Malachy Walsh and Partners
Engineering and Environmental Consultants

Screening for Appropriate Assessment

Revised Layout, Howth FHC Harbour Dredging and Reclamation Project, Howth, Co. Dublin.



This page is intentionally left blank.

ISSUE FORM	
Project number	19934
Document number	6016
Document revision	B
Document title	Screening for Appropriate Assessment: Howth FHC Harbour Dredging and Reclamation Project, Howth, Co. Dublin.
Document status	Draft
Document prepared by	IMD / MK
Document checked by	GT and MK
Date of Issue	31052022

Table of contents

1 SUMMARY OF FINDINGS 1

1.1 Screening for Appropriate Assessment 1

2 INTRODUCTION 2

2.1 Purpose of Assessment 2

2.2 Legislative Context 2

2.3 Stages of Appropriate Assessment 3

3 ASSESSMENT METHODOLOGY 3

3.1 Appropriate Assessment Guidance 3

3.2 Desk Study 3

3.3 Field Surveys 3

3.4 Screening for Appropriate Assessment 4

4 SCREENING FOR APPROPRIATE ASSESSMENT 4

4.1 Management of Natura 2000 sites 4

4.2 Description of Plan/Project 5

4.2.1 Brief Project Description 5
4.2.2 Purpose of the Project 7
4.2.3 Site Location 7
4.2.4 Description of the Site 7

4.3 Characteristics of the Project 8

4.3.1 Introduction 8
4.3.3 Summary of Proposed Works 9
4.3.4 Identification of Other Projects or Plans or Activities 10

4.4 Identification of Natura 2000 Sites 10

4.4.1 Likely Zone of Impact Influence 10
4.4.2 Identification of Natura 2000 Sites 11
4.4.3 Characteristics of Natura 2000 Sites 12
4.4.4 Conservation Objectives 15

4.5 Identification of Potential Impacts 17

4.6 Identification of Sites Within the Zone of Potential Impact Influence 18

4.6.1 Natura 2000 sites outside the zone of potential impact influence 18
4.6.2 Natura 2000 sites within the zone of potential impact influence 19

4.7 Assessment of Significance of Potential Impacts 20

4.7.1 Water Quality 20
4.7.2 Habitat Loss 23
4.7.3 Habitat Alteration 23
4.7.4 Disturbance and/or Displacement of Species 24

4.7.5 Habitat or Species Fragmentation 29
4.7.6 Cumulative/In-combination Impacts 30

4.8 Conclusion of Screening Stage 30

5 REFERENCES 31

Table of Tables

Table 1. Analysis results compared to MI lower and upper levels. 9
Table 3 Natura 2000 sites within the zone of influence of the proposal site 12
Table 4 Natura 2000 sites with qualifying features of conservation interest 12
Table 5 Natura 2000 sites identified as being outside the zone of potential impact influence 19

TABLE OF FIGURES

Figure 1. Approximate extent of proposed dredging and reclamation areas in Howth Harbour 6
Figure 2 Site location map showing location 7

LIST OF APPENDICES

Appendix 1 Stages of Appropriate Assessment

1 SUMMARY OF FINDINGS

1.1 SCREENING FOR APPROPRIATE ASSESSMENT

Project Title	Howth FHC, Proposed Dredging and Reclamation Works
Project Proponent	Department of Agriculture, Food and the Marine (DAFM)
Project Location	Howth Fishery Harbour Centre, Howth, Co. Dublin
Conclusion	The project has potential to have a significant effect on Natura 2000 sites. It is thus necessary to prepare a Natura Impact Statement (NIS) to fully assess the likely significant effects of the project on Natura 2000 sites, in view of their conservation objectives. The NIS will be used by the competent authority to carry out an Appropriate Assessment of the effects of the project.

2 INTRODUCTION

2.1 PURPOSE OF ASSESSMENT

An Appropriate assessment was carried out on the proposed development and included with the planning application to Fingal County Council (F21A/0368) in June 2021. In early 2022 the project underwent a redesign on the reclamation area. The original screening for Appropriate Assessment from 2021 was reviewed with regard to the redesign of the reclamation area. This is a screening for appropriate assessment of the proposed development based on the revised layout. The project description and revised layout is detailed below in **Section 4**.

This screening for Appropriate Assessment has been undertaken to determine the potential for significant impacts of a proposal to carry out dredging and reclamation works at Howth Fishery Harbour Centre (FHC), Howth, County Dublin, on nearby sites with European conservation designations (i.e. Natura 2000 Sites). The Screening for Appropriate Assessment determines the need for a full Appropriate Assessment, in which case a Natura Impact Statement (NIS) would need to be prepared. The Screening for Appropriate Assessment has been undertaken by Malachy Walsh and Partners ecologists.

An Environmental Impact Assessment Report (EIAR) has also been prepared to assess whether the project will have significant effects on the environment.

2.2 LEGISLATIVE CONTEXT

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and of wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (09/147/EC) seeks to protect birds of special importance by the designation of Special Protected Areas (SPAs). It is the responsibility of each member state to designate SPAs and SACs, both of which will form part of Natura 2000, a network of protected sites throughout the European Community. The Habitats Directive has been transposed into Irish law and the relevant Regulations are the European Communities (Birds and Natural Habitats) Regulations 2011-2015.

The requirement for Appropriate Assessment of the implications of plans and projects on the Natura 2000 network of sites comes from the Habitats Directive (Article 6(3)). Under the Planning and Development Act 2000 (amended) (Section 177U) a Local Authority is required to carry out a Screening for Appropriate Assessment of a proposed development prior to issuing consent. This information presented in this Screening for Appropriate Assessment will be used by the competent authority (in this case Fingal County Council) to complete their screening exercise.

The current assessment was conducted within this legislative framework and also the DoEHLG (2009) guidelines. As outlined in these, it is the responsibility of the proponent of the project (in this case the Department of Agriculture, Food and the Marine (DAFM)) to provide a comprehensive and objective Screening for Appropriate Assessment, which can then be used by the competent authority in order to conduct the Screening for Appropriate Assessment (DoEHLG, 2009).

2.3 STAGES OF APPROPRIATE ASSESSMENT

The Appropriate Assessment process is a four-stage process with issues and tests at each stage. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required. The stages are set out in **Appendix 1**.

3 ASSESSMENT METHODOLOGY

3.1 APPROPRIATE ASSESSMENT GUIDANCE

This screening for Appropriate Assessment, or Stage 1, has been undertaken in accordance with the European Commission Methodological Guidance on the provision of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC (EC, 2001) and the European Commission Guidance 'Managing Natura 2000 sites' (EC, 2000) and guidance prepared by the NPWS (DoEHLG, 2009).

3.2 DESK STUDY

In order to complete the screening for Appropriate Assessment certain information on the existing environment is required. A desk study was carried out to collate available information on the site's natural environment. This comprised a review of the following publications, data and datasets:

- OSI Aerial photography and 1:50000 mapping
- National Parks and Wildlife Service (NPWS)
- National Biodiversity Data Centre (NBDC) (on-line map-viewer)
- BirdWatch Ireland
- Geological Survey Ireland (GSI) area maps
- Environmental Protection Agency (EPA) water quality data
- Irish Whale and Dolphin Group (IWDG)
- Department of Agriculture, Food and the Marine fishery harbour information
- Joint Nature Conservation Council (JNCC)
- NPWS, 2019. The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished Report, NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill.
- Howth Harbour FHC Proposed Dredging and Reclamation Works Terrestrial Habitat, Otter and Bat Survey 2019 (Woodrow, 2020);
- Howth Harbour FHC Proposed Dredging and Reclamation Works Bird Surveys 2019 / 2020 Report (Woodrow, 2020);
- Natura Impact Statement for strategic housing development at Claremont, Howth, Co. Dublin (Enviroguide Consulting, 2019).
- Natura Impact Statement: Proposed Pier Protection Works, East Pier, Howth FHC, Co. Dublin (MWP, 2018)
- Natura Impact Statement: Upgrade of Middle Pier, Howth FHC, Co. Dublin (MWP, 2019)
- Other information sources and reports footnoted in the course of the report

3.3 FIELD SURVEYS

A number of ecological and hydrological surveys were completed as part of the Environmental Impact Assessment Report (EIAR) at the site including:

- Habitat surveys

- Bat surveys
- Mammal surveys
- Intertidal and sub-tidal benthos surveys
- Wintering and breeding bird surveys.
- Hydrodynamic Assessment

A risk assessment of the proposed works to marine mammals was carried out by the Irish Whale and Dolphin Group (IWDG) based on a review of available literature and data sources. Any other species of interest or ecological information pertinent to the project or this Appropriate Assessment screening was also recorded.

3.4 SCREENING FOR APPROPRIATE ASSESSMENT

As set out in the NPWS guidance, the task of establishing whether a project is likely to have an effect on a Natura 2000 site(s) is based on a preliminary impact assessment using available information and data, including that outlined above, and other available environmental information, supplemented as necessary by local site information and ecological surveys. This is followed by a determination of whether there is a risk that the ecological effects identified could be significant. The precautionary principle approach is required.

Once the potential impacts that may arise from the proposal are identified, the ecological significance of these is assessed through the use of key indicators:

- Habitat loss
- Habitat alteration
- Habitat or species fragmentation
- Disturbance and/or displacement of species
- Water quality and resource

4 SCREENING FOR APPROPRIATE ASSESSMENT

Screening for Appropriate Assessment (Stage 1) determines the need for a full Appropriate Assessment (Stage 2) and consists of a number of steps, each of which is addressed in the following sections of this report:

- Establish whether the proposal is necessary for the management of a Natura 2000 site
- Description of the proposed dredging and reclamation works at Howth Fishery Harbour Centre (FHC)
- Identification of Natura 2000 sites potentially affected
- Identification and description of individual and cumulative impacts of the project
- Assessment of the significance of the impacts on the integrity of Natura 2000 sites
- Conclusion of screening stage

4.1 MANAGEMENT OF NATURA 2000 SITES

The proposal is not connected with or necessary to the conservation management of a Natura 2000 site.

