to disturb sediment with contaminants above Irish Lower ALs or Cefas AL1.

Water Clarity

Increases in SSC are anticipated to last up to 15 days, affecting water clarity for greater than 14 days. Other factors such as temperature, salinity etc. will not be affected.

Increased SSC has the potential to interact with algae and phytoplankton due to the potential for reduction of light in the water column, and also from the potential release of sediment bound nutrients resulting in an increase in phytoplankton concentration (Essink, 1999). Nutrient input in coastal and estuarian areas typically come from terrestrial sources, such as river input, diffuse run-off during wet weather (EPA, 2023d), with nutrient inputs in Dublin Bay primarily come from terrestrial sources (Wilson, 2005), with limited accumulation in the seabed due to the mobile nature of sediments. This is reflected in the low total organic carbon (TOC) levels detected in site-specific surveys (**Appendix 8.1**). Release of sediment-bound nutrients from construction activities are anticipated to be localised and of low concentration, and not expected to influence phytoplankton growth within the water body.

Background SSC within Dublin Bay overlapping the offshore development area are observed to peak between 8 and 12 mg/L (Silva, 2016), however this can increase by a factor of 10 in storm conditions, as recorded during Storm Barra in 2021, where SSC increased from <10 Nephelometric Turbidity Units (NTU) to 110 NTU in storm conditions (RPS, 2022b). Total suspended solids (mg/l) within the approach channel to Dublin Port is estimated at 1.61 times the turbidity (NTU) (RPS, 2022b), therefore suspended sediments in Dublin Bay have been recorded to exceed 170 mg/l in storm conditions.

Based on the results of modelling outputs presented in **Appendix 6.3**, peak levels of SSC from the proposed activities only persist for a very short period of time (hours) and therefore it is assumed will affect only a very small area around the location of the activity (< 1 km). Increases in SSC and sediment deposition arising from construction activities in both the array site and OECC are mainly predicted to be transported eastward, or south eastward, away from Dublin Bay. Only finer fractions (particle size range of <63 µm) are expected to remain in suspension at levels equivalent to background concentration for up to 15 days. This is not anticipated to significantly affect phytoplankton concentration or algal condition in the Dublin Bay coastal water body.

Increases in SSC as a result of dredge disposal, modelling release at 5 km from the coast (and closest to water bodies) In one modelled dredging and disposal scenario, increases in SSC are predicted to travel inshore at an enhanced level of 80 mg / L for 4 km, returning to background concentration levels after c. 10 days.and is therefore not expected to impact the Dublin Bay coastal water body.

While these increases are anticipated to exceed one tide cycle (up to 15 days), effects are temporary and localised, and are not anticipated to impact the growth of algae and phytoplankton in the water body, and are therefore not anticipated to result in a deterioration of the water body's good status.

Contaminated sediments

Levels of contaminants above Irish Lower ALs or Cefas AL1 were detected at 4 stations during site-specific surveys (**Appendix 8.3 Benthic Baseline Report**), which may be disturbed during the works: Station 28, 30 and 77 (Arsenic), and Station 59 (Cadmium, Chromium and Zinc). None exceeded AL2 or Irish Upper Levels, and no other pollutants exceeded risk levels. Stations 59 is located with the Dublin Bay coastal water body, and as a result there is potential for contaminated sediments to be released within the Dublin Bay coastal water body. Stations 28, 30 and 77 however are located outside of the WFD water bodies, and a minimum of 5 km from the Dublin Bay coastal water boundary and is therefore outside the ZoI.

The potential for sediments to accumulate chemical contamination is linked with sediment type. Finer particles (muds and silts, <63 µm) have greater surface area to volume ratio and adsorptive capacity compared to coarser grains (sands and gravels) (Sheahan *et al*., 2001). As described in **Chapter 6 Marine Geology, Sediments and Coastal Processes** and site-specific PSA analysis (Osiris Projects, 2014), seabed across the offshore development area is predominantly sandy gravel (grain size >2 mm), with a higher percentage of sand (0.063 – 2.0 mm) found closer to the coastline. This is consistent with the 'good' chemical status (2016-2021) of the water body, indicating low background incidence of contaminants within sediments in the wider area.

In general, seabed sediments are mobile and susceptible to regular resuspension by tidal currents and waves, resulting in high natural dispersion and diffusion of any low level contaminants. Any disturbance of sediments as a result of the works would likely dilute contaminants further, and would not risk deterioration of the overall good chemical status of the water body.

The onshore infrastructure is located on an area previously used for landfill, and while no contamination has been found during site-specific surveys (which are ongoing), it is assumed for the purpose of assessment that there may be chemicals present that are on the EQSD list as a conservative approach. All landfall works will be undertaken within a cofferdam or soil berm in dry conditions, resulting in no connectivity between the marine environment and potential for disturbance of contamination from onshore sources. In addition, all works will be carried out in accordance with project management plans such as the CEMP, to manage and mitigate potential release of pollutants, therefore will be no additional contamination of the marine environment as a result of the works. Any soil found to be contaminated will be removed and disposed of appropriately in accordance with the relevant onshore management plan, such as the Construction Environmental Management Plan (CEMP).

Impacts to water quality are therefore are not anticipated to result in a deterioration of the water body's good chemical status.

Impacts to WFD Status

WFD status is reviewed in 6 year cycles, and given the localised nature of disturbance and short timescale of impacts, impacts to water quality via changes to water clarity and release of contaminants from sediments will not result in deterioration of WFD status, or prevent the attainment of good WFD status.

6.1.3. INNS

Dublin Bay, together with Howth and Dun Laoghaire, hosts significant marine traffic and the potential for INNS introduction is already high from pre-existing activities. It is recognised that a number of INNS species have been reported within the region, such as Australasian barnacle (*Elminius modestus*), carpet sea squirt (*Didemnum vexillum*) and wireweed (*Sargassum muticum*) (NBDC, 2023; GBIF, 2023).

The Marine Cables will be installed by burial as a preference, minimising the introduction of new hard substrate habitat on which colonising organisms can settle. Furthermore, any secondary cable protection will be free of marine INNS contamination thus removing the risk of direct introduction of INNS from other marine regions.

Vessels and equipment used during installation will likely be internationally sourced, travelling from other water bodies, however all vessels will operate with the required national and/or international standards anti-fouling and

biosecurity & ballast water protocols, in order to ensure that the risk of INNS introduction is as low as reasonably practicable.

Works will be carried out in line with the Project management plans, including Construction Environmental Management Plan (CEMP), which will include an offshore biosecurity and invasive species management detailing how the risk of introduction and spread of invasive non-native species will be minimised..

The risk of introducing or spreading INNS during construction of CWP Project is therefore reduced to as low as reasonably practicable.

Impacts to WFD Status

The low risk of introduction and spreading of INNS during construction activities is very low and will not result in deterioration of WFD status, or prevent the attainment of good WFD status.

6.1.4. Summary

No deterioration of the water body's status is anticipated as a result of the works.

6.2. Dublin Groundwater body

The onshore infrastructure is located within the Dublin Groundwater Body. The bedrock aquifer in this groundwater body is generally unconfined, but may become locally confined in areas of thicker and/ or lower permeability subsoil. Groundwater flow occurs within the effective thickness of the aquifer which is considered to be approximately 10 m thick and consists of a weathered zone above a connected fractured zone, as well as at depth within isolated faults and fractures located between 30 mbgl to 50 mbgl. Most groundwater flow in the aquifer occurs near the surface and flow path lengths are considered to be on a local scale typically less than one kilometre long. Groundwater flow is toward rivers and streams which are hydraulically connected to the aquifer and toward the coast (GSI, 2003).

The hydrochemical signature of groundwater in the Dublin groundwater body is very hard, calcium bicarbonate water with high alkalinity (300 mg / l – 350 mg / l CaCO3) and high conductivities (550 µS/cm – 900 µS / cm) (GSI, 2003).

The EPA classifies the Dublin groundwater body as having good water quality status but the risk of not meeting the WFD 2027 objectives is under review.

The construction compound wastewater will be collected and stored in sealed holding tanks. Wastewater or effluent from the construction works will be discharged under licence to the local sewer network. A Discharge licence to sewer is required under Section 16 of the Local Government (Water Pollution) Act 1977, as amended. Discharge licences to the foul/combined sewer are issued by Irish Water.

Cable trenches can act as preferential pathways which could allow groundwater to migrate to the foreshore. While material on the peninsula at the landfall is permeable, it is proposed to limit the potential for preferential pathways along the cable trenches by using lower permeability backfill material between the TBJs and foreshore (i.e. material with lower permeability than that surrounding the cable trenches). This will prevent unintended longitudinal drainage along the trench.

An Onshore Substation Site Drainage and Water Supply Design Report has been prepared to summarise the storm water and foul water drainage proposals for the CWP Project during the O&M phase, as well as the proposed potable water supply proposals. The Onshore Substation Site Drainage and Water Supply Design Report includes details of:

- Storm water network design
- Storm water collection and disposal systems
- Foul water collection and disposal systems
- Estimated potable water demand

The Onshore Substation Site Drainage and Water Supply Design Report will be implemented by the Applicant and its appointed contractor(s) and will be secured through conditions of the development consent.

Impacts to WFD Status

Works are small scale and the bedrock aquifer is located at a significant depth and overlain by low permeability materials. No significant modifications anticipated to the Groundwater Body. and will not result in deterioration of WFD status, or prevent the attainment of good WFD status.

6.2.1. Summary

No deterioration of the groundwater body's status is anticipated as a result of the works.

6.3. Liffey Estuary Lower Transitional Water Body

6.3.1. Biology: Fish

Activities could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow), or could cause entrainment or impingement of fish. Installation of the coastal wall requires piling, which produces noise and could affect fish entering or leaving the water body.

Marine species common in the vicinity include herring (*Clupea harengus*), sandeel *(Ammodytes* sp.), sprat (*Sprattus sprattus*) and smelt (*Osmerus eperlanus*) which are known to be present within the Irish Sea. Migratory species known to use the Liffey, and are therefore likely to migrate through the Liffey Estuary, include European eel (*Anguilla anguilla*) and seatrout (*Salmo trutta*) Atlantic salmon (*Salmo salar*) and sea and river lamprey (*Petromyzon marinus*, *Lampetra fluviatilis*)

There are numerous freshwater species found in the Liffey, such as brown trout (*Salmo trutta*), minnow (*Phoxinus phoxinus*), stone loach (*Barbatula barbatula*), pike (*Esox lucius*), perch (*Perca fluviatilis*), roach (*Rutilus rutilus*), three-spined stickleback (*Gasterosteus aculeatus*) and gudgeon (*Gobio gobio*) (Triturus, 2020; Delanty et al. 2022), however there were no freshwater watercourses recorded within the ZoI, therefore no potential impacts to freshwater species are anticipated.

Marine and migratory fish species are assessed in **Chapter 9 Fish, Shellfish and Turtle Ecology** which concludes no significant effects after mitigation to fish migrating through the estuary.

Impacts to WFD Status

WFD status is reviewed in 6 year cycles and given the localised nature of disturbance and short timescale of impacts, impacts to fish via changes in underwater noise will not result in deterioration of WFD status, or prevent the attainment of good WFD status.

6.3.2. Water Quality

Assessment is required where the phytoplankton status for a water body is moderate.

Phytoplankton status of the Lower Liffey Estuary for 2016-2021 was moderate, indicating a sensitivity to blooms of phytoplankton and algae. As per **Section 6.1.2**, SSC has the potential to interact with algal and phytoplankton compliment of the water body due to the potential for reduction of light in the water column, and also from the potential release of sediment bound nutrients resulting in an increase in phytoplankton concentration (Essink, 1999).

