January 2024

Stage 1: Screening Appropriate Assessment & Stage 2: Natura Impact Statement

Navigation Maintenance Dredging 2026-2033

On behalf of

Port of Waterford

MALONE O'REGAN ENVIRONMENTAL

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[redacted]

Title: Stage 1: Screening Appropriate Assessment & Stage 2: Natura Impact Statement, Navigation Maintenance Dredging 2026-2033, Port of Waterford

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Prepared By: [redacted] **Signed:** [redacted]

Checked By: **Signed:**

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Stage 1: Screening Appropriate Assessment & Stage 2: Natura Impact Statement

Navigation Maintenance Dredging 2026-2033

Port of Waterford

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1 INTRODUCTION

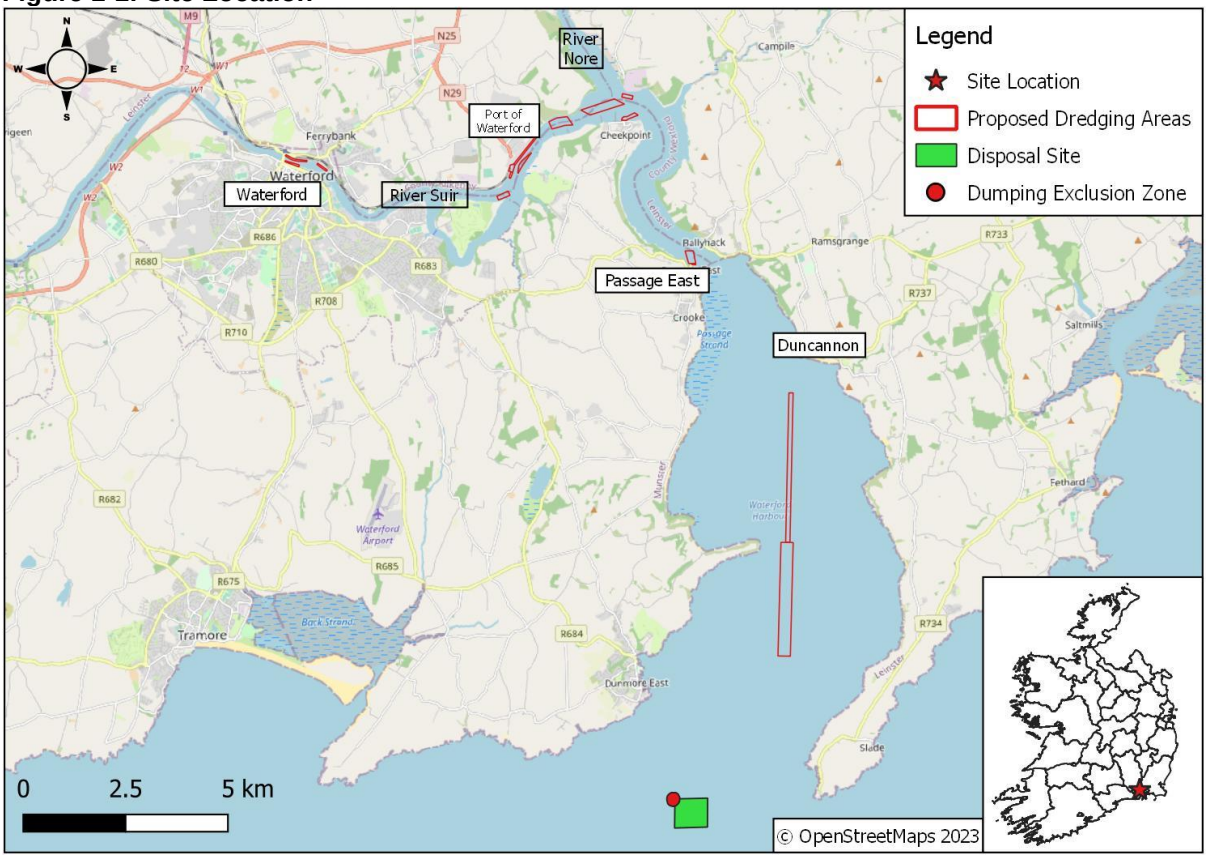
Malone O'Regan Environmental (MOR) has been commissioned by the Port of Waterford ('the Applicant') to undertake an Appropriate Assessment, to assess the likely significant effects, if any, in respect of ongoing maintenance dredging and disposal activities, and for slightly extended areas of dredging at Cheekpoint Lower Bar, Cheekpoint Harbour and O'Brien's Quay ('the Proposed Dredging Activities') in the Middle Suir Estuary, Lower Suir Estuary, Barrow-Suir-Nore Estuary and Waterford Harbour ('the Waterford Estuary') (OS ITM 668819 612137) on nearby sites with European conservation designations (i.e., Natura 2000 sites).

This report has been prepared in support of a Dumping at Sea (DaS) Permit applications to be submitted to the Environmental Protection Agency (EPA), and a licence application to be submitted to the Maritime Area Regulatory Authority (MARA) for a Licence to Carry Out Specified Maritime Usages in the Maritime Area under the Maritime Area Planning Act (2021) ('Maritime Licence').

This report has been prepared to inform the Planning Authority with regard to Stage 1 (Screening) and Stage 2 (Appropriate Assessment) of the Proposed Dredging Activities through the research and interpretation of best scientific, geographic and engineering knowledge and in view of the conservation objectives of the surrounding European sites. This report seeks to determine whether the Proposed Dredging Activities will, on its own or in-combination with other plans / projects, have a significant effect on European sites within a defined radius of the Proposed Dredging Areas.

On completion of the Appropriate Assessment Screening Report, it was found necessary to progress to Stage 2 of the Appropriate Assessment process and prepare a Natura Impact Statement (NIS), to assess effects on the integrity of the European sites.

Figure 1-1: Site Location



1.1 Statement of Authority

This report was reviewed and approved by Mr. [redacted], Associate Director - Ecologist. [redacted] is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM).[redacted] has over 18 years' experience working in the ecological consultancy sector, including habitat surveys and appraisals and specialist protected species surveys in support of Appropriate Assessments.

As part of this assessment, a Benthic Ecology Report and a Fish Report have been prepared and input from these reports has been included as part of this NIS. The Benthic Ecology Report was prepared by Aquafact International Services Ltd. (APEM Group) and the Fish Report has been prepared by Dr [redacted] of Aztec Management Consultants. These reports have been submitted as part of these applications and should be read in conjunction with this report.

1.2 Applicant

The Port of Waterford Company was originally known as Waterford Harbour Commissioners and was established in 1816. In 1999, the organisation was incorporated as the Port of Waterford Company, and now operates in the commercial semi-state sector in Ireland, reporting to the Department of Transport. Since its foundation, the organisation has played a vital role in the development of the city and the region.

The Port of Waterford is designated as a Port of National Significance (Tier 2) within the terms of the National Ports Policy as it is responsible for at least 2.5% of overall tonnage through Irish ports, has clear demonstrable potential to handle higher volumes of unitised traffic, and has the existing transport links to serve a wider, national marketplace beyond their immediate region. The Port of Waterford is the fifth largest of the State commercial ports in terms of total tonnage handled and the facilities are considered an infrastructure asset of national importance. The Southern Assembly Regional Spatial and Economic Strategy (RSES) supports the development of the port as a major international gateway and its achievement of Tier 1 status.

The Port of Waterford is a key port for shipping to and from the south-east of Ireland. The location of the Port of Waterford means that it is Ireland's closest multi-model port to mainland Europe and has transport links with Ireland's major cities.

The Port of Waterford currently comprises some 960m of marginal quays at Belview and 280m of layby quay at Waterford City centre, the Frank Cassin Wharf, currently used for cruise vessels on an occasional basis. The Port of Waterford has an area of 265 hectares (ha) designated 'Belview Port Zone' that includes open and covered storage areas and warehouses. The Port of Waterford current operations focus on bulk, general cargoes and container handling through its licenced stevedores. The Port can accommodate large vessels, with ships drafts of up to 9m and lengths of up to 190m.

1.3 Regulatory Context

The following guidance documents were adhered to for the preparation of this NIS report:

- *Appropriate Assessment for Screening for Development Management,* The Office of the Planning Regulator [1];
- *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*, European Commission [2, 3];
- *Guidelines for Ecological Impact Assessment in the UK and Ireland*, Chartered Institute of Ecology and Environmental Management [4];
- *Managing Natura 2000 Sites:* The Provision of Article 6 of the Habitats Directive 92/43/EEC [5]*;*

- *Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities,* DoEGLH [6]; and,
- *Appropriate Assessment under Article 6 of the Habitats Directive; Guidance for Planning Authorities. Circular NPW 1/10 and PSSP 2/10*, DoEGLH [7].

This Natura Impact Statement (NIS) was prepared in accordance with and in compliance with the following legislation:

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna better known as "The Habitats Directive". This provides the framework for legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000.

For completeness, the Planning and Development Act 2000 (as amended) states that "European site" means:

a. A candidate site of Community Importance;
b. A site of Community Importance, F815 [(ba) a candidate Special Area of Conservation];
c. A Special Area of Conservation (SAC);
d. A candidate Special Area of Conservation (cSAC); or,
e. A Special Protection Area (SPA)

These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/EEC as amended 2009/149/EC) (better known as "The Birds Directive").Article 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect Natura 2000 sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment.

> *"Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implication for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public"*

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures. First, the project should aim to avoid any negative impacts on European sites by identifying possible impacts early in the planning stage and designing the project in order to avoid such impacts. Second, mitigation measures should be applied, if necessary, during the Appropriate Assessment (AA) process to the point, where no adverse impacts on the site(s) remain. If the project is still likely to result in adverse effects, and no further practicable mitigation is possible, it is rejected. If no alternative solutions are identified and the project is required for imperative reasons of overriding public interest (IROPI test) under Article 6 (4) of the Habitats Directive, then compensation measures are required for any remaining adverse effect.

1.4 Stages of Appropriate Assessment

There are four distinct stages to undertaking an AA as outlined in current European Union (EU) and Department of Environment, Heritage and Local Government (DOEHLG) guidance:

Stage 1: Screening

This process identifies the potential impacts of a plan or project on a European site, either alone or in combination with other plans and projects and considers whether these impacts are likely to be significant. If potentially significant impacts are identified the plan or project cannot be screened out and must proceed to Stage 2.

Stage 2: Appropriate Assessment

Where potentially significant impacts are identified, an assessment of the potential mitigation of those impacts is required; this stage considers the appropriateness of those mitigation measures in the context of maintaining the integrity of the European sites. If potential significant impacts cannot be eliminated with appropriate mitigation measures, the assessment must proceed to Stage 3.

Stage 3: Assessment of Alternatives Solutions

This process examines alternative ways to achieve the objectives of the plan or project that avoid adverse impacts on the integrity of the European site if mitigation measures are deemed insufficient.

Stage 4: Imperative Reasons of Overriding Public Interest (IROPI)

Assessment where no alternative solution exists for a plan or project and where adverse impacts remain. This includes an assessment of compensatory measures, where in the case of projects or plans, can be considered necessary for IROPI.

2 METHODOLOGY

2.1 Determining Zone of Influence

The starting point for this assessment was to determine the Zone of Influence. The Zone of Influence comprises of the area which the Proposed Dredging Activities may potentially affect the conservation objectives (or qualifying interests) of a European site.

Guidance in Appropriate Assessment of plans and projects in Ireland notes that a distance of 15km is recommended for the identification of relevant European sites [6]. However, guidance from the NPWS recommends that the distance should be evaluated on a case-by case basis with reference to the nature, size and location of the project, the sensitivities of the ecological receptors, and the potential for in-combination effects (cumulative) [7]. For some projects, the distance could be greater than 15km, and in some cases less than 100m.

Definition of the zone of influence for the proposed works includes evaluating the following:

- Identification of the European sites that are situated within, in close vicinity or downstream within the zone of influence of the Proposed Dredging Activities;
- Identification of the designated habitats and species and Conservation Objectives for the identified European sites;
- Identification of the environmental conditions that stabilise and increase the qualifying interests of the European sites towards favourable conservation status;
- Identification of the threats/impacts – actual or potential that could negatively impact the conservation objectives for the European sites;
- Identifying the activities of the proposed works that could give rise to significant adverse impacts; and,
- Identification of other plans or projects, for which in-combination impacts would likely have significant adverse effects.

2.1.1 Source-Pathway-Receptor Model

European sites are only at risk from significant effects where a source-pathway-receptor link exists between a Proposed Dredging Activities and a European site. This can take the form of a direct impact (e.g., where the Proposed Dredging Activities is located within / in close vicinity to the boundary of a European site), or an indirect impact where impacts outside of the European site but affect ecological receptors within (e.g., impacts to water quality which can affect estuarine habitats at a distance from the impact source).

The likely effects of the Proposed Dredging Activities on any European site have been assessed using a source-pathway-receptor model. A source-pathway-receptor model is a standard tool used in environmental assessment [8] [9]. The model comprises of:

- A *source*: any potential impacts from the Proposed Dredging Activities, e.g., noise pollution.
- A *pathway*: the means or route by which a source can affect the ecological receptor.
- A *receptor*: the qualifying interests and / or special conservation interests of the European sites.

In order to establish the Zone of Influence of the Proposed Dredging Activities works, the likely key environmental impacts / changes associated with the Proposed Dredging Activities were determined having regard to the project characteristics set out in Section 3.3 of this report. Zone of Influence for various potential impact pathways are discussed in Section 4.1.

2.2 Desk Based Studies

A desk-based review of information sources was completed, which included the following sources of information:

- Review of aerial maps of the Proposed Dredging Areas, disposal site and surrounding area;
- The National Parks and Wildlife Service (NPWS) website was consulted with regard to the most up to date detail on conservation objectives for the European sites relevant to this assessment [10];
- The Kilkenny County Council Planning Portal to obtain details about existing / proposed plans in the vicinity of the Proposed Dredging Activities [11];
- The Waterford County Council Planning Portal to obtain details about existing / proposed plans in the vicinity of the Proposed Dredging Activities [12];
- The Wexford County Council Planning Portal to obtain details about existing / proposed plans in the vicinity of the Proposed Dredging Activities [13];
- The Department of Housing, Local Government and Heritage's planning portal – the National Planning Application Database to obtain details about existing / proposed plans in the vicinity of the Proposed Dredging Activities [14];
- The National Biodiversity Data Centre (NBDC) website was consulted with regard to species distributions [15];
- The EPA Maps website was consulted to obtain details about watercourses in the vicinity of the Proposed Dredging Activities [16]; and,
- Malone O'Regan otter survey information compiled as part of ongoing studies for the Port of Waterford Masterplan Projects (unpublished).

2.3 Field Based Studies

2.3.1 Bird Surveys

During the 2022 TSHD campaign, 2No. suitably qualified and experienced MOR ecologists undertook 2No. surveys from the dredger to assess potential disturbance responses from birds within the estuary on the 15th May 2022 and the 4th November 2022.

During these surveys, the dredging activity was taking place at the Cheekpoint Lower area and the surveys were completed during a full dredging cycle, which involved the dredger going up the estuary to the Cheekpoint Lower area, dredging and going to the offshore disposal site. The vessel was ca. 71.5m in length, had a width of 14m and had a top speed of ca. 10-11 knots.

The methodology utilised for the surveys was an adapted methodology based on the methods developed by Jarrett *et al* (2021) [17].

The surveyors recorded all bird species viewable from the dredger. The distance at which the bird was first observed was recorded and the distance at which the bird showed any observable response to the dredger were recorded (distance was recorded as the perpendicular distance of the bird to the route of the vessel: 0–50m, 50–100m, 100–200m, 200–300m), the behaviour response (categorised as: flight, swim away, evasive dive, or no response), and the duration that the behaviour response occurred.

The MOR ecologists undertook vantage point surveys from the top deck of the vessel, ca. 5-7m above the waterline. Each surveyor was located on either side of the bridge using binoculars to identify and record the responses of species. For each survey, the following

characteristics were collected: date, time of day, wind (knots), sea state (Douglas sea state), sea swell (m) and visibility. The surveys were undertaken in good weather conditions and good visibility, see Table 2-1 below.

Table 2-1: Dredger Survey Metadata

Date	Timing	Wind (knots)	Sea State	Sea Swell	Visibility
15/05/2022	9:30 – 13:00	18kt	4	1-2m	Good
04/11/2022	9:00 - 11:00	6kt	1	<1m	Very Good

2.4 External Specialist Studies

2.4.1 Benthic Habitat

A Benthic Ecology Report has been prepared by Aquafact International Services Ltd. (APEM Group) and has been submitted as part of these applications [18]. This report was prepared in order to obtain details about benthic ecology in the vicinity of the Proposed Dredging Areas. This report should be read in conjunction with this NIS.

As part of this assessment, Aquafact undertook subtidal benthic surveying at a total of twenty-seven (27No.) sample locations ('stations') on the 23rd and 24th May 2023 within the areas around the Port of Waterford, Little Island, Cheekpoint, Passage East, and Dollar Bay, Duncannon (see Figure 5-1).

At each station, a 0.025m^2 van Veen grab was used to grab samples, two (2No.) replicate grab samples were attempted at each of the stations for faunal analysis and a third sample was collected for sediment grain size and organic carbon analysis. However, it should be noted that of the twenty-seven (27No.) planned stations, eleven (11No.) of the sampling locations were not successfully sampled as the substrate was hard ground or cobbles. Additionally, a successful replicate faunal grab could not be collected at six (6No.) stations.

In order to assess the samples taken, Aquafact identified and analysed the faunal samples taken and also undertook sediment granulometric analysis and organic carbon analysis on the sediment samples.

Figure 2-1: Grab Sample Locations (Extract from Benthic Ecology Report [18])

2.4.2 Fisheries Studies

The Port of Waterford Maintenance Dredging Programme: Fish Report has been prepared by Dr [redacted] of Aztec Management Consultants and submitted as part of these applications [19]. This report should be read in conjunction with this NIS.

This report provides an assessment of the current status of fish in the Waterford Estuary (Barrow-Nore-Suir estuary), and designated fish species in the estuary, based on best scientific knowledge and an assessment of the potential impacts of the maintenance dredging programme.

The Fish Report was prepared using information from survey work carried out by Inland Fisheries Ireland (IFI), the competent authority, as part of the National Water Framework Directive (WFD) surveillance monitoring programme during the years 2016 and 2019 [20, 21]. The findings of these surveys formed the basis for estimating the ecological status of fish in the Waterford Estuary. Other survey results used to enhance the understanding of fish species present in the Waterford Estuary and their relative abundance included the results of trawl surveys throughout the Waterford Estuary as part of the IFI's National Bass Conservation Programme [20, 21] and fish impingement studies carried out at Great Island thermal electricity generating station cooling water system during the years 2017, 2018, 2020, 2021, 2022 and 2023 [22, 23, 24, 25, 26].

3 DESCRIPTION OF THE PROJECT

3.1 Project Location and Context

The Port of Waterford is a key port for shipping to and from the south-east of Ireland. The location of the Port of Waterford means that it is Ireland's closest multi-model port to mainland Europe and has transport links with Ireland's major cities.

The Port of Waterford currently comprises some 960m of marginal quays at Belview and 280m of layby quay at Waterford City centre, the Frank Cassin Wharf, currently used for cruise vessels on an occasional basis. The Port of Waterford has an area of 265 hectares (ha) designated 'Belview Port Zone' that includes open and covered storage areas and warehouses. The Port of Waterford current operations focus on bulk, general cargoes and container handling through its licenced stevedores. The Port can accommodate large vessels, with ships drafts of up to 9m and lengths of up to 190m.

The Port of Waterford is designated as a Port of National Significance (Tier 2) within the terms of the National Ports Policy as it is responsible for at least 2.5% of overall tonnage through Irish ports, has clear demonstrable potential to handle higher volumes of unitised traffic, and has the existing transport links to serve a wider, national marketplace beyond their immediate region. The Port of Waterford is the fifth largest of the State commercial ports in terms of total tonnage handled and the facilities are considered an infrastructure asset of national importance. The Southern Assembly Regional Spatial and Economic Strategy (RSES) supports the development of the port as a major international gateway and its achievement of Tier 1 status.

The Waterford Estuary, located in southeast Ireland, is a semi-enclosed coastal water body open to sea through an entrance ca. 4.25km wide between Hook Head and Dunmore East. Just north of the mouth of the estuary is Creadan Head, in which a series of beaches and tidal flats are located and extend north to Passage East. The water surface area covers approximately 80km^2, being for the most part relatively shallow riverine sections, however, a series of deep pockets occur within Waterford Estuary. Two major rivers join into the Waterford Estuary, the River Suir and the River Barrow. These rivers are both influenced by the tidal cycle within the estuary. The River Suir is tidal ca. 60km upstream from the entrance at Hook Head. The River Barrow and the River Nore, which is linked to the River Barrow, are both tidal for ca. 55km to St. Mullins on the River Barrow and to Inistioge on the River Nore.

The Port of Waterford's authority limits extends 6.5km south of a line between Hook Head and Falskirt Rock, encompassing the majority of the estuary. The Port's waterway consists of a primary navigational channel, to the main terminal at Belview, for the safe transit of trade vessel.

The estuary is extremely complex and dynamic in its sediment movement and because of this sedimentation is highly variable. However, ABPmer have undertaken extensive modelling of the sediment movement within the estuary and therefore, the general sediment movements are predicable within the estuary. Sedimentation in the upper estuary is dominated by the tides, with greater sedimentation during a spring tide, due to the greater amount of energy present. Flood tides transport sediment up the estuary in the water column or as bed load. However, the majority of the ebb tide flows are not strong enough to keep the material in suspension and push the sediment back down the estuary. Therefore, the sediment accumulates in the areas of lowest velocity. The outer estuary sedimentation is primarily storm driven and thus variable.

Overall, the navigation channel into Port of Waterford has good water depths. However, as a result of the sediment input from storm events, the Duncannon and Cheekpoint sand bars, and the ongoing maintenance of the berths at Belview, regular dredging is required to ensure of the navigation channel remains fit for purpose and safe to use. In addition, it should be

noted that the maintenance dredging programme in Waterford Estuary has now been ongoing for many decades.

3.2 Proposed Dredging Areas

In total there are 16No. areas that are included in these applications ('Proposed Dredging Areas'). This includes 3No. locations known as 'Primary Dredge Areas' that experience a high degree of sedimentation and therefore, over time, trigger the requirement for a maintenance dredging campaign to be undertaken. The Primary Dredge Areas therefore require dredging at least twice a year and these include Belview Berths, Cheekpoint Lower, and Duncannon Channel. There are also 13No. that require less frequent dredging (referred to as 'Secondary Dredge Areas'). The areas to be included in the forthcoming application may be broken down as presented below in Table 3-1 and Figure 3-1, and illustrated in Appendix A.

The Proposed Dredging Activities includes primarily areas directly related to trade vessels (berths) and access to the Port of Waterford (navigational channel); however, it also includes areas that are maintained for smaller harbour users, such as Cheekpoint Harbour, which is a community harbour facilitating local fishing and recreational vessels. It is considered unlikely that the responsible parties for each of these areas would have the resources required to seek a permit / licence individually. Whilst areas such as these are not the responsibility of the Port of Waterford, the Port recognises their importance to minor businesses and the general public and is happy to collaborate with them to ensure the licencing of the maintenance activities of the Waterford Estuary as a whole is streamlined.

It should be noted that 13No. of the areas included in this application are the same size and location as those previously authorised under previous permits held by the Port of Waterford. However, there are 3No. areas of slightly extended dredging and/or ploughing of ca. 9.97ha that the Port of Waterford are seeking, which will include:

- Cheekpoint Lower Bar;
- Cheekpoint Harbour Access; and,
- O'Brien's Quay.

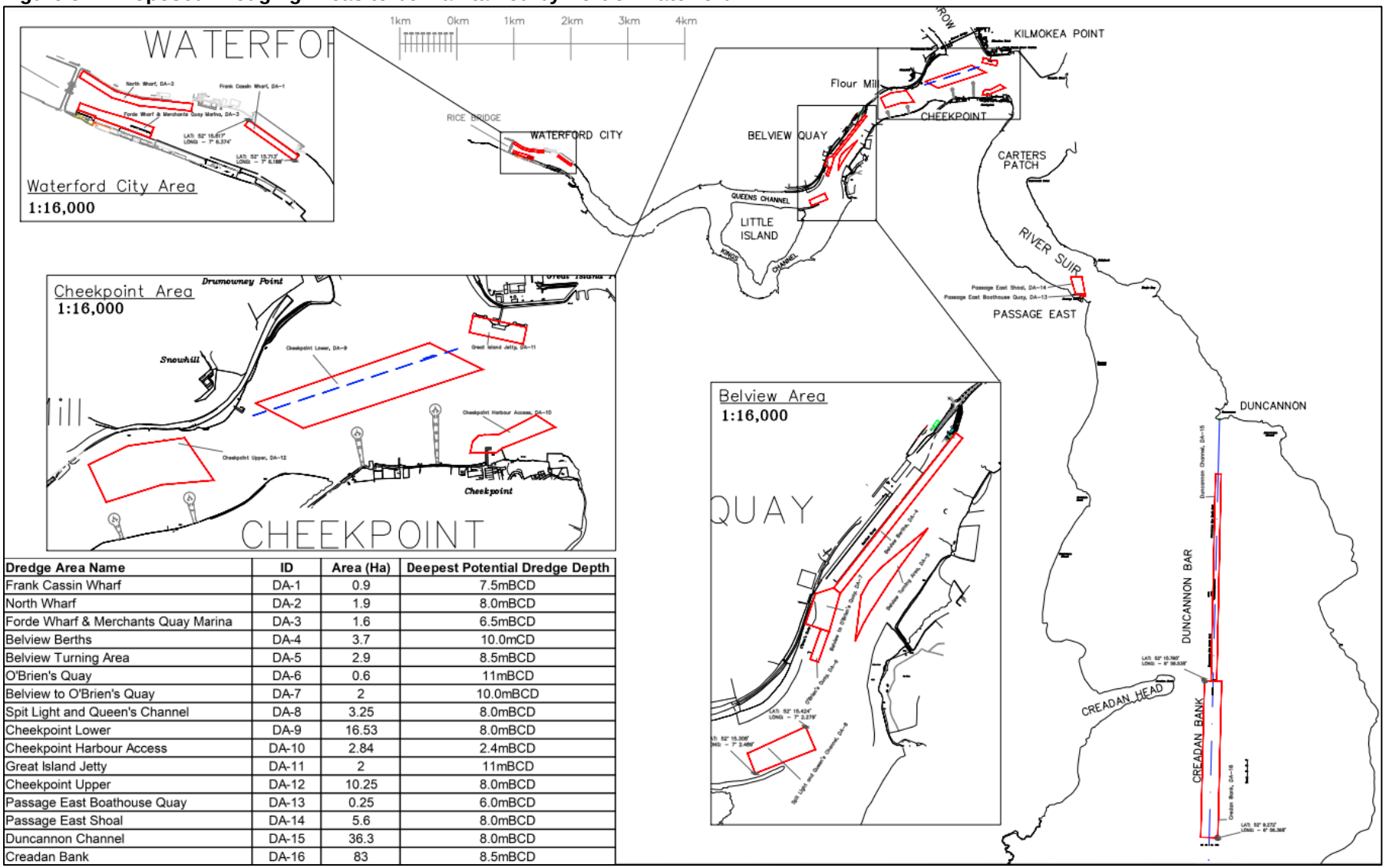
Further information on these extended areas for plough dredging is discussed below.