4.2 DESCRIPTION OF PLAN/PROJECT

4.2.1 Project reclamation area redesign

In early 2022 the project underwent a redesign on the reclamation area. The original AA screening from 2021 was reviewed with regard to the redesign of the reclamation area. This AA screening is a revision B of the 2021 AA screening and is a complete appropriate assessment screening of the proposed project based on the revised layout as shown below in **Figure 1**.

4.2.2 Brief Project Description

Howth Fishery Harbour Centre (FHC) was last dredged in the 1980s, and due in part to build-up of siltation and to increasing vessel sizes, it is necessary to dredge the existing basins & approach channels in Howth Harbour in order to provide safe access, navigation and berthing to the vessels currently using the harbour, and to provide for appropriate maintenance of same into the future through a programme of measurement and maintenance dredging.

For the bulk dredge it is proposed to dredge circa 240,000m^3, treat and re-use the material to the west of the West pier in order to create and additional circa 48,000 square metres of land area. The infill area will initially incorporate a mix of public realm, grassed areas, paths, water access point and hardstanding areas. Subsequently the hardstanding areas may incorporate a mix of fishing and industrial elements and light industrial/ commercial elements. These will ultimately require planning approval separate to the proposed development.

The aim of the overall project is to increase the depth of water in order to provide safe access and harbour, to the largest range of vessel size and type on the widest range of tides, within the structural parameters of the existing harbour quay structures and where possible to treat and re-use or dispose of dredge material in an environmentally sensitive and cost effective manner.

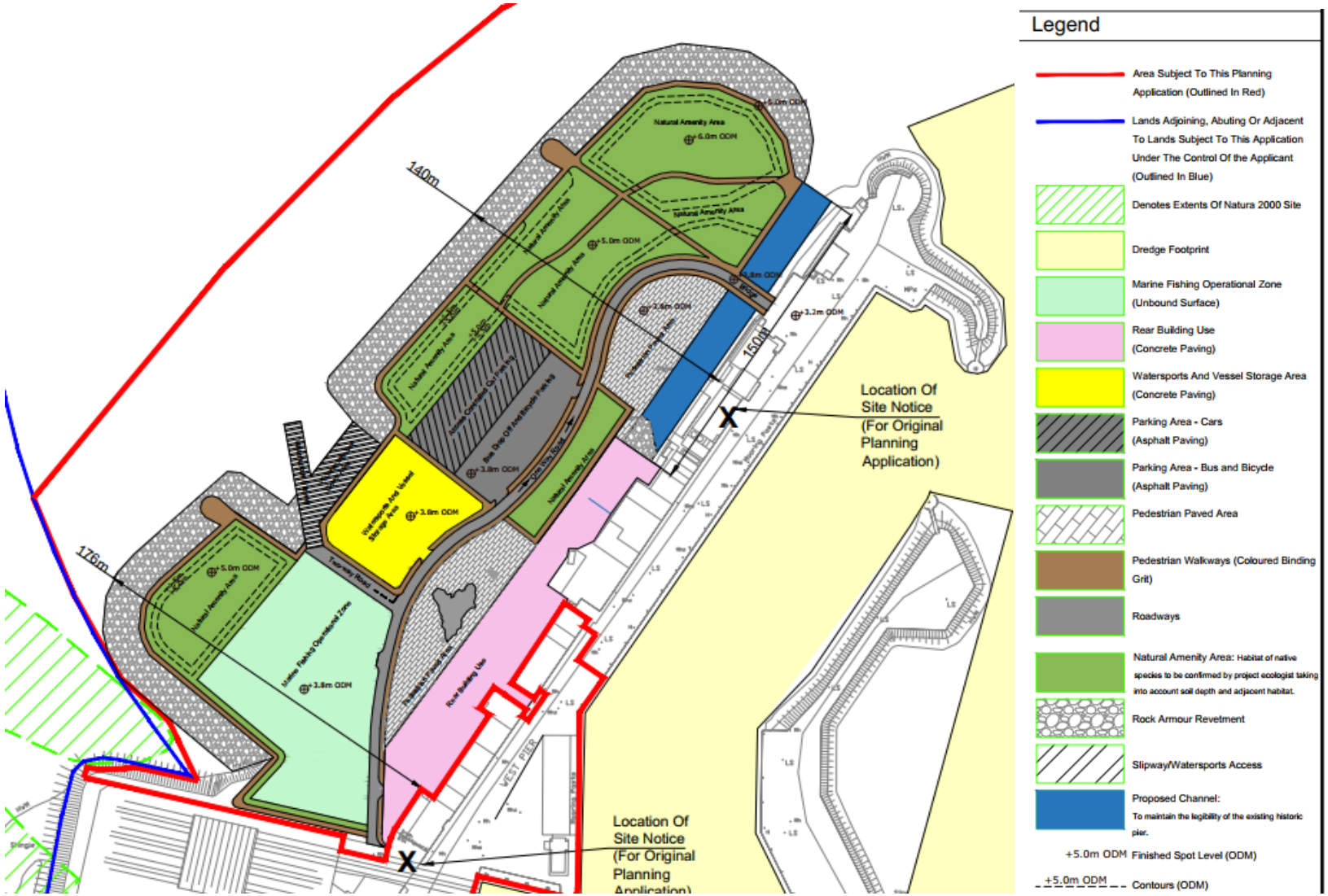


Figure 1. Reclamation areas layout in Howth Harbour (19934-5002-D-Site Layout Plan).

4.2.3 Purpose of the Project

The purpose of the proposed works is to provide the safe access, navigation and berthing of vessels in Howth Harbour while utilising the treated dredged material to create an additional area of land that in addition to public realm spaces, water access, paths, roads, parking and hardstanding spaces to be provided as part of this development will in the future also incorporate a mixture of fishing and industrial elements, and light industrial / commercial elements.

4.2.4 Site Location

Howth Harbour is situated on the north side of Howth Peninsula, to the north of Dublin Bay (**Figure 2**). The harbour itself comprises of three main areas; a trawler basin entered between two bull-noses to the north, swing moorings area to the east and a marked channel to the yacht club marina.

Howth Harbour operates as a Fishery Harbour Centre under the Department of Agriculture, Food and the Marine. The harbour area is enclosed by a west pier and an east pier. Within this enclosed area is a further pier, the middle pier, extending northwards from the south side of the harbour and a breakwater extending westwards from the east pier.



Figure 2 Site location map showing location

4.2.5 Description of the Site

Howth Head is a rocky peninsula situated on the northern side of Dublin Bay and comprises Cambrian rock including sea cliffs of up to 90 metres in height. Ireland's Eye, an uninhabited island, lies approximately 1.0km north of the harbour. To the east of the harbour are Howth Head and the

Irish Sea; to the west a large sandy intertidal area towards Baldoyle/Portmarnock. The coastal water quality is classified as 'unpolluted' by the EPA[1].

Howth Harbour operates as a Fishery Harbour Centre under the Department of Agriculture, Food and the Marine. The core fishing fleet is in the order of 65 vessels, and there is significant marine leisure activity including the Howth Yacht Club and the Howth Sailing and Boating Club. There are also a number of restaurants and shops along the west pier. Fish processing and boat repair works are also undertaken on the harbour.

4.3 CHARACTERISTICS OF THE PROJECT

4.3.1 Introduction

The purpose of this section is to provide an appropriate level of detail on the proposed development to present a basis for the assessment of potentially significant impacts in view of the conservation objectives of the surrounding Natura 2000 within the zone of influence. Further detail of the characteristics of the project is presented in **Chapter 2 of the EIAR** with relevant sections and summaries included here below.

The aim of the overall project is to increase the depth of water within Howth Harbour in order to provide safe access to a range of vessels and where possible to treat and re-use the dredged material in an environmentally sensitive and cost effective manner in order to create and additional circa 48,000 square metres of land area to the west of the west pier.

4.3.2 Dredging and Water Quality

During the dredging of the harbour some 240,000m^3 of material will be dredged and re-used for the reclamation of land to the west of the west pier. The majority of this material is fine material to which contaminants attach. An assessment of the average concentrations of contaminants are given in the table below together with the Marine Institute limit for contaminant levels of materials suitable for dumping at sea.

A site investigation was carried out in December 2019, where a total of 23 sediment samples (SP1 - SP23) were taken. The samples were analysed to enable a comparison of the sediment contaminant concentrations against the Marine Institute (MI) sediment quality Upper and Lower Levels for disposal at sea (Marine Institute, 2006). The Marine Institute guidelines are designed to assess the suitability of disposing of dredged material at sea: they identify a Lower Level (1) and Upper Level (2) of contamination and characterise the marine sediments into three classes of potential contamination.

1. Class 1: Where contamination concentrations are less than Level 1 the sediment is considered to be uncontaminated - with no biological effects likely.
2. Class 2: Where contamination concentrations are between Level 1 and Level 2 the sediment is considered to be marginally contaminated; further sampling and analysis should be considered to delineate problem areas, if possible.

[1] http://gis.epa.ie/Envision [Accessed 11/02/2020]

3. Class 3: Where contamination concentrations are above Level 2 the sediment is considered to be heavily contaminated and very likely to cause biological effects/toxicity to marine organisms. The MI guidelines recommend that alternative management options are considered for this level.

Table 1. Analysis results compared to MI lower and upper levels.

