

Greater Dublin Drainage Project Addendum

**Environmental Impact Assessment Report Addendum:
Volume 3A Part A of 6**

Chapter 9A Biodiversity (Marine)

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Contents

9. Biodiversity (Marine)	1
9.1 Introduction.....	1
9.2 Methodology.....	1
9.2.1 Desktop Study.....	2
9.2.2 Field Survey	2
9.2.3 Underwater Noise Modelling.....	4
9.2.4 Impact Assessment Methodology.....	4
9.2.5 Non-Statutory Consultation.....	5
9.3 Baseline Environment	6
9.3.1 Designated Sites for Nature Conservation	6
9.3.2 Geomorphology and Seabed Sediments.....	7
9.3.3 Sediment Chemistry.....	7
9.3.4 Marine Benthos.....	8
9.3.5 Water Quality Profiling, Sampling and Plankton	9
9.3.6 Baldoyle Estuary Walkover.....	10
9.3.7 Marine Mammals	11
9.3.8 Fish and Shellfish.....	12
9.3.9 Summary Evaluation (Importance) of Key Marine Ecological Receptors and Habitats ...	12
9.4 Impact of the Proposed Project – Construction Phase	13
9.5 Impact of the Proposed Project – Operational Phase.....	13
9.6 ‘Do Nothing’ Impact.....	13
9.7 Mitigation Measures	14
9.7.1 Construction Phase.....	14
9.7.2 Operational Phase	14
9.8 Residual Impacts.....	14
9.9 Oral Hearing	14
9.10 Conclusion.....	15
9.11 References	15

9. Biodiversity (Marine)

9.1 Introduction

As detailed in Chapter 1A (Introduction) in Volume 2A Part A of this Environmental Impact Assessment Report (EIAR) Addendum Report, we have reviewed Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIAR submitted with the original 2018 planning application, in the light of:

- Changes to the baseline environment;
- The requirement for updated surveys; and
- Any changes to the law, policy, or industry standards and guidance in the intervening period.

Table 9.1 includes a summary of the elements which were incorporated into the planning design for the Greater Dublin Drainage Project (hereafter referred to as the Proposed Project) following direction at the Oral Hearing in 2019 and the subsequent planning conditions applied to the 2018 planning application submission. A full description is included in Chapter 4A (Description of the Proposed Project) in Volume 2A Part A of the EIAR Addendum. The remaining elements of the Proposed Project included in the 2018 planning application remain unchanged.

Table 9.1: Updated Proposed Project Elements

Updated Element	Outline Description of Updated Element
Ultraviolet (UV) Treatment	<ul style="list-style-type: none"> • UV Treatment is to be included in the treatment process at the proposed wastewater treatment plant (WwTP) in the northern section of the WwTP site. • The UV treatment system will be designed for the expected flows at the plant and will be installed on the final effluent line. UV treatment will be in operation 24 hours a day, 365 days a year. • The UV system will consist of a minimum of three and a maximum of four treatment units located below or partially below ground level with an above-ground Motor Control Centre (MCC) (in a kiosk) along with minor maintenance and control equipment (e.g. shut-off button, frame for supporting, retracting and cleaning of UV lamps etc.).
River Mayne Culvert Extension	<ul style="list-style-type: none"> • Extension of the River Mayne Culvert on the proposed access road to the WwTP by 4m (from 21m to 25m) to cater for the full width of the future north south link road.

The updated biodiversity assessments contained in Chapter 10A (Biodiversity (Marine Ornithology)), Chapter 11A (Biodiversity (Terrestrial and Freshwater Aquatic)) and this Addendum Chapter are based on Chapter 4A (Description of the Proposed Project) in Volume 3A Part A of the EIAR Addendum, and the Addendum to the Outline Construction and Environmental Management Plan (CEMP) which is a standalone document. They are supported, as necessary, by other specialist assessments of the EIAR Addendum, including for example, Chapter 8A (Marine Water Quality), Chapter 15A (Noise and Vibration) and Chapter 17A (Hydrology and Hydrogeology).

This Addendum Chapter should be read in conjunction with Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIAR submitted with the original 2018 planning application, and should also be read in conjunction with the following:

- Appendix A9.1 Marine Habitat Assessment Survey Report in Volume 3A Part B of the EIAR Addendum;
- Appendix A9.2 Ireland's Eye Sublittoral Biotope Survey Report in Volume 3A Part B of the EIAR Addendum;
- Appendix A9.3 (Precis of Evidence and Written Responses to Queries at the 2019 Oral Hearing); and
- Revised Natura Impact Statement (NIS) Addendum (included as a standalone report).

9.2 Methodology

The methodology employed for the purpose of this Addendum assessment was to review the marine biodiversity baseline in terms of the physical environment (based on the completion of updated surveys) and

legislative / policy context. This was compared to the baseline that existed in 2018 when the original Chapter 9 (Biodiversity (Marine)) was submitted in Volume 3 Part A of the EIAR in the 2018 planning application.

9.2.1 Desktop Study

The following key additional literature sources have been considered as part of this Addendum and were used to identify or modify features of marine ecological value within the study area and surrounding region. It has been determined that these additional literature sources have no impact on the previous assessment completed as part of Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIAR in the 2018 planning application:

- Aerial Thermal-Imaging Survey of Seals in Ireland 2017 to 2018 (Morris and Duck 2019);
- Dublin Bay Seal Census 2018. Survey results and recommendations for future monitoring. (Lauder 2018);
- Harbour Porpoise Surveys in Rockabill to Dalkey Island Special Area of Conservation (SAC) (Berrow *et al.* 2021);
- The Irish Whale and Dolphin Group (IWDG) Marine Mammal Annual Report(s) Alexandra Basin Redevelopment Project, Dublin Port Company 2019 to 2022 (IWDG 2019; 2020; 2021; 2022); and
- Dumping at Sea Permit (S0024-01) Annual Environmental Reports 2020 and 2021 (RPS 2021; 2022).