Table 3-1: Proposed Dredging Areas to be Maintained by Port of Waterford (Note: grey shaded rows indicate proposed extended areas)

Dredging Areas	Dredge Area Name	Current Permitted Area (ha)	2026-2033 Area (ha)
Primary Dredge Areas	Duncannon Channel	36.0	36.0
	Cheekpoint Lower	8.4	16.53
	Belview Berths	3.7	3.7
Secondary Dredge Areas	Belview Turning Area	2.9	2.9
	Belview to O'Brien's Quay	2.0	2.0
	Cheekpoint Harbour Access	0.8	2.84
	Cheekpoint Upper	10.3	10.3
	Creadan Bank	83.0	83.0

Dredging Areas	Dredge Area Name	Current Permitted Area (ha)	2026-2033 Area (ha)
	Frank Cassin Wharf	0.9	0.9
	Forde Wharf & Merchants Quay Marina	1.6	1.6
	Great Island Jetty	2.0	2.0
	North Wharf	1.9	1.6
	O'Brien's Quay	0.5	0.6
	Passage East Boathouse Quay	0.3	0.3
	Passage East Shoal	5.6	5.6
	Spit Light and Queen's Channel	3.3	3.3
Total Area		**163.2**	**173.17**

Figure 3-1: Proposed Dredging Areas to be Maintained by Port of Waterford



Dredge Area Name	ID	Area (Ha)	Deepest Potential Dredge Depth
Frank Cassin Wharf	DA-1	0.9	7.5mBCD
North Wharf	DA-2	1.9	8.0mBCD
Forde Wharf & Merchants Quay Marina	DA-3	1.6	6.5mBCD
Belview Berths	DA-4	3.7	10.0mCD
Belview Turning Area	DA-5	2.9	8.5mBCD
O'Brien's Quay	DA-6	0.6	11mBCD
Belview to O'Brien's Quay	DA-7	2	10.0mBCD
Spit Light and Queen's Channel	DA-8	3.25	8.0mBCD
Cheekpoint Lower	DA-9	16.53	8.0mBCD
Cheekpoint Harbour Access	DA-10	2.84	2.4mBCD
Great Island Jetty	DA-11	2	11mBCD
Cheekpoint Upper	DA-12	10.25	8.0mBCD
Passage East Boathouse Quay	DA-13	0.25	6.0mBCD
Passage East Shoal	DA-14	5.6	8.0mBCD
Duncannon Channel	DA-15	36.3	8.0mBCD
Creadan Bank	DA-16	83	8.5mBCD

3.3 Sediment Characteristics

The Port of Waterford collected and analysed 18No. sediment samples to determine potential contamination and the physical nature of the sediment to be dredged. The samples were collected within the Waterford Estuary and the Port of Waterford commissioned the Socotec to analyse the samples. However, it should be noted that a sufficient sample could not be attained from sample location MD10 due to mussels. Therefore, only limited physical and chemical testing was completed for sample location MD10. In addition, there was not sufficient sediments obtained to undertake physical testing on samples MD4 and MD16. The Marine Institute was informed of all sampling and testing that was undertaken to facilitate their review and approval of the results and continuation of dredging activities under the current permit.

The physical composition of the material sampled is fairly consistent throughout Waterford Estuary (51% sand, 33% mud, and 16% gravel). Based on the comprehensive data set it can be concluded that the sediment to be dredged will essentially be clean sediment, comprising sand, silt and gravel. None of the samples exceeded the upper level (Level 2 Thresholds), which is the threshold of contaminant concentration above which biological effects are anticipated to occur. These results are consistent with all historical testing undertaken.

3.4 Description of the Proposed Dredging Activities

The Applicant intends to apply for an eight year DaS permit from the EPA and a Maritime Licence from MARA to dredge and dump at sea (2026-2033 inclusive). The maintenance dredging programme will consist of:

- Dredging of approximately 823,513 wet tonnes of spoil annually to maintain the Navigation Channel;
- Disposal of the dredged material at the existing licenced offsite disposal site; and,
- 3No. areas of extended dredging and/or ploughing at Cheekpoint Lower Bar, Cheekpoint Harbour, and O'Brien's Quay.

The proposed dredging methodologies are outlined below.

3.4.1 Dredging Methodologies

The dredging methodology utilised will vary depending on the following characteristics:

- Seabed / water depth;
- Access / manoeuvring within the area;
- Sediment type;
- Volume of sediment; and,
- Timeframe for the works.

The primary dredging method will be by Trailing Suction Hopper Dredger (TSHD), supported by a bed leveller. Allowances will also be made for the utilisation of Mechanical Dredging and Plough Dredging. In some areas, multiple strategies may be required to be engaged. Descriptions of each dredging activity are provided in the sections below and Table 3-2 outlines the dredging activity proposed at each location.

Table 3-2: Proposed Dredging Activity at each Location

Dredging Areas	Dredge Area Name	Dredging Activity		
		Loading		Plough
		TSHD	Mechanical	
Primary Dredge Areas	Duncannon Channel	✓		✓
	Cheekpoint Lower	✓		✓
	Belview Berths	✓	✓	✓
Secondary Dredge Areas	Belview Turning Area	✓	✓	✓
	Belview to O'Brien's Quay	✓	✓	✓
	Cheekpoint Harbour Access	✓	✓	✓
	Cheekpoint Upper	✓		✓
	Creadan Bank	✓		✓
	Frank Cassin Wharf			✓
	Forde Wharf & Merchants Quay Marina			✓
	Great Island Jetty	✓	✓	✓
	North Wharf			✓
	O'Brien's Quay	✓	✓	✓
	Passage East Boathouse Quay	✓	✓	✓
	Passage East Shoal	✓	✓	✓
	Spit Light and Queen's Channel			✓

3.4.1.1 Trailing Suction Hopper Dredging

Due to the specific characteristics of the Port of Waterford the TSHD is the primary dredging method used to maintain the design depth of the navigational channels, and the other accessible areas of the Port's berths. The areas to be dredged will be identified regularly by hydrographic survey.

To start the dredging operations, the TSHD will sail to the area to be dredged. Once in the vicinity of its dredging area, the TSHD will lower the draghead(s) to the seabed and dredging can commence. The centrifugal dredge pump, installed inside the dredger, takes up a mixture of water and soil through the draghead, and suction pipe, and pumps the mixture into its integral hopper. The sediment will settle in the hopper and, if advantageous, only the water is discharged through an adjustable overflow system. When the draught of the vessel reaches the dredging loading mark or when circumstances do not allow for further loading, dredging will cease, and the suction pipe hoisted on deck. The dredger will fill its hopper in each of the identified dredging areas as efficiently as possible.

Upon filling its hopper, the dredger will sail to the licensed disposal site and slows to approximately one to two knots. The dredger will then open bottom doors, or split along its hull, to allow the release of its contents over several minutes. During the disposal operation the dredger is travelling at between one to two knots within the disposal area. Due to this the material is spread over the disposal site and ensures against accumulation of material within an isolated area (i.e., the centre of the disposal site). This process is repeated for each disposal operation with the master of the vessel referring to the previous disposal locations used, within the on-board tracking system, and selecting a new disposal location within the licensed area. By using as much of the disposal site as possible any impacts of excessive accumulation in one location from the disposal activity will be minimised.

This process will be continued until interim hydrographic surveys show that the required safe navigation depths required have been achieved and dredging can cease.

3.4.1.2 Plough Dredging

A plough vessel generally uses, if available, a bulldozer type plough to relocate material, although a standard open box plough can suffice on occasion. Sediment movement is achieved by towing a bottomless rectangular box shaped fabricated steel implement behind a powered vessel, usually a small workboat or tug. When used correctly, the plough is suspended at a controlled height from an A-frame mounted over the stern of the towing vessel. Height, or depth of submergence, is controlled by a deck mounted hoist winch. The cutting blade at the leading edge of the plough slices the surface sediment which is then contained within the sides and rear of the following plough until reaching an area where the bed level is lower than the suspended level of the plough, whereupon the contained sediment falls from the open bottom of the plough. The plough is then raised above the general seabed level and the towing vessel returns to the area from which sediment is to be moved and repeats the cycle.

Ploughing is also undertaken regularly at Cheekpoint Lower Bar. The Port of Waterford has invested considerable time and effort over the last number of years to study the sedimentation regime that occurs at Cheekpoint Lower Bar. This is because it is the primary dredging cost for the Port annually. From a variety of studies and observations, the Port have ascertained with confidence that sedimentation is significantly greater over spring tide periods. Sedimentation rates on the spring tide can commonly be 2 to 3 times greater than the neaps, and on occasion considerably more. Turbidity monitors in and around Cheekpoint have reflected this assertion as the spring tide energy mobilises significant amounts of sediment around the estuary generally. A hydrodynamic model developed by the Port has corroborated this hypothesis. Therefore, the decision was taken to undertake ploughing during spring tide periods to minimise the amount of sediment settling in the area while it was still fluid and unconsolidated. The premise of these operations is prevention rather than cure. Also, environmentally, ploughing on spring tides is also more attractive due to the naturally elevated background levels of suspended sediment that are present. The port has used this preventative technique over the past number of years in compliance with its current licence/permit. Furthermore, the Port is currently looking at long term solutions to try and minimise or negate the sedimentation and associated dredging requirement at Cheekpoint Lower Bar and is seeking to progress these options.

3.4.1.3 Mechanical Dredging

There is also the potential for utilisation of a mechanical dredger in some areas. These dredgers use a bucket lowered to the seabed to excavate the targeted sediment material which is then raised to the surface. However, these dredgers do not have any means of transporting the dredged sediment so ‘hopper barges’ are required to be filled and transit to the licensed disposal site. The areas that may require the use of a mechanical dredger are limited to quay walls and berths where material has been compressed and has consolidated

to a degree that it cannot be removed by other methods of dredging. This option is not favoured by the Port as it is significantly more expensive that the use of a TSHD/plough and it is only utilised as a last resort when conditions dictate the standard processes are technically unfeasible.

3.4.2 Duration and Frequency

The current licence (S0012-03) expires on the 31st December 2025 and therefore the Port of Waterford is seeking an 8-year duration Dumping at Sea Permit and Maritime Licence under MAP to run inclusively from 2026 to 2033. It is requested that the maintenance dredging required be allowed to be undertaken at any time during this period as identified by regular hydrographic survey.

Any maintenance operations will be dictated by the extent of sedimentation that has occurred in each area of the harbour. These rates can fluctuate significantly, based on inclement weather resulting in storm conditions and high rainfall. Severe sedimentation has occurred in the past after a storm event and a contingency is included to ensure that the Port can act immediately to reduce the build-up and allow trade to continue.

The existing dumping at sea permit does not allow ploughing to occur between the start of March and the end of June, with the exception of those sites at Cheekpoint where ploughing is restricted to spring tides periods only. Bed levelling is permitted to be undertaken at all times of the year. No change to this is proposed.

No adjustment to this regime is requested.

3.4.3 Volume and Tonnage

The provisional volumes/tonnages of material to be dredged, and the anticipated schedule, are outlined in Appendix B.

Dredging will be carried out on an as required basis, with a degree of over dredging to provide sedimentation capacity and maintain minimum safe navigational depths.

Similar to the current permit, it is requested that 823,513 wet tonnes are permitted to be placed at the offshore site annually from 2026 to 2033 inclusive. There has been no increase in the permitted quantity of sediment disposed of at the offshore site since the inception of the site; however, it should be noted that the EPA currently uses wet tonnes as opposed to the historic unit dry tonnes.

The maximum volume of material disposed of per day at the designated disposal site has been variable over the past 20 years, with the figure selected dependent on the size of the dredger being utilised. The most recent permit granted stipulates a maximum disposal rate per day of 69,079 wet tonnes for the offshore disposal site. No change is proposed to these levels as no negative environmental impacts have been noted during the period when these limits has been in place.

Sedimentation rates can vary considerably depending on the severity of weather conditions, river flow and prevailing wind direction. Severe sedimentation has occurred in the past after a storm event and a contingency is included to ensure that the Port of Waterford can act immediately to reduce the build-up and allow trade to continue. Therefore, further to this regular disposal activity, it is also requested that an annual contingency tonnage of 175,000 dry tonnes (equivalent to 275,463 wet tonnes) be allocated to this disposal site should extreme weather events cause an inundation of sediment.

Th contingency allowance is included in the application, as per the current permit, due to the inclusion of Creadan Bank on this application, which is located in an extremely dynamic area and represents a significant risk in extreme events. As per previous permits this allocation would only be deposited if the dredging of this material is required to maintain navigable

depths, as evidenced by pre-dredge and post-dredge bathymetric surveys. The use of the contingency allowance would be subject to the prior written agreement of the Agency. This contingency allowance is not requested as part of the regular annual tonnage as it is likely it will not be needed, and it would unnecessarily increase the annual permitted dumping tonnage. However, failure to include an allowance for inundation events would be irresponsible of the Port, considering the estuary's history of such events. The inclusion of the contingency figure means that an emergency application to the EPA would not being required for an extreme weather/inundation event when a quick response to the conditions may be required.

Under its current permit/licence, the port is permitted to plough dredge a maximum of 159,165 wet tonnes annually. No change to this tonnage is proposed.

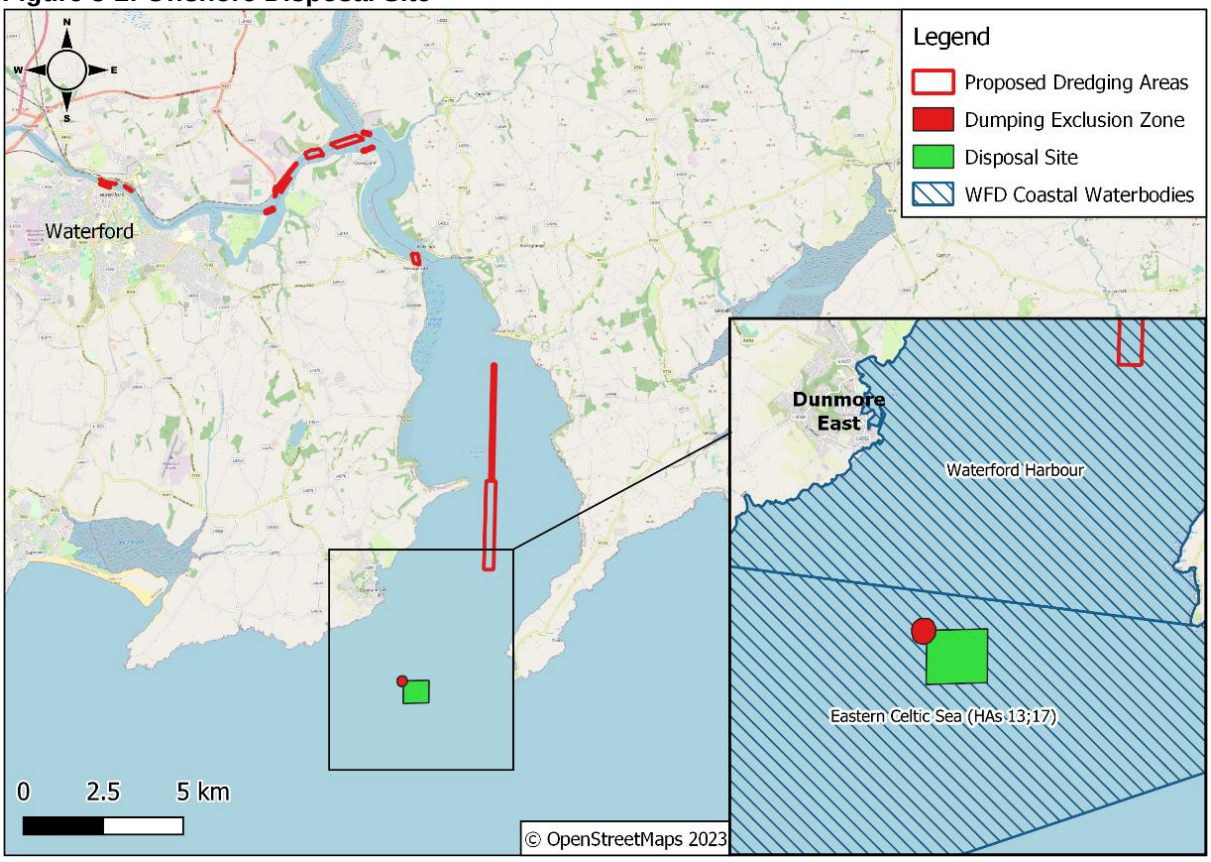
3.4.4 Offshore Disposal Site

The offshore disposal site proposed for this application has been in use since 1996. The dredging methodology, volume and local site characteristics have not changed in the intervening period, so all historical studies undertaken with respect to the disposal site and its impacts are deemed to be relevant.

The offshore disposal site is located ca. 22km south from the dredging area and ca. 2.6km southwest of Hook Head.

Figure 3-2 illustrated the location of the offshore disposal site and Appendix C.

Figure 3-2: Offshore Disposal Site



3.5 Watercourses within the Vicinity of the Proposed Dredging Areas

The dredging areas are located within four (4No.) watercourses the Middle Suir Estuary, Lower Suir Estuary, Barrow Suir Nore Estuary and Waterford Harbour. The disposal site is located within the Eastern Celtic Sea. Information on these watercourses / waterbodies are provided below:

1. Middle Suir Estuary

The Proposed Dredging Areas of North Wharf, Frank Cassin Wharf and Forde Wharf and Merchants Quay Marina are located within the River Suir known as the Middle Suir Estuary by the EPA. This river flows in a northeast direction for ca. 2.2km and then transitions into the Lower Suir Estuary. The watercourse is designated as part of the Lower River Suir SAC.

This watercourse then flows south into the Waterford Harbour ca. 20.5km downstream and then the Eastern Celtic Sea a further ca. 6.5km downstream. The Proposed Dredging Areas are located within a section of the River Suir that forms part of the Lower River Suir SAC and flows into the River Barrow and River Nore SAC ca. 8km downstream.

1. Lower Suir Estuary

The dredging sites Spit Light and Queen's Channel, O'Brien's Quay, Belview to O'Brien's Quay, Belview Berths, Belview Turning Area, Cheekpoint Upper, Cheekpoint Lower, Great Island Jetty and Cheekpoint Harbour Access are located within the River Suir known as the Lower Suir Estuary by the EPA [16]. This river flows in a northeast direction for ca. 3.6km and then converges with the River Barrow and forms the Barrow Suir Nore Estuary according to the EPA [16]. The watercourse is designated as part of the Lower River Suir SAC.

This watercourse then flows south into the Waterford Harbour ca. 15.2km downstream and then the Eastern Celtic Sea a further ca. 6.5km downstream. The Proposed Dredging Areas are located within a section of the River Suir that forms part of the Lower River Suir SAC and the River Barrow and River Nore SAC.

2. Barrow Suir Nore Estuary

The dredging sites Passage East Shoal, Passage East Boathouse Quay and Duncannon Channel are located within the Barrow Suir Nore Estuary. The watercourse flows in a south direction into the Waterford Harbour ca. 6.9km downstream and then the Eastern Celtic Sea a further ca 6.5km downstream. The Proposed Dredging Areas are located within the River Barrow and River Nore SAC.

3. Waterford Harbour

The Creadan Bank dredging area is located within the Waterford Harbour. The Waterford Harbour flows south into the Eastern Celtic Sea ca 6.5km downstream. The Proposed Dredging Area is located within the River Barrow and River Nore SAC.

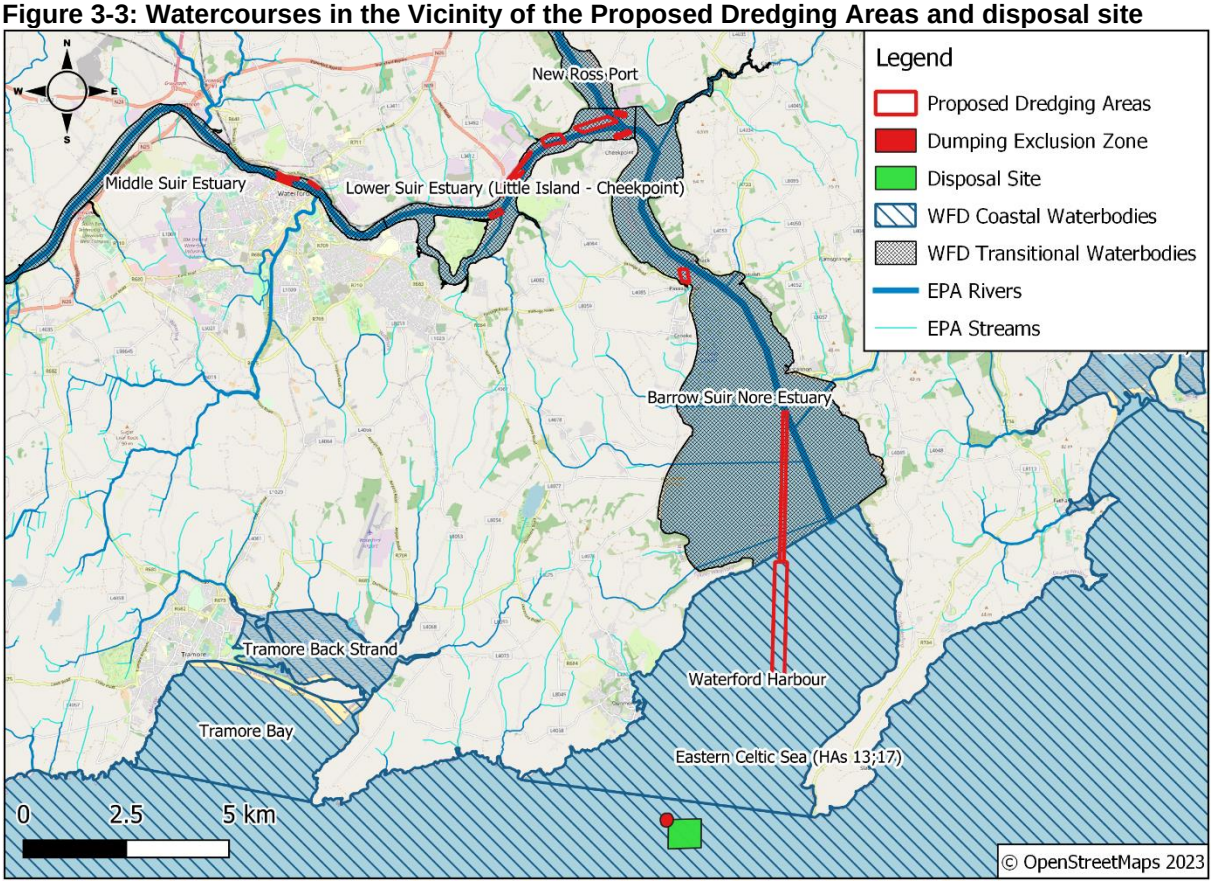
4. The Eastern Celtic Sea

The disposal site is located within the Eastern Celtic Sea ca. 2.6km southwest from Hook Head.

Under the Water Framework Directive (WFD) 2000/60/EC, the EPA classifies the status and the risk of not achieving good water quality status for all waterbodies in Ireland [16]. According to the River Waterbody WFD 2016-2021, the most up-to-date data at the time of writing this report, the water quality within the River Suir (Lower Suir Estuary), the Barrow Suir Nore Estuary and Waterford Harbour are all considered to have '*moderate' water quality and to be considered 'at risk'* [16]*.* The Eastern Celtic Sea is considered to have '*high*' water quality and is considered '*not at risk*' [16].

The location of the key surface water features in the vicinity of the Proposed Dredging Activities are illustrated in Figure 3-3 below.

Figure 3-3: Watercourses in the Vicinity of the Proposed Dredging Areas and disposal site



4 STUDY RESULTS

4.1 Desk-based Study Results

4.1.1 NBDC Records

Table 4-1 provides a summary of records of legally protected or otherwise notable species protected under the Lower River Suir SAC, River Barrow and River Nore SAC , Saltee Islands SAC and Seas off Wexford candidate SPA (cSPA) that occur within 2km of the Proposed Dredging Areas and disposal site (Grid Squares: S51W, S61A, S61B, S61K, S61L, S61R, S61S, S61W, S61X, S07A, S70C, S70D, S70F, S70G, S70H, S70I, X791, X69Y, X79D) [15].

CIEEM's guidelines recommend that consideration be given to the biodiversity conservation value of the species that occur within this zone of influence (as appropriate) [4].

Table 4-1: NBDC Records for Species Designated for the Lower River Suir SAC, the River Barrow and River Nore SAC, Saltee Island SAC and Seas off Wexford cSPA within 2km of the Proposed Dredging Areas and Disposal Site

Common Name	*Scientific Name*	Date of Last Record *	Designation
Species Designated under Lower River Suir SAC & River Barrow and River Nore SAC			
European Otter	*Lutra lutra*	31/10/2018	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II and IV
Species Designated under Saltee Islands SAC			
Grey Seal	*Halichoerus grypus*	07/10/2018	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II and V
Species Designated under Seas off Wexford cSPA			
Black-headed Gull	*Chroicocephalus ridibundus*	08/08/2017	Wildlife Acts 1976/200 Birds of Conservation Concern – Red List
Herring Gull	*Larus argentatus*	03/04/2018	Wildlife Acts 1976/200 Birds of Conservation Concern – Red List
Lesser Black – backed Gull	*Larus fuscus*	27/10/2014	Wildlife Acts 1976/200 Birds of Conservation Concern – Amber List
Manx Shearwater	*Puffinus puffinus*	09/08/2017	Wildlife Acts 1976/200 Birds of Conservation Concern – Amber List
Northern Gannet	*Morus bassanus*	27/10/2014	Wildlife Acts 1976/200 Birds of Conservation Concern – Amber List

Common Name	*Scientific Name*	Date of Last Record *	Designation
Species Designated under Lower River Suir SAC & River Barrow and River Nore SAC			
Northern Fulmar	*Fulmarus glacialis*	08/04/2018	Wildlife Acts 1976/200 Birds of Conservation Concern – Amber List

*Note that only species recorded within the past 10 years were included in this table. The parameter of 10 years was chosen to allow for habitat adaption and modification, it is considered that any records over 10 years old are not representative of the current distribution of species populations.

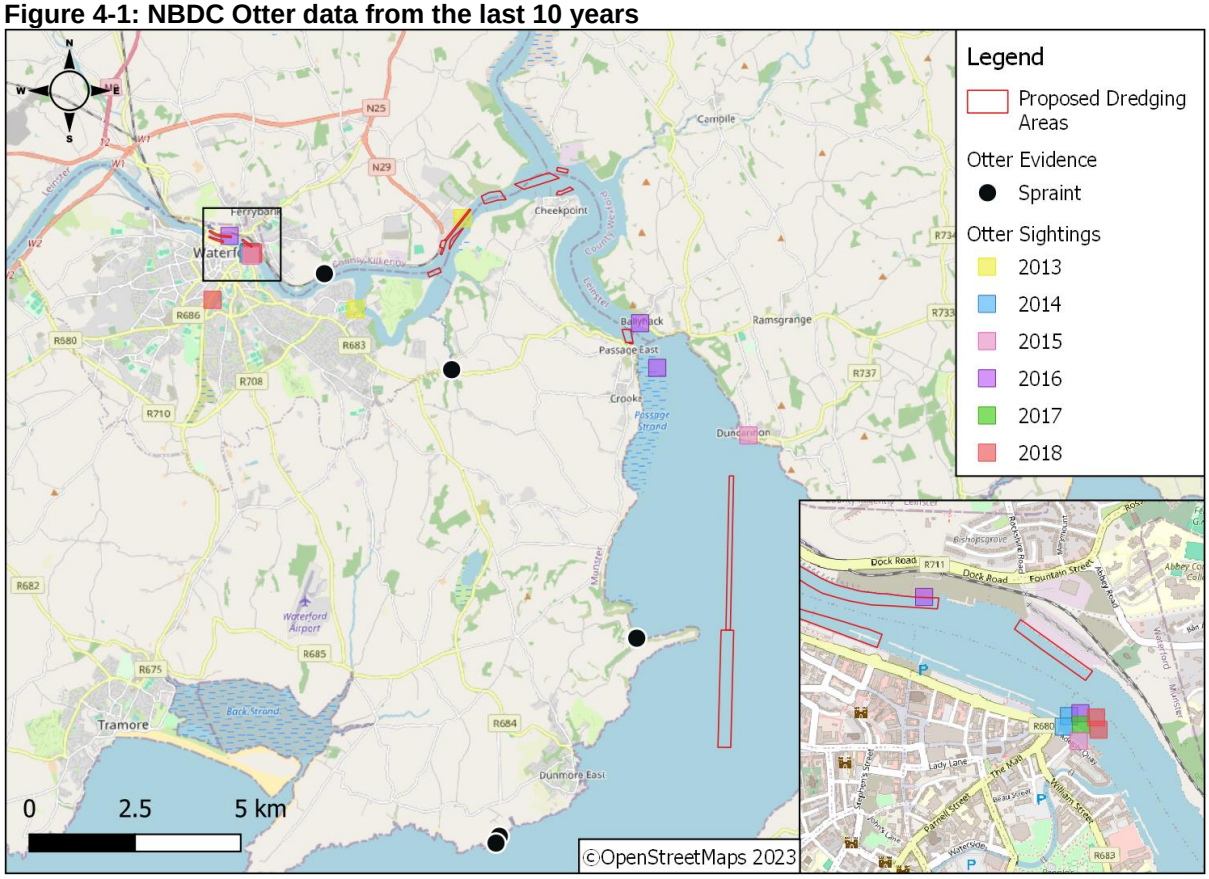
In addition to the above, Table 4-2 provides a summary of the different types of records held by the NBDC for otter within the vicinity of the proposed dredging areas within the last 10No. years [15].