Determinand	Units	MI Lower Level	MI Upper Level	Total Samples	Limit of detection	Count of samples exceeding MI		Soil concentrations (units/kg dry weight)	
						Lower level	Upper level	Ave	Max
Aluminium	mg/kg	n/a	n/a	23	10	n/a	n/a	27626.09	56000
Arsenic	mg/kg	20	70	23	1	21	0	34.62	51.8
Cadmium	mg/kg	0.7	4.2	23	0.1	17	0	0.87	1.3
Chromium	mg/kg	120	370	23	0.5	0	0	72.04	118
Copper	mg/kg	40	110	23	2	10	1	55.23	320
Lead	mg/kg	60	218	23	2	3	1	60.83	392
Lindane (GHCH)	µg/Kg	0.3	1	23	0.1	1	0	0.13	0.41
Mercury	mg/kg	0.2	0.7	23	0.01	1	0	0.08	0.34
Nickel	mg/kg	40	60	23	0.5	2	0	32.81	45.5
Zinc	mg/kg	160	410	23	3	11	0	177.35	377
Dibutyl Tin	mg/kg	n/a	n/a	23	0.001	n/a	n/a	0.07	0.636
Tributyl Tin	mg/kg	n/a	n/a	23	0.001	n/a	n/a	0.45	6.48
Dibutyl Tin & Tributyl Tin	mg/kg	0.1	0.5	23	0.001	7	3	0.53	7.116
HCB	µg/Kg	0.3	1	23	0.1	1	0	0.16	0.86
TEH (as THC)	g/kg	1	n/a	23	0.0001	8	0	0.86	2.94
Total Of 16 PAH's	mg/kg	4	n/a	23	0.001	2	0	2.46	12.6163
PCB (individual congeners)									
PCB28	µg/Kg	1	180	23	0.08	2	0	0.56	1.43
PCB52	µg/Kg	1	180	23	0.08	2	0	0.79	5.2
PCB101	µg/Kg	1	180	23	0.08	2	0	0.64	6.3
PCB118	µg/Kg	1	180	23	0.08	3	0	0.75	6.67
PCB138	µg/Kg	1	180	23	0.08	6	0	1.05	9.27
PCB153	µg/Kg	1	180	23	0.08	6	0	0.92	7.94
PCB180	µg/Kg	1	180	23	0.08	1	0	0.47	4.42
Total PCBs (7 Congeners)	µg/Kg	7	1260	23	0.56	4	0	5.17	41.23

The data indicates that all of the sediment samples are above the MI Lower level in one or more parameters. Three of the samples (SP8, SP12 and SP23) are above the MI Upper level. Due to the elevated levels of Copper, Lead and Tributyl Tin in three areas it is considered that this material is not suitable for dumping at sea.

4.3.3 Summary of Proposed Works

It's proposed to dredge an area of approximately 14 Ha (140,000m²) of bed within Howth Harbour. This amounts to a volume of 240,000m³ of material. The majority of this material is silty in nature and is potentially contaminated in places. It is proposed to treat the material and to re-use it in a reclamation area of approximately 4.8 Ha on the west side of the West Pier. The perimeter of the reclaimed land will be protected from wave action by means of a rock armour revetment.

Subject to obtaining planning approval, construction of the proposed development could commence in the summer of 2022. The project will take about 24 months to complete.

The proposed works can be divided into 4 elements as follows:

- Element 1: Construction of a perimeter bund and rock armour revetment to reclaimed land area;
- Element 2: Dredging of Howth Harbour;

- Element 3: Reclamation of land up to ground level; Element 3 will include the works around the redesign that will include a new water channel which has been included to maintain the legibility of the existing historic pier and to provide increased opportunities for creating active building uses overlooking the reclamation area. A new bridge crossing is also proposed.
- Element 4: Finishing's e.g. landscaping, pathways, roads, parking, drainage, water supply, electricity supply, storage areas, viewing areas, water access points.

The start date will depend on when statutory permits and funding are in place. Works will commence with Element 1. There will be an overlap between Elements 1 and Elements 2 and 3. This will be possible due to potential phasing of the perimeter into discrete cells. Elements 2 and 3 will be carried out in parallel. There will later be an overlap between Elements 2 and 3 and Element 4 where the formation level of the reclamation area has been reached.

4.3.4 Identification of Other Projects or Plans or Activities

There are a number of current grants of permission for remediation and extension works to existing dwellings and buildings in the greater area. Permission has been granted for the provision of a 134m long quay wall, associated deck and hard standing area, road access, dredging to the front of the new quay wall to provide berthing depth and land reclamation of an approximate area of 0.30ha on the east side of the Middle Pier at Howth Harbour (F19A/0296). Planning permission for this proposal now expires in 2023. Construction of the middle pier has commenced and should be completed by March 2022. The associated construction and development activities owing to this current grant of development are not expected to be above that of current levels experienced in the area and are considered unlikely to interact with the proposal to create cumulative impacts.

There is some potential for future proposed works to overlap with the timing of the proposal considered in this assessment. Therefore, there is potential for cumulative impacts. Other activities considered likely to create potential in combination impacts are municipal, recreation, sailing and commercial fishing.

4.4 IDENTIFICATION OF NATURA 2000 SITES

4.4.1 Likely Zone of Impact Influence

The screening stage of AA involves compiling a 'long list' of European sites within a zone of potential impact influence for later analysis which may or may ultimately not be significantly impacted upon by the proposal. All Natura 2000 sites within 15km of the proposal location will be characterised in the context of the rationale for designation and qualifying features, in accordance with NPWS guidance. In line with the precautionary principle, during the preparation of this report Natura 2000 sites that lie outside 15km that may be significantly impacted as a result of the proposed works were also considered. Following this, the potential impacts associated with the proposal will be identified before an assessment is made of the likely significance of these impacts.

As described above, the test for the screening for Appropriate Assessment is to assess, in view of best scientific knowledge, if the development, individually or in combination with other plan/project is likely to have a significant effect on a Nature 2000 site. If there are any significant, potentially significant, or uncertain effects, it will be necessary to proceed to Appropriate Assessment and submit a NIS. National guidance recommends that a list is compiled of all Natura 2000 sites within what is described as a 'likely zone of impact of [a] plan or project' (DoEHLG, 2009, p.32) and which

may, or ultimately may not, be impacted upon by the proposal. In the case of plans it is recommended that this zone extends out for a distance of 15km (Scott Wilson *et al*., 2006, cited in DoEHLG, 2009). With regard to projects such as the proposal considered in this report, the guidance goes on to state, as follows:

> *For projects, the distance could be much less than 15km, and in some cases less than 100m, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects.* (DoEHLG, 2009)

The Natura 2000 sites within this 'likely zone of impact' and their qualifying features of Special Conservation Interest are identified in **Section 0**, below, and the conservation objectives of the sites are described in accordance with the guidance. It is noted that the 15km radius has been extended for a number of mobile species that have the potential to travel to the proposed development site to feed i.e. 50km radius for Harbour seals (Hayden & Harrington, 2000), 170km for Grey seals and 160km for Harbour porpoises even though it is considered that in terms of the total population number, the number of individuals that may travel to the proposed site will be low. It is noted that there are no Natura 2000 sites outside the 15km radius that list mobile species that occur within these relative commuting distances for each species listed above.

Many bird species have the potential to fly for much greater distances than 15 km e.g. wetland wildfowl and sea birds. However, as the proposed development site has not been shown to be a critical resource for many species listed as species of conservation interest (SCI) in comparison to other areas of the nearby SPA's (see **Table 3 & 4** below), it is considered unlikely that birds would therefore seek specifically to fly from great distances to it. It is also considered that if any do migrate into the site, individual numbers are likely to be low in terms of the overall population size. The scope of this screening exercise has not been extended to include such bird species. Therefore, the only birds assessed are those that are SCIs for SPAs within 15 km of the proposed development.

Following this, the potential impacts associated with the proposal will be identified before an assessment is made of the likely significance of these impacts. If, at the end of the screening process, it cannot be objectively concluded that no significant impacts are likely or, if screening concludes that there is uncertainty about the significance of the impacts, it will be necessary to proceed to Stage 2, Appropriate Assessment.

4.4.2 Identification of Natura 2000 Sites

Adopting the precautionary principle in identifying potentially affected European sites, it has been decided to include all cSACs and SPAs within 15km of the proposal site.

Table 3, below lists designated cSACs and SPAs within 15km or the zone of influence of the proposal site including their proximity. Given the nature, scope, scale and location of the works, it is not considered that the proposal will significantly affect Natura 2000 sites outside of those considered here. A map showing these designated sites in relation to the proposal is given in **Appendix 3**.

Table 2 Natura 2000 sites within the zone of influence of the proposal site

Designated Site	Site Code	Proximity of site to nearest point of designated site (as the crow flies)
Baldoyle Bay SAC	000199	SAC located immediately adjacent
Howth Head SAC	000202	SAC located approx. 0.3km to south-east
Ireland's Eye SPA	004117	SPA located approx. 0.5km to north-east
Howth Head Coast SPA	004113	SPA located approx. 0.5km to east
Rockabill to Dalkey Island SAC	003000	SAC located approx. 0.5km to east
Ireland's Eye SAC	002193	SAC located approx. 0.8km to north-east
North Dublin Bay SAC	000206	SAC located approx. 1.9km to south-west
North Bull Island SPA	004006	SPA located approx. 1.9km to south-west
Baldoyle Bay SPA	004016	SPA located approx. 2.2km to west
Malahide Estuary SAC	000205	SAC located approx. 5.8km to north-west
Malahide Estuary SPA	004025	SPA located approx. 6.4km to north-west
South Dublin Bay and River Tolka Estuary SPA	004024	SPA located approx. 7.3km to south-west
South Dublin Bay SAC	000210	SAC located approx. 8.3km to south-west
Lambay Island SPA	004069	SPA located approx. 10km to north-east
Lambay Island SAC	000204	SAC located approx. 10.3km to north-east
Rogerstown Estuary SPA	004015	SPA located approx. 10.7km to north-west
Rogerstown Estuary SAC	000208	SAC located approx. 11.3km to north-west
Dalkey Islands SPA	004172	SPA located approx. 12.2km to south

4.4.3 Characteristics of Natura 2000 Sites

The following table lists the qualifying features of conservation interest for the cSACs and SPA sites that lie within the zone of influence of the proposal site. Information pertaining to designated sites is from site synopses, conservation objectives and other information available on www.npws.ie[2].