9.2.2 Field Survey

Updated field surveys were undertaken as part of the preparation of this EIAR Addendum. The following update surveys were completed in 2022 and 2023, none of which required a foreshore licence.

Geomorphology

The proposed outfall pipeline route (marine section) was reviewed as part of the benthic habitat survey undertaken in January 2023 (refer to Marine Benthos and Sediments Section below). Data from this visual inspection was used to update any changes within the marine geomorphology.

Marine Benthos and Sediments

An additional visual survey (non-invasive and therefore not requiring a foreshore licence) was carried out, at and around, the proposed outfall pipeline route (marine section) to provide updated data on the current condition of the sub-littoral environment.

On 5 and 6 January 2023, an experienced team of scientists from Benthic Solutions Limited (BSL) mobilised in Howth Harbour and completed a number of drop-down and towed camera surveys relating to the Proposed Project. This included a visual survey along the full length of the proposed outfall pipeline route (marine section), from the dredging interconnector location to the proposed marine diffuser location, as well as an additional camera-based survey at a site located south of Ireland's Eye (previously noted as Station 27 in the 2012 survey discussed in Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIAR in the 2018 planning application). The aim of this survey was to update our understanding of these dynamic environments and identify any material changes to the distribution or description of the habitats directly impacted by the proposed outfall pipeline route (marine section), or adjacent to the Proposed Project site.

The survey was consistent with previous surveys carried out at the site using drop-down camera equipment. However, an additional 'freshwater lens' adaptation was required to allow for the high turbidity in the waters in the region during the winter months. Two different systems were utilised and adapted based on either a towed BSL MOD4 camera system sled, producing approximately 1,300 images of 24Mp (megapixel) resolution along the proposed outfall pipeline route (marine section), or a drop-down system utilised around or south of Ireland's Eye (refer to Survey for Reefs Section below). The positions of all images were recorded using a Global

Greater Dublin Drainage Project Addendum

Positioning System (GPS) and the results of the survey were digitally mapped in a Geographical Information System (GIS).

This visual surveys were carried out in winter 2022 / 2023, a time of year which was deemed appropriate given that the primary objective for these surveys was to assess possible habitat changes from those previously described and presented in Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIA in 2018 planning application.

Water Quality Profiling and Sampling

No further surveys were undertaken or were deemed necessary, as the main function of these original assessments was to understand the basic structure of the water column during winter and summer seasons, and the general details of the existing water quality within the region are already understood and outlined in the water quality information presented in this Section of the EIA in the 2018 planning application.

A full updated description of overall water quality is included in Chapter 8A (Marine Water Quality) in Volume 3A Part A of this EIA Addendum.

Fish and Shellfish

No further surveys were undertaken as the current information is sufficient to adequately describe the likely populations surrounding the site. There are therefore no changes to the information presented in this Section of the EIA in the 2018 planning application.

Plankton

No further surveys were undertaken as the current information is sufficient to adequately describe the likely activity surrounding the site. There are therefore no changes to the information presented in this Section of the EIA in the 2018 planning application.

Baldoyle Estuary Walkover

In October and November 2022, a walkover survey of the entire marine inter-tidal Proposed Project boundary was undertaken during daylight hours. The aim of the survey was to identify any changes to the distribution or description of the habitats within and immediately adjacent to the Proposed Project boundary since the completion of the original surveys associated with Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIA in the 2018 planning application. The mapping and description of the habitats was completed with reference to A Guide to Habitats in Ireland (hereafter referred to Fossitt 2000) (Heritage Council 2000). This is consistent with the habitat classification system used in Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIA in the 2018 planning application. The results of the survey were digitally mapped in GIS. The weather conditions during the survey were mild (approximately 10 to 15°C (degrees Celsius)) and mostly dry with occasional showers.

Surveys for Reefs (1170) on Ireland's Eye – Rockabill to Dalkey Island Special Area of Conservation

Two additional visual surveys (non-invasive and therefore not requiring a foreshore licence) were carried out at the Ireland's Eye sublittoral reef to provide updated data on the current condition of the sub-littoral environment.

On 5 and 6 January 2023, an experienced team of scientists from BSL mobilised in Howth Harbour and completed a number of drop-down and towed camera surveys relating to the qualifying habitats in the Rockabill to Dalkey Island SAC. This was based on four transects surveyed across sublittoral reefs located on the north and eastern shorelines of Ireland's Eye.

An additional 'freshwater lens' adaptation was required to allow for the high turbidity in the waters found in the region due to winter conditions. Therefore, a small drop-down camera system was utilised for this purpose based on a Kongsberg digital camera, producing approximately 300 images of 6Mp resolution. Positions of all

Greater Dublin Drainage Project Addendum

images were recorded using a GPS and the results of the survey were digitally mapped in GIS. The weather conditions during the survey were marginal with slight to moderate seas of around 1m (metre) wave height.

These visual surveys were carried out in winter 2022 / 2023, a time of year which was deemed appropriate given that the primary objective for these surveys was to assess possible habitat changes from those previously described and presented in Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIAR in 2018 planning application.

In addition to the above video assessment, a further detailed sublittoral habitat survey was carried out on 31 March and 1 April 2023 at the four sublittoral sites originally assessed in 2015 (i.e. those previously described in Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIAR in the 2018 planning application). These were similarly undertaken using a scientific SCUBA diving protocol by the same scientists that carried out the original surveys (MERC assisted by ASML). The results of this study have been harmonised with those of the original assessment and presented in Appendix A9.2 in Volume 3A Part B of this EIAR Addendum.