Table 4-2: NBDC Records for otter within 2km of the Proposed Dredging Areas

Type of Sighting	Date of Record *	Location
Sighting of live animal	16/05/2013	River Suir, Belview Port, Waterford
	20/09/2013	Waterford Castle Jetty
	29/01/2016	River Suir, Waterford City
	14/05/2014	River Suir, Adelphi Quay, Waterford
	30/12/2014	
	26/11/2016	
	13/03/2017	
	26/04/2018	
	17/07/2018	
	31/12/2015	River Suir, Waterford Marina
	09/02/2016	Passage East, East Waterford
	16/09/2016	Ballyhack, Wexford
	15/11/2015	Duncannon, Wexford
	31/10/2018	Tramore Road Business Park, Waterford
Spraint	01/08/2013	Ballycanvan Stream, Halfway House, Waterford
	14/02/2013	Rathmoylan Cliff Face, Waterford
	15/12/2013	Portally, Waterford
	28/02/2014	Creadan, Waterford

*Note that only otter evidence recorded within the past 10 years were included in this table. The parameter of 10 years was chosen to allow for habitat adaption and modification, it is considered that any records over 10 years old are not representative of the current distribution of species populations.

Figure 4-1: NBDC Otter data from the last 10 years



4.1.2 I-WeBS

A data request was submitted on the 25th April 2023 to the Irish Wetland Bird Survey (I-WeBS), which is coordinated by BirdWatch Ireland and under contract to the National Parks and Wildlife Service (NPWS) [27]. The data request was for all available data from the I-WeBS sites within close proximity to the Proposed Dredging Areas. This included a number of subsites within the River Suir Lower site and the Waterford Harbour site:

- Belview – Little Island – Faithlegg subsite (subsite code: 0M390);
- Barrow Bridge - Passage East subsite (subsite code: 0M496); and,
- Barrow Bridge - Creadan Strand subsite (subsite code: 0M498).

The records were reviewed in order to gain an understanding into the potential assemblage of bird populations that may utilise the areas within and within the vicinity of the Proposed Dredging Areas.

The data received from BirdWatch Ireland covers a period from 2012/2013 winter season to 2021/2022 winter season. A total of 35No. species have been recorded during the 10-year period. Of the species recorded, 5No. bird species designated for the Sea off Wexford SPA have been recorded – black-headed gull, cormorant, herring gull, lesser black-backed gull and Mediterranean gull.

None of the designated species recorded in the last 10-years were recorded in numbers that would be considered of international or national importance. In addition, it should be noted that none of these species identified are considered to exclusively occur within this area.

4.1.3 MOR Otter Surveys (unpublished)

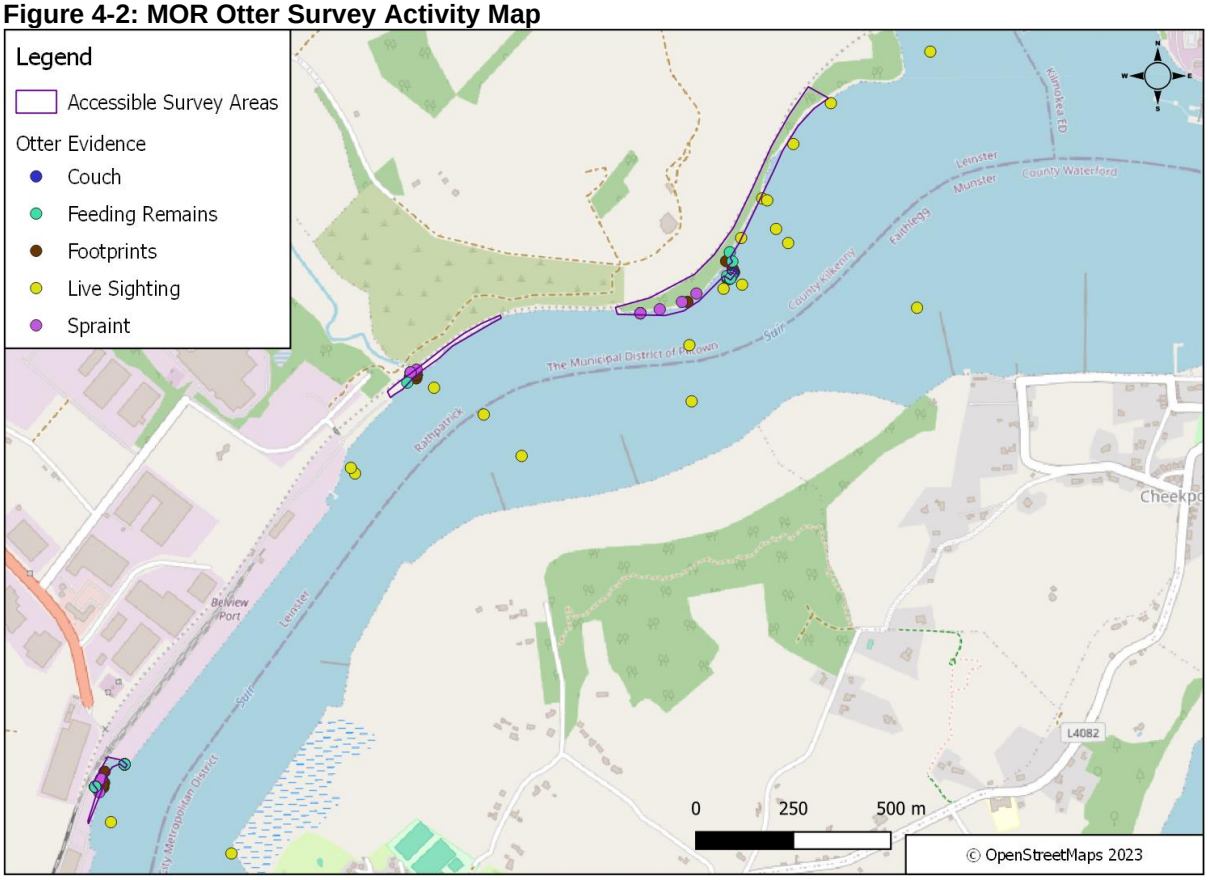
As part of the ongoing Port of Waterford Masterplan projects, MOR have been commissioned by the Port to undertaken otter surveys within the Belview Port area and its environs. The surveys undertaken by MOR have been ongoing since April 2021 and include bankside otter surveys, boat surveys and camera trap surveys.

During the surveys, areas of regular otter activity were identified, as these areas had the regular presence of otter footprints, spraints, foraging remains, couching areas and live sightings (see Figure 4-2). In addition, camera trap footage has shown otters regularly using these areas.

These areas shown on Figure 4-2 shows locations where otters activity has been recorded within the Belview-Faithlegg-Cheekpoint area during the surveys. However, it should be noted that while all the entirety of the coastline could not be regularly accessed, it is assumed that otter utilise the full coastline in this area. The full areas have been visually assessed by boat for the presence of otter activity / holts.

No otter holts have been identified within the surveyed areas.

Figure 4-2: MOR Otter Survey Activity Map



4.2 Field Based Study Results

4.2.1 Bird Surveys

Overall, a total of 12No. species were recorded during the surveys. The species recorded included:

- 5No. species designated for the Seas off Wexford cSPA - black-headed gull, cormorant, lesser black-backed gull, herring gull, kittiwake;

- 2No. were Green BoCCI listed non-designated species – great black-backed gull and heron;
- 1No. were Amber BoCCI listed non-designated species –gannet;
- 2No. was a Red BoCCI listed non-designated species – black-tailed godwit and oystercatcher;
- 1No. was a Green BoCCI listed non-designated Annex I species – little egret; and,
- 1No. was a Red BoCCI listed non-designated Annex II(II) species – curlew.

The survey results of the survey are shown in Table 4-3 and Table 4-4. As described in the tables, the majority of the species did not show a response to the dredger. Numerous species (black-headed gull, cormorant, gannet, great black-backed gull, herring gull and kittiwake) were observed foraging within the areas that had recently been dredged.

Some seabirds have been known to be initially attracted to areas where increased food sources are available as a result of bottom sediments being stirred up, which include dredging operations [28]. In addition, some bird species, specifically scavenging species like gulls, have been known to be attracted to areas with low vessel speeds, similar to those associated with dredging [28, 29].

Table 4-3: Dredging Survey Results from Survey 1

BoCCI Conservation Status [30]	**Species**	***Latin Name***	**Total Number Recorded**	**Number of Individuals (No Response)**	**Number of Individuals (Response)**	**Closest Distance of Individual Recorded (m)**	**Closest Individual Recorded - Behaviour**	**Closest Individual Recorded - Response to Dredger**	**Closest Individual Recorded - Duration of Response (seconds)**
Green	Greater Black-backed Gull	*Larus marinus*	1	1	0	200-300	Roosting on water	No response	N/A
Amber	Black-headed Gull	*Larus ridibundus*	6	6	0	200-300	Foraging on intertidal mudflats	No response	N/A
	Cormorant	*Phalacrocorax carbo*	30	28	2	0-50	Foraging in areas where dredger has passed	N/A	N/A
						0-50	Roosting on old fishing pier	Flight	25 seconds
	Gannet	*Morus bassana*	1	0	1	0-50	Flying behind boat and foraging in water	N/A	N/A
	Herring Gull	*Larus argentatus*	13	0	13	0-50	Foraging in areas where dredger has passed	N/A	N/A
Red	Black-tailed Godwit	*Limosa limosa*	23	23	0	200-300	Foraging on intertidal mudflats	No response	N/A
	Kittiwake	*Rissa tridactyla*	4	4	0	0-50	Foraging in areas where dredger has passed	N/A	N/A

Table 4-4: Dredging Survey Results from Survey 2

BoCCI Conservation Status [30]	**Species**	***Latin Name***	**Total Number Recorded**	**Number of Individuals (No Response)**	**Number of Individuals (Response)**	**Closest Distance of Individual Recorded (m)**	**Closest Individual Recorded - Behaviour**	**Closest Individual Recorded - Response to Dredger**	**Closest Individual Recorded - Duration of Response (seconds)**
Green	Great Black-backed Gull	*Larus marinus*	13	13	0	0-50	Foraging in areas where dredger has passed	N/A	N/A
	Grey Heron	*Ardea cinerea*	1	1	0	200-300	Perched on intertidal mudflat	No response	N/A
	Little Egret	*Egretta garzetta*	15	15	0	200-300	Foraging on intertidal mudflats	No response	N/A
Amber	Black-headed Gull	*Larus ridibundus*	211	176	35	0-50	A group of individuals flying behind boat and foraging in water	N/A	N/A
	Cormorant	*Phalacrocorax carbo*	36	36	0	200-300	Perching on old fishing pier	No response	N/A
	Herring Gull	*Larus argentatus*	39	36	3	0-50	A group of individuals foraging in areas where dredger has passed	N/A	N/A
	Lesser Black-backed Gull	*Larus fuscus*	8	8	0	0-50	Foraging in water	No response	N/A
Red	Black-tailed Godwit	*Limosa limosa*	2	2	0	300	Foraging on intertidal mudflats	No response	N/A
	Curlew	*Numenius arquata*	1	1	0	150	Foraging on intertidal mudflats	No response	N/A
	Oystercatcher	*Haematopus ostralegus*	28	28	0	150	Foraging on intertidal mudflats	No response	N/A

4.3 External Specialist

4.3.1 Benthic Ecology Survey Report - Aquafact

The granulometry and the percentage organic carbon indicated that the sediment within the estuary is comprised of sand in the Duncannon area, gravelly muddy sand in the Passage East area, and slightly gravelly muddy sands and muddy sands in Cheekpoint.

The faunal analysis of the samples identified a total of 44No. taxa ascribed to 6No. phyla and comprising 339No. individuals.

Further analysis of the faunal samples revealed 4 statistically significant groupings (Group A, Group B, Group C and Group D):

- Group A – Sample CP6 from Cheekpoint;
- Group B – Samples CP1, CP3, CP2 & CP9 from Cheekpoint;
- Group C – Samples CP4, CP5 & CP10 from Cheekpoint and PE3 from Passage East; and,
- Group D – DV1, DB3, DB4, DB2 & DB6 from Duncannon Channel.

Using the JNCC biotopes, Aquafact were able to confirm that the above-mentioned groups could be classified into 3No. biotopes:

- Group A (Cheekpoint) and Group B (Cheekpoint) were classified as belonging to the JNCC habitat SS.SMu.SMuVS.PolCvol *Polydora ciliate* and *Corophium volutator* in variable salinity infralittoral firm mud or clay (EUNIS Code: A5.321);
- Group C (Cheekpoint and Passage East) were classified as belonging to the JNCC habitat SS.SMu.SMuVS.MoMu – Infralittoral fluid mobile mud (EUNIS code: A5.324); and,
- Group D (Duncannon Channel) were classified as belonging to the JNCC habitat SS.SSa.IMuSa.FfabMag *Fabulina fabula* and *Magelona mirabilis* with venerid bivalves and amphipods in infralittoral compacted fine muddy sand (EUNIS code A5.242) [18].

Furthermore, Groups A & B were classified as the benthic community habitat 'muddy estuarine community complex,' which commonly occurs within the River Barrow and River Nore SAC [31]. This community complex is present intertidally and subtidally from Cheekpoint and Great Island northward to New Ross. The substrate of this community complex is predominantly of fine material and the distinguishing species for this group are the bivalve *Scrobicularia plana* and *Macoma balthica*, the amphipod *Corophium volutator*, the polychaete *Streblospio shrubsolii* and the oligochaetes *Tubificoides pseudogaster* and *Tubificoides benedii*. These species are indicative of variable salinity community.

In addition, Group D was also classified as belonging to another common benthic community habitat types occurring in the River Barrow and River Nore SAC namely 'fine sand with *Fabulina fabula* community' [31]. This subtidal community is confined to the southern margin of the Estuary at the mouth of the Waterford Estuary. The northern limit of this habitat is broadly delineated by a line extending from Crooke on the western side to Balinphile on the eastern side of the Waterford Estuary. The biological community is distinguished by the co-occurrence of moderately large numbers of the bivalve *Fabulina fabula* and the polychaete *Nephtys hombergii*. Also frequently present are the polychaetes *Owenia* and *Magelona filiformis* and the bivalve *Mactra stultorum*.

It should be noted that the habitat types 'muddy estuarine community complex' and 'fine sand with *Fabulina fabula* community' are community types that make up part of the Annex I habitat

'estuaries' [31]. In addition, 'muddy estuarine community complex' also makes up part of the Annex I habitat 'mudflats and sandflats not covered by seawater at low tide' [31].

Please refer to the Benthic Ecology Report has been prepared by Aquafact International Services Ltd. (APEM Group) for further details.

4.3.2 Fisheries Report – Dr. [redacted]

A generalised categorisation of fish in estuaries for part or all of their lives would include:

- Marine - species that spawn at sea;
- Freshwater - species that spawn in fresh water;
- Estuarine-resident - species that complete their life cycle within the estuary; and,
- Diadromous - species that feed at sea and migrate into fresh water to spawn (anadromous[1]) or undergo the reverse migration (catadromous[2]).

For fish species inhabiting the Waterford Estuary for all or part of their lives, there are corresponding preferential ranges of salinity, temperature and oxygen concentrations. Varying turbidity / suspended solids levels are normal for any estuarine regime and for many species, high turbidity and high suspended solids levels facilitate their avoidance of piscivorous fish and birds.

Following a review of the WFD surveillance monitoring reports, National Bass conservation programme surveys and the fish impingement studies undertaken at Great Island CWS, a total of 49 different fish species have been recorded in the Waterford Estuary.

It is well documented that the Waterford Estuary is designated for five (5No.) fish species under the River Barrow and River Nores SAC:

- Atlantic salmon (*Salmo salar*);
- Sea lamprey (*Petromyzon marinus*);
- Brook lamprey (*Lampetra planeri*);
- River lamprey (*Lampetra fluviatilis*); and,
- Twaite shad (*Alosa fallax*).

Of these species, it should be noted that brook lamprey has not been recorded within the Waterford Estuary as this species lives their entire lifecycle within freshwater habitat. A description of each species within Waterford Estuary is provided below:

Atlantic Salmon

The Atlantic salmon is an anadromous species, spawning in freshwater and migrating to sea, typically after one or more years of life in freshwater (depending on the productivity of the freshwater habitat and the temperature regime of the freshwater habitat, which can both be related to latitude) throughout its geographic range.

Atlantic salmon smolt pass seaward through Waterford Estuary rapidly, and all the available evidence on the duration of passage of Atlantic salmon through estuaries suggests that they pass through the estuary during a period lasting perhaps one to several days. Salmon smolt passing seaward will continue feeding during their seaward migration through Waterford Estuary.

[1] Anadromous species include the Atlantic salmon (*Salmo salar*) and river lamprey (*Lampetra fluviatilis*).
[2] Catadromous species include species such as the European eel (*Anguilla anguilla*).

The duration of passage through the estuary of maturing adult salmon on their return migration to their natal river will depend on the flows emanating from their natal river. During droughts when there is limited freshwater flow in rivers, returning adults will have prolonged residence within the Waterford Estuary. Whereas during non-drought conditions, returning adult salmon will pass rapidly through Waterford Estuary and enter their natal river when adequate freshwater flows are available to facilitate their entry and upstream migration in their natal river.

Typically, early running multi-sea-winter (MSW) fish enter natal rivers during the spring months while one-sea-winter (1SW) and MSW summer fish will enter their natal rivers during the summer months. It should be noted that mature adults on their return migration do not feed within the estuary during their migration, therefore, it can be stated that they have very little dependency on the estuarine environment.

Sea Lamprey

The spawning adult sea lamprey migrate from the sea through Waterford Estuary and to freshwater spawning habitat during the late spring months and typically spawn in suitable shallow flowing water habitat with stony substrate during the months of May and June. The juveniles (ammocoetes) spend several years in suitable silty substrates before they transform (metamorphose), typically during the autumn months, and make their downstream migration to the sea.

These transformers have been recorded in Waterford Estuary during the November fish impingement studies at Great Island. It is believed that the transformers typically migrate through the estuary quickly and enter the open sea where they attach to suitable hosts and commence feeding on host blood and other body fluids. There is evidence that sea lamprey are disloyal to their natal river and accordingly this species can be considered to have at least regional populations from which adults ascend into suitable spawning rivers which are not necessarily their natal river to spawn and die.

River Lamprey

The spawning adult river lamprey also migrate from the sea through Waterford Estuary and to freshwater spawning during the early spring months. This species typically spawn in suitable shallow flowing water habitat with stony substrate during the months of April and May, after which they die. The juveniles (ammocoetes) spend several years before they transform (metamorphose) and make their downstream migration to the sea, typically during the spring months.

These transformers have also been recorded in Waterford Estuary during November fish impingement studies at Great Island and adults have been recorded during fish impingement studies carried out during June. However, unlike sea lamprey, river lamprey spend all their adult lives in an estuarine / coastal environment where they attach to suitable hosts and commence feeding on host blood and other body fluids. Accordingly, river lamprey are highly estuary dependent during their adult lives. There is no evidence that adults return to their natal river to spawn, and it is likely that regional populations exist which spawn in a number of local rivers which are not necessarily their natal river.

Twaite Shad

In Waterford Estuary, adult Twaite shad are known to enter the lower reaches of the River Barrow where they spawn in the vicinity of St Mullins in April and May each year. Spawning activity peaking during May and eggs will hatch in a short time afterwards. Then the young shad begin to drift into the estuary proper where conditions of relatively low salinity are experienced.

While Twaite shad is considered a diadromous species, estuarine residence time for juveniles can be prolonged. There is evidence from Waterford Estuary that fish in their first and second

year of life continue to reside in the estuary. This evidence comes from WFD surveillance monitoring surveys carried out by Inland Fisheries Ireland [20, 21] and from the fish impingement studies carried out at Great Island thermal electricity generating station cooling water system [24]. The fork-length frequency distribution of Twaite shad washed off the band-screens at Great Island CWS during November 2022 confirms the presence of 0+(<13.5cm), 1+ (15.5-22.4cm) and a small number of older fish (>24.0cm) [25].

Ecological Status of Fish in Waterford Estuary

These WFD surveillance monitoring survey work and other research within the Waterford Estuary have identified a wide range of fish species life stages are present in Waterford Estuary and these species represent various categories which in general relate to their level of dependency on the estuarine environment to complete their life cycles.

The WFD surveillance monitoring survey carried out during 2016 and 2019 by the IFI, the competent authority in the Republic of Ireland, concluded that the ecological status of fish in Waterford Estuary was of '*good'* status [20, 21]. In addition, the Barrow-Nore-Suir Complex was designated by the IFI as having '*good*' status in 2022 [32].

Please refer to the Fish Report has been prepared by Dr [redacted] of Aztec Management Consultants for further details.

5 IDENTIFICATION OF EUROPEAN SITES

In accordance with the European Commission Methodological Guidance [5], a list of European sites that can be potentially affected by the Proposed Dredging Activities has been compiled. Guidance for Planning Authorities prepared by the Department of Environment Heritage and Local Government [6] states that defining the likely zone of impact for the screening and the approach used will depend on the nature, size, location and the likely significant effects of the project. The key variables determining whether or not a particular European site is likely to be negatively affected by a project are:

- The physical distance from the project to the European site;
- The presence of impact pathways;
- The sensitivities of the ecological receptors; and,
- The potential for in-combination effects.

All SPAs and SACs within 15km have been considered to assess their ecological pathways and functional links. As acknowledged in the OPR guidelines [1], few projects have a zone of influence this large, however the identification of European sites within 15km has become widely accepted as the starting point for the screening process. For this reason, all SPAs and SACs in 15km have been identified for consideration as part of the screening.

There are 12No. European sites located within 15km of the Proposed Dredging Areas and disposal site - these are identified in Figure 5-1. However, please note the Saltee Island SAC has also been included in the screening due to the mobility of the species designated as a qualifying interest.

It should also be noted that the Seas off Wexford candidate SPA has been included in this assessment. It should be noted that the period of observations for this SPA is open until the 9th April 2024, at which time the boundary and conservation objectives of the SPA could possibly be amended. Therefore, at the time of writing this report, the boundary and conservation objectives for this SPA used reflects the information issued by the NPWS on the 9th January 2024 [33].

Table 5-1 outlines the proximity of the European sites in relation to the disposal site and Table 5-2 outlines the proximity of the European sites in relation to the Proposed Dredging Areas.

Figure 5-1: Proposed Dredging Areas and European Designated Sites within 15km

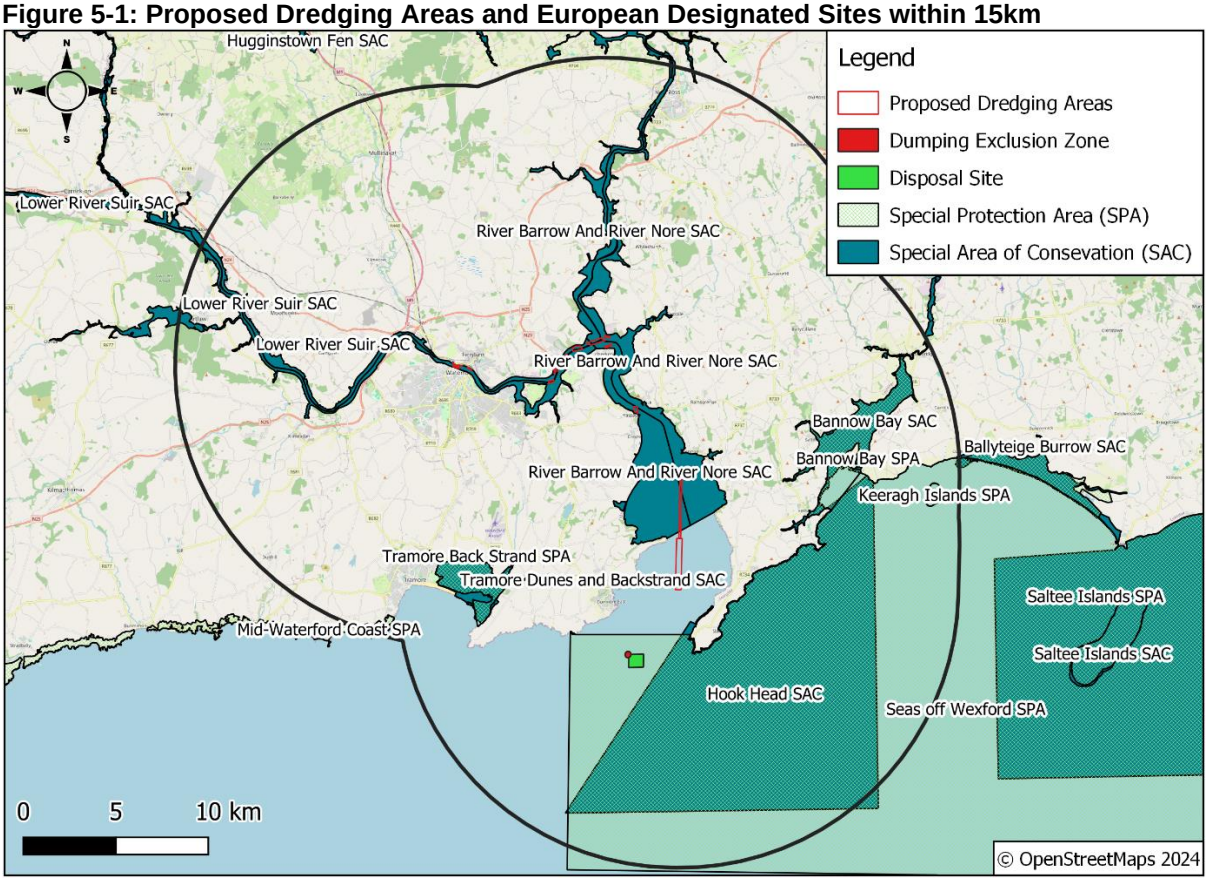


Table 5-1: European Designated Sites within 15km of the Disposal Site

Site Name	Code	Distance (km)	Direction from the Disposal Site
Special Areas of Conservation (SAC)			
Hook Head SAC	000764	0.8km	E
River Barrow and River Nore SAC	002162	6.5km	N
Tramore Dunes and Backstrand SAC	000671	7.9km	NW
Bannow Bay SAC	000697	10.0km	NE
Lower River Suir SAC	002137	13.2km	NW
Saltee Islands SAC	000707	19.1km	E
Ballyteige Burrow SAC	000696	19.6km	NE
Special Protection Area (SPA)			
Seas off Wexford cSPA	004237	Within	Within
Tramore Back Strand SPA	004027	7.9km	NW
Bannow Bay SPA	004033	11.6km	NE

Site Name	Code	Distance (km)	Direction from the Disposal Site
Mid Waterford Coast SPA	004193	12.9km	NW
Keeragh Islands SPA	004118	18.1km	NE

Table 5-2: Dredging Area distances from European Designated Sites

Dredging Area	Distance (Km)											
	Lower River Suir SAC	River Barrow & River Nore SAC	Tramore Dunes & Backstrand SAC	Bannow Bay SAC	Hook Head SAC	Ballyteige Burrow SAC	Saltee Islands SAC	Tramore Back Strand SPA	Bannow Bay SPA	Mid Waterford Coast SPA	Keeragh Islands SPA	Seas off Wexford cSPA
	002137	002162	000671	000697	000764	000696	000707	004027	004033	004193	004118	004237
Duncannon Channel	8.0km NW	**Within**	8.5km SW	5.5km E	4.0km SE	15.2km E	17km SE	8.7km SW	5.7km E	16.0km SW	13.4km E	5.4km S
Cheekpoint Lower	**Within**	**Within**	12.1km SW	11.3km SE	15.5km SE	20.0km SE	24.1km SE	12.1km SW	11.8km SE	18.2km SW	19.2km SE	16km SE
Belview Berths	**Within**	1.4km E	10.5km SW	12.9km SE	15.7km SE	21.7km SE	25.6km SE	10.5km SW	13.5km SE	16.1km SW	20.9km SE	15.2km SE
Belview Turning Area	**Within**	1.8km E	10.3km SW	13.0km SE	15.4km SE	21.8km SE	25.6km SE	10.3km SW	13.6km SE	16.0km SW	21.0km SE	14.7km SE
Belview to O'Brien's Quay	**Within**	2.3km E	10.2km SW	13.4km SE	15.3kmSE	22.2km SE	25.8km SE	10.2km SW	14.0km SE	16.0km SW	21.2km SE	14.5km SE
Cheekpoint Harbour Access	0.5km W	**Within**	12.3km SE	10.8km SW	15.0km SE	19.6km SE	23.6km SE	12.3km SE	11.8km SW	18.6km SW	18.8km SE	16.9km SE
Cheekpoint Upper	**Within**	0.7km E	11.5km SE	12.2km SE	15.5km SE	21.0km SE	25km SE	11.5km SE	12.8km SE	17.3km SW	20.3km SE	15.6km SE
Creadan Bank	11.0km NW	0.2km N	8.4km SW	5.4km E	1.8km SE	15.3km NE	16.9km SE	8.3km SW	6.3km NE	15.3km SW	13.3km NE	2.9km S

Dredging Area	Distance (Km)											
	Lower River Suir SAC	**River Barrow & River Nore SAC**	**Tramore Dunes & Backstrand SAC**	**Bannow Bay SAC**	**Hook Head SAC**	**Ballyteige Burrow SAC**	**Saltee Islands SAC**	**Tramore Back Strand SPA**	**Bannow Bay SPA**	**Mid Waterford Coast SPA**	**Keeragh Islands SPA**	**Seas off Wexford cSPA**
	002137	002162	000671	000697	000764	000696	000707	004027	004033	004193	004118	004237
Frank Cassin Wharf	**Within**	6.6km E	9.9km S	17.8km SE	18.0km SE	26.7km SE	30.1km SE	10.0km S	17.9km SE	14.0km SW	25.6km SE	15km SE
Forde Wharf & Merchants Quay Marina	**Within**	7.2km E	10.0km SW	18.5km SE	18.8km SE	27.3km SE	30.7km SE	10.1km SW	19.1km SE	13.8km SW	26.2km SE	15.4km SE
Great Island Jetty	0.7km W	**Within**	12.8km SW	11.1km SE	15.5km SE	18.8km SE	23.9km SE	12.8km SW	11.6km SE	19.2km SW	19.1km SE	16.1km S
North Wharf	**Within**	6.9km E	10.1km SW	18.3km SE	18.7km SE	27.1km SE	30.6km SE	10.2km SW	19.0km SE	14.0km SW	26.0km SE	15.4km SE
O'Brien's Quay	**Within**	2.4km E	10.0km SW	13.3km SE	15.2km SE	22.0km SE	25.8km SE	10.0km SW	14.0km SE	15.7km SW	21.3km SE	14.1km SE
Passage East Boathouse Quay	4.1km NW	**Within**	10.2km SW	8.5km SE	11.1km SE	17.4km SE	20.8km SE	10.2km SW	9.2km SE	17.2km SW	16.3km SE	11.9km SE
Passage East Shoal	3.8km NW	**Within**	10.1km SW	8.5km SE	11.1km SE	17.4km SE	20.9km SE	10.1km SW	9.2km SE	17.1km SW	16.3km SE	12km SE

Dredging Area	Distance (Km)											
	Lower River Suir SAC	**River Barrow & River Nore SAC**	**Tramore Dunes & Backstrand SAC**	**Bannow Bay SAC**	**Hook Head SAC**	**Ballyteige Burrow SAC**	**Saltee Islands SAC**	**Tramore Back Strand SPA**	**Bannow Bay SPA**	**Mid Waterford Coast SPA**	**Keeragh Islands SPA**	**Seas off Wexford cSPA**
	002137	002162	000671	000697	000764	000696	000707	004027	004033	004193	004118	004237
Spit Light and Queen's Channel	**Within**	2.8km E	9.4km SW	13.2km SE	14.8km SE	22.2km SE	25.7km	9.4km SW	13.9km SE	15.2km SW	21.2km SE	13.5km S

5.1 Identification of European Sites within ZoI

Habitat Loss / Degradation

The dredging areas are located within the Waterford Estuary and the River Suir. As outlined in Table 5-1, 10No. of the dredging areas are located within the Lower River Suir SAC and 6No. areas are located within the River Barrow and River Nore SAC. However, the disposal site is not located within a Designated site.