Nutrient input in coastal and estuarian areas typically come from terrestrial sources, such as river input, diffuse run-off during heavy rainfall (EPA, 2023d). Potential additional sources from the works include run-off from the onshore

site compound which flows into the Liffey. Increased turbidity and release of sediment bound nutrients from construction activities are anticipated to be localised and of very low concentration, and not expected to influence phytoplankton growth within the water body. Water use and run-off from the site will be managed via best practice on-site drainage management, managed via the CEMP, and will be disposed of in accordance with Onshore Infrastructure Drainage Strategy.

Impacts to WFD Status

WFD status is reviewed in 6 year cycles and given the localised nature of disturbance and short timescale of impacts, impacts to water quality via changes phytoplankton status will not result in deterioration of WFD status, or prevent the attainment of good WFD status.

6.3.3. INNS

The mouth of the Liffey serves as part of Dublin Port and, together with Howth and Dun Laoghaire, hosts significant marine traffic and the potential for INNS introduction is already high from pre-existing activities. It is recognised that a number of INNS species have been reported within the region, such as Australasian barnacle (*Elminius modestus*), carpet sea squirt (*Didemnum vexillum*) and wireweed (*Sargassum muticum*) (NBDC, 2023; GBIF, 2023).

The Marine Cables will be installed by burial as a preference, minimising the introduction of new hard substrate habitat on which colonising organisms can settle. Furthermore, any secondary cable protection will be free of marine INNS contamination thus removing the risk of direct introduction of INNS from other marine regions.

Vessels and equipment used during installation will likely be internationally sourced, travelling from other water bodies, however all vessels will operate with the required national and/or international standards anti-fouling and biosecurity & ballast water protocols, in order to ensure that the risk of INNS introduction is as low as reasonably practicable.

Works will be carried out in line with the Project management plans, including Construction Environmental Management Plan (CEMP), which will include an offshore biosecurity and invasive species management plan detailing how the risk of introduction and spread of invasive non-native species will be minimised.

The risk of introducing or spreading INNS during construction of the CWP Project is therefore reduced to as low as reasonably practicable.

Impacts to WFD Status

The risk of introduction and spreading of INNS during construction activities is very low and will not result in deterioration of WFD status, or prevent the attainment of good WFD status.

6.3.4. Summary

No deterioration of the water body's status is anticipated as a result of the works.

6.4. Irish Sea Dublin

The Irish Sea Dublin (HA 09) coastal water body is split in two, positioned either side (north and south) of the Dublin Bay coastal water body. Construction works are anticipated to pass through the southern section only, while the northern section is with the ZoI of the offshore infrastructure. Biology: Habitats

Works have the potential to exceed 1% of the water body's area.

Site-specific surveys of the offshore development area indicated the seabed was characterised predominately as *Mediomastus fragilis*, *Lumbrineris spp*. and venerid bivalves in circalittoral coarse sand or gravel (SS.SCS.CCSMedLumVen, or A5.142), with patches of circalittoral coarse sediment (SS.SCS.CCS, or A5.14), *Spirobranchus triqueter* with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles (SS.SCS.SSC.SpiB or A5.141) and *Fabulina fabula* and *Magelona mirabilis* with venerid bivalves and amphipods in infralittoral compacted fine muddy sand (Ss.SSa.IMuSa.FfabMag, or A5.242) near the border with Dublin Bay coastal water body. These receptors are consistent with lower sensitivity habitat types of subtidal soft sediment and coarse sediment habitats. Other habitats noted within the ZoI of increased SSC, but do not overlap the offshore development area include reef around Dalkey islands, kelp beds within 500 m which are also considered low sensitivity habitats requiring assessment. No higher sensitivity habitats are noted as present in the vicinity. Annex I intertidal and subtidal rocky reef complexes (1170) are part of the Rockabill and Dalkey SAC designation (NPWS, 2013). The designation includes a sparse covering of kelp species, which can constitute a high sensitivity habitat.

Benthic habitats are assessed in **Chapter 8 Subtidal and Intertidal Ecology**. The assessments conclude no significant effects for both low and high sensitivity habitats.

Impacts to WFD Status

WFD status is reviewed in 6 year cycles, and given the localised nature of disturbance and short timescale of impacts, impacts to benthic habitats will not result in deterioration of WFD status, or prevent the attainment of good WFD status.

6.4.1. Water Quality

Increase in SSC anticipated to last up to 15 days, affecting water clarity.

Water clarity

As per **Section 6.1.2** above, increases in SSC anticipated to last up to 15 days, affecting water clarity. Other factors such as temperature, salinity etc. will not be affected. Water clarity may disimprove for greater than 14 days, however increases will not exceed storm levels. Effects are temporary and localised and are not anticipated to impact the growth of algae and phytoplankton in the water body, and are therefore not anticipated to result in a deterioration of the water body's good status.

Contaminated Sediments

Levels of contaminants above Irish Lower ALs or Cefas AL1 were detected at 4 stations during site-specific surveys (**Appendix 8.3 Benthic Baseline Report**), which may be disturbed during the works: Station 28, 30 and 77 (Arsenic), and Station 59 (Cadmium, Chromium and Zinc). Stations 30 is 2.9 km southeast from the boundary of the Irish Sea Dublin (HA 09) water body, while stations 28, 59 and 77 are in excess of 4 km away.

As per **Section 6.1.2**, the potential for sediments to accumulate chemical contamination is linked with sediment type. Finer particles (muds and silts, <63 µm) have greater surface area to volume ratio and adsorptive capacity compared to coarser grains (sands and gravels) (Sheahan *et al*., 2001). As described in **Chapter 6 Marine Geology, Sediments and Coastal Processes** and site-specific PSA analysis (Osiris Projects, 2014), seabed across the offshore development area is predominantly sandy gravel (grain size >2 mm), with a higher percentage of sand (0.063 – 2.0 mm) found closer to the coastline. Sample 36 taken from within the Irish Sea Dublin (HA 09) water body indicates that the seabed is predominantly composed of coarse gravel/cobble/boulder, with predicted habitat mapping showing this is likely widespread through the area, and is unlikely to accumulate contaminated sediments suggesting a low background incidence of contaminants within sediments in the water body. The potential for disturbance of contaminated sediments is therefore not expected to result in a deterioration of the overall good status of the water body.

Impacts to WFD Status

WFD status is reviewed in 6 year cycles, and given the localised nature of disturbance and short timescale of impacts, impacts to water quality via changes to water clarity and release of contaminants from sediments will not result in deterioration of WFD status, or prevent the attainment of good WFD status.

6.4.2. INNS

The Dublin Bay area, together with Howth and Dun Laoghaire, hosts significant marine traffic and the potential for INNS introduction is already high from pre-existing activities. It is recognised that a number of INNS species have been reported within the region, such as Australasian barnacle (*Elminius modestus*), carpet sea squirt (*Didemnum vexillum*) and wireweed (*Sargassum muticum*) (NBDC, 2023; GBIF, 2023).

The Marine Cables will be installed by burial as a preference, minimising the introduction of new hard substrate habitat on which colonising organisms can settle. Furthermore, any secondary cable protection will be free of marine INNS contamination thus removing the risk of direct introduction of INNS from other marine regions.

Vessels and equipment used during installation will likely be internationally sourced, travelling from other water bodies, however all vessels will operate with the required national and/or international standards anti-fouling and biosecurity & ballast water protocols, in order to ensure that the risk of INNS introduction is as low as reasonably practicable.

Works will be carried out in line with the Project management plans, including Construction Environmental Management Plan (CEMP), which will include an offshore biosecurity and invasive species management plan detailing how the risk of introduction and spread of invasive non-native species will be minimised.

The risk of introducing or spreading INNS during construction of CWP Project is therefore reduced to as low as reasonably practicable.

Impacts to WFD Status

The risk of introduction and spreading of INNS during construction activities is very low and will not result in deterioration of WFD status, or prevent the attainment of good WFD status.

6.4.3. Summary

No deterioration of the water body's status is anticipated as a result of the works.

6.5. Southwestern Irish Sea – Killiney Bay

6.5.1. Biology: Habitats

Footprint of activities within the water body is anticipated to be up to 0.3 km^2 representing 0.6% of the water body's area, however the sediment plume as a worst case from the disturbance point has the potential to overlap over 5 km^2, exceeding 1% of the water body's area.

Due to the distance from the works, only small increases in SSC (up to 7 mg/l above background levels) are expected to be observed within the water body. Increased SSC relating to dredge disposal however is expected to travel up to 4 km towards the coast, with increases up to 44 mg/l above background levels anticipated within the water body. This is based on a single disposal location within the OECC, however the final disposal location will be determined as part of the EPA dredge licensing, and currently a precautionary approach is taken to assume spoil disposal could occur anywhere in the Project area, including along the OECC.

The array site is a minimum of 9.2 km away from WFD jurisdiction. The prevailing currents in the offshore area are predominantly in an easterly direction, therefore it is concluded that the majority of sediment disturbance from within the array site is not expected to impact WFD jurisdiction.

Regional data (INFOMAR) suggests that the sediment types within the Southwester Irish Sea – Killiney coastal water body consist of fine sand or infralittoral muddy sand (A5.23 or A5.24) with patches of rock (A3) to the north of the water body, giving way to coarser sediments (A5.13, A5.14 and A5.15) to the south. Sediments also become more coarse with water depth. Patches have also been identified as deep circalittoral sand (A5.27) and circalittoral mixed sediments (A5.44). As a precautionary approach in the absence of site-specific data, these will be assessed as low sensitivity habitats consistent with intertidal and subtidal soft sediments like sand and mud and cobbles, gravel and shingle. Rocky substrata may contain patches of reef habitat.

Benthic habitats are assessed in **Chapter 8 Subtidal and Intertidal Ecology**. The assessments conclude no significant effects for both low and high sensitivity habitats.

Impacts to WFD Status

WFD status is reviewed in 6 year cycles and given the localised nature of disturbance and short timescale of impacts, impacts to benthic habitats will not result in deterioration of WFD status, or prevent the attainment of good WFD status.

6.5.2. Water Quality

Increase in SSC anticipated to last up to 15 days, affecting water clarity. The activity will disturb sediment with contaminants above Irish Lower ALs or Cefas AL1 in the vicinity of the water body.

Water clarity

Increase in SSC anticipated to last up to 15 days, affecting water clarity. Other factors such as temperature, salinity etc. Will not be affected. Water clarity may disimprove for greater than 14 days, however increases will not exceed storm levels.

Contaminated Sediments

Levels of contaminants above Irish Lower ALs or Cefas AL1 were detected at 4 stations during site-specific surveys (**Appendix 8.3 Benthic Baseline Report**), which may be disturbed during the works: Station 28, 30 and 77 (Arsenic), and Station 59 (Cadmium, Chromium and Zinc). Stations 28 and 30 are 3.1 km east and 2.6 km southeast respectively at closest distance from the boundary of the Southwestern Irish Sea – Killiney (HA 10) water body, while stations 59 and 77 are in excess of 4 km away.

As per **Section 6.1.2**, the potential for sediments to accumulate chemical contamination is linked with sediment type. Finer particles (muds and silts, <63 µm) have greater surface area to volume ratio and adsorptive capacity compared to coarser grains (sands and gravels) (Sheahan *et al*., 2001). As described in **Section 6.5.1** above, the seabed is predominantly composed of sandy to coarse sediments and is unlikely to accumulate contaminated sediments. The potential for disturbance of contaminated sediments is therefore not expected to result in a deterioration of the overall good status of the water body.

Impacts to WFD Status

WFD status is reviewed in 6 year cycles and given the localised nature of disturbance and short timescale of impacts, impacts to water quality via changes to water clarity and release of contaminants from sediments will not result in deterioration of WFD status, or prevent the attainment of good WFD status.