Surveys for the Harbour Porpoise – Rockabill to Dalkey Island Special Area of Conservation

No field surveys were undertaken relating to this harbour porpoise as new third party extensive monitoring datasets have been made available since the submission of the EIAR in 2018 planning application. The new datasets have formed part of the literature review, discussed in Section 9.3.7 of this Addendum Chapter.

Ambient Noise Recording

No further surveys were undertaken as no material changes to the environment were expected and there are no changes to the proposed construction methodologies for the proposed outfall pipeline route (marine section) since the submission of the 2018 planning application. There are therefore no changes to the information presented in this Section of the EIAR in the 2018 planning application.

9.2.3 Underwater Noise Modelling

No further modelling was undertaken as no material changes to the environment were expected and there are no changes to the proposed construction methodologies for the proposed outfall pipeline route (marine section) since the submission of the 2018 planning application. There are therefore no changes to the information presented in this Section of the EIAR in the 2018 planning application.

9.2.4 Impact Assessment Methodology

Some of the guidelines which were used in the valuation of biodiversity features and ecological impact assessment (EclA) contained in Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIAR in the 2018 planning application have since been updated. These include:

- The Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland - Terrestrial, Freshwater, Coastal and Marine (hereafter referred to as the Guidelines for Ecological Impact Assessment) (CIEEM 2018) [version 1.2]; and
- The Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the updated EPA Guidelines) (EPA 2022).

The Guidelines for Ecological Impact Assessment were published by CIEEM in 2018, and subsequently modified in 2019 and 2022. The current version is the 2018 version (noted within the Guidelines for Ecological Impact Assessment as updated in April 2022 as Version 1.2). The principal purpose of and material change in the 2018 Guidelines for Ecological Impact Assessment is that they combine the 2016 Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition (CIEEM 2016) and the Guidelines for Ecological Impact Assessment in Britain and Ireland: Marine and Coastal (CIEEM 2010) (both of which informed the assessment for Chapter 10 (Biodiversity (Marine Ornithology)) in Volume 3 Part A of the EIAR in the 2018 planning application), to have only one set of Ecological Impact Assessment (EclA) guidelines in the UK and Ireland. The EclA prepared in accordance with the 2016 Guidelines for Ecological

Greater Dublin Drainage Project Addendum

Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition and the 2010 Guidelines for Ecological Impact Assessment in Britain and Ireland: Marine and Coastal, presented in the EIAR in the 2018 planning application remains valid and robust today, subject to any changes or modifications set out subsequently in this Chapter of the EIAR Addendum.

Since the 2018 planning application, the updated EPA Guidelines were published by the EPA in 2022. The Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the Draft EPA Guidelines) (EPA 2017) informed the assessment carried out in Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIAR in the 2018 planning application. The Draft EPA Guidelines were made available in 2017 following the transposition deadline set down in Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (hereafter referred to as the EIA Directive). The Draft EPA Guidelines have been updated following extensive consultation and the introduction of transposing legislation. The updated EPA Guidelines were formally adopted and published by the EPA in 2022, having been drafted with the primary objective of improving the quality of EIARs and with a view to facilitating compliance with the EIA Directive.

Insofar as the updated EPA Guidelines relate to the EclA presented in Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIAR in the 2018 planning application, in terms of describing the nature of effects on biodiversity features (extent, magnitude, duration, frequency and reversibility) and the significance of those effects, the same terms are used in both the Draft EPA Guidelines and the adopted updated EPA Guidelines (e.g. Table 3.3 of the Draft EPA Guidelines on the description of effects has been brought through to the adopted updated EPA Guidelines as Table 3.4).

The updated EPA Guidelines note that '*when more specific definitions exist within a specialised factor or topic, e.g. biodiversity, these should be used in preference to these generalised definitions*', which is the case for Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIAR in the 2018 planning application. The 2016 Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition were the principal guidance document used in preparing the EclA. As outlined previously, the EclA prepared in accordance with the 2016 Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition and presented in the EIAR in the 2018 planning application remains valid and robust today, subject to any changes or modifications set out subsequently in this Chapter of the EIAR Addendum.

9.2.5 Non-Statutory Consultation

There are no changes to the information presented in this Section of the EIAR in the 2018 planning application, in relation to the consultation undertaken prior to submission of the 2018 planning application. Following the submission of the application for planning approval for the Proposed Project to An Bord Pleanála (ABP) on 20 June 2018, the application documentation was placed on display during the period 28 June 2018 to 17 August 2018 (a seven-week period). Additionally, the application documentation was made available to view and download on a dedicated website (www.gddapplication.ie). Prescribed bodies, the general public, landowners and other interested parties were invited to make submissions on:

- The likely effects on the environment of the Proposed Project; and
- The implications of the Proposed Project for proper planning and sustainable development in the area concerned.

Following this consultation period, it came to the attention of the Applicant on 19 July 2018 that, in relation to the documents which were lodged with the planning application, some documentation forming part of the EIAR were inadvertently omitted. By agreement with ABP, these documents were placed on display during the period 13 September 2018 to 18 October 2018 (a five-week period) and prescribed bodies, the general public, landowners and other interested parties were invited to make further submissions on the entirety of the planning application until 18 October 2018. A total of 174 submissions / observations were received, comprising 145 from the first consultation period and 29 from the second consultation period.

Greater Dublin Drainage Project Addendum

All submissions were reviewed by Uisce Éireann and the Project Team, and responses were provided in a Response to Submissions Report (Uisce Éireann 2019), including those which specifically related to marine biodiversity. This Report was published on the dedicated website in January 2019.

Following an Oral Hearing process, ABP previously made a decision to grant this planning application by Order dated 11 November 2019 under reference number ABP-301908-18 for Proposed Project. That decision was quashed by Order of the High Court and the case was remitted by that Court to ABP for a fresh determination. Following the remittal Order, ABP decided that given the passage of time since the submission of the original planning application, and in accordance with Section 37F(1)(c) of the Planning and Development Act 2000 (as amended), Uisce Éireann should have the opportunity to update, where appropriate, the EIAR and Natura Impact Statement, and any other information submitted.