In addition, as discussed in Section 4.2.1, the benthic samples taken within the dredging areas in the Cheekpoint, Passage East were classified as the benthic community habitat 'muddy estuarine community complex,' and the samples taken in the Duncannon Channel dredging area were classified as belonging to another common benthic community habitat type 'fine sand with *Fabulina fabula* community' [31]. Both of these habitat are community types that make up part of the Annex I habitat 'estuaries,' which is designated as per the River Barrow and River Nore SAC [31].

It should be noted that Hook Head SAC is located ca. 0.8km from the disposal site and ca. 1.8km from the Creadan Bank dredging area. Therefore, although this European Designated site will not be subjected to direct habitat loss as a result of the Proposed Dredging Activities, it is considered that possible habitat degradation may occur due to water quality impairment.

Although the dredging areas are hydrologically linked to all of the European Designated sites outlined in Table 5-1, these sites are all located at a great distance to the dredging areas and disposal site (see Table 5-3)

Table 5-3: Distance between European Designated sites and the Dredging Areas and Disposal Site

European Designated Sites	Distance from Dredging Areas	Distance from Offshore Disposal Site
Bannow Bay SAC	5.4km	10.0km
Bannow Bay SPA	5.7km	11.6km
Tramore Back Strand SPA	8.3km	7.9km
Tramore Dunes and Backstrand SAC	8.4km	7.9km
Keeragh Islands SPA	13.0km	18.1km
Mid Waterford Coast SPA	13.8km	12.9km
Ballyteige Burrow SAC	15.2km	19.6km
Saltee Islands SPA	16.9km	19.1km

Therefore, it is concluded that these European designated sites will not be affected by direct habitat loss. Furthermore, given the distance separating these sites and the dredged areas and the disposal site, it is considered that habitat degradation will not occur due to the fact that any potential pollutants would be diluted to such a small factor should they eventually reach any of these European Designated sites.

However, in order to ensure no habitat loss or degradation occurs to the Lower River Suir SAC, the River Barrow and River Nore SAC and Hook Head SAC, water quality measures will be implemented (see below).

Water Quality Impairment

Potential water quality impacts would typically be associated with the release of sediment and other pollutants to surface water during the works, therefore the ZoI would be considered to include the receiving waterbodies within, upstream and downstream of the Proposed Dredging Areas and disposal site during the Proposed Dredging Activities within 5km.

As previously mentioned, the dredging area are located within four (4No.) watercourses the Middle Suir Estuary, Lower Suir Estuary, Barrow Suir Nore Estuary and Waterford Harbour, which make up the Lower River Suir SAC and the River Barrow and River Nore SAC. In addition, the disposal site is located within the Seas off Wexford cSPA and the Eastern Celtic Sea, which is located within close proximity to Hook Head SAC.

Therefore, due to the fact that the Lower River Suir SAC, the River Barrow and River Nore SAC, Hook Head SAC and Seas off Wexford cSPA are within the 5km ZoI, further consideration will be given to this European site and its qualifying features of interest to assess potential impacts arising from water quality impairment as a result of the proposed dredging activities.

Dust

The proposed works will constitute only underwater works. Therefore, there is no potential for dust to arise as part of the Proposed Dredging Activities and as such potential dust impacts have been screened out from further consideration.

Noise / Disturbance

Noise from the proposed dredging activities has the potential to cause disturbance to resting, foraging and commuting qualifying species of the European sites.

Ambient Noise

It should also be noted that the ambient acoustic environment within the Waterford Harbour is influenced by a mixture of sounds sources, including natural sources, such as tidal movement of water and sediment and wind, and anthropogenic sources, such as commercial and recreational movements of vessels from Waterford City to the Celtic Sea. The Port of Waterford is an established Tier 2 Port and is located within a zoned port and industrial setting.

Due to the setting the local ambient sound within the Proposed Dredging Areas are expected to be typically higher than those for areas not zoned for port and industrial operations. The Proposed Dredging Activities will take place from a dredging vessel. The vessel will produce ambient noise emissions that are anticipated to be similar to existing shipping movements within the Waterford Estuary.

Therefore, localised noise emissions may arise from dredging operations and there may be discernible noise levels within the immediate vicinity of the dredger. However, given the distances from the disposal location to the mainland areas are great enough that any airborne noise levels associated with the disposal at sea process will not significantly impact on potential receptors on land. Furthermore, it is considered that any species utilising the Waterford Estuary has been habituated to anthropogenic noise sources from the current shipping movements.

Avian Disturbance

Disturbances as a result of dredging can result in the flushing of bird species from an area or avoidance of an area by bird species. Flushing distance for bird species can vary by both species and flock size [28]. Species such as cormorant, divers, grebes, and seaduck (eiders, scoters and long-tailed ducks) are considered to be highly sensitive species to direct disturbances that may occur from dredging works [28, 34]. Disturbance / displacement from an area is considered to effectively be habitat loss as the species. However, it has been shown

that boats can approach within 100m to sensitive species before a response ('flight') is triggered [28, 34, 35]. Whereas, generally, it is considered that gulls, terns, gannets and storm petrels are to be of low sensitivity to disturbance effects that may occur as a result of dredging works [28].

Therefore, the ZoI for disturbance effects to avian species is therefore established as the Proposed Dredging Areas and the offshore disposal site with a 100m buffer. Given that the Seas of Wexford SPA overlap with the offshore disposal site, this SPA will be taken forward for further consideration.

Underwater Noise

As the works will be marine-based, the primary potential impacts are anticipated to be underwater noise impacts beyond the immediate vicinity of the Proposed Dredging Areas and disposal site.

Otter, which are designated under the Lower River Suir SAC and the River Barrow and River Nore SAC, are known to occur within the Waterford Estuary and there are recent records of otters occurring within 2km of the Proposed Dredging Areas [15]. It should be noted that otter tend to forage within 80m of the shoreline (high water mark) [36]. Therefore, given the fact that the Creadan Bank and Duncannon Channel dredging areas are located over 500m from the shoreline and the disposal site is ca. 2.3km from the shoreline, these areas are not considered suitable for otter. However, a number of the Proposed Dredging Areas are located within areas considered suitable for commuting and foraging otters. Therefore, potential underwater noise impacts will be considered for this species.

Furthermore, although the Saltee Island SAC is located ca. 19.1km from the disposal site, the SAC is designated for grey seals, which have been recorded foraging within the waters near the disposal site and within Waterford Estuary. Therefore, potential underwater noise impacts will be considered for this species.

Underwater noise and vibration impacts on designated fish and marine mammals may cause the following:

- Behavioural effects (Substantial change in behaviour for the animals exposed to a sound, i.e., changes in swimming behaviour and orientation, communication between individuals of the same species and detection of predators / prey);
- Masking effects (i.e., the reduction in the detectability of a given sound as a result of the simultaneous occurrence of another sound);
- Temporary Threshold Shift (TTS) in hearing (short-or long-term changes in hearing sensitivity that may or may not reduce fitness);
- Recoverable tissue injury (injuries including hair cell damage, minor internal or external hematoma etc. Injuries that are not likely to result in mortality.); and,
- Mortality and potential mortal injury (immediate or delayed death).

Disturbances to fish species as result a result of dredging activities include [37]:

- Increased suspended solids;
- Disturbances to benthic habitat and benthic invertebrate food supply for fish species;
- Alterations to the levels of organic matter and dissolved oxygen;
- Increased water turbidity; and,
- Potential release / exposure of contaminated sediments.

However, the consequences of dredging on fish assemblages are often species specific and the magnitude of impacts vary among estuaries.

Although, given the possibility of potential impacts to designated species of the Lower River Suir SAC, the River Barrow and River Nore SAC and Saltee Islands SAC (otter, grey seal and fish) will be screened in for potential underwater noise and disturbance impacts.

Identification of European Sites

The boundaries of 12No. European Designated sites are located within 15km from the Proposed Dredging Areas and the disposal site. In addition, the Saltee Island SAC has also been assessed due to the mobility of the species designated as a qualifying interest.

Overall, 10No. of the Proposed Dredging Areas are located within the Lower River Suir SAC and 6No. of the Proposed Dredging Areas are located within the River Barrow and River Nore SAC. The disposal site is also located within the Seas off Wexford cSPA.

Given the nature of the Proposed Dredging Activities, the distance and intervening lands separating the Proposed Dredging Areas and the disposal site from the Tramore Dunes and Backstrand SAC, Bannow Strand SAC, Tramore Back Strand SPA, Bannow Bay SPA, Ballyteige Burrow SAC, Mid Waterford Coast SPA and Keeragh Islands SPA, the Proposed Dredging Areas and the lack of impact pathways, it is considered that the Proposed Dredging Activities will not result in adverse effects to these European sites, and they have therefore been screened out from further consideration.

The following European sites listed in Table 5-4 have been screened in for further consideration to assess potential adverse effects resulting from the Proposed Dredging Activities.

Table 5-4: European Designated Sites within ZoI

Site Name	Code	Distance at closest point and source-pathway-receptor link
Lower River Suir SAC	002137	10No. Proposed Dredging Areas are located within the Lower River Suir SAC (see Figure 5-1), therefore this SAC will be taken forward for further consideration for potential water quality impairment that could result in habitat degradation and potential ambient and underwater noise and disturbance.
River Barrow and River Nore SAC	002162	6No. Proposed Dredging Areas are located within the River Barrow and River Nore SAC (see Figure 5-1); therefore this SAC will be taken forward for further consideration for potential water quality impairment that could result in habitat degradation and potential ambient and underwater noise and disturbance.
Hook Head SAC	000764	The disposal site is in close proximity to the SAC. Therefore, given the hydrological connection and close proximity, potential water quality impairment that could result in habitat degradation will be taken forward for further consideration
Saltee Island SAC	000707	The disposal site is hydrologically connected to the SAC and grey seal, which is a designated species is known to utilise the Waterford Harbour. Therefore, potential water quality and potential ambient and underwater noise and disturbance will be taken forward for further consideration.
Seas off Wexford cSPA	004237	The disposal site is located within this candidate SPA. Therefore, potential effects from disturbance and impairment to water quality to this SPA will be taken forward for further consideration.

The screening assessment for individual designated habitats and species for each of the screened in European sites and the potential for them to be adversely affected by the Proposed Dredging Activities are presented in Section 6 below.

Further information on the screened in European sites is provided below.

5.2 Lower River Suir SAC (Site Code: 002137)

The Lower River Suir SAC, is an extensive site, which covers the freshwater stretches of the River Suir from south of Thurles, Co. Tipperary, to the Barrow-Suir confluence east of Cheekpoint, Co. Waterford.

The SAC is comprised of a number of Annex I habitats, including the priority habitats alluvial forest and Yew woodland (Table 5-5). Other habitats within the SAC include wet and dry grassland, marsh, reed swamp, improved grassland, tidal river, deciduous woodland and mudflats.

The SAC is of conservation interest for the presence of a number of Annex II species including Freshwater Pearl Mussel, Otter, White-clawed Crayfish, Salmon, Twaite Shad and three species of Lampreys- Sea, Brook and River Lamprey. The site is one of only three known spawning grounds in the country for Twaite Shad. The site is also of ornithological importance for the number of Annex I bird species, E.U. Birds Directive including Golden Plover, Whooper Swan and Kingfisher.

Intensive agriculture is the primary land use along the banks of the river. The widespread use of fertiliser and slurry pose the greatest threats to the conservation status of the SAC due to the related impairment in water quality. Furthermore, there are multiple industrial developments, which border the SAC, and discharge into the river. Fishing is the primary tourism attraction along the stretches of the Suir, including both commercial and leisure fishing with numerous Angler Associations [38].

Table 5-5: Qualifying Annex I Habitats for the Lower Suir SAC

Qualifying Habitats **(* denotes Priority Habitat)**	**Code**	**Site Specific Conservation Objective**
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	1330	Restore favourable conservation condition
Mediterranean salt meadows (*Juncetalia maritimi*)	1410	Restore favourable conservation condition
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	3260	Maintain favourable conservation condition
Old sessile oak woods with Ilex and Blechnum in British Isles	91A0	Restore favourable conservation condition
Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)	91E0	Restore favourable conservation condition
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	6430	Maintain favourable conservation condition

Table 5-6: Qualifying Annex II Species for the Lower Suir SAC

Species	**Species Name**	**Code**
Mammals listed on Annex II of the Habitats Directive	Otter (*Lutra lutra*)	1355

Species	Species Name	Code
Fish listed on Annex II of the Habitats Directive	Atlantic salmon (*Salmo salar*)	1106
	Sea lamprey (*Petromyzon marinus*)	1095
	Brook lamprey (*Lampetra planeri*)	1096
	River lamprey (*Lampetra fluviatilis*)	1099
	Twaite shad (*Alosa fallax*)	1103
Molluscs listed on Annex II of the Habitats Directive	Freshwater pearl mussel (*Margaritifera margaritifera*)	1029
Crustaceans listed on Annex II of the Habitats Directive	White-clawed crayfish (*Austropotamobius pallipes)*	1092

5.3 River Barrow and River Nore SAC (Site Code: 002162)

The River Barrow and River Nore SAC consists of the freshwater stretches of the Barrow and Nore River catchments extending from the Slieve Bloom Mountains to the estuary and tidal elements in Creadan Head, Waterford.

Species rich habitats (Annex I of the EU Habitats Directive) including estuaries, alluvial forests, petrifying springs, and intertidal mudflats and sandflats can be found within this SAC.

This SAC is of considerable conservation significance for multiple reasons:

- Ornithological importance: This SAC supports Kingfisher, a nationally important bird population listed in Annex I of the EU Birds Directive. One SPA (River Nore), designated under the EU Birds Directive, is also located within the SAC; and,
- This SAC supports multiple species listed on Annex II of the EU Habitats Directive, including Otter, River Lamprey and Salmon.

Land use within the SAC is primarily agricultural, principally grazing and silage production. Fishing is also a main tourist attraction along stretches of the main rivers and their tributaries. Other recreational activities such as boating, golfing, and walking also occur within the SAC. The main threats to the SAC and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and sewage plants, along with over-grazing, invasion of non-native species and land reclamation [39].

Table 5-7: Qualifying Annex I Habitats for the River Barrow and River Nore SAC

Qualifying Habitats (*denotes Priority Habitat)	Code	Site Specific Conservation Objective
Estuaries	1130	Maintain favourable conservation condition
Mudflats and Sandflats not covered by seawater at low tide	1140	Maintain favourable conservation condition
Salicornia and other annuals colonizing mud and sand	1310	Maintain favourable conservation condition
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae)*	1330	Restore favourable conservation condition

Qualifying Habitats (*denotes Priority Habitat)	Code	Site Specific Conservation Objective
Mediterranean salt meadows (*Juncetalia maritimi)*	1410	Restore favourable conservation condition
Water courses of plain to montane levels with *the Ranunculion fluitantis* and *Callitricho - Batrachion* vegetation	3260	Maintain favourable conservation condition
European dry heaths	4030	Maintain favourable conservation condition
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	6430	Maintain favourable conservation condition
Petrifying springs with tufa formation (Cratoneuron)*	7220	Maintain favourable conservation condition
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	91A0	Restore favourable conservation condition
Alluvial forests with *Alnus glutinosa and Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)*	91E0	Restore favourable conservation condition

Table 5-8: Qualifying Annex II Species for the River Barrow and River Nore SAC

Qualifying Species	Species Name	Code
Mammals listed on Annex II of the Habitats Directive	Otter *(Lutra lutra)*	1355
Molluscs listed on Annex II of the Habitats Directive	Freshwater pearl mussel (*Margaritifera margaritifera*)	1029
	Nore Freshwater pearl mussel (*Margaritifera durrovensis*)	1990
	Desmoulin's whorl snail (*Vertigo moulinsiana)*	1016
Crustaceans listed on Annex II of the Habitats Directive	White-clawed crayfish (*Austropotamobius pallipes)*	1092
Fish listed on Annex II of the Habitats Directive	Salmon (*Salmo salar)*	1106
	Sea Lamprey (*Petromyzon marinus*)	1095
	Brook Lamprey (*Lampetra planeri*)	1096
	River Lamprey *(Lampetra fluviatilis)*	1099
	Twaite Shad *(Alosa fallax)*	1103
Flora listed on Annex II of the Habitats Directive	Killarney Fern (*Trichomanes speciosum)*	1421

5.4 Hook Head SAC (Site Code: 000764)

The areas of conservation interest at Hook Head comprise of marine subtidal reefs to the south and east of the Hook Head Peninsula, and also sea cliffs from Hook Head to Baginbun and Ingard Point. The peninsula forms the eastern side of Waterford Estuary, while to the east

it adjoins the estuary mouth of Bannow Bay. Hook Head itself is composed of Carboniferous limestone overlain by Devonian Old Red Sandstone and is paleontologically of international importance. The site is selected for the qualifying habitats set out in Table 5-9 below.

Table 5-9: Qualifying Annex I Habitats for the Hook Head SAC

Qualifying Habitats *(*denotes Priority Habitat)*	**Code**
Large shallow inlets and bays	1160
Reefs	1170
Vegetated sea cliffs of the Atlantic and Baltic coasts	1230

5.5 Saltee Islands SAC (Site Code:000707)

This SAC includes the 2No. Saltee Islands, Great Saltee and Little Saltee, and surrounding seas, located off the Wexford coast. The islands form a broken reef with various seabed features. Subtidal reefs range from rugged bedrock to boulders mixed with sand and cobbles, supporting diverse communities, including colonial sea squirts.

In shallow waters, mixed kelp species and fauna are found, while deeper areas feature kelp forests and animal-dominated reef communities. The littoral sediments support a range of marine life, and the terrestrial areas are dominated by bracken, bluebells, and bramble, with some dry grassland and seepage areas. Notable species with limited distribution in Britain and Ireland inhabit the area, particularly in ascidian-dominated communities.

The Great Saltee Island has a breeding population of grey seal, which is one of the very few in eastern Ireland.

The site is also of ornithological importance for a range of breeding seabird colonies, including gannets, cormorants, shags, fulmars, kittiwakes, guillemots, razorbills, puffins, and Manx shearwaters. Peregrine falcons and choughs have also been known to breed on the islands.

Table 5-10: Qualifying Annex I Habitats for the Saltee Islands SAC

Qualifying Habitats *(*denotes Priority Habitat)*	**Code**	**Site Specific Conservation Objective**
Mudflats and sandflats not covered by seawater at low tide	1140	Maintain favourable conservation condition
Large shallow inlets and bays	1160	Maintain favourable conservation condition
Reefs	1170	Maintain favourable conservation condition
Vegetated sea cliffs of the Atlantic and Baltic coasts	1230	Maintain favourable conservation condition
Submerged or partially submerged sea caves	8330	Maintain favourable conservation condition

Table 5-11: Qualifying Annex II Species for the Saltee Islands SAC

Qualifying Species	**Species Name**	**Code**
Mammals listed on Annex II of the Habitats Directive	Grey Seal *(Halichoerus grypus)*	1364

5.6 Seas off Wexford cSPA (Site Code: 004237)

The current boundary of this candidate SPA, at the time of writing this report, extends offshore along the majority of coastline of County Wexford and covers an area of ca. 3,054 km^2. The waters mark the boundary between the Irish and Celtic Seas and provide valuable feeding habitat for the seabirds that annually return to Wexford's coastal and island colonies for breeding during the spring

The site is connected to 4No. SPAs designated for breeding seabird namely the Lady's Island Lake SPA, the Wexford Harbour and Slobs SPA, the Keeragh Islands SPA and the Saltee Islands SPA.

Beyond the summer season, these relatively shallow coastal waters offer secure feeding and roosting opportunities for various marine birds that either overwinter in the area or on passage.

The site is of special conservation importance for the breeding populations of the species listed in Table 5-11, and for the non-breeding populations of cormorant, red-throated diver and common scoter.

Table 5-12: Qualifying Annex I Species of birds for Seas off Wexford cSPA

Common Name	Scientific name	Code
Red-throated Diver	*Gavia stellata*	A001
Fulmar	*Fulmarus glacialis*	A009
Manx Shearwater	*Puffinus puffinus*	A013
Gannet	*Morus bassanus*	A016
Cormorant	*Phalacrocorax carbo*	A017
Shag	*Phalacrocorax aristotelis*	A018
Common Scoter	*Melanitta nigra*	A065
Mediterranean Gull	*Larus melanocephalus*	A176
Black-headed Gull	*Chroicocephalus ridibundus*	A179
Lesser Black-backed Gull	*Larus fuscus*	A183
Herring Gull	*Larus argentatus*	A184
Kittiwake	*Rissa tridactyla*	A188
Sandwich Tern	*Sterna sandvicensis*	A191
Roseate Tern	*Sterna dougallii*	A192
Common Tern	*Sterna hirundo*	A193
Artic Tern	*Sterna paradisae*	A194
Little Tern	*Sterna albifrons*	A195
Guillemot	*Uria aalge*	A199
Razorbill	*Alca torda*	A200

Common Name	Scientific name	Code
Puffin	*Fratercula arctica*	A204

5.7 Conservation Objectives

European and national legislation places a collective obligation in Ireland and its citizens to maintain a favourable conservation status at areas designated as candidate Special Areas of Conservation. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

According to the EU Habitats Directive, favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, is stable or increasing;
- 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.

The favourable conservation status of a species is achieved when:

- Population data on the species concerned indicate that it is maintaining itself.
- The natural range of the species is neither being reduced or 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.

Conservation objectives for all identified European SAC Sites are as follows:

> *'To maintain or restore the favourable conservation condition of the Annex I habitat(s) and the Annex II species for which the SAC has been selected.'*

The full reports for the conservation objectives for the Lower River Suir SAC[3] and River Barrow and River Nore SAC[4], Hook Head SAC[5] ,Saltee Islands SAC[6] and Seas off Wexford cSPA[7] can be found on the NPWS website.

[3] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002137.pdf
[4] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002162.pdf
[5] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000764.pdf
[6] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000707.pdf
[7] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004237.pdf

6 STAGE 1 SCREENING: IDENTIFICATION OF POTENTIAL SIGNIFICANT IMPACTS

6.1 Potential Significant Impacts

Potential significant effects, if any, on the Lower River Suir SAC, the River Barrow and River Nore SAC, the Hook Head SAC, Saltee Islands SAC and Seas off Wexford cSPA were considered further in this section. The key output of this stage of the assessment was the identification of the types of threats to the integrity of the European sites as a result of implementing the Proposed Dredging Activities.

A number of factors were examined at this stage and dismissed due to the very low risk associated with them. Table 6-1, Table 6-2, Table 6-3, Table 6-4, Table 6-5, Table 6-6 and Table 6-7 present further details and rationale of the screening assessment undertaken for each of the qualifying interests of each of the European sites identified as having the potential to be significantly affected.