6.5.3. INNS

The Dublin Bay area, together with Howth and Dun Laoghaire, hosts significant marine traffic and the potential for INNS introduction is already high from pre-existing activities. It is recognised that a number of INNS species have been reported within the region, such as Australasian barnacle (*Elminius modestus*), carpet sea squirt (*Didemnum vexillum*) and wireweed (*Sargassum muticum*) (NBDC, 2023; GBIF, 2023).

Vessels and equipment used during installation will likely be internationally sourced, travelling from other water bodies, however all vessels will operate with the required national and/or international standards anti-fouling and biosecurity & ballast water protocols, in order to ensure that the risk of INNS introduction is as low as reasonably practicable. In addition, physical interaction between the offshore development area and the Southwestern Irish Sea – Killiney (HA 10) is limited to an area approx. 0.375 km^2, which reduces the likelihood of direct interaction and INNS contamination from project vessels or equipment.

Works will be carried out in line with the Project management plans, including Construction Environmental Management Plan (CEMP), which will include an offshore biosecurity and invasive species management plan detailing how the risk of introduction and spread of invasive non-native species will be minimised.

The risk of introducing or spreading INNS during construction of CWP Project is therefore reduced to as low as reasonably practicable.

Impacts to WFD Status

The risk of introduction and spreading of INNS during construction activities is very low and will not result in deterioration of WFD status, or prevent the attainment of good WFD status.

6.5.4. Summary

No deterioration of the water body's status is anticipated as a result of the works.

6.6. Tolka Estuary Transitional Water Body

6.6.1. Biology: Fish

Activities could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow), or could cause entrainment or impingement of fish.

Installation of the coastal wall requires piling, which produces a significant amount of noise.

Compared with the Liffey, the Tolka is significantly influenced by excess nutrients, however for the purposes of the assessment it is assumed that the Tolka has similar potential to support fish species as the Liffey in the future (see **Section 6.3.1**).

Marine and migratory fish species are assessed in **Chapter 9 Fish, Shellfish and Turtle Ecology** which concludes no significant effects after mitigation.

Impacts to WFD Status

WFD status is reviewed in 6 year cycles and given the localised nature of disturbance and short timescale of impacts, impacts to fish via changes in underwater noise will not result in deterioration of WFD status, or prevent the attainment of good WFD status.

6.6.2. Water Quality

Assessment is required where the phytoplankton status for a water body is moderate.

Phytoplankton status of the Tolka Estuary for 2016-2021 was moderate, indicating a sensitivity to blooms of phytoplankton and algae. As per **Section 5.1.2**, SSC has the potential to interact with algal and phytoplankton compliment of the water body due to the potential for reduction of light in the water column, and also from the potential release of sediment bound nutrients resulting in an increase in phytoplankton concentration (Essink, 1999).

Nutrient input in coastal and estuarian areas typically come from terrestrial sources, such as river input (EPA, 2023d), and the Upper Tolka which flows into the Tolka Estuary is subject to additional actions for management under the 2018-2021 RBMP due to excess nutrient loading (EPA, 2022a).

Potential sources affecting water quality from the works include run-off from the onshore site compound under the power plant's cooling channel, which flows into the Liffey. Increased turbidity and release of sediment bound nutrients from construction activities are anticipated to be localised and low concentration, and not expected to influence phytoplankton growth within the water body. The construction compound wastewater will be collected and stored in sealed holding tanks. Wastewater or effluent from the construction works will be discharged under licence to the local sewer network. A Discharge licence to sewer is required under Section 16 of the Local Government (Water Pollution) Act 1977, as amended. Discharge licences to the foul/combined sewer are issued by Irish Water.

Impacts to WFD Status

WFD status is reviewed in 6 year cycles and given the localised nature of disturbance and short timescale of impacts, impacts to water quality via changes to phytoplankton status from sediments are will not result in deterioration of WFD status, or prevent the attainment of good WFD status.

6.6.3. INNS

The Dublin Bay area, together with Howth and Dun Laoghaire, hosts significant marine traffic and the potential for INNS introduction is already high from pre-existing activities. It is recognised that a number of INNS species have been reported within the region, such as Australasian barnacle (*Elminius modestus*), carpet sea squirt (*Didemnum vexillum*) and wireweed (*Sargassum muticum*) (NBDC, 2023; GBIF, 2023).

Vessels and equipment used during installation will likely be internationally sourced, travelling from other water bodies, however all vessels will operate with the required national and/or international standards anti-fouling and biosecurity & ballast water protocols, in order to ensure that the risk of INNS introduction is as low as reasonably practicable. In addition, there will be no physical interaction between construction works and the Tolka Estuary transitional water body which reduces the likelihood of INNS contamination from project vessels or equipment.

Works will be carried out in line with the Project management plans, including Construction Environmental Management Plan (CEMP), which will include an offshore biosecurity and invasive species management plan detailing how the risk of introduction and spread of invasive non-native species will be minimised.

The risk of introducing or spreading INNS during construction of CWP Project is therefore reduced to as low as reasonably practicable.

Impacts to WFD Status

The risk of introduction and spreading of INNS during construction activities is very low and will not result in deterioration of WFD status, or prevent the attainment of good WFD status.

6.6.4. Summary

No deterioration of the water body's status is anticipated as a result of the works.

6.7. Liffey Estuary Upper Transitional Water Body

6.7.1. Biology: Fish

Activities could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow) or could cause entrainment or impingement of fish.

While noise impacts will not affect the Liffey Estuary Upper directly, access to this waterbody by marine and migratory fish (and in the case of migratory fish, the Liffey catchment in general) is achieved via the Liffey Estuary Lower water body, therefore conclusions of **Section 6.3.1** in relation to marine and migratory fish also apply here.

Marine and migratory fish species are assessed in **Chapter 9 Fish, Shellfish and Turtle Ecology** which concludes no significant effects after mitigation to fish entering the estuary.

Impacts to WFD Status

WFD status is reviewed in 6 year cycles and given the localised nature of disturbance and short timescale of impacts, impacts to fish via changes in underwater noise and will not result in deterioration of WFD status, or prevent the attainment of good WFD status.

6.7.2. INNS

The Dublin Bay area, together with Howth and Dun Laoghaire, hosts significant marine traffic and the potential for INNS introduction is already high from pre-existing activities. It is recognised that a number of INNS species have been reported within the region, such as Australasian barnacle (*Elminius modestus*), carpet sea squirt (*Didemnum vexillum*) and wireweed (*Sargassum muticum*) (NBDC, 2023; GBIF, 2023).

Vessels and equipment used during installation will likely be internationally sourced, travelling from other water bodies, however all vessels will operate with the required national and/or international standards anti-fouling and biosecurity & ballast water protocols, in order to ensure that the risk of INNS introduction is as low as reasonably practicable. In addition, there will be no physical interaction between construction works and the Tolka Estuary transitional water body which reduces the likelihood of INNS contamination from project vessels or equipment.

Works will be carried out in line with the Project management plans, including the Construction Environmental Management Plan (CEMP), which will include an offshore biosecurity and invasive species management plan detailing how the risk of introduction and spread of invasive non-native species will be minimised.

The risk of introducing or spreading INNS during construction of CWP Project is therefore reduced to as low as reasonably practicable.

Impacts to WFD Status

The risk of introduction and spreading of INNS during construction activities is very low and will not result in deterioration of WFD status, or prevent the attainment of good WFD status.

6.7.3. Summary

No deterioration of the water body's status is anticipated as a result of the works.

6.8. North Bull Island

6.8.1. INNS

The Dublin Bay area, together with Howth and Dun Laoghaire, hosts significant marine traffic and the potential for INNS introduction is already high from pre-existing activities. It is recognised that a number of INNS species have

been reported within the region, such as Australasian barnacle (*Elminius modestus*), carpet sea squirt (*Didemnum vexillum*) and wireweed (*Sargassum muticum*) (NBDC, 2023; GBIF, 2023).

Vessels and equipment used during installation will likely be internationally sourced, travelling from other water bodies, however all vessels will operate with the required national and/or international standards anti-fouling and biosecurity & ballast water protocols, in order to ensure that the risk of INNS introduction is as low as reasonably practicable. In addition, there will be no physical interaction between construction works and the North Bull Island water body which reduces the likelihood of INNS contamination from project vessels or equipment.

Works will be carried out in line with the Project management plans, including Construction Environmental Management Plan, (CEMP), which will include an offshore biosecurity and invasive species management plan detailing how the risk of introduction and spread of invasive non-native species will be minimised.

The risk of introducing or spreading INNS during construction of CWP Project is therefore reduced to as low as reasonably practicable.

Impacts to WFD Status

The risk of introduction and spreading of INNS during construction activities is very low and will not result in deterioration of WFD status, or prevent the attainment of good WFD status.

6.8.2. Summary

No deterioration of the water body's status is anticipated as a result of the works.

6.9. Protected Areas

6.9.1. SACs

South Dublin SAC

South Dublin Bay SAC overlaps OECC and landfall below MHW, protected for mudflats and sandflats, saltmarsh and dune habitats. The NIS concluded that, following mitigation (**Section 5**), there would be no Adverse Effect on Site Integrity (AESI) of South Dublin Bay SAC from the CWP Project alone or in-combination with other plans and projects.

Rockabill to Dalkey Island SAC

Rockabill to Dalkey Island SAC overlaps part of the cable route and includes reefs and harbour porpoise as features.

The NIS concluded no likely significant effect (LSE) on the Annex I reef habitats within Rockabill to Dalkey Island SAC and following mitigation (**Section 5**) there will be no AESI regarding harbour porpoise, from the CWP Project alone, or in-combination with other plans and projects.

North Dublin Bay SAC

North Dublin Bay is 1.28 km from OECC and 1.7 km from revetment and coastal wall works at the onshore substation location, protected for mudflats and sandflats, saltmarsh and salt meadows.

The NIS concluded that, following mitigation (**Section 5**), there would be no AESI of North Dublin Bay SAC from the CWP Project alone or in-combination with other plans and projects.

Wicklow Reef SAC

Wicklow Reef SAC is 5.5 km from the CWP Project and is protected for reefs.

The NIS concluded no LSE on the Annex I reef habitats within Wicklow Reef SAC from the CWP Project alone, or in-combination with other plans and projects.

6.9.2. SPA/Ramsar

- North Bull Island SPA (1.3 km)
- North Bull Island Ramsar (1.3 km)
- South Dublin Bay and River Tolka Estuary SPA (overlaps)
- Sandymount Strand/Tolka Estuary Ramsar (overlaps)
- Dalkey Islands SPA (0.5 km)
- Howth Head Coast SPA (8.2 km)
- Ireland's Eye SPA (9.0 km)
- Baldoyle Bay SPA (7.0 km)
- The Murrough SPA (5.9 km)
- North-West Irish Sea cSPA (1.3 km)

Water-dependent features include the water column.

The NIS concluded that following application of suitable mitigation (**Section 5**), there would be no AESI on any SPA for the CWP Project alone or in combination with other plans or projects.

6.9.3. Nature Reserve

- North Bull Island (1.3 km to OECC, 1.9 km to cable corridor).

There is considerable overlap between the marine features of this nature reserve and the North Dublin Bay SAC and SPA.

There will no impact to terrestrial features of the reserve as they are not water-dependent and there is no route to impact.

The NIS concluded no AESI on the North Dublin Bay SAC and SPA from the CWP Project alone, or in-combination with other plans and projects. As such it is considered that there will be no significant adverse impact on the North Bull Island Nature Reserve.

6.9.4. Bathing Waters

In the case of Sandymount Strand and Shelley Banks, this includes direct disturbance of the beach area, as well as increases in SSC. For all other bathing areas, impact is limited to increased SSC.