In light of this, ABP contacted those who had made submission as part of the original consultation process in 2018 advising that the case had been reactivated under a new reference number (ABP-312131-21) and invited those interested parties to make any further general submissions / observations on the planning application by 30 September 2022. A total of 16 submissions were received and have been considered in the updates to the EIAR as part of this EIAR Addendum. Where a submission that relates to terrestrial and freshwater aquatic biodiversity does not require an update to this Addendum Chapter, but does require further clarification based on the information provided either in the original EIAR submitted as part of the 2018 planning application or the information in this EIAR Addendum, responses will be provided in a new Response to Submissions Report which will be submitted to ABP as a separate report (in line with the process followed for the original 2019 A Response to Submissions Report), following the submission of the Addendum.

9.3 Baseline Environment

9.3.1 Designated Sites for Nature Conservation

Since the 2018 planning application, the National Parks and Wildlife Service (NPWS) has published site-specific conservation objectives for a number of European sites considered in the EIAR and the Natura Impact Statement associated with the Proposed Project. These site-specific conservation objectives replace the generic conservation objectives that had been published previously. The date of publication of the conservation objectives used in assessing the effects of the Proposed Project in the EIAR in the 2018 planning application are listed in Appendix E of the Natura Impact Statement, which was included as a standalone document in the 2018 planning application.

In July 2023, details of a new candidate Special Protection Area (cSPA), designated under Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (hereafter referred to as the Birds Directive) were announced. The North-West Irish Sea cSPA (004236) extends offshore along the coasts of counties Louth, Meath and Dublin and is approximately 2,333km² (kilometres squared). The site is of special conservation interest for the following species: common scoter, red-throated diver, great northern diver, fulmar, Manx shearwater, shag, cormorant, little gull, kittiwake, black-headed gull, common gull, lesser black-backed gull, herring gull, great black-backed gull, little tern, roseate tern, common tern, Arctic tern, puffin, razorbill and guillemot. Site-specific conservation objectives assigned to this cSPA have recently been published (NPWS 2023), and as anticipated, are similar to objectives from the existing marine Special Protection Areas (SPAs).

In compliance with its legal obligations, Uisce Éireann has treated the cSPA as a fully designated SPA in this assessment. Uisce Éireann has worked with its newly published conservation objectives. The length of the proposed outfall pipeline route (marine section), beyond Velvet Strand to the terminal marine diffuser (4,800m) will be located within the North-West Irish Sea cSPA. This comprises 108.5ha (hectares) of the red line boundary of the Proposed Project.

The EIAR Addendum and the Revised Natura Impact Statement currently assess the impact of the Proposed Project on the Ireland's Eye SPA and the North-West Irish Sea cSPA in terms of marine biodiversity and concludes that there are no predicted impacts on these designated sites during the Construction or Operational Phases.

Greater Dublin Drainage Project Addendum

European sites relevant to the marine biodiversity assessment that have subsequently had their generic conservation objectives re-published as site-specific conservation objectives are listed in Table 9.2.

Table 9.2: Updated Marine SACs Within the Vicinity of the Proposed Project

Site Code	Site Name	Habitat Code	Habitat Name	Distance
003015	Codling Fault Zone SAC	1180	Submarine structures made by leaking gases	28.5km

Following a review of the NPWS website, all other sites relevant to marine biodiversity have not had conservation objectives re-published since the preparation and submission of the EIAR and Natura Impact Statement in the 2018 planning application.

There are no other changes to the information presented in this Section of the EIAR in the 2018 planning application.

9.3.2 Geomorphology and Seabed Sediments

When comparing the results of the most recent subtidal habitat survey in 2023 with the previous habitat survey campaigns presented in the EIAR in the 2018 planning application, no significant changes in habitat type were noted along the proposed outfall pipeline route (marine section). The marine sediments are expected to remain in a consistent state of flux with finer sediment components, such as the fine and medium sands migrating in and out of the shorelines during storm events, and up and down the coastline through tidal currents and long-shore drift. The video survey undertaken along the length of the proposed outfall pipeline route (marine section) showed that the sediment and geomorphology outlined in the EIAR in the 2018 planning application remained largely unaltered, despite some storm events being recorded within the intervening years.

Previous surveys have demonstrated changes in the thickness of mobile sands immediately surrounding the proposed marine diffuser location, with erosion and accretion expected to occur periodically. The 2023 survey indicated that a fine sand veneer had accumulated at the proposed marine diffuser location, which was also previously recorded in 2013 (but absent in 2017). Refer to Figure 6.1 and Figure 6.2 of Appendix A9.1 in Volume 3A Part B of the EIAR Addendum for full details. These figures illustrate spatially, the distribution of visual habitat boundaries along the proposed outfall pipeline route (marine section).

An important substrate recorded in 2012 and noted in the EIAR in the 2018 planning application was that of biogenic maerl sands in isolated patches at Station 27, south of Ireland's Eye. This site was re-investigated using a drop-down and stills camera operation in the 2023 benthic habitat survey. This survey confirmed a heterogeneous seabed ranging from weathered bedrock and boulders to biogenic sands and gravels, although close inspection indicated that the biogenic material was the result of predominantly dead shell fragments rather than that of dead maerl algae (refer to Figure 6.4 of Appendix A9.1 in Volume 3A Part B of the EIAR Addendum for full details).

There are no other material changes to the information presented in this Section of the EIAR in the 2018 planning application.

9.3.3 Sediment Chemistry

We are satisfied without the need for additional surveys that we have sufficient current data to indicate that there are no material changes to the information presented in this Section of the EIAR in the 2018 planning application. Additional surveys will be carried out to further verify the data already held.