Table 3 Natura 2000 sites with qualifying features of conservation interest

Designated Site	Qualifying features of conservation interest
Special Areas of Conservation	
Howth Head SAC (000202)	• Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] • European dry heaths [4030]
Malahide Estuary SAC (000205)	• Mudflats and sandflats not covered by seawater at low tide [1140] • *Salicornia* and other annuals colonizing mud and sand [1310] • *Spartina* swards (Spartinion maritimae) [1320] • Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] • Mediterranean salt meadows (Juncetalia maritimi) [1410] • Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]
Lambay Island SAC (000204)	• Reefs [1170] • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] • Grey seal (*Halichoerus grypus*) [1364] • Harbour seal (*Phoca vitulina*)

[2] As of 28/03/2017

Designated Site	Qualifying features of conservation interest
Rogerstown Estuary SAC (000208)	• Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] • *Salicornia* and other annuals colonizing mud and sand [1310] • Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] • Mediterranean salt meadows (Juncetalia maritimi) [1410] • Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]
Rockabill to Dalkey Island SAC (003000)	• Reefs [1170] • Harbour porpoise (*Phocoena phocoena*) [1351]
Baldoyle Bay SAC (000199)	• Mudflats and sandflats not covered by seawater at low tide [1140] • *Salicornia* and other annuals colonizing mud and sand [1310] • Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] • Mediterranean salt meadows (Juncetalia maritimi) [1410]
Ireland's Eye SAC (002193)	• Perennial vegetation of stony banks [1220] • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]
North Dublin Bay SAC (000206)	• Mudflats and sandflats not covered by seawater at low tide [1140] • Annual vegetation of drift lines [1210] • *Salicornia* and other annuals colonizing mud and sand [1310] • Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] • Mediterranean salt meadows (Juncetalia 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] • Petalwort (*Petalophyllum ralfsii*) [1395]
South Dublin Bay SAC (000210)	• 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]
Special Protection Areas	
Ireland's Eye SPA (004117)	• Cormorant (*Phalacrocorax carbo*) [A017] • Herring Gull (*Larus argentatus*) [A184] • Kittiwake (*Rissa tridactyla*) [A188] • Guillemot (*Uria aalge*) [A199] • Razorbill (*Alca torda*) [A200]
Howth Head Coast SPA (004113)	• Kittiwake (*Rissa tridactyla*) [A188]
North Bull Island SPA (004006)	• Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Shelduck (*Tadorna tadorna*) [A048] • Teal (*Anas crecca*) [A052] • Pintail (*Anas acuta*) [A054] • Shoveler (*Anas clypeata*) [A056] • Oystercatcher (*Haematopus ostralegus*) [A130] • Golden Plover (*Pluvialis apricaria*) [A140] • Grey Plover (*Pluvialis squatarola*) [A141]

Designated Site	Qualifying features of conservation interest
	• 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 (*Tringa totanus*) [A162] • Turnstone (*Arenaria interpres*) [A169] • Black-headed Gull (*Larus ridibundus*) [A179] • Wetlands & Waterbirds [A999]
Baldoyle Bay SPA (004016)	• Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • 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] • Wetlands & Waterbirds [A999]
Malahide Estuary SPA (004025)	• Great Crested Grebe (*Podiceps cristatus*) [A005] • Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Shelduck (*Tadorna tadorna*) [A048] • Pintail (*Anas acuta*) [A054] • Goldeneye (*Bucephala clangula*) [A067] • Red-breasted Merganser (*Mergus serrator*) [A069] • Oystercatcher (*Haematopus ostralegus*) [A130] • Golden Plover (*Pluvialis apricaria*) [A140] • Grey Plover (*Pluvialis squatarola*) [A141] • Knot (*Calidris canutus*) [A143] • Dunlin (*Calidris alpina*) [A149] • Black-tailed Godwit (*Limosa limosa*) [A156] • Bar-tailed Godwit (*Limosa lapponica*) [A157] • Redshank (*Tringa totanus*) [A162] • Wetlands & Waterbirds [A999]
South Dublin Bay and River Tolka Estuary SPA (004024)	• Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Oystercatcher (*Haematopus ostralegus*) [A130] • Ringed Plover (*Charadrius hiaticula*) [A137] • Grey Plover (*Pluvialis squatarola*) [A140] • Knot (*Calidris canutus*) [A143] • Sanderling (*Calidris alba*) [A144] • Dunlin (*Calidris alpina*) [A149] • Bar-tailed Godwit (*Limosa lapponica*) [A157] • Redshank (*Tringa totanus*) [A162] • Black-headed Gull (*Croicocephalus ridibundus*) [A179] • Roseate Tern (*Sterna dougallii*) [A192] • Common Tern (*Sterna hirundo*) [A193] • Arctic Tern (*Sterna paradisaea*) [A194] • Wetlands & Waterbirds [A999]
Lambay Island SPA	• Fulmar (*Fulmarus glacialis*) [A009]

Designated Site	Qualifying features of conservation interest
(004069)	• Cormorant (*Phalacrocorax carbo*) [A017] • Shag (*Phalacrocorax aristotelis*) [A018] • Greylag Goose (*Anser anser*) [A043] • Lesser Black-backed Gull (*Larus fuscus*) [A183] • Herring Gull (*Larus argentatus*) [A184] • Kittiwake (*Rissa tridactyla*) [A188] • Guillemot (*Uria aalge*) [A199] • Razorbill (*Alca torda*) [A200] • Puffin (*Fratercula arctica*) [A204]
Rogerstown Estuary SPA (004015)	• Greylag Goose (*Anser anser*) [A043] • Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Shelduck (*Tadorna tadorna*) [A048] • Shoveler (*Anas clypeata*) [A056] • Oystercatcher (*Haematopus ostralegus*) [A130] • Ringed Plover (*Charadrius hiaticula*) [A137] • Grey Plover (*Pluvialis squatarola*) [A141] • Knot (*Calidris canutus*) [A143] • Dunlin (*Calidris alpina*) [A149] • Black-tailed Godwit (*Limosa limosa*) [A156] • Redshank (*Tringa totanus*) [A162] • Wetlands & Waterbirds [A999]
Dalkey Islands SPA (004172)	• Roseate Tern (*Sterna dougallii*) [A192] • Common Tern (*Sterna hirundo*) [A193] • Arctic Tern (*Sterna paradisaea*) [A194]

4.4.4 Conservation Objectives

According to the Habitats Directive, the *conservation status of a natural habitat* will be taken as 'favourable' within its bio-geographic range when:

- its natural range and areas it covers within that range are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable as defined below.

According to the Habitats Directive, the conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' within its bio-geographic range when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The specific conservation objectives for each site are available on www.npws.ie. These have been accessed for the sites listed in the tables above on the 11/02/2020 & 08/07/2020. Generic conservation objectives were available for the following sites:

- Ireland's Eye SPA. Site code 004117 (Produced April 2020, generic version 7.0)
- Howth Head Coast SPA. Site code 004113 (Produced April 2020, generic version 7.0)
- Lambay Island SPA. Site code 004069 (Produced April 2020, generic version 7.0)
- Dalkey Island SPA. Site code 004172 (Produced April 2020, generic version 7.0)

Site specific and more detailed conservation objectives were available for the following sites:

- Howth Head SAC. Site code 000202 (Produced December 2016, version 1.0)
- Rockabill to Dalkey Island SAC. Site code 003000 (Produced May 2013, version 1.0)
- Baldoyle Bay SAC. Site code 000199 (Produced November 2012, version 1.0)
- Ireland's Eye SAC. Site code 002193 (Produced January 2017, version 1.0)
- North Dublin Bay SAC. Site code 000206 (Produced November 2013, version 1.0)
- North Bull Island SPA. Site code 004006 (Produced March 2015, version 1.0)
- Baldoyle Bay SPA. Site code 004016 (Produced February 2013, version 1.0)
- Malahide Estuary SAC. Site code 000205 (Produced May 2013, version 1.0)
- Malahide Estuary SPA. Site code 004025 (Produced August 2013, version 1.0)
- South Dublin Bay and River Tolka Estuary SPA. Site code 004024 (Produced March 2015, version 1.0)
- South Dublin Bay SAC. Site code 000210 (Produced August 2013, version 1.0)
- Lambay Island SAC. Site code 000204 (Produced July 2013, version 1.0)
- Rogerstown Estuary SPA. Site code 004015 (Produced May 2013, version 1.0)
- Rogerstown Estuary SAC. Site code 000208 (Produced August 2013, version 1.0)

Management plans were not available for any sites. All conservation objectives together with other designated site information are available on http://www.npws.ie/protectedsites/.

4.5 IDENTIFICATION OF POTENTIAL IMPACTS

Potential likely ecological impacts arising from the project are identified in this section.

Description of elements of the project likely to give rise to potential ecological impacts.	Construction Phase • Construction of the perimeter bund and rock armour revetment to reclaimed land area (Element 1) • Dredging works within the marina of approximately 14 Ha (140,000m²) of bed within Howth Harbour. This amounts to a volume of 240,000m³ of material (Element 2). Approximately, 10% of the dredge material will be bedrock. It will be necessary to break this rock prior to excavation • Reclamation of land up to ground level (Element 3) • Finishing. • Use of plant, construction equipment and vehicles • Increase in human presence • Use of oils/fuels/lubricants/concrete etc • Timescale of the works - Element 1: - 9 months - Element 2: - 12 - 18 months - Element 3: - 12 - 18 months - Element 4: - 6 months • Potential for overlap between timing of proposed works with Middle Pier is unlikely. Operational Phase • Day-to-day use of mooring facilities • Increased activity due light industrial, commercial and public realm spaces created due to the land reclamation. • Potential overlap in timing with proposed Middle construction works is unlikely.
Describe any likely direct, indirect or secondary ecological impacts of the project (either alone or in combination with other plans or projects) by virtue of: ○ *Size and scale;* ○ *Land-take;* ○ *Distance from Natura 2000 Site or key features of the Site;* ○ *Resource requirements;* ○ *Emissions;* ○ *Excavation requirements;* ○ *Transportation requirements;* ○ *Duration of construction, operation etc.; and* ○ *Other.*	Construction Phase • Potential for water quality/habitat effects including ▪ Increased turbidity ▪ Sedimentation ▪ Pollution of marine environment • Potential for species disturbance and displacement effects via ▪ Adverse impacts to water quality ▪ Noise emissions to air and water ▪ Increased vessel movements • Loss and alteration of inter-tidal seabed habitat and associated species at the location of the dredge and reclamation area/s. • Potentially dredging could alter characteristics of benthic habitats, which may result in negative impacts on benthic flora and fauna. • Potential for reduced visibly due to re-suspension of sediments during construction which may result in negative impacts on feeding success for piscivorous birds

	and marine mammals. • Potential for cumulative effects as a result of existing and potentially occurring activities within Howth Harbour • Potential increase in risk of collision between vessels and marine mammals. • Cumulative disturbance effects as a result of existing and potentially occurring activities within Howth Harbour. <u>Operational Phase</u> • Potential for water quality effects • Potential for species disturbance and displacement effects via ▪ Potential adverse impacts to water quality ▪ Day-to-day harbour usage/vessel activity • Potential for cumulative effects as a result of existing and potentially occurring activities within Howth Harbour

The main potential impacts the works pose, are negative impacts to water quality at Howth Harbour, as a result of dredging works at the inner Harbour, and the construction works associated with the proposal. There is also the potential for disturbance/displacement impacts to marine mammals, avian fauna, aquatic and semi aquatic species as a result of increased noise levels.