Direct disturbance

The offshore development area overlaps the Sandymount Strand bathing water for 0.268 km^2, which represents approx. 27 % of the total designated bathing area. Landfall works are anticipated to be completed in two phases, affecting two bathing seasons. Activities in each phase are set out in detail in **Section 4.7 of Chapter 4 Project Description**, but can be summarised as activities relating to duct installation (Phase 1) and activities relating to cable installation including onshore connection (Phase 2). The total duration of landfall works for open cut trenching is expected to be 10 - 12 months with varying levels of activity on site, however vehicular and pedestrian site access will remain in place throughout, requiring restriction of public access until the works are completed. While this may impact local residents' use of the bathing water, which is outside the scope of this chapter, (assessed in **Chapter 29 Population**), it will not affect the bathing water's quality status. The beach area at Sandymount Strand is composed of soft sediments which are generally mobile and, as assessed in **Section 6.1.1**, are expected to recover in the short

term between 6 months and 2 years. Any hard substrate introduced will either be replacing existing revetment, and would not affect the safety or quality of the area as a bathing water.

Similarly, access to Shelley Banks can be expected to be restricted for two bathing seasons. The beach area is composed of soft sediments which are generally mobile and, as assessed in **Section 6.1.1**, are expected to recover in the short term between 6 months and 2 years. Any hard substrate introduced will either be replacing existing revetment, and would not affect the safety or quality of the area as a bathing water. Beach access will likely be affected and this is assessed in **Chapter 29 Population**.

Direct disturbance is therefore not expected to affect the quality status for Sandymount Strand or Shelley Banks.

Increases in SSC

Each of the following bathing waters are anticipated to experience increased SSC for up to 15 days during trenching works during a single bathing season:

- Sandymount Strand;
- Forty Foot Bathing Place;
- Sandycove Beach;
- Seapoint;
- White Rock Beach;
- Killiney;
- Dollymount Strand;
- White Rock;
- North Bull Wall;
- Half Moon;
- Shelley Banks;
- Merrion Strand; and
- Dun Laoghaire Baths

The highest concentrations will be seen at Sandymount Strand and Shelley Banks, where public access will also be restricted.

Local bathing waters are occasionally subject to temporary bathing restrictions, typically associated with heavy rainfall (and resulting increased terrestrial run-off) or pollution events, typically associated with wastewater overflows. Such closures are typically short lived (1 to 4 days) (EPA, 2022c). Previous studies on heavily nutrified sediment (from river dredging material) showed that disturbance and disposal of dredged material increased bacterial levels in the water course for up to 2 km downstream of a disposal site (Grimes, 1980), but returned to normal levels within 1 hour (Grimes, 1975; Grimes, 1980; Essink, 1999; Cefas, 2011 for review).

Background nutrient levels in coastal waters are known to be higher due to run-off from terrestrial sources (EPA, 2023d), however the status of the bathing waters within the ZoI have attained at least good status based on samples collected between 2018 and 2022.

Contaminated sediments were detected at 2 stations within the offshore development area, however both are situated at greater than 4 km from all bathing waters. As a result, any contamination released from these locations is anticipated to be very dilute and not anticipated to affect bathing waters.

6.9.5. Nutrient sensitive areas

NSAs are not relevant to coastal and transitional water bodies, however they do interact with groundwater bodies. Site investigations including boreholes to investigate ground water quality are presented in **Chapter 20 Hydrology and Hydrogeology**. These investigations detected some contaminants in groundwater, though levels were low and

mitigation measures (**Section 5**) will mitigate to as low as reasonably possible the risk of contaminants from the onshore activities entering the groundwater . A Construction Environmental Management Plan (CEMP) will be in place to manage water run-off and staff welfare facilities so that waste and waste water is disposed of appropriately and not released into the local wate supply.

Works do not require the input of nutrifying materials, therefore there is no risk to increase nitrogen or phosphorous in the groundwater.

6.9.6. Summary

The works are not anticipated to affect the status of WFD protected areas or interfere with management measures, and therefore will not result in deterioration of WFD status or prevent the attainment of good WFD status for any water body connected to the works.

7. Stage 5 Article 4.7 Derogation

The CWP Project, alone or in combination, will not lead to the deterioration of a water body or prevention of a water body to achieve good status, nor will it adversely impact the integrity of any WFD protected areas.

8. Summary and Conclusion

No deterioration or prevention of a water body to achieve good status is anticipated as a result of the proposed works.

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Appendices

A. WFD Scoping Tables

A.1. Dublin Bay Coastal Water Body

Table A 1: Dublin Bay coastal water body

Water body	Description, notes or more information
WFD water body name	Dublin Bay
Water body ID	EA_090_0000
Water body type (estuarine or coastal)	Coastal
Water body total area (ha, km^2)	6591.75868644 ha 65.91758686 km^2
Heavily modified water body and for what use	Not heavily modified
Higher sensitivity habitats present	Intertidal Seagrass; Saltmarsh
Lower sensitivity habitats present	Cobbles, gravel and shingle; intertidal soft sediments; rocky shore; subtidal rocky reef; subtidal soft sediments
History of harmful algae	Not provided
WFD protected areas within 2km/ZoI	SAC • Rockabill to Dalkey Island (overlaps OECC) • South Dublin Bay (overlaps OECC and landfall below MHW) • North Dublin Bay (1.28 km from OECC)SPA/Ramsar • Baldoyle Bay SPA (to OECC, km to cable corridor) • North-West Irish Sea cSPA (to OECC, km to cable corridor) • North Bull Island SPA (1.3 km to OECC, 1.9 km to cable corridor) • North Bull Island Ramsar (1.3 km to OECC, 1.9 km to cable corridor) • South Dublin Bay and River Tolka Estuary SPA (overlaps cable route and landfall below MHW) • Sandymount Strand/Tolka Estuary Ramsar (overlaps) • Dalkey Islands SPA (0.4 km to OECC, 0.5 km to cable route) • Howth Head Coast SPA (borders, no overlap) • Sandymount Strand/Tolka Estuary Ramsar • • Nature Reserve • North Bull Island (1.3 km to OECC, 1.9 km to cable corridor) • Booterstown Marsh (1.5 km to OECC and landfall) Bathing Water • Dollymount Strand (3.1 km, around the sea walls) • Sandymount Strand (overlaps) • Seapoint (2 km) • Sandycove Beach (1.1 km) • Forty Foot Bathing Place (1 km) There are no shellfish waters overlapping this water body Nutrient sensitive areas are terrestrial designations and therefore not relevant to coastal water bodies.

Water body	Description, notes or more information		
Overall Water Body Status	Good	Good	Not at Risk
Ecological status	Good	Good	
Chemical status	Good	Good	
Hydromorphology Status	Good	Good	
Quantitative Status	N/A	N/A	
Phytoplankton status	High		
Target water body status and deadline	N/A – Good status		

A.1.1. Section 1: Biology

Table A 2: Biology

Habitat			
Consider if the footprint of your activity is:	**Yes**	**No**	**Biology habitats risk issue(s)**
0.5km^2 or larger	Yes to one or more – requires impact assessment		Based on the estimated footprint of cable installation activities screened into further assessment, the footprint of activities within the water body is 0.88 km^2, which exceeds 0.5 km^2. Any sediment plume will be transient in nature as the cable installation activities move along the cable corridor and minimal in extent in the comparatively sheltered Dublin Bay area.
1% or more of the water body's area			The estimated footprint of cable installation activities screened into further assessment is approx. 1.3% of the water body's area.
Within 500m of any higher sensitivity habitat			There are no detailed maps of higher/lower habitats for WFD water bodies, however based on data published by NPWS, there is an area of intertidal seagrass to the south of Sandymount strand, as well as saltmarsh to the north of North Wall. While there is no overlap of these higher sensitivity habitats with screened in activities, they are within 4 km of activities.
1% or more of any lower sensitivity habitat			Much of the seabed south of Poolbeg is identified as [1140] Tidal mudflats as part of the designation of the South Dublin Bay SAC, therefore it is anticipated that the footprint of activity exceeds 1% of lower sensitivity habitats.
0.5km^2 or larger			Based on the estimated footprint of cable installation activities screened into further assessment, the footprint of activities within the water body is 0.88 km^2, which exceeds 0.5 km^2.

Habitat			
Consider if the footprint of your activity is:	**Yes**	**No**	**Biology habitats risk issue(s)**
			Any sediment plume will be transient in nature as the cable installation activities move along the cable corridor and minimal in extent in the comparatively sheltered Dublin Bay area.

Fish			
Consider if your activity:	**Yes**	**No**	**Biology habitats risk issue(s)**
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary		Impact assessment not required	Dublin Bay is not an estuary, however it is outside the Liffey and Tolka water bodies, which are both transitional water bodies. The works undertaken within the Dublin Bay water body are adjacent to the Liffey and Tolka but do not cross in front of the rivers. SSC plume modelling indicates that any SSC will remain in the vicinity of the works and will not cross the path to the rivers.
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)		Impact assessment not required	Potential impacts on fish have been assessed within **Chapter 9 Fish, Shellfish and Turtle Ecology**. No significant effects are predicted to occur due to the wide availability of similar habitat in the vicinity, distance of works from known important habitat, temporary and short-term duration of activities. It is not anticipated that normal fish behaviour will be impacted as a result of any activity screened in for assessment, including deposit of dredged materials beyond the 1 nm limit.
Could cause entrainment or impingement of fish		Impact assessment not required	Marine activities undertaken within the Dublin bay water body are in open water and are undertaken predominantly on the seabed. Activities do not have the potential to cause entrainment or impingement of fish.

A.1.2. Section 2: Hydromorphology

Table A 3: Hydromorphology

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status		Impact assessment not required	Water body is not high status

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Could significantly impact the hydromorphology of any water body		Impact assessment not required	Cable installation and burial are short term activities confined to the OECC and are temporary by their nature. The cable will be buried as a preference, leaving minimal permanent addition of features to interact with hydromorphology receptors. Any introduction of material (i.e. non-burial protection methods) will be highly localised and protection will be restricted in height in accordance with best practice guidance and navigational protocols and are thus unlikely to significantly interact with hydromorphology.
Is in a water body that is heavily modified for the same use as your activity		Impact assessment not required	Water body is not classified as heavily modified.

A.1.3. Section 3: Water quality

Table A 4: Water Quality

Consider if your activity:	Yes	No	Water quality risk issue(s)
Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)	Requires impact assessment		Marine activities are temporary and transient in nature. While the activities will temporarily increase SSC in the vicinity of the works. Initial increases in suspended sediments in the immediate vicinity of the works are anticipated to be 40-50 mg/l, finer fractions are anticipated to travel greatest distance, remaining suspended at low concentration for up to 15 days.
Is in a water body with a phytoplankton status of moderate, poor or bad		Impact assessment not required	Phytoplankton status (2016-2021) was high.
Is in a water body with a history of harmful algae		Impact assessment not required	History of harmful algae is not provided for this water body, however activities are not anticipated to affect algal complement in the water body.

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
The chemicals are on the EQSD list		Impact assessment not required	No chemicals on the EQSD list are intended for use during construction.
The activity will disturb sediment with contaminants above Irish Lower ALs or Cefas AL1?	Requires impact assessment		The chemical status (2016-2021) of the water body is 'good', indicating low levels of contaminants within sediments. Site specific chemical analysis for contaminants indicted there were exceedances of Irish Lower ALs or Cefas AL1 for contaminants at two stations: Stations 28, 30 and 77 (Arsenic), and Station 59 (Cadmium, Chromium and Zinc). None exceeded AL2 or Irish Upper Levels. No other pollutants exceeded risk levels. The onshore infrastructure is located on an area previously used for landfill, and while no contamination has been found during site-specific surveys (which are ongoing), it is assumed for the purpose of assessment that there may be chemicals present that are on the EQSD list as a conservative approach.
Where the activity has a mixing zone (like a discharge pipeline of outfall), the chemicals released are on the EQSD list		Impact assessment not required	The design does not include a discharge pipeline or outfall.