9.3.4 Marine Benthos

Macroinvertebrate Community

Based on video assessment and further sublittoral habitat survey, both undertaken in 2023, we are satisfied that we have sufficient data to indicate that there are no material changes to the information presented in this Section of the EIAR in the 2018 planning application.

Epifaunal Community

No further quantitative analysis of epifaunal benthos was undertaken during the 2023 survey of the proposed outfall pipeline route (marine section), although epifauna and conspicuous invertebrate species were observed and recorded along the length of the route. These observations largely supported previous observations provided in the EIAR submitted in the 2018 planning application, of a diverse community and typical for each sediment type along this mixed inshore sediment environment, with infaunal deposit feeders and surface living epifaunal species both well represented. Observations showing any notable change or further clarification from that of the previous 2018 planning application are as follows:

- The previous observations of seed mussel beds (*Modiolus modiolus*) were not recorded at Station 27, with only a single adult individual observed along a 1.2km transect. The presence of blue mussels (*Mytilus edulis*) was also not recorded at this site as per the previous survey; and
- The extended transects and higher resolution images of the biogenic sands recorded at Station 27 did not contain maerl, as previously thought in the earlier study, but was largely made up of the skeletal material of benthic organisms such as molluscs, bryozoans and sponges. As the presence of maerl had also previously been recorded by the Geological Survey Ireland as part of the INFOMAR project in this area of Dublin Bay, it is now concluded that the presence of maerl is likely to be restricted to slightly deeper waters to the east of this station.

There are no further changes to the information presented in this Section of the EIAR in the 2018 planning application.

Littoral and Sublittoral Reefs Around Ireland's Eye

As described in Section 9.2.2, a sublittoral habitat survey was further carried out on 31 March and 1 April 2023 at the four sublittoral sites originally assessed in 2015 (i.e. those previously described in Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIAR in the 2018 planning application).

No further littoral surveys were undertaken. The EIAR submitted in the 2018 planning application concluded that the previous surveys undertaken in 2015 adequately described these habitats as a continuation of the previous sublittoral assessment through vertical zonation, with sites representative of varying levels of exposure and wave energy. There are no changes to the information presented in this Section of the EIAR in the 2018 planning application.

Intertidal Reef Community Complex

As detailed above, no additional littoral surveys were required to be undertaken to inform this Section of the EIAR Addendum. The updated sublittoral surveys indicated no significant changes to the biotopes recorded despite the slightly reduced numbers of over-wintering species identified. The same is expected for the littoral zone. There are no changes to the information presented in this Section of the EIAR in the 2018 planning application.

Subtidal Reef Community Complex

Each of the sublittoral reef habitats identified and presented in the EIAR in the 2018 planning applications were further visited in 2023 using both a drop-down camera technique, and a resurvey using SCUBA assessment (refer to Appendix A9.2 in Volume 3A Part B of this EIAR Addendum).

These update surveys were able to replicate observations throughout the original sublittoral transects from the basal sediments to the extent of the sublittoral reefs at the sea surface. This indicated similar habitats and biotopes to those reported in the 2018 planning application, confirming *Laminaria digitata* forests in the shallower part and replaced by the biotope 'Foliose red seaweeds with dense *Dictyota dichotoma* and / or *Dictyopteris membranacea* on exposed lower infralittoral rock'. The deeper extent was also dominated by a 'Mixed turf of bryozoans and erect sponges with *Sagartia elegans* on tide-swept circalittoral rock' or in the case of Sublittoral S2, '*Flustra foliacea* and colonial ascidians on tide-swept moderately wave-exposed circalittoral rock'. The deeper biotope at Sublittoral S4 was categorised as a possible '*Polyclinum aurantium* and *Flustra foliacea* on sand scoured tide-swept moderately wave-exposed circalittoral rock'. The repeated surveys in 2023, undertaken during the winter, indicated no significant changes in the biotopes record, despite the slightly reduced number of over-wintering species identified. It should also be noted that the biotope *CR.HCR.XFa.ByErSp.Cyl* of a 'Mixed turf of bryozoans and erect sponges with *Cylista elegans* on tide-swept circalittoral rock', recorded at depth at Sublittoral S1 has been renamed from *CR.HCR.XFa.ByErSp.Sag*, as used in the 2015 survey. Furthermore, these recent surveys also confirmed a high level of suspended sediment within the water column, and areas on the rocky reef substrate also showed high levels of sedimentation and silt burden, both on open rocky surfaces as well as within the faunal swards.

There are no other changes to the information presented in this Section of the EIAR in the 2018 planning application.

9.3.5 Water Quality Profiling, Sampling and Plankton

[Water Quality Profiling \(Vertical Profile\)](#)

Previous datasets relating to ambient suspended sediment loads and turbidity measurements were based on water quality samples acquired during the baseline surveys undertaken between 2012 and 2017, and from a prolonged period of sampling and measuring taken throughout 2015 and 2016. The latter was carried out during on-site passive acoustic monitoring surveys at the proposed marine diffuser location. Expected suspended sediments were converted from turbidity using Field calibration of optical sensors for measuring suspended sediment concentration in the western Mediterranean (Guillen *et al.* 2000). These datasets revealed a variable ambient suspended sediment load ranging from 4mg/l (milligrams per litre) to 120mg/l calculated from the turbidity measurements or 15mg/l to 160mg/l directly from sampled water quality measurements taken over the same survey period. These longer-term observations revealed a significant variability by season as well as by tidal state, with a regular semi-diurnal pattern recorded over a slow seasonal increase in water clarity during the summer months. The occurrence of stronger spring currents also increased suspended sediment load by between 7mg/l and 25mg/l over equivalent neap levels.