Table 6-1: Screening Assessment: Annex I Habitats - Lower River Suir SAC

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	According to the Conservation Objectives Report, salt meadows occur below Waterford City in old meadows where the embankment is absent, or has been breached, and along the tidal stretches of some of the in-flowing rivers below Little Island [40]. There are also very narrow, non-continuous bands of this habitat along both banks. More extensive areas are also seen along the south bank at Ballynakill, the east side of Little Island, and in three large salt meadows between Ballynakill and Cheekpoint. It should be noted that this habitat occurs along the coastline of the estuary [40]. This habitat occurs along sheltered coasts, mainly on mud or sand, which are flooded periodically by the sea, and this habitat is restricted to the area between mid-neap tide level and high-water spring tide level [41]. The nearest potential Atlantic salt meadows habitat is located ca. 50m from the Spit Light and Queen's Channel dredging area and ca. 19.3km from the disposal site [40].	- Effects associated with pollution during the proposed works, i.e., Decrease in water quality. - Disturbance during the Proposed Dredging Activities.	Although the nearest Proposed Dredging Area is located ca. 50m from this habitat, it is considered highly unlikely that the works will have any significant direct effects to this habitat given the fact that the Proposed Dredging Activities will be marine-based and will not occur along the coastline where this habitat is located. In addition, it is considered unlikely that any indirect negative effects will occur to this habitat based on the fact that this habitat is located within an estuarine environment, which is a highly dynamic environment due to diurnal tides, resulting in huge variety in levels of salinity, suspended solids, and nutrients. Therefore, this habitat will not be adversely affected	**Screened Out**
Mediterranean salt meadows (*Juncetalia maritimi*)	This habitat has not been mapped in detail for the Lower River Suir SAC and the total area of this habitat is not currently known within the SAC [40]. However, it should be noted that this habitat is typically found high up in the saltmarsh but requires occasional tidal inundation [40].	As per Atlantic salt meadows.	As per Atlantic salt meadows	**Screened Out**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Water courses of plain to montane levels with *the Ranunculion fluitantis* and *Callitricho - Batrachion* vegetation	The distribution of this habitat or its sub-types throughout this SAC is currently unknown [40]. However, this habitat is a freshwater habitat.	N/A	As this is a freshwater habitat, it can be concluded that there are no impact pathways from the Proposed Dredging Activities to this habitat given the fact that the Proposed Dredging Activities will be located within the Waterford Estuary.	**Screened Out**
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	This habitat has not been mapped in detail for the Lower River Suir SAC and the total area of this habitat is not currently known within the SAC [40]. However, the lowland type communities of the habitat are considered to occur in association with various areas of alluvial forest within the SAC, notable at Fiddown, below Carrick-on-Suir and at Tibberaghny Marshes. Fiddown is located ca. 21.3km upstream of the North Wharf Dredging Area and ca. 50km upstream from the disposal site.	N/A	This terrestrial habitat is not located onsite or within the vicinity of the Proposed Dredging Activities and no impact pathways have been identified linking to this habitat. Therefore, there are no potential adverse effects anticipated that could affect this habitat.	**Screened Out**
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	The Conservation Objectives show that this habitat is not present in the immediate vicinity of the Proposed Dredging Activities [40]. The nearest recorded location of this habitat is located 46.2km upstream of the North Wharf Dredging Area at its nearest point and ca. 75km from the disposal site.	N/A	As per hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	**Screened Out**
Alluvial forests with *Alnus glutinosa and Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)	The Conservation Objectives show that this habitat is not present in the immediate vicinity of the Proposed Dredging Activities [40]. The Conservation Objectives show that this habitat is present ca. 830m from the Spit Light and Queen's Channel Dredging Area and ca. 22.5km upstream of the disposal site [40].	N/A	As per hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	**Screened Out**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Taxus baccata woods of the British Isles	This habitat has not been mapped in detail for the Lower River Suir SAC [40]. According to the Conservation Objectives, there are two stands of Yew woods within the SAC [40]. These stands occur on limestone ridges at Shanbally and Cahir Park, the nearest of which is over 60km northwest from the North Wharf Dredging Area [40].	N/A	As per hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	**Screened Out**

Table 6-2: Screening Assessment: Annex II Species - Lower River Suir SAC

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Sea Lamprey (*Petromyzon marinus*)	The NBDC holds records for sea lamprey within the River Suir catchment [40]. As discussed in Section 4.2.2 above, this species migrates through Waterford Estuary throughout its lifecycle.	- Effects associated with pollution during the proposed works, i.e., Decrease in water quality. - Disturbance during the Proposed Dredging Activities.	This species is known to occur within the Waterford Estuary. Therefore, although it is considered highly unlikely that the works will have any significant direct or indirect negative effects on this species given the fact that the Proposed Dredging Areas account for ca. 1.7km^2, which represents only 2% of the Waterford Estuary at high tide. Similarly, given the size of the Waterford Estuary, should any potential pollutants enter the water it can be concluded that these will be dispersed and diluted immediately within the regular flow and large expanse of the estuary. However, taking a precautionary approach, an assessment on potential adverse effects to this species water will be undertaken and mitigation measures will be incorporated into the works, as required, to ensure that there are no potential impacts to this species.	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
River Lamprey (*Lampetra planeri*)	The NBDC holds records for river lamprey within the River Suir catchment [15]. As discussed in Section 4.2.2 above, this species migrates through Waterford Estuary throughout its lifecycle.	As per sea lamprey.	As per sea lamprey.	**Screened In**
Twaite Shad *(Alosa fallax)*	The NBDC holds no records twaite shad within 2km of the Proposed Dredging Activities [15]. As discussed in Section 4.2.2 above, this species migrates through Waterford Estuary throughout its lifecycle.	As per sea lamprey.	As per sea lamprey.	**Screened In**
Atlantic Salmon (*Salmo salar)*	The NBDC holds no records for salmon within 2km of the Proposed Dredging Activities [15]. As discussed in Section 4.2.2 above, this species migrates through Waterford Estuary throughout its lifecycle.	As per sea lamprey.	As per sea lamprey.	**Screened In**
Otter *(Lutra lutra)*	Large river catchments, including the River Suir catchment, are considered to be among the more important SACs for otter. The NBDC holds multiple records for otter within a 2km boundary of the Proposed Dredging Areas [15], and evidence has been recorded by MOR ecologists within the Belview-Cheekpoint-Faithlegg area.	- Effects associated with pollution during the proposed works, i.e., Decrease in water quality. - Disturbance during the Proposed Dredging Activities.	Otters are known to occur within the Lower River Suir SAC and there are recent records of otters occurring within 2km of the Proposed Dredging Areas [15]. It should be noted that otter tend to forage within 80m of the shoreline (high water mark) [36]. Therefore, given the fact that the Creadan Bank and Duncannon Channel dredging areas are located over 500m from the shoreline and the disposal site is ca. 2.3km from the shoreline, these areas are not considered suitable for otter. However, a number of the Proposed Dredging Areas are located within areas considered suitable for commuting and foraging otters. Therefore, although it is considered highly unlikely that the works will have any significant direct or indirect negative effects on this species given the fact that the Proposed Dredging Areas account for	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
			ca. 1.7km^2, which represents only 2% of the Waterford Estuary at high tide. Similarly, given the size of the Waterford Estuary, should any potential pollutants enter the water it can be concluded that these will be dispersed and diluted immediately within the regular flow and large expanse of the estuary. However, taking a precautionary approach, an assessment on potential adverse effects to this species water will be undertaken and mitigation measures will be incorporated into the works as required to ensure that there are no potential impacts to this species.	
Freshwater pearl mussel (*Margaritifera margaritifera*)	Mussel habitat is widespread in the Clodiagh River, with mussels almost continually present in low numbers from downstream of Clonea to above Portlaw [42]. The species was not recorded to be abundant within any area of the SAC [42]. The NBDC holds records for Freshwater pearl mussel within the River Suir catchment [15]. However, there are no recent records held by NBDC for the species within a 2km boundary of the Proposed Dredging Activities [15]. The species is known to occur within the Clodiagh River catchment, which is 17.5km upstream of the North Wharf Dredging Areas at its nearest point and ca. 46.2km upstream of the disposal site [40]. As part of the lifecycle of freshwater pearl mussel, small larvae (glochidia) are released into the water and attach to the gulls of a host fish, typically juvenile Atlantic salmon or brown trout [43]. However, this species occurs within freshwater habitat.	- Indirect adverse effects associated with pollution during the proposed works i.e., a decrease in water quality.	This species occurs within freshwater, and therefore direct significant effects will not occur to this species from the marine-based Proposed Dredging Activities. However, this species is reliant on Atlantic salmon and other salmonid species for parts of its life cycle. Therefore, should any significant effects occur to their host species as they migrate through the Waterford Estuary, indirect significant effects could occur to this species.	**Screened In**
White-clawed crayfish	This white-clawed crayfish occurs extensively on the River Suir and its tributaries [40]. This	N/A	This freshwater species does not occur in the tidal sections of the SAC. The nearest record for this	**Screened Out**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
(*Austropotamobius pallipes)*	freshwater species has been recorded on almost the entire length of the non-tidal section of the River Suir main channel [40]. The NBDC holds no records for white-clawed crayfish within 2km of the Proposed Dredging Activities [15]. The nearest record held for this species is located ca. 5.1km upstream of the North Wharf Dredging Areas and ca. 34.3km upstream of the disposal site [15].		species is located ca. 5.1km upstream from the Proposed Dredging Areas. Therefore, this species does not require further consideration.	
Brook Lamprey (*Lampetra planeri*)	The NBDC holds records for brook lamprey within the River Suir catchment [40]; however, there are no records held by NBDC for the species within 2km of the Proposed Dredging Activities [15]. Brook lamprey are only known to occur within freshwater habitats, and brook lamprey have not been recorded in the Barrow-Nore-Suir estuary [19].	N/A	As per freshwater pearl mussel.	**Screened Out**

Table 6-3: Screening Assessment: Annex I Habitats – River Barrow and River Nore SAC

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Estuaries	The Conservation Objectives Report shows that the following Proposed Dredging Areas are located within this habitat: Cheekpoint Lower, Cheekpoint Harbour Access, Great Island Jetty, Passage East Boathouse Quay, Passage East Shoal and Duncannon Channel dredging areas [39]. Also, this habitat is located ca. 7.2km upstream of the disposal site [39].	- Effects associated with pollution during the proposed works, i.e., Decrease in water quality. - Direct disturbance from extraction (dredging). - Potential siltation.	Given the fact that 6No. Proposed Dredging Areas are located within this habitat, there is potential for direct disturbances to occur in the form of extraction during dredging and potential siltation. In addition, although it is considered unlikely that any indirect negative effects will occur to this habitat based on the fact that should any potential pollutants enter the watercourse, as they will be dispersed and diluted immediately within the regular flow and large expanse of the estuary,	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
			taking a precautionary approach appropriate mitigation measures will be implemented in order to ensure no adverse effects occur to this habitat.	
Mudflats and Sandflats not covered by seawater at low tide	The likely area of sediment communities was derived from a combination of intertidal and subtidal surveys [44] [45]. The Conservation Objectives Report shows that Passage East Boathouse Quay and the Passage Easy Shoal dredging areas overlap with this habitat; however, the disposal site is located ca. 9.3km from this habitat [39].	As per estuaries.	As per estuaries.	**Screened In**
Salicornia and other annuals colonizing mud and sand	This habitat is classified as a saltmarsh habitat, and saltmarshes are known to occur along sheltered coasts, mainly on mud or sand, that are flooded periodically by the sea, and are restricted to the area between mid-neap tide level and high-water spring tide level [46]. The Conservation Objectives show that this habitat is not present in the immediate vicinity of the Proposed Dredging Activities, and the nearest record of this habitat is located ca. 2.7km upstream of the Great Island Jetty dredging area and ca. 21.8km upstream of the disposal site [39].	N/A	It is considered highly unlikely that the works will have any significant direct effects on this habitat during based on the absence of this habitat within the vicinity of the Proposed Dredging Areas or the disposal site, and the distance separating this habitat from the sites. Furthermore, given the fact the Proposed Dredging Activities will be marine-based and will not occur along the coastline where this habitat is located, it is considered unlikely that any significant effects will occur to this habitat. In addition, it is considered unlikely that any indirect negative effects will occur to this habitat based on the fact that this habitat is located within an estuarine environment, which is a highly dynamic environment due to diurnal tides, resulting in huge variety in levels of salinity, suspended solids, and nutrients. Therefore, this habitat will not be adversely affected.	**Screened Out**
Atlantic salt meadows (*Glauco-*	This habitat occurs along sheltered coasts, mainly on mud or sand, that are flooded periodically by the sea, and this habitat is	N/A	As per Salicornia and other annuals colonizing mud and sand	**Screened Out**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Puccinellietalia maritimae)	restricted to the area between mid-neap tide level and high-water spring tide level [46]. The Conservation Objectives show that this habitat is present 1.4km upstream of the Cheek Harbour Access dredging area and ca. 19.3km upstream of the disposal site [39].			
Mediterranean salt meadows (*Juncetalia maritimi)*	It should be noted that this habitat is typically found high up in the saltmarsh but requires occasional tidal inundation [46]. The Conservation Objectives show that this habitat is present 1.9km upstream of the proposed Cheekpoint Harbour Access dredging area and ca. 19.5km upstream of the disposal site [39].	N/A	As per Salicornia and other annuals colonizing mud and sand	**Screened Out**
Water courses of plain to montane levels with *the Ranunculion fluitantis* and *Callitricho - Batrachion* vegetation	The distribution of this habitat within the SAC is currently unknown, however, this habitat is a freshwater habitat [39].	N/A	As this is a freshwater habitat, it can be concluded that there are no impact pathways from the Proposed Dredging Activities to this habitat given the fact that the Proposed Dredging Activities will be located within the Waterford Estuary.	**Screened Out**
European dry heaths	The distribution of this habitat within the SAC is currently unknown; however, this terrestrial habitat typically occurs occurring the steep, free-draining, nutrient poor soils along river valley sides [39].	N/A	This terrestrial habitat is not located onsite or within the vicinity of the Proposed Dredging Activities. There are no impact pathways connecting the Proposed Dredging Activities to this habitat given its terrestrial nature.	**Screened Out**
Hydrophilous tall herb fringe communities of plains and of the	The distribution of this habitat within the SAC is currently unknown; however, this habitat is typically associated with riverside woodlands, unmanaged river islands and in narrow bands	N/A	As per European dry heaths.	**Screened Out**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
montane to alpine levels	along the floodplain of slow-flowing stretches of river [39].			
Petrifying springs with tufa formation (Cratoneuron)*	The Conservation Objectives Report show that this habitat is not present in the immediate vicinity of the Proposed Dredging Activities [39]. The full extent of this habitat within the SAC is currently unknown; however, the only known occurrence of this habitat is located along the River Nore, between Thomastown and Inistioge, which is ca. 40.7km upstream of the Cheekpoint Lower Dredging Area and ca. 60.2km of the disposal site.	N/A	As per European dry heaths.	**Screened Out**
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	The Conservation Objectives show that this habitat is not present in the immediate vicinity of the Proposed Dredging Activities [39]. The nearest recorded location of this habitat is located ca. 6.7km upstream of the Cheekpoint Lower Dredging Area and ca. 25.8km upstream of the disposal site.	N/A	As per European dry heaths.	**Screened Out**
Alluvial forests with *Alnus glutinosa and Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)*	The Conservation Objectives show that this habitat is not present in the immediate vicinity of the Proposed Dredging Activities [39]. The nearest recorded location of this habitat within this SAC is located ca. 6km upstream of the Cheekpoint Lower Dredging Area and ca. 25.5km upstream of the disposal site.	N/A	As per European dry heaths.	**Screened Out**

Table 6-4: Screening Assessment: Annex II Species - River Barrow and River Nore SAC

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Sea lamprey (*Petromyzon marinus*)	The NBDC holds records for sea lamprey within the Barrow and Nore catchments; however, the NBDC holds no records of this species with 2km of the Proposed Dredging Activities [15]. As discussed in Section 4.2.2 above, this species migrates through Waterford Estuary throughout its lifecycle.	- Effects associated with pollution during the proposed works, i.e., Decrease in water quality. - Disturbance during the Proposed Dredging Activities.	This species is known to occur within the Waterford Estuary. Therefore, although it is considered highly unlikely that the works will have any significant direct or indirect negative effects on this species given the fact that the Proposed Dredging Areas account for ca. 1.7km^2, which represents only 2% of the Waterford Estuary at high tide. Similarly, given the size of the Waterford Estuary, should any potential pollutants enter the water it can be concluded that these will be dispersed and diluted immediately within the regular flow and large expanse of the estuary. However, taking a precautionary approach, an assessment on potential adverse effects to this species water will be undertaken and mitigation measures will be incorporated into the works, as required, to ensure that there are no potential impacts to this species.	**Screened In**
River lamprey (*Lampetra fluviatilis*)	The NBDC does not hold records for river lamprey within the Barrow and Nore catchments [15]. As discussed in Section 4.2.2 above, this species migrates through Waterford Estuary throughout its lifecycle.	As per sea lamprey.	As per sea lamprey.	**Screened In**
Twaite shad (*Alosa fallax fallax*)	According to the Conservation Objectives Report, the distribution of this species within the SAC is currently unknown; however, the species is known to breed within the River Barrow [39]. Therefore, as discussed in Section 4.2.2 above, this species migrates through Waterford Estuary throughout its lifecycle.	As per sea lamprey.	As per sea lamprey.	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Atlantic Salmon (*Salmo salar*)	This species was recorded in the Suir-Barrow-Nore estuary in by Inland Fisheries Ireland in 2019 [47]. As discussed in Section 4.2.2 above, this species migrates through Waterford Estuary throughout its lifecycle.	As per sea lamprey.	As per sea lamprey.	**Screened In**
Otter (*Lutra lutra*)	Large river catchments, including the Barrow and Nore catchments, are considered to be among the more important SACs for otter. The NBDC holds records for otter within a 2km of the Proposed Dredging Activities [15], and evidence has been recorded by MOR ecologists within the Belview-Cheekpoint-Faithlegg area.	-Effects associated with pollution during the proposed works, i.e., decrease in water quality; and, -Disturbance during the works.	Otters are known to occur within the River Barrow and River Nore SAC and there are recent records of otters occurring within 2km of the Proposed Dredging Activities. It should be noted that otter tend to forage within 80m of the shoreline (high water mark) [36]. Therefore, given the fact that the Creadan Bank and Duncannon Channel dredging areas are located over 500m from the shoreline and the disposal site is ca. 2.3km from the shoreline, these areas are not considered suitable for otter. However, a number of the Proposed Dredging Areas are located within areas considered suitable for commuting and foraging otters. Therefore, although it is considered highly unlikely that the works will have any significant direct or indirect negative effects on this species given the fact that the Proposed Dredging Areas account for ca. 1.7km^2, which represents only 2% of the Waterford Estuary at high tide. Similarly, given the size of the Waterford Estuary, should any potential pollutants enter the water it can be concluded that these will be dispersed and diluted immediately within the regular flow and large expanse of the estuary. However, taking a precautionary approach, an assessment on potential adverse effects to this species water will be undertaken and mitigation measures will be incorporated into the	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
			works as required to ensure that there are no potential impacts to this species.	
Freshwater pearl mussel (*Margaritifera margaritifera*)	The status of the freshwater pearl mussel as a qualifying Annex II species for the River Barrow and River Nore SAC is currently under review [39]. Moreover, the NBDC holds no records of this species with 2km of the Proposed Dredging Activities, the nearest record held within this SAC is located ca. 70km upstream of the Proposed Dredging Areas from 2007 [15]. As part of the lifecycle of freshwater pearl mussel, small larvae (glochidia) are released into the water and attach to the gulls of a host fish, typically juvenile Atlantic salmon or brown trout [43]. However, this species occurs within freshwater habitat.	- Effects associated with pollution during the proposed works, i.e., Decrease in water quality.	This species occurs within freshwater, and therefore direct significant effects will not occur to this species from the marine-based Proposed Dredging Activities. However, this species is reliant on Atlantic salmon and other salmonid species for parts of its life cycle. Therefore, should any significant effects occur to their host species as they migrate through the Waterford Estuary, indirect significant effects could occur to this species.	**Screened In**
Nore pearl mussel (*Margaritifera durrovensis*)	The NDBC holds no records for this freshwater species within 2km of the Proposed Dredging Areas [15]. According to the Conservation Objectives Report, the nearest known location of this species within the SAC is ca. 78km upstream of the Proposed Dredging Areas [39]. However, as part of the lifecycle of freshwater pearl mussel, small larvae (glochidia) are released into the freshwater and attach to the gulls of a host fish, typically juvenile Atlantic salmon or brown trout [43, 48].	As per freshwater peal mussel.	As per freshwater peal mussel.	**Screened In**
Desmoulin's Whorl Snail (*Vertigo moulinsiana*)	This snail lives on vegetation in swamps, fens and marshes. This habitat does not occur at the location of the Proposed Dredging Activities. According to the Conservation Objectives Report, this species is only known to occur in 2No. locations within the SAC, the nearest of which is	N/A	There is no suitable habitat for this species located within the Proposed Dredging Activities. Therefore, given the distance and lack of impact pathways between the Proposed Dredging Activities and areas designated for supporting Desmoulin's whorl	**Screened Out**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
	ca. 48.9km upstream of the Proposed Dredging Areas and ca. 68.4km upstream of the disposal site [39]. Moreover, the NBDC holds no records of this species with 2km of the Proposed Dredging Activities [15].		snails, this species has been screened out from further considerations.	
White-clawed crayfish (*Austropotamobius pallipes*)	This freshwater species has been recorded on almost the entire length of the non-tidal section throughout the SAC [39]. The NDBC holds no records for white-clawed crayfish within 2km of the Proposed Dredging Activities [15]. According to the Conservation Objectives Report, the nearest known location of this species within the SAC is ca. 40.8km upstream of the Proposed Dredging Areas and ca. 60.3km upstream of the disposal site [39].	N/A	This freshwater species does not occur in the tidal sections of the SAC. Therefore, given the distance and lack of impact pathways between the Proposed Dredging Activities and areas designated for supporting this species, this species has been screened out from further considerations.	**Screened Out**
Brook lamprey (*Lampetra planeri*)	According to the Conservation Objectives Report, the distribution of this species within the SAC is currently unknown [39]. The NBDC does not hold records for brook lamprey within the Barrow and Nore catchments [15]. Brook lamprey are only known to occur within freshwater habitats, and brook lamprey have not been recorded in the Barrow-Nore-Suir estuary [19].	As per white-clawed crayfish.	As per white-clawed crayfish.	**Screened Out**
Killarney Fern (*Trichomanes speciosum*)	The NDBC holds no records for Killarney fern within 2km of the Proposed Dredging Activities [15]. According to the Conservation Objectives Report, the nearest known location of this species within the SAC is ca. 27.8km upstream of the Cheekpoint Lower Dredging Area and ca. 47.3km upstream of the disposal site [39].	N/A	As Killarney fern is a terrestrial species, there are no impact pathways between the Proposed Dredging Activities and areas designated for supporting Killarney ferns. This species has been screened out from further considerations.	**Screened Out**

Table 6-5: Screening Assessment: Annex I Habitats – Hook Head SAC

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Large shallow inlets and bays	The Conservation Objectives show that this habitat is not present in the immediate vicinity of the Proposed Dredging Activities [49]. The nearest recorded location of this habitat within this SAC is located ca. 2.9km west of the Creedan Bank Dredging Area and ca. 2.9km of the disposal site.	- Effects associated with pollution during the proposed works, i.e., Decrease in water quality.	It is considered highly unlikely that the works will have any significant direct effects on this habitat during based on the absence of this habitat within the vicinity of the Proposed Dredging Activities and disposal area boundary and the distance separating this habitat from the Proposed Dredging Activities. Furthermore, it is considered highly unlikely that any potential pollutants could reach this habitat as waterborne contaminants will either dilute within the watercourse or settle to the bottom of the watercourse. However, taking a precautionary approach, water quality mitigation measures will be implemented as part of the proposed works to protect water quality upstream of this habitat.	**Screened In**
Reef	The Conservation Objectives show that this habitat is not present in the immediate vicinity of the Proposed Dredging Activities [49]. The nearest recorded location of this habitat within this SAC is located ca. 1.8km east of the Creadon Bank Dredging Area and ca. 0.8km east of the disposal site.	As per large shallow inlets and bays.	As per Large shallow inlets and bays.	**Screened In**
Vegetated sea cliffs of the Atlantic and Baltic coasts	This habitat is located on steep slopes fringing hard or soft coasts, that have been created by past or present marine erosion and support a wide diversity of vegetation types with variable maritime influence. While this habitat is exposed to the sea (waves and sea spay), this habitat is not located within the marine environment. The Conservation Objectives show that this habitat is not present in the immediate vicinity of the Proposed Dredging Activities [49]. The	As per large shallow inlets and bays.	It is considered highly unlikely that the works will have any significant direct effects on this habitat during based on the absence of this habitat within the vicinity of the Proposed Dredging Areas or the disposal site, and the distance separating this habitat from the Proposed Dredging Activities. Furthermore, given the fact the Proposed Dredging Activities will be marine-based and will not occur along the coastline where this habitat is located, it is considered unlikely that any significant direct or indirect effects will occur to this habitat.	**Screened Out**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
	nearest recorded location of this habitat within this SAC is located ca. 1.8km southeast of the Creadon Bank Dredging Area and ca. 3km upstream of the disposal site.			

Table 6-6: Screening Assessment: Annex I Habitats – Saltee Islands SAC

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Mudflats and sandflats not covered by seawater at low tide	The Conservation Objectives show that this habitat is not present in the immediate vicinity of the Proposed Dredging Activities [50]. The nearest recorded location of this habitat within this SAC is located ca. 26.2km east of the disposal site.	N/A	It is considered highly unlikely that the works will have any significant direct effects on this habitat during based on the distance separating this habitat from the Proposed Dredging Areas and the disposal site. Furthermore, it is considered highly unlikely that any potential pollutants could reach this habitat as waterborne contaminants will either dilute within the Celtic Sea or settle to the bottom of the Celtic Sea.	**Screened Out**
Large shallow inlets and bays	The Conservation Objectives show that this habitat is not present in the immediate vicinity of the Proposed Dredging Activities [50]. The nearest recorded location of this habitat within this SAC is located ca. 22km east of the disposal site.	N/A	As per mudflats and sandflats not covered by seawater at low tide	**Screened Out**
Reef	The Conservation Objectives show that this habitat is not present in the immediate vicinity of the Proposed Dredging Activities [50]. The nearest recorded location of this habitat within this SAC is located ca. 19.8km east of the disposal site.	N/A	As per mudflats and sandflats not covered by seawater at low tide	**Screened Out**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Vegetated sea cliffs of the Atlantic and Baltic coasts	This habitat is located on steep slopes fringing hard or soft coasts, that have been created by past or present marine erosion and support a wide diversity of vegetation types with variable maritime influence. While this habitat is exposed to the sea (waves and sea spay), this habitat is not located within the marine environment. The Conservation Objectives show that this habitat is not present in the immediate vicinity of the Proposed Dredging Activities [50]. The nearest recorded location of this habitat within this SAC is located ca. 23.6km east of the disposal site.	N/A	As per mudflats and sandflats not covered by seawater at low tide	**Screened Out**
Submerged or partially submerged sea caves	The Conservation Objectives show that this habitat is not present in the immediate vicinity of the Proposed Dredging Activities [50]. The nearest recorded location of this habitat within this SAC is located ca. 23.7km east of the disposal site.	N/A	As per mudflats and sandflats not covered by seawater at low tide	**Screened Out**

Table 6-7: Screening Assessment: Annex II Species - Saltee Islands SAC

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Grey Seal (*Halichoerus grypus*)	According to the Conservation Objectives grey seal are known to breed on the Saltee Islands ca. 25.7km of the Proposed Dredging Areas and ca. 23.7km of the disposal site. The nearest resting, breeding and moulding sites are over ca. 25km of the proposed sites. The NBDC holds records of grey seal within the within the Waterford Estuary and upstream of the Proposed Dredging Areas [15].	- Effects associated with pollution during the proposed works, i.e., Decrease in water quality. - Disturbance during the Proposed Dredging Activities.	Although there are no suitable haul out / breeding habitats within the Potential Dredging Areas and disposal site, grey seal could potentially use the areas for foraging and commuting. It is considered that there is potential for impacts to occur as a result of a potential pollution events or elevated noise levels during the proposed works. Therefore, water mitigation measures and disturbance mitigation measures will be incorporated into the works.	**Screened In**