A.1.4. Section 4: WFD protected areas

Table A 5: WFD protected areas

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within the ZoI of any WFD protected area	Requires impact assessment		There are several WFD protected areas with water-dependent features associated with this water body, outlined below. There are no shellfish waters overlapping this water body. Nutrient sensitive areas are terrestrial designations and therefore not relevant to coastal water bodies.
SAC	Requires impact assessment		• Rockabill to Dalkey Island (overlaps cable route) • South Dublin Bay (overlaps cable route) • North Dublin Bay (1.28 km from OECC)

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
SPA	Requires impact assessment		• Baldoyle Bay SPA (to OECC, km to cable corridor) • North-West Irish Sea cSPA (to OECC, km to cable corridor) • North Bull Island SPA (1.3 km to OECC, 1.9 km to cable corridor) • North Bull Island Ramsar (1.3 km to OECC, 1.9 km to cable corridor) • South Dublin Bay and River Tolka Estuary SPA (overlaps) • Sandymount Strand/Tolka Estuary Ramsar (overlaps) • Dalkey Islands SPA (0.4 km to OECC, 0.5 km to cable route) • Howth Head Coast SPA (borders, no overlap)
Nature Reserve	Requires impact assessment		• North Bull Island (1.3 km to OECC, 1.9 km to cable corridor) • Booterstown Marsh (1.5 km to OECC and landfall)
Bathing waters	Requires impact assessment		• Dollymount Strand (3.1 km, around the sea walls) • Sandymount Strand (overlaps) • Seapoint (2 km) • Sandycove Beach (1.1 km) • Forty Foot Bathing Place (1 km) • Half Moon (0.5 km) • Shelley Banks (Overlaps) • Merrion Strand (1.3 km)

A.1.5. Section 5: Invasive non-native species (INNS)

Table A 6: Invasive non-native species (INNS)

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS	Requires impact assessment		Works require use of marine vessels and equipment originating from areas outside the water body.

A.1.6. Summary

Table A 7: Summary

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	No	Works are small scale. No significant modifications anticipated to affect hydromorphology.

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Biology: habitats	Yes	Footprint of activity exceeds 1% of the water body's area and is within 500 m of a higher sensitivity habitat. Footprint may exceed 1% of lower sensitivity habitats present within the water body.
Biology: fish	No	Activities are not anticipated to delay or prevent fish entering an estuary, impact normal fish behaviour, or cause entrainment or impingement of fish.
Water quality	Yes	Increase in SSC anticipated to last up to 15 days, affecting water clarity. Levels of contaminants above Irish Lower ALs or Cefas AL1 were detected at 2 stations during site-specific surveys, which may be disturbed during the works.
Protected areas	Yes	There are WFD protected areas within the ZoI of the works.
Invasive non-native species	Yes	Activities require the use of marine vessels and equipment from outside the local area which could increase the risk of introduction or spread of INNS.

A.2. Dublin Groundwater body

Table 9.11: Dublin groundwater body

Water body	Description, notes or more information	
WFD water body name	Dublin	
Water body ID	IE_EA_G_008	
Water body type	Ground waterbody	
Water body total area (ha, km^2)	82525 ha	825 km^2
WFD protected areas within 2km/ZoI	None with water dependent elements	

Status	2013-2018	2016-2021	Current Risk
Overall Water Body Status	Good	Good	Review
Quantitative Status	Good	Good	
Chemical status	Good	Good	
Target water body status and deadline	N/A – Good status		

Source: <Insert Source or notes>

A.2.1. Section 1: Hydromorphology

Table A 8: Hydromorphology

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
If your activity has the potential to interact with the quantitative status of the water body (for example through extraction, diversion of water)	Requires impact assessment	Impact assessment not required	
Quantity of water to be extracted exceeds 100cm^3 per day for more than 30 days	Requires impact assessment	Impact assessment not required	
Causes diversion of water sources	Requires impact assessment	Impact assessment not required	
Activities could cause ingress of water from a novel source, e.g. the sea	Requires impact assessment	Impact assessment not required	

A.2.2. Section 2: Water quality

Table A 9: Water quality

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
The chemicals are on the EQSD list	Requires impact assessment	Impact assessment not required	
The activity will disturb sediment with contaminants above Irish Lower ALs or Cefas AL1?	Requires impact assessment	Impact assessment not required	
Where the activity has a mixing zone (like a discharge pipeline of outfall), the chemicals released are on the EQSD list	Requires impact assessment	Impact assessment not required	

A.2.3. Section 4: WFD protected areas

Table A 10: Section 4: WFD protected areas

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within the ZoI of any WFD protected area	Requires impact assessment	Impact assessment not required	

A.2.4. Summary

Table A 11: Summary

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology		
Biology: habitats		
Biology: fish		
Water quality		
Protected areas		
Invasive non-native species		

A.3. Liffey Estuary Lower

Table A 12: Liffey Esturay Lower

Water body	Description, notes or more information	
WFD water body name	Liffey Estuary Lower	
Water body ID	EA_090_0400	
Water body type (estuarine or coastal)	Transitional	
Water body total area (ha, km^2)	480.6 ha	4.806 km^2
Heavily modified water body and for what use	Yes, Navigation and Port Facilities	
Higher sensitivity habitats present		
Lower sensitivity habitats present		
History of harmful algae		
WFD protected areas within 2km/ZoI	SAC • North Dublin Bay SAC (1.28 km from OECC, 2.6 km revetment/coastal wall works) SPA/Ramsar • Baldoyle Bay SPA (to OECC, km to cable corridor) • North-West Irish Sea cSPA (to OECC, km to cable corridor)• North Bull Island SPA (1.3 km to OECC, 1.9 km to cable corridor, revetment/coastal wall works) • South Dublin Bay and River Tolka Estuary SPA (overlaps cable route, landfall below MHW, approx. 0.5 km from revetment/coastal wall works) Ramsar • North Bull Island Ramsar (1.3 km to OECC, 1.9 km to cable corridor, 2.6 km from revetment/coastal wall works) • Sandymount Strand/Tolka Estuary Ramsar (overlaps cable route, landfall below MHW, approx. 0.5 km from revetment/coastal wall works) Nature Reserve • North Bull Island (1.3 km to OECC, 1.9 km to cable corridor, 2.6 km from	

Water body	Description, notes or more information
	revetment/coastal wall works) There are no bathing waters overlapping this water body There are no shellfish waters overlapping this water body Nutrient sensitive area

Status	2013-2018	2016-2021	Current Risk
Overall Water Body Status	Good	Moderate	At risk
Ecological status	Good	Moderate	
Chemical status	Good	Good	
Hydromorphology Status	Moderate	Moderate	
Quantitative Status	N/A	N/A	
Phytoplankton status	Good	Moderate	
Target water body status and deadline	2027		

A.3.1. Section 1: Biology

Table A 13: Biology

Habitat			
Consider if the footprint of your activity is:	**Yes**	**No**	**Biology habitats risk issue(s)**
0.5km^2 or larger		Impact assessment not required	Footprint of works does not exceed 0.5 km^2
1% or more of the water body's area		Impact assessment not required	Footprint of works does not exceed 1% of the water body area
Within 500m of any higher sensitivity habitat		Impact assessment not required	No higher sensitivity habitats are associated with this water body
1% or more of any lower sensitivity habitat		Impact assessment not required	Footprint of works does not exceed 1% of the habitats in this waterbody

Fish			
Consider if the footprint of your activity is:	**Yes**	**No**	**Biology habitats risk issue(s)**
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent	Next question		Revetment replacement and coastal containing wall are within the estuary.

Fish			
Consider if the footprint of your activity is:	**Yes**	**No**	**Biology habitats risk issue(s)**
fish entering it or could affect fish migrating through the estuary			
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)	Requires impact assessment		Noise from piling activities could impact on normal fish behaviour in the estuary. Increases in SSC will be localised and temporary, and not expected to affect fish behaviour or ability to move freely in the river.
Could cause entrainment or impingement of fish	Requires impact assessment		Noise could impact on normal fish behaviour in the estuary. Increases in SSC will be localised and temporary, and not expected to affect fish behaviour or ability to move freely in the river.

A.3.2. Section 2: Hydromorphology

Table A 14: Hydromorphology

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status		Impact assessment not required	Not a high-status water body
Could significantly impact the hydromorphology of any water body		Impact assessment not required	Works are small scale and will have imperceptible impact on local hydromorphology (see **Chapter 6**).
Is in a water body that is heavily modified for the same use as your activity		Impact assessment not required	While the works require replacement of the revetment and installation of a coastal retaining wall which is similar in design to pre-existing modifications, it is not intended for navigation or port activities.

A.3.3. Section 3: Water quality

Table A 15: Water quality

Consider if your activity:	Yes	No	Water quality risk issue(s)
Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)		Impact assessment not required	Increases in SSC will be localised and temporary, and not expected to affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)
Is in a water body with a phytoplankton status of moderate, poor or bad	Requires impact assessment		Phytoplankton status for 2016-2021 is moderate, which has deteriorated from good since the 2013-2018 evaluation.
Is in a water body with a history of harmful algae		Impact assessment not required	History of harmful algae is not provided for this water body, however activities are not anticipated to affect algal complement in the water body.

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
The chemicals are on the EQSD list		Impact assessment not required	No chemicals on the EQSD list are intended for use during construction.
The activity will disturb sediment with contaminants above Irish Lower ALs or Cefas AL1?	Requires impact assessment		The chemical status (2016-2021) of the water body is 'good', indicating low levels of contaminants within sediments. The onshore infrastructure is located on an area previously used for landfill, and while no contamination has been found during site-specific surveys (which are ongoing), it is assumed for the purpose of assessment that there may be chemicals present that are on the EQSD list as a conservative approach. Establishment of site run-off management systems will prevent loss of material into the marine environment.
Where the activity has a mixing zone (like a discharge pipeline of outfall), the		Impact assessment not required	The design does not include a discharge pipeline or outfall.

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
chemicals released are on the EQSD list			

A.3.4. Section 4: WFD protected areas

Table A 16: WFD protected areas

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within the ZoI of any WFD protected area			There are several WFD protected areas with water-dependent features associated with this water body, outlined below. There are no bathing waters or shellfish waters overlapping this water body. Nutrient sensitive areas are terrestrial designations and therefore not relevant to coastal water bodies. There are no bathing waters overlapping this water body There are no shellfish waters overlapping this water body
SAC	Requires impact assessment		• South Dublin Bay (overlaps cable route) • North Dublin Bay (1.28 km from OECC)
SPA / Ramsar	Requires impact assessment		• Baldoyle Bay SPA (to OECC, km to cable corridor) • North-West Irish Sea cSPA (to OECC, km to cable corridor) • North Bull Island SPA (1.3 km to OECC, 1.9 km to cable corridor) • North Bull Island Ramsar (1.3 km to OECC, 1.9 km to cable corridor) • South Dublin Bay and River Tolka Estuary SPA (overlaps)
Nature Reserve	Requires impact assessment		• North Bull Island (1.3 km to OECC, 1.9 km to cable corridor)
Bathing waters	Requires impact assessment		• North Bull Wall (2.2 km from OECC, 2.0 km from onshore compound)

A.3.5. Section 5: Invasive non-native species (INNS)

Table A 17: Invasive non-native species (INNS)

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS	Requires impact assessment		Works require use of marine vessels and equipment originating from areas outside the water body.

A.3.6. Summary

Table A 18: Summary

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	No	Works are small scale. No significant modifications anticipated to affect hydromorphology.
Biology: habitats	No	Works are small scale.
Biology: fish	Yes	underwater noise may impact normal fish behaviour, or cause entrainment or impingement of fish.
Water quality	Yes	Phytoplankton status for 2016-2021 is moderate.
Protected areas	Yes	There are WFD protected areas within the ZoI of the works.
Invasive non-native species	Yes	Activities require the use of marine vessels and equipment from outside the local area which could increase the risk of introduction or spread of INNS.