4.6 IDENTIFICATION OF SITES WITHIN THE ZONE OF POTENTIAL IMPACT INFLUENCE

This section considers the list of sites identified in **Section 4.4.2** above, together with the potential ecological impacts identified in the previous section and determines whether the project is likely to have significant effects on a Natura 2000 site.

When assessing impact, Natura 2000 sites are only considered relevant where a credible or tangible source-pathway-receptor link exists between the proposed development and a protected species or habitat type. In order for an impact to occur there must be a risk initiated by having a 'source' (e.g. marine dredging), a 'receptor' (e.g. a protected habitat/species and/or the habitats on which they depend), and an impact pathway between the source and the receptor (e.g. a watercourse which connects the proposal site to the protected species or habitats). An evaluation based on these factors to determine which Natura 2000 sites are the plausible ecological receptors for potential impacts of the proposed works will be conducted in **Sections 4.6.1** and **4.6.2**, below. The evaluation takes cognisance of the scope, scale, nature and size of the project, its location relative to the Natura 2000 sites listed in **Table 3** above, and the degree of connectedness that exists between the project and each Natura 2000 site's potential ecological receptors.

4.6.1 Natura 2000 sites outside the zone of potential impact influence

With regards to the proposal, it is considered that the project does not include any element that has the potential to significantly alter the conservation objectives for which certain Natura 2000 sites, listed in **Table 4** above, are designated. It is considered that these Natura 2000 sites are outside the zone of potential impact influence of the proposal due to the absence of plausible impact pathways and/or the attenuating effect of the distance intervening. Therefore, it is objectively concluded that significant impacts on these sites are not reasonably foreseeable as a result of the programme of works described at **Section 4.3**. These sites are listed in **Table 5** below, along with their distance from the works and the rationale for exclusion from further assessment.

Table 4 Natura 2000 sites identified as being outside the zone of potential impact influence

Natura 2000 site	Linear / intervening distance and direction to Natura 2000 site	Rationale for exclusion from assessment
Ireland's Eye SAC (002193)	Located c.0.5km to north-east	• Designated for two terrestrial habitats • No spatial overlap • Significant impacts not reasonably foreseeable
Howth Head SAC (000202)	Located c.0.3km to south-east	• Designated for two terrestrial habitats • No spatial overlap • Significant impacts not reasonably foreseeable
North Dublin Bay SAC (000206)	Located c.1.9km to south-west	• Designated for a range of inter-tidal and dune habitats and one plant species • Significant volumes of suspended sediment not expected from the proposal • Intervening distance comprising coastal marine zone (>8km of coastline)
Malahide Estuary SAC (000205)	Located c.5.8km to north-west	• Designated for a range of inter-tidal and terrestrial dune habitats • Significant volumes of suspended sediment not expected from the proposal • Intervening distance of approximately 6km of coastal marine zones
South Dublin Bay SAC (000210)	Located c.8.3km to south-west	• Designated for a range of inter-tidal and one terrestrial dune habitats • Significant volumes of suspended sediment not expected from the proposal • Intervening distance comprising coastal marine zone (>12km coastline)
Rogerstown Estuary SAC (000208)	Located c.11.3km to north-west	• Designated for coastal, inter-tidal and terrestrial dune habitats • Significant volumes of suspended sediment not expected from the proposal • Intervening distance of approximately 11km, comprising coastal marine zone
Dalkey Islands SPA (004172)	Located c.12.2km to south	• Designated for three species of breeding tern • Nature, scale and location of the proposal • Intervening distance considered sufficient to negate any potential for significant disturbance/displacement impacts

4.6.2 Natura 2000 sites within the zone of potential impact influence

Of the designated sites listed in **Table 3** above, eleven are considered to have the potential to be impacted as a result of the proposal. There is potential for habitat, species disturbance/displacement and/or water quality impacts to occur within these remaining Natura 2000 sites as a result of the proposal. These Natura 2000 sites are intrinsically linked to the proposal site and to each other

through the coastal water body 'Irish Sea Dublin (HA 09)'[3]. Therefore, the assessment of significance of potential impacts that follows focuses on the following designated sites:

- Ireland's Eye SPA (004117)
- Howth Head Coast SPA (004113)
- Rockabill to Dalkey Island SAC (003000)
- Baldoyle Bay SAC (000199)
- North Bull Island SPA (004006)
- Baldoyle Bay SPA (004016)
- Lambay Island SAC (000204)
- Malahide Estuary SPA (004025)
- South Dublin Bay and River Tolka Estuary SPA (004024)
- Lambay Island SPA (004069)
- Rogerstown Estuary SPA (004015)

4.7 ASSESSMENT OF SIGNIFICANCE OF POTENTIAL IMPACTS

The likelihood of significant effects on the Natura 2000 sites considered to be within the zone of potential impact influence from the project was determined based on a number of indicators including:

- Water quality and resource
- Habitat loss
- Habitat alteration
- Habitat or species fragmentation
- Disturbance and/or displacement of species

The likelihood of significant cumulative/in-combination effects is assessed in **Section 4.7.6**, below.

4.7.1 Water Quality

4.7.1.1 Construction Phase

There are several aspects of the proposal which could potentially result in impairment of marine water quality during the construction phase of the project, as outlined in **Section 4.5**, above.

Dredging of the seabed within the harbour (approx. 240,000m^3) will result in an increase in suspended sediment concentration in the water column through disturbance of the harbour bed. It is envisaged that the construction of the perimeter embankment of the reclamation area will commence either with the placement of larger diameter rocks into the underlying silt material beneath the footprint of the embankment or the dredging of the thin layer of soft silty material from under the foundation of the embankment. These could result in adverse water quality effects e.g. increased turbidity and contaminant transfer, both within the harbour and in the greater marine area, as re-suspended sediment would be subject to tidal processes and potentially dispersion. Re-use of dredge material could also potentially pose a risk to marine water quality through the leaching of contaminants from material to the aquatic environment. The presence of additional vessels within the harbour associated with the works would increase the risk of fuel/oil spill into

[3] http://gis.epa.ie/Envision

surrounding waters were an accidental spillage to occur. Similarly, the use of concrete, lubricants and other such substances in close proximity to the marine zone could potentially lead to pollution of the aquatic environment and subsequent adverse impacts to qualifying features.

Dredging outside the confines of the harbour will result in an increase in suspended sediment within the water column in proximity to the works. This has the potential to alter the ecology of surrounding habitats and in turn impact on species recorded within. Reduced visibly due to re-suspension of sediments during construction may also result in negative impacts on feeding success for piscivorous birds and marine mammals utilising the surrounding waters.

Without mitigation, poor water quality, as a result of the proposed works at Howth Harbour, may have significant impacts on designated sites. However, it is noted that the sediment being dredged (fine muds and sandy muds) is similar in composition to much of the soft shallow intertidal/subtidal sediments in proximity to the development area (fine sands and muddy sands). Accordingly, any sediment which is to settle in proximity to the works area will readily assimilate into this existing sediment pool without adversely affecting its physical composition or ecological function. While there will be increased turbidity arising from the dredging works, this will be temporary in nature and is a naturally occurring feature of marine environments with no potential to give rise to negative ecological effects.

Any minor volumes of sediment which may be temporarily disturbed on the sea bed adjacent to the west pier with the placement of large diameter rocks into the underlying silt material beneath the footprint of the perimeter embankment and rock armour revetment will be localised and are expected to settle out quickly in the immediate area given its nature.

Habitats which are estuarine and marine in nature (Estuaries, Mudflats and sandflats etc.) are very unlikely to be affected. It is noted that due to the dilution provided in the marine environment and naturally fluctuating levels of silt, impacts are only likely to arise from extremely severe levels of siltation.

Bearing these factors in mind and the intervening distance between the subject area and any Natura 2000 sites, significant impacts as a result of increased turbidity, sedimentation and contamination are not envisaged as a result of the dredging works. However, using a precautionary principle, any habitats in immediate proximity to the proposed development site i.e. those listed as features of interest for the Baldoyle Bay SAC, will be brought forward for further assessment. Additionally, based on a precautionary principle, piscivorous birds listed as species of conservation interest for nearby SPA's and marine mammals of nearby Rockabill to Dalkey Island SAC and Lambay Island SAC, deemed within the zone of influence (see **Table 4** above), will also be brought forward for assessment.

4.7.1.2 Operational Phase

With regards to water quality the main potential impacts which are predicted are likely to occur during the construction phase of the project due to the nature and location of the works; however, there is, albeit limited, potential for operational phase water quality impacts associated with the utilisation of the reclamation area as a result of day-to-day trawler vessel operations. Such impacts

could arise as a result of the current number of fishing vessels which operate out of the harbour or potentially an increased level of fishing vessel activity which may result following the reclamation of land along the western pier.

Day-to-day vessel operations have the potential to result in water quality impacts as a result of fuel or oil spill, wash down of boats, discharge of wastewater, fish waste or other sources of potential pollution to which fishing harbours may be subject. However, Howth FHC operates within the operational guidelines and protocols outlined within the "Fishery Harbour Centres Best Practice Manual. A harbour spill kit is available in the event of any accidental fuel or oil spill.