Table 6-8: Screening Assessment: Annex I Bird Species - Seas off Wexford cSPA

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Red-throated Diver *(Gavia stellata)*	This species breeds primarily in northern Europe (Russia, Scandinavia, Iceland, Scotland). Small populations of this species breed in Ireland and area restricted to Co. Donegal [51]. This species nest in aquatic vegetation near the water's edge and have been known to exhibit site fidelity by returning to the same nest site [51]. This species winters in Irish coastal waters, arriving in September from their breeding grounds [51]. This species is typically found wintering in shallow sandy bays [51]. This species is known to have a diet of small dish, shrimp, frogs, molluscs, water insects and annelids [51]. The NBDC holds no records for this species within the vicinity of the Proposed Dredging Activities [15]. In addition, there are no suitable	**Main / Possible threats to the species include:** - Effects associated with pollution during the construction works – (i.e., decrease in water quality)	This species is not known to occur within the general vicinity of the Proposed Dredging Activities. However, as this species is designated under the Seas off Wexford cSPA, it is considered likely that this species may utilise the coastal waters within the vicinity of the offshore disposal site. However, it should be noted that the licensed offshore disposal site has been receiving dredged materials since 1996 and the material to be dredged is regularly tested every three years to ensure there is no impacts to water quality. Furthermore, the total area of the disposal site is ca. 0.52km^2, which is ca. 0.02% of the area covered by the SPA. Furthermore, the disposal site is only infrequently utilised during the dredging campaigns. Therefore, it is considered unlikely that this species will be disturbed during the Proposed	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
	nest locations within the vicinity of the Proposed Dredging Areas or the offshore disposal site.		Dredging Activities. In addition, given that birds are highly mobile species it is considered that any birds would be displaced to more suitable habitats within the wider area. However, as this SPA overlaps with the offshore disposal site, this SPA is located within the ZoI for disturbance to occur to bird species that may be within close proximity to the dredger. However, in the event of a worst-case scenario, a potential pollution event could occur that could adversely affect the water quality within the SPA. Given the fact that the offshore disposal site overlaps with this SPA, water quality impairment could result in decreases to the local fish populations. A decrease in fish populations could result in impacts to species that rely on fish as food sources by inducing a bottom-up trophic cascade wherein the abundance and distribution of prey species is altered, conferring a negative impact upon the fauna at higher trophic levels and upon the functioning of the ecosystem processes. Therefore, this species has been screened in and will require further assessment.	
Fulmar *(Fulmarus glacialis)*	This species is known to breed on sea cliffs, but will also nest on the ground, buildings and in burrows and crevasses [52]. This species winters at sea but can also be seen in Irish waters throughout the year [52]. This species is known to have a diet of fish, discards from trawlers, crustaceans and whale flesh [52]. The NBDC holds records for this species within the vicinity of the Proposed Dredging Activities [15]. Although there are no suitable nest locations within the vicinity of the Proposed Dredging Areas or the offshore disposal site, it is considered likely	As per red-throated diver.	As per red-throated diver.	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
	that this species will utilise the waters within the vicinity of the offshore disposal site for foraging.			
Manx Shearwater *(Puffinus puffinus)*	This species breeds on uninhabited off-shore islands in underground burrows, often in large colonies [53]. Large breeding colonies of this species are known on Blasket Islands, Co. Kerry, the Saltee Islands, Co. Wexford and Copeland Islands, Co. Down [53]. This species winters in the seas of the South Atlantic off the coast of South America [53]. This species has a diet of small fish, plankton, molluscs and crustaceans that it gets from diving in the sea [53]. The NBDC holds records for this species within the vicinity of the Proposed Dredging Activities [15]. Although there are no suitable nest locations within the vicinity of the Proposed Dredging Areas or the offshore disposal site, it is considered likely that this species will utilise the waters within the vicinity of the offshore disposal site for foraging.	As per red-throated diver.	As per red-throated diver.	**Screened In**
Gannet *(Morus bassanus)*	This species breeds in colonies on islands off the coast, large colonies are located on Great Saltee, Co. Wexford, the Bull Rock, Co. Cork and Little Skellig in Co. Kerry [54]. This species winters at sea but can be found within Irish waters year-round [54]. This species has a diet consisting of fish [54]. The NBDC holds records for this species within the vicinity of the Proposed Dredging Activities [15]. Although there are no suitable nest locations within the vicinity of the Proposed Dredging Areas or the offshore disposal site, it is considered likely that this species will utilise the waters within the vicinity of the offshore disposal site for foraging.	As per red-throated diver.	As per red-throated diver.	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
Cormorant *(Phalacrocorax carbo)*	Cormorant breed in colonies around the coastline, typically large colonies are located along the southern and north-western coasts of Ireland, and some birds have been observed nesting in trees [55]. This species also is known to winter along the coastline, at sea or within inland waterbodies [55]. This species is known to have a diet of fish [55]. The NBDC holds no records for this species within the vicinity of the Proposed Dredging Activities [15]. However, the I-WeBS surveys [27] and the surveys undertaken from the dredger did record this species. Although there are no suitable nest locations within the vicinity of the Proposed Dredging Areas or the offshore disposal site, it is considered likely that this species will utilise the waters within the vicinity of the offshore disposal site for foraging.	As per red-throated diver.	As per red-throated diver.	**Screened In**
Shag *(Phalacrocorax aristotelis)*	This species breeds in loose colonies on cliffs along the coastline of Ireland primarily along the western and southern coasts, with notable concentrations observed in Co. Dublin [56]. In the winter, the adults will typically remain within the vicinity of the breeding colonies; however, the young will disperse widely [56]. This species is known to have a diet of small fish caught just below the surface of the water [56]. The NBDC and the I-WeBS hold no records for this species within the vicinity of the Proposed Dredging Activities [15, 27]. In addition, the surveys undertaken from the dredger did not record this species. Furthermore, there are no suitable nest locations within the vicinity of the Proposed Dredging Areas or the offshore disposal site; however, it is considered likely that	As per red-throated diver.	As per red-throated diver.	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
	this species will utilise the waters within the vicinity of the offshore disposal site for foraging.			
Common Scoter *(Melanitta nigra)*	This species nest on islands with dense covering of scrub and tree cover; however, breeding population have been in declined in recent years due to mink predation [57]. This species is almost entirely marine during the winter season and will congregate in large flocks on shallow seas (less than 20m deep) with sandy bottoms [57]. This species his known to have a diet of water plants, insect larvae and freshwater crustaceans in the breeding season, and primarily molluscs in the winter season [57]. The NBDC and the I-WeBS hold no records for this species within the vicinity of the Proposed Dredging Activities [15, 27]. In addition, the surveys undertaken from the dredger did not record this species. Furthermore, there are no suitable nest locations within the vicinity of the Proposed Dredging Areas or the offshore disposal site; however, it is considered likely that this species will utilise the waters within the vicinity of the offshore disposal site for foraging.	As per red-throated diver.	As per red-throated diver.	**Screened In**
Mediterranean Gull *(Larus melanocephalus)*	This species breeds in colonies primarily on low lying islands in Eastern Europe; however, breeding gulls have been noted in Ireland since 1996 [58]. This species has been noted wintering in Ireland along the east coast, and elsewhere in small numbers [58]. This species is known to have a diet of insects, marine molluscs and fish [58]. The NBDC holds no records for this species within the vicinity of the Proposed Dredging Activities [15]. In addition, the surveys undertaken	As per red-throated diver.	As per red-throated diver.	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
	from the dredger did not record this species. However, the I-WeBS surveys do have records of Mediterranean gull [27]. Although, there are no suitable nest locations within the vicinity of the Proposed Dredging Areas or the offshore disposal site, it is considered likely that this species will utilise the waters within the vicinity of the offshore disposal site for foraging.			
Black-headed Gull *(Chroicocephalus ridibundus)*	This species typically nests in large colonies on the coasts and inland in wetland areas such as bogs, marshes, and man-made lakes [59]. However, it should be noted that inland breeding populations have declined dramatically due to predation [59]. The largest inland colonies are located in Galway, Monaghan and Mayo. This species is known to winter in both coastal and inland areas [59]. This species is known to have a diet of insects and will also exploit domestic and fisheries waste [59]. The NBDC holds records for this species within the vicinity of the Proposed Dredging Activities [15]. In addition, the I-WeBS surveys and the surveys undertaken from the dredger did record this species [27]. Although, there are no suitable nest locations within the vicinity of the Proposed Dredging Areas or the offshore disposal site, it is considered likely that this species will utilise the waters within the vicinity of the offshore disposal site for foraging.	As per red-throated diver.	As per red-throated diver.	**Screened In**
Lesser Black-backed Gull *(Larus fuscus)*	This ground nesting species typically breeds in colonies often with other gull species [60]. Most colonies are on the coastline; however, inland colonies have been recorded in Co. Mayo and Co. Donegal [60]. The habitats utilised by	As per red-throated diver.	As per red-throated diver.	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
	breeding lesser black-backed gulls include offshore islands, islands in lakes, sand dunes and coastal cliffs. This species winters both inland and on coastal habitats [60]. This species is known to have a diet of fish, waste from fisheries, rubbish from landfills, insects, young birds and scavenging food from other birds [60]. The NBDC holds records for this species within the vicinity of the Proposed Dredging Activities [15]. In addition, the I-WeBS surveys and the surveys undertaken from the dredger did record this species [27]. Although, there are no suitable nest locations within the vicinity of the Proposed Dredging Areas or the offshore disposal site, it is considered likely that this species will utilise the waters within the vicinity of the offshore disposal site for foraging.			
Herring Gull *(Larus argentatus)*	Herring gull are predominantly found breeding along the coastline with the only records of inland colonies in Co. Donegal and Co. Galway [61]. However, this species is also known to breed on rooftops in urban areas. In the winter season, this species is widespread with evidence of foraging in urban areas, agricultural land and along the coast [61]. This species is known to have a diet of fish, waste from fisheries, rubbish from landfills, insects, young birds and scavenging food from other birds. The NBDC holds records for this species within the vicinity of the Proposed Dredging Activities [15]. In addition, the I-WeBS surveys and the surveys undertaken from the dredger did record this species [27]. Although, there are no suitable nest locations within the vicinity of the Proposed Dredging Areas or the offshore disposal site, it is	As per red-throated diver.	As per red-throated diver.	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
	considered likely that this species will utilise the waters within the vicinity of the offshore disposal site for foraging.			
Kittiwake *(Rissa tridactyla)*	This species breeds in nest platforms that are constructed on vertical, steep sea cliffs, or occasionally nesting on man-made structures [62]. This species winters at sea [62]. This species is known to have a diet of fish, invertebrates and waste from commercial fishing [62]. The NBDC and the I-WeBS surveys hold no records for this species within the vicinity of the Proposed Dredging Activities [15, 27]. However, the surveys undertaken from the dredger did record this species. Although, there are no suitable nest locations within the vicinity of the Proposed Dredging Areas or the offshore disposal site, it is considered likely that this species will utilise the waters within the vicinity of the offshore disposal site for foraging.	As per red-throated diver.	As per red-throated diver.	**Screened In**
Sandwich Tern *(Sterna sandvicensis)*	This species a ground nesting bird species that breeds in colonies on coastal islands, shingle spits and sand dunes but with some colonies inland [63]. This species winters in southern Europe and Africa; however, ca. 10-15 birds have been recorded wintering in Galway Bay and Strangford Lough [63]. This species is known to have a diet of surface swelling fish [63]. The NBDC and the I-WeBS surveys hold no records for this species within the vicinity of the Proposed Dredging Activities [15, 27]. In addition, the surveys undertaken from the dredger did not record this species. Although, there are no suitable nest locations within the vicinity of the	As per red-throated diver.	As per red-throated diver.	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
	Proposed Dredging Areas or the offshore disposal site, it is considered likely that this species will utilise the waters within the vicinity of the offshore disposal site for foraging.			
Roseate Tern *(Sterna dougallii)*	This ground nesting species breeds in colonies along the Irish coastline and the 2 main colonies recorded in Ireland are located at Rockabill Island, Co. Dublin, and at Lady's Island, Co. Wexford [64]. Roseate terns have been recorded breeding on other islands including Dalkey Island, Co. Dublin and the Blasket Islands, Co. Kerry [64]. This species winters in west Africa [64]. This species is known to have a diet of marine fish [64]. The NBDC and the I-WeBS surveys hold no records for this species within the vicinity of the Proposed Dredging Activities [15, 27]. In addition, the surveys undertaken from the dredger did not record this species. Although, there are no suitable nest locations within the vicinity of the Proposed Dredging Areas or the offshore disposal site, it is considered likely that this species will utilise the waters within the vicinity of the offshore disposal site for foraging.	As per red-throated diver.	As per red-throated diver.	**Screened In**
Common Tern *(Sterna hirundo)*	This ground nesting species breeds in colonies along the Irish coastline and colonies have been recorded in Co. Dublin, Co. Wexford and Co. Galway [65]. It should be noted that some birds have been noted breeding on islets in freshwater lakes in Co. Galway and Co. Mayo [65]. Also, this species winters in west and south Africa [65]. This species is known to have a diet of marine fish [65].	As per red-throated diver.	As per red-throated diver.	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
	The NBDC and the I-WeBS surveys hold no records for this species within the vicinity of the Proposed Dredging Activities [15, 27]. In addition, the surveys undertaken from the dredger did not record this species. Although, there are no suitable nest locations within the vicinity of the Proposed Dredging Areas or the offshore disposal site, it is considered likely that this species will utilise the waters within the vicinity of the offshore disposal site for foraging.			
Arctic Tern *(Sterna paradisaea)*	This species breeds in colonies predominantly along the Irish coastline located in Co. Wexford, Co. Kerry, Co. Mayo and Co. Donegal [66]. However, this species has also been noted breeding in the freshwater lakes of Lough Corrib, Co. Galway and Lough Conn, Co. Mayo [66]. This species winters in the southern hemisphere [66]. This species is known to have a diet of marine fish, crustaceans and insects [66]. The NBDC and the I-WeBS surveys hold no records for this species within the vicinity of the Proposed Dredging Activities [15, 27]. In addition, the surveys undertaken from the dredger did not record this species. Although, there are no suitable nest locations within the vicinity of the Proposed Dredging Areas or the offshore disposal site, it is considered likely that this species will utilise the waters within the vicinity of the offshore disposal site for foraging.	As per red-throated diver.	As per red-throated diver.	**Screened In**
Guillemot *(Uria aalge)*	This species nests on sea cliff ledges in large colonies [67]. This species winters at sea, and some birds are believed to winter near their breeding sites [67]. This species is known to have a diet of small fish and invertebrates [67].	As per red-throated diver.	As per red-throated diver.	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
	The NBDC and the I-WeBS surveys hold no records for this species within the vicinity of the Proposed Dredging Activities [15, 27]. In addition, the surveys undertaken from the dredger did not record this species. Although, there are no suitable nest locations within the vicinity of the Proposed Dredging Areas or the offshore disposal site, it is considered likely that this species will utilise the waters within the vicinity of the offshore disposal site for foraging.			
Razorbill *(Alca torda)*	This species is known to nest on sea cliffs in large mixed colonies but has also been known to utilise secluded nest sites within fissures in cliffs and in screes [68]. This species is known to have a diet of small fish and invertebrates [68]. The NBDC and the I-WeBS surveys hold no records for this species within the vicinity of the Proposed Dredging Activities [15, 27]. In addition, the surveys undertaken from the dredger did not record this species. Although, there are no suitable nest locations within the vicinity of the Proposed Dredging Areas or the offshore disposal site, it is considered likely that this species will utilise the waters within the vicinity of the offshore disposal site for foraging.	As per red-throated diver.	As per red-throated diver.	**Screened In**
Puffin *(Fratercula arctica)*	This species breeds in burrows, in boulder screes, cracks in steep cliffs, or rabbit burrows on off-shore islands [69]. This species winters far out at sea and is often not seen outside the breeding season [69]. This species is known to have a diet of marine fish and crustaceans [69]. The NBDC and the I-WeBS surveys hold no records for this species within the vicinity of the Proposed Dredging Activities [15, 27]. In addition,	As per red-throated diver.	As per red-throated diver.	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Significant Effects	Screening Rationale	Screening Conclusion
	the surveys undertaken from the dredger did not record this species. Although, there are no suitable nest locations within the vicinity of the Proposed Dredging Areas or the offshore disposal site, it is considered likely that this species will utilise the waters within the vicinity of the offshore disposal site for foraging.			

6.2 Stage 1 – Analysis of 'In-Combination' Effects

The Habitats Directive requires competent authorities to make an appropriate assessment of any plan or project which is likely to have a significant effect alone or in-combination with other plans and projects.

The sources of information reviewed included:

- Maritime Area Consent (MAC) Information Notice – Phase One Projects [70];
- Dumping at Sea (DaS) Register [71];
- Foreshore Notices [72];
- An Bord Pleanála (ABP) Mapping Search [73];
- Department of Housing, Local Government and Heritage (DHLGH) - EIA Portal [74];
- Waterford City and County Council – Online Planning Enquiries [12];
- Wexford County Council – Planning Applications Search [13]; and,
- Kilkenny County Council – Search Planning Application Viewer [11].

The permitted or submitted plans or projects identified using these information sources are outlined in Table 6-9 below.

It is noted that there are numerous permissions have been identified along the coastline of Waterford, Wexford and Kilkenny [73, 74, 12, 13, 11]. However, it is not considered that these plans or projects will have any potential in-combination effects with the Proposed Dredging activities given the fact that these applications are all terrestrial in nature and the Proposed Dredging activities are solely marine-based.

It should also be noted that as part this project, there may be a requirement to install and / or remove navigation buoys. Therefore, as part of this assessment, the impacts of installing and / or removing navigation buoys have been considered and were judged to be negligible.

Table 6-9: Assessment of Potential In-Combination Effects

Project Ref	Applicant	Project Description	Status of Project	Location	Potential for In-combination Effects
Phase One Projects with Maritime Area Consents					
MAC Ref: 2022-MAC-001	Oriel Windfarm Ltd.	Oriel Wind Park	MAC Granted: 23/12/2022	Ca. 6km off the north Louth Coast	No – This project is located ca. 200km from the Proposed Dredging Activities. There is no potential for in-combinations effects.
MAC Ref: 2022-MAC-002	Sure Partners Ltd.	Arklow Bank II	MAC Granted: 23/12/2022	Ca. 6-15km off the coast of Arklow, Co. Wicklow	No – This project is located ca. 100km from the Proposed Dredging Activities. There is no potential for in-combinations effects.
MAC Ref: 2022-MAC-003 and 004	Bray Offshore Wind Ltd. & Kish Offshore Wind Ltd.	Bray Bank & Kish Bank	MAC Granted: 23/12/2022	Ca. 10km off the coast of Dublin	No – This project is located ca. 133km from the Proposed Dredging Activities. There is no potential for in-combinations effects.
MAC Ref: 2022-MAC-005	North Irish Sea Array Windfarm Ltd.	North Irish Sea Array	MAC Granted: 23/12/2022	Ca. 13.5km off the coast of Dublin, Meath and Louth	No – This project is located ca. 170km from the Proposed Dredging Activities. There is no potential for in-combinations effects.
MAC Ref: 2022-MAC-006	Codling Wind Park Ltd.	Codling Wind Park (Codling I and Codling II	MAC Granted: 23/12/2022	Ca. 13-22km off the coast of Greystones and Wicklow Town, Co. Wicklow	No – This project is located ca. 125km from the Proposed Dredging Activities. There is no potential for in-combinations effects.
MAC Ref: 2022-MAC-007	Fuinneamh Sceirde Teoranta	Skerd Rocks	MAC Granted: 23/12/2022	Ca. 5km off Connemara, Co. Galway	No – This project is located ca. 237km from the Proposed Dredging Activities. There is no potential for in-combinations effects.
Dumping at Sea (DaS) Register					
S0012-03	Port of Waterford Company	Maintenance Dredging within navigation channels.	Granted: 14/01/2020	Dredging areas are located within the River Suit and Waterford Estuary, and the disposal site is located ca. 2.5km southwest of Hook Head.	No – The permitted maintenance dredging will expire on the 31st December 2025, at which time this application will replace the previous permit.

Project Ref	Applicant	Project Description	Status of Project	Location	Potential for In-combination Effects
S0025-01	L&M Keating Ltd	Dredging of accumulated sediments to reinstate navigational and berthing depths.	Granted: 29/09/2015	Dredging areas are located within Dunmore East Harbour and the disposal site is located ca. 2.5km southwest of Hook Head.	No – This application was for dredging works that would be completed in 2 weeks during 2015 and has since then expired.
S0030-01	Wexford County Council	Dredged material from the mouth and approach channel to Kilmore Quay harbour and dumping at sea.	Granted: 02/08/2019	At mouth and approach channel to Kilmore Quay harbour and disposal site is ca. 11km west of the harbour.	No – The disposal site is located ca. 16.2km from the Proposed Dredging activities. Given the distance separating these activities it is not considered that in-combination effects will occur.
Foreshore Notices					
FS006684	Port of Waterford Company	Maintenance Dredging within navigation channels.	Granted: 14/01/2020	Dredging areas are located within the River Suit and Waterford Estuary, and the disposal site is located ca. 2.5km southwest of Hook Head.	No – The permitted maintenance dredging will expire on the 31st December 2025, at which time this application will replace the previous permit.
FS006983	SSE Renewables	Geophysical, Geotechnical and Environmental Site Investigation works	Current Status: Consultation Stage	Proposed site investigation works will be located off the coast of Bunmahon Bay, Co. Waterford and Bannow Bay, Co. Wexford.	No – The proposed site investigation works will be located ca. 11.5km from the Proposed Dredging activities at its nearest point. Given the distance separating these activities it is not considered that in-combination effects will occur. It should also be noted that the proposed site investigation works have not been granted.
FS007136	ESB Wind Development Limited	Site Investigations works to inform the engineering and design of a potential offshore wind farm and associated export cable route at a site named "Helvick Head Offshore Wind."	Current Status: Consultation Stage	Proposed site investigation works will be located to the ca. 10km offshore to the south of County Waterford and to the southeast of County Cork.	No – The proposed site investigation works will be ca. 9km from the Proposed Dredging activities at its nearest point. Given the distance separating these activities it is not considered that in-combination effects will occur. It should also be noted that the proposed site investigation works have not been granted.

Project Ref	Applicant	Project Description	Status of Project	Location	Potential for In-combination Effects
					An NIS was prepared as part of this planning application. It concluded that '*following application of suitable mitigation measures the site investigation work, either alone or in-combination with other plans or projects, will not have an adverse effect on the integrity of any Natura 2000 site.*'
FS007138	ESB Wind Development Limited	Site investigation works for the proposed Celtic Offshore Wind project comprising of two projects, one fixed and one floating.	Current Status: Consultation Stage	The fixed project (Celtic One) will be ca. 7.5 km from shore and the export cable corridor for the floating project (Celtic 2) is the only aspect of the floating project that lies within the 12nm limit.	No - The proposed site investigation works will be located ca. 42.3km from the Proposed Dredging activities at its nearest point. Given the distance separating these activities it is not considered that in-combination effects will occur. It should also be noted that the proposed site investigation works have not been granted. An NIS was prepared as part of this planning application. It concluded that *'following application of suitable mitigation measures the site investigation work, either alone or in-combination with other plans or projects, will not have an adverse effect on the integrity of any Natura 2000 site.'*
FS007384	Celtic Horizon Offshore Wind Farm Limited	Site investigations work including a combination of invasive and non-invasive survey activities, consisting geophysical, geotechnical, archaeological, ecological, metocean and benthic surveys.	Current Status: Applied	The foreshore licence area will be located off the coast of Co. Wexford and Co. Waterford, the area at its closest point, is 9.01km from the Saltee Islands and 13.49km from mainland Wexford.	No – Although the proposed site investigation areas is located ca. 1.1km from the Proposed Dredging activities, it is considered that these works will not result in in-combination effects with the Proposed Dredging activities. This conclusion is based on the fact that the proposed site investigations will take place on a phased basis over a 5-year period, the site investigation area does not overlap with the disposal site or the proposed dredging areas, and the mitigation measures in the documentation provided for the site investigations will ensure no impacts occur to

Project Ref	Applicant	Project Description	Status of Project	Location	Potential for In-combination Effects
					the receiving environment. It should also be noted that the proposed site investigation works have not been granted. An NIS was prepared as part of this planning application. It concluded that '*the activities proposed under this application for Foreshore Licence will not have a significant adverse effect on any Natura 2000 sites examined in this reports, either alone or in combination with other plans or projects'*.
FS007436	Voyage Offshore Array Limited	Surveys and site investigations which will include geophysical, geotechnical, and environmental surveys.	Current Status: Applied	The foreshore licence area will be located off the coast of Co. Wexford and Co. Waterford.	No – Although the site investigation area overlaps partially with the disposal site and the Creadan Bank dredging area, it is not considered that these investigations will result in cumulative impacts with the Proposed Dredging activities due to the fact that the site investigations will not involve any dredging or disposal of dredged materials and the Proposed Dredging activities will implement mitigation measures in order to ensure no impacts occur to any environmental receptors. It should also be noted that the proposed site investigation works have not been granted. An NIS was prepared as part of this planning application. It concluded that the development '*will not result in adverse effects, whether alone or in-combination with other plans and projects on the integrity of any Natura 2000 site within the relevant Management Unit area for mobile Annex II species'*.
FS007488	Celtic Offshore Renewable Energy Limited	Surveys and site investigations will include geotechnical, environmental and metocean surveys.	Current Status: Applied	The foreshore licence area will be located off the coast of Co. Wexford and Co. Waterford.	No – Although the site investigation area partially overlaps with the disposal site and the Creadan Bank dredging area, it is not considered that these investigations will result in cumulative impacts with the Proposed

Project Ref	Applicant	Project Description	Status of Project	Location	Potential for In-combination Effects
					Dredging activities due to the fact that the site investigations will not involve any dredging or disposal of dredged materials and the Proposed Dredging activities will implement mitigation measures in order to ensure no impacts occur to any environmental receptors. It should also be noted that the proposed site investigation works have not been granted. An NIS was prepared as part of this planning application. It concluded that the development '*will not result in adverse effects, whether alone or in-combination with other plans and projects, on the integrity of any Natura 2000 site deemed within the distance Zone of Influence or Management Unit areas for Annex II species'.*
FS007318	RWE Renewables Ireland East Celtic Limited	Surveys and site investigations will include hydrographical, geophysical, geotechnical, metocean, ecological and archaeological surveys.	Current Status: Applied	The foreshore licence area will be ca. 9km from the shore off the coast of Co. Waterford and Co. Wexford	No - The proposed site investigation works will be located ca. 8.3km from the Proposed Dredging activities at its nearest point. Given the distance separating these activities it is not considered that in-combination effects will occur. It should also be noted that the proposed site investigation works have not been granted. An NIS was prepared as part of this planning application. It concluded that '*the proposed site investigation activities will not have an adverse impact on the Natura 2000 sites, either alone or in combination with other plans or projects'.*
FS007621	Péarla Offshore Wind Limited	Surveys and site investigations will include geophysical, archaeological, subtidal, marine	Current Status: Applied	The foreshore licence area will be located off the coast of Co. Wexford and Co. Waterford.	No – Although the site investigation area overlaps with the disposal site and the Creadan Bank dredging area, it is not considered that these investigations will result in cumulative impacts with the Proposed

Project Ref	Applicant	Project Description	Status of Project	Location	Potential for In-combination Effects
		benthic, geotechnical and intertidal surveys.			Dredging activities due to the fact that the site investigations will not involve any dredging or disposal of dredged materials and the Proposed Dredging activities will implement mitigation measures in order to ensure no impacts occur to any environmental receptors. It should also be noted that the proposed site investigation works have not been granted. An NIS was prepared as part of this planning application. It concluded that '*no adverse effects are expected on the features of interest or conservation objectives of any European site and the integrity of the sites will not be adversely affected.'*
FS007661	EirGrid Public Limited Company	Surveys and site investigations will include geophysical, geotechnical and environmental surveys.	Current Status: Applied	The foreshore licence area will be located off the coast of Co. Wexford and Co. Waterford.	No – Although the site investigation area overlaps with the disposal site, it is not considered that these investigations will result in cumulative impacts with the Proposed Dredging activities due to the fact that the site investigations will not involve any dredging or disposal of dredged materials and the Proposed Dredging activities will implement mitigation measures in order to ensure no impacts occur to any environmental receptors. It should also be noted that the proposed site investigation works have not been granted. Following a review of available information for this project, a Screening for Appropriate Assessment has been prepared and concluded that '*a Stage 2 Appropriate Assessment is required and that a Natura Impact Statement should be requested from EirGrid for these European Sites, however it is noted that DHLGH is the competent authority in this regard*.'

6.3 Stage 1 – AA Screening Conclusion

A detailed assessment of the layout and nature of the Proposed Dredging Activities, the construction methods to be employed and the overall activities that will occur at the Proposed Dredging Areas and the disposal site has been carried out and the potential for significant effects on European sites and qualifying features of interest within a 15km radius of the Proposed Dredging Activities has been examined in detail.

The boundaries of 6No. designated sites, Tramore Dunes and Backstrand SAC, Bannow Bay SAC, Tramore Back Strand SPA, Bannow Bay SPA, Mid Waterford Coast SPA and Keeragh Islands SPA, were screened out given the distances separating the Proposed Dredging Activities from these European sites and lack of impact pathways. It could be objectively concluded that the Proposed Dredging Activities will not, either alone or in combination with other plans or projects, be likely to have significant effects on those sites.

The Proposed Dredging Areas are located within the Lower River Suir SAC and the River Barrow and River Nore SAC, the offshore disposal site is located within close proximity to the Hook Head SAC and overlaps with the Seas off Wexford cSPA, and the Proposed Dredging Areas and the disposal site are hydrologically linked to the Saltee Islands SAC (the qualifying species for this SAC are known to occur within the Waterford Estuary). Therefore, the Lower River Suir SAC, River Barrow and River Nore SAC, the Hook Head SAC, the Saltee Islands SAC and the Seas off Wexford cSPA were taken forward for further detailed consideration, Stage 2 - Appropriate Assessment. Using professional experience, guidance and judgement, the following factors have been taken into account on identifying potential significant impacts on the identified European sites:

- Qualifying interests;
- Special conservation interests;
- Conservation objectives;
- The nature of the onsite habitats; and,
- The location of the Proposed Dredging Activities.