A.4. Irish Sea Dublin (HA 09) Coastal Water Body

Table A 19: Irish Sea coastal water body

Water body	Description, notes or more information
WFD water body name	Irish Sea Dublin (HA 09)
Water body ID	EA_070_0000
Water body type (estuarine or coastal)	Coastal
Water body total area (ha, km^2)	4386.3506076 ha 43.86350608 km^2
Heavily modified water body and for what use	Yes, Urban, Navigation and Port Facilities
Higher sensitivity habitats present	
Lower sensitivity habitats present	
History of harmful algae	
WFD protected areas within 2km/ZoI	SAC • North Dublin Bay (overlaps) • South Dublin Bay (0.03 km across Great South Wall, approx. 0.5 km open water) SPA/Ramsar • North-West Irish Sea cSPA (to OECC, km to cable corridor) • North Bull Island SPA (overlaps) • South Dublin Bay and River Tolka Estuary SPA (overlaps) Ramsar • North Bull Island Ramsar (overlaps)

Water body	Description, notes or more information
	• Sandymount Strand/Tolka Estuary Ramsar (0.03 km across Great South Wall, approx. 0.5 km open water) Nature Reserve • North Bull Island (overlaps) Bathing Waters • Portmarnock, Velvet Strand Beach (8 km straight line, 15.8 km around Howth Head) • Sutton, Burrow Beach (7.5 km, 13.3 km around Howth Head) • Claremont Bech (7.9 km, 12 around Howth Head) Shellfish Waters • Malahide

Status	2013-2018	2016-2021	Current Risk
Overall Water Body Status	Good	Good	Not at Risk
Ecological status	Good	Good	
Chemical status	Not provided	Not provided	
Hydromorphology Status	Not provided	Not provided	
Phytoplankton status	Good	Good	
Target water body status and deadline	N/A – good status		

A.4.1. Section 1: Biology

Table A 20: Biology

Habitat			
Consider if the footprint of your activity is:	**Yes**	**No**	**Biology habitats risk issue(s)**
0.5km^2 or larger	Yes to one or more – requires impact assessment		Based on the estimated footprint of cable installation activities screened into further assessment, the footprint of activities within the water body is 0.27 km^2 for cable installation and up to 0.89 km^2 should pre-sweeping/sandwave clearance be required within the water body. This has the potential to exceed 0.5 km^2. Any plume will be transient in nature as the cable installation activities move along the cable corridor and is likely to be taken away from the coastline by the prevailing currents.
1% or more of the water body's area			The estimated footprint of cable installation activities screened into further assessment is approx. between 0.6 and 2% of the water body's area.

Habitat			
Consider if the footprint of your activity is:	**Yes**	**No**	**Biology habitats risk issue(s)**
Within 500m of any higher sensitivity habitat			No
1% or more of any lower sensitivity habitat			No

A.4.2. Section 2: Hydromorphology

Table A 21: Hydromorphology

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status		Impact assessment not required	Not a high-status water body
Could significantly impact the hydromorphology of any water body		Impact assessment not required	Cable installation and burial are short term activities confined to the OECC and are temporary by their nature. The cable will be buried as a preference, leaving minimal permanent addition of features to interact with hydromorphology receptors. Any introduction of material (i.e. non-burial protection methods) will be highly localised and protection will be restricted in height in accordance with best practice guidance and navigational protocols and are thus unlikely to significantly interact with hydromorphology.
Is in a water body that is heavily modified for the same use as your activity		Impact assessment not required	Water body is not classified as heavily modified.

A.4.3. Section 3: Water quality

Table A 22: Water quality

Consider if your activity:	Yes	No	Water quality risk issue(s)
Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)	Requires impact assessment		Marine activities are temporary and transient in nature. While the activities will temporarily increase SSC in the vicinity of the works. Initial increases in suspended sediments in the immediate vicinity of the works are anticipated to be 40-50 mg/l, remaining suspended at low concentration for up to 15 days.
Is in a water body with a phytoplankton status of moderate, poor or bad		Impact assessment not required	Phytoplankton status (2016-2021) was good.
Is in a water body with a history of harmful algae		Impact assessment not required	Harmful algal blooms are not monitored for this water body, therefore this is unknown however activities are not anticipated to affect algal complement in the water body. The water body contains several high-quality bathing areas however, which are classified as having 'good' or ‘excellent’ status (EPA, 2022c). It is considered therefore that harmful algal blooms are not a common occurrence.

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
The chemicals are on the EQSD list		Impact assessment not required	No chemicals on the EQSD list are intended for use during construction.
The activity will disturb sediment with contaminants above Irish Lower ALs or Cefas AL1?	Impact assessment required		The chemical status (2016-2021) is not provided for this water body. Site specific chemical analysis for contaminants indicted there were exceedances Irish Lower ALs or Cefas AL1 for contaminants at four stations, one of which is located within 4 km of the water body.

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
Where the activity has a mixing zone (like a discharge pipeline of outfall), the chemicals released are on the EQSD list		Impact assessment not required	Design does not include discharge requirements.

A.4.4. Section 4: WFD protected areas

Table A 23: WFD protected areas

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within the ZoI of any WFD protected area			There are several WFD protected areas with water-dependent features associated with this water body, outlined below. There are no nature reserves or shellfish waters overlapping this water body. Nutrient sensitive areas are terrestrial designations and therefore not relevant to coastal water bodies.
SAC	Requires impact assessment		• Rockabill to Dalkey Island (overlaps cable route)
SPA / Ramsar	Requires impact assessment		• North-West Irish Sea cSPA (to OECC, km to cable corridor) • Dalkey Islands SPA (overlaps)
Bathing waters		Impact assessment not required	There are three bathing waters associated with this water body, however none are within the ZoI: • Portmarnock, Velvet Strand Beach (8 km straight line, 15.8 km around Howth Head) • Sutton, Burrow Beach (7.5 km, 13.3 km around Howth Head) • Claremont Beach (7.9 km, 12 around Howth Head)

A.4.5. Section 5: Invasive non-native species (INNS)

Table A 24: WFD protected areas

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS	Requires impact assessment		Works require use of marine vessels and equipment originating from areas outside the water body.

A.4.6. Summary

Table A 25: Summary

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	No	Works are small scale. No significant modifications anticipated to affect hydromorphology.
Biology: habitats	Yes	Works have the potential to exceed 1% of the water body's area, and are within
Biology: fish	No	Not an estuary, no estuaries associated with this water body are within ZoI of the works.
Water quality	Yes	Increase in SSC anticipated to last up to 15 days, affecting water clarity.
Protected areas	Yes	There are WFD protected areas within the ZoI of the works.
Invasive non-native species	Yes	Activities require the use of marine vessels and equipment from outside the local area which could increase the risk of introduction or spread of INNS.

A.5. Southwestern Irish Sea – Killiney Bay Coastal Water Body

Table A 26: Southwestern Irish Sea – Kiliney Bay Coastal Water Body

Water body	Description, notes or more information	
WFD water body name	Southwestern Irish Sea – Killiney Bay (HA10)	
Water body ID	EA_100_0000	
Water body type (estuarine or coastal)	Coastal	
Water body total area (ha, km^2)	8728.65608128 ha	87.28656081 km^2
Heavily modified water body and for what use	Not heavily modified	
Higher sensitivity habitats present		
Lower sensitivity habitats present	Reefs	

Water body	Description, notes or more information
History of harmful algae	None provided
WFD protected areas within 2km/ZoI	SAC • Rockabill to Dalkey Island SAC (overlaps) • Wicklow Reef SAC (5.5km) SPA • Dalkey Islands SPA (0.5 km) Bathing Water • White Rock Beach (2.5 km) • Killiney (3.3 km) • Bray South Promenade (5.2 km) • Greystones South (5.8 km) • Silver Strand (12.5 km) • The Murrough SPA (5.9 km) There are no shellfish waters overlapping this water body Nutrient sensitive areas are terrestrial designations and therefore not relevant to coastal water bodies.

Status	2013-2018	2016-2021	Current Risk
Overall Water Body Status			Not a risk
Ecological status	High	High	
Chemical status	None provided	None provided	
Hydromorphology Status	Good	Good	
Phytoplankton status	High	None provided	
Target water body status and deadline	N/A - high status		

A.5.1. Section 1: Biology

Table A 27: Biology

Habitat			
Consider if the footprint of your activity is:	**Yes**	**No**	**Biology habitats risk issue(s)**
0.5km^2 or larger	Yes to one or more – requires impact assessment		The footprint of activities within the water body is 0.04 km^2 for cable installation and up to 0.13 km^2. Should pre-sweeping/sandwave clearance be required within the water body and does not exceed 0.5 km^2. However, the footprint of the resulting SSC plume is estimated to exceed 0.5 km^2. It should be noted that this plume will be transient in nature as the cable installation activities move along the cable

Habitat			
Consider if the footprint of your activity is:	**Yes**	**No**	**Biology habitats risk issue(s)**
			corridor and is likely to be taken away from the coastline by the prevailing currents.
1% or more of the water body's area			The estimated footprint of cable installation activities screened into further assessment is approx. between 0.05 and 0.15% of the water body's area. However, the footprint of the resulting SSC plume may exceed 1%
Within 500m of any higher sensitivity habitat			No
1% or more of any lower sensitivity habitat			No

Fish			
Consider if the footprint of your activity is:	**Yes**	**No**	**Biology habitats risk issue(s)**
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary		Go to next section	Water body is not an estuary. No estuaries associated with this water body are within the ZoI of the works.
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)		Impact assessment not required	Potential impacts on fish have been assessed within Chapter 9 Fish and Shellfish Ecology. No significant effects are predicted to occur due to the wide availability of similar habitat in the vicinity, distance of works from known important habitat, temporary and short-term duration of activities. It is not anticipated that normal fish behaviour will be impacted as a result of any activity screened in for assessment, including deposit of

Fish			
Consider if the footprint of your activity is:	**Yes**	**No**	**Biology habitats risk issue(s)**
			dredged materials beyond the 1 nm limit.
Could cause entrainment or impingement of fish		Impact assessment not required	Marine activities undertaken within the water body are in open water and are undertaken predominantly on the seabed. Activities do not have the potential to cause entrainment or impingement of fish.

A.5.2. Section 2: Hydromorphology

Table A 28: Hydromorphology

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status		Impact assessment not required	Water body is high status, however the works undertaken within the water body area will be very small scale (less than 0.15 km^2, will be predominantly buried (leaving no obstacles to affect hydromorpohology) or transient in nature (temporary increases in SSC). No impact expected.
Could significantly impact the hydromorphology of any water body		Impact assessment not required	Cable installation and burial are short term activities confined to the OECC and are temporary by their nature. The cable will be buried as a preference, leaving minimal permanent addition of features to interact with hydromorphology receptors. Any introduction of material (i.e. non-burial protection methods) will be highly localised and protection will be restricted in height in accordance with best practice guidance and navigational protocols and are thus unlikely to significantly interact with hydromorphology.
Is in a water body that is heavily modified for the same use as your activity		Impact assessment not required	Water body is not classified as heavily modified.