Surface water drainage will be constructed to collect and drain away surface water from areas with impermeable surfaces within the reclaimed area. Trenches will be excavated, drains will be placed on a stone bedding material and backfilled with stone fill as per best practice. Surface water will be collected via gullies. Surface water will be discharged to the sea via a hydrocarbon interceptor/silt trap. Surface water from wave overtopping will be collected in French drains constructed along the landward edge of the proposed crest wall pathway. Wave overtopped water will be outfalled via a series of weep holes (with non-return valves) in the crest wall.

Fishing vessels are not permitted to discharge any form of waste into the harbour. Dedicated waste storage areas are located on the piers. The operational guidelines to which trawlers are currently subject within the harbour will continue once the harbour upgrade works are complete. Therefore, it is not expected that the proposed upgrade works will have any potential for significant water quality impacts during the project's operational phase.

With regards to the potential for increased vessel activity following the works, it is noted that the main purpose of the project is to enhance the amenity value of the existing west pier, along which several private businesses are located and which is popular with the general public, as well as improve trawler mooring facilities. This is to be achieved by moving the primary trawler mooring facilities from the west pier to the middle pier. Therefore, rather than increase vessel activity or traffic within the harbour, the proposed works will allow for the enhancement of the harbour for the general public while continuing to facilitate commercial fishing and recreational activities. Therefore, any increase or intensification in harbour usage considerably over and above that which already occurs is not predicted once the proposed works are complete and so intensification of harbour activity, which could result in significant water quality effects within the harbour or surrounding marine environment during the operational phase of the project, is not envisaged. Furthermore, it is reasonably expected that any additional vessels operating within the harbour following the proposed works will comply with standard best practice operational guidelines with regards to usage of fuels and oils in the context of protection of harbour water quality and the wider marine environment.

Therefore, significant water quality effects once the proposed works are completed and during the operational phase of the project are not reasonably foreseeable.

4.7.2 Habitat Loss

There is no spatial overlap between any Natura 2000 site and the proposed area of works; therefore there will be no direct loss of any Annex I habitats for which the Natura 2000 sites considered to be within the zone of impact influence of the proposal are designated, namely *Baldoyle Bay SAC*, *Rockabill to Dalkey Island SAC*, and *Lambay Island SAC*.

As can be seen in **Section 3.3** above, a number of bird surveys were conducted as part of this project. In conjunction with the desktop review, it was identified that Claremont Beach, the middle pier, eastern pier and the western pier are utilised, primarily as high roost site, by a number of species which are listed as species of conservation interest (SCI) for a number of nearby SPA's, namely; Baldoyle Bay SPA, Malahide Estuary SPA, South Dublin Bay & River Tolka Estuary SPA, Ireland's Eye SPA, North Bull Island SPA, Lambay Island SPA and the Rogerstown Estuary SPA. During the construction of the reclamation area there will be a loss of habitat along the western side to the pier which is currently used as a high tide roost by a number of SCI's. The roosting habitat will become available after the construction phase and similar habitat i.e. rock armour revetment, will be available around the perimeter of the reclamation area as part of the proposed development. There will be no habitat loss within any SPA as a result of this project.

4.7.3 Habitat Alteration

4.7.3.1 Construction Phase

Given the nature and location of the dredging works in the marine zone, albeit primarily within the confines of the harbour, there is some limited potential for indirect alteration of marine aquatic, sub-tidal and/or inter-tidal Annex I habitats located in surrounding Natura 2000 sites through adverse impacts to water quality. Such impacts could potentially comprise increased turbidity in the water column and/or the potential dispersal and settlement of sediment, which could occur as a result of dredging, as well as other potential pollution effects, such as the unintentional release of contaminants into the marine environment. With regards to the potential for such impacts it has been objectively concluded in the preceding section, **Section 4.7.1.1** above, that significant water quality impacts during the construction phase are not envisaged as a result of the proposal.

Therefore, bearing the above factors in mind, it is objectively concluded that significant indirect impacts to any of the habitats for which *Baldoyle Bay SAC*, *Rockabill to Dalkey Island SAC*, and *Lambay Island SAC* are designated are not likely to occur and achievement of the targets of the sites Annex I habitat conservation objectives will not be affected, as a result of the construction phase of the proposal, described in **Section 4.5**, above. However, using a precautionary principle, any marine/estuarine habitats in immediate proximity to the proposed development site i.e. those listed as features of interest for the Baldoyle Bay SAC, will be brought forward for further assessment.

4.7.3.2 Operational Phase

During the operational phase of the project, it is not envisaged that the project will result in any direct loss or alteration of qualifying interests of any Natura 2000 site due to the nature of the project and the lack of spatial overlap between the harbour and any Natura 2000 site. With regard to the potential for indirect alteration of Annex I marine habitats via potential water quality effects, significant water quality effects are not envisaged during the project's operational phase due to the

proposed and existing water quality protection controls which will continue to be used within the harbour once the upgrade works are complete, as discussed in **Section 4.7.1.2** above.

Therefore, bearing the above factors in mind, it is objectively concluded that significant indirect impacts to any of the Annex I habitats for which *Baldoyle Bay SAC*, *Rockabill to Dalkey Island SAC*, and *Lambay Island SAC* are designated are not likely to occur and achievement of the targets of the Annex I habitats conservation objectives will not be affected as a result of the operational phase of the proposal.

4.7.4 Disturbance and/or Displacement of Species

4.7.4.1 Construction Phase

Birds

Birds are vulnerable to disturbance and/or displacement impacts due to fugitive noise emissions, particularly during the breeding season, and seabirds have the potential to be impacted by impairment of marine water quality, as increased turbidity could affect their ability to feed through a reduction in underwater visibility or indirect impacts on prey. There are a number of SPAs in proximity to the proposed area of work that could be potentially impacted by the proposed development.

Ireland's Eye SPA is an uninhabited island located to the north of Howth Head. The site boundary, which lies approximately 0.5km north-east of the harbour at the closest point, encompasses the island and several rocky outcrops surrounding it, as well as the marine area extending 0.2km west and 0.5km north and east of the island (NPWS, 2011a). The SPA is designated for the protection of five species, namely Cormorant, Herring Gull, Kittiwake, Guillemot and Razorbill. These species all either breed or winter within the SPA. Additionally, although not a qualifying feature of the site, Gannet also breeds on the island. This is a recently established population of Gannet which is one of only two on the east coast[4]. There is an intervening distance of approximately 1.0km between the area of works and the nearest potential breeding habitat within the SAC.

Howth Head Coast SPA is located approximately 0.5km to the east of the proposed area of works at its closest point. The site comprises the sea-cliffs which extend around the headlands eastern side, as well as the marine area extending 0.5km seaward of the cliff-base (NPWS, 2011). The SPA is designated for the protection of Kittiwake, which breeds in nationally important numbers on the sea cliffs within the site. Kittiwakes form large breeding colonies, often in association with other seabird species. The breeding season typically begins within the first two weeks of May, although sometimes earlier (Mitchell, et al., 2004; Taylor, et al., 2012). Nests are built on steep cliff-faces, often on narrow, precarious ledges affording protection from predators.

North Bull Island SPA is located approximately 1.9km to the south-west of the subject site. The site, which is designated for eleven wintering bird species, as outlined in **Table 4** above, encompasses all of north Dublin Bay including North Bull Island. This sand-spit, formed as a result of historic improvement works to Dublin Port, contains salt-marsh on its landward side which comprises the

[4] https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004117.pdf [Accessed 12/02/2020]

main winter roosting grounds for SCI species within the site (NPWS, 2014a). The SPA is separated from the works by the breadth of the Howth Head peninsula.

Baldoyle Bay SPA comprises a narrow estuary largely separated from the sea by a dune system. The SPA is located approximately 2.2km to the west of the subject area. The site contains both winter roosting and foraging grounds for a variety of species with large mud and sandflats exposed at low tide (NPWS, 2014b). The SPA is designated for the protection of six wintering bird species, namely Light-bellied Brent Goose, Shelduck, Ringed Plover, Golden Plover, Grey Plover and Bar-tailed Godwit, as outlined in **Table 4** above.

South Dublin Bay and River Tolka Estuary SPA comprises a substantial part of Dublin Bay and is located approximately 7.3km south-west of the subject area. The site, which is designated for thirteen bird species, as outlined in **Table 4**. The site is composed of intertidal habitats that vary from soft muds to well-aerated sands that are utilised by wintering birds as foraging grounds. Sand bars found within the site are used as roosts by waders, gulls and terns as the tide floods and ebbs in the south bay. Common Tern and Arctic Tern breed in Dublin Docks on a man-made mooring structure known as the E.S.B. dolphin and this is also included within the designated area (NPWS, 2014c).

Lambay Island SPA lies approximately 4 km off the north Co. Dublin coastline and 10km north-east of the subject site. The site, which is designated for ten bird species, as outlined in **Table 4**, holds an internationally important seabird colony and is one of the top seabird sites in Ireland. Three seabird species have breeding populations of international importance and a further six have populations of national importance. In addition to the seabirds, the island also supports nationally important wintering populations of Greylag Goose and Herring Gull (NPWS, 2011b).

Malahide Estuary SPA is located approximately 6.4km to the north-west of the subject site. The site, which is designated for fourteen wintering bird species, as outlined in **Table 4** above, is a fine example of an estuarine system, providing both feeding and roosting areas for a range of wintering waterfowl. The site is of high conservation importance, with internationally important populations of Light-bellied Brent Goose and Black-tailed Godwit, and nationally important populations of a further 12 species. Two of the species which occur regularly (Golden Plover and Bar-tailed Godwit) are listed on Annex I of the E.U. Birds Directive (NPWS, 2013b).

Rogerstown Estuary SPA is a relatively small, funnel shaped estuary separated from the sea by a sand and shingle peninsula. At low tide extensive intertidal sand and mud flats are exposed and these provide the main food resource for the wintering waterfowl that use the site, in addition to providing an important link in the chain of estuaries along the east coast (NPWS, 2014b). The SPA is designated for the protection of eleven wintering bird species, as outlined in **Table 4** above, and is located approximately 10.7km north-west of the subject site.