Long-term turbidity measurements have been recorded in Dublin Bay for the nearby Alexandra Basin Project, which is a dump site for dredged material from Dublin Port. For this development, four self-recording buoys within Dublin Bay were monitored throughout 2020 and 2021 (RPS 2020; 2021). These Dublin Bay offshore locations are expected to represent a similar level of ambient turbidity (during non-dredging periods for the Alexandra Basin Project) to that found north of Howth Head along the proposed outfall pipeline route (marine section), as well as for the waters surrounding Ireland's Eye. These data sets revealed a mean all-year round turbidity converted to suspended solids of around 25mg/l to 32mg/l at a control site south of Dublin Bay, and 42mg/l to 50mg/l in the centre of Dublin Bay. The time series profiles for these datasets also revealed that periods of spring tides routinely recorded calculated suspended sediment concentrations of over 75mg/l, and a maximum of around 140mg/l to the south of Dublin Bay, or over 300mg/l in the centre of Dublin Bay. Whilst both diurnal and tidal cycles indicated significant variations, it is not clear if the highest 'spikes' recorded within the time series related to other natural processes (such as plankton blooms), or an anthropogenic event not related to dredging or spoil dumping undertaken as part of the Alexandra Basin Project (e.g. fishing related).

Overall, these recent Dublin Bay datasets confirm high levels of natural suspended sediments, similar to previous observations given in this Section of the EIAR in the 2018 planning application.

Water Quality Sampling

We are satisfied without the need for additional surveys that we have sufficient current data to indicate that there are no material changes to the information presented in this Section of the EIAR in the 2018 planning application. Additional surveys will be carried out to further verify the data already held.

Zooplankton

We are satisfied without the need for additional surveys that we have sufficient current data to indicate that there are no material changes to the information presented in this Section of the EIAR in the 2018 planning application. Additional surveys will be carried out to further verify the data already held.

9.3.6 Baldoyle Estuary Walkover

Previous Survey Data

When comparing the results of the most recent habitat survey in 2022 with the previous habitat survey campaigns presented in the EIAR in the 2018 planning application, some changes in habitat type were noted along the Proposed Project boundary. It should be noted that the recent study was recorded in the field using primarily the Fossitt Habitat classification code (Heritage Council 2000) to align with the methodology used for the terrestrial habitat surveys. The previous walkover survey used the Annex I Habitat classification code, resulting in the slight differences in mapping classifications. The results of the current survey were mapped and cross checked for affinity to Annex I habitats, to allow comparison with the previous survey.

There are no further changes to the information presented in this Section of the EIAR in the 2018 planning application.

Proposed Outfall Pipeline Route (Marine Section) – Eastern Side

- North of the proposed outfall pipeline route: To the north of the eastern side of the proposed outfall pipeline route (marine section), the current survey indicated that there was slightly reduced Atlantic salt meadow directly above the proposed outfall pipeline route, which is currently dominated by *Spartina* swards and only extends into Atlantic salt meadow at the uppermost section of the marsh. Some species previously recorded in 2013, such as common scurvy grass (*Cochlearia officinalis*) and sea pink (*Armeria maritima*) were not encountered in the 2022 survey; and
- South of the proposed outfall pipeline route: To the south of the eastern side of the proposed outfall pipeline route (marine section), previously recorded patches of Mediterranean and Atlantic salt meadows Annex I habitat south of Portmarnock golf course were not noted in the current survey, with this area identified as a broadly Marram grass dune habitat. There was also a distinct cluster of sea buckthorn (*Hippophae rhamnoides*), associated with Dune Scrub and Woodland habitat (CD4), to the south of the golf course, not previously recorded.

Please refer to Figure 5.1 to Figure 5.3 in Appendix A9.1 in Volume 3A Part B of the EIAR Addendum.

Proposed Outfall Pipeline Route (Marine Section) – Western Side

- North of the proposed outfall pipeline route: To the north of the western side of the proposed outfall pipeline route (marine section), overall, the current survey indicated this section of the proposed outfall pipeline route is similar to the previous survey. The scrub vegetation, and mosaic of Mediterranean and Atlantic salt meadow marsh was also documented, although represents a smaller area in the current survey.
Previously recorded species such as bush vetch (*Vicia sepium*), common comfrey (*Symphytum officinale*), tall fescue (*Festuca aruninacea*), common scurvy grass (*Cochlearia officinalis*) and glasswort (*Salicornia sp.*) were not encountered in the 2022 survey; and
- South of the proposed outfall pipeline route: To the south of the western side of the proposed outfall pipeline route (marine section), the extent of *Spartina* swards at the lowermost sections

of the estuary was greater in 2022, although the Annex I Atlantic salt meadow habitat previously recorded was not identified in the current survey, with a marram dune habitat instead recorded. The Sand shore (LS2) and Mud shore habitat (LS4) remain unchanged, although a greater area of mudflats covered by seawater at low tide were recorded, not mapped in the original survey, as most likely covered by channels of seawater at the time of the survey. Refer to Figure 5.1 to Figure 5.3 of Appendix A9.1 in Volume 3A Part B of the EIAR Addendum for full details. These figures illustrate spatially any changes to estuarine wetland habitats as designated by the Fossitt Habitat classification code (Heritage Council 2000).

Please refer to Figure 5.1 to Figure 5.3 in Appendix A9.1 in Volume 3A Part B of the EIAR Addendum.

There are no further changes to the information presented in this Section of the EIAR in the 2018 planning application.

9.3.7 Marine Mammals

Information previously presented in this Section of the EIAR in the 2018 planning application has been augmented with recent data acquired during further literature reviews from projects and studies completed within the vicinity of the Proposed Project since 2018. These include the following:

- Aerial Thermal-Imaging Survey of Seals in Ireland 2017 to 2018 (Morris and Duck 2019);
- Harbour Porpoise Surveys in Rockabill to Dalkey Island Special Area of Conservation (SAC) (Berrow *et al.* 2021); and
- Marine Mammal Annual Report(s) Alexandra Basin Redevelopment Project, Dublin Port Company 2019 to 2022 (IWDG 2019; 2020; 2021; 2022).