The screening process has examined the potential for the Proposed Dredging Activities to cause to significant effects on the European sites and the qualifying features of interest as per the screening determination in Section 6.

<u>Lower River Suir SAC</u>

Taking a precautionary approach, the screening exercise has identified the possibility of likely significant disturbance and water quality effects on the following designated species for the Lower River Suir SAC:

- Sea lamprey
- River lamprey
- Twaite shad
- Atlantic salmon
- Otter
- Freshwater pearl mussel

<u>River Barrow and River Note SAC</u>

Taking a precautionary approach, the screening exercise has identified the possibility of likely significant water quality and habitat loss / degradation effects on the following designated habitats for the River Barrow and River Nore SAC:

- Estuaries

- Mudflats and Sandflats not covered by seawater at low tide

Taking a precautionary approach, the screening exercise has identified the possibility of likely significant water quality and disturbance effects on the following designated species for the River Barrow and River Nore SAC:

- Sea lamprey
- River lamprey
- Twaite shad
- Atlantic salmon
- Otter
- Freshwater pearl mussel
- Nore pearl mussel

Hook Head SAC

Taking a precautionary approach, the screening exercise has identified the possibility of likely significant water quality and habitat loss / degradation effects on the following designated habitats for the Hook Head SAC:

- Large shallow inlets and bays
- Reefs

Saltee Island SAC

Taking a precautionary approach, the screening exercise has identified the possibility of likely significant water quality and disturbance effects on the following designated species for the Saltee Islands SAC:

- Grey Seal (*Halichoerus grypus*)

Seas off Wexford cSPA

Taking a precautionary approach, the screening exercise has identified the possibility of likely significant water quality and disturbance effects on the following designated species for the Seas off Wexford cSPA:

- Red-throated Diver
- Fulmar
- Manx Shearwater
- Gannet
- Cormorant
- Shag
- Common Scoter
- Mediterranean Gull
- Black-headed Gull
- Lesser Black-backed Gull
- Herring Gull
- Kittiwake
- Sandwich Tern
- Roseate Tern
- Common Tern
- Artic Tern
- Little Tern
- Guillemot
- Razorbill
- Puffin

AA Screening Conclusion

These habitats and species have been brought forward for further consideration due to the potential for adverse effects, as a result of the Proposed Dredging Activities, in the absence of the appropriate mitigation measures.

Therefore, progression to Stage 2 of the Appropriate Assessment process is required.

7 STAGE 2 NIS

7.1 Assessment of Potential Significant Effects

This section provides recommendations for measures which will mitigate against any potential significant impacts of the proposed works on qualifying habitats and species throughout the duration of the project. The following effects with potential to adversely affect the conservation objectives of Lower River Suir SAC, the River Barrow and River Nore SAC, Hook Head SAC, Saltee Islands SAC and Seas off Wexford cSPA were identified and considered:

- Potential loss of, or disturbance to designated habitats;
- Potential disturbance to designated species; and,
- Potential impairment of water quality.

7.1.1 Loss of, or Disturbance to Designated Habitats

An assessment of potential adverse effects to the designated habitats within the River Barrow and River Nore SAC and the Hook Head SAC will be undertaken. 6No. of the Proposed Dredging Areas are located within the estuaries and the mudflats and sandflats not covered by seawater at low tide, which are designated under the River Barrow and River Nore SAC, and the fact that the Creedan Bank dredging area and the disposal site are located within close proximity to the large shallow inlets and bays and reefs, both of which are designated under the Hook Head SAC.

River Barrow and River Nore SAC

As discussed in Section 4.2.1, the sediments sampled from Cheekpoint and Passage East were classified 'muddy estuarine community complex' and the sediments sampled in Duncannon Channel were classified as fine sand with *Fabulina fabula* community.' These habitat types are known to be community types that make up part of the Annex I habitat 'estuaries' and the 'muddy estuarine community complex' also makes up part of the Annex I habitat 'mudflats and sandflats not covered by seawater at low tide' [31].

It is noted that the Proposed Dredging Areas within Cheekpoint, Passage East and Duncannon Channel will be located within these habitats. The potential impacts that may affect benthic communities include extraction (dredging) and siltation (both heavy siltation (30cm burial) and light siltation (5cm burial)). Therefore, sensitivity of the biotypes was reviewed for these potential impacts.

The sensitivity of 'muddy estuarine community complex' to heavy siltation is described as '*Low*.' Whereas the sensitivity to extraction (dredging) is described as '*Medium*,' as dredging will remove the substrate resulting in the loss of *Polydora* tubes and *Corophium* that burrows up to 5cm deep. However, this biotope is widespread in the estuary and recolonisation will occur [75].

The sensitivity of 'fine sand with *Fabulina fabula* community' to heavy siltation (30cm) is described as 'Medium' if siltation overburdens the sediment. However, sensitivity to lighter siltation (5cm) is '*Low'* as Tellinidae bivalves can migrate through 40cm in mud or 50cm in sand. Sensitivity to extraction (dredging) is described as '*Medium'* as most of the animals that occur in this biotope are shallowly buried and extraction of the sediment will remove the biological assemblage. Resilience is medium as some species may require longer than 2 years to re-establish [76].

It should be noted that the benthic community types identified by Aquafact during the 2023 survey have been recorded within the Waterford Estuary since the characterisation of the waterbody [77] and its designation as an SAC by NPWS [39].

Therefore, despite the ongoing maintenance dredging and disposal activities by Port of Waterford, the biotopes have remained in a stable condition, and it can be concluded that the proposed dredging and disposal operations will not result in any adverse effects on these benthic community types within the survey areas or on the integrity of the benthic community. Therefore, it can be concluded that there will be no direct adverse effects to the habitats designated under the River Barrow and River Nore SAC as a result of the Proposed Dredging Activities.

Hook Head SAC

As previously mentioned, the Creedan Bank dredging area and the disposal site are located within close proximity to the large shallow inlets and bays and reefs, both of which are designated under the Hook Head SAC.

The Proposed Dredging Areas or the dumpsite do not overlap with these habitats. However, given the proximity and hydrological connection between these habitats and the Proposed Dredging Activities, potential adverse effects would include siltation and accidental potential pollutants.

Plume Dispersion Modelling was undertaken by ABPmer focusing on the characterisation of the dispersion of deposited dredged sediment at the licensed disposal site, which is located within close proximity to the large shallow inlets and bays and reefs of the Hook Head SAC [78]. Results from the modelling in a worst-case scenario (a full dredge campaign from Duncannon Bar where peak storm waves coincides with mean neap tide) indicate peak excess suspended solid concentrations (SSC) values in excess of 400-500 mg/l in and around the disposal site and the Hook Heas SAC, and this would result in a maximum peak accretion in this area of ca. 1cm. Also, the model shows that when a full dredge campaign from Duncannon Bar coincides with peak storm waves and a mean spring tide, the larger tidal range (and faster tidal flows, as noted above) result in a higher overall dispersion and lower relative maximum concentrations (when compared to the neap tide conditions). Therefore, the peak excess suspended solid concentrations (SSC) values in excess of 300-400mg/l in and around the disposal site and the Hook Heas SAC and the maximum peak accretion in this area would be less than 1mm.

The modelling undertaken by ABPmer also included timestep plot modelling of the instantaneous predicted increased SSC and bed sedimentation at a range of time periods after the end of the Duncannon disposal campaign and shows how the disposal plume is predicted to develop, in response to the driving tidal and wave forcing conditions. The results of the instantaneous plume development indicate a peak concentrations of around 60 to 70mg/l in and around the disposal site. However, the plume concentrations were predicted to be ca. 10 - 20mg/l within the eastern section of the Hook Head SAC and little to no accretion.

However, it should be noted that the range of modelling scenarios undertaken show that the peak flows associated with spring tidal conditions are sufficient to remobilise the settled material and that the settling of material as a result of the Proposed Dredging Activities will only be temporary until the next spring tide or until further storm conditions return.

Overall, with ongoing dispersion across the subsequent tides (and following the end of disposal operations), the accretion typically drops to baseline levels. The model has shown that at all locations, the levels of peak siltation are predicted to be very small (typically <0.5mm).

Therefore, given the fact that any sediment that may potentially settle within the Hook Head SAC will be very small and will not be permanent given the tides and sea conditions. Therefore, it can be concluded that there will be no direct adverse effects to the habitats designated under the Hook Head SAC as a result of the Proposed Dredging Activities.

7.1.2 Potential Disturbance to Designated Species

As discussed in Section 5.1, the designated species that are considered to have the potential to be disturbed by Proposed Dredging Activities include fish, otter and grey seal designated for the Lower River Suir SAC, the River Barrow and River Nore SAC and Saltee Islands SAC.

Fish

The maintenance dredging programme in Waterford Estuary occurs in estuarine waters and has now been ongoing for many decades. Estuaries are turbid environments and frequently suspended solids levels increase from a moderate background level to higher levels depending on tidal and weather conditions.

It is considered that the potential impacts that may result from the proposed dredging activities would include increased suspended solids, change / disturb the benthic habitat and benthic invertebrate food supply for fish species, alter the levels of organic matter and dissolved oxygen, increase water turbidity and potentially result in release/exposure of contaminated sediments [37]. However, the consequences of dredging on fish assemblages are often species specific and the magnitude of impacts vary among estuaries.

Teichert et al. (2016) undertook an assessment using WFD surveillance monitoring data from a total of 90No. European estuaries (including 32No. estuaries on the island of Ireland) to investigate the combined stressor impacts in estuaries on fish communities [79]. The study investigated the impact of nine stressor categories on the fish ecological status and modelled the dominant stressors and their non-linear effects, evaluated the ecological benefits expected from reducing pressure from stressors and investigated the interactions among stressors. The results of this study found that the largest restoration benefits to the ecological status of estuaries were expected when mitigating water pollution and oxygen depletion. In addition, the study found that with regards to dredging (capital dredging), their model suggested that the assessed Ecological Quality Ratio for fish in estuaries would be impacted only when very high thresholds (more than 50%) of the subtidal area of an estuary was dredged. In the case of Waterford Estuary, the Primary and Secondary dredge areas extends to 1.7km^2, which represents only 2% of the estuary at high tide.

Wenger *et al.* (2017) assessed the potential impacts of estuary dredging on fish which included the entrainment of fish with the dredged material, the removal of benthic habitat, the smothering of benthic habitat (at the dredge and dump sites for the dredged material), the impact of temporarily high suspended solids concentration on fish and the impact of noise on fish [80]. The study assessed dredging-related stressors, including suspended sediment, contaminated sediment, hydraulic entrainment and underwater noise and how they directly influence the effect and the response elicited in fish across all aquatic ecosystems and all life-history stages. Their study found that contaminated sediment had significantly higher effect than clean sediment alone or noise effects, suggesting additive or synergistic impacts from dredging-related stressors. The early life stages such as eggs and larvae were most likely to suffer lethal impacts, while behavioural effects were more likely to occur in adult fishes. Both suspended sediment concentration and duration of exposure greatly influenced the type of fish response observed, with both higher concentrations and longer exposure durations associated with fish mortality. However, it should be noted that only clean material is dredged and disposed of as part of the ongoing maintenance dredging programme and chemistry analysis is carried out every 3No. years.

Wilber and Clarke (2001) undertook a study on the relationship between the duration of exposure of non-salmonid and estuarine fish and non-salmonid and estuarine eggs and larvae to varying concentrations of suspended solids (mg/L) and survival has shown that a wide range of suspended solids concentrations and exposure durations have no effect on fish in estuaries [81]. The study showed that increasing both the concentration and exposure time to suspended sediment increased the severity of fish response and there is a clear trend between

response type, increasing concentrations and exposure to suspended sediment; however, fish have different tolerances to suspended sediment, with some species able to withstand concentrations up to 28,000 mg/L, while others experience mortality starting at 25 mg/L. Overall, the study showed that suspended solids levels under 1000 mg/L and event durations of less than one day duration have largely no effect or only a sublethal effect on estuarine fish eggs and larvae.

In the context of the Proposed Dredging Activities and with particular reference to plough dredging, which results in higher suspended solids levels in the water column than TSHD and backhoe dredging, the 2021 turbidity assessment has shown that low mean levels of suspended solids (ca. 30-40 mg/L) occur in the vicinity of operations during periods of active dredging and during periods when dredging is not taking place [82]. Also, the duration of individual dredging events in Waterford Estuary (particularly TSHD dredging) average less than one hour. This short duration coupled with relatively low suspended solids levels indicate that the Proposed Dredging activities are very unlikely to cause problems for fish, either in the vicinity of operations or in the greater Waterford Estuary area.

The TSHD involves the deployment of a suction head into the sediment and suction occurs only when the suction head is immersed in the sediment at the commencement and termination of individual dredging events which are less than one hour in duration. Fish are mobile animals which, depending on species, can rest on the bottom or occupy the water column at varying distances from the bottom or surface. Either way, it can be expected that fish species can swim at normal or burst speeds (typically up to seven body lengths per second) away from any sudden disturbance in their immediate vicinity. Therefore, the entrainment of fish during the TSH dredging or the backhoe dredging is therefore unlikely to be significant. In addition, with regard to the plough dredging, soil is moved but not removed and it is likely that fish on or close to the bottom will be disturbed and flee to adjacent areas to avoid the disturbance.

Any potential disturbances to fish are likely to be very localised and restricted to the immediate vicinity of operations. Noise levels associated with the maintenance dredging are considered to be insignificant compared with the noise emanating from normal ship traffic in the estuary.

The soil being moved / removed as part of the maintenance dredging programme is of recent origin, and therefore it is considered unlikely to contain material which would be detrimental to fish during the removal / resuspension process. Some temporary habitat loss will occur for fish, particularly benthic fish, but in the context of the overall dimensions of Waterford Estuary, this temporary loss of habitat is not significant.

In addition, there is indirect evidence that the ongoing maintenance dredging operations in Waterford Estuary within the vicinity of Cheekpoint Lower Bar do not affect the behaviour of fish in that general area. This evidence was noted during the Great Island CWS fish impingement studies carried in November 2022 and June 2023, there were several days during the study periods when dredging operations were also carried out [25, 26]. However, the numbers and fish species range washed off bandscreens at the Great Island CWS (approximately 400m from the dredge area) did not vary between days when dredging occurred and when no dredging was carried out. It can thus be deduced that the maintenance dredging operation did not have any measurable local effect on fish [25, 26].

Based on best available scientific research and information that has been established throughout several years of sampling fish as part of the Water Framework Directive surveillance monitoring programme in Waterford Estuary, it can be concluded that the Waterford Estuary has good ecological status with regard to fish [20, 21], and that the ecological status of fish has not previously been significantly affected. In addition, based on the assessment of potential impacts on fish in Waterford Estuary, the ecological status of fish

in Waterford Estuary will not be adversely affected by the Proposed Dredging Activities in Waterford Estuary.

Otter

As discussed in Section 6.1, the Waterford Estuary is considered suitable for foraging and commuting otter. Otters are known to have acute sense of sight, smell and hearing for which they rely on for traveling through muddy water and for foraging [30]. Noise sources from the Proposed Dredging Activities have the potential to result in temporary adverse effects on the noise levels in the vicinity of the Proposed Dredging Activities. However, potential impacts that are likely to occur to this species are not as well studied as cetaceans and pinnipeds. Levels of Temporary Threshold Shift (TTS)[8] and Permanent Threshold Shift (PTS)[9] for otter are not known and there is yet to be a hearing sensitivity assessment of the Eurasian otter. Therefore, as a conservative approach the limits for other marine carnivores in water will be used for this assessment [83].

The proposed noise levels that would cause either TTS and / or PTS to individuals exposed to non-pulse sources (single or multiple discrete sound event within 24hrs – i.e., dredging) are outlined below in Table 7-1.

Table 7-1: Sound Exposure Level Injury Criteria for Other Marine Carnivores (OCW) [83]

OCW Groups	Injury Criteria (non-pulse)	
	TTS	PTS
OCW in Water	192 dB	219 dB
OCW in Air	157 dB	177 dB

The sound pressure levels from the dredging activities are estimated to be a maximum of ca. 186 dB re 1µPa within the immediate vicinity of the vessel [84]. However, these sound pressure levels would be expected to drop by at least 30 dB over 1km away from the vessel.

It is not anticipated that the Proposed Dredging Activities will have any impact on otters within the vicinity of the Proposed Dredging Areas and disposal site as otters would need to be within the water column to be impacted by the dredging activity. Additionally, the Proposed Dredging Activities will not directly impact on any breeding or resting sites for this species as the Proposed Dredging Activities will be solely focused on the seabed in targeted areas.

Therefore, the impacts of the Proposed Dredging Activities would be considered to be negligible on otters given the short nature, highly localised area of the works and the expected sound levels to be below the PTS threshold and below the TTS threshold. It is not considered that current mitigation measures will be continued for the Proposed Dredging Activities and the mitigation measures under the current permit (Permit Reg. No. S0012-03 for 2020 – 2025) should remain place for the Proposed Dredging Activities.

The duration of the proposed works is intermittent and will happen over the course of 8No. years. Therefore, any disturbances that occur to species within the immediate vicinity of the Proposed Dredging Activities will be short-term and temporary. Furthermore, otter within the Waterford Estuary are subject to anthropogenic noise sources from port related activities, and therefore, it can be concluded that these otter are habituated to anthropogenic noise. Furthermore, given the availability of suitable habitats within the wider area it can be concluded that should be these species be temporarily disrupted, they will move to a suitable area

[8] TTS may result in a reduction in hearing sensitivity but is not permanent.
[9] PTS may result in auditory injuries and in some cases can lead to death.

elsewhere. It is therefore concluded that any potential increases in noise as a result of the Proposed Dredging Activities will not adversely affect this species.

Grey Seal

Grey seals are 1No. of 2No. Phocid species found in Ireland, the other being harbour seal (*Phoca vitulina).* Like otters and other marine mammals, phocids have evolved to produce a variety of sounds which are critical for both social and reproductive interactions [85]. Unlike cetaceans and similar to otters, phocids spend their time either at sea and on land, and thus produce sounds in both water and air.

Grey seal are sensitive to sound and can be affected by high sound pressure levels. This species is affected by both in water sound and in air sound at different levels, as shown in Table 7-2.

Table 7-2: Phocids Hearing Groups [83]

Phocids Groups	Estimate Hearing Range	Examples (see Southall, et al., for full list)
Phocids in Water	50 Hz to 86 kHz	Grey Seal and Harbour Seal
Phocids in Air	75 Hz to 30 kHz	

For each of the above groups, the proposed noise levels that would cause either TTS and / or PTS to individuals exposed to non-pulse sources (single or multiple discrete sound event within 24hrs – i.e., dredging) are outlined below in Table 7-3.

Table 7-3: Sound Pressure Level Injury Criteria for Phocids [83]

Phocids Groups	Injury Criteria (non-pulse)	
	TTS	PTS
Phocids in Water	181 dB	201 dB
Phocids in Air	134 dB	154 dB

The sound pressure levels from the dredging activities are estimated to be a maximum of ca. 186 dB re 1µPa within the immediate vicinity of the vessel [84]. However, these sound pressure levels would be expected to drop by at least 30 dB over 1km away from the vessel.

It is not anticipated that the grey seals or their haul-out sites will be severely impacted as a result of the Proposed Dredging Activities given that PTS threshold levels in water will not be breached and given that phocids are highly mobile species, and it would be expected that any species within the vicinity of the Proposed Dredging Areas and disposal site would leave the area of the proposed works [86].

Therefore, the impacts of the Proposed Dredging Activities would be considered to be negligible on grey seals given the short nature, highly localised area of the works and the expected sound levels to be below the PTS threshold and below the TTS threshold a few hundred metres or less away from the vessel. It is not considered that mitigation measures will be required for the Proposed Dredging Activities and the mitigation measures under the current permit (Permit Reg. No. S0012-03 for 2020 – 2025) should remain place for the Proposed Dredging Activities.

Birds

As previously mentioned, it has been shown that boats can approach within 100m to sensitive species before a response (‘flight’) is triggered [28, 34, 35].However, it is considered that gulls,

terns, gannets and storm petrels are to be of low sensitivity to disturbance effects that may occur as a result of dredging works [28].

Although the Seas off Wexford cSPA overlaps with the offshore disposal site, it is considered that these bird species will not be disturbed by the Proposed Dredging Activities due to the fact that the disposal site is infrequently utilised during the dredging campaigns and as such, will not be in use throughout the majority of the year. In addition, it can be concluded that bird species that regularly utilise the Waterford Estuary and Celtic Sea are considered habituated to shipping traffic to and from the Belview Port. Therefore, it is considered that the dredger vessel will not differ significantly from the existing vessel movements.

In addition, it should be noted that the Proposed Dredging Areas are located within the Waterford Estuary, and the offshore disposal site is located ca. 2.6km southwest of Hook Head. There are no areas of cliffs, rocky shores, intertidal mudflats, saltmarshes or habitats of a similar nature located within the dredge areas or disposal site, therefore, the Proposed Dredging Activities will not have result in a loss of potential nesting or foraging habitat for birds utilising the coastal habitat given the distance separating the Proposed Dredging Areas and the coastal habitats.

Therefore, it is concluded that the Proposed Dredging Activities will not result in any significant disturbances to bird species within the Waterford Estuary.

7.1.3 Potential Impairment of Water Quality

The Proposed Dredging Activities will involve dredging within 16No. areas (refer to Figure 3-1 and Appendix A) and will result in temporary suspension of sediments at the loading sites. The disposal of the dredged material or spoil within the existing disposal site, south of Waterford Estuary, will also give rise to temporary sediment plumes within the disposal site.

Such adverse effects resulting from the proposed works could include suspended solids and / or hydrocarbon leaks or spills that could affect both protected species within the European designated sites, such as designated aquatic habitats, designated fish species - Atlantic salmon, sea lamprey, brook lamprey, river lamprey, Twaite shad - and designated mammals and marine mammal- otter, grey seal.

However, extensive modelling has been undertaken at the Waterford Estuary to assess the dredging and disposal activities undertaken by the Port of Waterford during the maintenance dredging operations [78, 87, 88, 89].

Naturally occurring, tidally generated suspended solid concentrations (SSC) were modelled by Delft Hydraulics [88, 89]:

- Tidally generated SSC range from 50 and 500mg/l at both Belview Point in the River Suir and at Garraunbaun Rock near Ferry Point in the White Horse Reach of the River Barrow;
- Tidally generated SSC at Cheekpoint, the confluence of the River Barrow and the River Suir, were typically less than 150mg/l;
- Tidally generated SSC downstream in the River Suir, between Passage East and Buttermilk Point, exceeded 1,000mg/l; and,
- Tidally generated SSC at Duncannon Bar within the Suir Estuary were above 100mg/l at bed and mid-water on spring tides.

The 2017 modelling undertaken by ABPmer on the potential impacts of plough dredging at Cheekpoint showed that the dispersed sediment would move throughout the estuary, with the vast majority moving up-estuary, but would generally be confined to the area between Buttermilk Point and Little Island. The greatest effects were seen throughout the estuary at the end of the plough disturbance scenario (8 days with ploughing ceasing on Day 4). These

effects fall back to background levels within ca. 4No. days following cessation of ploughing on falling spring tides. Most material would be moved (transported and eroded) on the flood tide and during spring tides whereas neap tides would predominantly be accretional. The modelling identified locations of temporary sediment storage (later eroded) as well as sediment 'sinks', where accretion would be more permanent, notably the southern edge of the Cheekpoint section, adjacent to the maintained channel. Maximum SSC (above background) at the point of disturbance were around 2,500mg/l near-bed at the time of peak flows and 1,500mg/l during slack flows. One day following completion of plough disturbance, peak SSC would reduce by over an order of magnitude at the disturbance site. Maximum concentrations away from the disturbance location, for the most part, would occur on peak flood flows as 'pulses' that rarely last for longer than 30 minutes per tide. Individual spikes can reach 1,000mg/l at some locations. Elevated SSC that last for several hours are generally in the range 150-250mg/l, depending on location, on spring flood tides, and lower on ebb tides. Average elevated concentrations are rarely above 50mg/l [87].

The 2023 modelling undertaken by ABPmer assessed dredging campaigns from Belview Quay, Cheekpoint Lower Bar and Duncannon Bar, interacting with different tidal conditions (mean neap or spring tides) in storm wave conditions (worst-case scenarios) [78]. It was noted that the relatively low volume of disposal material from Belview and the relatively higher fine sediment content of material dredged from Cheekpoint Lower Bar result in generally limited siltation from these campaigns. Where material does settle to the bed (under slack water conditions around high and low tide), the subsequent peak flows are sufficient to remobilise the material and put it back into suspension for further dispersion. The influence of the storm event is also a contributing factor, providing added energy to the system and resulting in wave-induced bed shear stress, which further limits the sedimentation potential for the material in suspension [78].

The 2023 modelling also included selected timestep to provide the instantaneous predicted increased SSC and bed sedimentation at a range of time periods after the end of the Duncannon disposal campaign (only the plume development from Duncannon is shown as the smaller disposal volume from Belview and the larger dispersion of the finer material from Cheekpoint Lower Bar results in overall lower instantaneous concentrations from these campaigns). The results of the instantaneous plume development indicate a peak concentrations of around 60 to 70mg/l in and around the disposal site. Across the wider region, plume concentrations above 10mg/l are predicted to extend west to Rinnashark Harbour and east to Hook Head. In addition, a sediment plume with concentrations of up to 30 to 40mg/l (above baseline) extends into the outer estuary, past Dunmore East and, for disposal campaigns from Duncannon, this plume extends further north, past Creadan Head and on towards Duncannon Strand [78].

With a greater volume of deposited material, the results of the timestep modelling for the Duncannon campaign indicate some settling of material to the bed. Initially (around 2No. hours after the end of the disposal campaign), as the storm event builds towards its peak, bed accretion is generally limited. With greater time passing from the end of the campaign, and as the peak of the storm event passes and calmer conditions return (from both lower wave heights and with the tide moving away from the peak of the spring towards neap conditions), more settling of material is predicted. By 36No. hours after the end of disposal, accretion of up to around 1cm is predicted to the southwest of the disposal site and of around 0.7cm further west towards Brazen Head. However, the peak flows associated with spring tidal conditions are sufficient to remobilise this material, indicating that the settling sediment will only be temporary until the next spring tide or until further storm conditions return. The peaks in excess suspended solid concentrations (SSC) values, which 'spike' for a short period of time as the plume passes the location, before dropping off as the plume moves away. This cycle continues as the disposal events are underway (and as the flood and ebb tides move material back and forth across the site). Once the disposals cease, the material in suspension becomes

continuously more dispersed and concentrations drop back to existing (baseline) levels. At all locations, the levels of peak siltation are predicted to be very small (typically <0.5mm) [78].

In addition, in order to assess any potential impacts from dredging on the water quality within the Waterford Estuary, LCF Marine undertook a review and analysis of water monitoring and turbidity data within the Waterford Estuary before and during the plough dredging campaign between January to June 2023 using data gathered by 2No. water quality monitoring buoys within the Waterford Estuary [90].

The analysis concluded that the rise in suspended solids/turbidity, due to ploughing, was of no practical significance as it was hidden within the natural variability of the turbidity within the estuarine system. In addition, the strategy of dredging during spring tides appears to be robust as it occurred when levels of suspended sediments are already naturally elevated, and during the daytime, when more sediment will be mobilised and when mid tide flow rates are higher than at night [90].

A previous water quality assessment undertaken by IDS Monitoring in 2017 during plough dredging campaigns and a TSHD campaign at Cheekpoint using data collected from 2No. monitoring buoys concluded that there was no significant change in the turbidity levels at the upstream and downstream monitoring stations during any of the dredging campaigns at Cheekpoint, turbidity variance between plough dredging campaigns and TSHD dredging was not discernible and any differences observed during dredging were not greater than what was seen when comparing data from different periods without dredging and are accounted for as natural temporal variation and are caused by the strong tidal and fluvial flows [91].

Following a review of the historic WFD water quality from 2013-2018 for the waterbodies in which the Proposed Dredging Activities are located, it should be noted that only the River Suir (Lower Suir Estuary) status decreased from '*good*' to '*moderate*' due to increased phosphate concentrations, primarily associated with pasture and urban wastewater discharges in the Suir, and driven by benthic invertebrates [92]. However, the Barrow Suir Nore Estuary and the Waterford Estuary other waterbodies remained at the same status, and the Eastern Celtic Sea increased in status from '*good*' to '*high*' [16].