With regards to potential disturbance/displacement due to noise generated by the works it is noted that noise emissions are not expected to be excessive given the nature of the works. There is no requirement for drilling or other construction methods such as pile driving which would act as sources of considerable noise. The greatest potential source of noise is expected to be dredging and rock-breaking activity. However, these aspects of the works will be temporary in nature. Any noise

emissions generated by the works are not likely to be considerably over and above ambient noise levels within the harbour given existing levels of trawler and other vessel activity, which are operating out of the harbour on a continuous basis. While some SCIs are likely to occur within the vicinity of the harbour while foraging or loafing/roosting, any potential disturbance/displacement of these birds from the area of works will at most be temporary and is not expected to be significant. The intervening distance between the subject area and the SPA boundaries, the closest of which is located approximately 0.5km away, will further reduce any risk of significant impacts as a result of noise emissions.

However, as can be seen in **Section 3.3** above and **Appendix 7 of the EIAR**, a number of bird surveys were conducted as part of this project. In conjunction with the desktop review, it was identified that both the adjacent section of Claremont Beach and the harbour are utilised, primarily as roosting sites, by a number of species which are listed as species of conservation interest (SCI) for a number of nearby SPA's, namely; Baldoyle Bay SPA, Malahide Estuary SPA, South Dublin Bay & River Tolka Estuary SPA, Ireland's Eye SPA, North Bull Island SPA, Lambay Island SPA and the Rogerstown Estuary SPA. Due to the overlap in species between the SPA's it is difficult to be confident that the birds noted within Howth Harbour correspond to a particular SPA's population. Therefore, environmental nuisances i.e. noise and vibration, generated during the construction phase, primarily during that of the reclamation area, could cause displacement / disturbance of SCI's utilising the middle pier, eastern pier, western pier and the adjacent section of Claremont Beach. This may lead to reduced survival in SCI or have indirect impacts on population trends of species within the SPA's. Several authors have tentatively suggested a link between the usage of foraging areas and the availability of high-tide roosts in their vicinity, therefore the loss of roosts may affect the carrying capacity of estuaries for birds, with negative consequences for shorebird populations (Dias et al, 2006).

In relation to indirect species disturbance/displacement via potential impairment of water quality resulting in a decrease of potential prey biomass, it is noted that minimum intervening distance between the proposed works site and nearby SPA's is 0.5km of marine waters. Any sediment which is carried outside the confines of the harbour by tidal flows or suspended by reclamation works will become further diluted within the open marine environment such that water quality impacts are short-lived and not significant. Any sediment carried to surrounding SPA's in which wading birds rely on mudflat infaunal communities will be considerably low. Deposition in intertidal habitats is a natural occurrence which occurs over a number of tidal cycles and thus any minor increase as a result of the proposed project will not result in any change to the existing infaunal communities in these habitats. These primarily burrowing organisms have adapted to the natural deposition of sediments in estuarine/marine environments. While it is unlikely that the construction phase of the project will reduce the availability and quality of habitat for fish in which piscivorous species rely on e.g. Guillemot and Razorbill, it is deemed appropriate that these species be brought forward for further assessment.

Therefore, bearing the above factors in mind, it is objectively concluded that potential disturbance/displacement impacts to a number of SCI species for which *Baldoyle Bay SPA, Malahide Estuary SPA, South Dublin Bay & River Tolka Estuary SPA, Ireland's Eye SPA, North Bull Island SPA, Lambay Island SPA* and the *Rogerstown Estuary SPA* are designated, could potentially occur. While there will be no direct impact within the boundary of each SPA, indirect impacts via disturbance/displacement of SCI species utilising Howth Harbour as a roosting site or piscivorous

species foraging in the surrounding waters, could potentially impact the targets of the conservation objectives for qualifying interest avian species within these Natura 2000 sites i.e. long-term population trend stable or increasing. Therefore, these sites will be brought forward for further assessment.

Marine Mammals

Disturbance or displacement impacts to marine mammals could potentially arise as a result of the proposal via a number of mechanisms, namely potential impacts to water quality, fugitive noise emissions to air and water and to a lesser extent increased vessel movement associated with the construction phase of the works.

Rockabill to Dalkey Island SAC is designated for the protection of one species, namely harbour porpoise. Although the SAC is situated 0.5km from the subject site, given the highly mobile nature of this marine species, harbour porpoise could potentially occur within waters surrounding the subject area at the time of the proposed works.

Lambay Island SAC is designated to protect the breeding and resting places of grey and harbour seal. While the SAC is located over 10.3km to the north-east of the site, these mobile species use the waters in the vicinity of Howth Harbour and thus may be subject to disturbance/displacement effects as a result of underwater noise emissions and/or increased vessel movements associated with the works.

While grey seals frequently and regularly occur inside Howth Harbour in small numbers, there may be some local disturbance to these individuals. However, the survival and population density of the species, as a result of increased turbidity within the harbour, will not result in a significant impact on the species due to volume of higher value foraging habitat outside the harbour. Outside Howth Harbour it is unlikely there will be any disturbance to cetaceans or seals as a result of potential increase in sedimentation. Marine mammals often inhabit turbid environments and many utilize acoustic techniques to communicate and navigate.

In relation to potential noise impacts, although the project does not require drilling, which would result in the emission of continuous underwater noise, or pile driving which can produce excessive noise emissions to air and water, dredging, excavation works and installation of rock armour will lead to underwater noise emissions. This could potentially result in some disturbance/displacement impacts to cetaceans and pinnipeds (seals) were their presence in the area to overlap with such activities. Underwater emissions of certain types of noise have the potential to cause lower level disturbance, masking or behavioural impacts (DAHG, 2014). During the works there is therefore potential for physical (auditory), perceptual and behavioural effects to harbour porpoise and seals which could potentially lead to disturbance/displacement effects as a result of the proposal. With regards to risk of injury via accidental collision, it is considered that the, albeit minor, increase in vessel movements associated with the works marginally increases the risk posed to marine mammals in the area.

There is therefore potential for significant disturbance/displacement impacts to harbour porpoise, harbour (common) and grey seal, or significant impacts cannot be ruled out at this stage, as a result of the construction phase of the proposal.

4.7.4.2 Operational Phase

Birds

Birds could potentially be vulnerable to disturbance/displacement impacts during the operational phase of the project by virtue of impairment of marine water quality or fugitive noise emissions and harbour activity. However, it has already been concluded that significant water quality effects during the operational phase of the project are not envisaged, as described in **Section 4.7.1.2** above. With regards to the potential for bird disturbance arising from existing levels of harbour activity following the upgrade works, it is noted that birds regularly occurring within the vicinity of the harbour can be expected to be accustomed to a moderate degree of vessel/human activity. Any disturbance of SCI species potentially occurring is likely to be temporary in nature, associated with the general day-to-day activities taking place within the harbour, given the temporary nature of such activities and, bearing in mind the intervening distance between the harbour and any SPA, such activities are not considered to have the potential to result in significant species impacts. With regard to potentially increased levels of harbour activity following the works, it is noted that the project is not predicted to result in any considerable increase or intensification of activity within the harbour over and above that which already occurs.

With regard to displacement, it is noted that two high tide roosts identified during the bird survey (Woodrow, 2020a), will be potentially disturbed as a result of the construction of the reclamation area. However, once construction is over the roosts will be available again with no construction disturbance.

Therefore, in summary, as significant water quality effects are not predicted, intensification of the harbour is not envisaged, and day-to-day harbour activities at existing vessel levels are not inherently large/complex in scale and are temporary in nature, it is objectively concluded that significant disturbance impacts to any of the SCI species for which *Baldoyle Bay SPA, Malahide Estuary SPA, South Dublin Bay & River Tolka Estuary SPA, Ireland's Eye SPA, North Bull Island SPA, Lambay Island SPA* and the *Rogerstown Estuary SPA* are designated, are not reasonably foreseeable. Thus, the achievement of the targets of the conservation objectives for qualifying interest avian species within the Natura 2000 sites will not be affected as a result of the operational phase of the proposal. However, due to the loss of existing roosting habitat during the operational phase of the reclamation area, displacement of roosting SCI of the *Baldoyle Bay SPA, Malahide Estuary SPA, South Dublin Bay & River Tolka Estuary SPA, Ireland's Eye SPA, North Bull Island SPA, Lambay Island SPA* and the *Rogerstown Estuary SPA* could occur and significant impacts due to displacement cannot be ruled out at this stage.

Marine mammals

Disturbance or displacement impacts to marine mammals could potentially arise during the operational phase of the project via a number of mechanisms, namely potential impacts to water quality, fugitive noise emissions to air and water, and vessel movements, associated with either existing or increased levels of vessel activity following the proposed works.

With regards to potential disturbance/displacement impacts arising as a result of adverse impacts to water quality, it has already been objectively concluded that significant water quality impacts during

the operational phase of the project are not envisaged as a result of the proposal, as described in detail in **Section 4.7.1.2** above.

With regards to the potential for disturbance/displacement of marine mammals during the operational phase of the project, it is noted that marine mammals occurring within the vicinity of the harbour can be expected to be accustomed to existing levels of vessel/harbour activity. Grey seals have been found to occur regularly within Howth Harbour, foraging and scavenging around fishing boats and have become accustomed to human presence and boat traffic (Berrow, 2017). During previous Marine Mammal Observer (MMO) contracts carried out at Howth Harbour in 2015 and 2016 by Meade and Levesque respectively, grey seals were sighted regularly swimming, socialising and feeding within the inner harbour during construction works to the trawler basin and trawler pontoon, which included drilling works (Meade, 2015 and Levesque, 2016 as cited in Berrow, 2017). As day-to-day harbour activities during the operational phase of the project, which could impact on marine mammals i.e. vessel movements in and out of the harbour, fugitive noise emissions to air and water etc., are expected to have less potential for significant disturbance/displacement impacts relative to intensive construction activities such as underwater drilling. It is expected that any disturbance or displacement of marine mammals potentially occurring within the vicinity of harbour is likely to be temporary in nature and not significant.