A.5.3. Section 3: Water Quality

Table A 29: Water Quality

Consider if your activity:	Yes	No	Water quality risk issue(s)
Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)	Requires impact assessment		Marine activities are temporary and transient in nature. While the activities will temporarily increase SSC in the vicinity of the works. Initial increases in suspended sediments in the immediate vicinity of the works are anticipated to be 40-50 mg/l, finer fractions are anticipated to travel greatest distance from the works, remaining suspended at low concentration for up to 15 days.
Is in a water body with a phytoplankton status of moderate, poor or bad		Impact assessment not required	Phytoplankton status (2013-2018) was high. No status has been provided for 2016-2018, it is anticipated that the status has not significantly changed.
Is in a water body with a history of harmful algae		Impact assessment not required	Harmful algal blooms are not monitored for this water body, therefore this is unknown, however activities proposed are not predicted to increase occurrence of such. The water body contains several high quality bathing areas however, all of which are classified as having 'excellent' status (EPA, 2022c). It is assumed for the purpose of this assessment that harmful algal blooms are not a common occurrence.

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
The chemicals are on the EQSD list		Impact assessment not required	No chemicals on the EQSD list are intended for use during construction.
The activity will disturb sediment with contaminants above Irish Lower ALs or Cefas AL1?	Requires impact assessment		The chemical status (2016-2021) is not provided for this water body. Site specific chemical analysis for contaminants indicted there were exceedances Irish Lower ALs or Cefas AL1 for contaminants at four stations, two of which is located within 4 km of the water body.
Where the activity has a mixing zone (like a discharge pipeline of outfall), the chemicals released are on the EQSD list	Requires impact assessment	Impact assessment not required	Design does not include discharge requirements.

A.5.4. Section 4: WFD protected areas

Table A 30: WFD protected areas

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within the ZoI of any WFD protected area			There are several WFD protected areas with water-dependent features associated with this water body, outlined below. There are no nature reserves or shellfish waters overlapping this water body. Nutrient sensitive areas are terrestrial designations and therefore not relevant to coastal water bodies.
SAC	Requires impact assessment		• Wicklow Reef SAC (5.5km) •Rockabill to Dalkey Island SAC (overlaps)
SPA	Requires impact assessment		• The Murrough SPA (5.9 km) • Dalkey Islands SPA (0.5 km)
Bathing waters	Requires impact assessment		There are 5 bathing waters associated with this water body, only 2 lie within the ZoI: • White Rock Beach (2.5 km) • Killiney (3.3 km) • Bray South Promenade (5.2 km) - outside ZoI, scoped out • Greystones South (5.8 km) - outside ZoI, scoped out • Silver Strand (12.5 km) - outside ZoI, scoped out

A.5.5. Section 5: Invasive non-native species (INNS)

Table A 31: Invasive non-native species (INNS)

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS	Requires impact assessment		Works require use of marine vessels and equipment originating from areas outside the water body.

A.5.6. Summary

Table A 32: Summary

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	No	Works are small scale. No significant modifications anticipated to affect hydromorphology.

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Biology: habitats	Yes	Footprint of sediment plume as a worst case of 4 km exceeds 1% of the water body's area.
Biology: fish	No	Not an estuary, no estuaries associated with this water body are within ZoI of the works.
Water quality	Yes	Increase in SSC anticipated to last up to 15 days, affecting water clarity.
Protected areas	Yes	There are WFD protected areas within the ZoI of the works.
Invasive non-native species	Yes	Activities require the use of marine vessels and equipment from outside the local area which could increase the risk of introduction or spread of INNS.

A.6. Tolka Estuary Transitional Water Body

Table A 33: Tolka Estuary Transitional Water Body

Water body	Description, notes or more information	
WFD water body name	Tolka Estuary	
Water body ID	EA_090_0200	
Water body type (estuarine or coastal)	Transitional	
Water body total area (ha, km^2)	357.82205784 ha	3.57822058 km^2
Heavily modified water body and for what use	Not heavily modified	
Higher sensitivity habitats present	Seagrass; saltmarsh	
Lower sensitivity habitats present		
History of harmful algae	Not provided	
WFD protected areas within 2km/ZoI	SAC • North Dublin Bay SAC (1.28 km from OECC, 2.6 km revetment/coastal wall works) SPA/Ramsar • North-West Irish Sea cSPA (to OECC, km to cable corridor) • North Bull Island SPA (1.3 km to OECC, 1.9 km to cable corridor, revetment/coastal wall works) • South Dublin Bay and River Tolka Estuary SPA (overlaps cable route, landfall below MHW, approx. 0.5 km from revetment/coastal wall works) Ramsar • North Bull Island Ramsar (1.3 km to OECC, 1.9 km to cable corridor, 2.6 km from revetment/coastal wall works) • Sandymount Strand/Tolka Estuary Ramsar (overlaps cable route, landfall below MHW, approx. 0.5 km from revetment/coastal wall works)	

Water body	Description, notes or more information
	Nature Reserve • North Bull Island (1.3 km to OECC, 1.9 km to cable corridor, 2.6 km from revetment/coastal wall works) There are no bathing waters overlapping this water body There are no shellfish waters overlapping this water body Nutrient sensitive area

Status	2013-2018	2016-2021	Current Risk
Overall Water Body Status	Moderate	Poor	At risk
Ecological status	Moderate	Poor	
Chemical status	Not provided	Not provided	
Hydromorphology Status	Moderate	Good	
Phytoplankton status	Moderate	Moderate	
Target water body status and deadline	Not provided		

A.6.1. Section 1: Biology

Table A 34: Biology

Habitat			
Consider if the footprintof your activity is:	**Yes**	**No**	**Biology habitats risk issue(s)**
0.5km^2 or larger		Impact assessment not required	Footprint of works does not exceed 0.5 km^2. Works in Liffey not predicted to lead to increases in SSC above imperceptible levels.
1% or more of the water body's area			Footprint of works does not exceed 1% of the water body area. Works in Liffey not predicted to lead to increases in SSC above imperceptible levels.
Within 500m of any higher sensitivity habitat			Footprint of works does not exceed 1% of the habitats in this waterbody. Works in Liffey not predicted to lead to increases in SSC above imperceptible levels.
1% or more of any lower sensitivity habitat			Footprint of works does not exceed 1% of the habitats in this waterbody. Works in Liffey not predicted to lead to increases in SSC above imperceptible levels.

Fish			
Consider if the footprint of your activity is:	**Yes**	**No**	**Biology habitats risk issue(s)**
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary	Next question		Revetment replacement and coastal containing wall are within Liffey estuary Lower water body, adjacent to the entrance to the Tolka.
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)	Requires impact assessment		While noise is not a monitored characteristic under WFD, noise could impact on normal fish behaviour in the estuary. Increases in SSC will be localised and temporary, and not expected to affect fish behaviour or ability to move freely in the river.
Could cause entrainment or impingement of fish	Requires impact assessment		While noise is not a monitored characteristic under WFD, noise could impact on normal fish behaviour in the estuary. Increases in SSC will be localised and temporary, and not expected to affect fish behaviour or ability to move freely in the river.

A.6.2. Section 2: Hydromorphology

Table A 35: Hydromorphology

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status		Impact assessment not required	Not a high-status water body.
Could significantly impact the hydromorphology of any water body		Impact assessment not required	No works to be undertaken within the water body, no potential for impact to hydromorphology.

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Is in a water body that is heavily modified for the same use as your activity		Impact assessment not required	No works to be undertaken within the water body, no potential for impact to hydromorphology.

A.6.3. Section 3: Water Quality

Table A 36: Water Quality

Consider if your activity:	Yes	No	Water quality risk issue(s)
Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)	Requires impact assessment	Impact assessment not required	Increases in SSC will be localised and temporary, and not expected to affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)
Is in a water body with a phytoplankton status of moderate, poor or bad	Requires impact assessment		Phytoplankton status for 2016-2021 is moderate.
Is in a water body with a history of harmful algae		Impact assessment not required	Not specified for this water body. Activities not predicted to increase levels of harmful algae.

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
The chemicals are on the EQSD list		Impact assessment not required	No chemicals on the EQSD list are intended for use during construction.
The activity will disturb sediment with contaminants above Irish Lower ALs or Cefas AL1?		Impact assessment not required	The chemical status (2016-2021) is not provided for this water body, however as the works do not overlap this water body, there is no potential for disturbance of contaminated sediment. The risk of contaminated sediments being introduced from the works is also low, due to the good chemical status of the Liffey Lower and Dublin Bay water bodies (as the source of disturbed sediment plume). In addition, the minimum distance between revetment/coastal wall works is 1 km and 2.7 km from cable installation works. Any potential contaminants present would be very

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
			dilute and would not pose a risk to the water body.
Where the activity has a mixing zone (like a discharge pipeline of outfall), the chemicals released are on the EQSD list		Impact assessment not required	The design does not include a discharge pipeline or outfall.

A.6.4. Section 4: WFD protected areas

Table A 37: WFD protected areas

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within the ZoI of any WFD protected area			There are several WFD protected areas with water-dependent features associated with this water body, outlined below. There are no bathing waters or shellfish waters overlapping this water body. Nutrient sensitive areas are terrestrial designations and therefore not relevant to transitional water bodies. There are no bathing waters overlapping this water body. There are no shellfish waters overlapping this water body.
SAC	Requires impact assessment		• North Dublin Bay SAC (1.28 km from OECC, 2.6 km revetment/coastal wall works)
SPA	Requires impact assessment		• North-West Irish Sea cSPA (to OECC, km to cable corridor) • North Bull Island SPA (1.3 km to OECC, 1.9 km to cable corridor, revetment/coastal wall works) • South Dublin Bay and River Tolka Estuary SPA (overlaps cable route, landfall below MHW, approx. 0.5 km from revetment/coastal wall works) • North Bull Island Ramsar (1.3 km to OECC, 1.9 km to cable corridor, 2.6 km from revetment/coastal wall works) • Sandymount Strand/Tolka Estuary Ramsar (overlaps cable route, landfall below MHW, approx. 0.5 km from revetment/coastal wall works)

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Nature reserve	Requires impact assessment		• North Bull Island (1.3 km to OECC, 1.9 km to cable corridor, 2.6 km from revetment/coastal wall works)

A.6.5. Section 5: Invasive non-native species (INNS)

Table A 38: Invasive non-native species (INNS)

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS	Requires impact assessment		Works require use of marine vessels and equipment originating from areas outside the water body.

A.6.6. Summary

Table A 39: Summary

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	No	Works are small scale. No significant modifications anticipated to affect hydromorphology.
Biology: habitats	No	Works are small scale.
Biology: fish	Yes	Underwater noise impacts may affect fish species normal behaviours.
Water quality	Yes	Phytoplankton status for 2016-2021 is moderate.
Protected areas	Yes	There are WFD protected areas within the ZoI of the works.
Invasive non-native species	Yes	Activities require the use of marine vessels and equipment from outside the local area which could increase the risk of introduction or spread of INNS.

A.7. Liffey Estuary Upper

Table A 40: Liffey Estuary Upper

Water body	Description, notes or more information
WFD water body name	Liffey Estuary Upper
Water body ID	EA_090_0300
Water body type (estuarine or coastal)	Transitional

Water body	Description, notes or more information
Water body total area (ha, km^2)	19.5210223 ha 0.19521022 km^2
Heavily modified water body and for what use	Not heavily modified
Higher sensitivity habitats present	None
Lower sensitivity habitats present	None
History of harmful algae	Not provided
WFD protected areas within 2km/ZoI	None

Status	2013-2018	2016-2021	Current Risk
Overall Water Body Status	Good	Good	Review
Ecological status	Good	Good	
Chemical status	Not provided	Not provided	
Hydromorphology Status	Moderate	Moderate	
Phytoplankton status	Good	Good	
Target water body status and deadline	N/A - good status		

A.7.1. Section 1: Biology

Table A 41: Biology

Habitat			
Consider if the footprint of your activity is:	**Yes**	**No**	**Biology habitats risk issue(s)**
0.5km^2 or larger		No to all – impact assessment not required	Footprint of works does not exceed 0.5 km^2. Works in Liffey not predicted to lead to increases in SSC above imperceptible levels.
1% or more of the water body's area			Footprint of works does not exceed 1% of the water body area. Works in Liffey not predicted to lead to increases in SSC above imperceptible levels.
Within 500m of any higher sensitivity habitat			Footprint of works does not exceed 1% of the habitats in this waterbody. Works in Liffey not predicted to lead to increases in SSC above imperceptible levels.
1% or more of any lower sensitivity habitat			Footprint of works does not exceed 1% of the habitats in this waterbody. Works in Liffey not predicted to lead to increases in SSC above imperceptible levels.