Protection for Cetaceans

The further literature review did not identify any required changes to the information presented in this Section of the EIAR in the 2018 planning application.

Toothed Whales and Dolphins

Estimates of overall harbour porpoise populations within the Rockabill to Dalkey Island SAC (Site Code: 003000) have been undertaken using a variety of both visual and passive acoustic monitoring techniques to estimate population size, density and distribution.

A visual and passive acoustic monitoring survey of harbour porpoise was previously carried out in the summer of 2013 by Berrow and O'Brien in order to derive local density and abundance estimates. This was repeated in 2016 and again in 2021. These were based on line-transect surveys over selected days in the summer. These surveys concluded a similar importance of the area to this species, although the mean density changed from 1.44 individuals per km² (ind/km²) in 2013, to 1.55 ind/km² in 2016, and only 0.83 ind/km² in 2021, indicating significant variability between surveys. This recent density estimate is around 44% of that reported in 2013 and 2016. The number of sightings per survey was down by around 17% on the mean of the previous surveys. This appears to reveal a real decrease in the density of harbour porpoises recorded in the Rockabill to Dalkey Island SAC during 2021, a decline that has similarly been reported in other SACs designated for harbour porpoise off Ireland's east coast. Using the same methodology, the other SACs with harbour porpoise as qualifying interests were located at Roaringwater Bay and Islands SAC and Blasket Islands SAC, both reporting significant declines over a similar period for harbour porpoise of 70% and 53%, respectively (O'Brien and Berrow 2018). This suggests that the driver of this decline is widespread throughout Irish waters.

To understand changes in seasonality around the proposed outfall pipeline route (marine section), the recent harbour porpoise data collected in 2021 (Berrow *et al.* 2021) shows that harbour porpoise numbers increased in late summer, coincidental with the presence of calves, whilst reduced numbers were recorded during late spring / early summer, which may be associated with an offshore movement of this species before calving. These data were limited to summer observations only.

Greater Dublin Drainage Project Addendum

A separate and more comprehensive study was undertaken as part of the Alexandra Basin Project, which carried out continuous long-term passive acoustic monitoring within Dublin Bay, to the south of Howth Head, over two survey years (2020 and 2021). These datasets similarly confirmed the presence of harbour porpoise every day, with the greatest concentration during the summer months of July and August, with half to a quarter of detections recorded later in the year. The lowest numbers recorded were also confirmed in early summer when adults are expected to be further offshore whilst calving.

There are no further changes to the information presented in this Section of the EIAR in the 2018 planning application.

Baleen Whales

The further literature review did not identify any required changes to the information presented in this Section of the EIAR in the 2018 planning application.

Opportunistic observations by the IWDG over the period following the submission of the 2018 planning application gave very limited information on the observation of occasional Minke whale offshore, and unusually, the spotting of a juvenile Fin whale south of Howth Head, which was also recorded in the mouth of the River Liffey.

Pinnipeds

Information relating to pinniped populations can be updated following a comprehensive aerial thermal-imaging study carried out in August 2017 in the study area for NPWS, which was published in 2019 (Morris and Duck 2019) as part of nationwide assessment. This study indicated a significant increase in numbers of both indigenous species around the Howth Head and Lambay Island areas. Denominated as Section 2 of the Eastern Ireland area, the recent census indicated 70 individuals for harbour seals (an increase of 105% since 2003) and 335 individuals for grey seals (an increase of 59% since 2003) for this entire region. Furthermore, a local census by Irish Seal Sanctuary completed around Dublin Bay in 2018 also indicated significant numbers of grey seals hauled out on the coast from Howth to Ireland's Eye (70 individuals, including one pup (Lauder 2018). The seasonality and patterns of distribution are expected to be as previously reported.

There are no further changes to the information presented in this Section of the EIAR in the 2018 planning application.

Otters

The further literature review did not identify any required changes to the information presented in this Section of the EIAR in the 2018 planning application.

9.3.8 Fish and Shellfish

The further literature review did not identify any required changes to the information presented in this Section of the EIAR in the 2018 planning application. No further surveys were necessary given the existing information available for both finfish and shellfish groups, commercially or recreationally, already outlined in the information presented in this Section of the EIAR in the 2018 planning application.

9.3.9 Summary Evaluation (Importance) of Key Marine Ecological Receptors and Habitats

The updated information has not resulted in any material change to the presence or importance of key marine ecological receptors. Consequently, there are no further changes required to the information presented in this Section of the EIAR in the 2018 planning application.

9.4 Impact of the Proposed Project – Construction Phase

The updated Proposed Project elements, as outlined in Section 9.1, and the changes to the baseline environment outlined in Section 9.3, have been considered against the previous assessment of potential Construction Phase impacts in Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIAR in the 2018 planning application.

Due to the passage of time since the submission of the 2018 planning application, the proposed construction programme was reviewed and revised. An updated timeline including individual activities is provided in Chapter 4A (Description of the Proposed Project) in Volume 2A Part A of the EIAR Addendum. The total Construction Phase will remain as approximately 48 months, including 12 months of commissioning. While there are two new elements to the Proposed Project, they are both within the existing planning application boundary and there are no changes to the proposed construction methodologies previously outlined in the 2018 planning application.

The Construction Phase impacts of the Proposed Project on marine biodiversity features therefore remain the same as reported in Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIAR in the 2018 planning application.

There are no further changes to the information presented in this Section of the EIAR in the 2018 planning application.

9.5 Impact of the Proposed Project – Operational Phase

The updated Proposed Project elements, as outlined in Section 9.1, and updates to Chapter 8A (Marine Water Quality), have been considered against the previous assessment of potential Operational Phase impacts in Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIAR in the 2018 planning application.