With regard to potentially increased levels of harbour activity following the works, it is noted that the project is not predicted to result in any considerable increase or intensification of activity within the harbour over and above that which already occurs.

Therefore, as significant water quality effects are not predicted and intensification of the harbour is not envisaged, it is objectively concluded that significant disturbance/displacement impacts to any of the marine mammal species for which *Rockabill to Dalkey Island SAC* or *Lambay Island SAC* are designated, are not reasonably foreseeable during the project's operational phase. Bearing the above factors in mind, it is therefore objectively concluded that the achievement of the targets of the conservation objectives for qualifying interest marine mammal species within any Natura 2000 site considered to be within the zone of potential impact influence of the proposal, as outlined in **Section 4.6.2** above, will not be affected as a result of the operational phase of the proposal.

4.7.5 Habitat or Species Fragmentation

Habitat fragmentation has been defined as 'reduction and isolation of patches of natural environment' (Hall *et al*., 1997 cited in Franklin *et al*., 2002) usually due to an external disturbance such that an alteration of the spatial composition of a habitat occurs that alters the habitat and 'create[s] isolated or tenuously connected patches of the original habitat' (Wiens, 1989 cited in Franklin *et al*., 2002). This results in spatial separation of habitat units which had previously been in a state of greater continuity. Adverse effects of habitat fragmentation on species/populations can include increased isolation which can detrimentally impact on their resilience or robustness potentially altering species abundance and leading to a reduction in overall diversity.

Given the nature and location of the works, primarily within the confines of Howth Harbour and immediately adjacent to the western pier, and the lack of spatial overlap between the subject site and any Natura 2000 site, habitat or species fragmentation is not envisaged as a result of either the

construction or operational phases of the proposal. Therefore, significant habitat or species fragmentation impacts are not likely to occur.

4.7.6 Cumulative/In-combination Impacts

Projects/activities that could act in-combination with the proposal include the normal day-to-day operations within Howth Harbour, as well as other potential sources, as outlined in **Section 4.3** above. There is potential for overlap in the timing of construction activities required to carry out this proposal with other existing activities within the area, including potential and permitted development in other parts of the harbour. Based on the precautionary principle cumulative or in-combination effects cannot be ruled out at this stage.

4.8 CONCLUSION OF SCREENING STAGE

In conclusion, to determine the potential impacts, if any, of the proposed works at Howth Harbour, on nearby Natura 2000 sites, a screening process for Appropriate Assessment was undertaken. The proposed development is within 15km of eighteen Natura 2000 Sites. It has been objectively concluded during the screening process that there will be no significant impacts to the following sites as a result of the proposed development:

- **Howth Head SAC (000202)**
- **Howth Head Coast SPA (004113)**
- **Ireland's Eye SAC (002193)**
- **North Dublin Bay SAC (000206)**
- **Malahide Estuary SAC (000205)**
- **South Dublin Bay SAC (000210)**
- **Rogerstown Estuary SAC (000208)**
- **Dalkey Islands SPA (004172)**

It has been objectively concluded that the proposal to undertake the works at the Howth Harbour could have significant effects, or significant effects cannot be ruled out at this stage, on ten of the Natura 2000 sites within 15km of the proposal. Therefore, further assessment is required to determine whether the project is likely to adversely affect the integrity of these Natura 2000 sites. Hence, the recommendation of the screening process is to proceed to Stage 2; Statement for Appropriate Assessment for these two Natura 2000 sites, namely:

- **Baldoyle Bay SAC (000199)**
- **Rockabill to Dalkey Island SAC (003000)**
- **Lambay Island SAC (000204)**
- **Rogerstown Estuary SPA (004015)**
- **Lambay Island SPA (004069)**
- **Malahide Estuary SPA (004025)**
- **North Bull Island SPA (004006)**
- **Baldoyle Bay SPA (004016)**
- **Ireland's Eye SPA (004117)**
- **South Dublin Bay and River Tolka Estuary SPA (004024)**

5 REFERENCES

DAHG, 2014. *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters,* Dublin, Ireland: Department of Arts, Heritage and the Gaeltacht.

Department of the Environment, Heritage and Local Government (DoEHLG) (2009). *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities.* Department of Environment, Heritage and Local Government.

Dias, Maria & Granadeiro, José & Lecoq, Miguel & Santos, Carlos & Palmeirim, Jorge. (2006). Distance to high-tide roosts constrains the use of foraging areas by dunlins: Implications for the management of estuarine wetlands. Biological Conservation. 131. 446-452. 10.1016/j.biocon.2006.02.020.

EC (2000). *Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC*. Luxembourg: Office for Official Publications of the European Communities.

EC (2001). *Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*. Luxembourg: Office for Official Publications of the European Communities.

Franklin, Alan B., Noon, Barry R. & Luke George T., (2002). What is Habitat Fragmentation?, *Studies in Avian Biology* **No. 25**: 20-29.

Hayden, T. & R. Harrington. 2000. Exploring Irish mammals. Duchas The Heritage Service. Department of Arts,Heritage, Gaeltacht and the Islands.

Mitchell, I. P., Newton, S. F., Ratcliffe, N. & Dunn, T. E., 2004. *Seabird Populations of Britain and Ireland.* London, United Kingdom: A & C Black Publishers Ltd.

NPWS, 2016. *Conservation Objectives: Howth Head SAC 000202. Version 1. ,* Dublin, Ireland: National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

NPWS, 2014a. *Site Synopsis - North Bull Island SPA. Site code: 004006,* Dublin, Ireland: National Parks and Wildlife Service, Dept. Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

NPWS, 2014b. *Site Synopsis – Balydoyle Bay SPA. Site code: 004016*, Dublin, Ireland: National Parks and Wildlife Service, Dept. Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

NPWS, 2014c. *Conservation Objectives Supporting Document Version 1 North Bull Island Special Protection Area (Site Code 4006) & South Dublin Bay and River Tolka Estuary Special Protection Area (Site Code 4024).,* National Parks and Wildlife Service.

NPWS, 2014d. *Site Synopsis – Rogerstown Estuary SPA. Site code: 004015,* Dublin, Ireland: National Parks and Wildlife Service, Dept. Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

NPWS, 2013. *The Status of EU Protected Habitats and Species in Ireland. Overview Volume 1. Unpublished report.,* Dublin, Ireland.: National Parks and Wildlife Service. Department of Arts, Heritage and the Galetacht.

NPWS, 2013a. *The Status of EU Protected Habitats and Species in Ireland. Habitats Assessment Volume 2. Version 1.1.,* Dublin, Ireland: Unpublished report, National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS, 2013b. *Site Synopsis - Malahide Estuary SPA. Site code: 004025,* Dublin, Ireland: National Parks and Wildlife Service, Dept. Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

NPWS, 2011. *Site Synopsis - Howth Head Coast SPA. Site code: 004113,* Dublin, Ireland: National Parks and Wildlife Service, Dept. of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

NPWS, 2011a. *Site Synopsis - Ireland's Eye SPA. Site code: 004117,* Dublin, Ireland: National Parks and Wildlife Service, Dept. of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

NPWS, 2011b. *Site Synopsis – Lambay Island SPA. Site code: 004069,* Dublin, Ireland: National Parks and Wildlife Service, Dept. of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

Taylor, C. J., Boyle, D., Perrins, C. M. & Kipling, R., 2012. *Seabird Monitoring on Skomer Island in 2012,* Peterborough, United Kingdom: Joint Nature Conservation Committee.

Tough, H. & Murphy, J. N., 2015. *Report on the Biodiversity of Skellig Michael (2015),* Tralee, Ireland: Malachy Walsh and Partners Engineering and Environmental Consultants.

Walsh, P. M. et al., 1995. *Seabird monitoring handbook for Britain and Ireland.* Peterborough: JNCC/RSPB/ITE/Seabird Group.

Woodrow Sustainable Solutions Ltd. (2020) Howth Harbour FHC Proposed Dredging And Reclamation Works Terrestrial Habitat, Otter And Bat Survey 2019. Report produced by Woodrow Sustainable Solutions Ltd. For Malachy Walsh and Partners On Behalf of Department of Agriculture, Food and the Marine.

Woodrow Sustainable Solutions Ltd. (2020a) Howth Harbour FHC Proposed Dredging And Reclamation Works Bird Surveys 2019 / 2020 Report. Report produced by Woodrow Sustainable Solutions Ltd. For Malachy Walsh and Partners On Behalf of Department of Agriculture, Food and the Marine

Appendix 1

Stages of Appropriate Assessment

Stage 1 - Screening

This is the first stage of the Appropriate Assessment process and that undertaken to determine the likelihood of significant impacts as a result of a proposed project or plan. It determines need for a full Appropriate Assessment.

If it can be concluded that no significant impacts to Natura 2000 sites are likely then the assessment can stop here. If not, it must proceed to Stage 2 for further more detailed assessment.

Stage 2 - Natura Impact Statement (NIS)

The second stage of the Appropriate Assessment process assesses the impact of the proposal (either alone or in combination with other projects or plans) on the integrity of the Natura 2000 site with respect to the conservation objectives of the site and its ecological structure and function. This is a much more detailed assessment that Stage 1. A Natura Impact Statement containing a professional scientific examination of the proposal is required and includes any mitigation measure to avoid, reduce or offset negative impacts.

If the outcome of Stage 2 is negative i.e. adverse impacts to the sites cannot be scientifically ruled out, despite mitigation, the plan or project should proceed to Stage 3 or be abandoned.

Stage 3 - Assessment of alternative solutions

A detailed assessment must be undertaken to determine whether alternative ways of achieving the objective of the project/plan exists.

Where no alternatives exist the project/plan must proceed to Stage 4.

Stage 4 - Assessment where no alternative solutions exist and where adverse impacts remain

The final stage is the main derogation process examining whether there are imperative reasons of overriding public interest (IROPI) for allowing a plan or project to adversely affect a Natura 2000 site where no less damaging solution exists.