Overall, the majority of the Proposed Dredging Areas have been dredged for many years and although there will be a minor extension at 3 locations, which will result in an increase of the total Proposed Dredging Areas of ca. 9.97ha or 6.1%, this is not considered to be a significant change. The disposal site has been receiving dredged material since 1996, and the material to be dredged is regularly tested every three years to ensure there is no change to water quality resulting from the continued dredging and disposal operation. Therefore, the Proposed Dredging Activities will not result in significant impacts to water quality as a result of increased (or increases in) suspended solids.

Regardless, during the Proposed Dredging Activities, all works will comply with all relevant legislation and best practice to reduce potential environmental impacts of the works. Furthermore, as a precautionary principle, the following mitigation measures will be put in place, to ensure that water quality will be protected within the vicinity of the Proposed Dredging Activities and further downstream. The measures that will be put in place to remove the risk from potential contamination and emergency procedures to be implemented in the event of an accidental release or spill of potentially contaminating substances are outlined below:

- Best practice measures to minimise the release of suspended solids into the receiving environment shall be implemented;
- Overflow of dredged sediment will only be permitted when it can be demonstrated that the majority of material dredged is being retained onboard;
- A documented Accident Prevention Procedure will be put in place prior to commencement;

- A documented Emergency Response Procedure will be put in place prior to commencement;
- A full record of loading and disposal tracks and a record of the material being deposited will be maintained for each trip;
- Disposal at the disposal site will be carried out through the vessel's hull whilst moving at slow speed;
- Plough dredging will be limited to spring tide periods only for Cheekpoint locations;
- The disposal site will be divided into subsections with each used sequentially to ensure there is a uniform spread of the dredged sediments;
- All loading operations will be managed to be as efficient as possible and minimise the duration of the dredging activities;
- To ensure that only suitably clean material shall be dumped at sea, the Port shall carry out sediment chemistry analysis in 2026, 2029 and 2032; and,
- The dredging works will be carried out in full accordance with the conditions stipulated in the Dumping at Sea permit.

The mitigation measures outlined above will minimise the identified potential risks to water quality associated with the Proposed Dredging Activities.

7.2 Stage 2 - Analysis of 'In-Combination' Effects

Based on the mitigation measures as described in Section 7.1, the Proposed Dredging Activities alone will not have any direct or indirect adverse effects on the integrity of any European Sites.

As outlined in Section 6.2, a review of information sources was undertaken and include that following sources:

- Maritime Area Consent (MAC) Information Notice – Phase One Projects [70];
- Dumping at Sea (DaS) Register [71];
- Foreshore Notices [72];
- An Bord Pleanála (ABP) Mapping Search [73];
- Department of Housing, Local Government and Heritage (DHLGH) - EIA Portal [74];
- Waterford City and County Council – Online Planning Enquiries [12];
- Wexford County Council – Planning Applications Search [13]; and,
- Kilkenny County Council – Search Planning Application Viewer [11].

A number of plans and projects were assessed, refer to Table 6-9, and it was determined that no current or previously granted plans / projects were identified in the immediate vicinity that are considered to have the potential to have any in-combination with the Proposed Dredging Activities to result in significant impacts on the integrity of European Designated sites.

It is therefore considered that the Proposed Dredging Activities are unlikely to have any significant in-combination contribution to possible significant effects on the Lower River Suir SAC, the River Barrow and River Nore SAC, the Hook Head SAC, Saltee Islands SAC and Seas off Wexford cSPA.

This statement is supported by:

I. The localised nature of the Proposed Dredging Activities.

II. The marine nature of the Proposed Dredging Activities.

III. The dilution factor between the Proposed Dredging Activities and European Designated sites.

IV. The mitigation measures that will be put in place.

V. The best practice guidelines which will be implemented during the Proposed Dredging Activities.

Taking the above into account and given the fact that the aforementioned projects will not result in any adverse effects to European Designated sites, it can be concluded that the Proposed Dredging Activities will not result in any in-combination contribution to adverse effects on the integrity of any European Designated sites.

8 NIS CONCLUSIONS AND STATEMENT

A detailed assessment of the nature of the Proposed Dredging Activities, the methods to be employed, and the overall activities that will occur has been carried out, and the potential for significant effects on European sites and qualifying features of interest within a 15km radius of the Proposed Dredging Activities has been examined in detail.

As detailed in Section 6.3, the Stage 1 AA Screening conclusion states that the boundaries of six (6No.) designated sites, Tramore Dunes and Backstrand SAC, Bannow Bay SAC, Tramore Back Strand SPA, Bannow Bay SPA, Mid Waterford Coast SPA and Keeragh Islands SPA, were screened out. It could be objectively concluded that the Proposed Dredging Activities will not, either alone or in combination with other plans or projects, be likely to have significant effects on those sites.

However, the Proposed Dredging Areas are located within the Lower River Suir SAC and the River Barrow and River Nore SAC, and the offshore disposal site is located within the Seas off Wexford cSPA. A hydrological connection was also identified between Hook Head SAC, Saltee Islands and the Proposed Dredging Activities. Therefore, the Lower River Suir SAC, River Barrow and River Nore SAC, Hook Head SAC, Saltee Islands SAC and Seas of Wexford SPA need to be screened in for further consideration.

Avoidance, design requirements and mitigation measures are set out within this NIS and the effective implementation of these mitigation measures will ensure that any impacts on the European sites, having regard to their conservation objectives, will be avoided during all phases of the Proposed Dredging Activities, such that there will be no adverse effects on the integrity of any European sites.

It has been objectively concluded, following an examination, analysis and evaluation of the relevant information, including in particular the nature of the predicted impacts from the Proposed Dredging Activities, and with implementation of the proposed mitigation measures, that the Proposed Dredging Activities will not, either alone or in combination with other plans or projects, adversely affect the integrity of Lower River Suir SAC, the River Barrow and River Nore SAC, the Hook Head SAC, the Saltee Islands SAC, the Seas off Wexford cSPA or any other European site in light of the sites' conservation objectives and best scientific knowledge, and no reasonable scientific doubt exists in relation to this conclusion.

Accordingly, progression to Stage 3 of the Appropriate Assessment process (i.e., Assessment of Alternatives Solutions) is not considered necessary.

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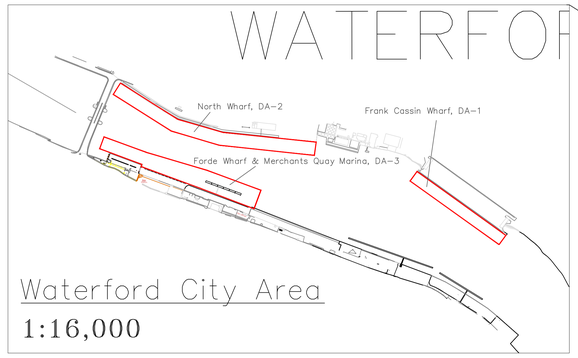
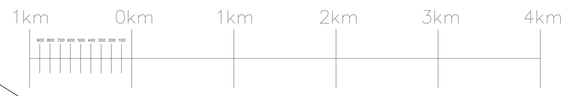
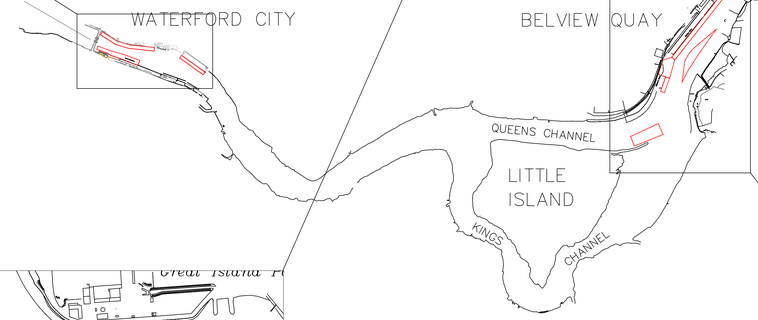
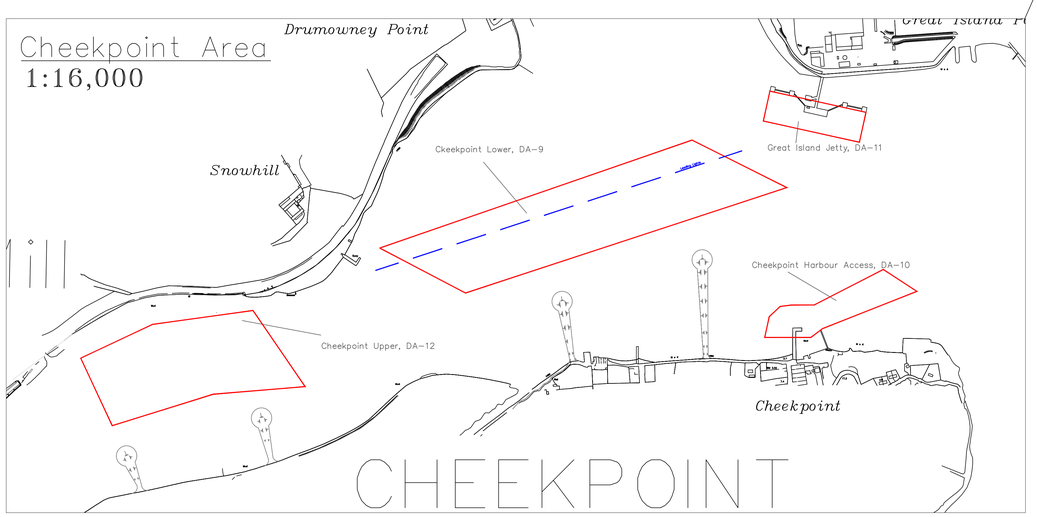
APPENDICES

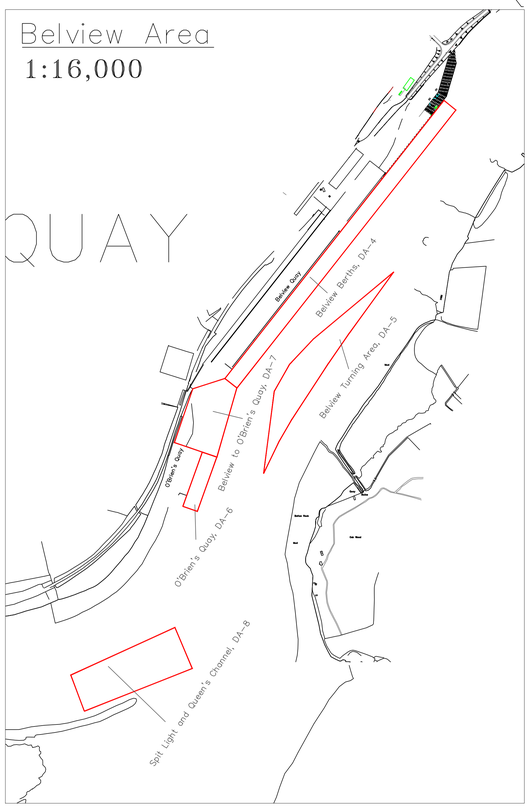
APPENDIX A

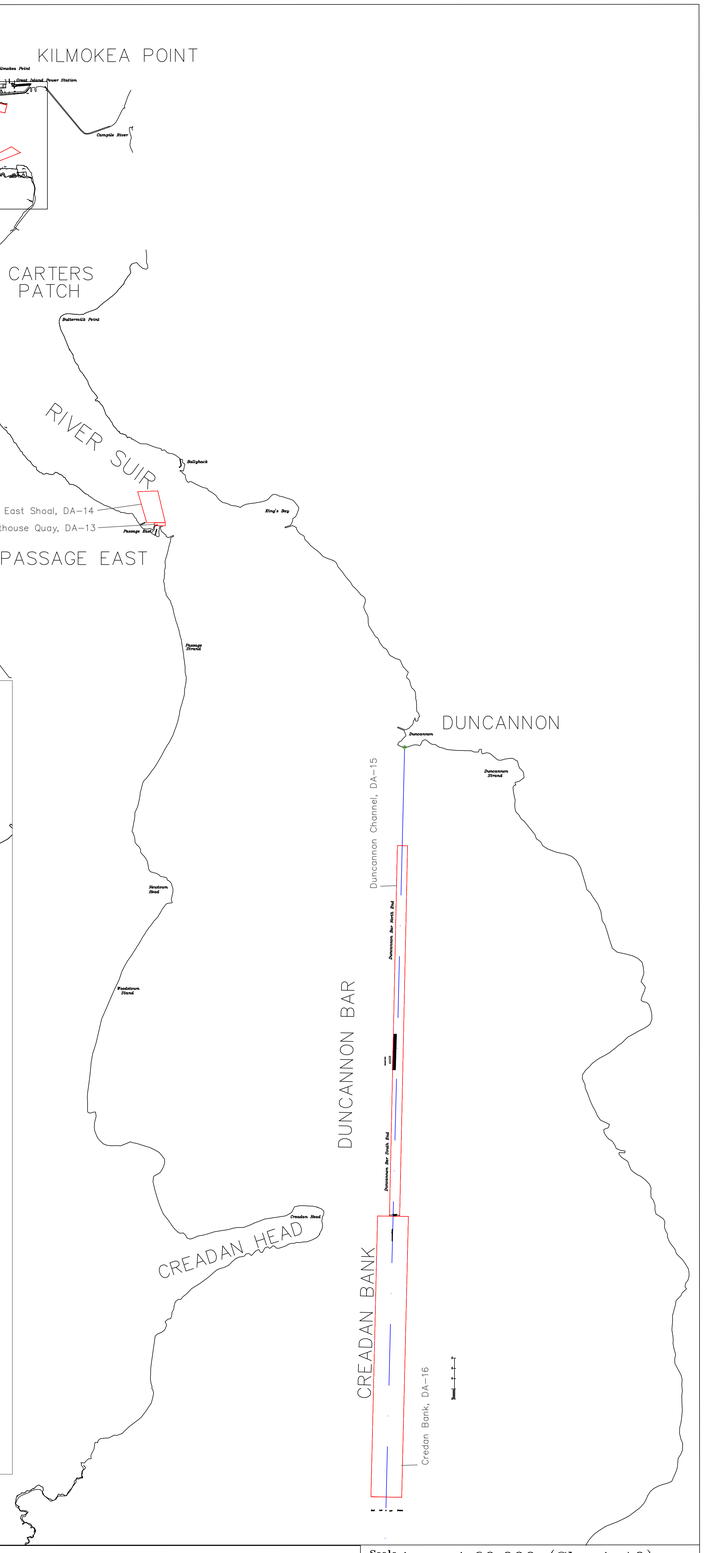












Dredge Area Name	ID	Area (Ha)	Deepest Potential Dredge Depth
Frank Cassin Wharf	DA-1	0.9	7.5mBCD
North Wharf	DA-2	1.9	8.0mBCD
Forde Wharf & Merchants Quay Marina	DA-3	1.9	6.5mBCD
Belview Berths	DA-4	3.7	10.0mCD
Belview Turning Area	DA-5	2.9	8.5mBCD
O'Brien's Quay	DA-6	0.6	11mBCD
Belview to O'Brien's Quay	DA-7	2	10.0mBCD
Spit Light and Queen's Channel	DA-8	3.25	8.0mBCD
Cheekpoint Lower	DA-9	16.53	8.0mBCD
Cheekpoint Harbour Access	DA-10	2.84	2.4mBCD
Great Island Jetty	DA-11	2	11mBCD
Cheekpoint Upper	DA-12	10.25	8.0mBCD
Passage East Boathouse Quay	DA-13	0.3	6.0mBCD
Passage East Shoal	DA-14	5.8	8.0mBCD
Duncannon Channel	DA-15	36	8.0mBCD
Creadan Bank	DA-16	83	8.5mBCD

Consultant

[redacted]

Client

PORT OF WATERFORD – MAINTENANCE DREDGING

Title

FIGURE 1 – DREDGE AREA OVERVIEW

Scale : 1:60,000 (Sheet A0)

Dwg Date : January 2024

DECLG FILE NUMBER: N/A

Drg.No. 636_D@S_Application_01

Certified By: [redacted] PhD CEng FIEI

11/01/2024

APPENDIX B

Proposed Maintenance Dredging Tonnage 2026-2033

Conversion Rates	Insitu Density (wet t/m^3)	Conversion Rate to Dry Tonnes	Offshore Disposal Rate per day		
			Dry Tonnes	Insitu Cubic Metres	Wet Tonnes
Creadan Bank	1.7	1.08	35,000	32,407	55,093
Duncannon	1.6	0.92	35,000	38,043	60,870
Cheekpoint Lower	1.5	0.76	35,000	46,053	69,079
Belview Berths	1.5	0.76	35,000	46,053	69,079
Passage East Boathouse Quay	1.6	0.92	35,000	38,043	60,870
Passage East Shoal	1.6	0.92	35,000	38,043	60,870
Cheekpoint Harbour Access	1.5	0.76	35,000	46,053	69,079
Great Island Jetty	1.5	0.76	35,000	46,053	69,079
Cheekpoint Upper	1.5	0.76	35,000	46,053	69,079
Belview Turning Area	1.5	0.76	35,000	46,053	69,079
O'Brien's Quay	1.5	0.76	35,000	46,053	69,079
Belview to O'Brien's Quay	1.5	0.76	35,000	46,053	69,079
Spit Light and Queen's Channel	1.5	0.76	N/A	N/A	N/A
Frank Cassin Wharf	1.5	0.76	N/A	N/A	N/A
North Wharf	1.5	0.76	N/A	N/A	N/A
Forde Wharf & Merchants Quay Marina	1.5	0.76	N/A	N/A	N/A

Particle Density	2.65	t/m^3			
Water Density	1.025	t/m^3			

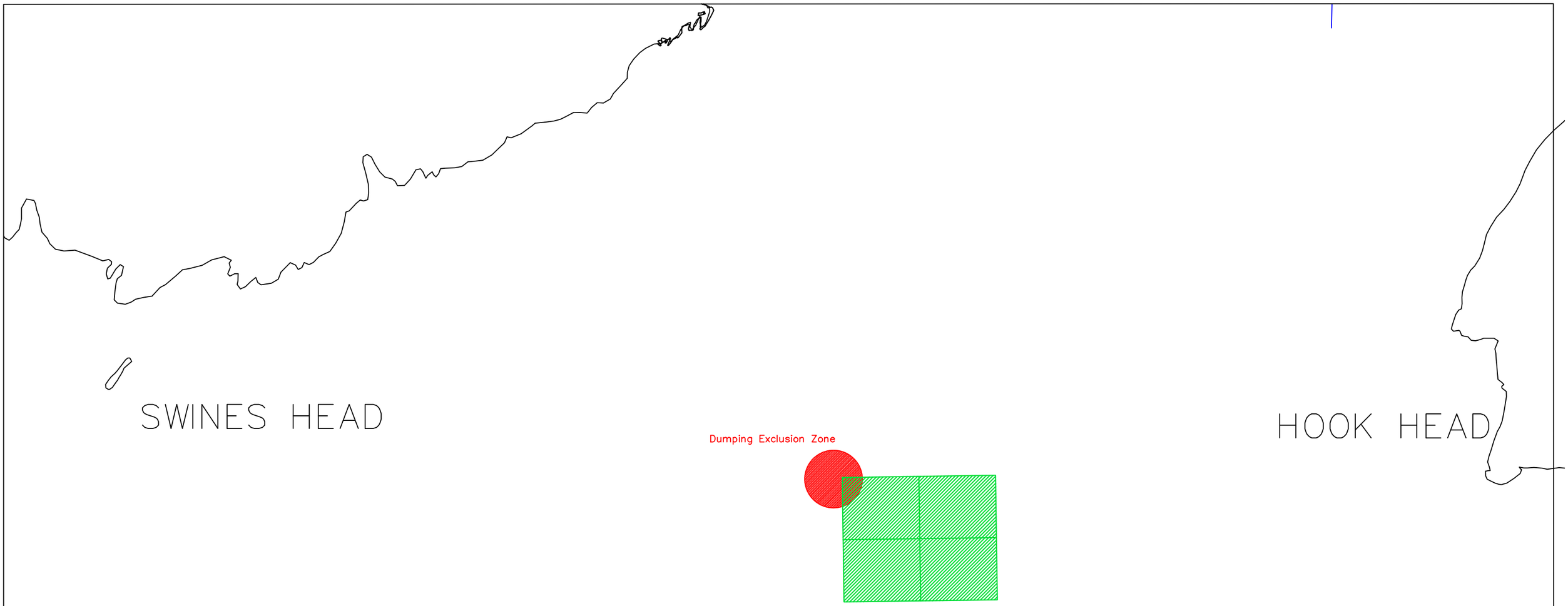
Dry Tonnage

Dredge Area Name	Method of Dredging	2026	2027	2028	2029	2030	2031	2032	2033	Total	Contingency
		(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes/year)
Creadan Bank	TSHD	0	0	0	0	0	0	0	0	**0**	175,000
	Plough	0	0	0	0	0	0	0	0	**0**	5,000
Duncannon	TSHD	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	**1,600,000**	150,000
	Plough	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	**8,000**	0
Cheekpoint Lower	TSHD	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	**1,200,000**	80,000
	Plough	52,500	52,500	52,500	52,500	52,500	52,500	52,500	52,500	**420,000**	27,500
Belview Berths	TSHD/Mechanical	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	**240,000**	17,500
	Plough	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	**80,000**	5,000
Passage East Boathouse Quay	TSHD/Mechanical	5,000	0	5000	0	5000	0	5000	0	**20,000**	0
	Plough	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	**8,000**	0
Passage East Shoal	TSHD/Mechanical	7,500	0	7,500	0	7,500	0	7,500	0	**30,000**	0
	Plough	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	**8,000**	0
Cheekpoint Harbour Access	TSHD/Mechanical	0	11,000	0	11,000	0	11,000	0	11,000	**44,000**	0
	Plough	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	**20,000**	2,500
Great Island Jetty	TSHD/Mechanical	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	**40,000**	5,000
	Plough	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	**16,000**	0
Cheekpoint Upper	TSHD	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	**40,000**	50,000
	Plough	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	**8,000**	0
Belview Turning Area	TSHD/Mechanical	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	**160,000**	10,000
	Plough	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	**16,000**	2,500
O'Brien's Quay	TSHD/Mechanical	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	**80,000**	5,000
	Plough	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	**8,000**	1,000
Belview to O'Brien's Quay	TSHD/Mechanical	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	**80,000**	20,000
	Plough	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	**12,000**	2,500
Spit Light and Queen's Channel	Plough	750	750	750	750	750	750	750	750	**6,000**	0
Frank Cassin Wharf	Plough	750	750	750	750	750	750	750	750	**6,000**	0
North Wharf	Plough	500	500	500	500	500	500	500	500	**4,000**	0
Forde Wharf & Merchants Quay Marina	Plough	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	**28,000**	0
Total Disposed at offshore dumping site (excl. contingency)		**442,500**	**441,000**	**442,500**	**441,000**	**442,500**	**441,000**	**442,500**	**441,000**	**3,534,000**	
Total Disposed at offshore dumping site (incl. max contingency)		**617,500**	**616,000**	**617,500**	**616,000**	**617,500**	**616,000**	**617,500**	**616,000**	**4,934,000**	
Total Dumped by Plough Dredging		**81,000**	**81,000**	**81,000**	**81,000**	**81,000**	**81,000**	**81,000**	**81,000**	**648,000**	

Wet Tonnage

Dredge Area Name	Method of Dredging	2026	2027	2028	2029	2030	2031	2032	2033	Total	Contingency
		(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes/year)
Creadan Bank	TSHD	0	0	0	0	0	0	0	0	**0**	275,463
	Plough	0	0	0	0	0	0	0	0	**0**	7,870
Duncannon	TSHD	347,826	347,826	347,826	347,826	347,826	347,826	347,826	347,826	**2,782,609**	260,870
	Plough	1,739	1,739	1,739	1,739	1,739	1,739	1,739	1,739	**13,913**	0
Cheekpoint Lower	TSHD	296,053	296,053	296,053	296,053	296,053	296,053	296,053	296,053	**2,368,421**	157,895
	Plough	103,618	103,618	103,618	103,618	103,618	103,618	103,618	103,618	**828,947**	54,276
Belview Berths	TSHD/Mechanical	59,211	59,211	59,211	59,211	59,211	59,211	59,211	59,211	**473,684**	34,539
	Plough	19,737	19,737	19,737	19,737	19,737	19,737	19,737	19,737	**157,895**	9,868
Passage East Boathouse Quay	TSHD/Mechanical	8,696	0	8,696	0	8,696	0	8,696	0	**34,783**	0
	Plough	1,739	1,739	1,739	1,739	1,739	1,739	1,739	1,739	**13,913**	0
Passage East Shoal	TSHD/Mechanical	13,043	0	13,043	0	13,043	0	13,043	0	**52,174**	0
	Plough	1,739	1,739	1,739	1,739	1,739	1,739	1,739	1,739	**13,913**	0
Cheekpoint Harbour Access	TSHD/Mechanical	0	21,711	0	21,711	0	21,711	0	21,711	**86,842**	0
	Plough	4,934	4,934	4,934	4,934	4,934	4,934	4,934	4,934	**39,474**	4,934
Great Island Jetty	TSHD/Mechanical	9,868	9,868	9,868	9,868	9,868	9,868	9,868	9,868	**78,947**	9,868
	Plough	3,947	3,947	3,947	3,947	3,947	3,947	3,947	3,947	**31,579**	0
Cheekpoint Upper	TSHD	9,868	9,868	9,868	9,868	9,868	9,868	9,868	9,868	**78,947**	98,684
	Plough	1,974	1,974	1,974	1,974	1,974	1,974	1,974	1,974	**15,789**	0
Belview Turning Area	TSHD/Mechanical	39,474	39,474	39,474	39,474	39,474	39,474	39,474	39,474	**315,789**	19,737
	Plough	3,947	3,947	3,947	3,947	3,947	3,947	3,947	3,947	**31,579**	4,934
O'Brien's Quay	TSHD/Mechanical	19,737	19,737	19,737	19,737	19,737	19,737	19,737	19,737	**157,895**	9,868
	Plough	1,974	1,974	1,974	1,974	1,974	1,974	1,974	1,974	**15,789**	1,974
Belview to O'Brien's Quay	TSHD/Mechanical	19,737	19,737	19,737	19,737	19,737	19,737	19,737	19,737	**157,895**	39,474
	Plough	2,961	2,961	2,961	2,961	2,961	2,961	2,961	2,961	**23,684**	4,934
Spit Light and Queen's Channel	Plough	1,480	1,480	1,480	1,480	1,480	1,480	1,480	1,480	**11,842**	0
Frank Cassin Wharf	Plough	1,480	1,480	1,480	1,480	1,480	1,480	1,480	1,480	**11,842**	0
North Wharf	Plough	987	987	987	987	987	987	987	987	**7,895**	0
Forde Wharf & Merchants Quay Marina	Plough	6,908	6,908	6,908	6,908	6,908	6,908	6,908	6,908	**55,263**	0
Total Disposed at offshore dumping site (excl. contingency)		**823,513**	**823,484**	**823,513**	**823,484**	**823,513**	**823,484**	**823,513**	**823,484**	**6,587,986**	
Total Disposed at offshore dumping site (incl. max contingency)		**1,098,976**	**1,098,947**	**1,098,976**	**1,098,947**	**1,098,976**	**1,098,947**	**1,098,976**	**1,098,947**	**8,791,690**	
Total Dumped by Plough Dredging		**159,165**	**159,165**	**159,165**	**159,165**	**159,165**	**159,165**	**159,165**	**159,165**	**1,273,318**	

APPENDIX C



	WGS84 Coordinates		Irish Transverse Mercator (ITM)		Area (Ha)
	Latitude	Longitude	Eastings (m)	Northings (m)	
Disposal Site	52° 07.45' N	06° 58.80' W	669785.25	597454.29	52 Hectares
	52° 07.10' N	06° 58.80' W	669794.37	596805.42	
	52° 07.10' N	06° 58.10' W	670593.21	596816.54	
	52° 07.45' N	06° 58.10' W	670583.99	597465.57	

Consultant [redacted]

Client

PORT OF WATERFORD – MAINTENANCE DREDGING

Title

FIGURE 8 – DISPOSAL AREA

Scale : 1:20000

Dwg Date : January 2024

DECLG FILE NUMBER: N/A

Drg.No 636_D@S_Application_08

Certified By: [redacted] PhD CEng FIEI

11/01/2024