Fish			
Consider if the footprint of your activity is:	**Yes**	**No**	**Biology habitats risk issue(s)**
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary	Next question		Revetment replacement and coastal containing wall are within Liffey estuary Lower water body, downstream from Liffey Upper.
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)	Requires impact assessment		While noise is not a monitored characteristic under WFD, noise could impact on normal fish behaviour in the estuary. Increases in SSC will be localised and temporary, and not expected to affect fish behaviour or ability to move freely in the river.
Could cause entrainment or impingement of fish	Requires impact assessment		While noise is not a monitored characteristic under WFD, noise could impact on normal fish behaviour in the estuary. Increases in SSC will be localised and temporary, and not expected to affect fish behaviour or ability to move freely in the river.

A.7.2. Section 2: Hydromorphology

Table A 42: Hydromorphology

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status		Impact assessment not required	Not a high-status water body.
Could significantly impact the hydromorphology of any water body		Impact assessment not required	No works to be undertaken within the water body, no potential for impact to hydromorphology.

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Is in a water body that is heavily modified for the same use as your activity		Impact assessment not required	No works to be undertaken within the water body, no potential for impact to hydromorphology.

A.7.3. Section 3: Water Quality

Table A 43: Water Quality

Consider if your activity:	Yes	No	Water quality risk issue(s)
Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)		Impact assessment not required	Increases in SSC will be localised and temporary, and not expected to affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)
Is in a water body with a phytoplankton status of moderate, poor or bad		Impact assessment not required	Phytoplankton status for 2016-2021 is good.
Is in a water body with a history of harmful algae		Impact assessment not required	Not specified for this water body. Activities not predicted to increase algal levels

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
The chemicals are on the EQSD list		Impact assessment not required	No chemicals on the EQSD list are intended for use during construction.
The activity will disturb sediment with contaminants above Irish Lower ALs or Cefas AL1?		Impact assessment not required	The chemical status (2016-2021) of the water body is 'good', indicating low levels of contaminants within sediments. The onshore infrastructure is located on an area previously used for landfill, downstream of the water body. Establishment of site run-off management systems will prevent loss of material into the marine environment. No impact predicted
Where the activity has a mixing zone (like a discharge pipeline of outfall), the chemicals released are on the Environmental Quality Standards Directive (EQSD) list		Impact assessment not required	The design does not include a discharge pipeline or outfall.

A.7.4. Section 4: WFD protected areas

Table A 44: WFD protected areas

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within the ZoI of any WFD protected area		Impact assessment not required	There are no protected areas associated with this waterbody. Nutrient sensitive areas are a terrestrial designation, and not associated with transitional water bodies.

A.7.5. Section 5: Invasive non-native species (INNS)

Table A 45: Invasive non-native species (INNS)

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS	Requires impact assessment		Works require use of marine vessels and equipment originating from areas outside the water body.

A.7.6. Summary

Table A 46: Summary

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	No	Works are small scale. No significant modifications anticipated to affect hydromorphology.
Biology: habitats	No	Works are small scale.
Biology: fish	No	Activities are not anticipated to delay or prevent fish entering an estuary, impact normal fish behaviour, or cause entrainment or impingement of fish.
Water quality	No	Subject to RPS modelling showing potential impacts to water clarity (increased SSC for longer than 14 days), works are small scale and temporary, and limited to increases in SSC. Any increase in SSC will be dilute and temporary.
Protected areas	No	There are no WFD protected areas associated with this water body.
Invasive non-native species	Yes	Activities require the use of marine vessels and equipment from outside the local area which could increase the risk of introduction or spread of INNS.

A.8. North Bull Island

Table A 47: North Bull Island

Water body	Description, notes or more information	
WFD water body name	North Bull Island	
Water body ID	EA_090_0100	
Water body type (estuarine or coastal)	Transitional	
Water body total area (ha, km^2)	212.5857468 ha	2.12585747 km^2
Heavily modified water body and for what use	Not heavily modified	
Higher sensitivity habitats present	Yes	
Lower sensitivity habitats present	Yes	
History of harmful algae	Not provided	
WFD protected areas within 2km/ZoI	SAC • North Dublin Bay SAC (1.28 km from OECC, 2.6 km revetment/coastal wall works) SPA/Ramsar • North-West Irish Sea cSPA (to OECC, km to cable corridor) • North Bull Island SPA (1.3 km to OECC, 1.9 km to cable corridor, revetment/coastal wall works) • South Dublin Bay and River Tolka Estuary SPA (overlaps cable route, landfall below MHW, approx. 0.5 km from revetment/coastal wall works) Ramsar • North Bull Island Ramsar (1.3 km to OECC, 1.9 km to cable corridor, 2.6 km from revetment/coastal wall works) • Sandymount Strand/Tolka Estuary Ramsar (overlaps cable route, landfall below MHW, approx. 0.5 km from revetment/coastal wall works) Nature Reserve • North Bull Island (1.3 km to OECC, 1.9 km to cable corridor, 2.6 km from revetment/coastal wall works) There are no bathing waters overlapping this water body There are no shellfish waters overlapping this water body Nutrient sensitive area	

Status	2013-2018	2016-2021	Current Risk
Overall Water Body Status	Moderate	Moderate	Review
Ecological status	Moderate	Moderate	
Chemical status	Not provided	Not provided	
Hydromorphology Status	Not provided	Not provided	
Quantitative Status	Not provided	Not provided	

Status	2013-2018	2016-2021	Current Risk
Target water body status and deadline	Not provided		

A.8.1. Section 1: Biology

Table A 48: Biology

Habitat			
Consider if the footprint of your activity is:	**Yes**	**No**	**Biology habitats risk issue(s)**
0.5km^2 or larger		No to all – impact assessment not required	No overlap. Distance from revetment/coastal wall works or OECC to the entrance to the Bull Island water body is approx. 6.9 km and 6.1 km respectively. Water body will not be impacted by increases in SSC above background levels.
1% or more of the water body's area			No overlap. Water body will not be impacted by increases in SSC above background levels.
Within 500m of any higher sensitivity habitat			No overlap. Water body will not be impacted by increases in SSC above background levels.
1% or more of any lower sensitivity habitat			No overlap. Water body will not be impacted by increases in SSC above background levels.

Fish			
Consider if the footprint of your activity is:	**Yes**	**No**	**Biology habitats risk issue(s)**
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary		Impact assessment not required	Potential impacts on fish have been assessed within Chapter 9 Fish, Shellfish and Turtle Ecology. No significant effects are predicted to occur due to the temporary and short-term duration of activities. It is not anticipated that normal fish behaviour will be impacted
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)		Impact assessment not required	Marine activities undertaken within the water body are in open water and are undertaken predominantly on the seabed. Activities do not have the potential to cause entrainment or impingement of fish.
Could cause entrainment or impingement of fish		Impact assessment not required	Potential impacts on fish have been assessed within Chapter 9 Fish, Shellfish and Turtle Ecology. No significant effects are predicted to occur due to the temporary and short-term duration of activities.

Fish			
Consider if the footprint of your activity is:	**Yes**	**No**	**Biology habitats risk issue(s)**
			It is not anticipated that normal fish behaviour will be impacted

A.8.2. Section 2: Hydromorphology

Table A 49: Hydromorphology

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status		Impact assessment not required	Not a high-status water body.
Could significantly impact the hydromorphology of any water body		Impact assessment not required	No works to be undertaken within the water body, no potential for impact to hydromorphology.
Is in a water body that is heavily modified for the same use as your activity		Impact assessment not required	No works to be undertaken within the water body, no potential for impact to hydromorphology.

A.8.3. Section 3: Water Quality

Table A 50: Section 3: Water Quality

Consider if your activity:	Yes	No	Water quality risk issue(s)
Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)		Impact assessment not required	Distance from revetment/coastal wall works or OECC to the entrance to the Bull Island water body is approx. 6.9 km and 6.1 km respectively. Water body will not be impacted by increases in SSC above background levels.
Is in a water body with a phytoplankton status of moderate, poor or bad		Impact assessment not required	Phytoplankton Status not provided. Distance from revetment/coastal wall works or OECC to the entrance to the Bull Island water body is approx. 6.9 km and 6.1 km respectively. Water body will not be impacted by increases in SSC above background levels. No impact to Phytoplankton.
Is in a water body with a history of harmful algae		Impact assessment not required	Distance from revetment/coastal wall works or OECC to the entrance to the Bull Island water body is approx. 6.9 km and 6.1 km respectively. Water body will not be impacted by increases in SSC above background levels.

If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
The chemicals are on the EQSD list		Impact assessment not required	No chemicals on the EQSD list are intended for use during construction.
The activity will disturb sediment with contaminants above Irish Lower ALs or Cefas AL1?	Requires impact assessment	Impact assessment not required	Distance from revetment/coastal wall works or OECC to the entrance to the Bull Island water body is approx. 6.9 km and 6.1 km respectively. Water body will not be impacted by increases in SSC above background levels.
Where the activity has a mixing zone (like a discharge pipeline of outfall), the chemicals released are on the Environmental Quality Standards Directive (EQSD) list	Requires impact assessment	Impact assessment not required	The design does not include a discharge pipeline or outfall.

A.8.4. Section 4: WFD protected areas

Table A 51: Section 4: WFD protected areas

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within the ZoI of any WFD protected area			There are several WFD protected areas with water-dependent features associated with this water body, outlined below. There are no bathing waters or shellfish waters overlapping this water body. Nutrient sensitive areas are terrestrial designations and therefore not relevant to transitional water bodies. There are no bathing waters overlapping this water body. There are no shellfish waters overlapping this water body.
SAC	Requires impact assessment		• North Dublin Bay SAC (1.28 km from OECC, 2.6 km revetment/coastal wall works)
SPA	Requires impact assessment		• North-West Irish Sea cSPA (to OECC, km to cable corridor) • North Bull Island SPA (1.3 km to OECC, 1.9 km to cable corridor, revetment/coastal wall works) • South Dublin Bay and River Tolka Estuary SPA (overlaps cable route, landfall below MHW, approx. 0.5 km from revetment/coastal wall

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
			works) Ramsar • North Bull Island Ramsar (1.3 km to OECC, 1.9 km to cable corridor, 2.6 km from revetment/coastal wall works) • Sandymount Strand/Tolka Estuary Ramsar (overlaps cable route, landfall below MHW, approx. 0.5 km from revetment/coastal wall works)
Nature reserve	Requires impact assessment		• North Bull Island (1.3 km to OECC, 1.9 km to cable corridor, 2.6 km from revetment/coastal wall works)

A.8.5. Section 5: Invasive non-native species (INNS)

Table A 52: Section 5: Invasive non-native species (INNS)

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS	Requires impact assessment		Works require use of marine vessels and equipment originating from areas outside the water body.

A.8.6. Summary

Table A 53: Summary

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	No	Works are small scale. No modifications within the water body anticipated to affect hydromorphology.
Biology: habitats	No	Works are small scale.
Biology: fish	No	Activities are not anticipated to delay or prevent fish entering an estuary, impact normal fish behaviour, or cause entrainment or impingement of fish.
Water quality	No	No effects on water quality predicted.
Protected areas	Yes	There are WFD protected areas within the ZoI of the works.
Invasive non-native species	Yes	Activities require the use of marine vessels and equipment from outside the local area which could increase the risk of introduction or spread of INNS.

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