Following the construction of the proposed WwTP, the inclusion of UV treatment for wastewater will not impact the marine biodiversity in the vicinity of the discharge. The only impact on water quality during the Operational Phase will be due to the treated wastewater discharge, or the potential discharge of untreated wastewater for a very short duration owing to a pumping failure in the proposed WwTP. As outlined in Chapter 22A (Risk of Major Accidents and / or Disasters) in Volume 3A Part A of this Addendum EIAR, with consideration of all of the embedded measures included in the design of the Proposed Project and the additional mitigation measures outlined in Chapter 22 (Risk of Major Accidents and / or Disasters) in Volume 3 Part A of the EIAR in the 2018 planning application, the risk of a discharge of untreated wastewater during Commissioning and the Operational Phase to the marine environment is 'Very Unlikely'. A risk category that is classified as 'Very Unlikely' is 'not expected to occur', as per A Guide to Risk Assessment in Major Emergency Management (Department of Environment, Heritage and Local Government 2010).

The Operational Phase impacts of the Proposed Project on marine biodiversity features remain the same as reported in Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIAR in the 2018 planning application.

There are no further changes to the information presented in this Section of the EIAR in the 2018 planning application.

9.6 'Do Nothing' Impact

The 'Do Nothing' scenario, in the absence of the Proposed Project, remains unchanged. There are therefore no further changes to the information presented in this Section of the EIAR in the 2018 planning application.

9.7 Mitigation Measures

9.7.1 Construction Phase

Based on the comparative assessment of impacts on marine biodiversity identified in Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIAR in the 2018 planning application and the present day, the previously proposed mitigation measures for the Construction Phase still remain valid and applicable. There are no further changes to the information presented in this Section of the EIAR in the 2018 planning application.

9.7.2 Operational Phase

Based on the comparative assessment of impacts on marine biodiversity identified in Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIAR in the 2018 planning application and the present day, the previously proposed mitigation measures for the Operational Phase still remain valid and applicable. There are no further changes to the information presented in this Section of the EIAR in the 2018 planning application.

9.8 Residual Impacts

There are no changes to the information presented in this Section of the EIAR in the 2018 planning application, as there are no other material changes to the previously assessed impacts of the Proposed Project on marine biodiversity in Chapter 9 (Biodiversity (Marine)) in Volume 3 Part A of the EIAR of the 2018 planning application. Therefore, the mitigation measures originally proposed will also remain valid and applicable, and the remaining residual impacts of the Proposed Project are considered to be the same as presented in this Section of the EIAR in the 2018 planning application.

9.9 Oral Hearing

During the 2019 Oral Hearing, the Inspector and Fingal County Council requested further information and / or clarity on a number of issues relating to marine biodiversity. Further clarification was provided in 'Response to Inspector's Questions (Marine Ecology) – Ian Wilson' and the 'Statement by Ian Wilson (27th March 2019)'. These two responses are provided in Appendix A9.3 in Volume 3A Part B of this EIAR Addendum. These questions are summarised as follows:

Screening out of Ireland's Eye SAC in the Appropriate Assessment;

- Cumulative Impacts on the harbour porpoise from proposed developments on Dublin Array (offshore windfarm), redevelopment of Dublin Port (Alexandra Basin) and Howth Harbour development; and
- Codling nursery in the Proposed Project Area.

These additional statements provided clarification at the Oral Hearing based on the above points:

- No marine habitats are included as qualifying interests within this SAC. The designated habitats of 'Vegetated sea cliffs [1230] habitat' and 'Perennial vegetation of stony banks habitat' are both terrestrial interests fundamentally based on a bedrock that are isolated from the marine section of the works. No construction operations are proposed for the island, and therefore, there is no potential pathway for likely significant effects;
- Consideration was given to the possible interface along the coastline via sea spray. The extensive height of the cliffs recorded on the northern face of the island isolates the 1230 habitat (Vegetated sea cliffs), whilst the mapped distribution of the 1220 habitat (Perennial vegetation) indicates a location on the southern tip of the main island, the opposite side of island to the proposed project and plume trajectories;
- It was concluded that impact from seawater spray would not cause any impact to these habitats, as elevations in suspended sediments or other elevated nutrients from a project would be imperceptible over the natural background;
- Further clarification on the potential cumulative impacts on harbour porpoise, a qualifying interest of the Rockabill to Dalkey SAC, from other projects in the region. The pathways for any

combination impact for the harbour porpoise would be disturbance / displacement from noise or from plumes impacts affecting foraging areas and food sources;

- The proposed Dublin Array offshore windfarm will be located approximately 13km to 28km from the proposed outfall pipeline (marine section). The mitigation outlined in the EIAR in the 2018 planning application, as well as supplied literature for the Dublin Array (Dublin Array 2020) shows all piling operations carried out for both the Proposed Project and the Dublin Array construction will be subject to the Guidelines to Manage the Risk to Marine Mammals from Man-Made Sound Sources in Irish Waters (NPWS 2014);
- The deposition of the dredge spoil from Dublin Port at the Burford Bank has been carried out at this site for a significant number of years and will produce only a limited plume on discharge prior to settling. The area of impact, limiting prey species for harbour porpoise transiting through the SAC, will be limited in area and over a short-term duration; and
- Increased suspended sediments from Howth Harbour development are modelled to be below 15mg/l within 2km of the port. This is well below the natural tidal variability recorded at the site of the proposed diffuser and the at the sublittoral reef qualifying habitats located within the Rockabill to Dalkey SAC.

9.10 Conclusion

This Addendum Chapter has considered all updates to elements of the Proposed Project, updates to the baseline environment, and whether there have been any updates to guidance and reference material since the 2018 planning application submission. Following consideration, there are no material changes to the assessment of biodiversity (marine section) as a result of any of the updates discussed in this Addendum Chapter.

9.11 References

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Greater Dublin Drainage Project Addendum

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Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment